**The food environment in Latin America: a systematic review with a focus on environments relevant to obesity and related chronic diseases**

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# Supplementary file I: Methodology details

## Search strategy

We followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines for systematic reviews. We searched the literature published from January 1, 1999 up to July 2017 using Web of Science (which includes the indexes in PubMed), LILACS and SciELO. The search strategy and comprehensive list of search terms was developed with input from all members of the writing group.

Our search strategy was broad in order to identify descriptive studies of the food environment and those which investigated the association between the food environment and a health outcome or policy. The search strategy was designed to include (diet-food AND spatial) OR food retail OR food composition OR food marketing OR food labelling OR food price AND Latin America. Key words were translated into Portuguese and Spanish by native Portuguese/Spanish speakers and used for the SciELO and LILACS databases.

*Exclusion criteria*

Exclusion criteria were as follows: 1. Context is outside Latin America; 2. Not related to food-diet-obesity-chronic diseases (e.g., studies examining food safety and infection); 3. No explicit link to food environment or empirical evidence on policies targeting the food environment (e.g., only diet/health measurements were presented); 4. Not focused on empirical field quantitative data (study types excluded: modelling studies, lab-based experiments, commentaries, reviews, thought-pieces and qualitative studies); 5. Consumer demand-side behaviours or studies focused on consumers’ knowledge-attitudes; 6. Home food environment studies; 7. Macro-economic studies of food demand; 8. Studies with a very small analytic sample (<10 units for analyses /summarization); 9. Studies that described instruments, methodologies or validations; 10. Studies where some variable relating to the food environment was used as a covariate in the study of some other association.

*Search words:*

**Diet-Food**: eat\*, diet, nutrition, food.

**Spatial**: environmental factor, environmental condition\*, built env\*, community-level determinant, environmental design, community-level info\*, GIS, geographic information system, residence characteristic, neighbourhood, neighbourhood, street\*, area-level.

**Food Retail**: food environment, food outlet, food store, food shop\*, food retail, restaurant\*, fast food, supermarket, food availability.

**Food Composition or Marketing or Price**: processed food, food promotion, ultra-processed, food labelling, food marketing, food packaging, front-of-Pack marketing, persuasive marketing techniques, food price, food tax.

**Latin America** were: Latin America, Central America, South America, Mexico, Guatemala, El Salvador, Honduras, Nicaragua, Panama, Costa Rica, Colombia, Venezuela, Brazil, Uruguay, Paraguay, Argentina, Chile, Peru, Bolivia, Ecuador, Caribbean, Cuba, Dominican Repubic, Haití, Belize, French Guiana, Suriname, Guiana

*Databases*

Web of Science

SciELO and LILACS (mainly articles in Spanish and Portuguese)

Search words were translated to Spanish and Portuguese for SciELO and LILACS.

*Limits for Web of Science*

Subjects excluded: biochemistry and molecular biology OR biotechnology and applied microbiology OR cell biology OR fisheries OR marine and fresh water biology OR microbiology OR plant sciences OR toxicology OR chemistry OR engineering OR parasitology OR Marine & Freshwater Biology OR Tropical medicine OR zoology OR veterinary sciences OR agriculture dairy animal science OR entomology OR oceanography OR biology OR infectious diseases OR environmental sciences

**Final query run on 4th July, 2017**

Web of Science search strategy

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| #14 | #13 AND #4 *DocType=All document types; Language=All languages;*  |
| #13 | (TS=("food marketing" OR "food packaging" OR "front-of-Pack marketing" OR "persuasive marketing techniques")) *AND* **LANGUAGE:** (English OR Portuguese OR Spanish) *AND* **DOCUMENT TYPES:** (Article) *DocType=All document types; Language=All languages;*  |
| #12 | (#11 OR #10 NOT SU=(biochemistry and molecular biology OR biotechnology and applied microbiology OR cell biology OR fisheries OR marine and fresh water biology OR microbiology OR plant sciences OR toxicology OR chemistry OR engineering OR parasitology OR Marine & Freshwater Biology OR Tropical medicine OR zoology OR veterinary sciences OR agriculture dairy animal science OR entomology OR oceanography OR biology OR infectious diseases OR environmental sciences)) *AND* **LANGUAGE:** (English OR Portuguese OR Spanish) *AND* **DOCUMENT TYPES:** (Article) *DocType=All document types; Language=All languages;*  |
| #11 | #9 AND #5 AND #4 *DocType=All document types; Language=All languages;*  |
| #10 | #9 AND #4 *DocType=All document types; Language=All languages;*  |
| #9 | #8 OR #6 *DocType=All document types; Language=All languages;*  |
| #8 | #7 AND #1 *DocType=All document types; Language=All languages;*  |
| #7 | (TS= (spatial OR "environmental factor\*" OR "environmental condition\*" OR "environment design" OR "built env\*" OR "community-level determinant\*" OR "community-level info\*" OR GIS OR "geographic information system" OR "residence characteristic" OR neighbourhood OR neighbourhood OR Street OR "area-level")) *AND* **LANGUAGE:** (English OR Portuguese OR Spanish) *AND* **DOCUMENT TYPES:** (Article) *DocType=All document types; Language=All languages;*  |
| #6 | (TS= ("food environment" OR "food outlet" OR "food store\*" OR "food shop\*" OR "food retail\*" OR restaurant\* OR "fast food" OR supermarket\* OR "food availability" OR "processed food" OR "ultra-processed" OR "food labeling" OR "food promotion" OR "food advertising")) *AND* **LANGUAGE:** (English OR Portuguese OR Spanish) *AND* **DOCUMENT TYPES:** (Article) *DocType=All document types; Language=All languages;*  |
| #5 | (((TS= (BMI OR "Body Mass Index" OR obesity OR "body weight" OR overweight OR "weight gain" OR "weight loss" OR adiposity)))) *AND* **LANGUAGE:** (English OR Portuguese OR Spanish) *AND* **DOCUMENT TYPES:** (Article) *DocType=All document types; Language=All languages;*  |
| #4 | #3 OR #2 *DocType=All document types; Language=All languages;*  |
| #3 | (((CU= (Mexico OR Guatemala OR "El Salvador" OR Honduras OR Nicaragua OR Panama OR "Costa Rica" OR Colombia OR Venezuela OR Brazil OR Uruguay OR Paraguay OR Argentina OR Chile OR Peru OR Bolivia OR Ecuador OR Cuba OR "Dominican Repubic" OR Haití OR Belize OR "French Guiana" OR Suriname OR Guiana)))) *AND* **LANGUAGE:** (English OR Portuguese OR Spanish) *AND* **DOCUMENT TYPES:** (Article) *DocType=All document types; Language=All languages;*  |
| #2 | (((TS= ("Latin America" OR "Central America" OR "South America" OR Mexico OR Guatemala OR "El Salvador" OR Honduras OR Nicaragua OR Panama OR "Costa Rica" OR Colombia OR Venezuela OR Brazil OR Uruguay OR Paraguay OR Argentina OR Chile OR Peru OR Bolivia OR Ecuador OR Caribbean OR Cuba OR "Dominican Repubic" OR Haití OR Belize OR "French Guiana" OR Suriname OR Guiana)))) *AND* **LANGUAGE:** (English OR Portuguese OR Spanish) *AND* **DOCUMENT TYPES:** (Article) *DocType=All document types; Language=All languages;*  |
| #1 | (TS= (food OR diet OR eat\* OR nutrition\*)) *AND* **LANGUAGE:** (English OR Portuguese OR Spanish) *AND* **DOCUMENT TYPES:** (Article) *DocType=All document types; Language=All languages;*  |

## Data extraction fields

Using an excel template we extracted study information including: country, sample size, study setting, study design, data collection methods, INFORMAS dimension, key variables, main findings, whether findings were stratified by a variable of socioeconomic position, funding sources and language. For each INFORMAS dimension we identified key aspects of the studies using as a guideline the extraction fields used for INFORMAS systematic reviews.(Kelly et al. 2013; Lee et al. 2013; Neal et al. 2013; Ni Mhurchu et al. 2013; Rayner et al. 2013)

For **food retail** studies we extracted information on whether the interest was the consumer food environment (availability and nutritional quality of products within stores) or the community food environment (type, availability and accessibility of food outlets)(Glanz et al. 2005), whether the measurement of the food environment was objective (i.e. GIS based), or subjective (i.e. perception surveys), the methods used to estimate density or distance to food stores and the definition of the geographic area that was used.

For **labelling studies**, we extracted information on the food-labelling component studied (i.e. supplementary nutrition information, nutrition/health claims), sampling frame, sample design and whether the study aimed to monitor an existing regulation or policy.

For **promotion studies** we extracted information on media platform, monitoring approach, promotion element assessed, system for defining products as healthy and unhealthy and target audience.

For **composition studies** we extracted the type and number of foods studied, the nutrients studied and the methods used to assess composition (i.e. from ingredient lists, or direct chemical analyses of products).

For **price studies** we extracted comparison unit (e.g. price per calorie), definition of healthy/unhealthy food, and for intervention studies pricing strategy (i.e. taxes, value added tax exemptions or subsidies).

## Analysis of food retail analytic studies

To summarize findings from the analytic food retail studies we first classified associations into one of four possible combination categories between: healthier/unhealthier food environment and favourable/unfavourable health outcome/behaviour. Heathier food environments had higher density of fresh produce stores (including fruit and vegetable stores) and supermarkets. Unhealthier food environments had higher density of fast food restaurants and convenience stores. Favourable health outcomes/behaviours related to consumption of fruits and vegetables mainly while unfavourable health outcomes/behaviours were overweight/obesity, and sugar sweetened beverage consumption. We evaluated the direction and strength of each association and classified according to whether the association was in the expected direction i.e. in agreement with hypothesis, null or in unexpected direction. We then summarised associations within each combination category. We took note about factors which could potentially affect the associations for example whether the food environment measures were objective or subjective and whether health behaviours/outcomes were self-reported or measured however, due to high heterogeneity of published studies we were not able to summarize results within finer categories.

# Supplementary file II: List of all included studies

## Food retail/provision

1. Alexander E, Yach D, Mensah GA. Major multinational food and beverage companies and informal sector contributions to global food consumption: implications for nutrition policy. Globalization and Health. 2011;7.

2. Alvirde-García U, Aguilar-Salinas CA, Gómez-Pérez FJ, Henao-Morán S, Rodríguez-Guerrero AJ. Resultados de un programa comunitario de intervención en el estilo de vida en niños. Salud Publica Mex. 2013;55(supl.3):406-14.

3. Azeredo CM, de Rezende LFM, Canella DS, Claro RM, Peres MFT, Luiz OD, et al. Food environments in schools and in the immediate vicinity are associated with unhealthy food consumption among Brazilian adolescents. Preventive Medicine. 2016;88:73-9.

4. Bridle-Fitzpatrick S. Food deserts or food swamps?: A mixed-methods study of local food environments in a Mexican city. Social Science & Medicine. 2015;142:202-13.

5. Chaudhari LS, Begay RC, Schulz LO. Fifteen years of change in the food environment in a rural Mexican community: the Maycoba project. Rural and Remote Health. 2013;13(3).

6. Chor D, Cardoso LO, Nobre AA, Griep RH, Fonseca MDM, Giatti L, et al. Association between perceived neighbourhood characteristics, physical activity and diet quality: results of the Brazilian Longitudinal Study of Adult Health (ELSA-Brasil). Bmc Public Health. 2016;16.

7. Constante Jaime P, Sarti Machado FM, Faria Westphal M, Monteiro CA. Impacto de una intervención basada en la comunidad, en el mayor consumo de frutas y vegetales en familias de bajos ingresos, Sao Paulo, Brasil. Revista chilena de nutrición. 2006;33:266-71.

8. Correa EN, Padez CMP, de Abreu AH, de Vasconcelos FDG. Geographic and socioeconomic distribution of food vendors: a case study of a municipality in the Southern Brazil. Cadernos De Saude Publica. 2017;33(2).

9. Costa BVD, Oliveira CD, Lopes AC. Food environment of fruits and vegetables in the territory of the Health Academy Program. Cadernos De Saude Publica. 2015;31:S159-S69.

10. da Silva SA, Cardoso RDV, Goes JAW, Santos JN, Ramos FP, de Jesus RB, et al. Street food on the coast of Salvador, Bahia, Brazil: A study from the socioeconomic and food safety perspectives. Food Control. 2014;40:78-84.

11. Duran AC, Diez Roux AV, Latorre M, Jaime PC. Neighborhood socioeconomic characteristics and differences in the availability of healthy food stores and restaurants in Sao Paulo, Brazil. Health & place. 2013;23:39-47.

12. Gartin M. Food deserts and nutritional risk in paraguay. American Journal of Human Biology. 2012;24(3):296-301.

13. Barrera LH, Rothenberg SJ, Barquera S, Cifuentes E. The Toxic Food Environment Around Elementary Schools and Childhood Obesity in Mexican Cities. American Journal of Preventive Medicine. 2016;51(2):264-70.

14. Jaime PC, Duran AC, Sarti FM, Lock K. Investigating Environmental Determinants of Diet, Physical Activity, and Overweight among Adults in Sao Paulo, Brazil. Journal of Urban Health-Bulletin of the New York Academy of Medicine. 2011;88(3):567-81.

15. Leite FHM, de Oliveira MA, Cremm ED, de Abreu DSC, Maron LR, Martins PA. Availability of processed foods in the perimeter of public schools in urban areas. Jornal De Pediatria. 2012;88(4):328-34.

16. Lopez-Barron RG, Jimenez-Cruz A, Bacardi-Gascon M. Modifiable environmental obesity risk factors among elementary school children in a Mexico-US Border City. Nutricion Hospitalaria. 2015;31(5):2047-53.

17. Matozinhos FP, Melendez GV, Pessoa MC, Mendes L, Gomes CS, Costa MA. Spatial distribution of obesity in an urban Brazilian area. Ciencia & Saude Coletiva. 2015;20(9):2779-86.

18. Mendes LL, Nogueira H, Padez C, Ferrao M, Velasquez-Melendez G. Individual and environmental factors associated for overweight in urban population of Brazil. Bmc Public Health. 2013;13.

19. Motter AF, de Vasconcelos FDG, Correa EN, de Andrade DF. Retail food outlets and the association with overweight/obesity in schoolchildren from Florianopolis, Santa Catarina State, Brazil. Cadernos De Saude Publica. 2015;31(3):620-32.

20. Pessoa MC, Mendes LL, Gomes CS, Martins PA, Velasquez-Melendez G. Food environment and fruit and vegetable intake in a urban population: A multilevel analysis. Bmc Public Health. 2015;15.

21. Pessoa MC, Mendes LL, Caiaffa WT, Malta DC, Velasquez-Melendez G. Availability of food stores and consumption of fruit, legumes and vegetables in a Brazilian urban area. Nutricion Hospitalaria. 2015;31(3):1438-43.

22. Safdie M, López-Olmedo N, Campirano-Núñez F, Janssen I, Lévesque L, Aburto T, et al. Impact of a school-based intervention program on obesity risk factors in Mexican children. Salud Publica Mex. 2013;55(supl.3):374-87.

23. Soltero EG, Ortiz Hernandez L, Jauregui E, Levesque L, Taylor JLY, Barquera S, et al. Characterization of the School Neighborhood Food Environment in Three Mexican Cities. Ecology of Food and Nutrition. 2017;56(2):139-51.

24. Tofanell MBD, Fernandes MD, Filho OBM, Carrijo NS. Fresh fruit losses at retail markets in mineiros, state of Goias, Brazil. Revista Brasileira De Fruticultura. 2007;29(3):513-7.

25. Vedovato GM, Trude ACB, Kharmats AY, Martins PA. Degree of food processing of household acquisition patterns in a Brazilian urban area is related to food buying preferences and perceived food environment. Appetite. 2015;87:296-302.

26. Velasquez-Melendez G, Mendes LL, Padez CMP. Built environment and social environment: associations with overweight and obesity in a sample of Brazilian adults. Cadernos De Saude Publica. 2013;29(10):1988-96.

27. Zuccolotto DCC, Barbieri P, Sartorelli DS. Food environment and family support in relation to fruit and vegetable intake in pregnant women. Archivos Latinoamericanos De Nutricion. 2015;65(4):216-24.

## Food promotion

28. Amanzadeh B, Sokal-Gutierrez K, Barker JC. An interpretive study of food, snack and beverage advertisements in rural and urban El Salvador. Bmc Public Health. 2015;15.

29. Britto SDR, Viebig RF, Morimoto JM. Analysis of food advertisements on cable television directed to children based on the food guide for the Brazilian population and current legislation. Revista De Nutricao-Brazilian Journal of Nutrition. 2016;29(5):721-9.

30. Carriedo Á, Théodore FL, Bonvecchio A, Mena C, López N, Morales M, et al. Uso del mercadeo social para aumentar el consumo de agua en escolares de la Ciudad de México. Salud Publica Mex. 2013;55(supl.3):388-96.

31. Castillo-Lancellotti C, Perez-Santiago O, Rivas-Castillo C, Fuentes-Garcia R, Tur-Mari JA. Analysis of food advertising aimed at children and adolescents in Chilean open channel television. Revista Espanola De Nutricion Comunitaria-Spanish Journal of Community Nutrition. 2010;16(2):90-7.

32. Soo J, Letona P, Chacon V, Barnoya J, Roberto CA. Nutritional quality and child-oriented marketing of breakfast cereals in Guatemala. International Journal of Obesity. 2016;40(1):39-44.

33. Chacon V, Letona P, Villamor E, Barnoya J. Snack food advertising in stores around public schools in Guatemala. Critical Public Health. 2015;25(3):291-8.

34. Gimenez A, de Saldamando L, Curutchet MR, Ares G. Package design and nutritional profile of foods targeted at children in supermarkets in Montevideo, Uruguay. Cadernos De Saude Publica. 2017;33(5).

35. Gunderson MD, Clements D, Neelon SEB. Nutritional quality of foods marketed to children in Honduras. Appetite. 2014;73:1-6.

36. Kelly B, Halford JCG, Boyland EJ, Chapman K, Bautista-Castano I, Berg C, et al. Television Food Advertising to Children: A Global Perspective. American Journal of Public Health. 2010;100(9):1730-6.

37. Maia EG, Costa BVD, Coelho FD, Guimaraes JS, Fortaleza RG, Claro RM. Analysis of TV food advertising in the context of recommendations by the Food Guide for the Brazilian Population. Cadernos De Saude Publica. 2017;33(4).

38. Pagnoncelli MGB, Batista AM, Da Silva MCM, Da Costa APM, De Araujo FR, Marques MP, et al. Analysis of advertisements of infant food commercialized in the city of Natal, Rio Grande do Norte, Brazil. Brazilian Journal of Pharmaceutical Sciences. 2009;45(2):339-48.

39. Patino SRG, Tolentino-Mayo L, Monterrubio EAF, Harris JL, Vandevijvere S, Rivera JA, et al. Nutritional quality of foods and non-alcoholic beverages advertised on Mexican television according to three nutrient profile models. Bmc Public Health. 2016;16.

40. Perez-Salgado D, Rivera-Marquez JA, Ortiz-Hernandez L. Food advertising in Mexican television: are children more exposed? Salud Publica De Mexico. 2010;52(2):119-26.

41. Ramirez-Ley K, De Lira-Garcia C, Souto-Gallardo MD, Tejeda-Lopez MF, Castaneda-Gonzalez LM, Bacardi-Gascon M, et al. Food-related advertising geared toward Mexican children. Journal of Public Health. 2009;31(3):383-8.

42. Chacon V, Letona P, Barnoya J. Child-oriented marketing techniques in snack food packages in Guatemala. BMC Public Health. 2013;13:967.

43. Mazariegos S, Chacon V, Cole A, Barnoya J. Nutritional quality and marketing strategies of fast food children's combo meals in Guatemala. BMC obesity. 2016;3:52.

44. Almeida SD, Nascimento P, Quaioti TCB. Amount and quality of food advertisement on Brazilian television. Revista De Saude Publica. 2002;36(3):353-5.

## Food Labelling

45. Blanco-Metzler A, Rosello-Araya M, Nunez-Rivas HP. Basal state of the nutritional information declared in labels of foods products marketed in Costa Rica. Archivos Latinoamericanos De Nutricion. 2011;61(1):87-95.

46. Dias JR, Goncalves E. Consumption and analysis of nutricional label of foods with high content of trans fatty acids. Ciencia E Tecnologia De Alimentos. 2009;29(1):177-82.

47. Kraemer MVD, Machado PP, Kliemann N, Chica DAG, Proenca RPD. The Brazilian population consumes larger serving sizes than those informed on labels. British Food Journal. 2015;117(2):719-30.

48. Kliemann N, Veiros MB, Gonzalez-Chica DA, Proenca RPD. Reference serving sizes for the Brazilian population: An analysis of processed food labels. Revista De Nutricao-Brazilian Journal of Nutrition. 2014;27(3):329-41.

49. Kliemann N, Veiros MB, Gonzalez-Chica DA, Proenca R. Serving size on nutrition labeling for processed foods sold in Brazil: Relationship to energy value. Revista De Nutricao-Brazilian Journal of Nutrition. 2016;29(5):741-50.

50. Machado PP, Kraemer MVD, Kliemann N, Colussi CF, Veiros MB, Proenca RPD. Serving sizes and energy values on the nutrition labels of regular and diet/light processed and ultra-processed dairy products sold in Brazil. British Food Journal. 2016;118(7):1579-93.

51. Kraemer MVD, de Oliveira RC, Gonzalez-Chica DA, Proenca RPD. Sodium content on processed foods for snacks. Public Health Nutrition. 2016;19(6):967-75.

52. Maestro V, Salay E. Nutritional and health information released to consumers by commercial fast food and full service restaurants. Ciencia E Tecnologia De Alimentos. 2008;28:208-16.

53. Mayhew AJ, Lock K, Kelishadi R, Swaminathan S, Marcilio CS, Iqbal R, et al. Nutrition labelling, marketing techniques, nutrition claims and health claims on chip and biscuit packages from sixteen countries. Public Health Nutrition. 2016;19(6):998-1007.

54. Nishida W, Fernandes AC, Veiros MB, Chica DAG, Proenca R. A comparison of sodium contents on nutrition information labels of foods with and without nutrition claims marketed in Brazil. British Food Journal. 2016;118(7):1594-609.

55. Rodrigues VM, Rayner M, Fernandes AC, de Oliveira RC, Proenca RPD, Fiates GMR. Comparison of the nutritional content of products, with and without nutrient claims, targeted at children in Brazil. British Journal of Nutrition. 2016;115(11):2047-56.

56. Silveira BM, Gonzalez-Chica DA, Proenca RPD. Reporting of trans-fat on labels of Brazilian food products. Public Health Nutrition. 2013;16(12):2146-53.

57. Urquiaga I, Lamarca M, Jimenez P, Echeverria G, Leighton F. Assessment of the reliability of food labeling in Chile. Revista Medica De Chile. 2014;142(6):775-81.

58. Zucchi ND, Fiates GMR. Analysis of the presence of nutrient claims on labels of ultra-processed foods directed at children and of the perception of kids on such claims. Revista De Nutricao-Brazilian Journal of Nutrition. 2016;29(6):821-32.

## Food composition

59. Ferrante D, Apro N, Perel P, Sosa M, Aguilar V, Casas J, et al. Feasibility of salt reduction in processed foods in Argentina. Rev Panam Salud Publica. 2011;29(2):69-75.

60. Heredia-Blonval K, Blanco-Metzler A, Montero-Campos M, Dunford EK. The salt content of products from popular fast-food chains in Costa Rica. Appetite. 2014;83:173-7.

61. Martins CA, de Sousa AA, Veiros MB, Gonzalez-Chica DA, Proenca RPD. Sodium content and labelling of processed and ultra-processed food products marketed in Brazil. Public Health Nutrition. 2015;18(7):1206-14.

62. Morales-Guerrero JC, Garcia-Zepeda RA, Ruiz-Jimenez S, Rosas-Romero MJ, Salas-Velazquez V, Morales-Ravel C. CHEMICAL ANALYSIS OF TYPICAL COOKED FOODS OF THE STATES OF PUEBLA AND TLAXCALA, MEXICO. Agrociencia. 2015;49(7):749-58.

63. Scherr C, Ribeiro JP. Composição química de alimentos: implicações na prevenção da aterosclerose. Rev Assoc Med Bras. 2011;57(2):153-7.

64. Suzuki RM, Montanher PF, Visentainer JV, de Souza NE. Proximate composition and quantification of fatty acids in five major Brazilian chocolate brands. Ciencia E Tecnologia De Alimentos. 2011;31(2):541-6.

65. Bandoni DH, Canella DS, Levy RB, Jaime PC. Eating out or in from home: Analyzing the quality of meal according eating locations. Revista De Nutricao-Brazilian Journal of Nutrition. 2013;26(6):625-32.

## Food Price

66. Claro RM, Monteiro CA. Family income, food prices, and household purchases of fruits and vegetables in Brazil. Rev Saude Publica. 2010;44(6):1014-20.

67. Claro RM, Maia EG, Costa BVD, Diniz DP. Food prices in Brazil: prefer cooking to ultra-processed foods. Cadernos De Saude Publica. 2016;32(8).

68. Claro RM, Carmo HC, Machado FM, Monteiro CA. [Income, food prices, and participation of fruit and vegetables in the diet]. Rev Saude Publica. 2007;41(4):557-64.

69. Colchero MA, Zavala JA, Batis C, Shamah-Levy T, Rivera-Dommarco JA. [Changes in prices of taxed sugar-sweetened beverages and nonessential energy dense food in rural and semi-rural areas in Mexico]. Salud Publica Mex. 2017;59(2):137-46.

70. Colchero MA, Salgado JC, Unar-Munguia M, Molina M, Ng S, Rivera-Dommarco JA. Changes in Prices After an Excise Tax to Sweetened Sugar Beverages Was Implemented in Mexico: Evidence from Urban Areas. PloS one. 2015;10(12):e0144408.

71. Colchero MA, Guerrero-Lopez CM, Molina M, Rivera JA. Beverages Sales in Mexico before and after Implementation of a Sugar Sweetened Beverage Tax. PloS one. 2016;11(9):e0163463.

72. Moubarac JC, Claro RM, Baraldi LG, Levy RB, Martins APB, Cannon G, et al. International differences in cost and consumption of ready-to-consume food and drink products: United Kingdom and Brazil, 2008-2009. Global Public Health. 2013;8(7):845-56.

73. Yuba TY, Sarti FM, Campino ACC, do Carmo HCE. Evolution of the relative prices of food groups between 1939 and 2010 in the city of Sao Paulo, Southeastern Brazil. Revista De Saude Publica. 2013;47(3):549-59.

## Food composition and labelling

74. Campos MDM, Blanco-Metzler A, Chan VC. Sodium in breads and snacks of high consumption in Costa Rica. Basal content and verification of nutrition labeling. Archivos Latinoamericanos De Nutricion. 2015;65(1):36-43.

75. Gagliardi ACM, Mancini J, Santos RD. Nutritional profile of foods with zero trans fatty acids claim. Revista Da Associacao Medica Brasileira. 2009;55(1):50-3.

76. Lobanco CM, Vedovato GM, Cano C, Bastos DHM. Reliability of food labels from products marketed in the city of Sao Paulo, Southeastern Brazil. Revista De Saude Publica. 2009;43(3).

77. Longo-Silva G, Toloni MHD, Taddei J. Traffic light labeling: translating food labeling. Revista De Nutricao-Brazilian Journal of Nutrition. 2010;23(6):1031-40.

78. Ribeiro VF, Ribeiro MD, Vasconcelos MAD, Andrade SAC, Stamford TLM. Processed foods aimed at children and adolescents: Sodium content, adequacy according to the dietary reference intakes and label compliance. Revista De Nutricao-Brazilian Journal of Nutrition. 2013;26(4):397-406.

79. Rodrigues VM, Rayner M, Fernandes AC, de Oliveira RC, Proenca RPC, Fiates GMR. Nutritional quality of packaged foods targeted at children in Brazil: which ones should be eligible to bear nutrient claims? International Journal of Obesity. 2017;41(1):71-5.

## Food composition and price

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**Food retail and price**

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# Supplementary File III: Figure S1. Number of studies by INFORMAS dimension and country

\*For studies investigating more than one dimension, the dominant dimension was counted in order to better display the data

# Supplementary file IV: Table S1. Measures of the retail food environment and neighbourhood definition, descriptive studies

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Objective / perception** | **Availability / accessibility** | **FE variable definition** | **Geographic level** | **Study** |
| **Community food environment** |  |  |   |
| Objective measures | Availability | Number and type of stores  | Neighbourhood (census tract) | Duran 2013 |
|  |  | Number of food stores by type‡ | Neighbourhood (coverage area of health units) | Matozinhos, 2015 |
|   |  | Density of food stores | Neighbourhood (1.5 sq. Km that included three schools) | Briddle-Fitzpatrick, 2015 |
|   |  | Density of food stores by type‡ | Neighbourhood (census tract) | Correa, 2017 |
|   |  | Density of food stores by type‡ | Neighbourhood (coverage area of health units) | Pessoa, 2015 |
|   |  | Density of food stores by type‡ | School neighbourhood (800m buffer around schools in 3 cities) | Soltero, 2016 |
| **Consumer food environment** |  |  |   |
| Objective measures | Availability | Within store healthy food availability, using adapted NEMS, EPOCH instruments \*◊ | Neighbourhood (census tract) | Duran 2013 |
|   |  | Within in store healthy food availability, using adapted NEMS\* | Neighbourhood (1mile buffer around supermarket) | Gartin, 2012 |
|   |  | Within store food availability, using own instrument | Rural community | Chaudhari, 2013 |
|   |  | Within store availability, variety and advertising of foods, using ESAO instrument♦ | Neighbourhood (1.6 km buffer around public fitness programmes) | Costa, 2015 |
|   |  | Food items sold by street vendors using validated questionnaire | Neighbourhood (the city's beach) | da Silva, 2014 |
|   |  | Within store availability of ultra-processed foods and minimally processed foods in shops, using validated adapted NEMS ⸸ | School neighbourhood (500m buffer around schools) | Leite, 2012 |
|   |  | Within store availability of foods with and without trans fats, using own instrument | School neighbourhood (500m buffer around schools) | Silveira, 2014 |
|   |  | Within store availability, price and promotion of foods, using adapted NEMS instrument | Neighbourhood (1.5 sq. Km that included three schools) | Briddle-Fitzpatrick, 2015 |
| Perception measures |  | Perception of food environment | Neighbourhood (1.5 sq. Km that included three schools) | Briddle-Fitzpatrick, 2015 |
|   |   | Perception of food availability in school and around school | School and neighbourhood (undefined buffer around schools) | Lopez-Barron, 2015 |

\*(Glanz et al. 2007) ◊(Chow et al. 2010) ♦ (Duran et al. 2013) ⸸(Martins et al. 2013). ‡ type: supermarkets, grocery stores, convenience stores, fresh produce stores. No descriptive studies used objectively measured distance to food stores, nor perception measures of availability and accessibility of foods.

# Supplementary file V: Table S2. Measures of the retail food environment and neighbourhood definition, analytic studies

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Objective / perception**  | **Availability / accessibility** | **FE variable definition** | **Geographic level** | **Study** |
| **Community food environment** |  |  |
| Objective measures  | Availability | Number of food vendors (formal and informal)  | School neighbourhood (100 m buffer around schools) | Hernandez Barrera, 2008 |
|  |  | Density of food stores by type‡  | Neighbourhood (sub municipalities of Sao Paulo)  | Jaime, 2011 |
|   |  | Presence of supermarkets (y/n) presence of FV shops (y/n)  | Neighbourhood (census tract) | Mendes, 2013 |
|   |  | Number of food stores by type‡ | Neighbourhood (coverage area of health units) | Pessoa, 2015 |
|   |  | Presence of supermarkets (y/n) presence of FV shops (y/n)  | Neighbourhood (census tract) | Velasquez-Melendez 2013 |
|   |  | Density of food stores  | Neighbourhood (Euclidean buffer of 1.6km around households) | Duran 2015 |
|   | Accessibility | Euclidean distance to the nearest food store from home | Neighbourhood (Euclidean buffer of 1.6km around households) | Duran 2015 |
| Perception measures  | Availability  | Perceived availability of healthy food using 'Availability of Healthy Foods Scale'◊ | Neighbourhood ("area around where you live and around your house") | Chor, 2016 |
|   |  | Perceived availability of FV and' healthy food', using own instrument | Neighbourhood (unspecified) | Vedovato, 2015 |
|   | Accessibility | Perceived walking distance to different types of shops (e.g. FV, butcher) from home (>20 minutes vs ≤10) | Neighbourhood (unspecified) | Motter, 2015 |
|   |  | Perceived walking distance to buy FV from home (≤10 minutes vs >10 minutes) | Neighbourhood (unspecified) | Zuccoloto, 2015 |
| **Consumer food environment** |  |  |   |
| Objective measures | Availability | Availability of foods in school cafeteria e.g. fruit sold at school | School | Azeredo, 2016 |
|   | Availability and acceptab. | Availability, price, quality and variety of FV and SSB, using standardised instrument (ESAO-s) | Neighbourhood (Euclidean buffer of 1.6km around households) | Duran 2015 |
| Perception measures | Acceptab. | Perceived variety and quality of FV in place of purchase, using own instrument | Neighbourhood (unspecified) | Zuccolotto, 2015 |
|  | Acceptab. | Perceived variety and quality of FV and' healthy food', using own instrument  | Neighbourhood (unspecified) | Vedovato, 2015 |

\*Objective measures are GIS based, perception measures are questionnaire based. ◊Used in Multi-Ethnic Study of Atherosclerosis study. FV: Fruits and vegetables; SSB: Sugar sweetened beverages.

## Notes for Tables S1 and S2

Tables S1 and S2 exclude three experimental studies and one cohort study which evaluated multi-component interventions i.e. changes to the food environment plus nutrition education (Alvirde-García et al. 2013; Carrillo-Larco et al. 2016; Jaime et al. 2007; Safdie et al. 2013) and one study which investigated sales of fruit and vegetables in supermarkets(Alexander et al. 2011).

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