

Program and Policy Options for Preventing Obesity in Low, Middle, and Transitional Income Countries: background research and program evaluation Brazil

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NUPENS/USP

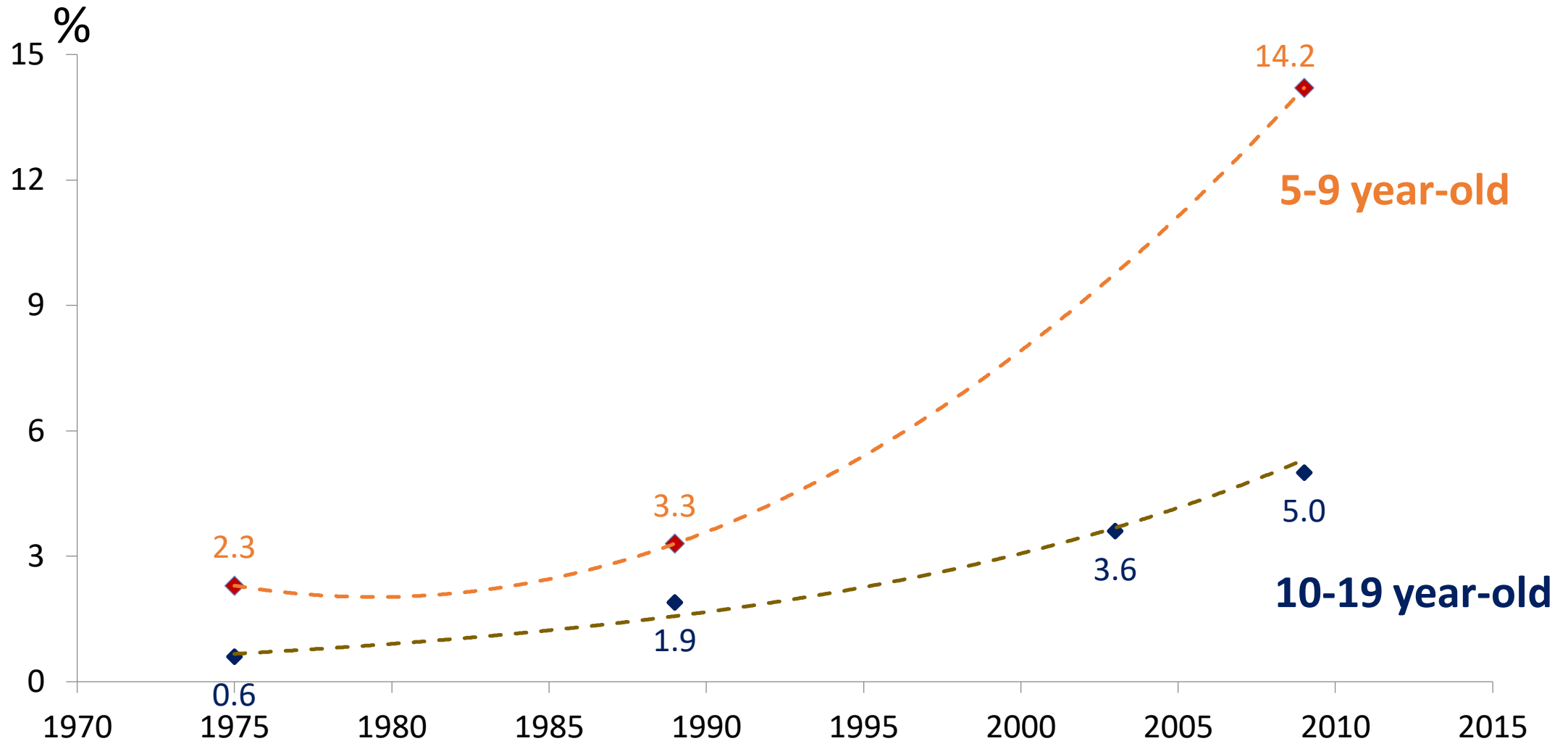
Outline

- Background in obesity, diabetes, and hypertension prevalence and trends
- Background in economics research
- Taxation potential
- National school feeding program farm-to-school regulatory policy evaluation proposal
- Future actions

Obesity, diabetes (and diet), and hypertension: secular and recent trends in Brazil

Secular trends in the prevalence (%) of obesity

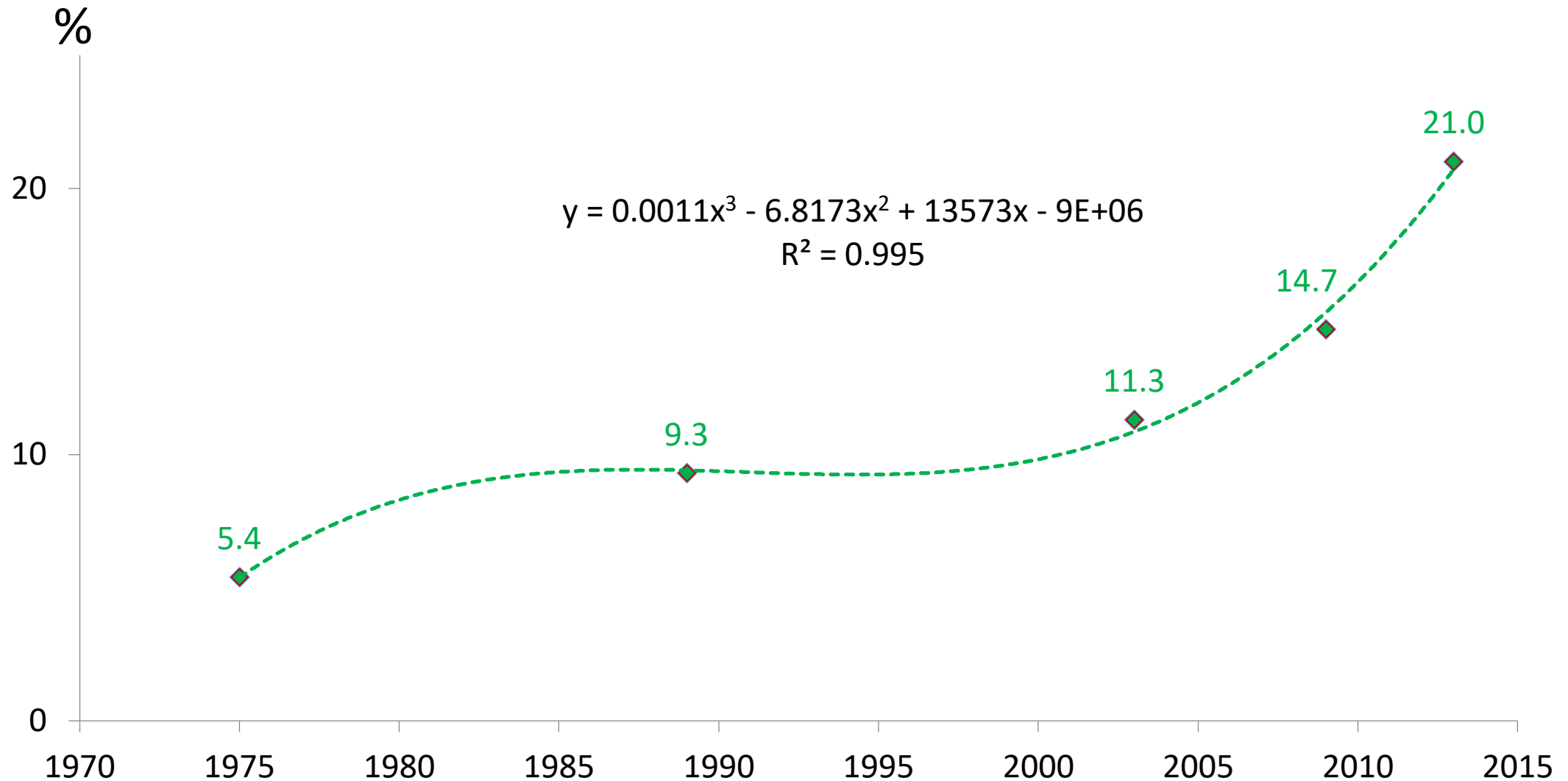
Brazilian child and adolescent population, 1975-2009



Sources: 1975, 1989, 2003, and 2009 national anthropometric surveys (WHO standards for obesity)

Secular trends in the prevalence (%) of obesity

Brazilian adult population, 1975-2013



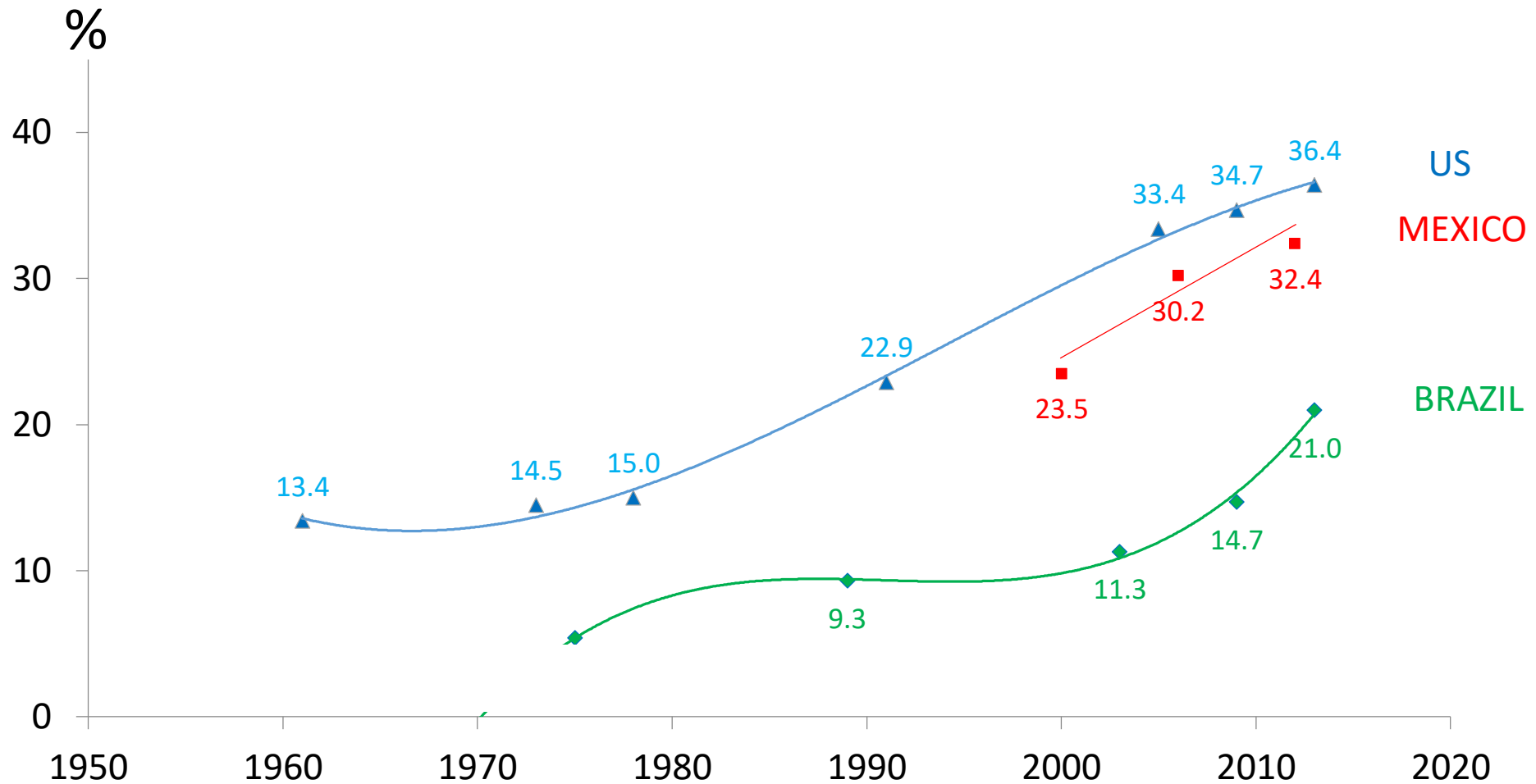
Sources: 1975, 1989, 2003, 2009 and 2013 national anthropometric surveys

Prevalence of obesity among adults. Brazilian National Health Survey, 2013

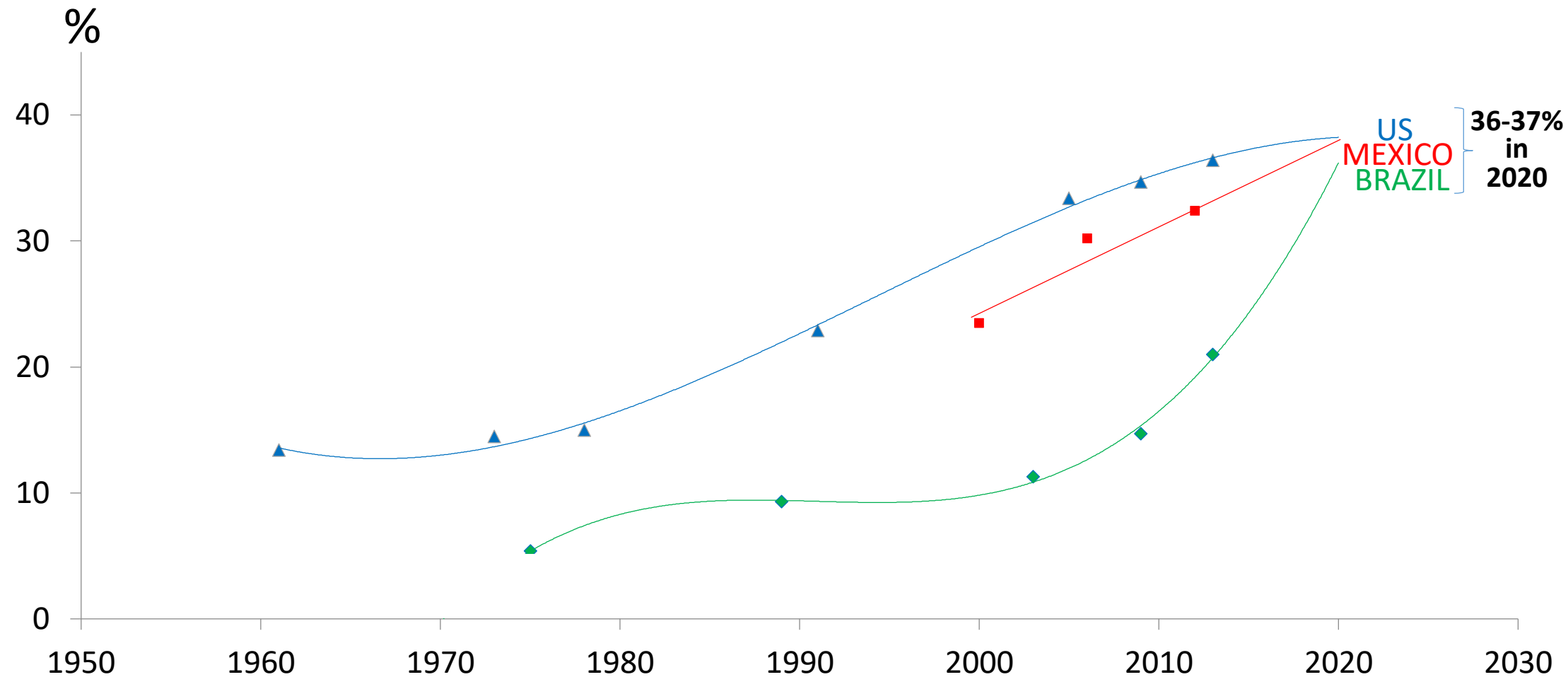
- **Obesity: 20.8%** (95% CI 20.2,21.4) ~ **26.6 million Brazilian adults**
 - Women: 24.3 (95% CI 23.5,25.1)
 - Men: 16.8 (95% CI 16.0,17.6)

Secular trends in the prevalence (%) of obesity

Brazilian, Mexican and US adult population



Secular trends in the prevalence (%) of obesity among adults (20 y+)
... with forecast for 2020



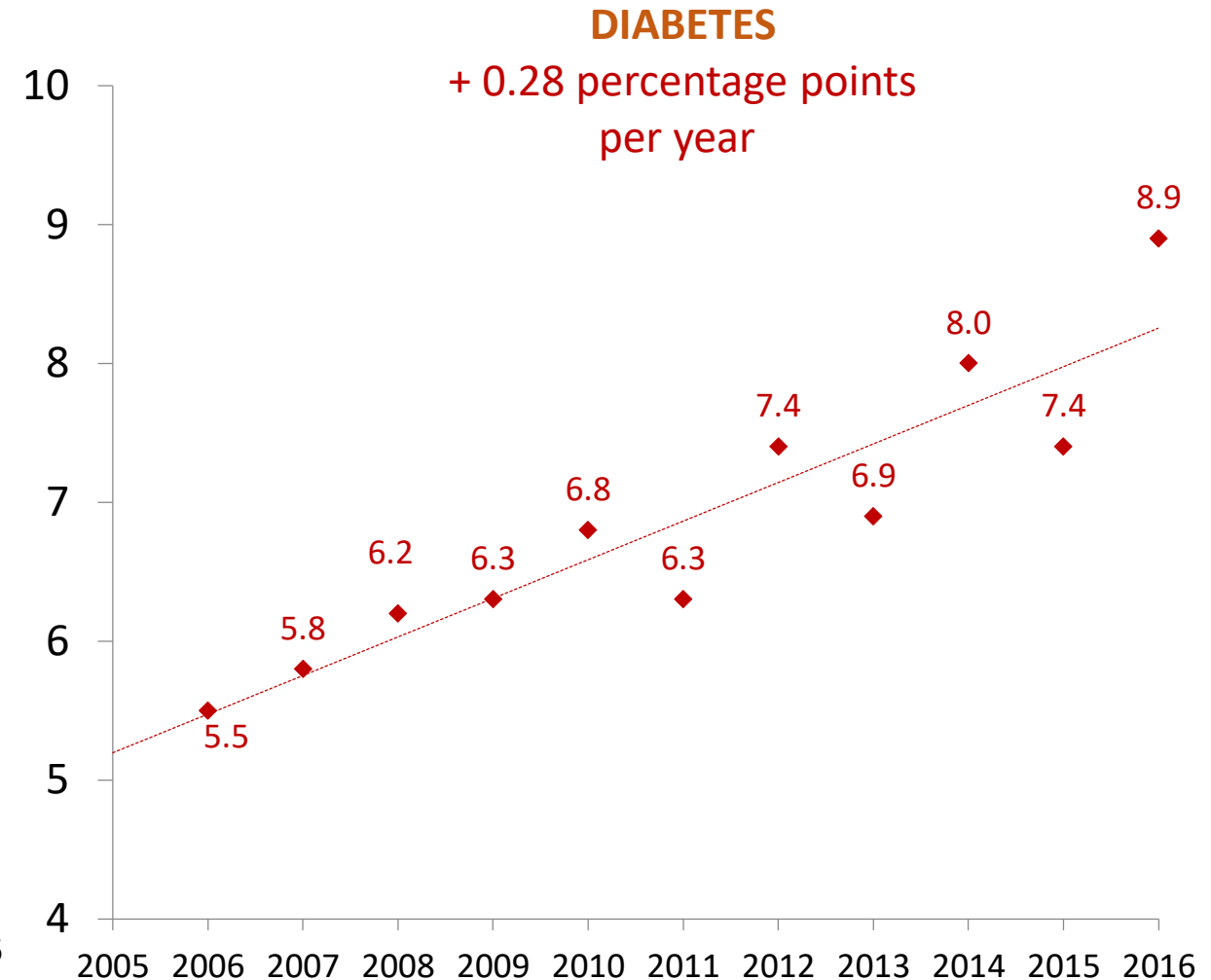
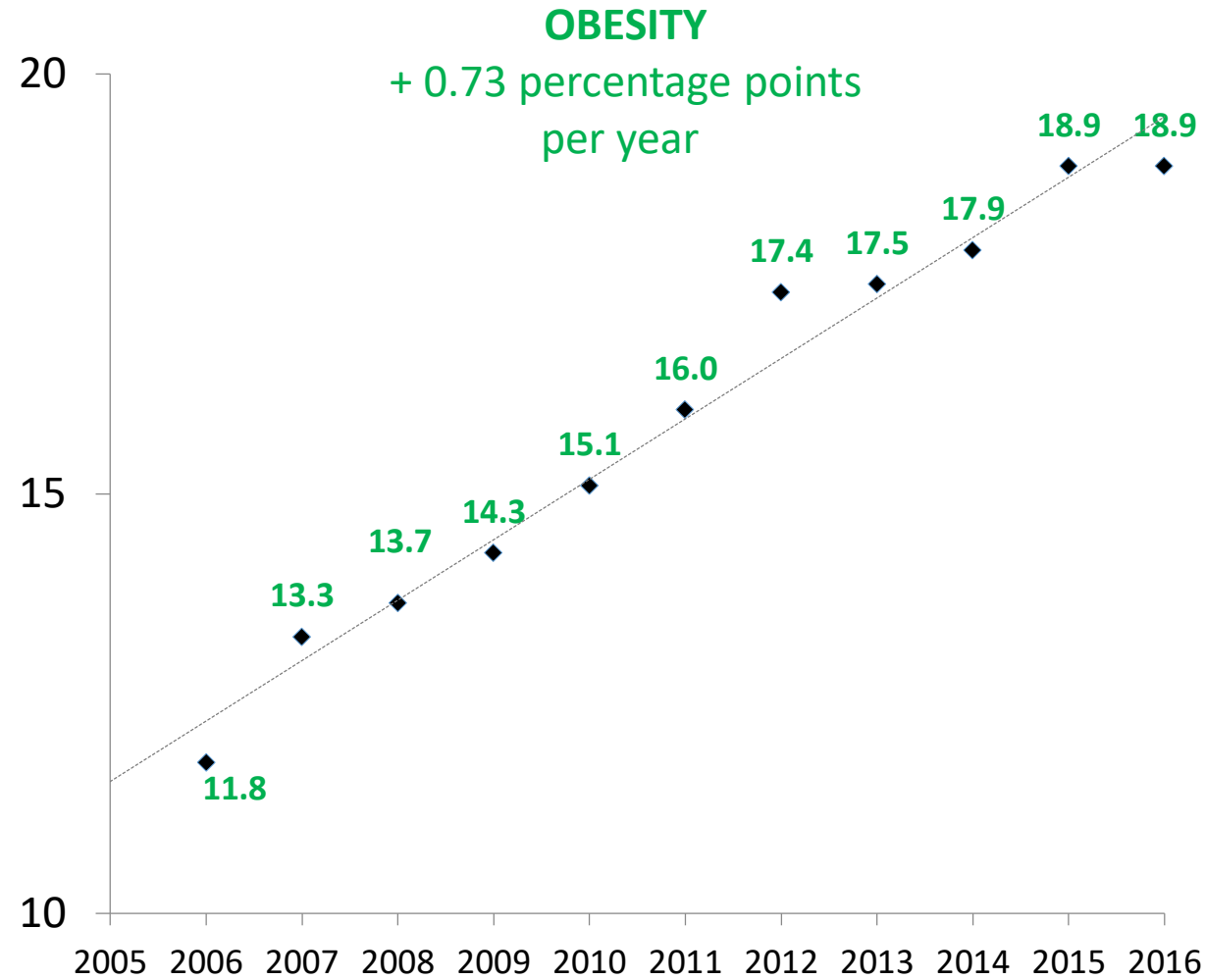
Sources: National anthropometric surveys

Prevalence of diabetes among adults. Brazilian National Health Survey, 2013

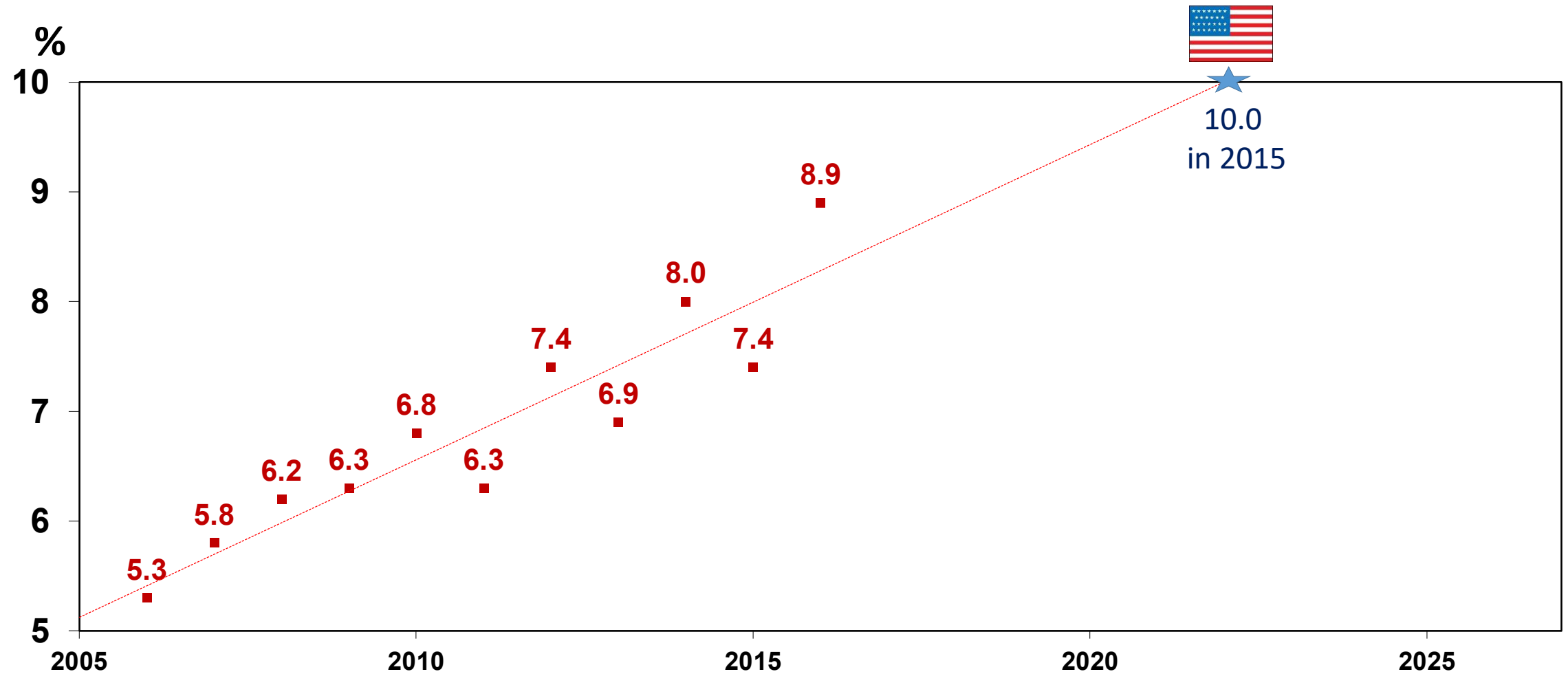
- **Diabetes (self-reported): 6.2 % (95% CI 5.9,6.6) ~ 7.9 million Brazilian adults**
 - Women: 7.0 (95% CI 6.6,7.5)
 - Men: 5.4 (95% CI 4.9,5.9)

Recent trends in self-reported prevalence (%) of obesity and diabetes

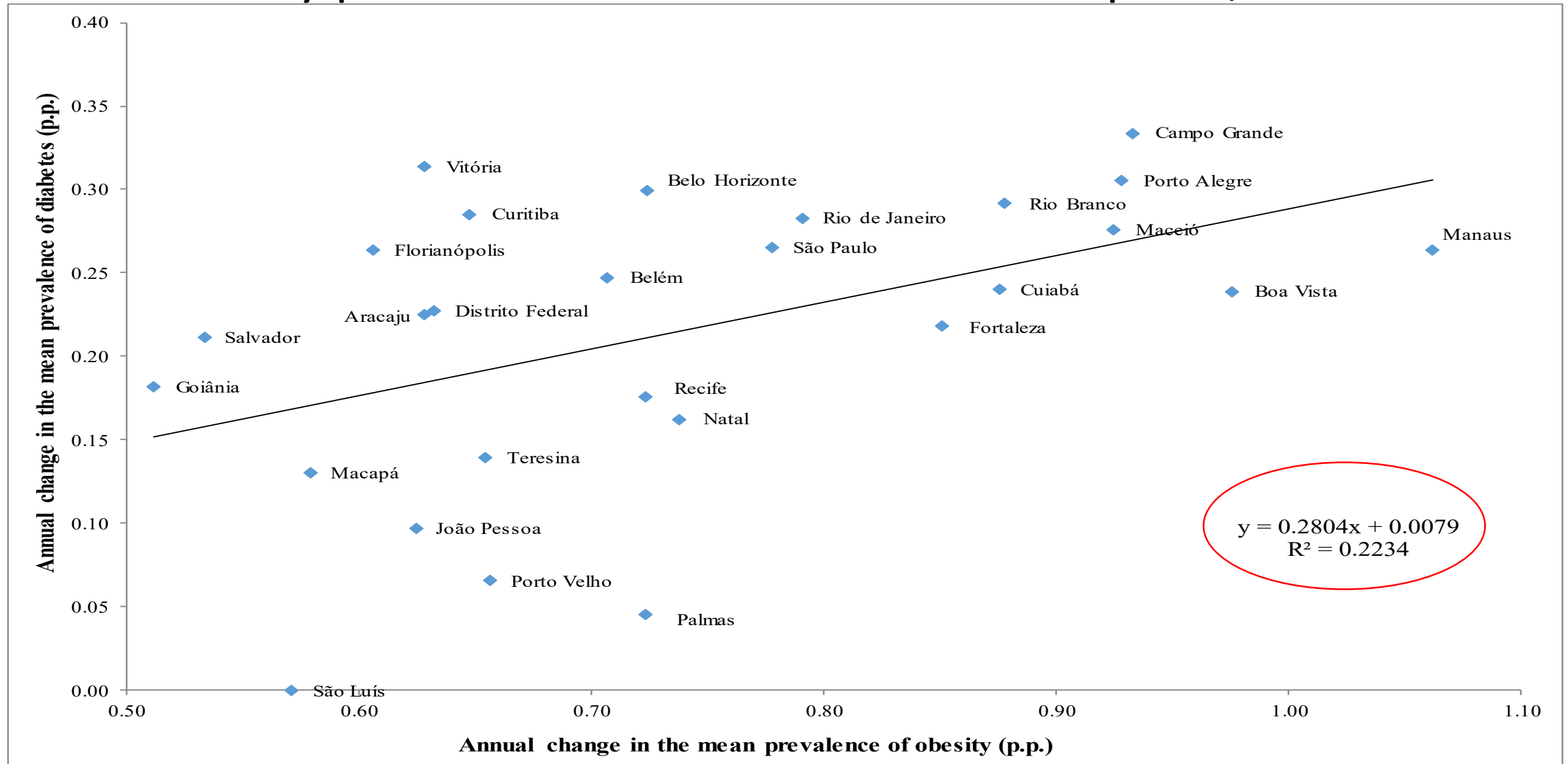
Brazilian adult population in 27 state capitals: 2006-2016



Recent trends in self-reported prevalence (%) of diabetes Brazilian adult population in 27 state capitals: 2006-2016 ... with forecast for 2022



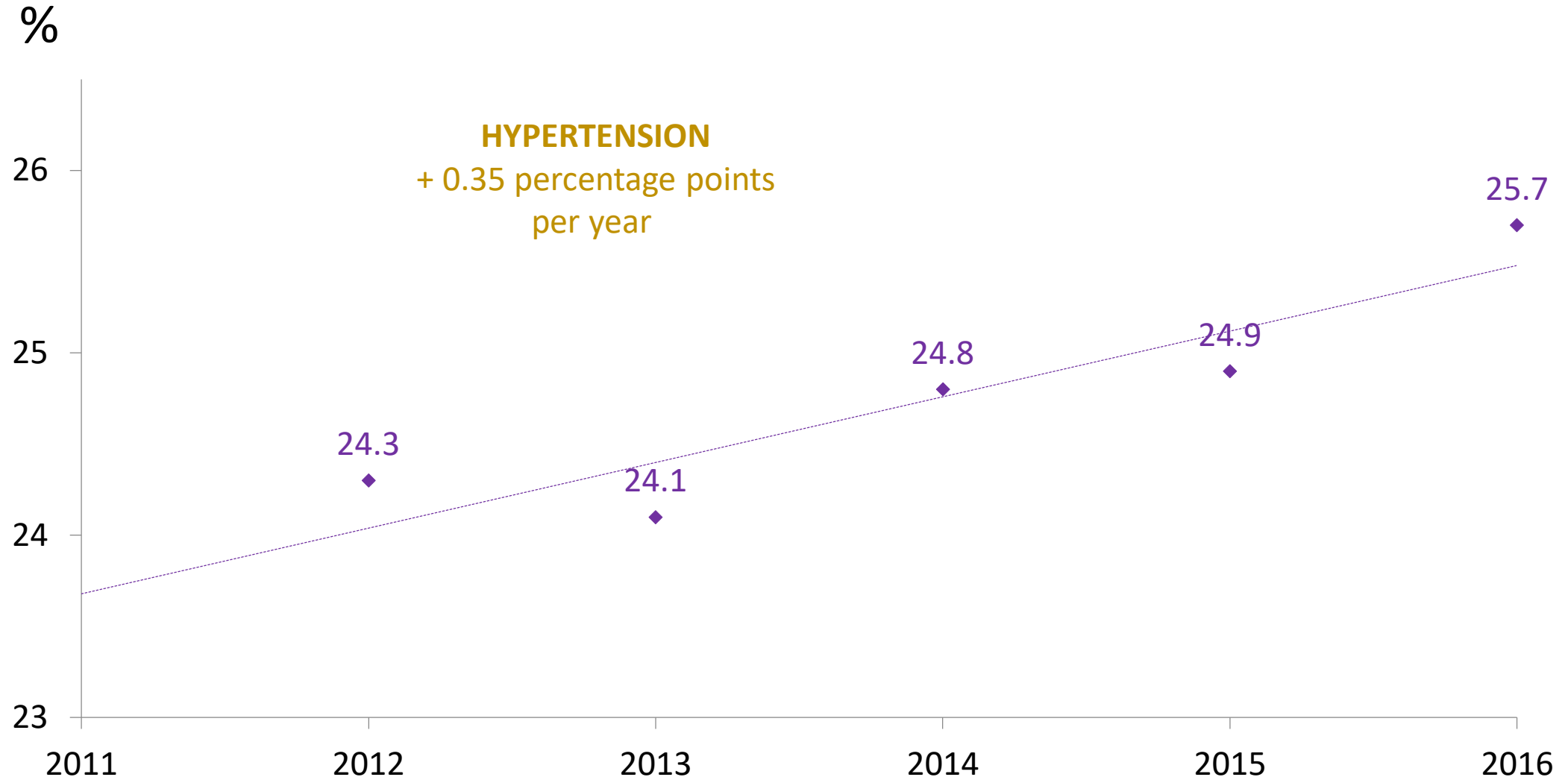
Annual change in diabetes prevalence regressed on the annual change in obesity prevalence in 27 Brazilian state capitals, 2006-2016



Prevalence of hypertension among adults Brazilian National Health Survey, 2013

- **Hypertension: 32.3 % (95% CI 31.6,33.1) ~ 41.2 million Brazilian adults**
 - Women: 31.7 (95% CI 30.8,32.6)
 - Men: 33.0 (95%CI 32.0,34.1)

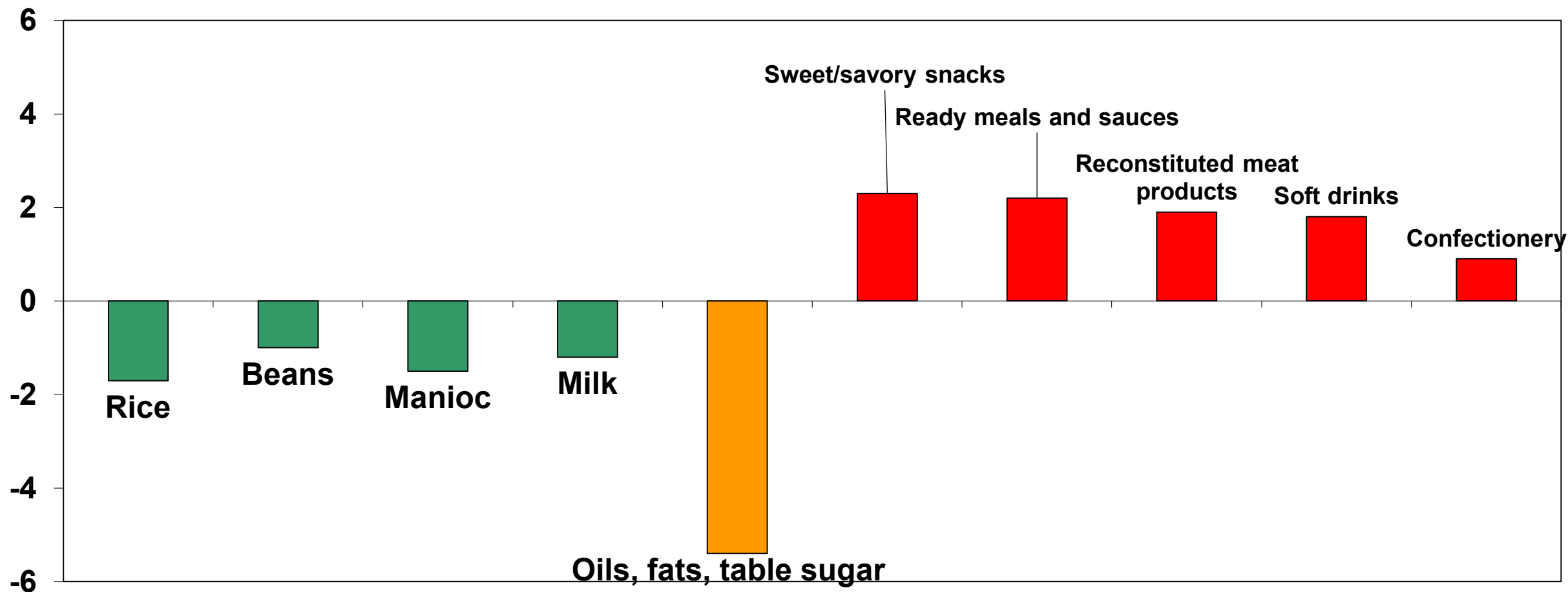
Recent trends in the prevalence (%) of self-reported hypertension Brazilian adult population of 27 state capitals: 2012-2016



Secular trends in the national household food basket

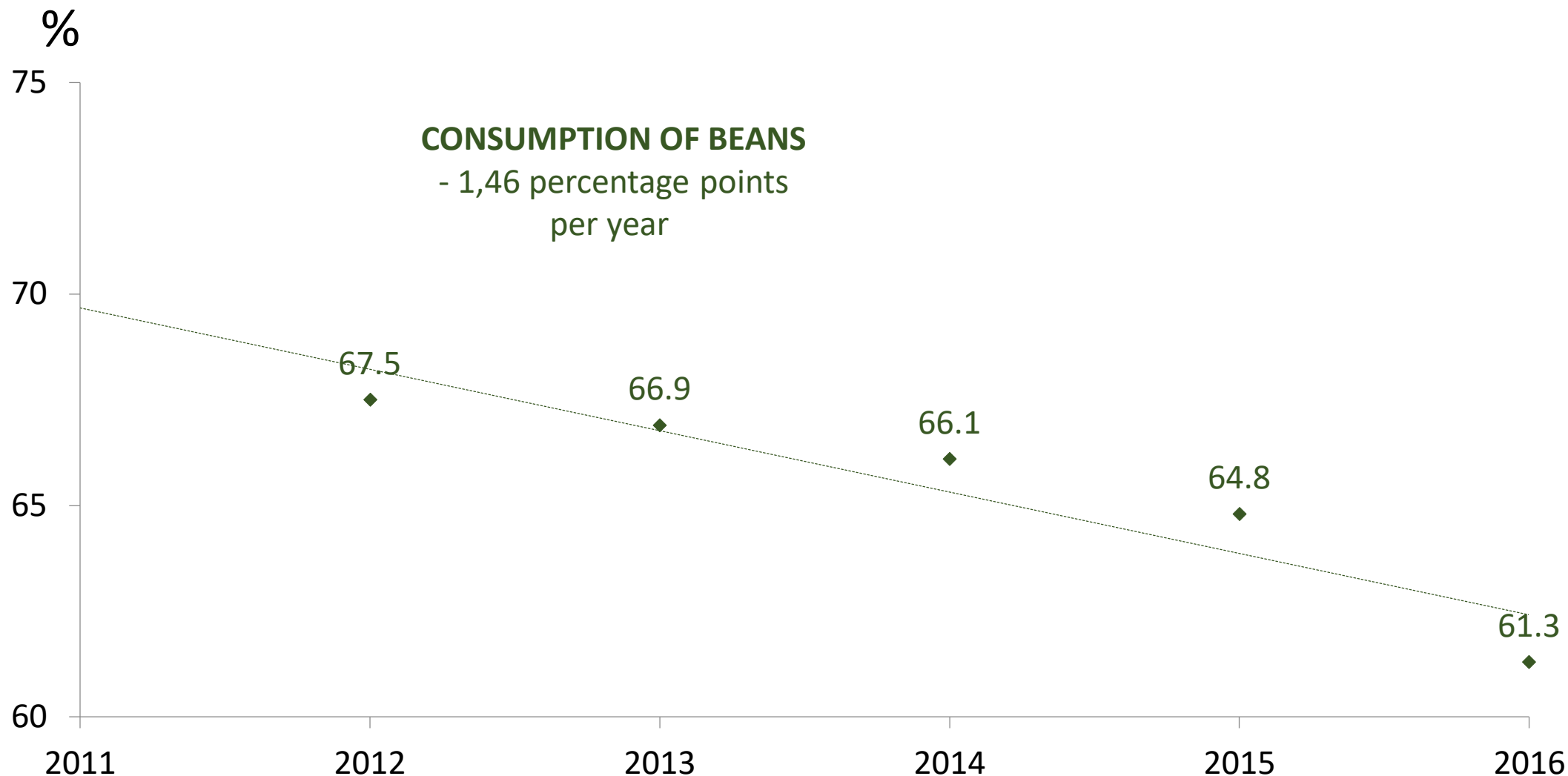
Brazil: 1987-2009

Δ
percentage points
of total purchased
calories



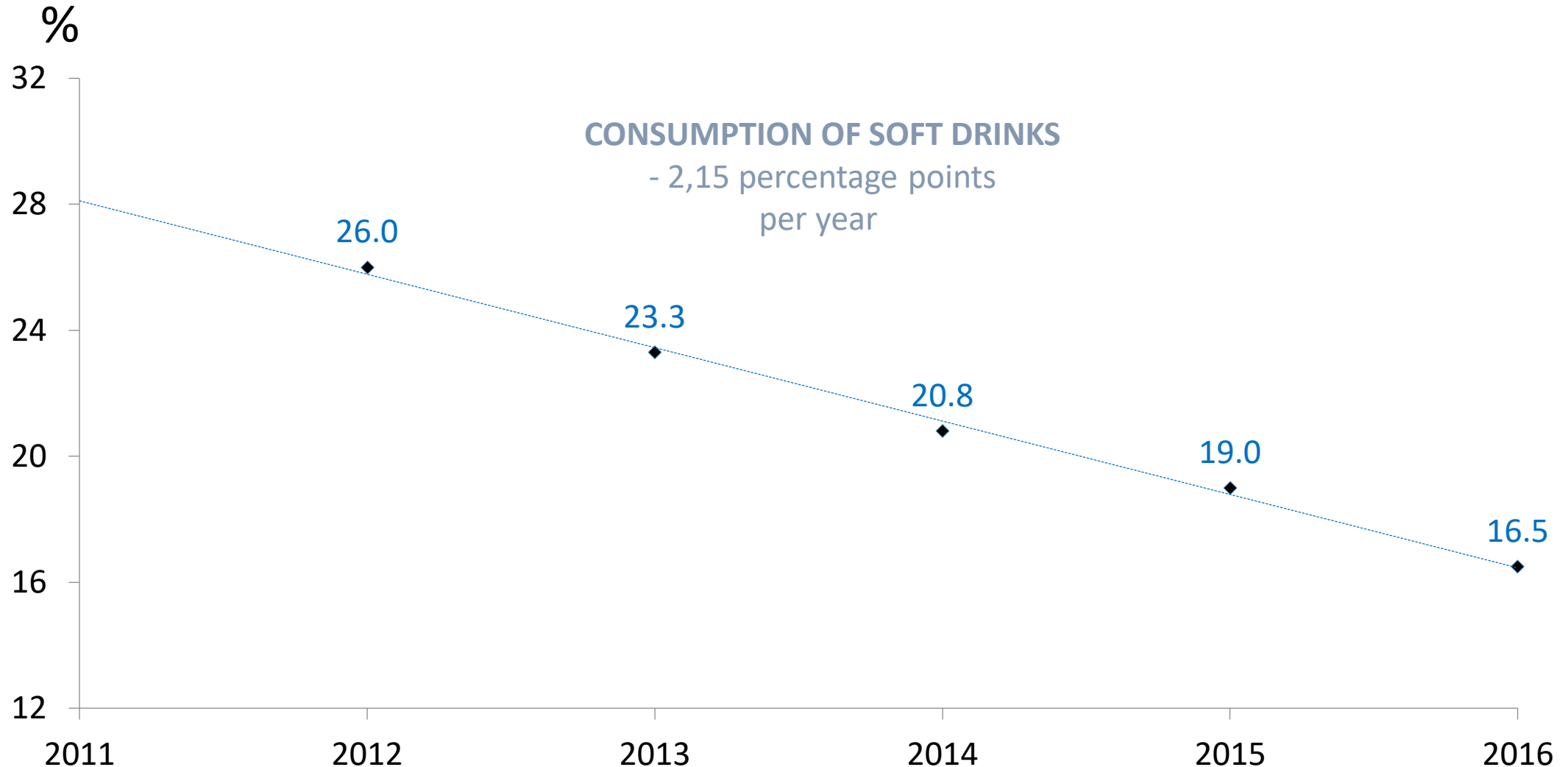
Recent trends in consumption of beans ≥ 5 d/week

Brazilian adult population of 27 state capitals: 2012-2016

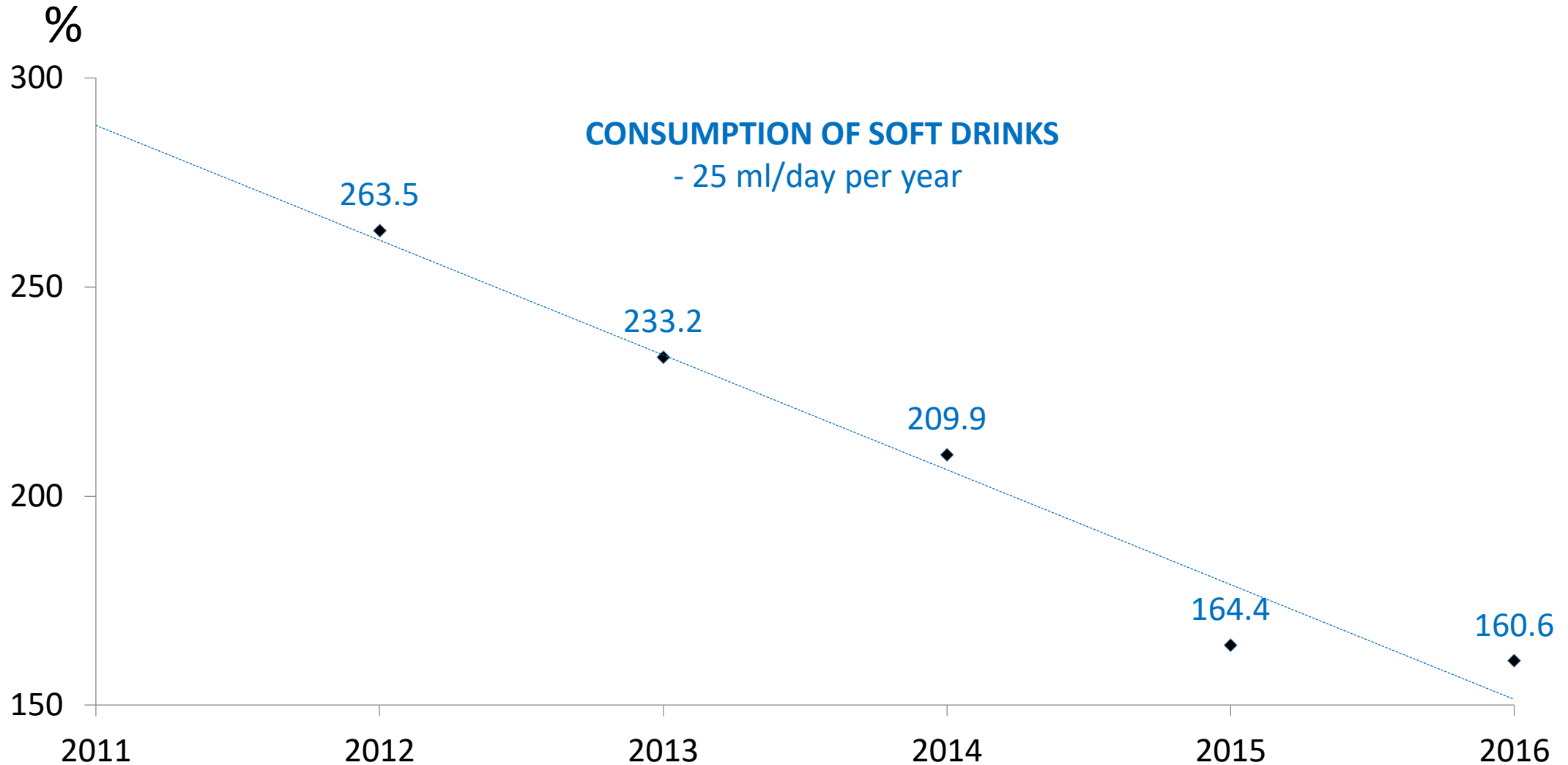


Recent trends in consumption of soft drinks ≥ 5 d/week

Brazilian adult population of 27 state capitals: 2012-2016

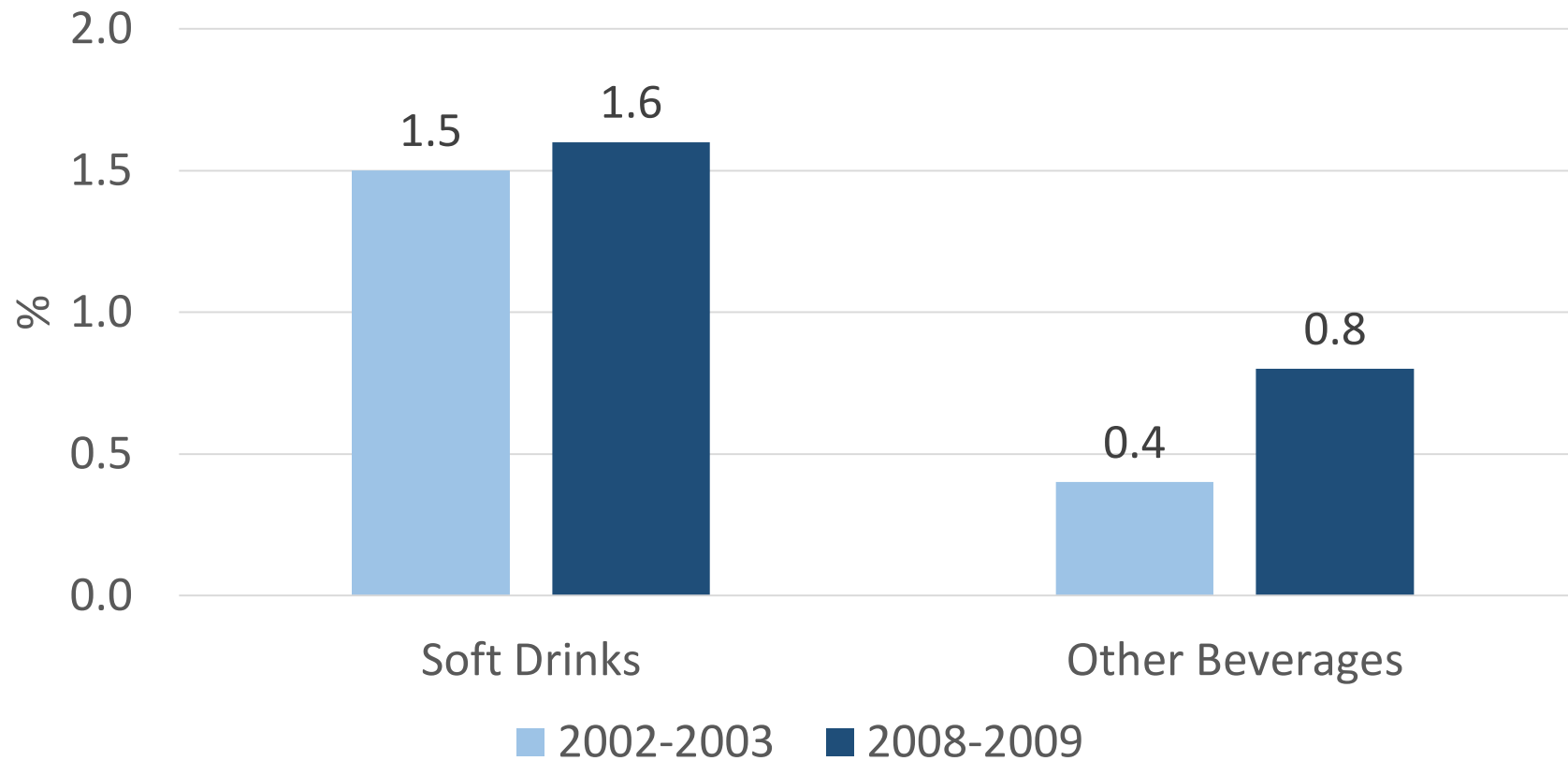


Recent trends in mean consumption of soft drinks (ml/day) Brazilian adult population of 27 state capitals: 2012-2016

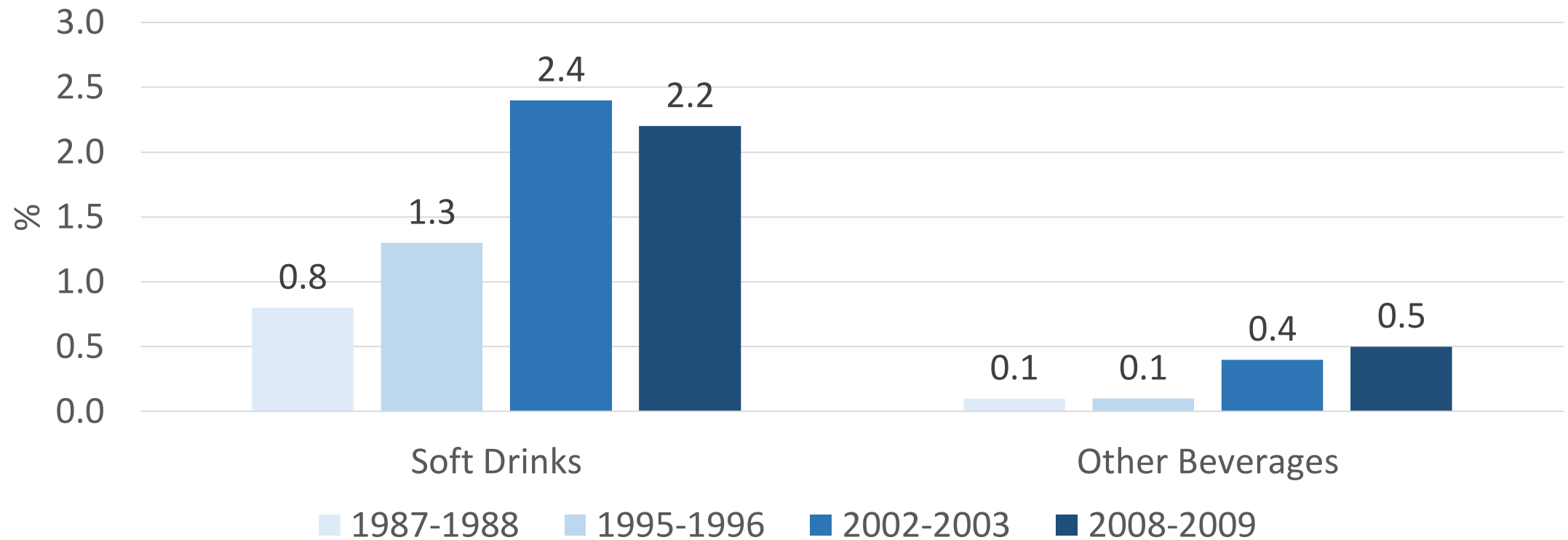


Economics research background

Household purchase of sugar sweetened beverages (% total calories acquired). Brazil, 2002/03 and 2008/09.



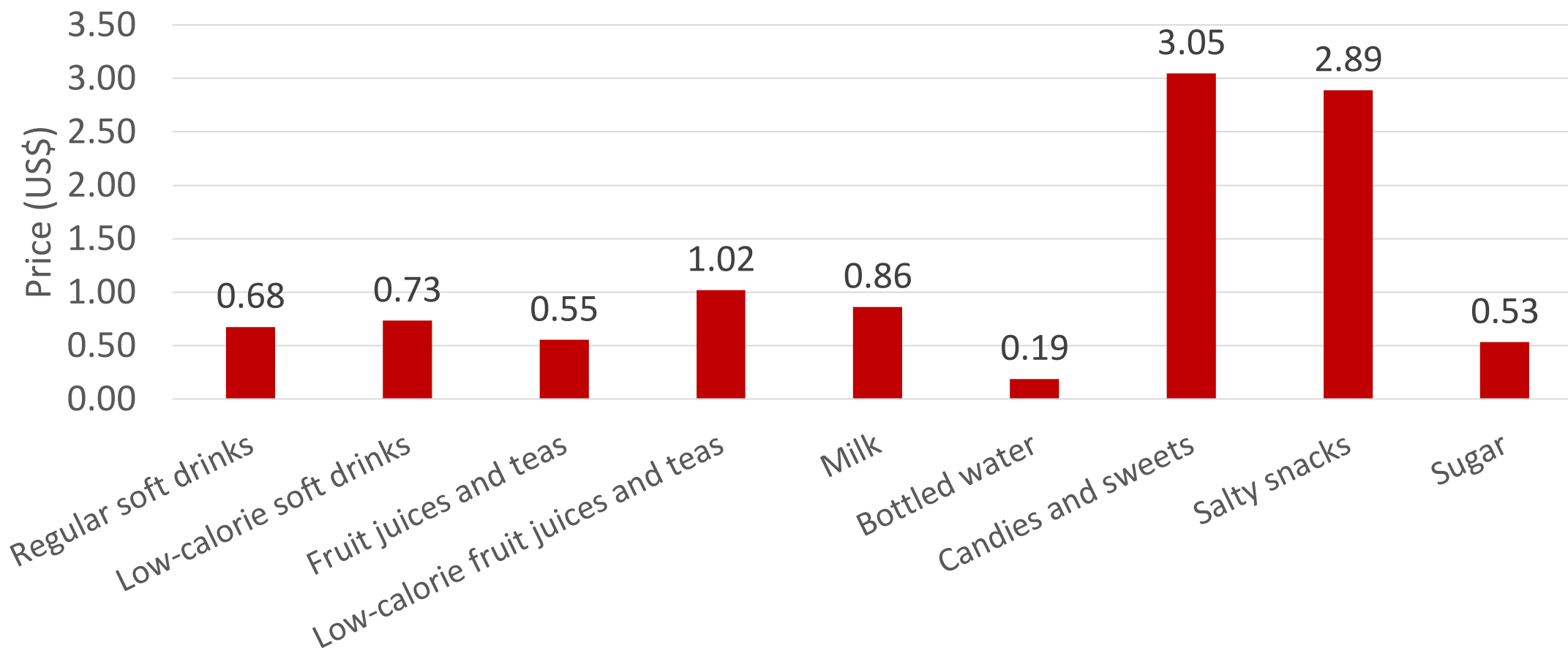
Household purchase of sugar sweetened beverages (% total calories acquired). Brazil, 1987/88 to 2008/09.



Methods

- National Household Budget Survey 2008/09:
 - 55,590 households:
 - Detailed information on the acquisition of 1.7 thousand foods and drinks acquired for household consumption during 1 week;
 - Sociodemographic information.
- Unit prices and budget shares were used for the estimation of a censored demand system (9 groups):
 - 2 stage QUAIDS;
 - Income, own-price and cross-price elasticity;
 - Total population and according to income levels.

Price (US\$)* of selected beverage and food groups**. Brazil. POF-IBGE 2008/09.

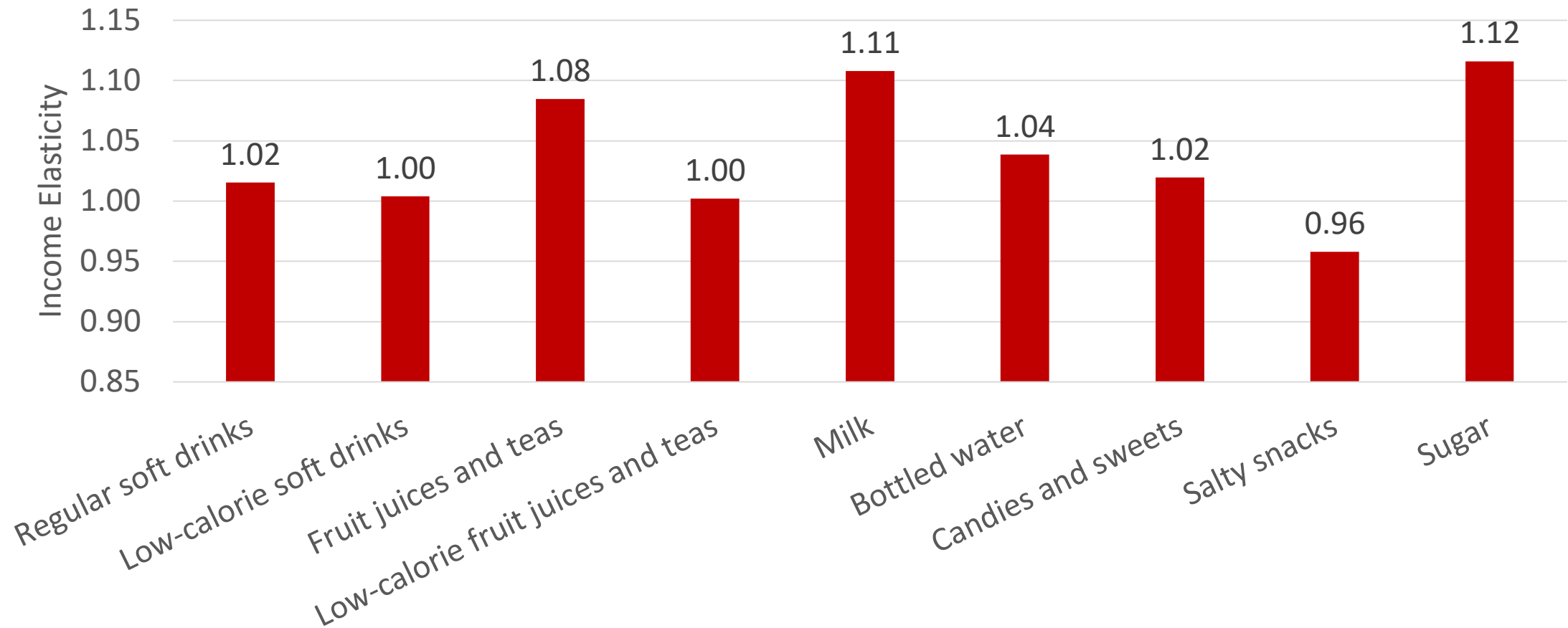


*: Per liter for the beverages and per kilo for foods .

** : Considered for the estimation of the demand system.

Source: Prepared by the authors

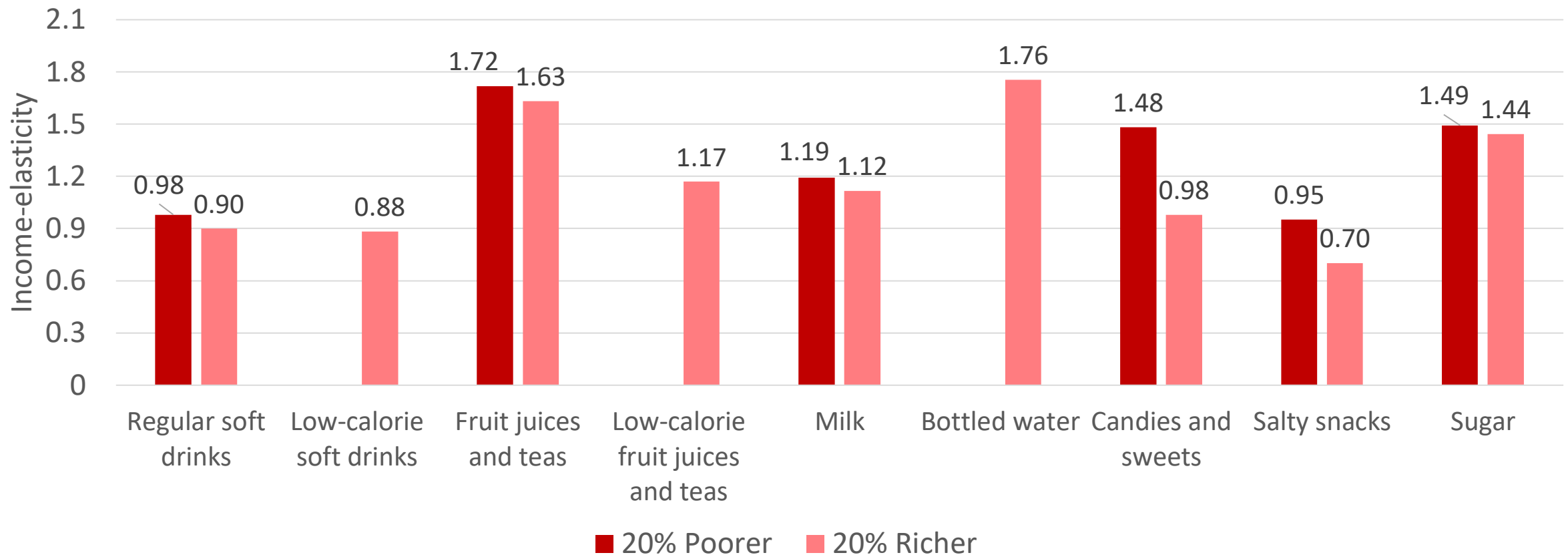
Income-elasticity of selected beverage and food groups**. Brazil. POF-IBGE 2008/09.



** : Considered for the estimation of the demand system.

Source: Prepared by the authors

Income-elasticity of selected beverage and food groups**, according to income level. Brazil. POF-IBGE 2008/09.



** : Selected among those considered for the estimation of the demand system.

Source: Prepared by the authors

Own and cross price elasticity (non-compensated) of the demand for selected beverage and food groups. Brazil. HBS-IBGE 2008/09.

Beverage and food groups	Own price elasticity (1% increase in the own price)	Cross price elasticity (1% increase in the price of soft drinks)
Regular soft drinks	-0,64	
Low-calorie soft drinks	-1,00	0,23
Fruit juices and teas	-1,06	0,33
Low-calorie fruit juices and teas	-1,00	0,29
Milk	-0,95	0,26
Bottled water	-1,07	0,30
Candies and sweets	-0,85	0,17
Salty snacks	-0,61	0,21
Sugar	-0,86	0,36

Obs: $p < 0,001$ for all values.

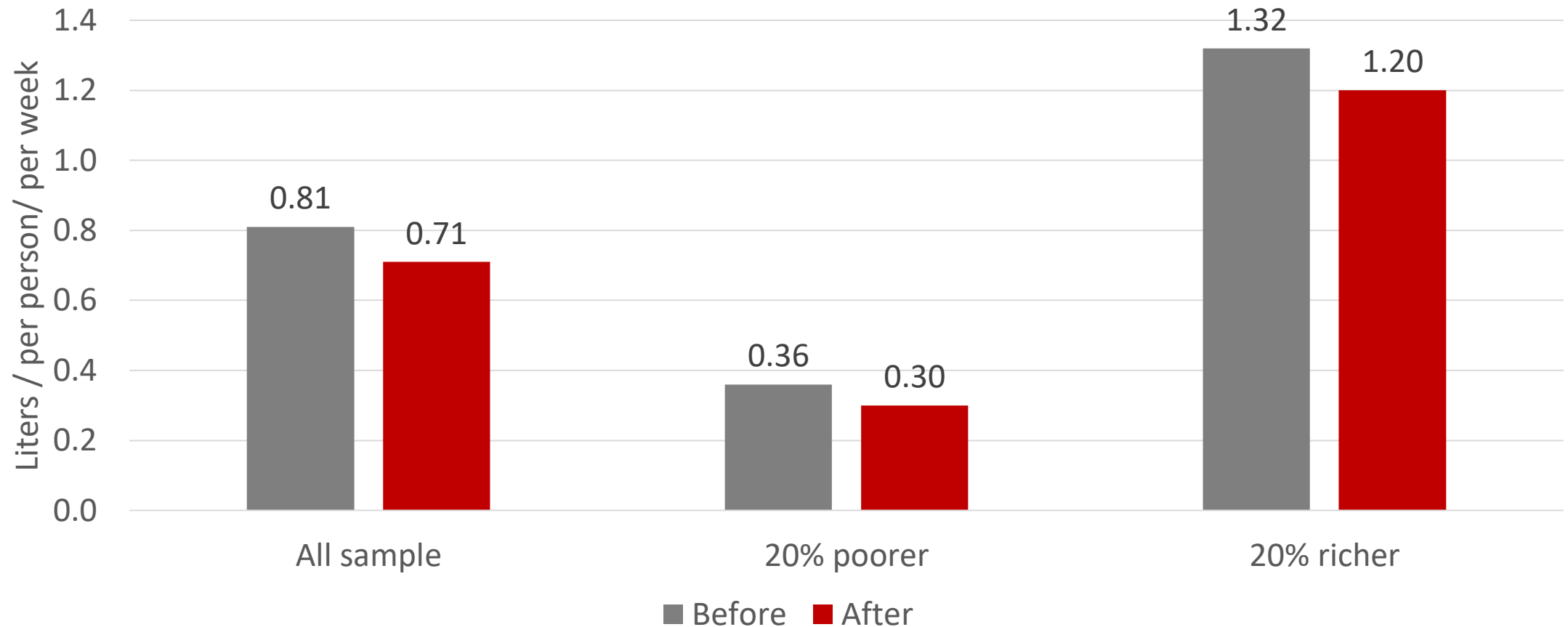
Own and cross price elasticity (non-compensated) of the demand for selected beverage and food groups, according to income level. Brazil. HBS-IBGE 2008/09.

Beverage and food groups	20% POORER		20% RICHER	
	Own price elasticity	Cross price elasticity (1% increase in the price of soft drinks)	Own price elasticity	Cross price elasticity (1% increase in the price of soft drinks)
Regular soft drinks	-0,833		-0,453	
Low-calorie soft drinks	-0,989	0,258	-0,957	0,316
Fruit juices and teas	-1,241	0,334	-0,957	0,359
Low-calorie fruit juices and teas	-1,045	0,235	-0,994	0,387
Milk	-0,884	0,229	-0,888	0,299
Bottled water	-1,018	0,297	-1,109	0,426
Candies and sweets	-0,911	0,254	-0,692	0,266
Salty snacks	-0,998	0,074	-0,443	0,222
Sugar	-0,694	0,437	-0,888	0,382

Obs: $p < 0,001$ for all values.

Source: Prepared by the authors

Predicted impact of a 20% tax on regular soft drinks on its consumption. Brazil. HBS-IBGE 2008/09.



Taxation opportunity

Senate Bill Nº430/2016 (Project)



SENADO FEDERAL **PROJETO DE LEI DO SENADO** **Nº 430, DE 2016**

Institui Contribuição de Intervenção no Domínio Econômico incidente sobre a comercialização da produção e da importação de refrigerantes e bebidas açucarados (Cide-Refrigerantes), e dá outras providências

Senador Jorge Viana

Assuntos Econômicos, em decisão terminativa

Contribution of intervention in the economic domain (“CIDE”)

- Contribution of intervention in the economic domain
 - In Portuguese: *CIDE*;
 - The Contribution of intervention in the economic domain are a special type of Brazilian taxes, of exclusive competence of the Union (Article 149 of the FC);
 - They are tributes of an extra-fiscal nature and linked to consumption.

Senate Bill №430/2016 (Project)

- Affects sales and imports of soft drinks and other sweetened beverages;
- Revenues should be directed to use in public health (National Health Fund);
- 20% EXTRA TAX.

Senate Bill Nº430/2016 (Project)

alíquota é de vinte por cento. Determina que o montante da Cide-Refrigerantes será recolhido ao Tesouro Nacional e repassado de (FNS).

Em tramitação

Participe

ção

5 – Comissão de Assuntos Econômicos

de Apoio à Comissão de Assuntos

)

5 – MATÉRIA COM A RELATORIA



Opine sobre esta matéria

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Compartilhe



Resultado apurado em 10/02/2017 às 15:18

+ Acompanhar esta matéria



In addition...

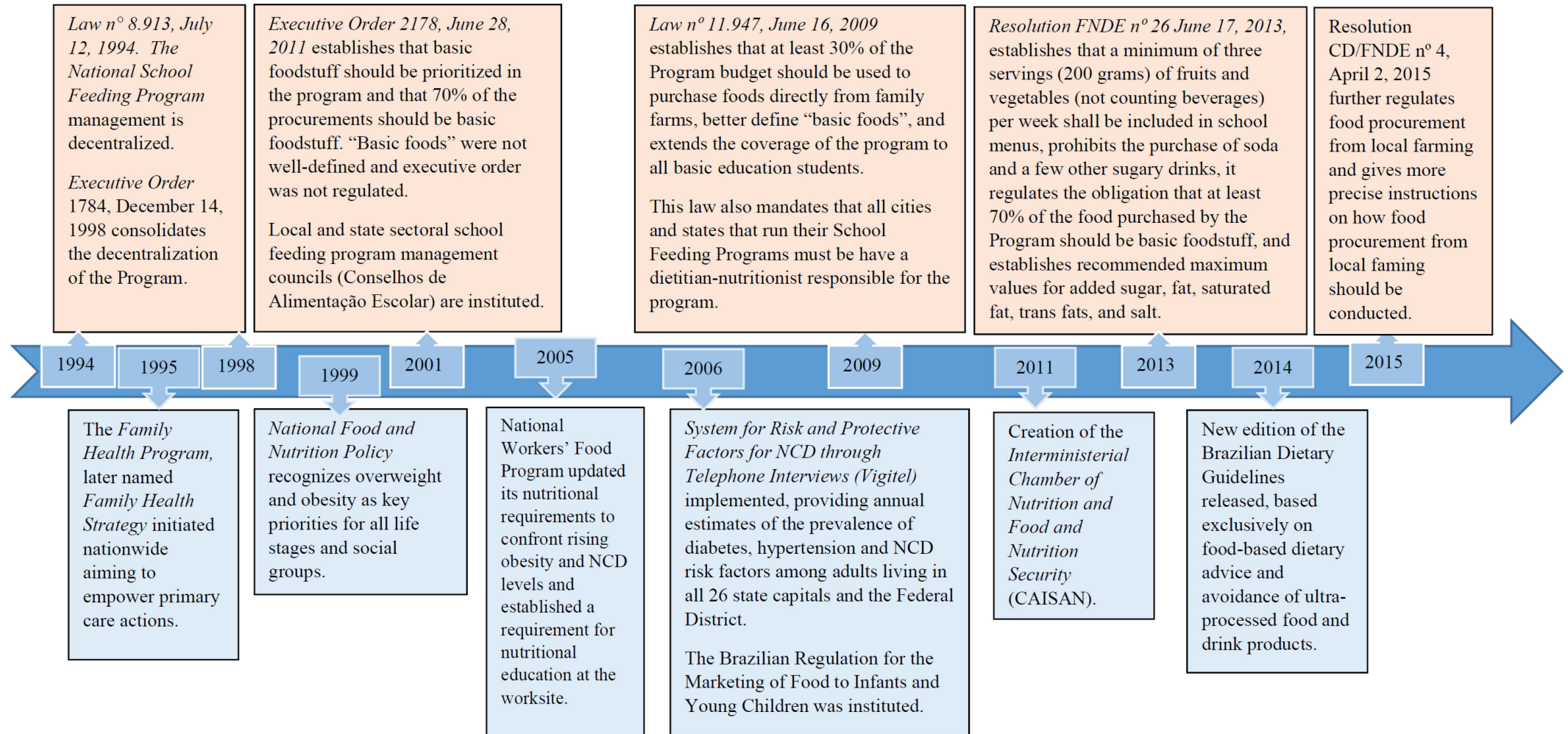
- Taxing exemptions for non-alcoholic beverages are being removed.
- States are already increasing state taxes for non-essential goods:
 - Including non-alcoholic beverages.
- Federal government is currently discussing the possibility of a major fiscal reform.

Brazilian National school feeding program Farm-to-school regulatory policy evaluation proposal

Brazilian National School Feeding Program

- Implemented in 1955, it is universal and free
- In 2014, it served 42.2 million public school students (75% of the total number of students in the country)
 - early childhood education, elementary school, high school, and basic education for adults.
- R\$ 3.7 billion (US\$ 1.2 billion) budget in 2014
- Strongly regulated and is the responsibility of the National Fund for Educational Development (FNDE), which is linked to the Ministry of Education

Brazilian National School Feeding Program timeline



Farm-to-school regulations

Article 14 of 2009 Law 11,947:

“At least 30.0% of the foods in school meals should be purchased directly from family farms and local rural enterprises, giving priority to the resettled farmers (former landless people), traditional indigenous communities and *quilombolas* as a means of supporting local economic development.”

They aim to provide both healthier school meals for children and economic security to small and medium-sized family farmers – which often struggle to survive in a global economy

By approving Article 14 of Law 11,947, Brazil became the first country to have a national law that requires a link between school feeding and agricultural production (Hawkes et al., 2016)

National School Feeding Program

Table 1 Number and Percentage of Municipalities, by Region and for Brazil, Which Received Funds From FNDE for School Feeding in the Period 2011–14

Regions	2011 ^a		2012		2013		2014	
	No.	%	No.	%	No.	%	No.	%
North	374	83.3	363	80.8	434	96.9	424	94.2
Northeast	1627	90.7	1623	90.5	1792	99.9	1780	99.2
Southeast	1624	97.4	1627	97.5	1655	99.3	1647	98.8
South	1180	99.3	1179	99.2	1184	99.6	1189	99.8
Midwest	440	94.6	436	93.8	456	98.1	453	97.2
Total and Brazil	5245	94.3	5228	94	5521	99.2	5493	98.7

Table 2 Participation of Family Farming in School Feeding Supply in the Period 2011–14, Brazil

	2011		2012		2013		2014	
	No.	%	No.	%	No.	%	No.	%
Municipalities that purchased from family farming	3097	59.0	3484	66.6	3529	63.9	4229	77.0
Municipalities that did not purchase from family farming	2148	40.9	1744	33.4	1992	36.1	1264	23.0
Municipalities that purchased over 30%	1410	26.8	1576	30.1	1412	25.6	2168	39.5
Ratio of participation of family farming to the total national PNAE funds		10.8		14.5		16.8		23.3

International cooperation

Program of Brazil-FAO International Cooperation

	Program Summary	Projects	News	Events	Resources	Partners
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School Feeding

Humanitarian
Cooperation

Public Procurement within
Rural Family Farming

Strengthening the Civil
society

Strengthening the Cotton
Sector

Agro-Environmental
Policies

Food and Nutritional
Security

Implementation of a Model for Public Procurement within Rural Family Farming for School Feeding Programs

Latin America is promoting measures aimed at reducing hunger and malnutrition; however, the complexity of this issue affects progress and achievements. For this reason, countries of the region have launched various initiatives to develop programs focused on improving the food and nutritional security of the population, based on a dynamic exchange of successful experiences through South- South Cooperation. Examples of such programs are the national initiatives of strengthening the School Feeding Programs and their connection with family farming.

Strengthening the School Feeding Programs and supporting the local socio-economic development, through local procurement from family farms is an opportunity to offer the farmers a market (of school food programs) and to offer the students of the schools a variety of healthy, fresh food that respects the local food culture.

Project Factsheet

Objective: Contribute to increasing the food and nutritional security of rural communities in El Salvador, Nicaragua, Honduras and Paraguay, through the School Feeding Programs; strengthened and coordinated with the production of local and regional family farms.

Geographic areas to benefit: El Salvador, Honduras, Nicaragua and Paraguay.

Símbolo: TCP/RLA/3406

Program of Brazil-FAO International Cooperation

	Program Summary	Projects	News	Events	Resources	Partners
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School Feeding

Sustainable Schools

Humanitarian
Cooperation

Public Procurement within
Rural Family Farming

Strengthening the Civil
society

Strengthening the Cotton
Sector

Agro-Environmental
Policies

Food and Nutritional
Security

Activation of RAA

Strengthening School Feeding Programs in the Framework of the Zero Hunger Initiative in Latin America and the Caribbean 2025

The experience in Brazil of its National School Feeding Program (PNAE, for its acronym in Portuguese) has been recognized for over 60 years, especially by developing countries, as a point of reference for its sustainability, quality, progress and challenges; thus allowing for the provision of necessary support to the countries of Latin America and the Caribbean.

The lessons learned in Brazil with school feeding were based on several key elements, such as program coverage; systematization and continuity of supply; quality of food offered at the schools; comprehensive program regulations; nutritional recommendations; public oversight; procurement of food from family farming; construction of on-site and virtual support systems; monitoring and evaluation; decentralized management; mechanisms and educational tools for food and nutrition through school gardens, among others. The scope of this collaborative implementation includes the participation of 5,570 municipalities and 27 states, assisting 43 million students per day for 200 school days. The PNAE also highlights the model of school feeding as part of the human right to food, prompting discussion on the processes of food assistance still present in many countries.

Project Factsheet

Objective: To strengthen the institutionalization of school feeding programs and the associated food security policies, through regional and national mechanisms.

Parteners: Belize, Costa Rica, El Salvador, Granada, Guatemala, Guyana, Honduras, Jamaica, Paraguay, Peru, Dominican Republic, Saint Lucia, and Saint Vincent and the Grenadines.

Símbolo: GCP/RLC/180/BRA

More information

- [Sustainable Schools](#)

Brazilian National School Feeding Program farm-to-school regulatory policy evaluation

- Aim 1: Explore to what extent municipal and state-level determinants (such as participatory democracy and incentives and policies that support local farming agriculture) help explain the compliance with the farm-to-school regulatory policy that states that at least 30% of the foods must come from family farming as well as differences in the implementation rate.
- Aim 2: Evaluate the impact of a farm-to-school regulatory policy on dietary intake of Brazilian public middle-school students living in Brazilian state capitals and the Federal District.

Methods: Aim 1

- Outcome: annual percentage of the food procurement from family farming in each municipality and state
- Exposure:
 - measures of participatory democracy related to the implementation of the farm-to-school regulatory policy (presence and characteristics of local and state sectoral school feeding program management councils (Conselhos de Alimentação Escolar))
 - presence of incentives and policies that support local agriculture

Methods: Aim 1

- Secondary data on federal transfers to 5,526 municipalities (out of a total of 5,570 municipalities in the country), the Federal District and all 26 states for food procurement as part of the Brazilian National School Feeding Program from 2011 to 2015
- Year and municipality/Federal District or year and state fixed-effect models will be used:
 - for the 26 states
 - for the municipalities/Federal District

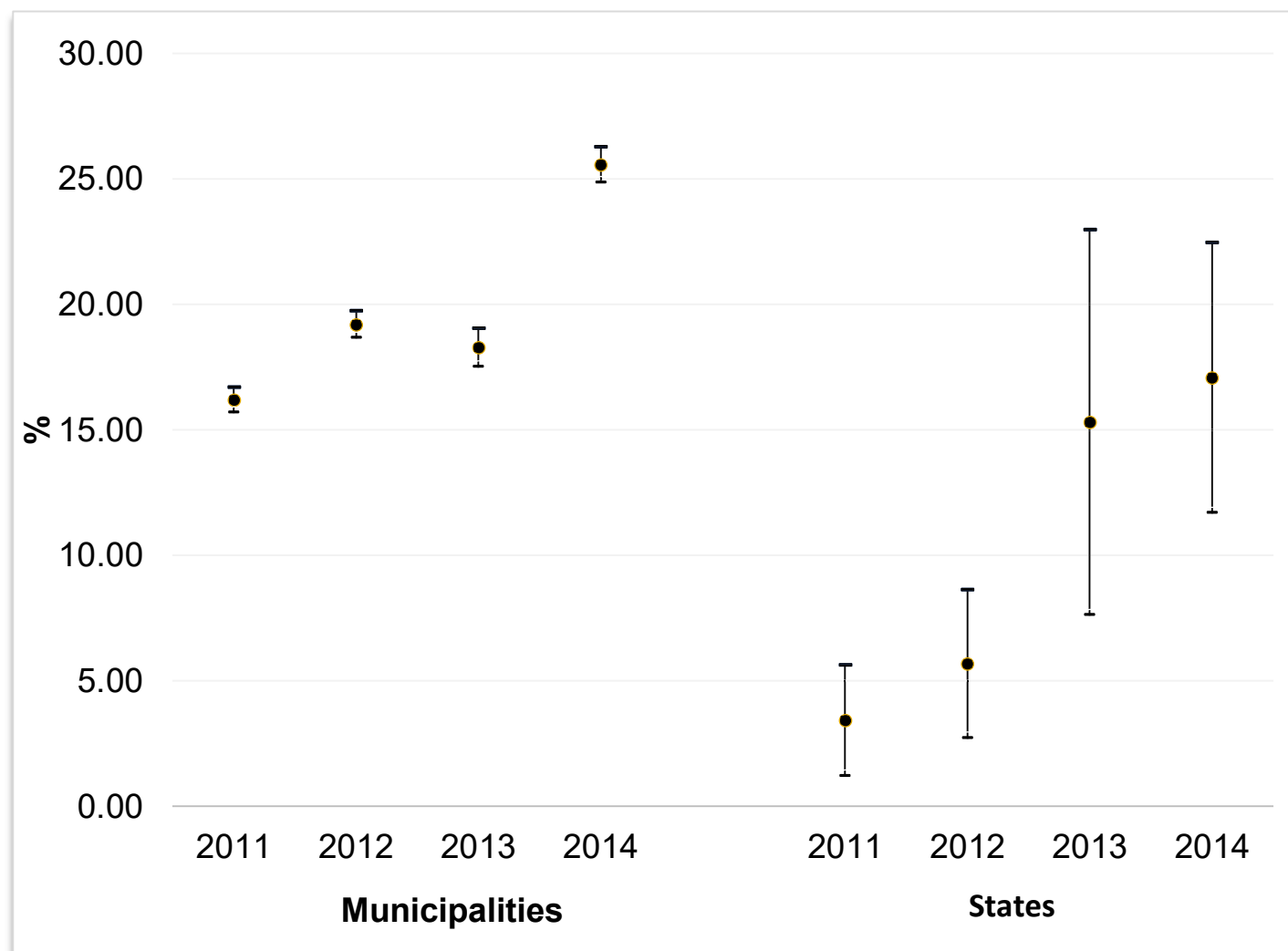
Methods: Aim 2

- Pooled cross-sectional analysis using food procurement data in the 26 state capitals and the Federal District
- Data: Publicly available survey data of Brazilian 9th graders attending public schools across all 26 state capitals and the Federal District (2009, 2012 and 2015 National School-Based Health Surveys (PeNSE))
- PeNSE surveys are based on the Global School-Based Student Health Survey and the Youth Risk Behavior Surveillance System

Methods: Aim 2

- Sample
 - 45,597 students from 1,109 schools in 2009
 - 44,269 students from 1,048 schools in 2012
 - 36,250 students from 940 schools in 2015
- Outcome
 - Consumption of fruits, vegetables, and beans
- Exposure
 - Annual percentage of the National School Feeding Program municipal purchases that come from family farming in each year of the study

Federals transfers for food procurement from family farming



*Bars denote
mean (95%CI)

State capitals and the Federal District

Weighted federal transfers for food procurement from family farming (%)			
Year	Median	p25	p75
2011	0.68	0.00	4.71
2012	1.75	0.00	8.24
2013	10.09	1.84	21.02
2014	14.92	5.01	25.87

Questions

- Discuss whether evaluations of regulatory measures of school feeding programs are worth pursuing
 - Including other program regulations (restriction of a few processed foods)
- If these evaluations are worth pursuing, discuss the availability of other secondary datasets considering the strong limitations of the National School-Based Health Surveys (PeNSE))
- Other suggestions

Future actions

NUPENS/USP

1. Estimate price elasticities for nonessential foods
2. Effect of regulatory policies that ban sales of sugar-sweetened beverages and snacks inside schools on students' dietary intake
3. Update on obesity and diabetes cost and propose simulations of effects of a potential tax on obesity and diabetes

In-country partners (ACT and IDEC)

1. School food environment regulation
2. Food labelling (including FOP) under discussion
3. Marketing restrictions