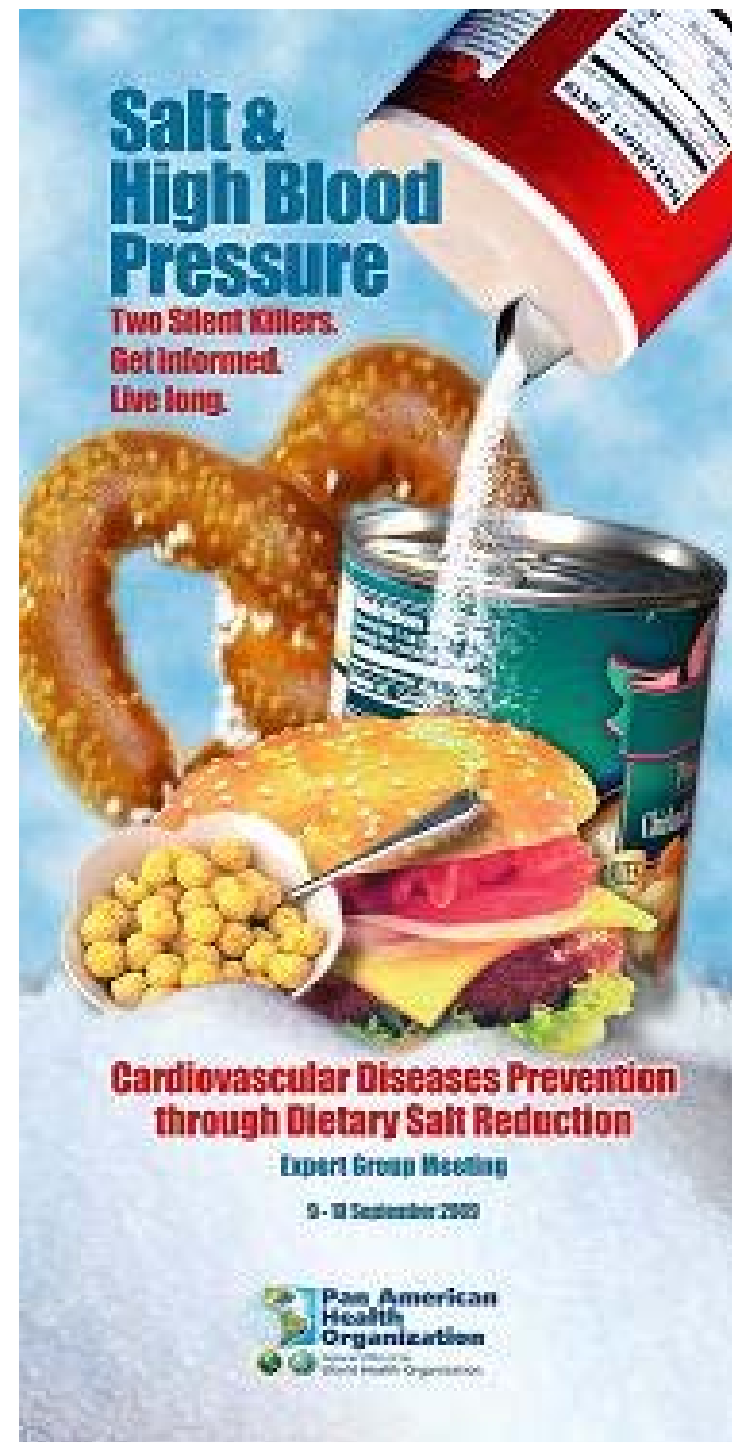



Cardiovascular Disease Prevention through Dietary Salt Reduction

First PAHO Expert Group Meeting

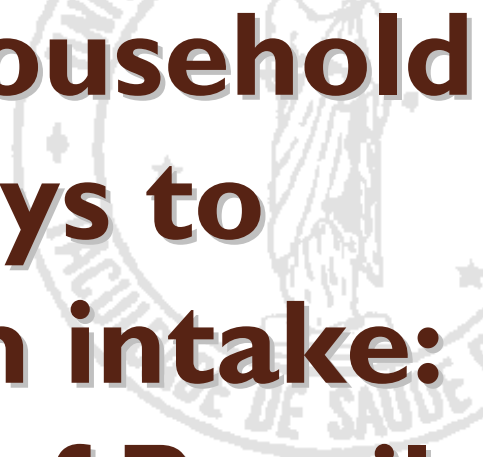
Washington, D.C.

9-10 September 2009





Using national household budget surveys to estimate sodium intake: the experience of Brasil



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Sodium intake data sources

- National supply
 - Salt Industry
 - Government
- Household availability
 - **Households Budget Surveys**
- Individual intake

Brazilian National HBS

- HBSs since 70s
- Multistage cluster sampling, stratified by geographic location and economic level
- National representative
 - 48,470 households
 - 5 Regions / 26 States (+FD)
 - Urban and Rural areas





Brazilian National HBS

- Records of all food and drink purchases
 - Family consumption
 - Seven consecutive days
 - 969,989 records
- Unit of study
 - Groups of households
 - Location and economic level
 - 443 HBS strata (sampling strategy)



Methods

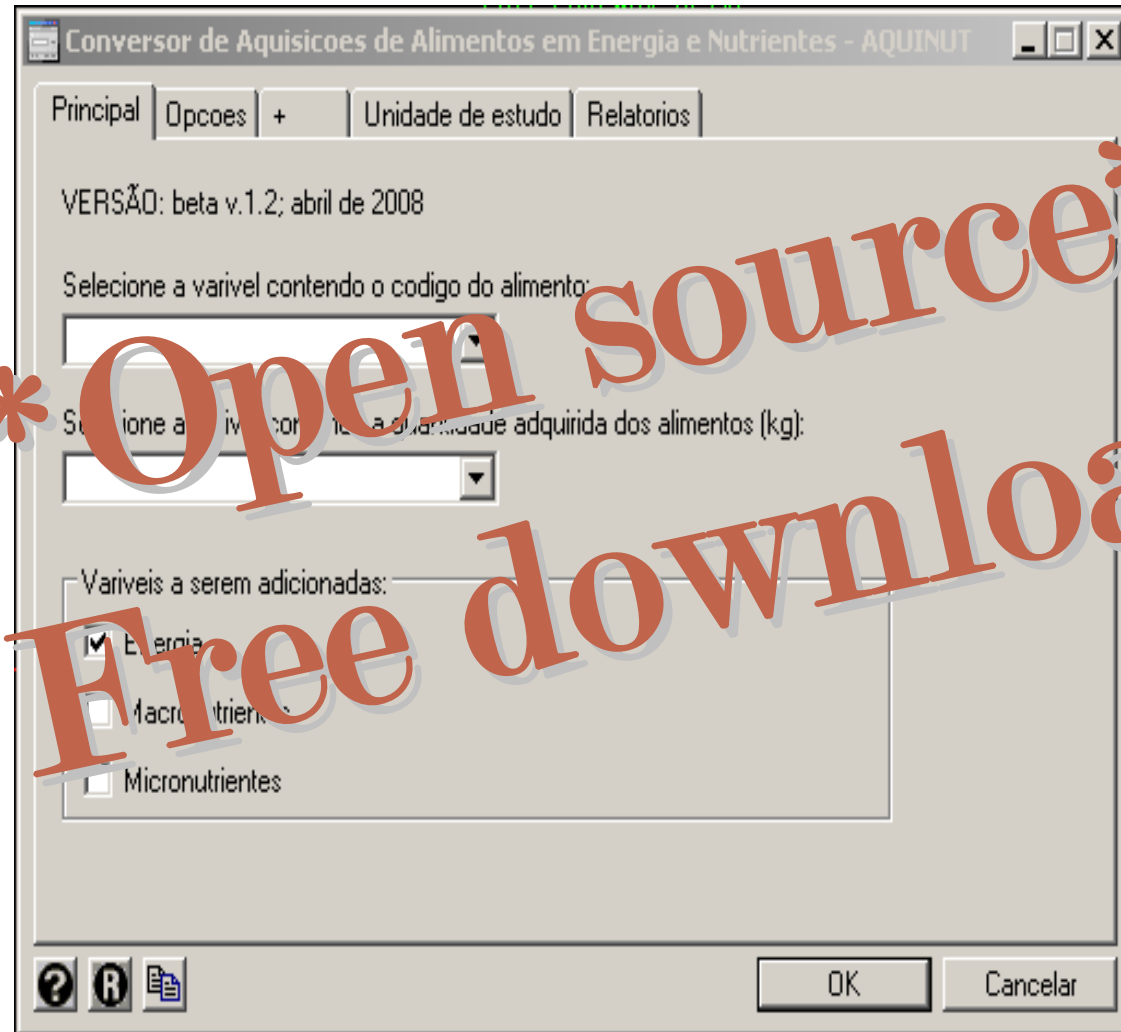
- Approximately 1,300 food items:
 - 4 food groups (69 subgroups)
- Non-edible parts were excluded
- Edible fraction:
 - Energy (kcal)
 - Sodium (grams)



Methods

- Software: Aquinut (NUPENS/USP):
 - Includes correction for non-edible fraction
 - Brazilian Food Composition Table (v.1)
 - USDA food composition table (v.15)
- *Adjustment*: Foods preserved in salt
 - salted/dried beef or fish
 - Convert the original amount of sodium in:
 - Sodium concentration equivalent to the desalted product

AQUINUT

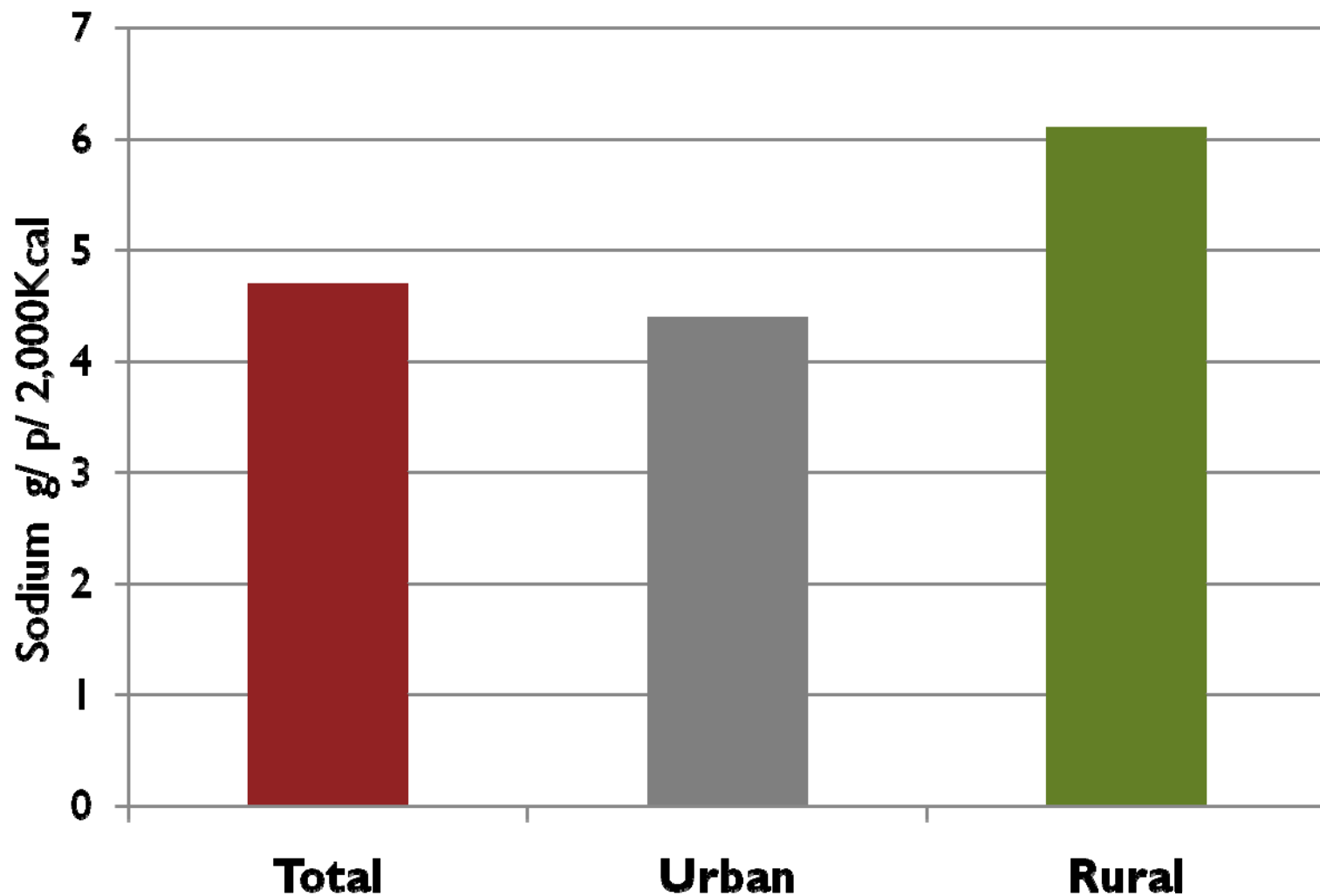




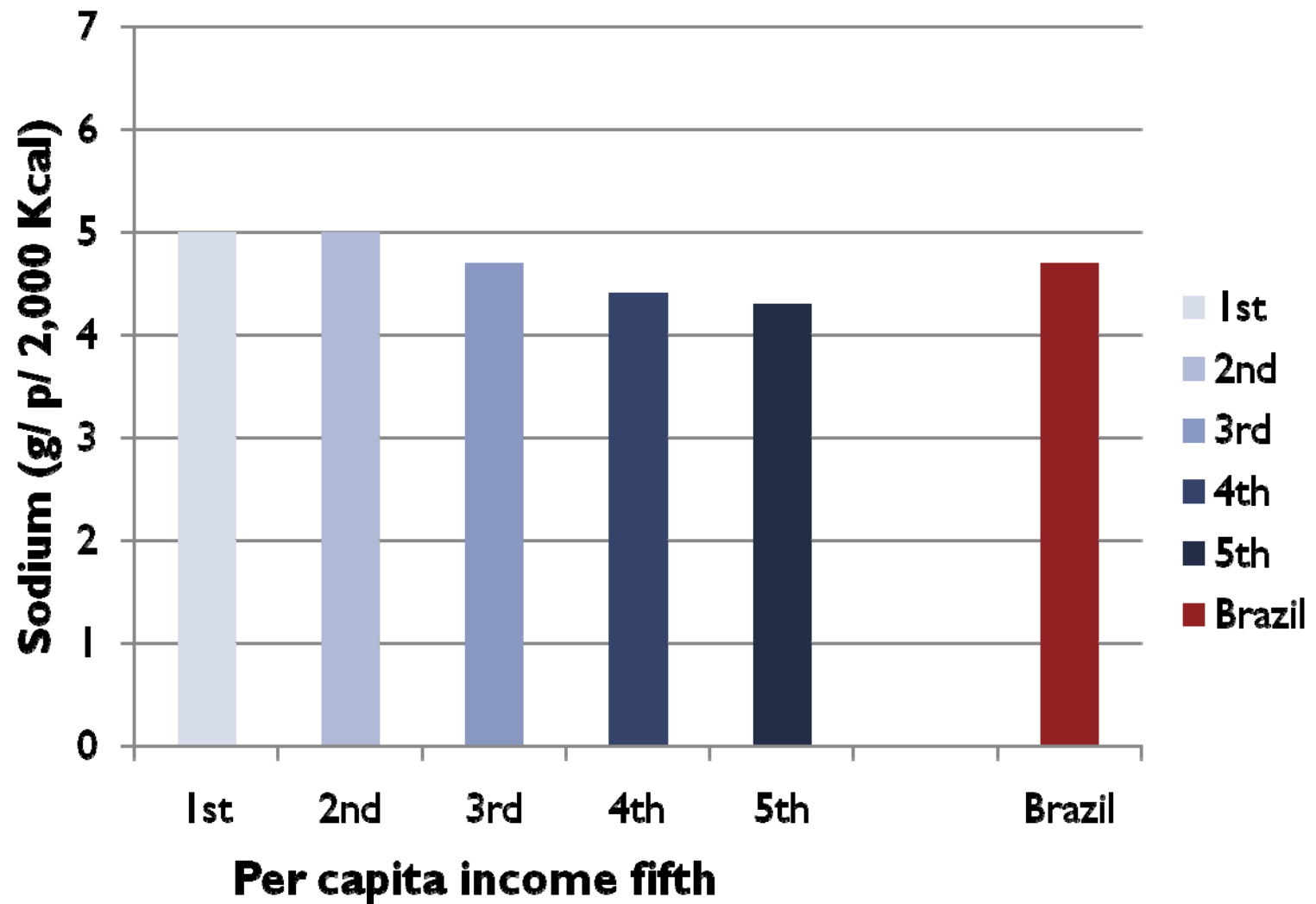
Methods

- Estimated daily *per capita* availability:
 - Energy (Kcal/ d/ p)
 - Sodium (mg/ d/ p)
- Sodium availability was adjusted to an energy consumption of 2,000 kcal
 - To approximate the household availability to the actual intake:
 - Meals outside home

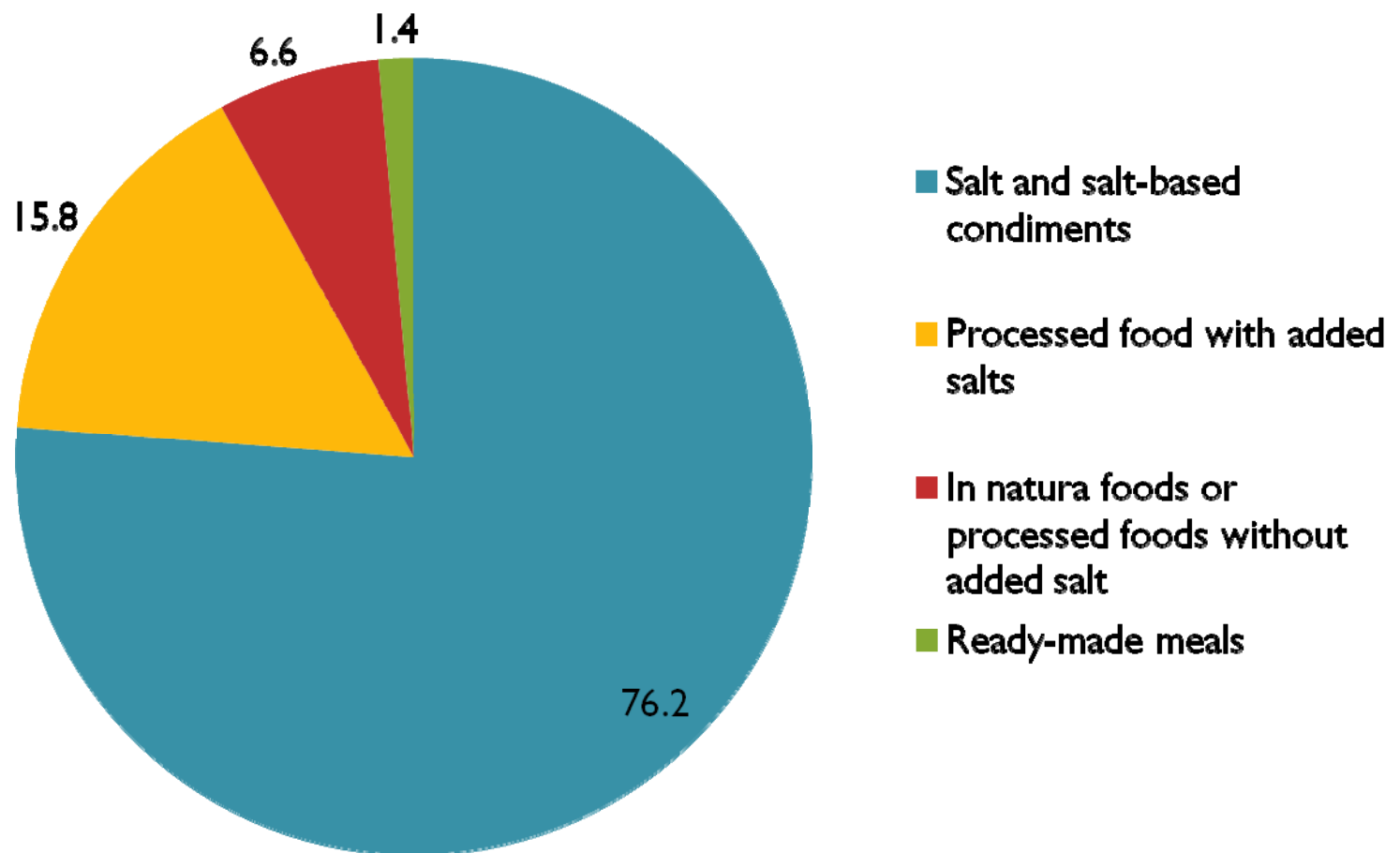
Graphic I. Average household availability of sodium (g/ d/ 2,000Kcal). Brazil, 2002/03.



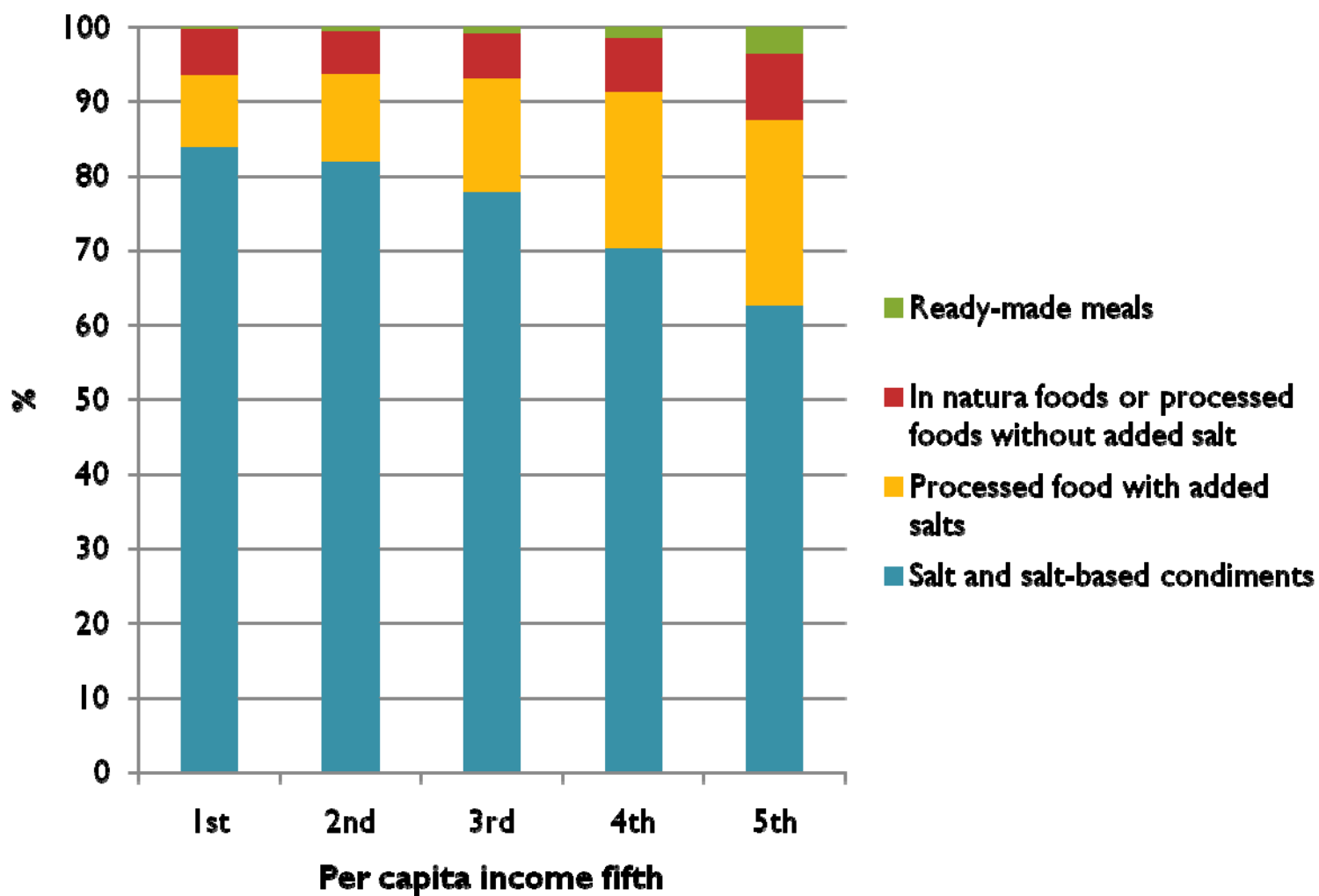
Graphic 2. Average household availability of sodium (g/ d/ 2,000Kcal) according to income levels. Brazil, 2002/03.



Graphic 3. Distribution (%) of household sodium availability according to food groups. Brazil, 2002/03.



Graphic 4. Distribution (%) of household sodium availability according to income levels and food groups. Brazil, 2002/03.





Limitations

- Household availability X Actual consumption
 - **Food eaten away from home**
 - Sodium content of outside meals is generally assumed to be higher
 - **Wastage**
 - Wastage is assumed to be low
 - Cooking foods in salted water (like pasta, potatoes, and carrots)
 - Wastage source = 9% of all sodium purchased by Brazilian families
 - Home-salted foods
 - Rarity in urban households
 - Could account for the greater sodium availability in rural households



Strengths

- HBS estimates tend to agree with results obtained by individual intake surveys
- In the case of cooking ingredients HBS might provide better estimates of actual intake
 - It may be difficult for individuals to accurately estimate the amount of such ingredients on prepared meals.
 - Periodicity
 - Cost
 - Methods
 - Allow stratifications
 - Geographic and economic



Conclusions

- HBS provide a reliable estimate of sodium availability
- The availability of sodium for consumption in Brazilian households is more than two-fold higher than maximum recommended ingestion levels
 - The most important sources are kitchen (table) salt and salt-based condiments
 - *The contribution from processed foods increases as household income increases*

HBS in Americas and Caribbean



Canada

Mexico

United States of America

Antigua and Barbuda

The Bahamas

Barbados

Belize

Costa Rica

Cuba

Dominica

Dominican Republic

El Salvador

Grenada

Guatemala

Haiti

Honduras

Jamaica

Nicaragua

Panama

Saint Kitts and Nevis

Saint Lucia

Saint Vincent and the Grenadines

Trinidad and Tobago

Argentina

Bolivia

Brazil

Chile

Colombia

Ecuador

Guyana

Paraguay

Peru

Suriname

Uruguay

Venezuela

HBS in Americas and Caribbean



Canada

Mexico

United States of America

Antigua and Barbuda

The Bahamas

Barbados

Belize

Costa Rica

Cuba

Dominica

Dominican Republic

El Salvador

Grenada

Guatemala

Haiti

Honduras

Jamaica

Nicaragua

Panama

Saint Kitts and Nevis

Saint Lucia

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Argentina

Bolivia

Brazil

Chile

Colombia

Ecuador

Guyana

Paraguay

Peru

Suriname

Uruguay

Venezuela



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Complementary information

- Full set of Results

Table 1. Household energy and sodium availability based on food purchases according to macroregion and urban/rural status of the household. Brazil, 2002-03.

Macroregion/household status	Energy (kcal/p/day)		Sodium (g/p/day)		Sodium (g/p/2,000 kcal)	
	Mean	(Standard-error)	Mean	(Standard-error)	Mean	(Standard-error)
North						
Urban	1848.6	(75.0)	4.3	(0.4)	4.7	(0.4)
Rural	2951.6	(142.2)	11.4	(3.9)	7.4	(2.2)
Total	2111.9	(107.5)	6.0	(1.1)	5.4	(0.6)
Northeast						
Urban	1720.6	(27.2)	3.9	(0.1)	4.5	(0.1)
Rural	2092.3	(52.3)	6.5	(0.4)	6.2	(0.4)
Total	1818.4	(30.9)	4.6	(0.2)	5.0	(0.2)
Southeast						
Urban	1760.8	(61.8)	3.8	(0.2)	4.3	(0.1)
Rural	2623.4	(316.2)	7.0	(1.0)	5.8	(1.3)
Total	1830.0	(64.3)	4.0	(0.2)	4.4	(0.2)
South						
Urban	1858.5	(67.1)	4.4	(0.2)	4.8	(0.2)
Rural	3008.7	(244.5)	8.0	(0.9)	5.4	(0.4)
Total	2045.8	(94.5)	5.0	(0.3)	4.9	(0.1)
Center-West						
Urban	1654.3	(47.0)	3.4	(0.2)	4.1	(0.3)
Rural	2588.3	(136.5)	8.7	(2.1)	6.4	(1.3)
Total	1763.7	(61.6)	4.0	(0.4)	4.3	(0.3)
Brazil						
Urban	1764.6	(33.5)	3.9	(0.1)	4.4	(0.1)
Rural	2489.5	(110.0)	7.5	(0.6)	6.1	(0.4)
Total	1875.1	(34.7)	4.5	(0.1)	4.7	(0.1)

Table 2. Household energy and sodium availability based on food purchases according to increasing fifths of *per capita* family income. Brazil, 2002-03.

Per capita income fifth	Energy (kcal/p/day)		Sodium (g/p/day)		Sodium (g/p/2,000 kcal)	
	Mean	(Standard-error)	Mean	(Standard-error)	Mean	(Standard-error)
1st	1950.6	(59.3)	4.9	(0.3)	5.0	(0.2)
2nd	1976.7	(87.7)	5.1	(0.4)	5.0	(0.2)
3rd	1922.9	(93.2)	4.6	(0.4)	4.7	(0.3)
4th	1735.0	(92.2)	3.8	(0.2)	4.4	(0.1)
5th	1787.7	(46.1)	3.8	(0.2)	4.3	(0.2)
Brazil	1875.1	(34.7)	4.5	(0.1)	4.7	(0.1)

Table 3. Distribution (%) of household sodium availability based on food purchases according to increasing fifths of the *per capita* income distribution and to food group. Brazil, 2002-03.

Food group	Fifth of <i>per capita</i> income distribution					
	Brazil	1 st	2 nd	3 rd	4 th	5 th
Salt and salt-based condiments	76.2	83.8	81.9	77.8	70.2	62.5
Processed foods with added salts	15.8	9.7	11.8	15.2	21.0	25.0
In natura foods or processed foods without added salt	6.6	6.1	5.6	6.0	7.3	8.8
Ready-made meals	1.4	0.4	0.7	1.0	1.5	3.7
Total	100.0	100.0	100.0	100.0	100.0	100.0