Author's response to reviews

Title: Dietary patterns in the five brazilian macro-regions.

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Version: 3 Date: 18 April 2011

Author's response to reviews: see over
Cover letter
April, 2011
MS: 1962061214869310
Title: Socioeconomic factors associated to dietary patterns in the five Brazilian macro-regions.
Autor: Sileia Nascimento, Flávia S Barbosa, Rosely Sichieri and Rosangela A Pereira
Version: 1 Date: 28 December 2010

Reviewer: Patrick Mullie

Reviewer's report:

The objective of the study was to describe dietary patterns in Brazilian macro-regions using data from household budget surveys. The authors identified a traditional pattern composed of rice and beans, and a mixed pattern in areas of high economic level.

Questions:

Major Compulsory Revisions Data are on the ecological level, so individual conclusions are not possible. The socioeconomic aspect, mentioned in the title, is very minor in the publication, because there are no data about individual food consumption and the socioeconomic levels of individuals are unknown.

There is a possible ecological fallacy present: it is not because some geographical macro-regions include more adolescents or illiterate of low income that you may conclude that these influence dietary patterns.

Answers:

We changed title to “Dietary patterns in the five Brazilian macro-regions”. We also changed all statements indicating that analyzes were done at individual level.

There is no possibility of excluding all possible ecological fallacies in this study, however presence of adolescents and illiterates were controlled for education and income at the level of primary sampling units (PSU) that are the units of analysis.

Question:

Not all consumed foods were captured (see discussion about snacks and beverages among adolescents; items purchased and eaten out-of-home are not included in HBS); this is a main problem for the validity of the study.

Answers:

The eating out of home has been increasing in Brazil, but in the HBS 2002-2003 it was about 35 % a percentage that is much lower than those observed in developed countries such as
U.S. We had included this possibility in the previous version and now we also included the possibility that an incomplete register of beverages, snacks, and fast-foods may have attenuated our associations related to traditional or regional dietary pattern.

**Question:**
There are much better publications relating dietary patterns to socioeconomic level.

**Answers:**
We agree but we have reduced all associations studied mainly at ecological level, therefore much of the individual level references were excluded.

**Minor remarks**

**Abstract**

**Question:**
Line 9: 15% to 28% of the variation …. Variation of what?

**Answers:**
It is the percent of total variance accounted for each factor. The expression: “…15 to 28% of the variation…” was changed to “…15 to 28% of the variance…”

**Question:**
Line 9: delete sentence in the South, Southeast …

**Answers:**
It’s important to keep this sentence because it determines the patterns found in these three regions.

**Question:**
What is a mixed pattern?

**Answers:**
The mixed pattern was characterized by high factor loadings for many groups of foods, such as: vegetables and leafy vegetables (ex.: lettuces, pumpkin, chayote); potatoes; other tuberous roots (ex.: yam, sweet potatoes, beets); fruits; breads; cakes and cookies; milk and dairy; butter and margarine; sweetened beverages (soft drinks; juices and others); and diet and/or light products. Now the patterns were given a title in the tables that facilitates the reading.

**Introduction**

**Question:**
Line 8: obtaining data on food intake … I do not agree with this sentence, obtaining data using food-frequency questionnaire is rather inexpensive.

**Answer:**
It was changed in the text for: “Obtaining data on food intake in population-based studies is neither an easy nor an expensive task.”

**Question:**
Line 11: … updated using international standardized methodology (ref; which methodology?

**Answer:**
It is now included in the text:


**Question:**
Line 14: these surveys replace by HBS and Line 17: Household Budget Surveys replace by HBS.

**Answer:**
It is now changed in the text.

**Question:**
Line 17: describe the patterns observed by Naska et al.

**Answer:**
It was included in the text: “… the first pattern indicated ‘wide-range’ food buyers, was more common among households whose head was retired and elderly, possibly indicating infrequent out-of-home and second indicated ‘beverage and convenience’ food buyers, were more common among households located in urban or semi urban areas and among adult Scandinavians living alone.”

**Question:**
Line 21: the socioeconomic factors replace socioeconomic determinants

**Answer:**
It is now replaced.

**Methods**

**Question:**
Line 12: what is POF?

**Answer:**
Sorry, it is Portuguese. It is now changed in the text.

**Question:**
Line 21 to 29: due to the time frame …. Unclear, please reformulate

**Answer:**
It was changed in the text for: “Household data were collected during one week. Therefore for purchases such as rice, beans, sugar, oils, etc. are usually bought monthly the total amount was zero or many kilograms. The amount in kilos or liters acquired by each PSU of all food groups was divided by the number of households composing each PSU. These average amount of food groups presented asymmetrical distributions with a large number of values equaling zero. In order to render the data more symmetrical, the amounts acquired of the food groups were log transformed and PSU instead of household were used in the analysis. Following the logarithmic transformation, the mean quantities in kilos or liters were evaluated by attributing a score of 0 to 4, where 0 indicated no acquisition and 1 to 4 referred to the quartiles of distributions of the mean amounts purchased.”

**Results**

**Question:**
Line 1: high KMO values, what is KMO?

**Answer:**
It is test of Kaiser-Meyer-Olkin (KMO) was included in the text.

**Discussion**

**Question:**
Discuss the problems associated with ecological data

**Answer:**
There is no possibility of excluding all possible ecological fallacies in this study; however associations found such as presence of adolescents, elderly and illiterates were controlled for education and income at the level of primary sampling units (PSU) that are the units of analysis, as an attempt to reduce this bias.

**Question:**
Where food data adjusted for energy before using principal component analysis, discuss the consequence of energy-adjustments.

**Answer:**
Studies using dietary patterns have as the main focus to substitute the nutrient analysis that are highly dependent on energy-adjustment since most nutrients are highly associated to energy. Since our analysis aggregate food groups there is no need of adjusting for energy and most studies using dietary patterns have not being adjusted.

**Question:**
Line 22: Why mentioning studies conducted in Europe?

**Answer:**
The use of HBS data for the assessment of nutritional information has been enhanced by the Data Food Networking (DAFNE), an effort for the development for a European food databank based on HBSs\cite{1} and it is now one main source of this data. Efforts in Latin America to explore HBS data include Bolivia and Mexico.
**Reviewer:** Catherine Lau

This paper examines dietary availability pattern in macro-regions of Brazil and examines the association between socioeconomic and demographic factors and the patterns. The methods are overall fine and it is a well written paper.

**Concerns:**

**Question:**

Minor Essential Revisions: Title is not good.

**Answer:**

The title was changed for “Dietary Availability patterns in the five Brazilian Macro-regions”

**Abstract:**

**Question:**

Minor Essential Revisions: Method section does not make sense without further details.

**Answer:**

It was included:

**Study design:**

1) First paragraph, lines 94-98: “…The present study utilized data from the nationwide 2002-2003 Brazilian HBS [2]. The study adopted a two-stage cluster sample design. The geographic sectors of the 2000 Brazilian Demographic Census were the primary sampling units (PSU), stratified according to geographic location and socioeconomic level, selected via systematic sampling with a probability proportional to the number of households in the sector.”

2) First paragraph, lines 101 and 102: “…In order to capture seasonal variability, sample collection was distributed evenly throughout the year…”

3) Third paragraph, lines 110 – 114: “The data of the HBS in Brazil allow assessing the dietary availability pattern to country and all large regions, the sampling HBS was structured to produce representative estimates the country as a whole and the regions North, Northeast, Southeast, South and Midwest. Information was also collected on the sociodemographic characteristics of the household members [2], thus allowing linkage of dietary habits to explanatory socioeconomic factors.”

**Data on food availability**

1) First paragraph, lines 116-118: “Since HBS are not designed to primarily serve Nutrition purposes, the food data vary from very detailed records to more aggregated ones. Therefore, it became necessary to aggregate food items to the lowest level of information (i.e. fish is classified under 900 different codes).”
Identification of food patterns and statistical analysis

1) First paragraph, lines 136-137: “In order to verify whether the data being analyzed were appropriate for the factorial analysis, the test of Kaiser-Meyer-Olkin (KMO) was used\[^{3,4}\]…”

2) First paragraph, lines 140-141: “To identify the number of factors to be retained two commonly applied criteria were used: (1) the eigenvalues > 1.0 criterion, and (2) the graphical Cattell’s scree test.”

3) Second paragraph, lines 145-146: “…Cronbach’s Alpha coefficient and values greater than 0.6 were considered acceptable.”

4) Third paragraph, lines 129-133: “…Linear regression models included the patterns identified as dependent variables. The independent variables were: the percents of elderly people, children, and adolescents in the PSUs, the PSU’s average monthly total household income and the percents in the education categories regarding the head of household (illiterate, elementary school, high school, college or more) in the PSUs.”

5) Sixth paragraph, lines 157-156: “All ethical related questions are in conformity with the Brazilian Resolution Number 196/96- on research involving human subjects. For all the census and surveys conducted by the bureau of census there is a specific federal law (law number 5534 from November 14, 1968) which guarantees strict secrecy of information.”

Question:

Minor Essential Revisions: Conclusion in abstract is not correct. It is incorrect to state that a dietary pattern is frequent when PCA have been used to identify the dietary patterns.

Answer:

It was corrected the Conclusion of abstract: “The Brazilian rice and beans dietary pattern and Regional patterns are still important in Brazil manly among the low socioeconomic areas (PSUs).
Dietary recommendations in Brazil should promoting eating habits healthy nationwide”. And we changed the term “frequent” to “associated”.

**Introduction:**

**Question:**

Minor Essential Revisions: Use dietary availability patterns through out the entire paper. Eating patterns, dietary practices etc should be changed to dietary availability patterns.

**Answer:**

It was changed throughout the text.

**Question:**

Minor Essential Revisions: Last paragraph before objective: reference is missing and it is relevant to know the method used to identify the dietary availability patterns.

**Answer:**

The reference was included. The study of the Bolivia estimated the food and nutrient availability in Bolivian households using data from the nationally representative sample. To allow comparisons with data collected in other countries, the survey used the methodology developed in the European Data Food Networking (DAFNE).

**Question:**

Minor Essential Revisions: Objective: the second aim is to EXAMINE not to explain the socioeconomic factors associated with………..

**Answer:**

It was corrected in the text.

**Methods:**

**Question:**

Minor Essential Revisions: What is POF?

**Answer:**

Sorry, it is Portuguese. It is now changed in the text.

**Question:**

Minor Essential Revisions: What is PSU = primary selection unit in terms of region, area or???

**Answer:**

The PSU stands for primary sampling unit, used by the bureau of census to design complex sampling.

**Question:**
Major Compulsory Revisions: Categorizing the availability of the food groups result in loss of data information. Re-do analyses on continuous food groups or argue for your choice of categorization.

Answer:
There are more than 2000 foods and food groups such as meet and fish in the HBS. All reduction of variables, that is what the analytical tool used (factor analysis) make usually initiate with grouping similar items in order to gain in interpretability of the factors extracted. Therefore, there is no possibility of including all the foods in the analysis.

Question:
How big is the fraction of PSU’s with 0 acquisition of one or more of the 21 food groups? Discuss how this may have affected the results.

Answer:
The fraction of PSU’s with 0 acquisitions was observed only for food group diet and light among 1.46% of the PSUs. We believe that this do not affect the results.

Results:
Question:
Minor Essential Revisions: KMO is not explained in the methods section. This is needed.

Answer:
Now corrected in the text: “In order to verify whether the data being analyzed were appropriate for the factorial analysis, the test of Kaiser-Meyer-Olkin (KMO) …”

Question:
Minor Essential Revisions: Is minimum wage on page 5 and in table 1 per month? Please specify and make sure that the numbers are right.

Answer:
It’s minimum wage per month and the numbers was corrected.

Question:
Major Compulsory Revisions: There does not seem to be accordance between pattern numbers in table 2 and 4. Names are absolutely needed. Otherwise it is impossible to check the correctness of the results described.

Answer:
Now patterns were named.

Discussion:
Question:
Minor Essential Revisions: What does it mean for your results/interpretation that availability of rice and beans decreased from 1974 to 2003?

Answer:
This fact has no association with the results, therefore it was excluded.

Question:
Minor Essential Revisions: Results of linear regression adjusted for income and schooling have not been described previously.

Answer:
Now it was changed for: “Linear regression models included the patterns identified as dependent variables. The independent variables were: the percents of elderly people, children, and adolescents in the PSUs, the PSU’s average monthly total household income and the percents in the education categories regarding the head of household (illiterate, elementary school, high school, college or more) in the PSUs.”

Question:
Minor Essential Revisions: Discuss how does the results fit we current dietary recommendations and what should be changed to get closer to the recommendations?

Answer:
It was included: “The Brazil have taken many actions for to improve nutrition as part of their public health policies, the data of the HBS could help to recognize the different food choices in the large regions of the country. Although data of HBS reflect the availability of foods rather than the consumption, the data are a useful tool to depict comparisons between large regions of country, that are regularly updated and allow to monitor changes and support programs education for promoting eating habits healthy nationwide.”

Question:
Minor Essential Revisions: Discuss the representativeness of the HBS.

Answer:
The data of the HBS in Brazil allow assessing the dietary availability pattern to country and all large regions, the sampling HBS was structured to produce representative estimates the country as a whole and the regions North, Northeast, Southeast, South and Midwest.

Question:
Minor Essential Revisions: Discuss how to make guidelines based on results from Principal component analyses. Would it be more relevant to make cluster analyses when the goal is to guide politicians?
Answer:
In general cluster analysis would be more appropriate to make recommendations due to the fact that individuals are grouped. In our case we are making analysis at the PSU level.

Question:
Minor Essential Revisions: Use of terms is not rigorous. In the last paragraph on page 7 low adherence and higher acquisition should be replaced with weaker association and stronger association, respectively.

Answer:
It was changed in the text.

Conclusion:

Question:
Minor Essential Revisions: Correlation should be changed to association or relationship to be strict on the use of terms.

Answer:
It was changed in the text.

Question:
Nutritional guidelines are based on studies of diet-health associations and intervention – and these are “true” independent of social class. It would therefore be more relevant that the politicians change the price on healthy food to make it possible for low income families to buy what is most healthy. This could be incorporated in the discussion/conclusion.

Answer:
We incorporated in the discussion: “The Brazil have taken many actions for to improve nutrition as part of their public health policies, the data of the HBS could help to recognize the different food choices in the large regions of the country. Although data of HBS reflect the availability of foods rather than the consumption, the data are a useful tool to depict comparisons between large regions of country, that are regularly updated and allow to monitor changes and support programs education for promoting eating habits healthy nationwide.”

Tables:
Question:
Table 2:
Major Compulsory Revisions: Extreme large reduction in data and with no details on types of products in each group, making it impossible to use for comparison with other studies.

Answer:
There are more than 2000 foods and food groups such as meat and fish in the HBS, there is no possibility of including all types of products in each group.

It was included in the results: “In the South, Southeast and Midwest beyond of Brazilian rice and beans pattern, other designed as Mixed pattern with high factor loadings for the groups of vegetables and leafy vegetables (ex.: lettuces, pumpkin, chayote); potatoes; other tuberous roots (ex.: yam, sweet potatoes, beets); fruits; breads; cakes and cookies; milk and dairy; butter and margarine; sweetened beverages (soft drinks; juices and others); and diet and/ or light products was also extracted (Table 2).”

**Question:**
Discretionary Revisions: This table needs legend explaining which loadings that are shown in the table.

**Answer:**
Now it was changed for: “Table 2: Loading values according to dietary patterns extracted by principal components analyses in the five geographic regions of Brazil. National Household Budget Survey 2002/2003.”

**Question:**
Minor Essential Revisions: Flour is not part of the traditional North pattern.

**Answer:**
We excluded flour as the main component of the North region.

**Question:**
Sugar is not part of what you called the traditional pattern in Southeast, South and Midwest. This should be corrected.

**Answer:**
We corrected in the text.

**Question:**
Minor Essential Revisions: Names on the patterns in table 2 are needed.

**Answer:**
The names on the patterns were included in table.
Reviewer: Rachel Millstein

Reviewer's report:

-Major compulsory revisions:

Question:
Abstract: add to the methods that you ran a regression.

Answer:
Added to the methods: “Linear regression models included the patterns identified as dependent variables. The independent variables were: the percents of elderly people, children, and adolescents in the PSUs, the PSU’s average monthly total household income and the percents in the education categories regarding the head of household (illiterate, elementary school, high school, college or more) in the PSUs.”

Question:
Methods, 2nd paragraph: justify the use of Eigenvalues greater than 1.25.

Answer:
The value of Eigenvalues was incorrect and was corrected in text for: “…To identify the number of factors to be retained two commonly applied criteria were used: (1) the eigenvalues > 1.0 criterion, …”.

Question:
Methods, 5th paragraph: clarify how you are defining income groups. For instance, what exactly does "1 to 2 minimum wages" mean? Is this a multiplicative factor?

Answer:
This minimum wage isn’t multiplicative factor. Workers nationwide are guaranteed a minimum wage established by law equivalent to approximately US$ 74.00 in the period of the study. The variable average monthly household income per PSU was categorized with this value.

Question:
Results. Table 1: clarify the minimum wage categories, and also, the dollar value is different from that reported in the text- make consistent.

Answer:
It’s corrected in the table and in the text; the correct value is US$ 74.00.

Question:
Table 2 and 3: It would be helpful to include the names of the patterns.

Answer:
The names on the patterns were included in table.
Discussion, paragraph 5: please elaborate or remove. As it is, it doesn't add to your discussion.

Answer:
This fact has no association with the discussion, therefore it was removed.

Discussion: why are adolescents more associated with traditional patterns? Your explanation does not seem sufficient- what else might be working to make this association so strong?

Answer:
Our analysis level PSUs is being acquisitions of adolescents influenced by the purchase of the family. The expression “strong” was excluded from the text.

Discussion, 2nd to last paragraph: these are big limitations of this study. Please elaborate. The last sentence of this paragraph does not make sense or help your argument.

Answer:
Now it was changed for: “The household purchase data can be a valuable tool for obtaining information on the food pattern of a population. HBS data could help highlight issues such as differences in dietary patterns, high-risk population groups on account of their nutritional habits and valuable tool for many purposes, including nutrition and agricultural planning and marketing strategies [1, 5]. A limitation of HBS studies, particularly of those conducted in Brazil is the short time (only a seven–day purchase period). For that reason, only clusters of households could be analyzed.”

How could you test if food eaten away from home is "significantly different"?

Answer:
The eating out of home has been increasing in Brazil in the HBS 2002-2003 it was about 35 %. In study that used the data HBS 2002/2003 found an association between eaten out of home (soft drinks, fast food, deep-fried snacks, sweets, sit-down meals) and overweight and obesity among men, except for the ‘sweets’ group[6].

You need either more data or to suggest more tests for how to assess the validity of your results and their implications for practice or policy.

Answer: 
???????????????
**Question:**
Overall, the paragraphs are too short- either combine them or write more, to make them more substantial.

**Answer:**
It was changed in the text.

**Minor essential revisions:**

**Question:**
Overall, use "education," not "schooling."

**Answer:**
It was changed in the text.

**Question:**
Be consistent and use "% of variance" explained, not "variability."

**Answer:**
It was changed in the text.

**Question:**
Abstract, results- change "loads" to "loadings."

**Answer:**
It was changed in the text.

**Question:**
Introduction, 2nd paragraph: add an S to make it "local populations"

**Answer:**
It was changed in the text.

**Question:**
Intro, 3rd paragraph: HBS allows whom to estimate?

**Answer:**
HBS allow estimating dietary availability patterns in households and creating the opportunity to test associations with the demographic and socioeconomic factors.

**Question:**
Intro, 4th paragraph- this is not a paragraph- too short. May put into methods instead.

**Answer:**
It was excluded from the text.

**Question:**
Intro, 5th paragraph: be consistent with using HBS as the abbreviation. Also end that paragraph with a period.

Answer:
It was changed in the text.

Question:
Methods, 1st paragraph: you have already defined PSU, just use that abbreviation.

Answer:
It was changed in the text.

Question:
Methods: 1st paragraph: define POF.

Answer:
Sorry, it is Portuguese. It is now changed in the text.

Question:
Add an "e" to "local," as it should be: "locale."

Answer:
It was changed in the text.

Question:
Methods/Identification of food patterns: 3rd paragraph: Clarify how you used Cronbach's alpha. Were values of greater than 0.6 considered "good" or "acceptable"?

Answer:
It is now changed in the text for: “The internal consistency of the items that compose each pattern was evaluated by a Cronbach’s Alpha coefficient and values greater than 0.6 were considered acceptable.”

Question:
Results, 1st paragraph: define KMO.

Answer:
Now corrected in the text: “In order to verify whether the data being analyzed were appropriate for the factorial analysis, the test of Kaiser-Meyer-Olkin (KMO) …”

Question:
Table 1: add an "s" to PSU.

Answer:
It is now added in the text

**Question:**
Table 4: don't need "..." following "continued" in the table titles on each page.

**Answer:**
It was excluded from the expressions.

**Question:**
Tables 2-4: you could include the pattern names (also noted this in the previous section).
The names on the patterns were included in tables.
**Reviewer:** Laurie Ricciuto  

**Reviewer's report:**  

Minor Essential Revisions  

**Question:**  

1. Methods, paragraph 2 – what is POF? Please provide clarification.  

**Answer:**  

Sorry, it is Portuguese. It is now changed in the text.  

**Question:**  

2. Methods, "Data on food availability", paragraph 2 – unclear, “combined purchases from PSUs” How did you do this? “All other variables were also related to the PSUs, such as percentage of PSUs with children” – not clear, what variables, what do you mean by related to the PSUs? More description in this paragraph would be helpful to clarify what is being done in terms of data analysis.  

**Answer:**  

It was changed in the text for: “Household data were collected during one week. Therefore for purchases such as rice, beans, sugar, oils, etc. are usually bought monthly the total amount was zero or many kilograms. The amount in kilos or liters acquired by each PSU of all food groups was divided by the number of households composing each PSU. These average amount of food groups presented asymmetrical distributions with a large number of values equaling zero. In order to render the data more symmetrical, the amounts acquired of the food groups were log transformed and PSU instead of household were used in the analysis. Following the logarithmic transformation, the mean quantities in kilos or liters were evaluated by attributing a score of 0 to 4, where 0 indicated no acquisition and 1 to 4 referred to the quartiles of distributions of the mean amounts purchased  

All other variables were also related to the PSUs, such as percentage of PSUs with children, adolescents, or elderly people, PSUs’ mean income, and percentages of PSUs according to head of household’s education levels (illiterate, elementary school, high school, and college or more).”  

**Question:**  

3. Table 1 – typo in ‘South’ in heading, In first column – the family composition variables are unclear. Is it 'mean % of PSUs with children' that you are showing? Perhaps some revision of the terminology would help make this more clear.  

**Answer:**  

The terminology was revised, the expression “mean” was excluded and now is: “Children per PSU (%),” “Adolescents per PSU (%),” “Elderly per PSU (%).”


