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# Comparative analysis of dietary guidelines in the Spanish-Speaking Caribbean

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Submitted 1 February 2015: Final revision received 7 June 2015: Accepted 10 June 2015: First published online 10 July 2015

## Abstract

**Objective:** Dietary guidelines are important education and policy tools to address local nutrition concerns. The current paper presents a comparative analysis of nutrition messages from three Spanish-speaking Caribbean countries (Cuba, Puerto Rico and Dominican Republic) to explore how these dietary guidelines address common public health nutrition concerns, contextualized in different changing food environments and food culture similarities.

**Design:** Qualitative, comparative analysis of current dietary guideline documents and key recommendations.

**Results:** Key recommendations were categorized into sixteen themes (two diet-based, ten food-based and four 'other'). Only the Cuban dietary guidelines included diet-based key recommendations. Of the ten food-based key recommendations, only four themes overlapped across the three dietary guidelines (the encouragement of fruits and vegetables, addressing protein sources and fat). Other overlaps were found between dietary guideline pairs, except between Cuba and Puerto Rico. Further analysis revealed differences in levels of specificity and acknowledgement of local dietary patterns and issues, as well as the need to revise the guidelines to account for current scientific advances.

**Conclusions:** The present study underscored the importance of context in the framing of dietary advice and the influence of national socio-economic and political situations on nutrition policy and education efforts. The results contribute to inform efforts to improve nutrition communication in the region and among migrant communities.

**Keywords**  
Dietary guidelines  
Caribbean  
Puerto Rico  
Cuba  
Dominican Republic  
Nutrition transitions  
Nutrition education

Global dietary patterns increasingly favour the consumption of animal products and ultra-processed foods, accompanied by high intakes of sodium, sugar and fat<sup>(1)</sup>. These dietary trends contribute to increased levels of obesity and diet-related diseases, especially in low- and middle-income countries, where increases are the most rapid<sup>(2)</sup>. The present paper addresses this situation by analysing one of the main tools to positively affect population eating behaviour: national dietary guidelines. This research contributes to tackling the pressing need to better address the burden of non-communicable, diet-related diseases through effective national policies that take a comprehensive, context-sensitive and multi-stakeholder approach to improve dietary quality and physical activity<sup>(3)</sup>.

National dietary guidelines represent the nutrition policy and priorities of many countries. These are meant to be the result of consensus among food and nutrition experts, whose task is to translate scientific evidence into practical messages that encourage populations to select a

healthy diet within their specific cultural and food context. While dietary guidelines can be useful as educational tools for local nutritionists and health providers, their effectiveness depends on how nutrition advice is framed<sup>(4)</sup> and, ultimately, the public's perceptions and interests concerning healthy eating behaviours<sup>(5–8)</sup>.

Comparative dietary guidelines research has mostly focused on their development, implementation<sup>(9–13)</sup> and pictorial representations<sup>(10,14)</sup>. While there has been comparative research concerning overall guideline messages<sup>(15)</sup>, there is a paucity of in-depth, cross-country comparative research on what the guidelines actually say and how nutrition messages are framed. The present study addresses this gap in the literature by engaging in a comparative content analysis of guidelines in the Spanish-speaking Caribbean (Cuba, Puerto Rico and the Dominican Republic), a region that shares a similar food culture, concerns over growing obesity rates and an increased consumption of energy-dense and ultra-processed foods,

but differs in current economic and political conditions (Table 1).

Spanish-speaking Caribbean countries are characterized by traditional dietary patterns, where rice and beans are staples and meat is central in the plate. Accompanying foods include *viandas* (starchy roots such as yucca, taro and plantains), fried snacks (*frituras*) and preserved foods (such as salted dried codfish and sausages). Today, a variety of ultra-processed foods and drinks, including sugar-sweetened beverages, constitute add-ons to the traditional diets. Current diets tend towards energy-dense foods, an increase in the consumption of pre-prepared food products and foods away from home, and a low consumption of fruits and vegetables<sup>(16–18)</sup>. While these changes go hand-in-hand with global dietary transitions, they are also influenced by circumstances unique to each context. Since the late 1950s, Puerto Rico has experienced a continued increase in fast-food restaurants. According to 2005 statistics, there were about 2000 fast-food restaurants, with a revenue of \$US 1.0–1.3 billion per year and 77 % of the population visited these restaurants often<sup>(19)</sup>. These fast-food restaurants coexist with street food stands, mostly selling fried snacks, as well as traditional meals. The foreign franchise food market started later in the Dominican Republic, in the late 1970s. In 2005 there were about 250 franchises, with 900 establishments, including non-food franchises<sup>(20)</sup>, a considerably lower number compared with Puerto Rico, especially when accounting for the geographical size difference between the two countries (Table 1). While Cuba's communist system and the US blockade have affected the country's food supply stability<sup>(21)</sup>, there is local production of ultra-processed foods, including, for example, local brands of sugar-sweetened

beverages (tuKola), among other similar products. In addition, access to foods away from home is increasing gradually with the recent upsurge in privately run restaurants (locally known as *paladares*) and the gradual opening of the country to foreign investment and food establishments<sup>(22,23)</sup>.

As a result of these changes, overweight and non-communicable diet-related diseases are present and increasing in the region. Puerto Rico shows the highest rate of adult obesity and childhood overweight (Table 1)<sup>(24,25)</sup>. The Dominican Republic presents issues related to undernutrition, having a high level of childhood stunting, closely surpassing the percentage of childhood overweight (Table 1).

The present research focuses on how the national dietary guidelines address pressing local nutritional issues, contextualized in changing food environments and food culture similarities. The information provided by this comparative exercise can inform future public health nutrition initiatives in the region as well as those targeting migrant communities, including improvements in nutrition messaging and potential regional collaborations.

### Dietary guidelines in the Spanish-speaking Caribbean

In the 1990s, the WHO and the FAO led a global effort to translate nutrient intake recommendations into food-based dietary guidelines<sup>(11)</sup>. However, guidelines have existed in the region since the late 1940s. As reviewed by Palacios and Anglero, the first Puerto Rican guidelines date back to 1946 and were based on the population nutrient needs

**Table 1** Selected descriptive country indicators (from CIA World Fact Book<sup>(39)</sup>, unless otherwise noted)

	Cuba	Puerto Rico	Dominican Republic
General descriptive indicators			
Government type	Communist state	US territory/commonwealth	Democratic republic
Economic system	Socialist	Capitalist	Capitalist
Size (km <sup>2</sup> )	100 860	13 790	48 670
Population (2014)	11 047 251	3 620 897	10 349 741
Urbanization (% , 2014)	77.0	78.1	93.6
Life expectancy at birth (years, 2014)	78.2	79.1	77.8
Litaracy (% , age 15+ years, 2011)	99.8	90.3	90.1
Per capita GDP (\$US)	10 200 (2010)	16 300 (2010)	9700 (2013)
Selected nutrition and health indicators			
% of children (<5 years) overweight (WHZ > +2)	10.7†	37.8§	8.1¶
% of children (<5 years) stunted (HAZ < -2)	3.7†	ND	9.8¶
% of adults obese (BMI ≥ 30.0 kg/m <sup>2</sup> )	21.5‡	27.5	21.2‡
Selected adjusted causes of death (per 100 000)*			
Diabetes	13.4	56.0	29.6
IHD	90.9	56.9	114.9
Cerebrovascular disease	50.7	26.2	78.0

CIA, Central Intelligence Agency; GDP, Gross Domestic Product; WHZ, weight-for-height Z-score; HAZ, height-for-age Z-score; ND, no data available.

\*Figures represent 2011 data for Cuba and 2010 data for Puerto Rico and Dominican Republic<sup>(40)</sup>.

†2005 statistic<sup>(41)</sup>.

‡2008 statistic<sup>(39)</sup>.

§2010 statistic<sup>(25)</sup>.

||2009 statistic<sup>(25)</sup>.

¶2007 statistic<sup>(29)</sup>.

and dietary patterns. However, since the 2000s, the island's Food and Nutrition Commission of Puerto Rico (Comisión de Alimentación y Nutrición, CAN-PR) has been adapting the guidelines and icons from the US Department of Agriculture's (USDA) Dietary Guidelines, starting with the Food Guide Pyramid for Puerto Rico<sup>(26)</sup>. The current Puerto Rican Dietary Guidelines (PR-DG), released in 2013, are based on the USDA 2005 and 2010 Dietary Guidelines. They include an adapted and translated version of MyPlate (*MiPlato*)<sup>(27)</sup>. The history of dietary guidelines in Cuba and the Dominican Republic is not well documented. Both countries published their current guidelines in 2009, following an internal process of review and consultation with local experts<sup>(28,29)</sup>. In Cuba, the guidelines were developed using a nationwide survey of food consumption and preferences, and included members of the culinary sector as part of the local experts consulted<sup>(18,30)</sup>. The current guidelines (Cuban-DG) are a revision of those published in 2000<sup>(31)</sup>. The current 2009 Dietary Guidelines in the Dominican Republic (DR-DG) seem to be the first in the country, developed with local and international actors, including the FAO and the Pan-American Health Organization<sup>(31)</sup>.

No information is available about the actual reach and use of these documents. They are disseminated through the usual channels, including schools, health providers and community-based nutrition education initiatives<sup>(31)</sup>.

## Methodology

The present paper is based on a qualitative analysis of current dietary guidelines for each location. They were

accessed electronically, through the official government agency responsible for their dissemination (Table 2). These guidelines include a long, complete policy document (targeting service providers), key recommendations (KR; targeting the general public) and the corresponding pictorial representation. The analysis was organized around the KR. These were summarized into main themes and categorized according to whether the recommendation was diet-based (addressing overall dietary patterns) or food-based (addressing specific food groups). Themes falling outside these main categories were classified as 'other' (e.g. exercise, weight control, breast-feeding and food safety) and excluded from the present food- and diet-centred analysis.

The policy documents were analysed using the qualitative analysis software, Atlas.ti version 7.5.2. Coding was organized around the KR themes, focusing on how the documents discussed each one, including the provision of practical advice, engagement with traditional dietary patterns and addressing local food availability and access, among other factors related to food selection.

## Results and discussion

### Overview of national dietary guideline policy documents

The different local procedures in the development of the national dietary guidelines included in the current analysis yielded documents that differ in organization, focus and the information presented. While the Cuban-DG and PR-DG share the stated emphasis on overnutrition and are

**Table 2** Selected characteristics of current dietary guidelines in the Spanish-speaking Caribbean

	Cuba	Puerto Rico	Dominican Republic
Date released	2009	2013	2009
Length (pages)	61 pp.	39 pp.	52 pp.
Main agency	INHA	CAN-PR	SESPAS
No. of agencies involved	23	7	38
Main focus	Overnutrition	Overnutrition	Over-/undernutrition
Stated purpose	Healthy eating promotion	Health promotion	Food security and poverty reduction emphasis
Target audience	Healthy population, >2 years	Healthy population, >2 years	General population
Illustration (Fig. 1)	'The Healthy Eating Table'	'My Plate for a Healthy Puerto Rico'	'The Pestle of Nourishment and Nutrition'
No. of KR	9	7	10
Food groups	Seven groups: <ul style="list-style-type: none"> <li>• Cereals and starches</li> <li>• Vegetables</li> <li>• Fruits</li> <li>• Milk, yoghurt and cheese</li> <li>• Meats, poultry, fish, eggs and beans</li> <li>• Fats and its sources</li> <li>• Sugar</li> </ul>	Six groups + water: <ul style="list-style-type: none"> <li>• Cereals and starches</li> <li>• Vegetables and grains*</li> <li>• Fruits</li> <li>• Milk and dairy</li> <li>• Meat and substitutes</li> <li>• Oils and fats</li> <li>• Water</li> </ul>	Seven groups + maternal milk: <ul style="list-style-type: none"> <li>• Cereals</li> <li>• Fruits and vegetables</li> <li>• Starchy vegetables</li> <li>• Legumes</li> <li>• Eggs, milk and dairy</li> <li>• Fish, poultry, beef and entrails</li> <li>• Fats, sugar and iodized salt</li> <li>• Maternal milk</li> </ul>

KR, key recommendation; INHA, Instituto de Nutrición e Higiene de los Alimentos; CAN-PR, Comisión de Alimentación y Nutrición; SESPAS, Secretaría de Estado de Salud Pública y Asistencia Social.

\*Grains (*granos*) include beans and corn.

directed at the healthy population over the age of 2 years, the DR-DG introduce the document with a food security emphasis, targeting all age groups, including children under 2 years of age. In this attempt, the DR-DG underscore the importance of infant feeding (lactation and complementary feeding) in a single document.

The guidelines also differ in the pictorial representations (Table 2, Fig. 1). While the illustrations agree on the relative importance or prominence of basic grains, fruits and vegetables, they differ in how proportionality is displayed. The Puerto Rican MyPlate is visually more fitting for meal-based food selection, while the Cuban Table and the Dominican Mortar and Pestle provide a more general guidance for daily overall dietary patterns (Fig. 1). While the Mortar and Pestle is an important culinary tool in the region, its use to display proportionality may not be as apparent when compared with the other two illustrations. Differences are also found in food groupings (Table 2) and

how (and if) serving recommendations are specified (Table 3). The next section focuses on comparing the key recommendations for the public.

### Comparison of key recommendations

The guidelines varied in the number of KR for the public (Table 2). The coding process of these KR yielded sixteen distinct themes across the three documents (two diet-based, ten food-based and four 'other'; Table 4). Only the Cuban-DG document addressed dietary patterns as part of the KR, by including diet variety and breakfast. The Cuban-DG link this meal to productivity and worker safety, underscoring the personal responsibility of eating breakfast. In contrast, the DR-DG indirectly include breakfast (as well as lunch and dinner) in the KR related to grains (Table 4), discussed further. Breakfast is not addressed in the PR-DG.



Fig. 1 Pictorial representations for dietary guidelines (from left to right): Cuba<sup>(28)</sup>, Puerto Rico<sup>(27)</sup> and Dominican Republic<sup>(29)</sup>

Table 3 Comparison of daily food group recommendations for the reference group in current dietary guidelines in the Spanish-speaking Caribbean

	Cuba		Puerto Rico		Dominican Republic	
	No. of servings	1 serving	No. of servings	1 serving	No. of servings	1 serving
	Reference group: 18–60 years age group (2500 kcal diet*)		Reference group: 2000 kcal diet*		Reference group: NSp	
Grains/starches	7	1 c rice, 1 c pasta, 1 small plantain	6 (oz-equivalent)	1 oz = 1/3 c rice; 1/2 c pasta	NSp	NSp
Legumes	1	1 c beans	NSp	1/2 c beans	At least 1 c	NSp
Vegetables	3	1 c leafy greens, 1 medium tomato	2 1/2 c	NSp	2–3	NSp
Fruits	3	1 medium banana, orange or passion fruit	2	1 c fresh fruit or juice	3	NSp
Dairy	1	1 c milk, 1 cheese slice	3 c milk (or 1.5 oz cheese)	NSp	NSp	NSp
Animal products	3	1 chicken leg, 3 tbsp meat, 1 egg	5 oz	NSp	NSp	NSp
Fat	2	1 tsp oil, lard or butter	5 tsp	NSp	NSp	NSp
Sugar	3	1 tsp sugar	NSp	NSp	NSp	NSp

NSp, not specified; c, cup; tbsp, tablespoon; tsp, teaspoon.

\*2500 kcal = 10 460 kJ; 2000 kcal = 8368 kJ.

**Table 4** Key recommendations, organized by theme and country (author's translations), in current dietary guidelines in the Spanish-speaking Caribbean

Message theme	Cuba	Puerto Rico	Dominican Republic
Diet-based Variety	A varied diet during the day is enjoyable and necessary for your health		
Breakfast	A good day starts with breakfast. Consume some food in the morning		
Food-based Cereals/starch		Eat whole grains and a variety of <i>viandast</i>	Consume cereals or <i>viverest</i> at breakfast, lunch and dinner every day to maintain your energy
Protein sources	Fish and chicken are the healthiest meats	Eat lean meats and poultry, fish, seafood, legumes and seeds	Increase the consumption of beans and other grains, fish, egg and dairy to preserve healthy bones and organs
Dairy		Drink milk, eat cheese and other dairy products with no fat or low in fat	
Vegetables	Eat vegetables every day. Fill yourself with life	Make sure that half of the plate is fruits and vegetables Pick produce of every colour	Add five fruits and vegetables of different colours and taste a day to fill yourself with health and life
Fruits	Eat fresh fruits and your vitality will increase		
Water		Drink water with meals and throughout the day	Drink at least eight glasses of water a day because it is a warranty for life
Fats/oil/high-fat foods	Prefer vegetable oils. Lard is too costly for your health	Eat lean meats and poultry, fish, seafood, legumes and seeds Drink milk, eat cheese and other dairy products with no fat or low in fat	Eat less sugars, fats and fried foods ( <i>frituras</i> ) to avoid fattness ( <i>gordura</i> )
Sugar	Lower your sugar consumption		
Salt	Lower your salt consumption. Start by not adding it at the table		
Fortified foods			
Other			
Food safety			
Breast-feeding/child nutrition*			
Weight	Know the healthy weight for your height. Keep in shape		
Physical activity		Accumulate 30 min of physical activity for adults and 60 min for children every day	Exercise every day to give wellness to your life

\*The present analysis focuses on general population messages; therefore breast-feeding and child nutrition are included in the 'other' category.  
† *Viveres* and *viandas* refer to starchy root crops such as potato, plantain, taro root, etc.

Of the ten food-based recommendations, only four themes overlapped across the three sets of guidelines: the encouragement of fruits and vegetables, encouraging low fat consumption and addressing protein sources. Other overlaps were found between Cuba and the Dominican Republic (sugar) and the Dominican Republic and Puerto Rico (dairy, grains/starches and water; Table 4). There were no unique KR overlaps between the Cuban-DG and the PR-DG. The Cuban KR are the only ones that include salt and the Dominican KR are unique in the inclusion of fortified foods (Table 4).

Commonalities in KR themes do not necessarily translate into how they are addressed. Some differences are small, as in the case of messages concerning fruits and vegetables (Table 4), while others are more noticeable. For instance, both the DR- and the PR-DG address grains and starches as part of the KR, but the DR-DG fail to make the distinction between whole and refined grains found in the PR-DG (also found in the Cuban document). In the Dominican KR, cereals and starches (*viveres*) are prescribed for all meal times, including breakfast, denoting differences in traditional eating patterns; in this case, the Dominican custom of eating *mangú* (boiled, mashed plantains) for breakfast.

The greatest differences within these guidelines lie in how they address protein sources, salt, sugar and fat, discussed next.

#### *Eat your protein*

Meat is an important part of meals in the Spanish-speaking Caribbean and this is addressed, albeit in different detail, throughout the three sets of KR and the policy documents. Messages concerning the consumption of meat are mostly based on nutritional content (saturated fat and cholesterol in the case of beef and chicken; *n*-3 fatty acids in the case of fish). However, while the Cuban- and PR-DG emphasize lean cuts of meat, the DR-DG do not make this distinction, encouraging red meat for the reduction of anaemia, along with beans and leafy greens.

Eggs are discussed as a protein source to a lesser extent than meat, with overall recommendations to limit their consumption in the Cuban-DG and PR-DG to avoid high cholesterol, a linkage disputed in recent research<sup>(32)</sup>. Eggs are generally encouraged in the DR-DG, including the KR (Table 4), as a good source of protein, iron and other micronutrients.

Similar differences are found around messages concerning dairy. While the PR-DG encourage low-fat sources of dairy, this distinction is not present in the DR-DG (Table 4), where all dairy is recommended to promote 'healthy bones and organs'. The Cuban KR do not include dairy, although the food guide illustrates this food group. The DR- and PR-DG encourage dairy consumption as the most important source of calcium, but the DR-DG also mention alternative sources for this mineral. These alternatives sources are also outlined in the Cuban document, where it is noted that 'calcium requirements for adult men

are lower and can be covered through a combination of alternative sources, such as cereals, beans, egg and fish<sup>(28)</sup>. While not explicit in the Cuban-DG, this recommendation for non-dairy calcium sources is in line with emerging research linking dairy products and prostate cancer risk<sup>(33)</sup>. While eggs are mentioned as an 'alternative source', it is important to note that, except for the shells, they are not good sources of calcium. However, eggs' vitamin D content can help in the absorption of the mineral.

The Cuban-DG document is the most detailed concerning discussions of animal and vegetable protein sources, including a direct criticism of the over-consumption and preference for meat as part of the traditional Cuban diet. It focuses on soya as an alternative to animal protein, lauding its benefits as a 'superfood':

The soybean is considered the most valuable of all beans [...] The phytochemical profile of soy is the most interesting of the plant kingdom and is credited with the greatest potential to reduce the risk of cancer<sup>(28)</sup>.

While the encouragement of vegetable protein sources and a reduction in meat consumption are in line with emerging public health and environmental concerns associated with eating meat<sup>(34)</sup>, this advice may be linked to the limited meat supply in the country. Additionally, the exaltation of soya is congruent with local strategies to address meat scarcity in the general Cuban population. Since the economic crisis of the 1990s (known as the Special Period in Times of Peace), the government has been mixing soya and ground meat in the food rations<sup>(35)</sup>. At the same time, it does not conform to the ongoing debates surrounding the science on the benefits and potential harms of this legume<sup>(36)</sup>.

The PR-DG also acknowledge plant sources of protein (legumes and seeds), providing some guidance for vegetarians. While legumes constitute an independent food group in the Dominican Republic food guide, these are not as explicitly presented as an alternative protein source for vegetarians.

#### *Limit salt, sugar and fat*

Spanish-speaking Caribbean diets are marked by high intakes of salt, sugar and fat<sup>(16-18)</sup>. However, the three guidelines differ in the extent these pressing issues are addressed. For instance, they are mostly missing from the current Puerto Rican KR (except for the mention of low-fat protein and dairy sources), and only sugar and fat are addressed in the Dominican KR (Table 4). The Cuban-DG are consistently more specific in how they address these, using the results of the local consumption survey to frame their advice. This is accompanied with practical culinary tips to diminish the consumption of fats, sugar and salt during cooking and highlights ultra-processed industrial foods as hidden food sources for these, a message largely missing from the other two sets of guidelines.

While the Dominican KR include sugar and fat, no further discussion is found in the document, beyond asking the public to ‘avoid’ frying during food preparation. In the PR-DG, fats are mostly addressed as a condiment and nutrient (including *trans* fats). While sources of fats (i.e. fried foods) were included in previous guidelines<sup>(26)</sup>, the current document lacks this level of specificity, despite the high consumption of fried foods and fast foods on the island<sup>(16)</sup>. Sugar consumption is not directly addressed in the current PR-DG either.

The Cuban-DG are unique among the three in addressing salt as part of the KR (Table 4), advising against the use of salt at the table, a custom also present in Puerto Rico and the Dominican Republic. While not included in the KR, the three policy documents mention salt as a condiment to decrease. However, in the DR-DG salt is also indirectly encouraged as a source of iodine:

Always consume iodized salt and seafood [...] limiting to the minimum needed for preparations or cooking foods<sup>(29)</sup>.

The emphasis on iodized salt corresponds to the inclusion of fortified foods in the KR (Table 4), absent from the other two sets of guidelines, and to a concurrent public health campaign, *Consuma sal yodada, o nada* (Consume iodized salt or nothing), established in collaboration with UNICEF to address the prevalent use of non-iodized salt in the country (despite its prohibition) and the persisting thyroid issues coming from the inadequate intake of this mineral at the time<sup>(37)</sup>. The underscoring of salt as a source of iodine could also be a potential source for confusion regarding dietary advice concerning this condiment, as one to decrease, but containing a nutrient that needs to be consumed. At the same time, a recent analysis has shown that actual intake of iodine is excessive, coming from the use of imported bouillon cubes and powder soups made with iodized salt<sup>(38)</sup>, calling for a change in messaging and a revision of the document taking these new data into consideration.

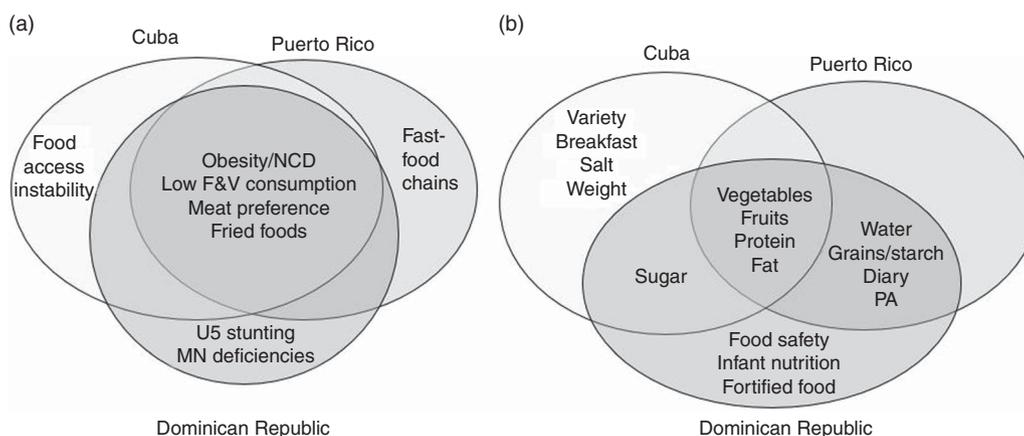
*Water and liquid calories*

The DR- and PR-DG encourage water as part of the KR (Table 4) and include it as part of the pictorial representations (Fig. 1). Water is encouraged over sugar-sweetened beverages, especially in the PR-DG. The Cuban-DG also discourage sugar-sweetened beverage and beer consumption, as part of messaging dissuading the consumption of industrially processed foods. However, water is not addressed in the Cuban guidelines as a beverage, but as part of cooking, ingredient substitution, hygiene, and food production.

**Overview of results**

The present comparison revealed differences that mirror the contrasting socio-economic and political situations in the region. The Spanish-speaking Caribbean region shares concerns over high intakes of fat, sugar and salt, a preference for animal sources of protein and a low intake of fruits and vegetables. The present analysis revealed that despite these important overlaps, the guidelines coincided only in the promotion of fruits and vegetables and the guidance (albeit different) concerning animal protein sources and fats (Fig. 2). There were discernible differences in level of specificity, especially when addressing issues of concern (salt, sugar and fat), as well as the different populations addressed.

The DR- and Cuban-DG were more in tune with local food and nutrition issues. The DR-DG document reflected the country’s dual concern with issues of undernutrition and overnutrition. The Cuban-DG made active use of local consumption data and collaborations with the culinary sector, being the most specific of the three. These approaches differ greatly from the current PR-DG. As an adapted version of the USDA Dietary Guidelines, the PR-DG missed pressing issues of concern, namely the high consumption of fatty foods and fast foods<sup>(16)</sup>, despite being addressed in previous iterations of these guidelines<sup>(26)</sup>. This is an important, and perhaps unintended, consequence of the current political situation of the island, as a territory of the USA, and an example of how such



**Fig. 2** Overlapping (a) food and nutrition issues and (b) key recommendation themes in dietary guidelines in the Spanish-speaking Caribbean (NCD, non-communicable diseases; F&V, fruit and vegetable; U5, under 5 years of age; MN, micronutrient; PA, physical activity)

status can affect local policy making and the framing of nutrition advice.

Lastly, the analysis revealed areas of improvement in light of emerging nutrition science. This was the case in advice concerning egg, meat and soya consumption. While the PR-DG will undergo a revision after the upcoming publication of the USDA 2015 Dietary Guidelines, no such process is currently planned for Cuba and the Dominican Republic.

## Conclusion

The present study underscored the importance of context in the framing of dietary advice and the influence of national socio-economic and political situations on nutrition policy and education efforts. The results contribute to inform efforts to improve nutrition communication with the public in the Spanish-speaking Caribbean, including the importance of revising guidelines to account for current nutrition scientific advances. The commonalities in public health nutrition issues in the region present an opportunity for collaboration and resource sharing within these three countries. Moreover, it can also be applied to ameliorate health disparities among migrant communities from the Spanish-speaking Caribbean by gaining a better understanding on how experts frame and address these issues locally.

Future studies should address the information gap on the reach, use and effectiveness of the dietary guidelines included in the present analysis. This can include a comparative analysis evaluating the effectiveness of these documents, as well as the public reception and service provider use of the guidelines.

## Acknowledgements

*Acknowledgements:* The author wishes to acknowledge valuable feedback from Marion Nestle, Professor of Nutrition, Food Studies and Public Health at New York University (NYU) and NYU Faculty Fellows Sophia Domokos and Natasha Wilson. *Financial support:* This work was supported by the NYU Postdoctoral and Transition Program for Academic Diversity. The funder had no role in the design, analysis or writing of this article. *Conflict of interest:* None. *Authorship:* The author formulated the research question, designed the study, carried out the analysis and wrote the present manuscript. *Ethics of human subject participation:* Ethical approval was not required.

## References

1. Popkin BM, Adair LS & Ng SW (2012) Global nutrition transition and the pandemic of obesity in developing countries. *Nutr Rev* **70**, 3–21.
2. Baker P & Friel S (2014) Processed foods and the nutrition transition: evidence from Asia. *Obes Rev* **15**, 564–577.
3. Lachat C, Otchere S, Roberfroid D *et al.* (2013) Diet and physical activity for the prevention of noncommunicable diseases in low- and middle-income countries: a systematic policy review. *PLoS Med* **10**, 1–19.
4. Capra S (2000) Dietary guidelines and recommended dietary intakes for a new millennium – do dietitians care and how do they use them? A professional perspective. *Aust J Nutr Diet* **57**, 138–140.
5. Vandevijvere S, De Vriese S, Huybrechts I *et al.* (2009) The gap between food-based dietary guidelines and usual food consumption in Belgium, 2004. *Public Health Nutr* **12**, 423–431.
6. Povey R, Conner M, Sparks P *et al.* (1998) Interpretations of healthy and unhealthy eating, and implications for dietary change. *Health Educ Res* **13**, 171–183.
7. Fuster M, Messera E, Houser RF *et al.* (2013) Local notions of healthy eating and national dietary guidelines: a comparison in vulnerable Salvadoran communities. *Food Foodways* **21**, 288–314.
8. Nayga RM Jr & Capps O Jr (1999) US consumers' perceptions of the importance of following the US dietary guidelines. *Food Policy* **24**, 553–564.
9. Albert JL, Samuda PM, Molina V *et al.* (2007) Developing food-based dietary guidelines to promote healthy diets and lifestyles in the Eastern Caribbean. *J Nutr Educ Behav* **39**, 343–350.
10. Murphy SP & Barr SI (2007) Food guides reflect similarities and differences in dietary guidance in three countries (Japan, Canada, and the United States). *Nutr Rev* **65**, 141–148.
11. Dwyer JT (2012) Dietary standards and guidelines: similarities and differences among countries. In *Present Knowledge in Nutrition*, pp. 1110–1134 [JW Erdman, IA Macdonald and SH Zeisel, editors]. Oxford: John Wiley & Sons.
12. Keller I & Lang T (2008) Food-based dietary guidelines and implementation: lessons from four countries – Chile, Germany, New Zealand and South Africa. *Public Health Nutr* **11**, 867–874.
13. Aranceta J & Serra-Majem L (2001) Dietary guidelines for the Spanish population. *Public Health Nutr* **4**, 1403–1408.
14. Painter J, Rah JH & Lee YK (2002) Comparison of international food guide pictorial representations. *J Am Diet Assoc* **102**, 483–489.
15. Sichieri R, Chiuvè SE, Pereira RA *et al.* (2010) Dietary recommendations: comparing dietary guidelines from Brazil and the United States. *Cad Saude Publica* **26**, 2050–2058.
16. Colón-Ramos U, Pérez-Cardona CM & Monge-Rojas R (2013) Socio-demographic, behavioral, and health correlates of nutrition transition dietary indicators in San Juan, Puerto Rico. *Rev Panam Salud Publica* **34**, 330–335.
17. Menchu MT, Mendez H & Dary O (2013) *La Calidad de la Dieta en República Dominicana Aproximada con los Datos de la ENIGH-2007*. Santo Domingo, República Dominicana: Fundación REDDOM.
18. Porrata-Maury C (2009) Consumo y preferencias alimentarias de la población cubana de 15 y más años de edad. *Rev Cubana Aliment Nutr* **19**, 87–105.
19. Rosa T (2005) The fast-food industry. *Puerto Rico Herald*, 28 July, p. 9; available at <http://www.puertorico-herald.org/issues2/2005/vol09n30/CBFastFood.html>
20. Chacon Valverde M (2013) *El mercado de franquicias en República Dominicana*. San Jose, Costa Rica: Promotora del Comercio Exterior de Costa Rica, Contract No.: IC-IM-05-2013.
21. Benjamin M, Collins J & Scott M (1989) *No Free Lunch: Food and Revolution in Cuba Today*. Washington, DC: Institute for Food and Development Policy.
22. Feinberg R (2014) Cuba's foreign investment invitation: insights into internal struggles. *Brookings Up Front*, 21 November; available at <http://www.brookings.edu/blogs/up-front/posts/2014/11/21-cuba-foreign-investment-feinberg>

23. Feinberg RE (2013) *Soft Landing in Cuba? Emerging Entrepreneurs and Middle Classes*. Washington, DC: Brookings Institution.
24. Jimenez AS, Díaz SME, García RRG *et al.* (2012) Cambios en el estado nutricional de la población cubana adulta de diferentes regiones de Cuba (Changes in the nutritional status of adult Cuban population from different regions of Cuba). *Rev Cubana Hig Epidemiol* 50, issue 1; available at <http://www.medigraphic.com/pdfs/revcubhigepi/chi-2012/chi121b.pdf>
25. Pan American Health Organization/World Health Organization (2013) Health in the Americas: Puerto Rico. [http://www.paho.org/saludenlasamericas/index.php?id=52&option=com\\_content](http://www.paho.org/saludenlasamericas/index.php?id=52&option=com_content) (accessed September 2014).
26. Palacios C & Angleró I (2013) Puerto Rican guidelines on food and diet quality. In *Diet Quality: An Evidence-Based Approach*, pp. 213–224 [VR Preedy, LA Hunter and B Patel, editors]. New York: Springer.
27. Comisión de Alimentación y Nutrición en Puerto Rico (2012) *Guía Alimentaria para Puerto Rico*. San Juan, PR: CAN-PR.
28. Instituto de Nutrición e Higiene de los Alimentos (2009) *Guías Alimentarias para la Población Cubana Mayor de Dos Años de Edad*. Ciudad de La Habana: Ministerio de Salud Pública, INHA.
29. Secretaría de Estado de Salud Pública y Asistencia Social (2009) *Guías Alimentarias Basadas en Alimentos de la República Dominicana*. Santo Domingo, República Dominicana: SESPAS.
30. Gorry C (2009) Cubans team up for better nutrition. *MEDICC Rev* 11, 20–22.
31. Fppd and Agriculture Organization of the United Nations (2014) *El Estado de las Guías Alimentarias Basadas en Alimentos en América Latina y el Caribe: 21 años después de la Conferencia Internacional sobre Nutrición*. Rome: FAO, Nutrition Division.
32. Rong Y, Chen L, Zhu T *et al.* (2013) Egg consumption and risk of coronary heart disease and stroke: dose–response meta-analysis of prospective cohort studies. *BMJ* 346, e8539.
33. Aune D, Navarro Rosenblatt DA, Chan DS *et al.* (2015) Dairy products, calcium, and prostate cancer risk: a systematic review and meta-analysis of cohort studies. *Am J Clin Nutr* 101, 87–117.
34. Walker P, Rhubart-Berg P, McKenzie S *et al.* (2005) Public health implications of meat production and consumption. *Public Health Nutr* 8, 348–356.
35. Shurtleff W & Aoyagi A (2009) *History of Soybeans and Soyfoods in the Caribbean/West Indies (1767–2008): Extensively Annotated Bibliography and Sourcebook*. Lafayette, CA: Soyinfo Center.
36. D'Adamo CR & Sahin A (2014) Soy foods and supplementation: a review of commonly perceived health benefits and risks. *Altern Ther Health Med* 20, Suppl. 1, 39–51.
37. UNICEF (2008) Campaña por sal yodada en República Dominicana. <http://www.un.org/spanish/News/story.asp?NewsID=11996#.VUEDMiFVhHw> (accessed April 2015).
38. World Health Organization (2013) *Salt Reduction and Iodine Fortification Strategies in Public Health. Report of a Joint Technical Meeting convened by the World Health Organization and The George Institute for Global Health in collaboration with the International Council for the Control of Iodine Deficiency Disorders Global Network, Sydney, Australia, March 2013*, p. 16. Geneva: WHO.
39. Central Intelligence Agency (2014) The World Fact Book. <https://www.cia.gov/library/publications/the-world-factbook/index.html> (accessed November 2014).
40. Pan American Health Organization/World Health Organization (2012) *Health Situation in the Americas. Basic Health Indicators 2012*. Washington, DC: PAHO.
41. World Health Organization (2005) Global Database on Child Growth and Malnutrition: Cuba. <http://www.who.int/nutgrowthdb/database/countries/cub/en/> (accessed November 2014).