Obesity Prevention Policies in Mexico: Is It Possible to Modify Nutrition and Physical Activity Behaviors?

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Content

• The need for obesity prevention policies in Mexico
• Evidence based policy formation model in Mexico
• Evidence of strong environmental factors opposing healthy behaviors in Mexico
• Conceptual behavioral change model that led to developing current policies in Mexico
• Description of the policies that are being implemented
• Are policies likely to modify nutrition and physical activity behaviors?
• What are the challenges and key factors needed for current policies to be effective?

Prevalence of overweight and obesity in Mexican women 20 to 49 years old (1988, 1999 and 2006)

Overweight and Obesity * trends in Mexican school age children (5-11 y) and adolescents (12-18 y) in 1988, 1999 and 2006


Overweight and obesity in women 20-49 years by living conditions in 1988, 1999 and 2006
Prevalence of stunting in children < 5 y in two decades by quintiles of well-being conditions.
Ideally, evidence based policy making requires several steps:

A. A review of the literature, its synthesis and interpretation

B. Empirical data for adaptation of scientific evidence and recommendations to the local situation.

C. Development of recommendations that consider both the literature review and empirical evidence (local adaptation)

D. Pilot studies or efficacy trials

E. Implementation and impact evaluations for design or implementation modifications

In real life, not all steps are covered since often the “political timing” is in conflict with the ideal process

## WCRF/AICR Expert panel conclusions on obesity risk factors

<table>
<thead>
<tr>
<th>Evidence</th>
<th>Decreased Risk</th>
<th>Increased Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convincing</td>
<td>Physical Activity</td>
<td>Sedentary Living</td>
</tr>
<tr>
<td>Probable</td>
<td>Low Energy-dense Foods</td>
<td>Energy-Dense Foods</td>
</tr>
<tr>
<td></td>
<td>Being Breastfed</td>
<td>Sugary drinks (SSB)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Fast Foods”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Television Viewing</td>
</tr>
</tbody>
</table>
Changes in food purchases between 1984 and 1998 (%) for different food groups

Rivera JA et al. Epidemiological and nutritional transition in Mexico: Rapid increase of non-communicable chronic diseases and obesity. Public Health Nutrition. 5: (1A) 113-122, 2002
### Consumption of fruits and vegetables in school aged children in México

**Means adjusted for sex, age, socioeconomic level and design**

<table>
<thead>
<tr>
<th>Quintiles of living conditions</th>
<th>Fruits</th>
<th>Vegetables</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>57.2</td>
<td>27</td>
</tr>
<tr>
<td>5</td>
<td>81.6</td>
<td>46.5</td>
</tr>
<tr>
<td>Rural</td>
<td>68.7</td>
<td>31.9</td>
</tr>
<tr>
<td>Urban</td>
<td>69.1</td>
<td>35.6</td>
</tr>
<tr>
<td>Girls</td>
<td>71</td>
<td>35.3</td>
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<tr>
<td>Boys</td>
<td>66.9</td>
<td>33.2</td>
</tr>
<tr>
<td>Total</td>
<td>68.9</td>
<td>34.2</td>
</tr>
</tbody>
</table>

Beverage Consumption Trends in adolescent and adult women in Mexico in 1999 and 2006.

**High sugar**, includes soft drinks, sweetened juice, fruit drinks sweetened with sugar and alcohol

**High energy and low benefit**, mainly full-fat milk

**Low energy**, coffee with little sugar and skim milk

Consumption patterns of alcoholic energy intake in adults (≥19 years) by sex in 2006 Mexican

Social determinantes of obesity

• “Food deserts” are poor communities where supply of healthy food is restricted
• In Mexico we have described lower supply of fruits and vegetables and high supply of unhealthy foods in poor communities
• In a study of rural communities we found no regular supply of fruits and vegetables in 21% and 13%, respectively
• While sugar sweetened beverages and food with high contents of sugar or fat were found in all communities

Cost of 1000 calories by energy density category and income quintile in 1992 and 2000 in Mexico

<table>
<thead>
<tr>
<th>Energy density of food groups</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q5</th>
<th>NATIONAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low (&lt; 145 Kcal/100g)</td>
<td>33.1</td>
<td>28.3</td>
<td>29.1</td>
<td>29.1</td>
<td>36.4</td>
<td>31.5</td>
</tr>
<tr>
<td>Medium (145-300 Kcal/100g)</td>
<td>9.9</td>
<td>10.7</td>
<td>12.2</td>
<td>12.2</td>
<td>21.2</td>
<td>14.6</td>
</tr>
<tr>
<td>High (300-900 Kcal/100 g)</td>
<td>3.2</td>
<td>4.4</td>
<td>5.2</td>
<td>5.2</td>
<td>8.4</td>
<td>5.2</td>
</tr>
<tr>
<td>TOTAL</td>
<td>5.9</td>
<td>8.5</td>
<td>10.7</td>
<td>10.7</td>
<td>18.4</td>
<td>11.6</td>
</tr>
<tr>
<td>2000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low (&lt; 145 Kcal/100g)</td>
<td>27.6</td>
<td>25.5</td>
<td>26.1</td>
<td>26.1</td>
<td>30.2</td>
<td>27.7</td>
</tr>
<tr>
<td>Medium (145-300 Kcal/100g)</td>
<td>7.9</td>
<td>8.8</td>
<td>9.9</td>
<td>9.9</td>
<td>15.1</td>
<td>11.0</td>
</tr>
<tr>
<td>High (300-900 Kcal/100 g)</td>
<td>2.5</td>
<td>3.9</td>
<td>5.1</td>
<td>5.1</td>
<td>7.2</td>
<td>4.6</td>
</tr>
<tr>
<td>TOTAL</td>
<td>4.8</td>
<td>7.9</td>
<td>10.0</td>
<td>10.0</td>
<td>14.6</td>
<td>9.9</td>
</tr>
</tbody>
</table>


Using Mexican Income and expenditure surveys 1992, 2000 (ENIGH)
School context in Mexico in 2006 was “obesogenic”

- Most children spend 4½-5 hours at school (most school are part time)
- Most children have breakfast at home and about 25% at school
- Children return home for their main meal: a “collation” (light repast) rather than a formal lunch should be offered at school
- Foods and beverages sold by vendors licensed by local school authorities with no regulations on nutrition quality
- Food vendors in the streets by the school entrance and surroundings out of school control
- School breakfast program provided energy dense food, high in sugar and/or fats and sugar sweetened whole milk (>70% children have breakfast at home)

Rivera, et al. Documento técnico de recomendaciones para guías de alimentación en escuelas primarias públicas. 2009. Secretaría de Salud (upon request: mlagunas@insp.mx)
Factors which promote obesity in the school environment in Mexico City: **Food and beverage intake**

- **Five opportunities to eat during school period**
  - School entrance (in streets), school breakfast distributed by Government, in classrooms during classes, during recess (main collation), when leaving school (in streets)

- **Wide availability of high-fat and high-sugar foods at school**

- **High availability of SSB**

- **Limited availability of fruits, vegetables and drinking water**
Factors which promote obesity in the school environment in Mexico City: Energy intake

- During school period: 560 kcals (95% CI 114 – 1186): 31 % of total daily energy intake
- During recess: 433 kcal (CI 95% 392.0-474.4 kcal): 24% of total daily energy intake
- On average $0.66 US ($0.41-1.65) for food purchase at school
- 42.6% of children purchase food at school, 26.6% brought food from home and 30.8% did both
Average energy density of foods available in schools

<table>
<thead>
<tr>
<th>Food groups</th>
<th>Average Energy Density (kcal/100g)</th>
<th>Relative Density (Vegetables as reference)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetables</td>
<td>35.5</td>
<td>1</td>
</tr>
<tr>
<td>Fruits</td>
<td>46.5</td>
<td>1.3</td>
</tr>
<tr>
<td>Average food dishes prepared by food vendors</td>
<td>151.4</td>
<td>4.3</td>
</tr>
<tr>
<td>Savory and sweet snacks</td>
<td>447</td>
<td>12.6</td>
</tr>
</tbody>
</table>
Factors which promote obesity in the school environment in Mexico City: results from formative research

**Physical Activity (PA)**

- Limited opportunities to engage in PA during the school period (~12 min MVPA/day)
- Physical Education sessions do not meet PA recommendations (9-10 min of MVPA/ PE session)
- Restrictions to run during recess time
- Limited space and resources to promote PA

![Bar chart showing PA during the physical education class (SOFIT)]

Aburto N, Nava F, Bonvecchio A, Safdie M, González-Casanova I, Gust T, Rivera J. Salud Publica Mex 2009;51:00-00
Unethical Marketing of food and beverages which increases risk of obesity

It states that 200 ml of the sugar sweetened beverage, with an energy value of 84 Kcal (21 g of sugar) provides only 17% of the recommended intake of sugar per day.

But in fact, 200 ml provide 42% of the maximum limit of sugar as recommended by WHO (10% of the total energy intake).

The title of the add is “Nothing to hide”; that is, the company is proud of the nutrition content of the beverage.

The true is that the can contains 355 ml... so the add is hiding the real content of the can which is 37g of sugar (150 Kcal), which provides 74% of the upper level of sugar intake as recommended by WHO without contributing with any other nutrient (empty calories).

So, nothing to hide, really?
### Design of an intervention based on formative research

**Strategies implemented 2006-07 and 2007-08 school periods by education authorities in 25 schools in Mexico City, under the advise of INSP:**
- Changing environment
- Communication/Education strategy for behavioral change

**Aims:**
- Healthy diets at school
- Increase physical activity

**Randomized control group pre-post evaluation:**
- 15 Intervention schools (8 basic and 7 plus)
- 10 Control Schools

### Two types of intervention:

- **“BASIC” (8 schools):** High potential to be replicated in the short term with available resources from the Secretary of Education (SE). Based on regulations, little investments
- **“PLUS” (7 schools):** Need some investments by SE to be Replicated (i.e. more PE Teachers, investment in water Systems)
Design of an intervention based on formative research

<table>
<thead>
<tr>
<th>Healthy diets</th>
<th>Increase Physical Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Reduce opportunities for buying and consuming food: recess as only time during school day to eat and enforce not eating in classrooms</td>
<td>• Increase time and quality of Physical Education (PE) sessions</td>
</tr>
<tr>
<td>• Increase availability of F&amp;V and water in the school</td>
<td>• <strong>Basic</strong>: 1 session of 50 minutes of PE class with a minimum of 25 min of MVPA/wk</td>
</tr>
<tr>
<td>• Decrease the number of high- sugar and high-fat foods and caloric beverages</td>
<td>• <strong>Plus</strong>: 2 sessions of 50 min each <em>(100 minutes total) of PE with a minimum of 50 min of MVPA/wk</em></td>
</tr>
<tr>
<td></td>
<td>• Increase PA in free time  20 min PA daily, at beginning of school day (“activation period”)</td>
</tr>
</tbody>
</table>
Food available during recess time was classified into three categories

- **Non recommended**: Traditional fried foods (“tacos”, “gorditas”), Pizzas, French fries, fried & breaded meat sandwiches (“tortas de milanesa”), hot dogs, caloric carbonated beverages, doughnuts, ice cream, milk based jells, cookies

- **For consumption less than twice a week**: Pop corn with butter, salted peanuts, salted corn, rice with milk and sugar (“arroz con leche”), pudding, non-fried high-fat “tacos” (meat, potatoes with sausage, chili pepper with cream), ham sandwich, water based jells, boiled corn with mayonnaise

- **Highly recommended**: Corn with lemon, “no fried, low-fat tacos” (mushroom, cactus), potatoes, “enfrijoladas” (tortilla wrapped beans), vegetables with lemon (cucumber, carrots), fruits (mango, “jícama”, melon, pineapple, watermelon), sorbets
Change in % of total portions of foods available in each category during recess time by intervention group from BL Y1 to Final Y2

* Differences of differences statistically significant from control (p<0.05)
% of food portions purchased at school and consumed during recess time by intervention group and year

* Differences of Differences statistically significant from control
Changes in step counts (final-baseline) during school journey by year and intervention group

Differences of differences relative to control (\* p<0.1; ** p<0.05)
Recognize the collective responsibility in obesity prevention; therefore, the role of government intervention

Knowledge

Motivation

The Individual

Healthy Behaviors

Strong Environmental Factors interfere with healthy behaviors

Social Norms

Regulation, Legislation

Macro Policies

Economics: Availability, accessibility, prices

Environmental Factors

Healthy behaviors become optimal default

Healthy Behaviors

Beverage intake for a healthy life: Recommendations for the Mexican population

Level 1.
• Potable water (750-2000 ml/day)

Level 2.
• Low fat (1%) milk, skim milk, and not sweetened soy drinks (0-500 ml/d)

Level 3.
• Coffee and tea/infusions with no added sugar (0-1000 ml/d)

Level 4.
• Non calorically beverages with artificial sweeteners (0-500 ml/d). Not recommended for consumption by children


NOM-043-SSA2-2005,
Beverage intake for a healthy life:
Recommendations for the Mexican population

Level 5.
- Caloric beverages with little health benefits:
  - fruit juices (0-125 ml/d)
  - alcoholic drinks (≤ 180 ml beer or ≤ 100 ml wine or ≤ 30 ml liquor)
  - Sport drinks (just for endurance athletes)
- Whole milk (not recommended)

Level 6.
- Calorically sweetened beverages and low nutrient contribution: (soft drinks and other beverages with added sugar such as juices, fresh fruit drinks and coffee.) Their consumption is not recommended, consume sparingly

National Strategy for Obesity Prevention

1. National, multi-sector agreement among different levels of government and key sectors in society
2. Promotes actions at individual, community and national level
3. Recognizes obesity prevention as a central priority to contribute to a sustainable national development and public health
4. Based on best available evidence, international recommendations (WHO, WCRF) and experiences, adapted to the local situation (considers epidemiology and key risk factors in Mexico)
National Strategy for Obesity Prevention

5. Considers the complex interaction between personal choices, social norms, and environmental factors as drivers of obesity.

6. Recognizes the collective responsibility in the prevention of obesity and, therefore, the crucial role of government intervention.

7. Directs efforts to the two main immediate causes of obesity: excess energy intake and low physical activity and their determinants.

8. Includes 10 objectives agreed by participating actors and state goals and actions from Government Sectors and agencies participating in the national agreement.
National Agreement for Obesity Prevention

1. Promote **Physical Activity**
2. Increase availability and intake of **water**
3. Increase intake of **vegetables, fruits, legumes, whole grains and fiber**
4. **Communication/Education** on healthy diet
5. Promote **breastfeeding**
6. Reduce intake of **sugars and fat in beverages and liquid foods**
7. Reduce intake of **added sugar to food**
8. Reduce intake of **total, saturated and trans fats**
9. Reduce **portion sizes**
10. Reduce intake of **sodium**
1. Estrategia nacional, multisectorial, multinivel...

**Objetivos del Acuerdo Nacional para la Salud Alimentaria:**

<table>
<thead>
<tr>
<th>Objetivo</th>
<th>Acción</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Actividad física</td>
</tr>
<tr>
<td>2</td>
<td>Agua simple potable</td>
</tr>
<tr>
<td>3</td>
<td>Disminuir azúcar y grasa en bebidas</td>
</tr>
<tr>
<td>4</td>
<td>Aumentar consumo de frutas y verduras</td>
</tr>
<tr>
<td>5</td>
<td>Alfabetismo nutricional</td>
</tr>
<tr>
<td>6</td>
<td>Lactancia materna</td>
</tr>
<tr>
<td>7</td>
<td>Reducir azúcar en alimentos</td>
</tr>
<tr>
<td>8</td>
<td>Disminuir grasas saturadas</td>
</tr>
<tr>
<td>9</td>
<td>Disminuir tamaños de porción</td>
</tr>
<tr>
<td>10</td>
<td>Limitar cantidad de sodio</td>
</tr>
</tbody>
</table>

**Acciones Transversales**

1. Información, educación, comunicación
2. Abogacía, regulación, corregulación
3. Monitoreo y evaluación
4. Investigación

**Acciones adicionales específicas**

Metas cuantificables de cada sector responsable para prevención y control de la obesidad 2010 y 2012
Some obesity prevention actions that have been implemented by different Government Sectors

• Secretariats of Health and Education
  – School program: Food regulations, PA promotion and changes in curricula
  – Improvements in content and quality of school breakfasts

• Secretariats of Social Development and Health
  – Obesity prevention as part of nutrition and health education
  – Moving to low-fat milk in a Federal distribution Program

• Secretariat of Health
  – Mass media promotion of weight monitoring, healthy eating and PA
  – Emphasis on secondary prevention in patients with NRCD’s
  – Monitoring trends and Programs (National Nutrition Surveys)
Some obesity prevention actions that have been implemented by different Government Sectors

• Secretariat of Health (continuation)
  – Surgeon General regulations on:
    • Breast feeding promotion (mandatory monitoring of 10 steps in maternity hospitals)
    • Reduction of sodium in bread
    • Introduction of obesity and NRCD’s prevention in medical school curricula

• Secretariat of Agriculture
  – Incentives and programs for production of Fruits, Vegetables, Whole grains
  – Promotion of Fruits and Vegetables intake (5 a day)

• Secretariat of Economy
  – Actions to increase supply of Fruits, vegetables and whole grains
  – Development of a simple FOP labeling system (not implemented)
Food regulations in the school System in Mexico

Recommendations for daily intake

1 portion of fruits or 2 portions of vegetables
40 Kcal

+ 1 healthy dish *
140 Kcal

+ Water
0 Kcal

Products allowed up to 1-2 times week

1 portion of low fat milk and Fruit juices *

Aver. 100 Kcal/d

1 portion of savory or sweet snacks*

As part of the National Strategy, since 2010 food sold in school is regulated. Regulations are becoming increasingly strict. The second phase started last month (2011-2012)
<table>
<thead>
<tr>
<th>Requirements</th>
<th>Healthy Dishes</th>
<th>Savory Snacks</th>
<th>Sweet snacks (Cookies and desserts)</th>
<th>Milk and Dairy</th>
<th>Fruit Juices and nectars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy per portion or portion size</td>
<td>≤180 Kcal</td>
<td>≤130 Kcal</td>
<td>≤130 Kcal</td>
<td>≤200 ml</td>
<td>≤125 ml</td>
</tr>
<tr>
<td>Protein</td>
<td>≥ 10% of total calories</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sugar and sweeteners</td>
<td>w/o added sugar</td>
<td>&lt;10% of total calories</td>
<td>&lt;20% of total calories (non-caloric sweeteners)</td>
<td>No added sugar (non-caloric sweeteners)</td>
<td>No added sugar (non-caloric sweeteners)</td>
</tr>
<tr>
<td>Fat</td>
<td>&lt; 15 % of total calories from saturated fat</td>
<td>≤1 g en 100 g of milk</td>
<td>No added fat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trans FA</td>
<td>&lt;0.3 mg</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sodium (mg)</td>
<td>≤ 220 (1.22 mg/Kcal)</td>
<td>≤ 160 (1.3 mg/Kcal)</td>
<td>≤ 140 (1.08 mg/Kcal)</td>
<td>-</td>
<td>≤ 60 (in processed juices)</td>
</tr>
<tr>
<td>Dietary fiber (mg/Kcal)</td>
<td>≥15</td>
<td>≥15</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Energy Density</td>
<td>Eliminated</td>
<td>Eliminated</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>other</td>
<td>100% whole grain</td>
<td>In processed food, only 1 portion size per package</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Implementation is a great challenge!

- Implementation of this regulations have been a great challenge, given the number of schools (225,000), teachers (1.2 million) and students (25.6 million) from preschool to middle school in Mexico and the fact that education services are run by each State.

- Activities in preparation for the implementation of the regulations in January, 2011 were the following:
  - Training of teachers and principals in application of new regulations
  - Development of final lists of food products allowed in schools
  - Reproduction and dissemination of food recipes for the school collations to comply with regulations to parents and vendors
  - Training school vendors to comply with recipes
  - Completion of education material for the new curriculum on nutrition
Even if school regulations are implemented properly, other actions considered in the National Strategy plan should start implementation soon in order to have effects, particularly:

- Improvement of the quality and increasing the time spent in physical education and other physical activity opportunities during school and out of school
- Regulation of foods sold in the school surroundings
- A mass campaign to promote healthy eating and drinking and active lives to influence healthy behaviors beyond school
- Regulation of food marketing to children (current self regulatory code insufficient)
- Implementation of plans to reduce availability and intake of SSB, energy dense foods, added sugar, and total calories in foods
Recognizes the collective responsibility in obesity prevention; therefore, the **role of government intervention**

Challenges and key factors needed for policies to be effective

• **1. Lack of a clear coordination mechanism**, such as a national council for obesity prevention, a group of experts and representatives from key sectors and stakeholders appointed by highest possible level of Government (President)

• **2. Lack of clear accountability mechanisms and no explicit monitoring and evaluation** activities and processes

• **3. Given that the strategy is based on a national “agreement” not a law, it is vulnerable to changes in government**, particularly, given opposition of strong economic actors (*Should it become a law?*)

• **4. Need of a well synchronized and harmonized national communications/education campaign** based on state of the art methodology to foster the adoption of healthy choices as they become easy choices with participation of key sectors
5. Need to consider **policies at macro level which have an effect on the food system** (trade and agricultural policies)

6. Need to include **regulations for marketing food to children and to avoid unethical marketing**, currently not part of the National Agreement, since food industry adopted a self regulatory code, that does not follow current international (PAHO) recommendations

7. Need of a **simple Front of Pack labeling system** such as the one proposed by the IOM or Choices international. Industry adopted unilaterally the GDA´s system which has proven to be ineffective for decision making at the purchasing point in Mexico
Challenges and key factors needed for policies to be effective

• 8. Implementation of regulations/legislation to guarantee effective changes in environments other than schools (working places, communities, food supply and prices) to make healthy choices the optimal default, along with effective communication strategy

• 9. Food industry has become a barrier for development and implementation of required changes in regulations

• 10. Process and impact evaluations are crucial for ensuring systematic learning from actions and strategies implemented in different settings and Countries
Thank you

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