The challenges of data collection for physical activity studies in Latin America: The IPEN-study experience (Brazil, Colombia and Mexico)

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Background: Physical Activity Research worldwide

A. Map showing country area by population size

B. Map showing country area by publications on PA-interventions
Background: PA correlate studies in LMIC

- US, Northern Europe and Australia: **Many studies** to identify characteristics of the built environment associated to PA
- 2012 Lancet: Synthesis of 9 reviews of environmental correlates of PA for adults  *(over 400 studies represented)*
- LMIC: **Only 11 studies with environmental correlates for PA**
Why is PA research so scarce in Latin America?

- Lack of recognition of physical inactivity as a public health problem
- Lack of funds for PA research
- Lack of capacity (highly trained researchers in the field of physical activity epidemiology)

But also... **inability to replicate in an exact manner the state-of-the-art data collection protocols developed in HIC**
  - Key to generate high-quality, comparable data
**OBJECTIVE:** To accurately assess the relation between physical activity and built environment features using pooled data from all the studied countries

**Measurement tools:**

- **PA:** International Physical Activity Questionnaire (IPAQ) and Accelerometers
- **Built Environment:** GIS data, Neighborhood Environment Walkability Scale Survey (NEWS)
CUERNAVACA, BOGOTÁ, CURITIBA
Key areas requiring data-collection protocol adaptation for PA research in Latin America

- Research/Academic capacity
- Data availability, access and quality
- Political, institutional, economic infrastructure
- Socio-Cultural issues
- Safety
- Appropriateness of measures and instruments
Research capacity for state-of-the-art PA research in Latin America

- Nascent field of research in Latin America
  - Brazil and Colombia have led the way

- Few highly-trained professionals specialized in PA as it relates to public health

- Very few academic programs specialized in PA and public health/epidemiology

- A generation of highly motivated individuals with training from top-academic institutions from HIC are making a difference
Data Availability, Access and Quality

<table>
<thead>
<tr>
<th>HIC</th>
<th>Latin America</th>
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</table>
| Obtain “public access” data for various phases of research | - Data not always available or accessible  
- Quality/detail is not the same as in HIC  
Eg: GIS shapefiles for land use, crime data at the census tract level, public transit stops, etc. |

Identify an **adequate, well respected and influential local partner**: e.g. INSP in Mexico

**Optimize the available data**: Eg. Digitalization of land use data and participants address
## Data format: Sampling Units for IPEN

<table>
<thead>
<tr>
<th>IPEN</th>
<th>Situation in Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary sampling units</td>
<td>- Neighborhoods are <strong>not official administrative units</strong></td>
</tr>
<tr>
<td>Neighborhoods</td>
<td></td>
</tr>
</tbody>
</table>

### Localidades
- Available maps (shapefiles)
- Smallest administrative unit in a city in Mexico
- Vary in size and shape
- 29 in Cuernavaca

### Census Tracts
- Available maps (shapefiles)
- Used only for the census
- 18 to 25 blocks
- 126 in Cuernavaca
Contextual Factors

- Inherent factors of conducting research (of any type) in LMIC

- Country/City level factors **beyond the scope of research**
  - Unreliable postal service
  - Low literacy (general, health-literacy, tech-literacy)
  - Lower labor costs allow to hire data collectors and recruiters → in-person data collection more feasible than in HIC
Socio-cultural issues

<table>
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<th>HIC</th>
<th>Latin America</th>
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<tr>
<td>Recruitment, surveys and accelerometry</td>
<td>- Not culturally accepted</td>
</tr>
<tr>
<td>Phone and/or mail</td>
<td>- Low response and compliance rates</td>
</tr>
<tr>
<td></td>
<td>- Low literacy</td>
</tr>
<tr>
<td></td>
<td>- Not always used to participating in research studies</td>
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**In-person recruitment and data collection**

- ↑ Human Resources needed
- Field work and planning is more challenging
- Low labor costs for professional field workers
### Socio-cultural/regulatory issues: Incentives

<table>
<thead>
<tr>
<th>HIC</th>
<th>LMIC</th>
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<tbody>
<tr>
<td>Many countries provide monetary incentives for participation</td>
<td>Not always allowed to provide cash as an incentive for participation in research studies</td>
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</table>

### Options

<table>
<thead>
<tr>
<th>No Incentives</th>
<th>Alternative monetary/material incentive</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>• No cost</td>
<td>• Higher Cost</td>
<td>• Lower cost</td>
</tr>
<tr>
<td>• Low participation and/or compliance</td>
<td>• 8-15 dollar limits</td>
<td>• Increased participation and/or compliance</td>
</tr>
<tr>
<td></td>
<td>• Increased participation and/or compliance</td>
<td>• Time consuming</td>
</tr>
<tr>
<td></td>
<td>• Complicated approval by IRBs</td>
<td>• Human resources required</td>
</tr>
<tr>
<td></td>
<td>• Safety issues</td>
<td>• Delivery issues</td>
</tr>
</tbody>
</table>
Safety considerations

A) For field workers (recruiters and data collectors)
   – Hired field workers; restricted use of students
   – Work in pairs
   – Provide cell phones/calling cards
   – Sometimes → avoid certain neighborhoods
   – Notify local authorities of research study

B) For participants
   – Mistrust of strangers recruiting
     • Partner with well-known institution; field workers should always wear appropriate uniform
     • Difficult to access high-income gated communities/buildings
   – Provide coordinating center phone number to verify that it is a real study
   – Are accelerometers tracking where I go? → NO!
In spite of the challenges...

- In person recruitment and survey application
- Coordinate appointments, more challenging logistically

In person data collection has some benefits!
Accurate survey data and possibility to obtain more objective data

- Data collectors trained to apply the survey can clarify questions and make sure participant is answering adequately

- **Objective measures** of height and weight
  - 100% in Cuernavaca and Curitiba
  - Bogota: 100% self-report and 70% objectively measured
Verification of appropriate use of measurement instruments

- accelerometer log
- demonstration of appropriate wearing position
Appropriateness of measures and instruments

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| Surveys (IPAQ, NEWS, etc) → Self or phone-based administration | - Field workers are in charge of in person administration of the surveys  
- They do not include the assessment of certain characteristics of Latin American environment |

1. Modify **language** for cultural appropriateness

2. Modify **structure** for in person application
   - Collaborative effort with Colombian and Brazilian teams

3. New section to assess PA in **specific LA settings** (soccer fields, shopping malls, plazas)
   - Collaborative effort with Colombian and Brazilian teams

4. Two weeks prior to data collection → **Pilot test**
Brazil, Curitiba – Low SES

Low walkability

High walkability
México, Cuernavaca:
Low Walkability, Low SES Neighborhood
Colombia, Bogotá: Low Walkability, High SES
Latin American IPEN-Network: Model of multi-national/institutional collaboration

- **Akira Ferreira Hino** → UNIANDES, Bogotá, Colombia (2 months, 2009) and became IPEN-Brazil’s GIS expert

- **Deborah Salvo** → UNIANDES, Bogota, Colombia (1 month) and at PUCPR, Curitiba, Brazil (1 month), 2010
  - GIS, accelerometry, data collection procedures
  - Co-PI for IPEN-Mexico (with Michael Pratt, CDC), INSP-CDC-Emory collaborative effort

- **Andrea Ramírez** (data collection coordinator of IPEN-Colombia) → 1 month at INSP Cuernavaca, Mexico (2011)
  - Help launch and set up the data collection process for IPEN-Mexico
## Data collection outcomes in 3 IPEN-LA countries

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<th></th>
<th>Mexico</th>
<th>Colombia</th>
<th>Brazil</th>
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</thead>
<tbody>
<tr>
<td><strong>Duration</strong></td>
<td>6 months</td>
<td>6 months</td>
<td>4 months</td>
</tr>
<tr>
<td><strong>Cost</strong></td>
<td>60,000 USD</td>
<td>60,000 USD</td>
<td>60,000 USD</td>
</tr>
<tr>
<td><strong>Accelerometer loss-rate</strong></td>
<td>2/65 = 3%</td>
<td>2/35 = 5%</td>
<td>0 %</td>
</tr>
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</table>
Impact and implications for public policies in Latin America (IPEN)

- The project has generated interest from the ministries & departments of health, urban planning, communication, sports & recreation → Recognition of the problem

- Our work has set the way to...
  - Develop standards to assess how health/unhealthy LA cities are
  - Design environmental interventions for LA settings
  - Focalize resources to improve the built environment where it’s needed

- **Training and capacity building** → 1st generation of highly trained researchers in the field of physical activity epidemiology/public health
Conclusions

- Performing high quality physical activity epidemiological research in Latin American is **challenging but feasible**
- A committed, influential **local partner** is essential for success
- **Creative solutions** to adapt to the local context should be favored, without sacrificing methodological rigor
- **Cost-effective decisions** based on the available monetary, time and human resources should be made
- Our study may be used as a **model for future studies**, programs and policies addressing physical activity and the environment in the Latin American region
- A strong, well-connected, **collaborative network** (between countries and institutions) is key for a successful PA study in Latin America
- Our experience provides valuable information for studies involving **Latino population in the US**, and studies in **other LMIC**
THANK YOU!