How to Scale up CVD Prevention and Control for “25 x 25”: a national Emerging Leaders Program in Brazil

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• International Associate Researcher, PHRI, McMaster University, Hamilton, Canada
AGENDA

– Why Collaborative Research is needed

– Examples of Efficient Collaboration in Brazil

– Brazilian CVD Landscape

– Emerging Leaders platform in Brazil
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Why do we need global collaborative research?

1. Efficiency on recruitment
2. External validity of study results
3. Opportunity for regional scientific questions
4. More robust, reliable and unbiased study results
5. Connectivity Era
6. Global vision of the world (global change for local impact)
Benefits from Collaboration

1. Opportunity for sharing/exchange knowledge
2. Capacity building in all research related areas
3. Efficiency for conducting studies (RCTs & Epi studies)
4. Opportunity for publication in high impact journals
5. Tool for improving clinical care
6. Broader questions may be reliably evaluated
Benefits from Collaboration from a Brazilian Perspective

1. Brazilian population of 200 M + Ethnic diversity
2. Well-established CV research network
3. MI & Stroke (#1 and #2 cause of death)
4. Heart Failure as main cause of hospitalization
5. Epidemic increase on obesity, hypertension, DM
6. Young population with non-trivial CV risk
7. Need for answering local/regional scientific questions
Next Steps for Collaboration

1. Strength long-term collaborative efforts
2. Continue capacity building process
3. Simplify regulatory barriers
4. Linkage between epi/clinical research+implementation science
5. Shift from selected population to broader communities for research questions and utilization of new technologies
6. Continuing seek for new model of research and new paradigms for preventing CV diseases
7. Patient advocacy (pt associations, pt-oriented medicine)
8. Shift from Collaboration to True Partnership
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Facts behind Collaboration (from 1989 to 2015)

1. EMERAS/ISIS-4 Trials (89-92)

2. Formal training was required

3. 2-year training at PHRI (MSc courses and real-life research exposure: 93-95)

4. Expansion of Brazilian CV Research Network

5. Long-term collaboration based on clinical relevant research questions (RCTs & Epi studies)

6. Sustainable and continuous research cooperation based on commitment and friendship (truly defined)

7. Continuous re-evaluation of model for research collaboration
Brazilian Cardiovascular Network
Age: 25 yr; States: 22; Cities: 60; Sites: 250
Cardiovascular Disease Chain
Link between Research and Clinical Practice

Risk Factors:
- Atherosclerosis
- LVH
- CAD

Coronary Thrombosis

ACS (AMI & UA)

Arrhythmias & Myocardial damage

Sudden Death

Ventricular Remodelling

Ventricular Dysfunction

Heart Failure

End-stage HF

Death

Myocardial Ischemia

AF

Stroke & SE

Stroke

Death
AVERROES
Apixaban VERsus Acetylsalicylic Acid (ASA) to PREvent StROKES

OASIS Organization to Assess Strategies for Ischemic Syndromes

Hope-Too

RELY Study of stroke prevention in oral anticoagulation

CURRENT

INTERSTROKE

SIRS

COMPASS

CURE

EpiDREAM

TIMACS

RIVAL

OASIS

POLYCAP

TOTAL
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Life Expectancy at birth - 1930/2013

Fonte/Source: IBGE, Diretoria de Pesquisas, Coordenação de População e Indicadores Sociais, Projeção da população do Brasil por sexo e idade para o período 2000-2060 - Revisão 2013.
<table>
<thead>
<tr>
<th>Causes of death</th>
<th>Total (1)</th>
<th>%</th>
<th>Male</th>
<th>%</th>
<th>Female</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total/Total</td>
<td>1170498</td>
<td>100%</td>
<td>665551</td>
<td>100%</td>
<td>504415</td>
<td>100%</td>
</tr>
<tr>
<td>Algumas doenças infecciosas e parasitárias/Certain infectious and parasitic diseases</td>
<td>49175</td>
<td>4,20%</td>
<td>28347</td>
<td>4,26%</td>
<td>20816</td>
<td>4,13%</td>
</tr>
<tr>
<td>Neoplasmas (tumores)/neoplasms</td>
<td>184384</td>
<td>15,75%</td>
<td>98444</td>
<td>14,79%</td>
<td>85931</td>
<td>17,04%</td>
</tr>
<tr>
<td>Doenças endócrinas, nutricionais e metabólicas/Endocrine, nutritional and metabolic diseases</td>
<td>73929</td>
<td>6,32%</td>
<td>33296</td>
<td>5,00%</td>
<td>40625</td>
<td>8,05%</td>
</tr>
<tr>
<td><strong>Cardiovascular Diseases</strong></td>
<td>335213</td>
<td>28,64%</td>
<td>175254</td>
<td>26,33%</td>
<td>159923</td>
<td>31,70%</td>
</tr>
<tr>
<td>Doenças do aparelho respiratório/Doenças do aparelho respiratório/</td>
<td>126693</td>
<td>10,82%</td>
<td>66443</td>
<td>9,98%</td>
<td>60220</td>
<td>11,94%</td>
</tr>
<tr>
<td>Doenças do aparelho digestivo/Diseases of the digestive system</td>
<td>59707</td>
<td>5,10%</td>
<td>38019</td>
<td>5,71%</td>
<td>21677</td>
<td>4,30%</td>
</tr>
<tr>
<td>Algumas afeccões originadas no período perinatal/Certain conditions originating in the perinatal period</td>
<td>23579</td>
<td>2,01%</td>
<td>13340</td>
<td>2,00%</td>
<td>10144</td>
<td>2,01%</td>
</tr>
<tr>
<td>Causas externas/External causes</td>
<td>145842</td>
<td>12,46%</td>
<td>119947</td>
<td>18,02%</td>
<td>25738</td>
<td>5,10%</td>
</tr>
<tr>
<td>Outras/Others</td>
<td>171976</td>
<td>14,69%</td>
<td>92461</td>
<td>13,89%</td>
<td>79341</td>
<td>15,73%</td>
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</table>
Chronic non-communicable diseases in Brazil: burden and current challenges

### InterHeart Latin America

**RF associated with AMI (Clinical Impact - PAR)**

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>% of Controls</th>
<th>PAR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LA</td>
<td>IH Global</td>
</tr>
<tr>
<td>ApoB/ApoA1</td>
<td>42</td>
<td>32</td>
</tr>
<tr>
<td>Smoking</td>
<td>48,1</td>
<td>48,1</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>9,54</td>
<td>7,2</td>
</tr>
<tr>
<td>Hipertension</td>
<td>29,1</td>
<td>20,8</td>
</tr>
<tr>
<td>Waist-Hip Ratio</td>
<td>48,6</td>
<td>31,2</td>
</tr>
<tr>
<td>Depression</td>
<td>28,9</td>
<td>15,8</td>
</tr>
<tr>
<td>Permanent Stress</td>
<td>6,8</td>
<td>3,9</td>
</tr>
<tr>
<td>Physical Activity</td>
<td>22</td>
<td>18,9</td>
</tr>
<tr>
<td>Alcohol</td>
<td>19,4</td>
<td>11,9</td>
</tr>
<tr>
<td>Fruits/Vegetables daily</td>
<td>15</td>
<td>16,3</td>
</tr>
<tr>
<td>All Combined</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Two Cities Metropolitan Area Cross-Sectional Study:
97,502 individuals - São Paulo/Campinas, SP, Brazil


### RISK LEVELS (5)

<table>
<thead>
<tr>
<th>Level</th>
<th>Count</th>
<th>Percent</th>
<th>Count</th>
<th>Percent</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>VERY LOW</td>
<td>15000</td>
<td>16.35%</td>
<td>11186</td>
<td>18.33%</td>
<td>3814</td>
<td>12.41%</td>
</tr>
<tr>
<td>LOW</td>
<td>21249</td>
<td>23.16%</td>
<td>14844</td>
<td>24.33%</td>
<td>6405</td>
<td>20.84%</td>
</tr>
<tr>
<td>INTERMEDIATE</td>
<td>24575</td>
<td>26.78%</td>
<td>17223</td>
<td>28.23%</td>
<td>7352</td>
<td>23.92%</td>
</tr>
<tr>
<td>HIGH</td>
<td>17829</td>
<td>19.43%</td>
<td>11316</td>
<td>18.55%</td>
<td>6513</td>
<td>21.19%</td>
</tr>
<tr>
<td>VERY HIGH</td>
<td>13104</td>
<td>14.28%</td>
<td>6449</td>
<td>10.57%</td>
<td>6655</td>
<td>21.65%</td>
</tr>
</tbody>
</table>

### RISK LEVELS (3)

<table>
<thead>
<tr>
<th>Level</th>
<th>Count</th>
<th>Percent</th>
<th>Count</th>
<th>Percent</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>36249</td>
<td>39.51%</td>
<td>26030</td>
<td>42.66%</td>
<td>10219</td>
<td>33.24%</td>
</tr>
<tr>
<td>INTERMEDIATE</td>
<td>24575</td>
<td>26.78%</td>
<td>17223</td>
<td>28.23%</td>
<td>7352</td>
<td>23.92%</td>
</tr>
<tr>
<td>HIGH</td>
<td>30933</td>
<td>33.71%</td>
<td>17765</td>
<td>29.11%</td>
<td>13168</td>
<td>42.84%</td>
</tr>
</tbody>
</table>

Total # individuals: 91757, 61018, 30739
Leading Cause of Death, According to Population

- Doenças: 37%
- Violência/Criminalidade: 21%
- Trânsito: 16%
- Drogas/Vício: 8%
- Acidentes: 4%
- Fome/Miséria: 3%
- Outras respostas: 3%
- Não sabe: 9%

Câncer: 16%
DCV'S: 13% 12% Infarto do miocárdio 1% Derrame cerebral
AIDS: 6%

Em um ranking geral, as doenças cardiovasculares ocupam, na percepção da população, o quarto lugar como principal causa de óbitos no Brasil.

Base: Total da amostra 2.012 entrevistas
Fonte: P1.Pelo que você sabe ou já ouviu falar, qual é a principal causa de morte no Brasil?
Base: Total da amostra 2.012 entrevistas
Fonte: P2. Pelo que você sabe ou já ouviu falar, quais são os fatores que aumentam os riscos de uma pessoa ter doenças cardiovasculares, como infarto do coração e derrame cerebral? Quais outros? Algum outro? P3. Pelo que você sabe ou já ouviu falar, aumentam os riscos de uma pessoa ter um infarto do coração ou derrame cerebral?
Children and Adolescents Task Force

- Children and adolescents between 7 -18 years, both gender, 11 public schools from Campinas, SP, 2011.
- Cross-sectional study, 4699 students (47,1% male, mean age 11,1±2,9 yr).
- Questionnaire, anthropometric measurements and lipid profile.
- Results:
  - Physical activity: 1.5h – PC/TV/VG: 4,2h
  - LDL-c>110 mg/dL: 15%,
  - HDL <40 mg/dL: 58%,
  - TG > 150 mg/dL: 28%
  - Obesity/Overweight: 32%
  - Hypertension/pre-hypertension: 20%

Avezum A. Preventive Cardiology Congress, Montreal 2013
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Components of an Effective Leader of Change in CVD Prevention

- Clear Commitment
- Time Dedication
- Previous Formal Training
- Long-term Mentorship
- Environmental Exposure
- Continuous “training”
- Local ARO
- Natl. leadership & Intl. influential KOL
Effective Leader of Change in CVD Prevention - Key Steps I

• Identify high quality ELs (Solid training with tangible academic biography, who are actively working on CV prevention and control)
• Provide formal research training (WHF Seminar)
• Extensive and comprehensive exposure on CVD prevention (either local or through PHRI training)
• Reassure an efficient network for collaboration at the country or region level
• Academic-oriented collaboration
Effective Leader of Change in CVD Prevention - Key Steps II

- Simple/efficient academic research organization (project office)
- Understanding of local health system, local barriers for care improvement and evidence-based CV prevention and treatment implementation
- Government interface (ex. Brazil)
- National Co-Funding strategy making clear relevance/impact of the CVD prevention project for the country
- Community cluster randomized trials
National Emerging Leader Program - Brazil

- 2 EIs – WHF seminar
- 10 BELs – Brazil training
- 22 Research Investigators (State Level Network)
- 250 Research Investigators (City Level Network)
- +/- 5000 cities Family Health Program (60% Brazilian Population coverage)
The value of proven therapies are not optimally realized by physicians, payers and patients.

Best care ≠ usual care
population outcomes are not reflecting trials’ results

In The Continua Of Care
An Important Gap

basic science
promise

clinical trial
efficacy

population
effectiveness