



## **Case examples of implementation research focused on context**

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### **Two examples of implementation research trials to prevent and control CVD in Argentina**

- A comprehensive strategy of hypertension control in Argentina (funded by NHLBI/NIH under GACD, 2012-2017)
- An Educational Intervention to reduce LDL-chol in patients with high CV risk in low-resource settings in Argentina (funded by the International Atherosclerotic Society, 2014-2017)

## About these studies..

- Both cRCTs were conducted in partnership with the National MoH, which participated in the design and implementation.
- Both studies have been set up as “potentially scalable” since its concept and design
- Were built upon existent programs and strategies implemented at national or subnational levels with more or less success. Policy makers and key stakeholders were involved and committed at national and local levels
- Process measures (and not only outcome measures) have been analyzed to evaluate implementation and effectiveness as well as understanding change process
- Cost-Effectiveness of the intervention program have been estimated along the studies

## A Cluster Randomized Trial of a Comprehensive Approach for Hypertension Control in Low-income Patients in Argentina

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## Objectives

- The primary objective is to test whether implementation of an 18-month comprehensive intervention program will lower systolic BP and diastolic BP among uncontrolled hypertensive patients compared with usual care.
- The secondary objective is to test whether the comprehensive intervention program will improve hypertension control among uncontrolled hypertensive patients.

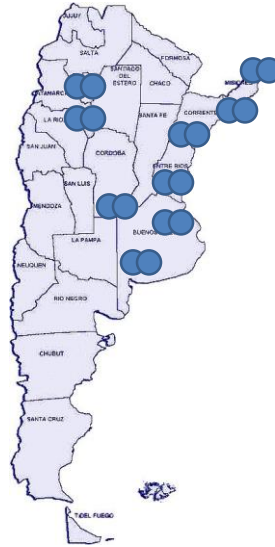
## Context

- Context consists of a constellation of active interacting variables and is not just a backdrop for the intervention.
- It is the set of circumstances or unique factors that surround a particular implementation effort.

Dopson and Fitzgerald, 2006

## Context

- Local and national policies
- Primary care centers and health providers
- Community and individual patients



## Context

- Local and national policies
  - Strong support from the National MoH: political will to strengthening the primary care level
  - Support from the local Departments of Health at each district
  - REDES Program: focused on chronic diseases, HTN and DB; training of physicians; incentives for CV risk classification
  - REMEDIAR Program: free medication at primary care centers

## Context

- Primary care centers and health providers
  - Practice culture and staffing:
    - PCC traditionally focused on maternal and child care
    - Understaffed
    - Goals and outcomes: Dependent on individual leadership
    - Poorly developed research culture
    - Physicians: low adherence to CPGs, degree of involvement with chronic patient care was variable
  - Georeferenced catchment area
  - Clinic employed community health workers (CHW) in addition to general practitioners and nurses
  - CHW highly valued being trained in HTN management and being “empowered” to help hypertensive patients and have a leading role in HTN care at their clinics

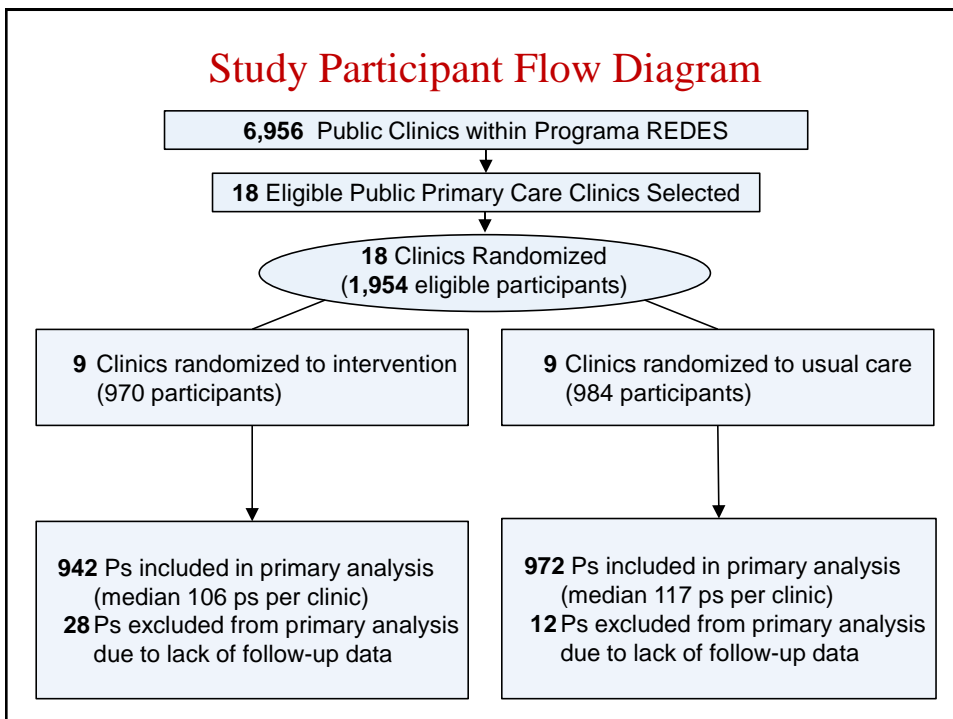
## Context

- Community and individual patients
  - Poor urban areas
  - Vulnerable population, competing needs
  - Gender perspective: cultural and logistic barriers to access the PCC for men; recognition of the role of peers (spouse and family members)

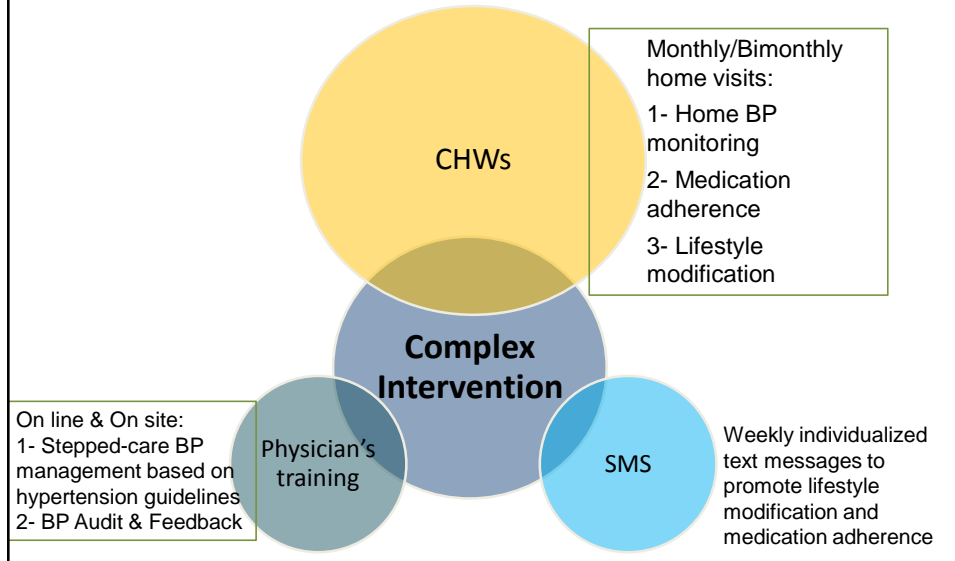
## Eligibility Criteria

- Primary Healthcare Centers (Public Clinics)
  - Clinic was affiliated with the REDES program
  - Clinic was located in a poor urban area
  - Clinic provided free medical care and medications
  - Clinic employed community health workers (CHW) in addition to general practitioners and nurses
- Study Participants
  - Patients aged  $\geq 21$  years who received primary care from the participating clinics
  - Systolic BP  $\geq 140$  mmHg and/or diastolic BP  $\geq 90$  mm Hg on at least 2 separate visits
  - Their spouses (with or without hypertension) and/or adult hypertensive family members (age  $\geq 21$  year) living in the same household were willing to participate in study

## Study Participant Flow Diagram



## Comprehensive Intervention



## Baseline Characteristics of Participants

|                                       | Intervention<br>(n=743) | Control<br>(n=689) | <i>P</i> Value |
|---------------------------------------|-------------------------|--------------------|----------------|
| Age, year                             | 56.1 (0.50)             | 55.5 (0.50)        | 0.45           |
| Female, %                             | 52.6                    | 53.4               | 0.53           |
| History of major CVD, %               | 12.7                    | 9.0                | 0.03           |
| History of diabetes, %                | 23.6                    | 21.1               | 0.27           |
| Weekly alcohol drinking, %            | 33.4                    | 30.1               | 0.19           |
| Physical activity, MET/w              | 21.8 (1.62)             | 24.2 (2.28)        | 0.39           |
| Morisky Score                         | 6.3 (0.08)              | 6.3 (0.09)         | 0.69           |
| Body-mass index, kg/m <sup>2</sup>    | 31.8 (0.24)             | 31.5 (0.25)        | 0.47           |
| Systolic BP, mmHg                     | 151.7 (0.61)            | 149.8 (0.59)       | 0.03           |
| Diastolic BP, mm Hg                   | 92.1 (0.45)             | 90.1 (0.49)        | 0.002          |
| Use of antihypertensive medication, % | 86.0                    | 83.5               | 0.18           |

## Effect of Intervention on the Primary Outcome: Systolic Blood Pressure

|              | Mean Systolic BP Reductions<br>from Baseline (95% CI) |                      | Net<br>Reductions<br>(95% CI) | P<br>Value |
|--------------|---|----------------------|-------------------------------|------------|
|              | Intervention  | Control              |                               |            |
| At 6 months  | 11.9<br>(10.5, 13.3)                                  | 7.4<br>(5.9, 8.9)    | 4.5<br>(2.4, 6.6)             | <0.001     |
| At 12 months | 15.6<br>(14.4, 16.8)                                  | 10.1<br>(8.8, 11.3)  | 5.5<br>(3.8, 7.3)             | <0.001     |
| At 18 months | 19.3<br>(17.9, 20.8)                                  | 12.7<br>(11.3, 14.2) | 6.6<br>(4.6, 8.6)             | <0.001     |
| Overall      | 15.6<br>(14.3, 16.8)                                  | 10.0<br>(8.8, 11.3)  | 5.5<br>(3.8, 7.3)             | <0.001     |

## Effect of Intervention on Secondary Outcomes: Diastolic Blood Pressure

|              | Mean Diastolic BP Reductions<br>from Baseline (95% CI) |                   | Net<br>Reductions<br>(95% CI) | P<br>Value |
|--------------|--|-------------------|-------------------------------|------------|
|              | Intervention   | Control           |                               |            |
| At 6 months  | 6.5<br>(5.5, 7.4)                                      | 3.5<br>(2.6, 4.4) | 2.9<br>(1.6, 4.3)             | <0.001     |
| At 12 months | 9.4<br>(8.5, 10.2)                                     | 5.2<br>(4.4, 6.0) | 4.2<br>(3.0, 5.3)             | <0.001     |
| At 18 months | 12.2<br>(11.2, 13.2)                                   | 6.9<br>(5.9, 7.8) | 5.4<br>(4.0, 6.8)             | <0.001     |
| Overall      | 9.3<br>(8.5, 10.2)                                     | 5.2<br>(4.4, 6.0) | 4.1<br>(3.0, 5.3)             | <0.001     |



## Effect of Intervention on Secondary Outcomes: Proportion of Controlled Hypertension

|              | Proportions of Controlled Hypertension (95% CI) |                      | Net Differences (95% CI) | P Value |
|--------------|---|----------------------|--------------------------|---------|
|              | Intervention                                    | Control              |                          |         |
| At baseline  | 17.0<br>(14.4, 20.0)                            | 17.6<br>(14.9, 20.6) | -0.6<br>(-4.6, 3.4)      | 0.78    |
| At 6 months  | 46.1<br>(42.5, 50.0)                            | 40.4<br>(36.8, 44.4) | 5.7<br>(0.4, 11.0)       | 0.04    |
| At 12 months | 61.0<br>(57.4, 64.8)                            | 43.9<br>(40.2, 48.0) | 17.1<br>(11.7, 22.4)     | <0.001  |
| At 18 months | 72.9<br>(69.6, 76.3)                            | 52.3<br>(48.4, 56.4) | 20.6<br>(15.4, 25.8)     | <0.001  |

Process measures focused on whether the  
intervention actually works  
(comparison btw intervention & control arms)

## Effect of Intervention on High Adherence to Medications\*

|              | Proportions of High-Adherence to Medications (95% CI) |                      | Net Differences (95% CI) | P Value |
|--------------|---|----------------------|--------------------------|---------|
|              | Intervention  | Control              |                          |         |
| At baseline  | 31.4<br>(27.6, 35.7)                                  | 38.0<br>(33.9, 42.5) | -6.6<br>(-12.4, -0.7)    | 0.03    |
| At 6 months  | 48.3<br>(44.2, 52.8)                                  | 41.1<br>(37.0, 45.7) | 7.2<br>(1.0, 13.3)       | 0.02    |
| At 12 months | 54.6<br>(50.6, 59.0)                                  | 49.7<br>(45.4, 54.5) | 4.9<br>(-1.3, 11.1)      | 0.13    |
| At 18 months | 66.2<br>(62.2, 70.4)                                  | 53.1<br>(48.8, 57.8) | 13.1<br>(7.0, 19.2)      | <0.001  |

\* Morisky Score equal to eight.

## Effect of Intervention on Intensification of BP Medications

|                       | Proportions of Intensifying Medications (95% CI) |                      | Net Differences (95% CI) | P Value |
|-----------------------|--|----------------------|--------------------------|---------|
|                       | Intervention                                     | Control              |                          |         |
| Baseline to 6 months  | 41.1<br>(37.6, 44.9)                             | 33.2<br>(29.8, 36.9) | 8.0<br>(2.8, 13.1)       | 0.003   |
| 6 to 12 months        | 33.4<br>(30.0, 37.1)                             | 25.6<br>(22.3, 29.6) | 7.7<br>(2.6, 12.8)       | 0.004   |
| 12 to 18 months       | 37.3<br>(33.7, 41.2)                             | 20.6<br>(17.5, 24.2) | 16.7<br>(11.6, 21.7)     | <0.001  |
| Baseline to 12 months | 56.1<br>(52.6, 59.8)                             | 46.9<br>(43.1, 51.0) | 9.2<br>(3.9, 14.6)       | 0.001   |
| Baseline to 18 months | 66.3<br>(63.0, 69.9)                             | 54.3<br>(50.4, 58.4) | 12.1<br>(6.8, 17.4)      | <0.001  |

Process measures focused on whether the intervention is fully implemented  
(intervention arm only)

Number of CHW home visits at 18-Month  
(intervention arm)\*

Note: There should be 12 CHW visits before the 18-Month Nurse Visit

| No. CHW Visits | Frequency | Percent |
|----------------|-----------|---------|
| 0              | 1         | 0.11    |
| 1              | 4         | 0.45    |
| 5              | 3         | 0.34    |
| 6              | 8         | 0.9     |
| 7              | 32        | 3.62    |
| 8              | 21        | 2.37    |
| 9              | 24        | 2.7     |
| 10             | 24        | 2.7     |
| 11             | 84        | 9.48    |
| 12             | 741       | 78.66   |

\* Preliminary data.

### Number of participants who fully complied with registering their BP in their personal log (intervention arm)\*

| Clinic | <9 Visits<br>N (%) | 9~11<br>Visits<br>N (%) | 12 Visits<br>(Good)<br>N (%) | Total<br>N |
|--------|--------------------|-------------------------|------------------------------|------------|
| 52     | 0 ( 0.0)           | 16 (25.8)               | 46 (74.2)                    | 62         |
| 53     | 0 ( 0.0)           | 13 (24.5)               | 40 (75.5)                    | 53         |
| 56     | 0 ( 0.0)           | 8 (16.0)                | 42 (84.0)                    | 50         |
| 61     | 0 ( 0.0)           | 8 (15.4)                | 44 (84.6)                    | 52         |
| 63     | 1 ( 1.8)           | 3 ( 5.3)                | 53 (93.0)                    | 57         |
| 72     | 0 ( 0.0)           | 2 ( 3.5)                | 55 (96.5)                    | 57         |
| 74     | 3 ( 5.3)           | 18 (31.6)               | 36 (63.2)                    | 57         |
| 82     | 0 ( 0.0)           | 3 ( 5.9)                | 48 (94.1)                    | 51         |
| 91     | 0 ( 0.0)           | 1 ( 2.3)                | 42 (97.7)                    | 43         |
| Total  | 4 ( 0.83)          | 72 (14.94)              | 406 (84.23)                  | 482        |

\* Preliminary data.

## Conclusions

- The primary outcome, net change in systolic BP from baseline to month 18, was significantly reduced in the intervention group compared to the control group.
- The secondary outcomes, the proportion of controlled hypertension at 18 months, high adherence to antihypertensive medications (Morisky Score =8), and intensification of antihypertensive medications over the 18-month intervention, were significantly higher in the intervention group.
- This study indicates that this multilevel comprehensive intervention program is effective for BP control among low-income hypertensive patients.