# Real-world data
# for measuring Primary Health Care quality and its effects on Maternal and Child Health in Brazil

**Acácia Mayra Pereira de Lima, Valentina Martufi, Maria del Pilar Quispe-Flores, Leandro Luz, Helena Guerra, Rosana Aquino, Anya Pimentel Gomes Fernandes Vieira-Meyer, Maurício Lima Barreto, Maria Yury Ichihara, Elzo Pereira Pinto Junior**

# Introduction

Primary Health Care
- ✓ pillar of any universal health system.
- ✓ determinant of Maternal and Child Health (MCH) outcomes

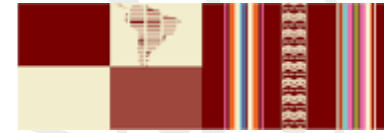The Centre for Data and Knowledge Integration for Health (Cidacs) - in Brazil
- ➢ pioneering research center
- ➢ real-world data from millions of Brazilians
- ➢ population-based cohorts
- ➢ how public policies impact the population's health

Innovative approach to evaluate the relationship between PHC components and under-5 mortality in Brazil.
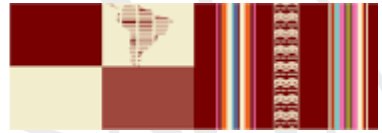
# Objective

Describe the utilization of real-world data to explore the relationship between the quality of PHC components and under-5 mortality in Brazil.
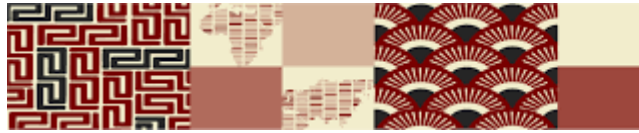
# Methodology
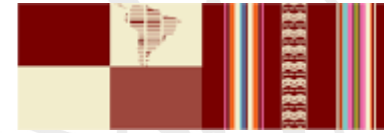
❑ Experience report

❑ Integration of different administrative databases

❑ Use/re-use of real-world data to understand how PHC interventions impact MCH outcomes

# Results

Anonymized database → linkages from:

a) the Live Births Information System (SINASC);
b) the Mortality Information System (SIM);
c) the Unified Registry of Social Programs (CadUnico) – which provides socioeconomic information on over 130 million individuals who applied to any social benefits programs;
d) the external assessment database from the National Primary Health Care Access and Quality Improvement Programme (PMAQ-AB) – which characterizes the structure and work processes of PHC teams;
e) the Bolsa Família Programme (BFP) Conditionalities database – which details at which PHC facilities BFP beneficiaries complied with cash transfer conditionalities.

# Results

Population:
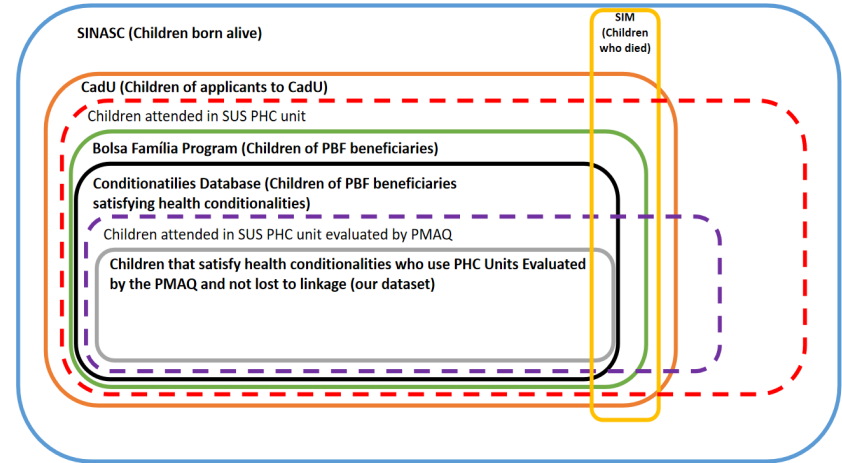- ✓ 143'000 children
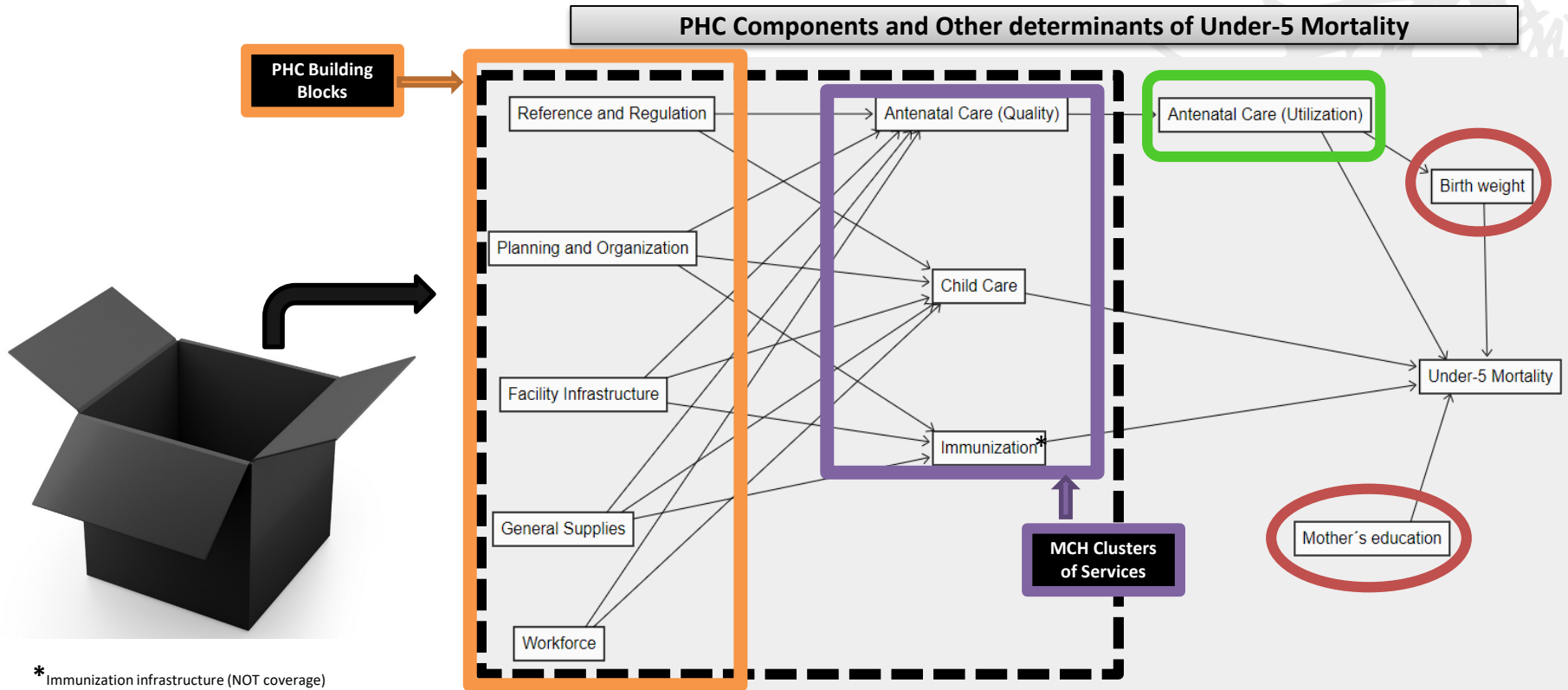- ✓ Born in 2010
- ✓ 12,085 PHC teams
- ✓ 3,601 Brazilian municipalities



Theoretical model: determinants of under-5 mortality
- ➢ ten PHC components
- ➢ proximal determinants (individual SE and biological charachteristics)

# 1.f.i PHC Model components: Opening the "PHC Black Box" and deciphering its relationship with Under-5 Mortality



*Immunization infrastructure (NOT coverage)

# Conclusions

Using real-world data enables innovative approaches to assess the impact of PHC quality on MCH outcomes. These strategies allow an agile, robust scientific production capable of uncovering scientific evidence in unprecedented proportions, quickly and with low costs.

# Challenges in the process/methodology and lessons learned

- ➢ **Assessing simultaneously the effect of various components of PHC → limited methogologies to study multiple exposures at the same time;**
- ➢ **U5 mortality (fortunately) rare health outcome (in Brazil) – even in our cohort of millions → further methodological limitations;**
- ➢ **Nature of data (dichotomous: adequate/inadequate) → limited further our choice of methodology**

- ➢ **It is possible to measure clearly and concretely the quality of PHC → variables/indicators/componentes;**
- ➢ **Can apply our PHC model to study the impact of PHC on other (less rare) outcomes;**
- ➢ **Our statistics team adjusted existing methodologies to be able to measure our exposures and their impact on U5 mortality → pioneering work!**

# More details on process/methodology

- ✓ **Literature review and expert consultation to develop PHC componentes;**
- ✓ **Bayesian Confirmatory Factor Analysis to measure the quality of our PHC componentes on a continuous scale;**
- ✓ **Bayesian Path Analysis to measure the impact of our PHC components on U5 mortality;**
- ✓ **Predictive modelling to obtain more concrete estimates of the effect of better PHC quality on predicted U5 mortality.**

# Spoiler of study results and recommendations for policy makers

Improving the quality of Planning and organization of the work processes can decrease U5 mortality by almost 6%, by increasing the quality of Child Care Services -> greatest effect among our PHC Building Blocks; Improving all of our PHC Building Blocks can descrease U5 mortality by over almost 41% -> PHC is greater than the sum of its parts!
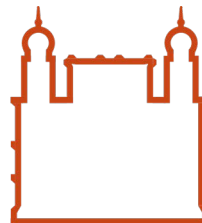
Policy makers in Brazil should valorize the development of first line implementers' capacity for planning and organization of PHC services.

Policy makers from other LMICs can try to adapt our PHC model to their contexts to try and measure PHC quality and understand – in their health systems – which PHC components should be prioritized.
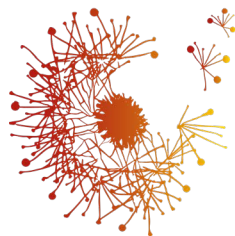
**THANK YOU!**

Valentina.Martufi@fiocruz.br