Global
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Health Conference
_reaching every mother and newborn with quality care_

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# Continuity of antenatal care in Mexico: a measurement proposal in the context of universal health coverage

**Ileana B. Heredia-Pi**, Edson E. Serván-Mori, Blair G. Darney, Hortensia Reyes-Morales,  Rafael Lozano
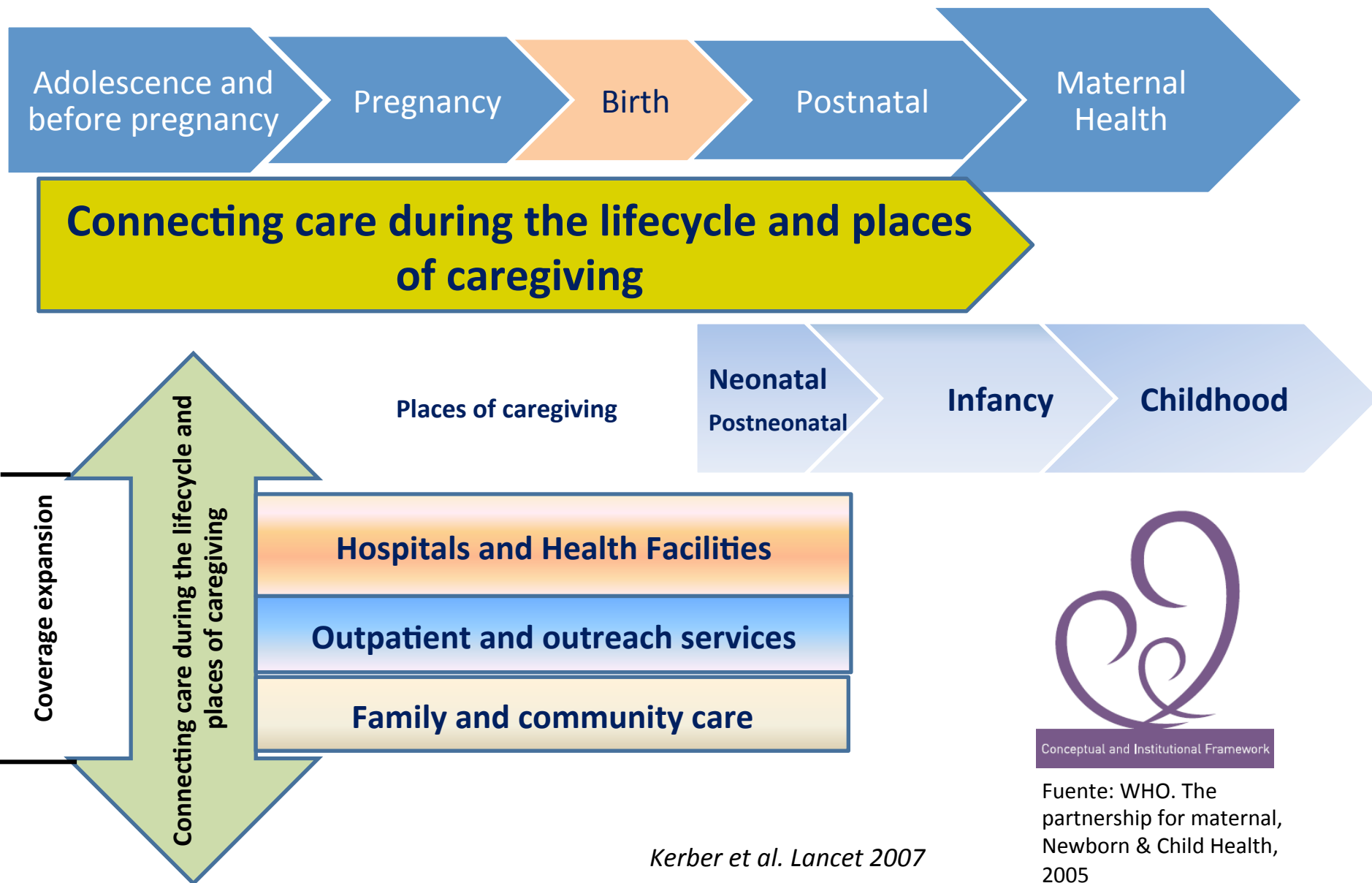
Health System Research Center
National Institute of Public Health, Mexico

# Background

- High levels of antenatal care (ANC) coverage are **necessary but not sufficient** to reduce maternal and neonatal morbidity and mortality.

- It is also crucial that services be of **high quality.**

- **Continuity of care** is a cornerstone of quality care.

- We propose a novel approach to measuring continuity of care using existing data and identify correlates of receipt continuity of ANC in Mexico.

# Maternal continuum care framework

Adolescence and before pregnancy → Pregnancy → Birth → Postnatal → Maternal Health

**Connecting care during the lifecycle and places of caregiving**

Places of caregiving

Neonatal
Postneonatal → Infancy → Childhood

Coverage expansion

Connecting care during the lifecycle and places of caregiving

**Hospitals and Health Facilities**

**Outpatient and outreach services**

**Family and community care**

Conceptual and Institutional Framework

Fuente: WHO. The partnership for maternal, Newborn & Child Health, 2005

*Kerber et al. Lancet 2007*

# Methods

- Source:  2012 National Health and Nutrition Survey (ENSANUT).

- Sample: women who reported a live birth between 2006-2012 and answered a series of questions about ANC preceding that birth (population N= 9,052,044; sample n=6,494).

- ANC continuous and adequate (quality) if:
  - Access to **skilled care** during pregnancy
  - It began during the first trimester of pregnancy (**opportunity**),
  - ≥4 ANC visits and (**sufficient**),
  - At least 7 out of 8 evidence-based procedures were received during ANC visits during the last pregnancy.(**adequate  content**)

# Methods

- Factors associated with receipt of adequate ANC
  - Multivariable logistic regression and included individual, household, and locality-level covariates. We also estimated marginal effects for ease of interpretation.
- Finally, we analyzed the potential relation between ANC coverage and Maternal and Infant mortality at State level
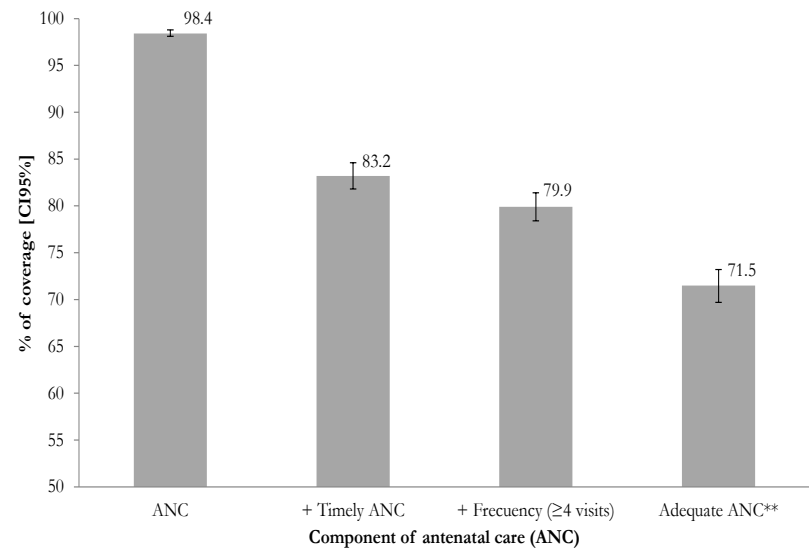  - By socioeconomic level
  - By health insurance

# Results

# Independent and conditional coverage of antenatal care



**PANEL A: Independent coverage**
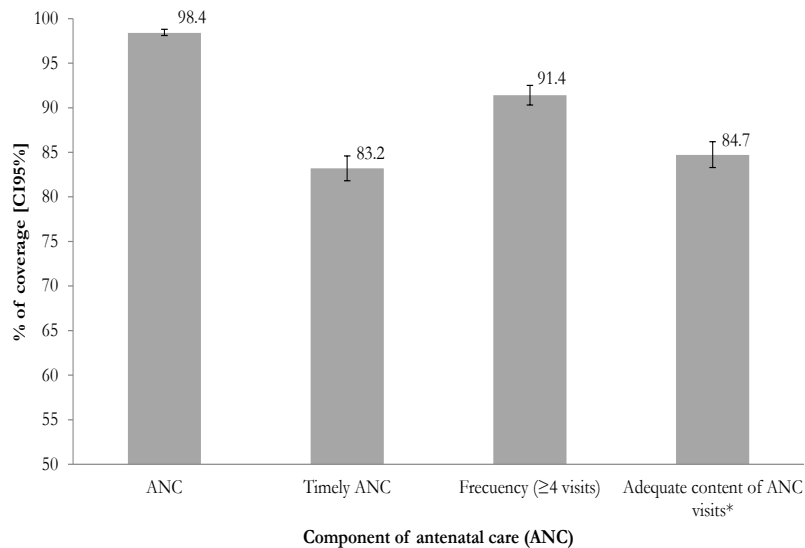
**PANEL B: Conditional coverage**

# Sample characteristics among women who accessed or not to antenatal care

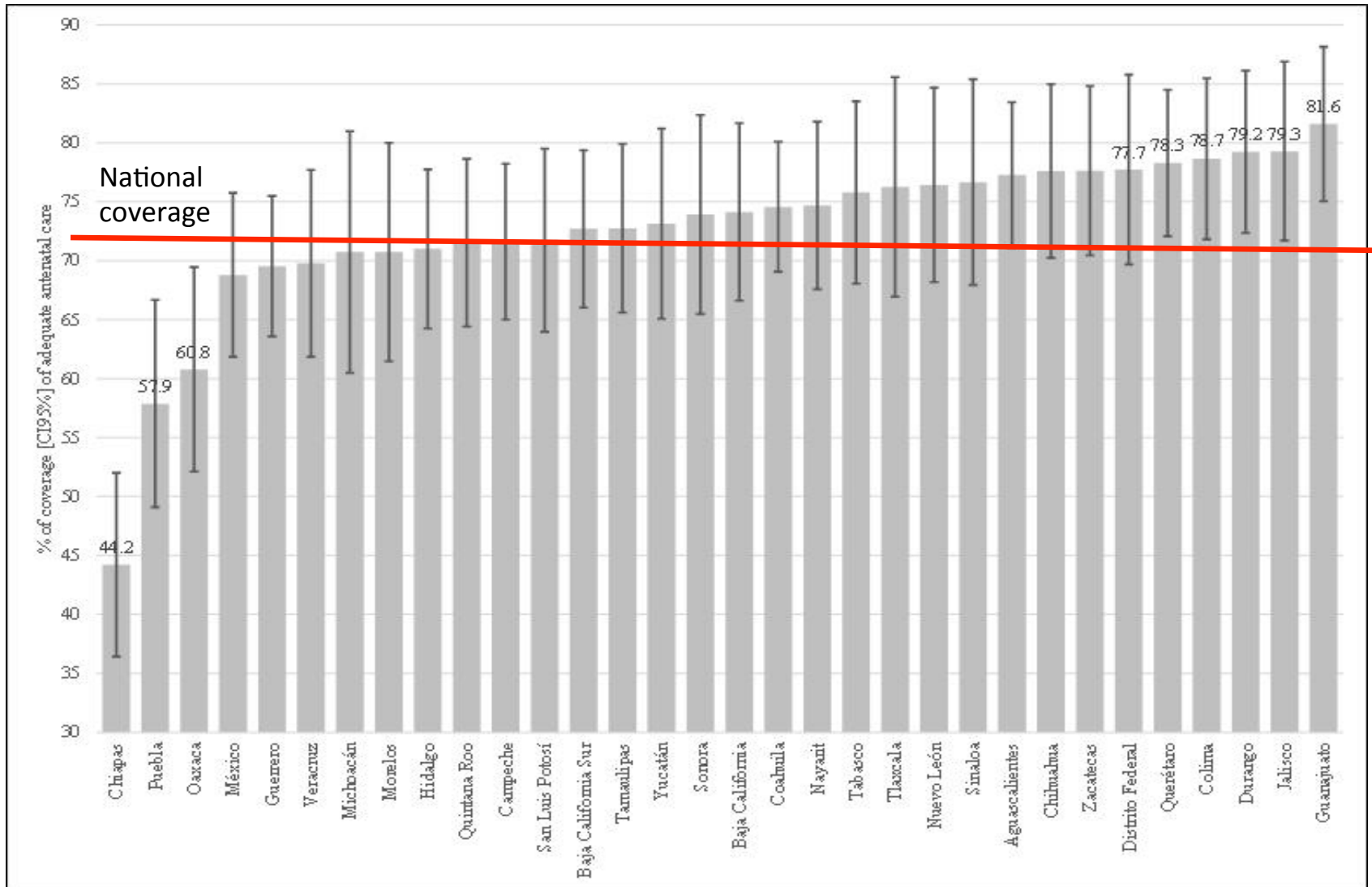| | No antenatal care | Access to antenatal care | | p-value corrected by survey design effect |
| --- | --- | --- | --- | --- |
| | | Inadequate | Adequate | |
| n | 146 | 1,718 | 4,630 | |
| N | 142,117 | 2,439,526 | 6,470,401 | |
| Prevalence | 1.6 [1.2;2.0] | 27.0 [25.3;28.7] | 71.5 [69.7;73.2] | |
| Individuals (%) | | | | |
| Schooling (yrs.) | | | | |
| Zero | 22.3 [13.6,34.3] | 6.4 [5.0,8.1] | 3.2 [2.4,4.4] | <0.001 |
| 1-6 | 34.3 [24.4,45.8] | 25.1 [22.1,28.3] | 20.3 [18.5,22.3] | |
| 7-9 | 31.5 [22.3,42.6] | 41.6 [38.0,45.3] | 36.8 [34.4,39.2] | |
| 10-12 | 10.1 [3.8,24.2] | 20.2 [17.3,23.4] | 26.4 [24.2,28.8] | |
| ≥13 | 1.7 [0.4,7.8] | 6.7 [5.0,9.0] | 13.2 [11.6,15.1] | |
| Age at the time of last delivery (yrs.) | | | | |
| 12-19 | 22.6 [15.0,32.5] | 25.3 [22.2,28.7] | 18.0 [16.4,19.9] | <0.001 |
| 20-29 | 48.6 [37.7,59.7] | 51.0 [47.5,54.6] | 54.5 [52.3,56.7] | |
| 30-49 | 28.8 [20.6,38.7] | 23.6 [20.9,26.7] | 27.4 [25.6,29.4] | |
| N° of children at the time of last delivery | | | | |
| 0 | 35.1 [23.4,48.8] | 35.5 [31.8,39.5] | 31.3 [29.3,33.5] | 0.001 |
| 1 | 22.3 [14.9,32.1] | 27.3 [24.1,30.7] | 33.9 [31.8,36.0] | |
| ≥2 | 42.6 [31.5,54.5] | 37.2 [33.5,41.1] | 34.8 [32.7,36.9] | |
| Any child dead at childbirth or during the 1st yr. | 13.8 [7.1,24.9] | 3.6 [2.7,4.8] | 3.9 [3.1,4.8] | <0.001 |
| At least one miscarriage or abortion | 20.5 [12.9,31.0] | 13.1 [10.9,15.6] | 15.1 [13.7,16.6] | 0.138 |
| Medical insurance | | | | |
| Social Security | 12.1 [6.0,23.1] | 19.9 [16.9,23.2] | 34.2 [31.9,36.6] | <0.01 |
| Seguro Popular | 57.7 [46.4,68.2] | 52.0 [48.0,55.9] | 44.5 [42.2,46.8] | |
| Nothing | 30.2 [21.7,40.3] | 28.2 [24.6,32.0] | 21.3 [19.0,23.8] | |
| Frequent antenatal care provider | | | | |
| Social Security | | 21.1 [18.2,24.2] | 32.2 [29.9,34.6] | <0.001 |
| Ministry of Health | | 52.2 [48.5,56.0] | 42.7 [40.1,45.4] | |
| Private | | 23.5 [20.2,27.1] | 22.8 [20.7,25.1] | |
| Other | | 3.2 [2.3,4.4] | 2.2 [1.7,2.9] | |
| Diagnosis of some health problem during pregnancy** | | 55.2 [51.3,59.1] | 60.4 [58.0,62.7] | 0.027 |

Fuente: Heredia-Pi I, et al bajo embargo

# Sample characteristics among women who accessed or not to antenatal care (Cont...)

| | No antenatal care | Access to antenatal care | | p-value corrected by survey design effect |
|---|---|---|---|---|
| | | Inadequate | Adequate | |
| n | 146 | 1,718 | 4,630 | |
| N | 142,117 | 2,439,526 | 6,470,401 | |
| Prevalence | 1.6 [1.2;2.0] | 27.0 [25.3;28.7] | 71.5 [69.7;73.2] | |
| Household characteristics (%) | | | | |
| Indigenous | 43.8 [31.9,56.5] | 12.1 [10.1,14.4] | 7.9 [6.7,9.4] | <0.001 |
| Oportunidades beneficiary | 41.4 [30.1,53.6] | 26.8 [23.7,30.1] | 20.9 [19.2,22.7] | <0.001 |
| Asset and housing index (SES) (tercile) | | | | |
| I (low) | 72.4 [60.5,81.8] | 42.5 [38.6,46.4] | 29.9 [27.9,32.1] | <0.001 |
| II (middle) | 17.8 [11.5,26.7] | 33.4 [29.6,37.4] | 32.8 [30.7,35.0] | |
| III (high) | 9.7 [3.7,23.4] | 24.1 [20.9,27.8] | 37.2 [34.7,39.8] | |
| Place of residence characteristics (%) | | | | |
| Rural | 47.9 [36.2,59.8] | 25.5 [22.6,28.6] | 21.6 [20.0,23.2] | <0.001 |
| Urban | 15.4 [9.6,23.8] | 23.3 [20.3,26.6] | 19.2 [17.8,20.6] | |
| Metropolitan | 36.7 [25.2,49.9] | 51.2 [47.3,55.2] | 59.3 [57.2,61.4] | |
| Low deprivation | 56.5 [44.6,67.6] | 72.7 [69.4,75.7] | 77.6 [76.0,79.1] | <0.001 |
| High deprivation | 43.5 [32.4,55.4] | 27.3 [24.3,30.6] | 22.4 [20.9,24.0] | |

Fuente: Heredia-Pi I, et al bajo embargo

# Coverage (in %) and CI95% of adequate antenatal care among Mexican Sates

# Ordered and binary logit models to adequate antenatal care

| | Ordered logit model | | | Logit model |
|---|---|---|---|---|
| | | Access to antenatal care | | Adequate=1, inadequate=0 |
| | No antenatal care | Inadequate | Adequate | |
| Estimated percentage | 5.24 | 55.0 | 39.8 | 49.0 |
| | | Marginal effects reported | | |
| Individuals | | | | |
| Schooling (yrs.) [Ref.: Zero] | | | | |
| 1-6 | -2.4* | -13.3** | 15.7** | 11.2* |
| | [-4.5;-0.3] | [-21.5;-5.1] | [5.7;25.7] | [1.0;21.4] |
| 7-9 | -2.4* | -13.4** | 15.8** | 10.4+ |
| | [-4.6;-0.2] | [-21.7;-5.1] | [5.5;26.1] | [-0.3;21.2] |
| 10-12 | -3.2** | -20.3** | 23.4** | 17.9** |
| | [-5.5;-0.9] | [-29.3;-11.3] | [12.5;34.4] | [6.6;29.3] |
| ≥13 | -3. 6** | -24.8** | 28.4** | 23.0** |
| | [-6.0;-1.1] | [-35.8;-13.8] | [15.4;41.3] | [9.9;36.2] |
| N° of children at the time of last delivery [Ref.: Zero] | | | | |
| 1 | -1.4* | -6.4* | 7.8** | 7.2* |
| | [-2.6;-0.1] | [-11.3;-1.5] | [1.9;13.6] | [1.1;13.3] |
| ≥2 | -0.7 | -2.8 | 3.5 | 2.4 |
| | [-2.0;0.7] | [-8.3;2.6] | [-3.2;10.2] | [-4.9;9.8] |
| Medical insurance [Ref.: Nothing] | | | | |
| Social Security | -2.4** | -13.3** | 15.7** | 12.2** |
| | [-3.9;-0.9] | [-19.2;-7.5] | [9.1;22.3] | [4.8;19.7] |
| Seguro Popular | -1.2* | -5.7* | 7.0* | 6.2+ |
| | [-2.4;-0.1] | [-10.5;-0.9] | [1.2;12.7] | [0.02;12.3] |

# Ordered and binary logit models to adequate antenatal care (Cont…)

| | Ordered logit model | | | Logit model |
|---|---|---|---|---|
| | | Access to antenatal care | | |
| | No antenatal care | Inadequate | Adequate | Adequate=1, inadequate=0 |
| Estimated percentage | 5.24 | 55.0 | 39.8 | 49.0 |
| | | Marginal effects reported | | |
| Household characteristics | | | | |
| Indigenous | 2.3* | 6.5** | -8.7** | -4.3 |
| | [0.1;4.5] | [1.8;11.1] | [-14.8;-2.6] | [-10.9;2.3] |
| Asset and housing index (SES) [Ref.: tercile I-low] | | | | |
| II (middle) | -1.0+ | -4.3+ | 5.3+ | 4.2 |
| | [-2.0;0.1] | [-8.9;0.3] | [-0.2;10.7] | [-1.6;10.1] |
| III (high) | -2.1** | -10.9** | 12.9** | 12.1** |
| | [-3.5;-0.7] | [-16.6;-5.1] | [6.4;19.5] | [5.2;19.0] |
| Observations | | | | |
| n | | | 6,494 | 6,348 |
| N | | | 9,052,044 | 8,910,309 |
| Design-based Goodness of fit | | | | |
| F-adjusted test statistic | | | | 0.69 |
| Prob > F | | | | 0.72 |
| Specification test (p-value) | | | | |
| _hat | | | <0.001 | <0.001 |
| _hatsq | | | 0.37 | 0.99 |

# Maternal mortality at State level, by inadequate and adequate antenatal care (ANC)



**PANEL A: Maternal mortality ratio**
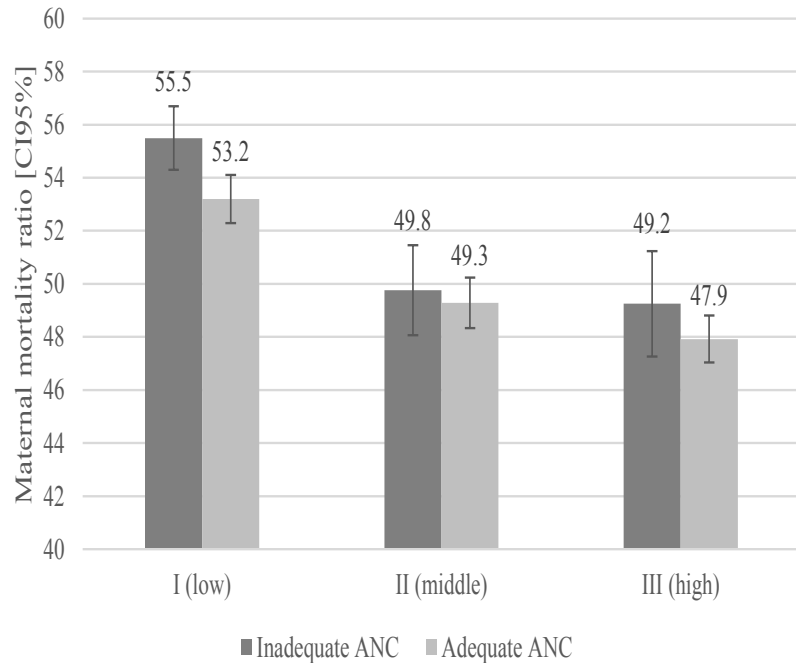
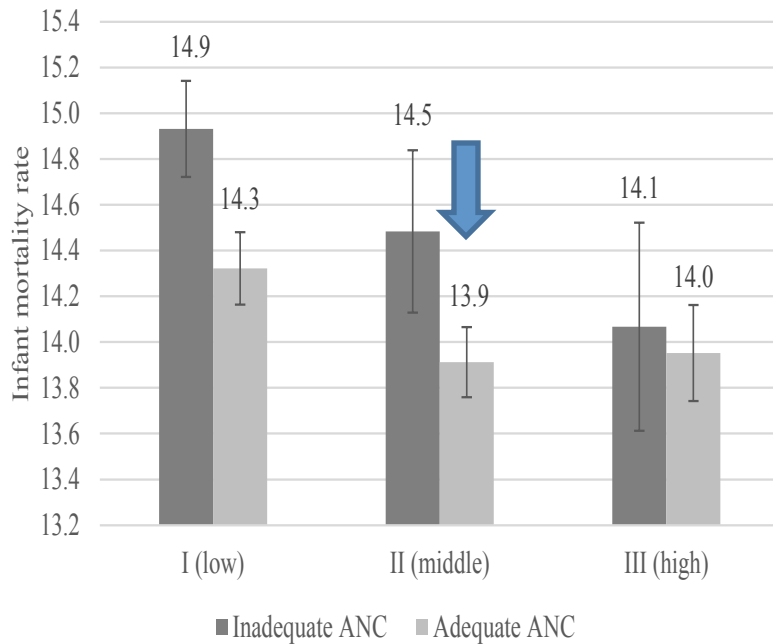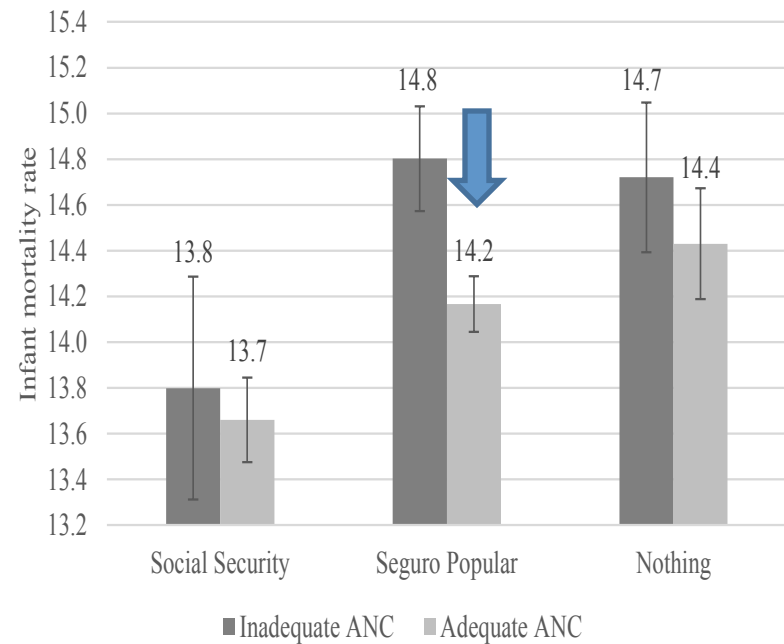By tercile of asset and housing index (SES) — By medical insurance
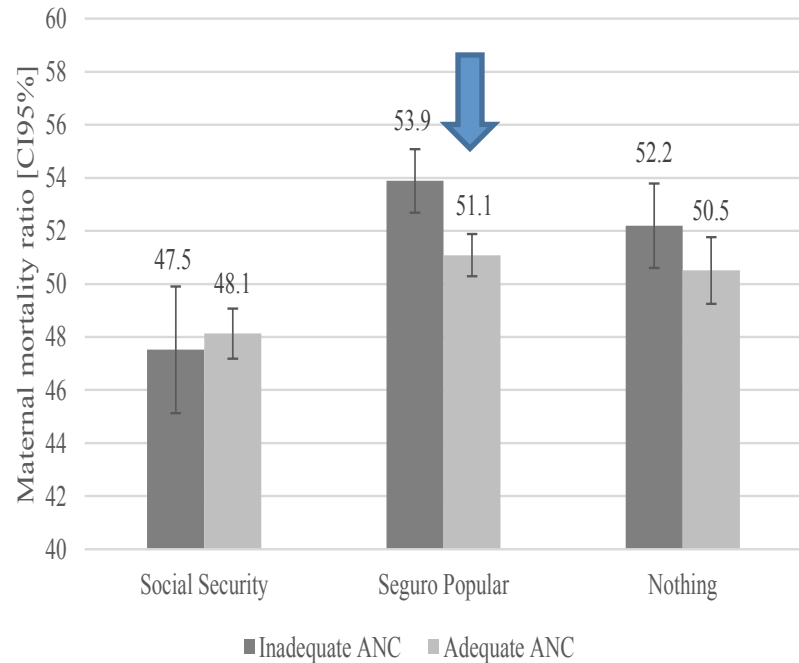
# Infant mortality at State level, by inadequate and adequate antenatal care (ANC)



**PANEL B: Infant mortality rate**

By tercile of asset and housing index

By medical insurance

# Conclusions

- ANC coverage is high if only a single indicator is considered;

- However, when we consider the concept of continuity of care, coverage is much lower.

- Improving quality of ANC includes improving continuity of care for women before, during, and after pregnancy.

- There are a potential relation between Maternal and Infant mortality and the ANC received.