

# ***FAIR /CARE CASE STUDY LIVE BIRTH DATA PROCESSING***

**UHC Summer Institute- June 26-30, 2023**

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# DATA CYCLE OF LIVE BIRTH REGISTRIES

Collection of  
registries from  
each country

Data cleaning

Harmonization

Data  
warehouse &  
documentation

Analysis of data  
& Research

**FAIR → Interoperable &  
Reusable**

**CARE → Ethics**

# LIVE BIRTHS REGISTRIES

## Definition of Live Birth

Live births “live birth as “the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or any definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached” (WHO)

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# LIVE BIRTHS REGISTRIES

- **Live birth records are used**
  - analyses of birth outcomes (such as prematurity)
  - as denominator for calculation infant mortality and neonatal mortality rates. (IMR = # death <1y per 1,000 live births)
- **Live birth records also represent**
  - the legitimation of those newborns as civil persons
  - the consequent access to human and social rights

# COLLECTION OF DATA IN EACH COUNTRY

‘Data Becoming’

WHO register the information

WHERE the event occurred

HOW it is registered

WHAT it is registered

The image displays four distinct birth registration forms from different countries, illustrating the collection of data in each:

- Top Left (Brazil):** A form titled "República Federativa do Brasil, Ministério da Saúde, 1ª VIA - SECRETARIA DE SAÚDE, Declaração de Nascimento Vivo". It includes fields for the date and time of birth, sex, and place of birth.
- Top Right (Colombia):** A form titled "SISTEMA DE ESTADÍSTICAS VITALES, Informe Estadístico de NACIDO VIVO". It includes fields for the date of birth, sex, and place of birth.
- Bottom Left (Guatemala):** A form titled "REPUBLICA DE GUATEMALA, INFORME DE NACIMIENTO". It includes fields for the date of birth, sex, and place of birth.
- Bottom Right (Mexico):** A form titled "MEDANE, República de Colombia, CERTIFICADO DE NACIDO VIVO". It includes fields for the date of birth, sex, and place of birth.

# COLLECTION OF DATA IN EACH COUNTRY

## ‘Data Becoming’

WHO register the information

- Doctors
- Public servants in National Civil Registry offices

The image displays four distinct birth registration forms from different countries, illustrating the collection of data in each country:

- República Federativa do Brasil, Ministério da Saúde, 1ª VIA - SECRETARIA DE SAÚDE, Declaração de Nascimento Vivo:** This form includes fields for the date and time of birth, sex, place of birth, and the name of the mother. It also has a section for the birth attendant and the place of birth.
- República de Colombia, MEDANE, CERTIFICADO DE NACIDO VIVO:** This form includes fields for the date and time of birth, sex, place of birth, and the name of the mother. It also has a section for the birth attendant and the place of birth.
- República de Guatemala, RENAP, INFORME DE NACIMIENTO:** This form includes fields for the date and time of birth, sex, place of birth, and the name of the mother. It also has a section for the birth attendant and the place of birth.
- SISTEMA DE ESTADÍSTICAS VITALES, Informe Estadístico de NACIDO VIVO:** This form includes fields for the date and time of birth, sex, place of birth, and the name of the mother. It also has a section for the birth attendant and the place of birth.



# COLLECTION OF DATA IN EACH COUNTRY

## ‘Data Becoming’

WHERE the event occurred

- Health care institutions
- Non-institutionalized births
- Remote areas

The image displays four different birth registration forms from various countries, illustrating the collection of data in each country.

- Declaração de Nascido Vivo (Brazil):** This form includes fields for the mother's name, date and place of birth, sex, and whether the birth was at home or in a hospital. It also includes a section for the father's name and the date and place of birth.
- Certificado de Nacido Vivo (Colombia):** This form includes fields for the mother's name, date and place of birth, sex, and whether the birth was at home or in a hospital. It also includes a section for the father's name and the date and place of birth.
- Informe de Nacimiento (Guatemala):** This form includes fields for the mother's name, date and place of birth, sex, and whether the birth was at home or in a hospital. It also includes a section for the father's name and the date and place of birth.
- Informe Estadístico de NACIDO VIVO (Mexico):** This form includes fields for the mother's name, date and place of birth, sex, and whether the birth was at home or in a hospital. It also includes a section for the father's name and the date and place of birth.



# COLLECTION OF DATA IN EACH COUNTRY

## ‘Data Becoming’

HOW/ WHAT it is registered

- Weight measures
- Gestational age

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- República de Colombia, MEDANE, CERTIFICADO DE NACIDO VIVO:** This form is divided into two main sections: 'I. DATOS DEL NACIMIENTO' (Birth Data) and 'II. DATOS DE LOS PADRES DEL NACIDO VIVO' (Parents' Data). It includes fields for the date and time of birth, sex, place of birth, and the names of the parents. It also has a section for the medical professional who attended the birth.
- República de Guatemala, RENAP, INFORME DE NACIMIENTO:** This form is divided into five main sections: 'I. Datos del que sufre', 'II. Datos del lugar de nacimiento', 'III. Datos del niño (a) y del nacimiento', 'IV. Datos de la madre', and 'V. Datos del padre'. It includes fields for the date and time of birth, sex, place of birth, and the names of the parents. It also has a section for the medical professional who attended the birth.
- SISTEMA DE ESTADÍSTICAS VITALES, Informe Estadístico de NACIDO VIVO:** This form is divided into three main sections: 'I. DATOS DEL NACIMIENTO', 'II. DATOS DE LOS PADRES DEL NACIDO VIVO', and 'III. DATOS DE LA MADRE DEL NACIDO VIVO EN EL MOMENTO DEL PARTO'. It includes fields for the date and time of birth, sex, place of birth, and the names of the parents. It also has a section for the medical professional who attended the birth.

# DATA CLEANING

- **Biological plausibility of data**

- Data entry error?
- Moral consequences

## Distribution of maternal age in live birth registries

Country	Less than 10	Between 10 and 54	Greater than 54	Missing
AR 2009-2017	0% (0)	98.8% (1489017)	0% (30)	1.3% (57357)
BR 2006-2016	0% (5)	100% (18493226)	0% (262)	0% (685)
CL 2007-2016	0% (2)	100% (1763409)	0% (7)	0% (472)
CO 1998-2016	0% (0)	99.6% (8090864)	0% (0)	0.4% (29177)
CR 2010-2016	0% (0)	99.7% (237708)	0% (0)	0.3% (771)
GT 2009-2017	0% (0)	99.8% (645303)	0% (0)	0.2% (1267)
MX 2008-2017	0% (103)	99.9% (13697918)	0% (614)	0.3% (38474)
PA 2012-2016	0% (0)	100% (220781)	0% (2)	0% (71)
PE 2014-2016	0% (3)	100% (900145)	0% (14)	0% (10)
SV 2010-2014	0% (0)	99.8% (175746)	0% (0)	0.2% (365)
All	0% (212)	99.8% (45639727)	0% (843)	0.2% (88971)

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# DATA CLEANING

- **Biological plausibility of data**
  - Data entry error?
  - Moral consequences
- **Definition of cut-offs**
  - What is the minimum value of **birthweight** for a live birth?
  - What is the minimum value of **gestational age for** a live birth?

# DATA CLEANING

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Live births "live birth as "the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or any definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached" (WHO)

# HARMONIZATION

- **Comprehensiveness vs accuracy**

Newborn characteristics							
		<u>Newborn's sex</u>	<u>Birthweight</u>			<u>Gestational age</u>	
Country	Year(s)	BINMALE	BINWT	BINWTCAT1	BINWTCAT2	BINGA	BINGACAT
AR	2009-2017	X	X	X	X	X	X
BR	2006-2016	X	X	X	X	0	X
CL	2007-2016	X	X	X	X	X	X
CO	1998-2016	X	0	X	X	0	X
CR	2010-2016	X	X	X	X	0	0
GT	2009-2017	X	X	X	X	0	0
MX	2008-2017	X	X	X	X	X	X
PA	2012-2015	X	0	0	0	0	0
PA	2016	X	0	X	0	0	0
PE	2014-2016	X	X	X	X	0	0
SV	2010-2012	X	0	0	0	0	0
SV	2013-2014	X	X	X	X	0	0



# HARMONIZATION

- Comprehensiveness vs accuracy

Newborn characteristics							
		<u>Newborn's sex</u>	<u>Birthweight</u>			<u>Gestational age</u>	
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AR	2009-2017	X	X	X	X	X	X
BR	2006-2016	X		X	X	0	X
CL	2007-2016	X	X	X	X	X	X
CO	1998-2016	X	0	X	X	0	X
CR	2010-2016	X	X	X	X	0	0
GT	2009-2017	X	X	X	X	0	0
MX	2009-2017	X	X	X	X	X	X

		Where BINWT is available	Where BINWT is not available (Colombia)
BINWTCAT2 = 1 (extreme low birth weight)		215-1499	<1,000 gr (1) 1,000 - 1,499 gr (2)
BINWTCAT2 = 2 (low birth weight)		1500-2499	1,500 - 1,999 gr (3) 2,000 - 2,499 gr (4)
BINWTCAT2 = 3 (normal birth weight)		2500-3999	2,500 - 2,999 gr (5) 3,000 -3,499 gr (6) 3,500 - 3,999 gr (7)
BINWTCAT2 = 4 (high birth weight)		4000-8150	4,000 and more gr (8)



# DATA ANALYSIS & RESEARCH

- Making evidences from data using analysis for meaningful approaches or for statistical efficiency?

## Characterising variability and predictors of infant mortality in urban settings: findings from 286 Latin American cities

Ana F Ortigoza <sup>1</sup>, José A Tapia Granados <sup>2</sup>, J Jaime Miranda <sup>3</sup>,  
 Marcio Alazraqui <sup>4</sup>, Diana Higuera <sup>5</sup>, Georgina Villamonte <sup>3</sup>,  
 Amélia Augusta de Lima Friche <sup>6</sup>, Tonatiuh Barrientos Gutierrez <sup>7</sup>, Ana V Diez Roux <sup>1</sup>

### ABSTRACT

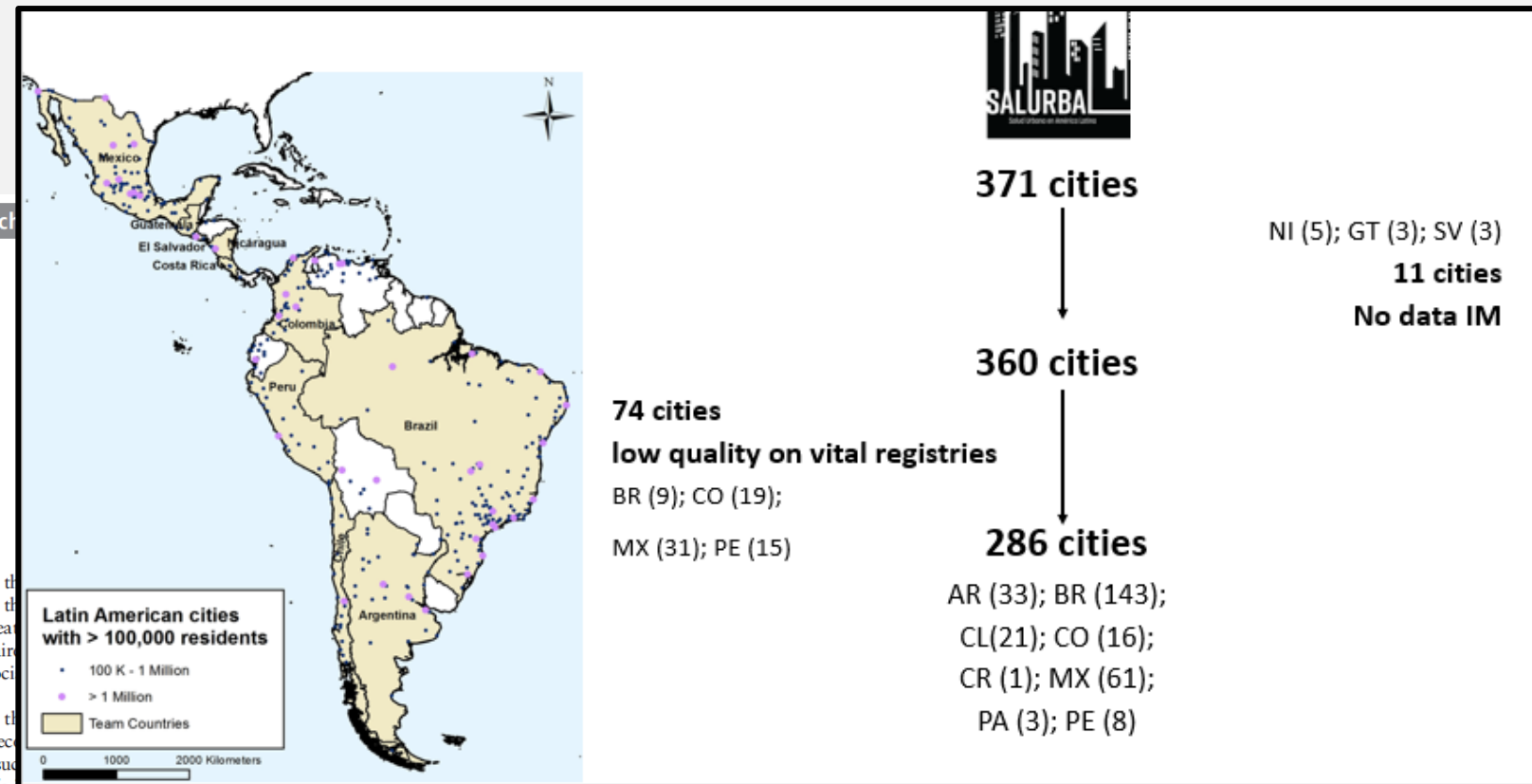
**Background** Urbanisation in Latin America (LA) is heterogeneous and could have varying implications for infant mortality (IM). Identifying city factors related to IM can help design policies that promote infant health in cities.

**Methods** We quantified variability in infant mortality rates (IMR) across cities and examined associations between urban characteristics and IMR in a cross-sectional design. We estimated IMR for the period 2014–2016 using vital registration for 286 cities above

other regions since 2005.<sup>3</sup> This stagnation in the decrease of mortality rates could result from the fact that once easily preventable causes of death are tackled, achieving further reductions requires addressing drivers of mortality related to social inequalities in the population.

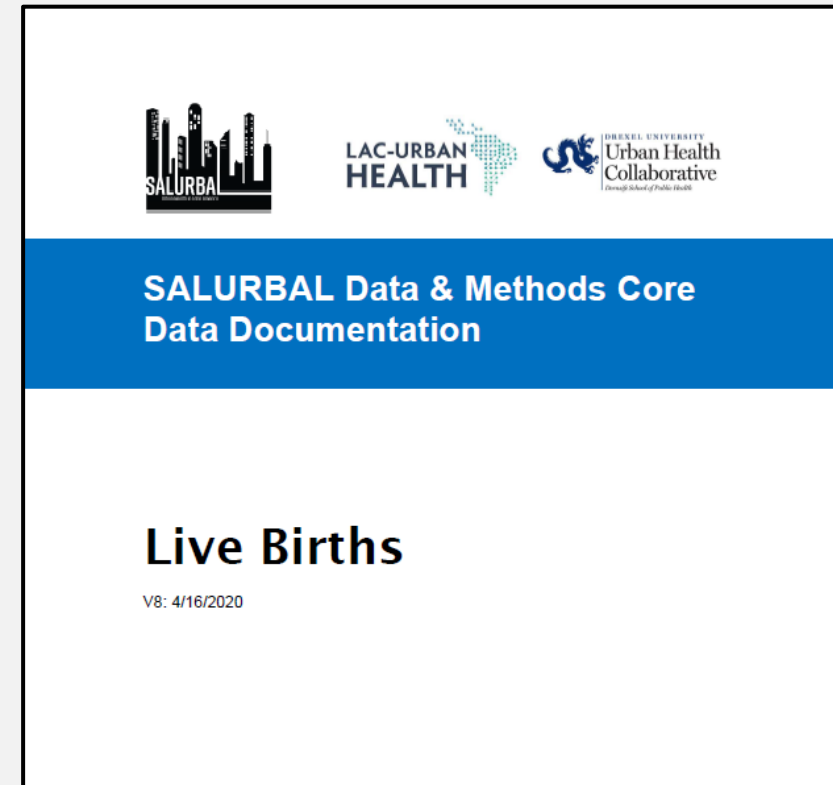
LA is one of the most urbanised regions in the world.<sup>4</sup> While cities have been seen as places of economic opportunities and better access to services such as education and healthcare,<sup>5</sup> many aspects of life in cities can negatively affect infant and child health. The

Original research



# DATA WAREHOUSE AND DOCUMENTATION

- Creating documentation of the process and recommendation for users, and data stakeholders



# ACKNOWLEDGEMENTS TO 'INVISIBLE WORKERS'

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# THANK YOU

