Microcephaly in Brazil: prevalence and characterization of cases from the Information System on Live Births (Sinasc), 2000-2016

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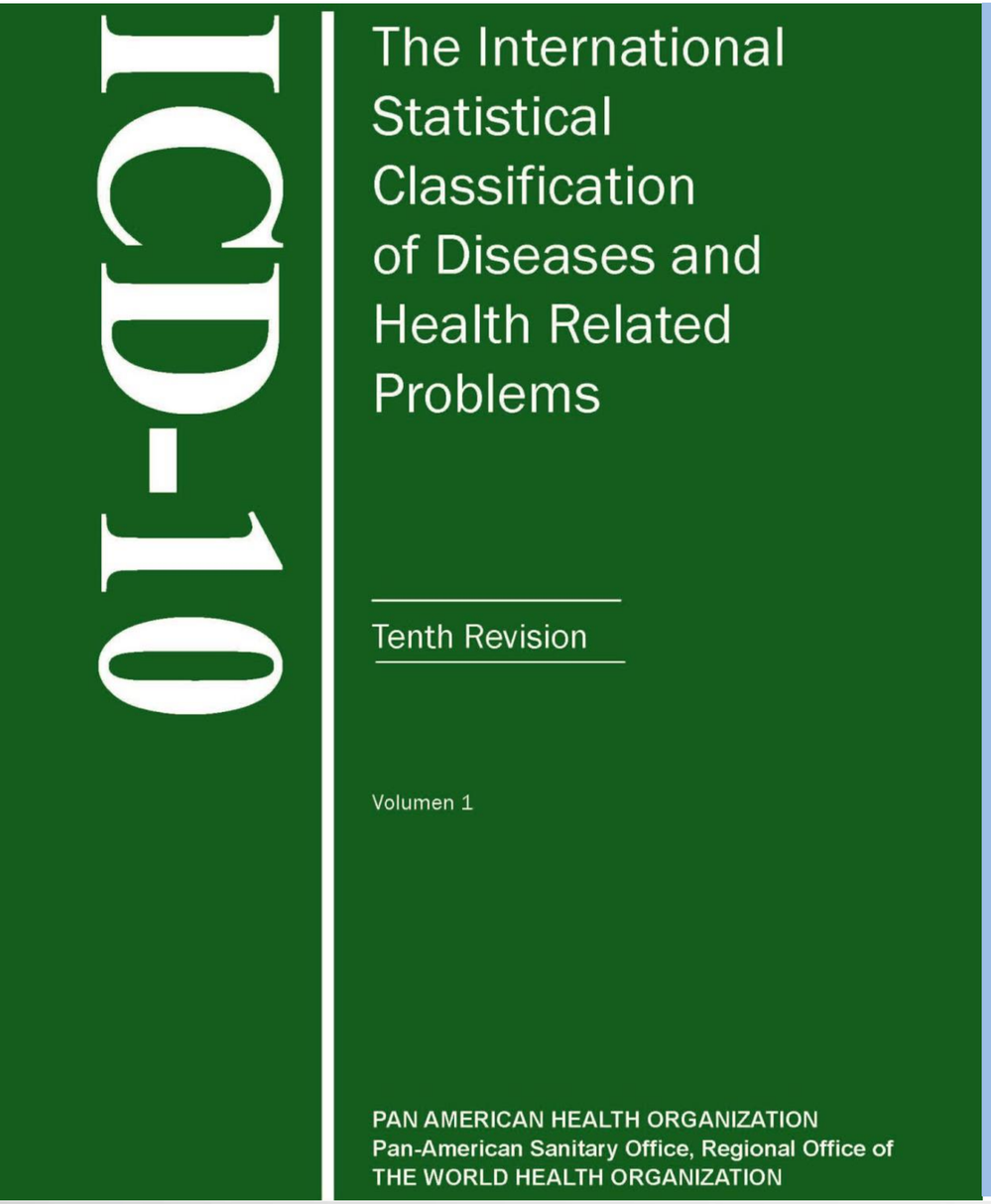
Objectives

To estimate the prevalence of microcephaly (2000-2016) and characterize the cases in Brazil (2015)

Brazilian live birth information system - SINASC

- Vital registration: birth throughout the country
  - public and private health facilities
  - other places as domicile
- Standardized document for data collection
- Objective: to provide information on the characteristics of
  - live births (including congenital anomalies)
  - mothers
  - pregnancy
  - childbirth
- Filled by health professional
- Congenital anomalies detectable at birth (textual form)
- Qualified coding of the described anomalies is performed in a second moment by trained staff (coders)

Introduction



Chapter 17 - Congenital malformations, deformations and chromosomal abnormalities

- Q00-Q07 Nervous system
  - **Q02 - Microcephaly**
- Q10-Q18 Eye, ear, face and neck
- Q20-Q28 Circulatory system
- Q30-Q34 Respiratory system
- Q35-Q37 Cleft lip and cleft palate
- Q38-Q45 Other congenital malformations of the digestive system
- Q50-Q56 Genital organs
- Q60-Q64 Urinary system
- Q65-Q79 Musculoskeletal system
- Q80-Q89 Other congenital malformations
- Q90-Q99 Chromosomal abnormalities, not elsewhere classified

Methods

1. **Data source**: Live Birth Information System (Sinasc)

2. **Measures**

2.1 Prevalence percentage

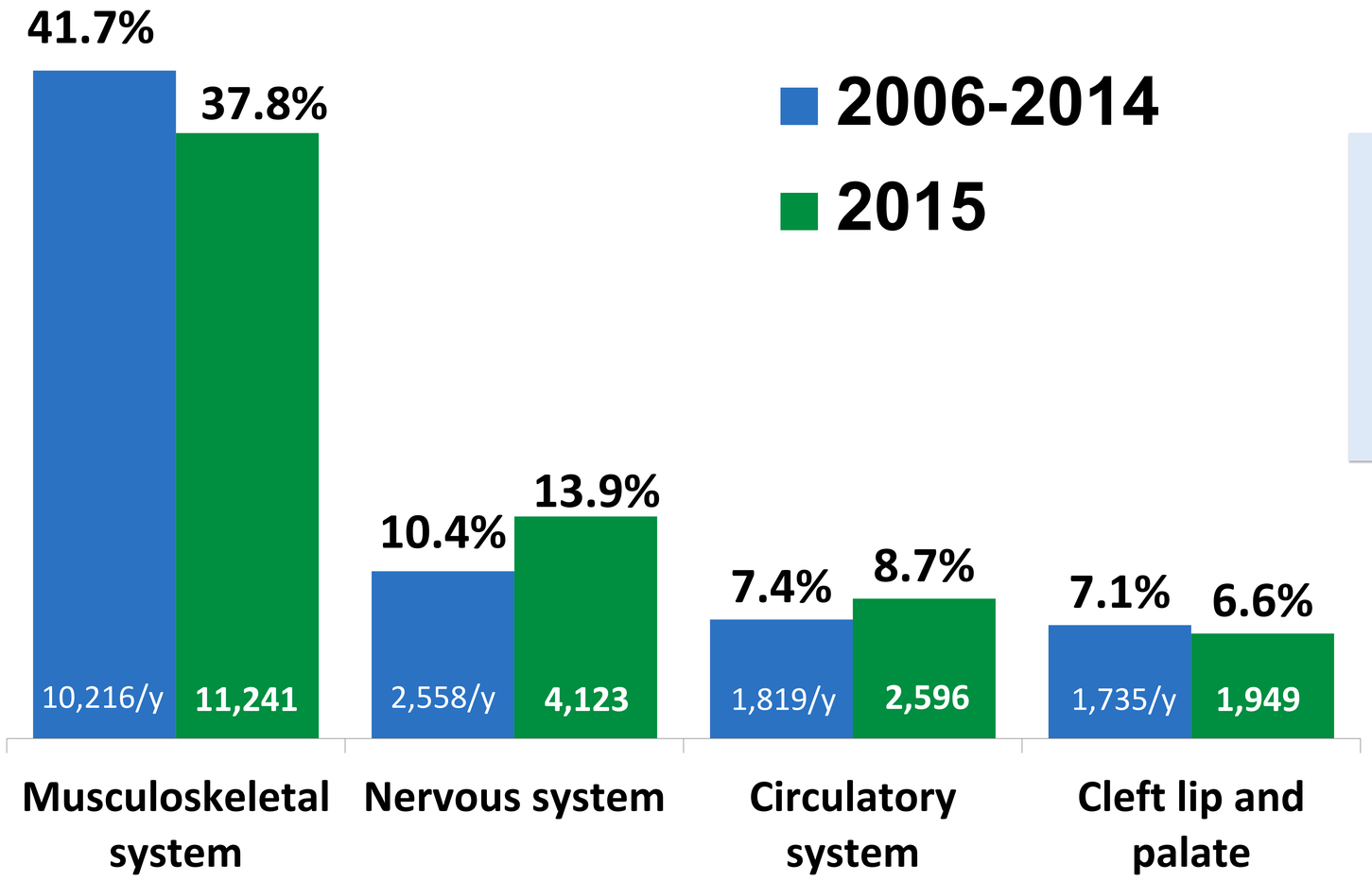
Prevalence 2006-2014 (mean) vs Prevalence 2015

2.2 Prevalence of microcephaly at birth

Prevalence by regions, states, characteristics of the mother and the newborn

$$= \frac{\text{\# of LB with microcephaly}}{\text{Total of LB}} \times 100{,}000$$

Percentage of most frequent groups of congenital anomalies 2006-2014 to 2015 in Brazil



2006-2014: ≈**24,500** anomalies/year

2015: ≈**29,800** anomalies (**+21.6%**)

Microcephaly in the News

Date	Prev (per 100,000 LB)
2000	5.5
2001	5.5
2002	6.1
2003	5.7
2004	5.7
2005	5.4
2006	5.3
2007	4.7
2008	5.1
2009	4.9
2010	5.7
2011	5.3
2012	6.5
2013	6.3
2014	5.4
jan/15	7.5
fev/15	6.3
mar/15	5.0
abr/15	6.1
mai/15	7.8
jun/15	6.3
jul/15	**11.1**

WHO advised that the cluster of microcephaly cases and other neurological disorders reported in Brazil constitutes a Public Health Emergency of International Concern (PHEIC)

Brazil asks whether Zika acts alone to cause birth defects

Puzzling distribution of cases suggests Zika is not the only factor in reported microcephaly surge.

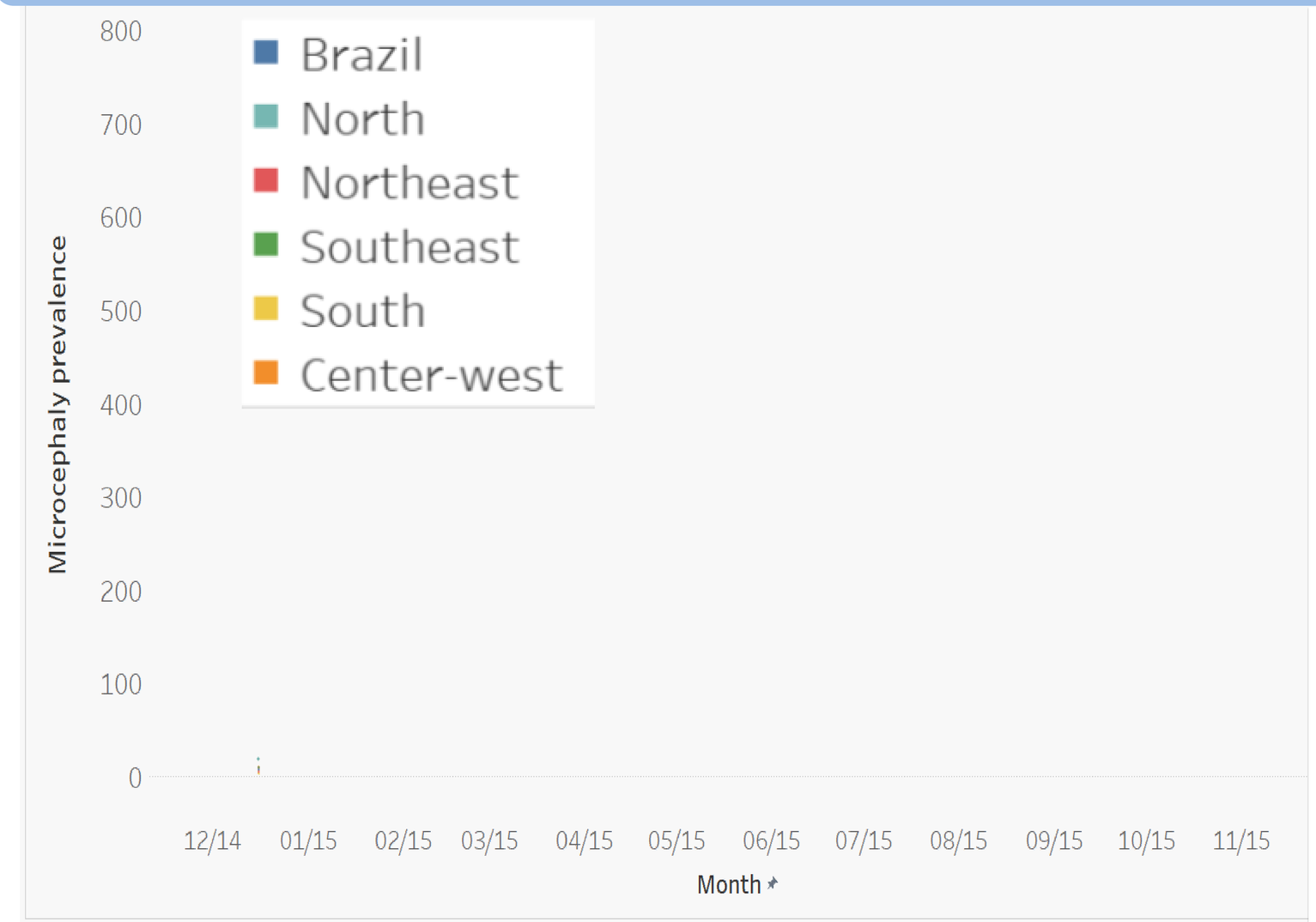
Surto de microcefalia coloca Brasil em emergência em saúde pública

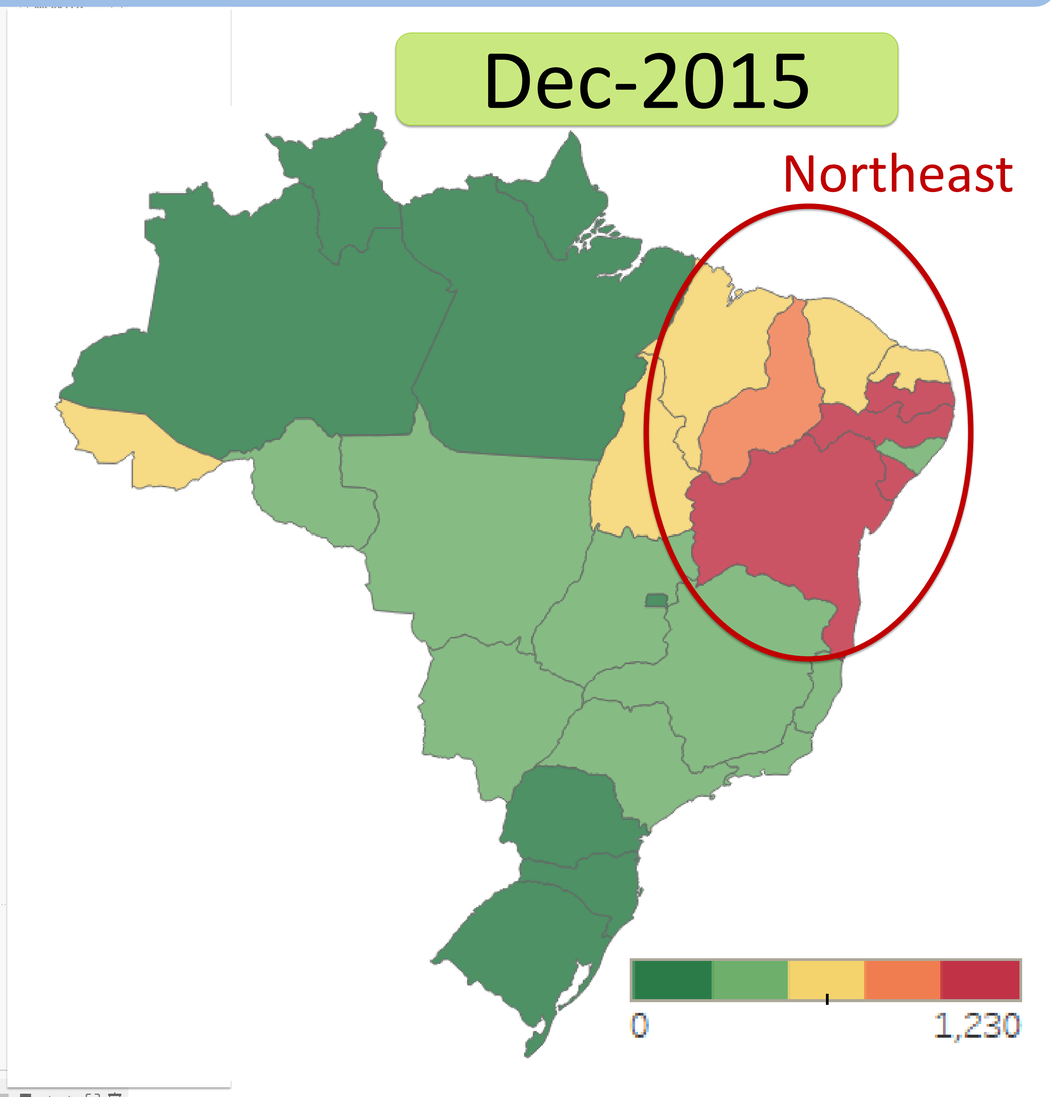
EPIDEMIA DE MICROCEFALIA NO BRASIL ›

Microcefalia: a doença que passou a assombrar as grávidas no Brasil

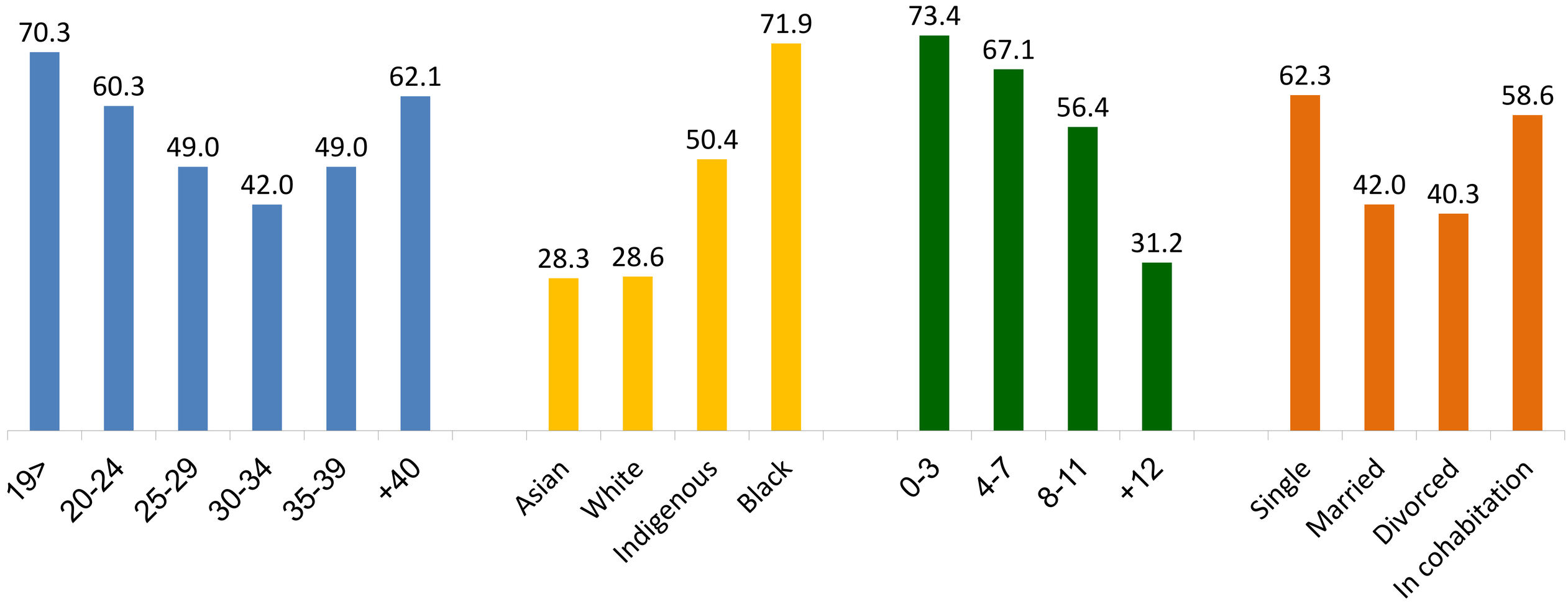
Results

Prevalence of microcephaly in Brazil, Jan-2015 to Dec-2015

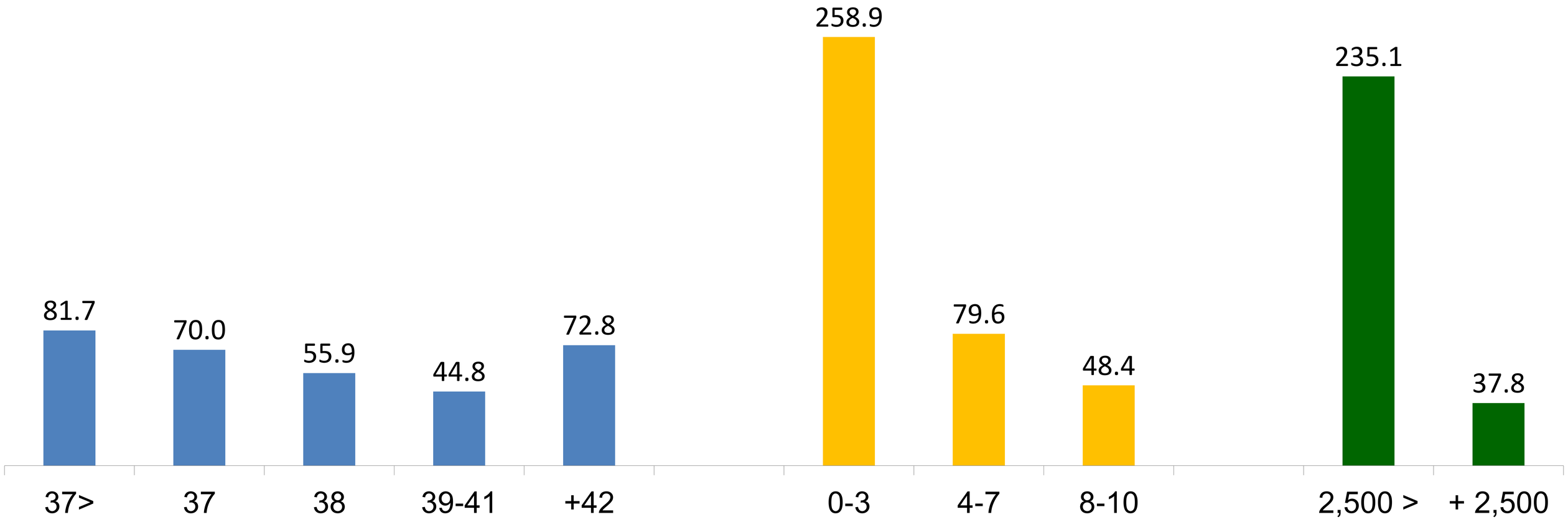




Prevalence by characteristics of the mother (per 100,000 LB)



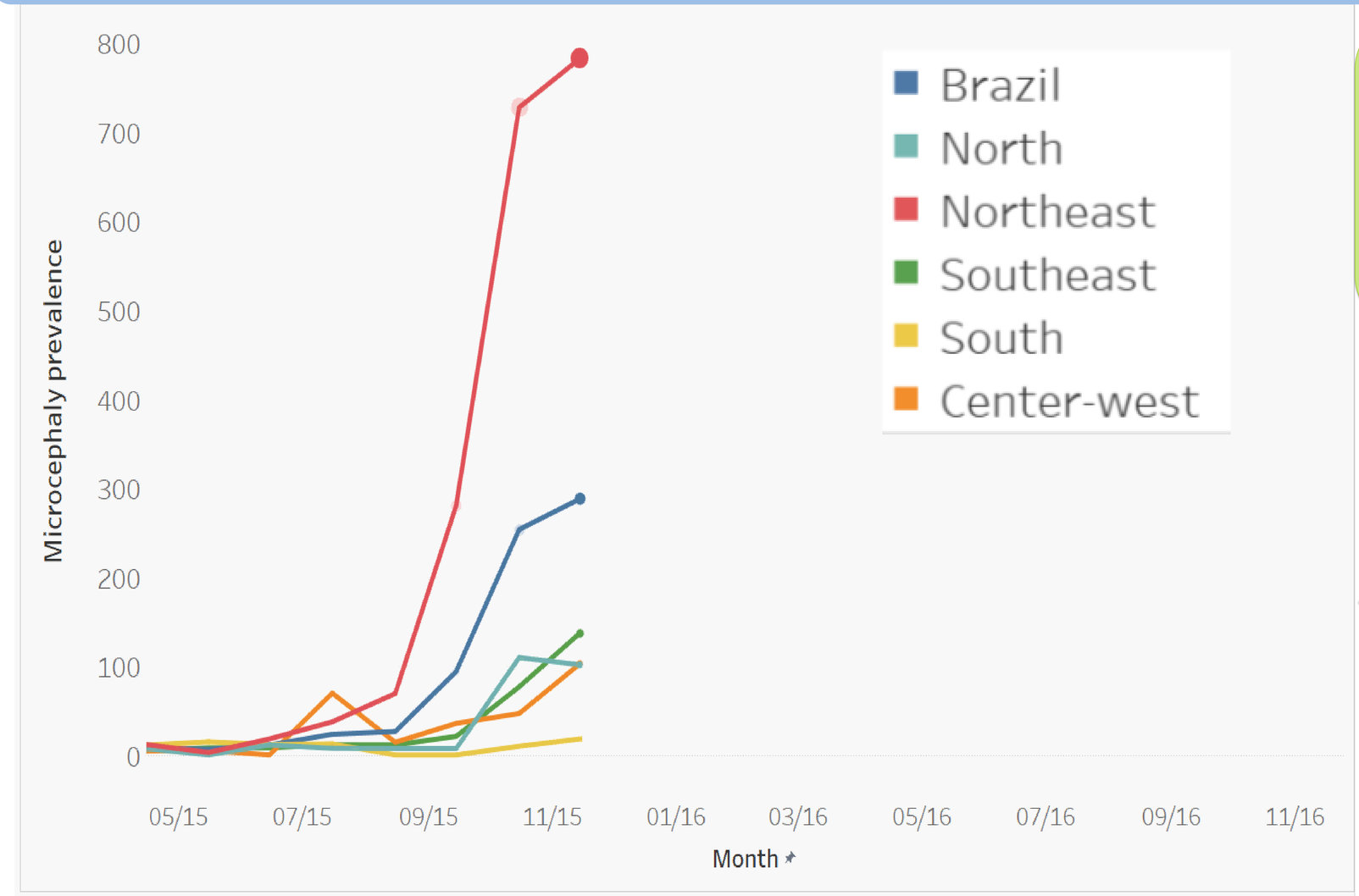
Prevalence by neonates characteristics (per 100,000 LB)



Weeks of pregnancy | **Apgar 1st min** | **Birth weight (g)**

Results

Post-outbreak



- **A sharp drop in prevalence**
- **Higher levels compared to the period prior to the outbreak**

Zika (feb/2016) *vs* Microcephaly (aug/2016)

Conclusions

- Zika outbreak throughout the country
- Microcephaly prevalence increased specially in the Northeast region
- Improvement in the standardized document for data collection
- Microcephaly outbreak increased anomalies awareness and notification
    - Osteomuscular anomalies (visible) increased too

Final considerations

- Why end of 2015 - beginning of 2016?
- Why the intensity and severity in Northeast?
- Ethilogy: unicausal?

Thank you!

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