Think locally, act globally:  
*From the South to the world*

2017 John Dirks Canada  
Gairdner Global Health Award  

CUGH 2017, Washington DC

Cesar Victora  
Federal University of Pelotas
Influencing global health by doing research in the South
Pelotas, Brazil

Photos: Marilda
Pelotas, Brazil

Photos: Silvia and Cintia
Four decades of research

1987: Exclusive breastfeeding
1997-2006: WHO Child Growth Standards
1982-2017: The first 1,000 days
2003-2017: Countdown to 2015/2030
Importance of exclusive breastfeeding

1985
Exclusive breastfeeding

THE LANCET, AUGUST 8, 1987

Nutrition

EVIDENCE FOR PROTECTION BY BREAST-FEEDING AGAINST INFANT DEATHS FROM INFECTIOUS DISEASES IN BRAZIL

CESAR G. VICTORA
J. PATRICK VAUGHAN
CINTIA LOMBARDI
SANDRA M. C. FUCHS
LUCIANA P. GIGANTE

PETER G. SMITH
leticia C. NOBRE
ANA MARIA B. TEIXEIRA
LEILA B. MOREIRA
FERNANDO C. BARROS

Department of Social Medicine, Faculty of Medicine, Federal University of Pelotas, Brazil; and Tropical Epidemiology Unit, and Evaluation and Planning Centre, London School of Hygiene and Tropical Medicine
Exclusive breastfeeding

Odds ratio for diarrhea mortality

- Formula or cow's milk: 14.2
- Breast + formula or cow's milk: 3.6
- Breastmilk: 1

Results adjusted for several confounding variables

Lancet, 1987
INFANT FEEDING AND DEATHS DUE TO DIARRHEA

A CASE-CONTROL STUDY

CESAR G. VICTORA,1 PETER G. SMITH,2 J. PATRICK VAUGHAN,3
LETICIA C. NOBRE,1 CINTIA LOMBARDI,1 ANA MARIA B. TEIXEIRA,1
SANDRA C. FUCHS,1 LEILA B. MOREIRA,1 LUCIANA P. GIGANTE,1 AND
FERNANDO C. BARROS1

One other food variable was associated with the risk of death after adjustment for all confounding variables. This was the frequency of having tea, water, or juice, with each additional feed increasing the risk of death by 42 per cent (95 per cent CI 4–93 per cent).
Exclusive breastfeeding

- **Brazil**

- **Peru**

- **Philippines**

- Plus research on water requirements for young infants and on contamination of feeding bottles
Considering that Recent Research has found that: these benefits increase with increased exclusiveness of breastfeeding during the first six months of life...
WHO Expert Committee recommends creation of new growth standards

NCHS curves do not reflect the growth of breastfed infants
Child growth standards

The WHO Multicentre Growth Reference Study: Planning, study design, and methodology

Mercedes de Onis, Cutberto Garza, Cesar G. Victora, Adelheid W. Onyango, Edward A. Frongillo, and Jose Martines, for the WHO Multicentre Growth Reference Study Group
Child growth standards

Six-country study recruited children with the following characteristics:

- High socioeconomic status families
- Healthy, non-smoking mothers
- Singletons, born at term
- Free from important morbidity
- Adequate preventive and curative health care
- Mothers willing to comply with breastfeeding recommendations
Child growth standards
Child growth standards

Luiza, first child to complete the study (1999)
The WHO Child Growth Standards

This web site presents the WHO Child Growth Standards. These standards were developed using data collected in the WHO Multicentre Growth Reference Study. The site presents documentation on how the physical growth curves and motor milestone windows of achievement were developed as well as application tools to support implementation of the standards.
WHO standards adopted by 140 countries

Worldwide implementation of the WHO Child Growth Standards (April 2011)
Importance of nutrition in the first 1,000 days

1982-2017
The Pelotas birth cohorts

- 1982: 68%
- 1993: 81%
- 2004: 90%
- 2015: 95%
The 1982 cohort

Characteristics of the Pelotas 1982 cohort:

- Population based, including all births in the city
- <1% refusals at baseline
- 68% follow-up rate at 30 years of age
- Participants from all social classes
- No social patterning of breastfeeding
1980’s
Field work in Pelotas, 1980’s
2010’s
2010’s
In LMICs, growth falters mostly in the first 2 years

**Timing of growth faltering, 54 DHS surveys**

Victora et al, Pediatrics (2010)
Lancet Series on Maternal and Child Undernutrition

Undernutrition 2

Maternal and child undernutrition: consequences for adult health and human capital

Cesar G Victora, Linda Adair, Caroline Fall, Pedro CHallal, Reynaldo Martorell, Linda Richter, Harshpal Singh Sachdev, on behalf of the Maternal and Child Undernutrition Study Group

COHORTS
Consortium of Health Orientated Research in Transitioning Societies
Brazil Guatemala India Philippines South Africa
The COHORTS group
Some COHORTS publications

Size at birth, weight gain in infancy and childhood, and adult blood pressure in 5 low- and middle-income-country cohorts: when does weight gain matter? 1,2

Linda S Adair, Richard Heneine, Andrew K Wills, 

Weight Gain in the First Two Years of Life Is an Important Predictor of Schooling Outcomes in Pooled Analyses from Five Birth Cohorts from Low- and Middle-Income Countries 1,2

Reynaldo J. Hernández-Cueto, Caroline H. Fall, Cesar G. Victora

Original Research Article

Growth Patterns in Early Childhood and Final Attained Stature: Data from Five Birth Cohorts


Original Research Article

Birth Weight, Postnatal Weight Gain, and Adult Body Composition in Five Low- and Middle Income Countries

CHRISTOPHER W. KUZAWA, MANUEL RAMIREZ-ZELA, PHD, NANCY M. BROWN, PHD, CYNTHIA G. ADAMS, PHD, NANCY M. RICKABY, PHD, CARMEN H. FALL, MD, THE COHORTS GROUP

Size at Birth, Weight Gain in Infancy and Childhood, and Adult Diabetes Risk in Five Low- or Middle-Income Country Birth Cohorts

Shane A. Norris, PhD1, Denise Gigante, PhD2, Christopher W. Kuzawa, PhD3, Lakshmi Ramakrishnan, PhD4, Nanette R. Lee, PhD4, Manuel Ramirez-Zela, PhD5, Linda M. Richter, PhD6, Aryeh D. Stein, PhD7, Najeh Tandon, MD8, Caroline H. Fall, MD9, THE COHORTS GROUP9

with an increased incidence of DM and insulin resistance (2). Therefore, impaired fetal growth and excess postnatal weight gain are both potential precursors to adult DM.

Four-fifths of all individuals with DM live in low- and middle-income countri-
The COHORTS – 1,000 days

Child survival and human capital

Effect

Conditional weight (gain)

Birth

1 yr

2 yr

4 yr

Adult age
The COHORTS – 1,000 days

Risk of non-communicable diseases

Effect

Conditional weight (gain)
The COHORTS – 1,000 days

Child survival and human capital

Risk of non-communicable diseases

Effect

Conditional weight (gain)

Birth 1 yr 2 yr 4 yr Adult age
Linear growth x weight gain

Associations of linear growth and relative weight gain during early life with adult health and human capital in countries of low and middle income: findings from five birth cohort studies

Linda S Adair, Caroline H D Fall, Clive Osmond, Aryeh D Stein, Reynaldo Martorell, Manuel Ramirez-Zea, Harshpal Singh Sachdev, Darren L Dahly, Isabelita Bas, Shane A Norris, Lisa Miclesfield, Pedro Hallal, Cesar G Victora, for the COHORTS group
COHORTS key messages

• Rapid weight gain after 2-4 years of age – but not before - increases the risk of NCDs

• Linear growth has few if any of the detrimental effects of weight gain

• Linear growth in the first two years improves human capital
**COHORTS – policy implications**

**Human capital and child survival**

- **Prevent Growth Faltering**
- **Prevent Rapid Weight Gain**

**Risk of non-communicable diseases**
Association between breastfeeding and intelligence, educational attainment, and income at 30 years of age: a prospective birth cohort study from Brazil

Cesar G Victora, Bernardo Lessa Horta, Christian Loret de Mola, Luciana Quevedo, Ricardo Tavares Pinheiro, Denise P Gigante, Helen Gonçalves, Fernando C Barros
Pelotas 1982 birth cohort: outcomes at 30 years of age

- 68% follow-up
- No clear social patterning of BF
- Analyses adjusted for 11 confounding factors
"Success in breastfeeding is not the sole responsibility of a woman—the promotion of breastfeeding is a collective societal responsibility."

The Lancet Breastfeeding Series confirms: each year of breastfeeding decreases a woman’s chance of developing invasive breast cancer by 6%.

Improving breastfeeding practices could save more than 820,000 lives a year. Source: The Lancet Breastfeeding Series.
Breastfeeding in Brazil, 1974-2007

Median duration of BF, Brazil

Months

<table>
<thead>
<tr>
<th>Year</th>
<th>Median Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>2.5 months</td>
</tr>
<tr>
<td>1989</td>
<td>5.5 months</td>
</tr>
<tr>
<td>1996</td>
<td>7 months</td>
</tr>
<tr>
<td>2007</td>
<td>14 months</td>
</tr>
</tbody>
</table>

Success was due to actions at multiple levels

- Policy
- Enforcement of the Code
- Involvement of civil society
- Health worker training
- Baby-Friendly Hospitals
- Human milk banks
- Professional associations
- Workplaces
- Mass media
- Communities
Countdown to 2015
Countdown to 2030

2003-2017
“We commit ourselves to convening a series of meetings, every 2 years, ... to take stock of progress in preventing child deaths, and to hold countries and their partners accountable.”
Countdown: monitoring RMNCH coverage

www.countdown2030.org

2015 report
Countdown: A multi-stakeholder initiative
Country Profiles

Malawi

Demographics

Maternal and Newborn Health

Equity

Child Health

Nutrition

Water and Sanitation

Policies

Malawi

Counts to 2015

Maternal, Newborn and Child Survival

Building a Future for Women and Children: The 2012 Report

Building a Future for Women and Children: The 2012 Report
Regular monitoring of inequities and use of the resulting information for education, advocacy, and increased accountability is urgently needed...
The wide bars show Nigeria’s **highly inequitable coverage** for many coverage indicators.
Social inequalities in health are important due to:

- **Ethical** reasons
- **Practical** reasons
Inequalities in stunting, Brazil

The graph illustrates the prevalence of stunting across different income groups in Brazil from 1975 to 2007. The x-axis represents the stunting prevalence (%) and the y-axis represents the years (1975, 1989, 1996, 2007). The graph shows a trend where the stunting prevalence decreases as income increases, indicating a reduction in inequalities in stunting over time.
SDGs and Countdown to 2030
The last SDG

17.18 Data, monitoring and accountability

“to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts.”
What can we do about the brain drain?

- Fair trade in researchers?
  - Governments?
  - Global Health Departments?
  - Funding agencies?
Planetary health

8th Annual CUGH Conference
Hosted by Johns Hopkins University & Makerere University
Healthy People, Healthy Ecosystems
THINK GLOBALLY
ACT LOCALLY