

EPI Seminar: National Health Surveys

Benjamin Acosta-Cazares MD, PhD

November 2022

Presentation outline

- Brief resume
- Objective of this presentation
- My academic relationship with Ron
- Background
- Health system in Mexico
- Origin of PREVENIMSS (Integrated Health Programs)
- Description of the surveys
- Impacts and products of the surveys
- Some publications
- Conclusions

Brief resume

- Education:
 - Doctor of philosophy. University of Pittsburgh (1996-2001, 2015)
 - Education specialist. University LaSalle (2012-2013)
 - Epidemiologist. Mexican Institute of the Social Security (1992-1995)
 - Medical Doctor. National University of Mexico (1985-1988)

- Current position
 - Head of the Area of community health assessments. Mexican Institute of the Social Security
 - Professor of the medical specialization course of epidemiology. Mexican Institute of the Social Security-National University of Mexico
 - Associate Researcher. Mexican Institute of the Social Security

Objective

Show some aspects of how Professor **Ron LaPorte** has influenced my professional career: Realization of the projects called National health surveys in Mexico

Pay tribute to **Ron LaPorte** as my teacher, my guide, my advisor and as one of the best epidemiologists of the world.



Origins

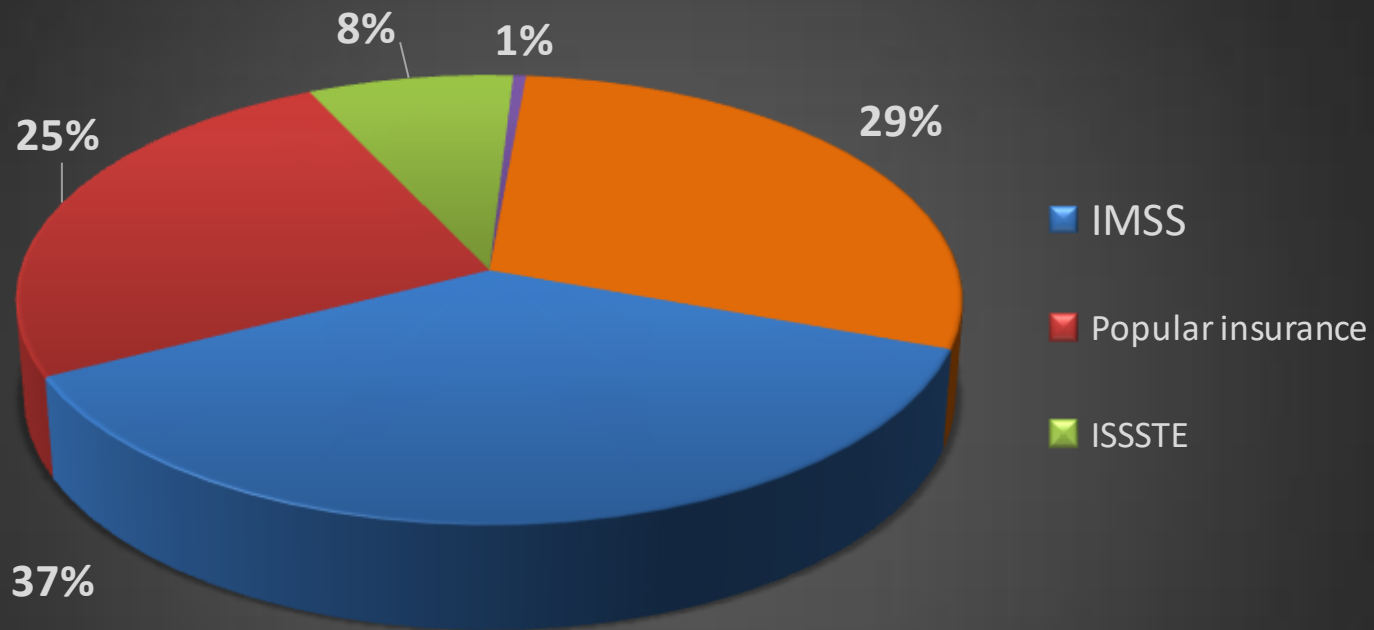
- I met Ron in 1996 in Mexico
- I wrote an essay about and capture-recapture in health
- My PhD program in the GSPH started in 1996.
- During five years always heard from him about his students:
 - *“To be successful you do not need that all people think like one; you need a handful of people who want to work”*
 - “Think big”
 - “I trust you”
 - “Think out of the box”
 - “Be creative”
 - “First think about what to do” *(and then how to do it)*
 - “Of course, science exists in developing countries” *(especially important to me)*

Background

- In 2001 I went back to Mexico.
- I started to work in the Mexican Institute of the Social Security (IMSS) of Mexico in 2002
- According to my profile and my epidemiology training in the Pittsburgh I was designated to create the National Health Studies at IMSS to evaluate PREVENIMSS (Health Integrated Programs)
- The first National Study was done in 2003

Health system in Mexico

Participation by Institution



National population
112 million

Adapted from: Gómez-Dantes O. Sistema de salud en México. Salud Pública Méx 2011; Vol. 53(2):220-232

Origin of PREVENIMSS at
IMSS:

PREVENIMSS (Health Integrated Programs)

Why was this program created?

- ✓ It was started in 2002
- ✓ Difficulties to coordinate public health programs in the Mexican Institute of the Social Security
- ✓ Limited participation of people (selfcare)
- ✓ Limited assessment of preventive actions
 - Coverage of programs
 - Impact of health programs

Table 1 PREVENIMSS main activities by age group

Activities	Children 0-10 years	Adolescents 11 -19 years	Women 20-59 years	Men 20-59 years	Older adults > = 60 years
Health promotion	Delivery of PREVENIMSS booklets				
	Measurement of height, weight and waist				
Nutrition	Iron supplementation Vitamin A supplementation Intestinal parasites treatment	Intestinal parasites treatment Folic acid supplementation (pregnant teenagers)	Detection of anemia; iron supplementation; folic acid supplementation (pregnant women)		
Prevention and control of diseases	Vaccines: BCG, Sabin; DPT+HB +H1b; Influenza; measles, rubella, pertussis, Oral rehydration therapy for acute diarrhea, identification of alarm signs in acute respiratory infections	Vaccines: measles-rubella, tetanus toxoid, two-dose hepatitis B, Provision of condoms to prevent STDs and HIV/AIDS and unwanted pregnancies	Vaccines: measles-rubella, tetanus toxoid, diphtheria Tuberculosis: screening and directly observed treatment	Vaccines: measles-rubella, tetanus toxoid. Tuberculosis: screening and directly observed treatment	Vaccines: pneumonia, influenza, tetanus toxoid and diphtheria; Tuberculosis: screening and directly observed treatment
Screening	Congenital hypothyroidism, Phenylketonuria. Congenital adrenal hyperplasia, Biotinidase deficiency, Visual acuity, Childhood caries	Visual acuity	Cervical cancer Breast cancer Type 2 diabetes Hypertension	Type 2 diabetes Hypertension	Cervical cancer Breast cancer Type 2 diabetes Hypertension
Reproductive health		Family planning and antenatal care		Family planning	

National Surveys of Coverage 2003, 2004, 2005, 2006 and 2010

My role in these surveys:

- ✓ Since 2002 I was the head of the area of health surveys at the Coordination of Health Integrated Programs, so I lead the whole research.
- ✓ I was the responsible researcher of these surveys
- ✓ I received 3 grants
- ✓ My work team was responsible of organizing:
 - Writing five proposals
 - Asking for financial support
 - Design of questionnaires
 - Training for interviewers
 - Fieldwork
 - Data entry process ← **Key**
 - Sample design (*support from a statistician team*)
 - Statistical analysis
 - Quality control
 - Publications

National Surveys of Coverage 2003, 2004, 2005, 2006 and 2010

Objectives:

- ✓ To assess changes of preventive services coverage in Mexican population insured by the IMSS
- ✓ To complete Health Information Systems of IMSS
- ✓ To complete health profile in Mexican population
- ✓ To determine pattern of health care utilization of Mexican population

Justification :

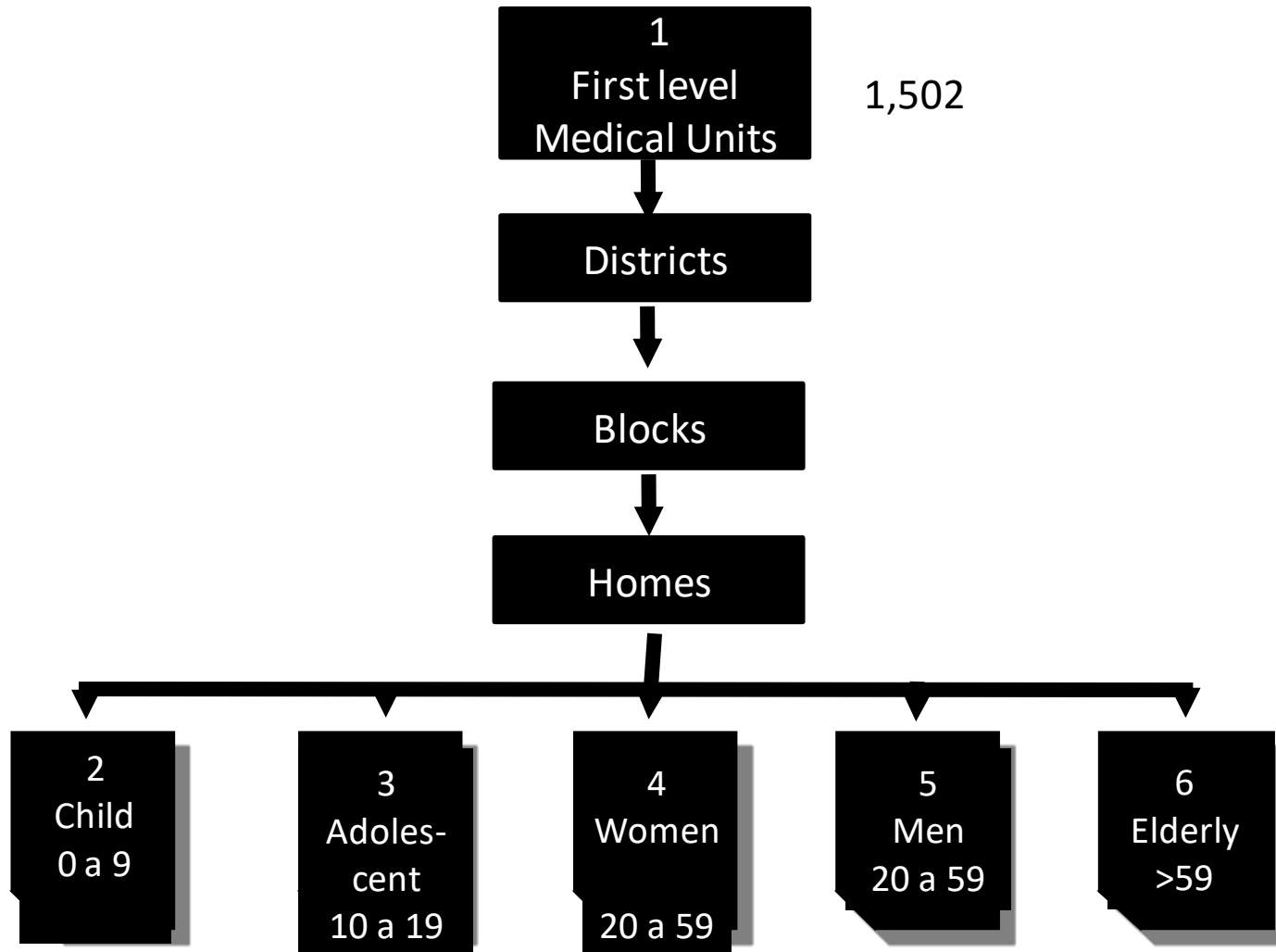
- ✓ To complete health pattern of Mexican population at the IMSS
- ✓ To make adequate decisions to improve health conditions

National Surveys of Coverage Methods

- ✓ Cross sectional studies in 2003, 2004, 2005, 2006 and 2010
- ✓ House to house visits in selected areas looking for insured people by IMSS
- ✓ To avoid selection bias, in-person interviews were done at home regardless if participant had previously used IMSS services
- ✓ Sampling stratified with several stages by clusters
- ✓ Samples were representative of each state and each age group
- ✓ Fieldwork period of two-three months for each study
- ✓ At least 350 field personnel visited houses each survey in the country.

National Surveys of Coverage

Sampling stratified with several stages by clusters



Medical care units of the Mexican Institute of the Social Security, 2015



First care level 1,502



Second care level 246



Third care level 36



National Surveys of Coverage

Components included in questionnaires 2003-2010

Section	2003	2004	2005	2006	2010
Coverage of health preventive actions	Included	Included	Included	Included	P
Health services utilization	Included	Included	Included	Included	Included
Detection of diseases	Included	Included	Included	Included	P
Reproductive health	Included	Not included	Not included	Included	P
Drug consumption	Not included	Not included	Not included	Included	Included
Eating habits	Not included	Included	Not included	Not included	Not included
Physical activity	Not included	Included	Not included	Not included	Not included
Anemia	Included	Not included	Not included	Not included	Not included
Somatometry (obesity and central obesity)	Included	Not included	Not included	Included	P
Diabetes, hypertension & hypercholesterolemia (capillary blood sample)	Not included	Not included	Not included	Included	Not included
Prevalence of cardiovascular disease, cerebrovascular disease, kidney disease, depression and accidents (by questionnaire)	Not included	Not included	Not included	Not included	Included

P= partial information with current information systems

 Included

 Not included

National Surveys of Coverage Included population 2003-2010

	2003	2004	2005	2006	2010
Medical units	180	222	222	222	222
Population(n)					
Children (0 a 9)	15,289	20,762	23,177	22,365	12,345
Adolescents (10 a 19)	13,356	20,259	21,474	20,701	17,111
Women (20 a 59)	22,165	20,910	32,317	29,939	13,670
Men (20 a 59)	16,275	24,745	25,375	24,507	17,217
Elderly (≥60)	12,712	20,208	20,037	19,524	11,214
TOTAL	79, 797	117,884	122,380	117,036	71,557

**One of the largest sample size studies in Mexico EVER.
The largest sample size study in the IMSS EVER.**

How many people were in my work team?

- 3 epidemiologists (including myself)
- 1 mathematician
- 1 informatics engineer
- 1 secretary
- 8 persons for data entry



National Surveys of Coverage

Quality control

- ✓ Personnel recruitment according to a requested profile
- ✓ Five days training for all fieldwork team
- ✓ Daily monitoring sample size productivity
- ✓ Daily monitoring of questionnaires filling
- ✓ At least two advisory visits from us in each state
- ✓ Validation of questionnaires answers at several steps:
 - Interview technique in field
 - Data entry in the databases

Creation of an automated data entry system in 2003, 2004, 2005, 2006 and 2010.

Optical Character Recognition (OCR)

At that time just some big stores used this technology for accounting purposes (one page invoices)

We were the first group to use this technology for health research in Mexico

The recognition of the characters was about 98%

National Surveys of Coverage 2003, 2004, 2005, 2006 and 2010

Products obtained

National

- Information to increase coverage of preventive actions and improve their effectiveness in the whole country.
- Papers on journals
- Chapters in books
- Interviews on newspapers, television, radio
- Information on the Internet

National Surveys of Coverage 2003, 2004, 2005, 2006 and 2010

Some products obtained

International

- Papers on journals

High burden of cardiovascular disease risk factors in Mexico: An epidemic of ischemic heart disease that may be on its way?

Benjamín Acosta-Cázares, MD,^a and Jorge Escobedo-de la Peña, MD, FACP^b *Mexico City, Mexico*

Background Whereas developed nations have witnessed a drop in the occurrence and mortality of ischemic heart disease, developing nations have recorded a constant rise. The burden of cardiovascular disease risk factors may explain this increase.

Methods We conducted a population-based cross-sectional survey to estimate the prevalence of cardiovascular risk factors in the population protected by the Mexican Social Security Institute. A total of 20,062 Mexicans, aged ≥ 20 years, 43.5% (8,727) male and 56.5% (11,335) female, randomly selected in a 4-stage stratified population-based sampling process were included.

American Heart Journal
Volume 160, Number 2

P53. Prevalence of Central Obesity in Mexico: A National Study.

Benjamin Acosta-Cazares MD. Mexican Institute of the Social Security

Purpose: To establish national prevalence of central obesity in Mexican adults during the year 2010.

Methods: This analysis is part of a cross sectional Health National Study that was applied to all population affiliated to the Mexican Institute of the Social Security. For most variables the sample size was intended to be national and state representative. The sampling was stratified, with several stages, by clusters and all subjects were selected and interviewed at their homes. Body measures included weight, height and waist circumference for adults in 25% of the sample size. Central obesity was assessed according to the World Health Organization. All interviewers received a standardized training from main researches.

Results: Sample included for body measures included 3,984 women between 20 and 59 years old; 4,236 men from 20-59 and 3,440 women and men older than 59 years. National central obesity prevalence was 78.6% (95%

Abstracts / Annals of Epidemiology 24 (2014) 682–702

RESEARCH ARTICLE

Open Access

Strengthening preventive care programs: a permanent challenge for healthcare systems; lessons from PREVENIMSS México

Gonzalo Gutiérrez¹, Ricardo Pérez-Cuevas^{1,2*}, Santiago Levy³, Hortensia Reyes⁴, Benjamín Acosta⁵,
Sonia Fernández Cantón⁶, Onofre Muñoz¹

ABOUT US

How NCD-RisC functions

[Home](#) / [About Us](#)

NCD Risk Factor Collaboration (NCD-RisC) is a network of health scientists around the world that provides rigorous and timely data on risk factors for non-communicable diseases (NCDs) for 200 countries and territories. The group works closely with the World Health Organisation (WHO), through the WHO Collaborating Centre on NCD Surveillance and Epidemiology at Imperial College London. NCD-RisC pools high-quality population-based data using advanced statistical methods, designed specifically for analysing NCD risk factors. The Collaboration currently has data from over 3,300 population-based surveys from 196 countries since 1957, with nearly 200 million participants whose risk factor levels have been measured.

NCD-RisC is coordinated by the WHO Collaborating Centre on NCD Surveillance and Epidemiology at Imperial College London, and by its Director, Professor Majid Ezzati. NCD-RisC members are researchers and practitioners from a variety of fields and disciplines who re-analyse specific population-based data that are eventually included in the Collaboration's pooling analyses. They come from all regions of the world, and are indicated on the map below by country of their primary institution. Core funding for the NCD-RisC database is provided by the Wellcome Trust. Work on children and adolescents is funded by a charitable grant from the AstraZeneca Young Health Programme.

To join NCD-RisC, please complete the [NCD-RisC data request and study information file](#) and send to ncdrisc@imperial.ac.uk together with additional information about your study, including publications, websites and protocol documents.

200

Countries

3,300+

Population-based surveys

~200Mil

Participants

Mexico ×

- Benjamin Acosta-Cazares** (Instituto Mexicano del Seguro Social)
- Margot González-Leon (Instituto Mexicano del Seguro Social)
- Clicerio González-Villalpando (National Institute of Public Health)
- María-Elena González-Villalpando (Centro de Estudios en Diabetes A.C.)
- Leticia Hernandez Cadena (National Institute of Public Health)
- Eric Monterrubio-Flores (National Institute of Public Health)
- Ramon A Rascon-Pacheco (Instituto Mexicano del Seguro Social)
- Juan A Rivera (National Institute of Public Health)
- Rosalba Rojas-Martinez (National Institute of Public Health)
- Blanca Sandra Ruiz-Betancourt (Instituto Mexicano del Seguro Social)
- Eduardo Salazar Martinez (National Institute of Public Health)
- Teresa Shamah-Levy (National Institute of Public Health)
- Carlos A Aguilar-Salinas (Instituto Nacional de Ciencias Médicas y Nutrición)
- Jorge Escobedo-de la Peña (Instituto Mexicano del Seguro Social)
- Salvador Villalpando (National Institute of Public Health)

CLOSE

List of collaborators by country



A century of trends in adult human height

NCD Risk Factor Collaboration (NCD-RisC)*

Abstract Being taller is associated with enhanced longevity, and higher education and earnings. We reanalysed 1472 population-based studies, with measurement of height on more than 18.6 million participants to estimate mean height for people born between 1896 and 1996 in 200 countries. The largest gain in adult height over the past century has occurred in South Korean women and Iranian men, who became 20.2 cm (95% credible interval 17.5–22.7) and 16.5 cm (13.3–19.7) taller, respectively. In contrast, there was little change in adult height in some sub-Saharan African countries and in South Asia over the century of analysis. The tallest people over these 100 years are men born in the Netherlands in the last quarter of 20th century, whose average heights surpassed 182.5 cm, and the shortest were women born in Guatemala in 1896 (140.3 cm; 135.8–144.8). The height differential between the tallest and shortest populations was 19–20 cm a century ago, and has remained the same for women and increased for men a century later despite substantial changes in the ranking of countries.

DOI: [10.7554/eLife.13410.001](https://doi.org/10.7554/eLife.13410.001)



International Journal of Epidemiology, 2018, 872–883i

doi: 10.1093/ije/dyy016

Advance Access Publication Date: 19 March 2018

Original article



Blood Pressure Patterns

Contributions of mean and shape of blood pressure distribution to worldwide trends and variations in raised blood pressure: a pooled analysis of 1018 population-based measurement studies with 88.6 million participants

**NCD Risk Factor Collaboration (NCD-RisC)
Members are listed at the end of the paper.**

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Editorial decision 16 January 2018; Accepted 24 January 2018



Effects of diabetes definition on global surveillance of diabetes prevalence and diagnosis: a pooled analysis of 96 population-based studies with 331 288 participants



NCD Risk Factor Collaboration (NCD-RisC)*

Summary

Background Diabetes has been defined on the basis of different biomarkers, including fasting plasma glucose (FPG), 2-h plasma glucose in an oral glucose tolerance test (2hOGTT), and HbA_{1c}. We assessed the effect of different diagnostic definitions on both the population prevalence of diabetes and the classification of previously undiagnosed individuals as having diabetes versus not having diabetes in a pooled analysis of data from population-based health examination surveys in different regions.

Lancet Diabetes Endocrinol 2015;
3: 624-37

Published Online
June 22, 2015

[http://dx.doi.org/10.1016/
S2213-8587\(15\)00129-1](http://dx.doi.org/10.1016/S2213-8587(15)00129-1)

Height and body-mass index trajectories of school-aged children and adolescents from 1985 to 2019 in 200 countries and territories: a pooled analysis of 2181 population-based studies with 65 million participants



*NCD Risk Factor Collaboration (NCD-RisC)**

Summary

Background Comparable global data on health and nutrition of school-aged children and adolescents are scarce. We aimed to estimate age trajectories and time trends in mean height and mean body-mass index (BMI), which measures weight gain beyond what is expected from height gain, for school-aged children and adolescents.

Methods For this pooled analysis, we used a database of cardiometabolic risk factors collated by the Non-Communicable Disease Risk Factor Collaboration. We applied a Bayesian hierarchical model to estimate trends from 1985 to 2019 in mean height and mean BMI in 1-year age groups for ages 5–19 years. The model allowed for non-linear changes over time in mean height and mean BMI and for non-linear changes with age of children and adolescents, including periods of rapid growth during adolescence.



Lancet 2020; 396: 1511–24

See [Comment](#) page 1465

*Members listed at the end of the Article, and affiliations listed in the appendix

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See [Online](#) for appendix



Heterogeneous contributions of change in population distribution of body mass index to change in obesity and underweight

NCD Risk Factor Collaboration (NCD-RisC)*

Abstract From 1985 to 2016, the prevalence of underweight decreased, and that of obesity and severe obesity increased, in most regions, with significant variation in the magnitude of these changes across regions. We investigated how much change in mean body mass index (BMI) explains changes in the prevalence of underweight, obesity, and severe obesity in different regions using data from 2896 population-based studies with 187 million participants. Changes in the

Trends in adult body-mass index in 200 countries from 1975 to 2014: a pooled analysis of 1698 population-based measurement studies with 19·2 million participants



NCD Risk Factor Collaboration (NCD-RisC)*



Summary

Background Underweight and severe and morbid obesity are associated with highly elevated risks of adverse health outcomes. We estimated trends in mean body-mass index (BMI), which characterises its population distribution, and in the prevalences of a complete set of BMI categories for adults in all countries.

Methods We analysed, with use of a consistent protocol, population-based studies that had measured height and weight in adults aged 18 years and older. We applied a Bayesian hierarchical model to these data to estimate trends from 1975 to 2014 in mean BMI and in the prevalences of BMI categories (<18·5 kg/m² [underweight], 18·5 kg/m² to <20 kg/m², 20 kg/m² to <25 kg/m², 25 kg/m² to <30 kg/m², 30 kg/m² to <35 kg/m², 35 kg/m² to <40 kg/m², ≥40 kg/m² [morbid obesity]), by sex in 200 countries and territories, organised in 21 regions. We calculated the posterior probability of meeting the target of halting by 2025 the rise in obesity at its 2010 levels, if post-2000 trends continue.

Lancet 2016; 387: 1377–96

See [Comment](#) page 1349

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Worldwide trends in diabetes since 1980: a pooled analysis of 751 population-based studies with 4·4 million participants



NCD Risk Factor Collaboration (NCD-RisC)*

Summary

Background One of the global targets for non-communicable diseases is to halt, by 2025, the rise in the age-standardised adult prevalence of diabetes at its 2010 levels. We aimed to estimate worldwide trends in diabetes, how likely it is for countries to achieve the global target, and how changes in prevalence, together with population growth and ageing, are affecting the number of adults with diabetes.

Methods We pooled data from population-based studies that had collected data on diabetes through measurement of its biomarkers. We used a Bayesian hierarchical model to estimate trends in diabetes prevalence—defined as fasting plasma glucose of 7·0 mmol/L or higher, or history of diagnosis with diabetes, or use of insulin or oral hypoglycaemic drugs—in 200 countries and territories in 21 regions, by sex and from 1980 to 2014. We also calculated the posterior probability of meeting the global diabetes target if post-2000 trends continue.

Findings We used data from 751 studies including 4 372 000 adults from 146 of the 200 countries we make estimates for. Global age-standardised diabetes prevalence increased from 4·3% (95% credible interval 2·4–7·0) in 1980 to 9·0% (7·2–11·1) in 2014 in men, and from 5·0% (2·9–7·9) to 7·9% (6·4–9·7) in women. The number of adults with diabetes



Lancet 2016; 387: 1513–30

Published Online

April 6, 2016

[http://dx.doi.org/10.1016/S0140-6736\(16\)00618-8](http://dx.doi.org/10.1016/S0140-6736(16)00618-8)

See [Comment](#) page 1485

See [Perspectives](#) page 1505

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Worldwide trends in blood pressure from 1975 to 2015: a pooled analysis of 1479 population-based measurement studies with 19·1 million participants



*NCD Risk Factor Collaboration (NCD-RisC)**

Summary

Background Raised blood pressure is an important risk factor for cardiovascular diseases and chronic kidney disease. We estimated worldwide trends in mean systolic and mean diastolic blood pressure, and the prevalence of, and number of people with, raised blood pressure, defined as systolic blood pressure of 140 mm Hg or higher or diastolic blood pressure of 90 mm Hg or higher.

Methods For this analysis, we pooled national, subnational, or community population-based studies that had measured blood pressure in adults aged 18 years and older. We used a Bayesian hierarchical model to estimate trends from 1975 to 2015 in mean systolic and mean diastolic blood pressure, and the prevalence of raised blood pressure for 200 countries. We calculated the contributions of changes in prevalence versus population growth and ageing to the increase in the number of adults with raised blood pressure.

Findings We pooled 1479 studies that had measured the blood pressures of 19·1 million adults. Global age-standardised mean systolic blood pressure in 2015 was 127·0 mm Hg (95% credible interval 125·7–128·3) in men and 122·3 mm Hg



Lancet 2017; 389: 37–55

Published Online
November 15, 2016
[http://dx.doi.org/10.1016/S0140-6736\(16\)31919-5](http://dx.doi.org/10.1016/S0140-6736(16)31919-5)

See [Comment](#) page 3

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Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based measurement studies in 128·9 million children, adolescents, and adults



NCD Risk Factor Collaboration (NCD-RisC)*

Summary

Background Underweight, overweight, and obesity in childhood and adolescence are associated with adverse health consequences throughout the life-course. Our aim was to estimate worldwide trends in mean body-mass index (BMI) and a comprehensive set of BMI categories that cover underweight to obesity in children and adolescents, and to compare trends with those of adults.

Methods We pooled 2416 population-based studies with measurements of height and weight on 128·9 million participants aged 5 years and older, including 31·5 million aged 5–19 years. We used a Bayesian hierarchical model to estimate trends from 1975 to 2016 in 200 countries for mean BMI and for prevalence of BMI in the following categories for children and adolescents aged 5–19 years: more than 2 SD below the median of the WHO growth reference for children and adolescents (referred to as moderate and severe underweight hereafter), 2 SD to more than 1 SD below the median (mild underweight), 1 SD below the median to 1 SD above the median (healthy weight), more than 1 SD to 2 SD above the median (overweight but not obese), and more than 2 SD above the median (obesity).



Lancet 2017; 390: 2627–42

Published Online

October 10, 2017

[http://dx.doi.org/10.1016/S0140-6736\(17\)32129-3](http://dx.doi.org/10.1016/S0140-6736(17)32129-3)

See [Comment](#) page 2607

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See Online for appendix

Rising rural body-mass index is the main driver of the global obesity epidemic in adults

NCD Risk Factor Collaboration (NCD-RisC)*

Body-mass index (BMI) has increased steadily in most countries in parallel with a rise in the proportion of the population who live in cities^{1,2}. This has led to a widely reported view that urbanization is one of the most important drivers of the global rise in obesity³⁻⁶. Here we use 2,009 population-based studies, with measurements of height and weight in more than 112 million adults, to report national, regional and global trends in mean BMI segregated by place of residence (a rural or urban area) from 1985 to 2017. We show that, contrary to the dominant paradigm, more than 55% of the global rise in mean BMI from 1985 to 2017—and more than 80% in some low- and middle-income regions—was due to increases in BMI in rural areas. This large contribution stems from the fact that, with the exception of women in sub-Saharan Africa, BMI is

over short durations, and/or in one sex and narrow age groups. The few studies that covered more than one country⁷⁻¹² used at most a few dozen data sources and hence could not systematically estimate trends, and focused primarily on women of child-bearing age.

Data on how BMI in rural and urban populations is changing are needed to plan interventions that address underweight and overweight. Here, we report on mean BMI in rural and urban areas of 200 countries and territories from 1985 to 2017. We used 2,009 population-based studies of human anthropometry conducted in 190 countries (Extended Data Fig. 1), with measurements of height and weight in more than 112 million adults aged 18 years and older. We excluded data based on self-reported height and weight because they are subject to bias. For each sex, we used a Bayesian hierarchical model to estimate mean BMI

Repositioning of the global epicentre of non-optimal cholesterol

<https://doi.org/10.1038/s41586-020-2338-1>

NCD Risk Factor Collaboration (NCD-RisC)*

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Published online: 3 June 2020

Open access

 Check for updates

High blood cholesterol is typically considered a feature of wealthy western countries^{1,2}. However, dietary and behavioural determinants of blood cholesterol are changing rapidly throughout the world³ and countries are using lipid-lowering medications at varying rates. These changes can have distinct effects on the levels of high-density lipoprotein (HDL) cholesterol and non-HDL cholesterol, which have

Nature | Vol 582 | 4 June 2020 | **73**

Trends in cardiometabolic risk factors in the Americas between 1980 and 2014: a pooled analysis of population-based surveys

*NCD Risk Factor Collaboration (NCD-RisC)—Americas Working Group**

Summary

Background Describing the prevalence and trends of cardiometabolic risk factors that are associated with non-communicable diseases (NCDs) is crucial for monitoring progress, planning prevention, and providing evidence to support policy efforts. We aimed to analyse the transition in body-mass index (BMI), obesity, blood pressure, raised blood pressure, and diabetes in the Americas, between 1980 and 2014.

Methods We did a pooled analysis of population-based studies with data on anthropometric measurements, biomarkers for diabetes, and blood pressure from adults aged 18 years or older. A Bayesian model was used to estimate trends in BMI, raised blood pressure (systolic blood pressure ≥ 140 mm Hg or diastolic blood pressure ≥ 90 mm Hg), and diabetes (fasting plasma glucose ≥ 7.0 mmol/L, history of diabetes, or diabetes treatment) from 1980 to 2014, in 37 countries and six subregions of the Americas.

Findings 389 population-based surveys from the Americas were available. Comparing prevalence estimates from 2014 with those of 1980, in the non-English speaking Caribbean subregion, the prevalence of obesity increased from 3.9%



Lancet Glob Health 2020;
8: e123-33

This online publication has been corrected. The corrected version first appeared at thelancet.com/lancetgh on XXX, 2020

See [Comment](#) page e18

*Members listed at end of paper

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Prof J Jaime Miranda, CRONICAS Centre of Excellence in Chronic Diseases, and Department of Medicine, School of Medicine, Universidad Peruana Cayetano

Conclusions

- It is one of the largest sample size studies in Mexico EVER.
- It is the largest sample size study at the IMSS EVER.
- After 20 years that we did the first survey, some national and international researchers are still interested in their analysis to get some papers.
- This national survey is an example of how epidemiologists should work together with other epidemiologists, statisticians, nurses, health administrators, informatics experts, among others.

How a handful of persons were able to do those studies?



How did a handful of persons do all those studies?

- *“To be successful you do not need that all people think like one; you need a handful of people who want to work”*
- “Think big”
- “I trust you”
- “Think out of the box”
- “Be creative”
- “First think about what to do” *(and then how to do it)*
- “Of course, science exists in developing countries”



When there is no one left in the living world who remembers you, you disappear from this world. We call the final death.

*From Coco (2017 film) Disney
PIXAR*



Thanks for your attention



acostacb@yahoo.com