



Pan American
Health
Organization



World Health
Organization

REGIONAL OFFICE FOR THE Americas

NCD Surveillance and Monitoring: enhancing data use and communication with visual analytic and information visualization

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Contents

- **NCD Surveillance** – data use, analysis and information dissemination
- **Visualizations** – tools for communicating results and insight
- **NMH Data Portal** – a platform for data and information dissemination

NCD Surveillance: the concept

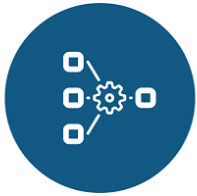
the ongoing systematic **collection** and **analysis** of data to **provide** appropriate **information** regarding:

- NCD disease burden,
- the population groups at risk,
- estimates of NCD mortality, morbidity, risk factors and determinants,
- coupled with the ability to track health outcomes and risk factor trends over time.

NCD Surveillance definition, World Health Organization (WHO)

NCD Surveillance:

analysis & information dissemination



Data Preparation and Integration

- Integration of multiple data sources
- NCD Data Repository (Data Warehouse)



Data Analysis

- Statistical & Epidemiological methods
- Scientific computation
- Visual analytic techniques and tools



Information Visualization

- Data & Information Visualizations to communicate results and insights



Information Dissemination and Sharing

- NMH Data Portal - <http://bit.ly/1dZXBAM>

NCD Surveillance: information system architecture

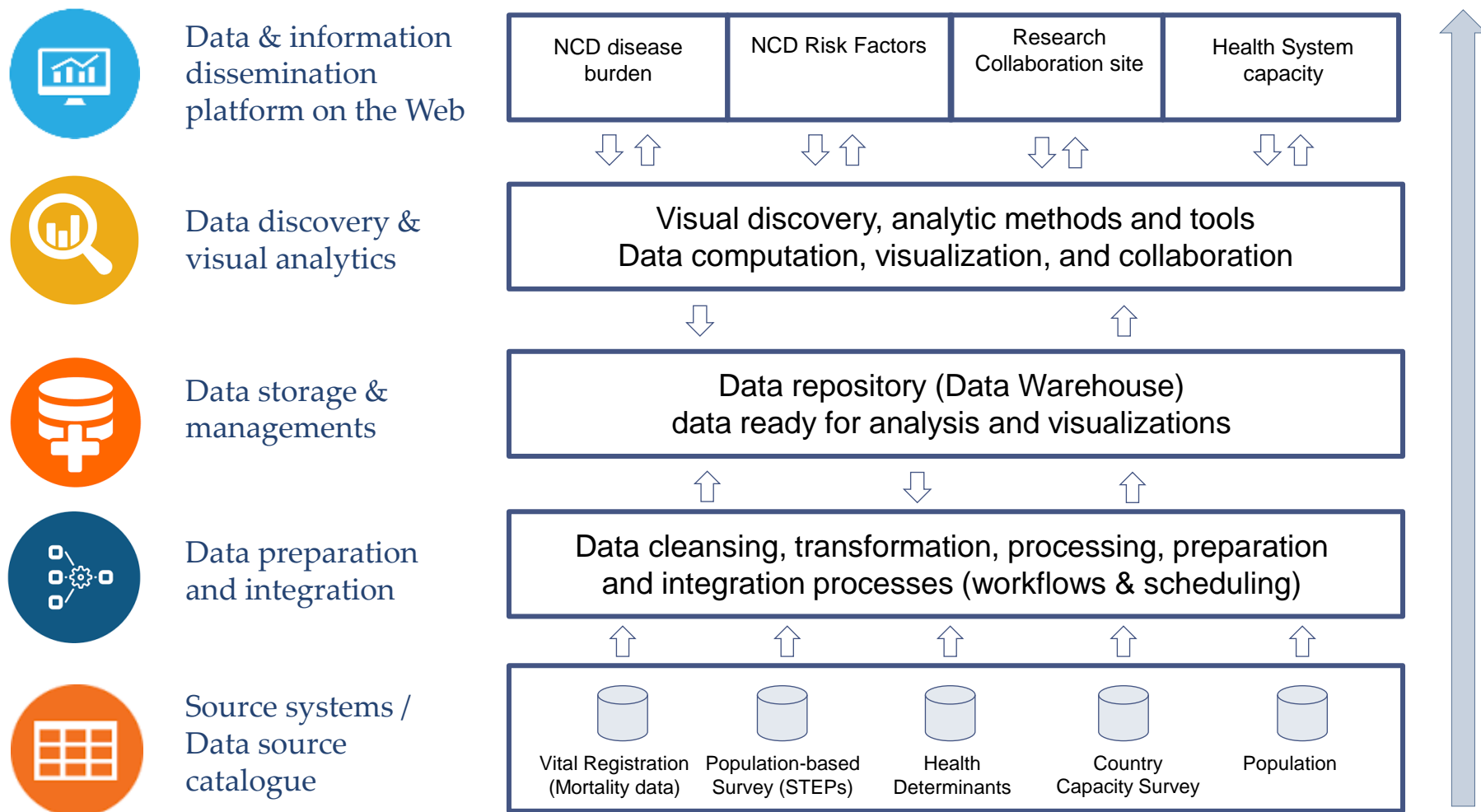
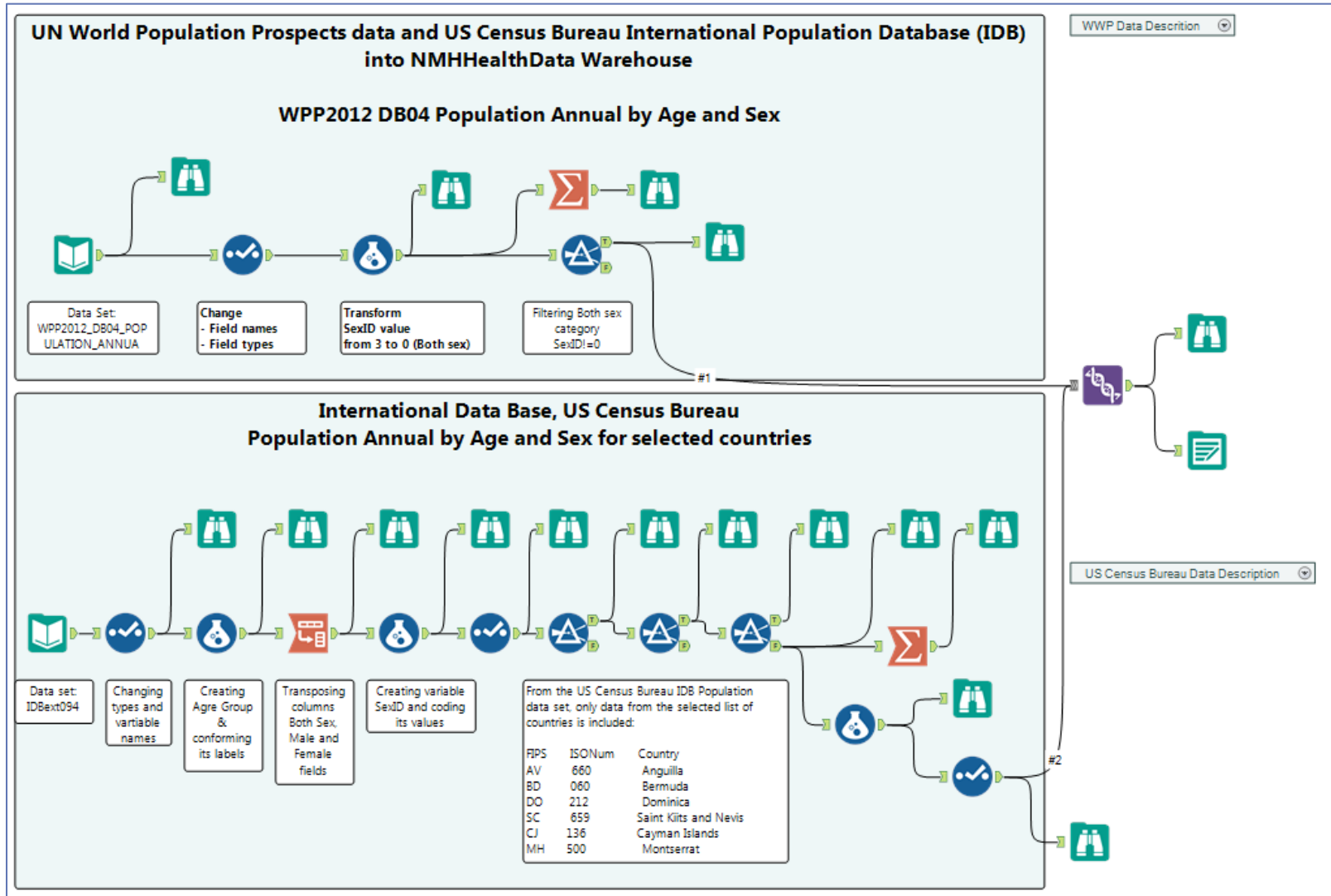


Diagram adapted from Business Intelligence & Data Warehouse technical system architecture



Data Preparation and Integration





Data Repository:



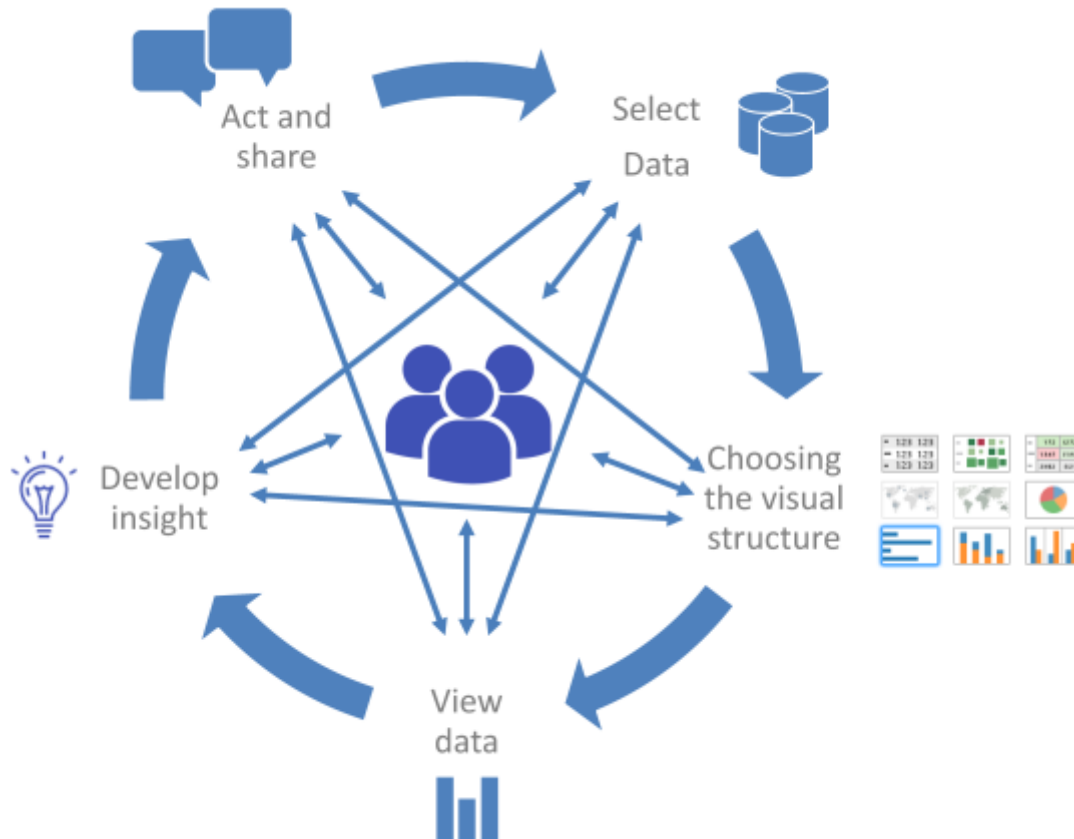
Data Warehouse

The **data** is:

- validated,
- clean,
- integrated,
- organized,
- Accessible, and
- ready for use and analysis



The Analytic Cycle/Process



When people are **exploring and analyzing data**, they enter into an **iterative and non-linear cycle** of

1. data acquisition,
2. selection of visual structures
3. instantiate data views (graphs, visual forms)
4. analysis and synthesis, hypothesis building
5. sharing and re-examination

where at any point they may need to skip steps, back-up, seek additional data, or even start over.

Diagram adapted from the cycle of visual analytic diagram.
Pat Hanrahan, Chris Stolte and Jock MacKinlay. Visual Analysis for Everyone.
Whitepaper. Tableau Software, Inc., 2007
<http://www.tableau.com/sites/default/files/whitepapers/visual-analysis-for-everyone.pdf>



Assessing Level and Trends: NCD Premature Mortality

MONITORING & ASSESSING TRENDS: premature mortality from NCDs

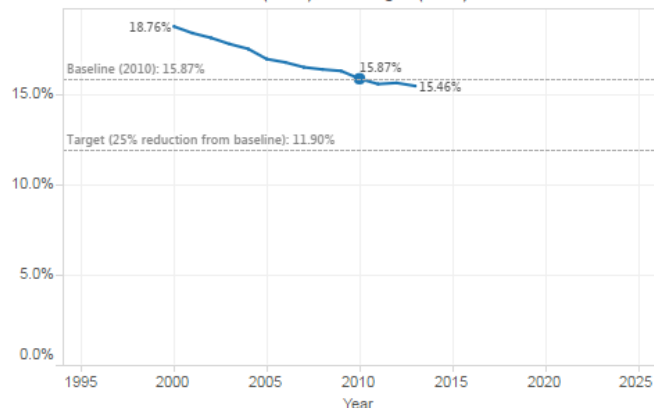
Indicator: Unconditional probability of dying at exact ages between 30 and 70 years from selected NCD cause of death

Select Cause of Death
Four NCD (CVD, cancer, diabetes & respiratory diseases)

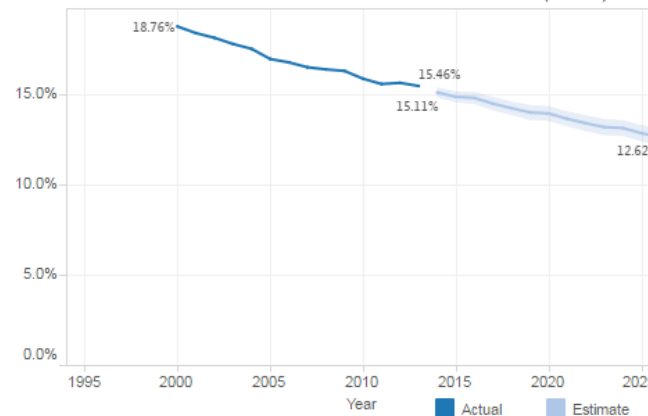
Select Country
Americas

Select Sex
Both sexes

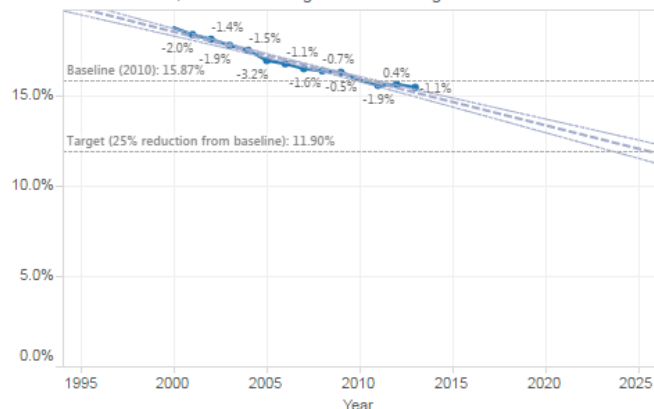
Panel 1. Time series, baseline (2010), and target (2025)



Panel 2. Actual series and forecast with 95% Confidence Interval (95% CI)



Panel 3. Time series, annual % change and linear regression with 95% CI



Panel 4. Trends Analysis Summary Metrics

Average annual percent change & 95% CI: -1.52% [-1.64, -1.39]
Overall % change 2010-2025: -22.75%

The **Average Annual Percent Change (AAPC)** is significantly different from zero when its 95% CI does not contain zero.

An AAPC of at least **-1.7%** is required to reach the target of **25% relative reduction on year 2025** from baseline on year 2010.

Select the period for trends analysis

2000 2013

Source: NMH Surveillance Team. NCD premature mortality estimates. Regional Mortality Information System. Pan American Health Organization (PAHO).

It helps to answer questions such as:

What are the level and trends of NCD premature mortality in a Country?

Is the Country on track to reach the target?

Available online:
<http://bit.ly/1Ffe5Py>



NCD Premature Mortality

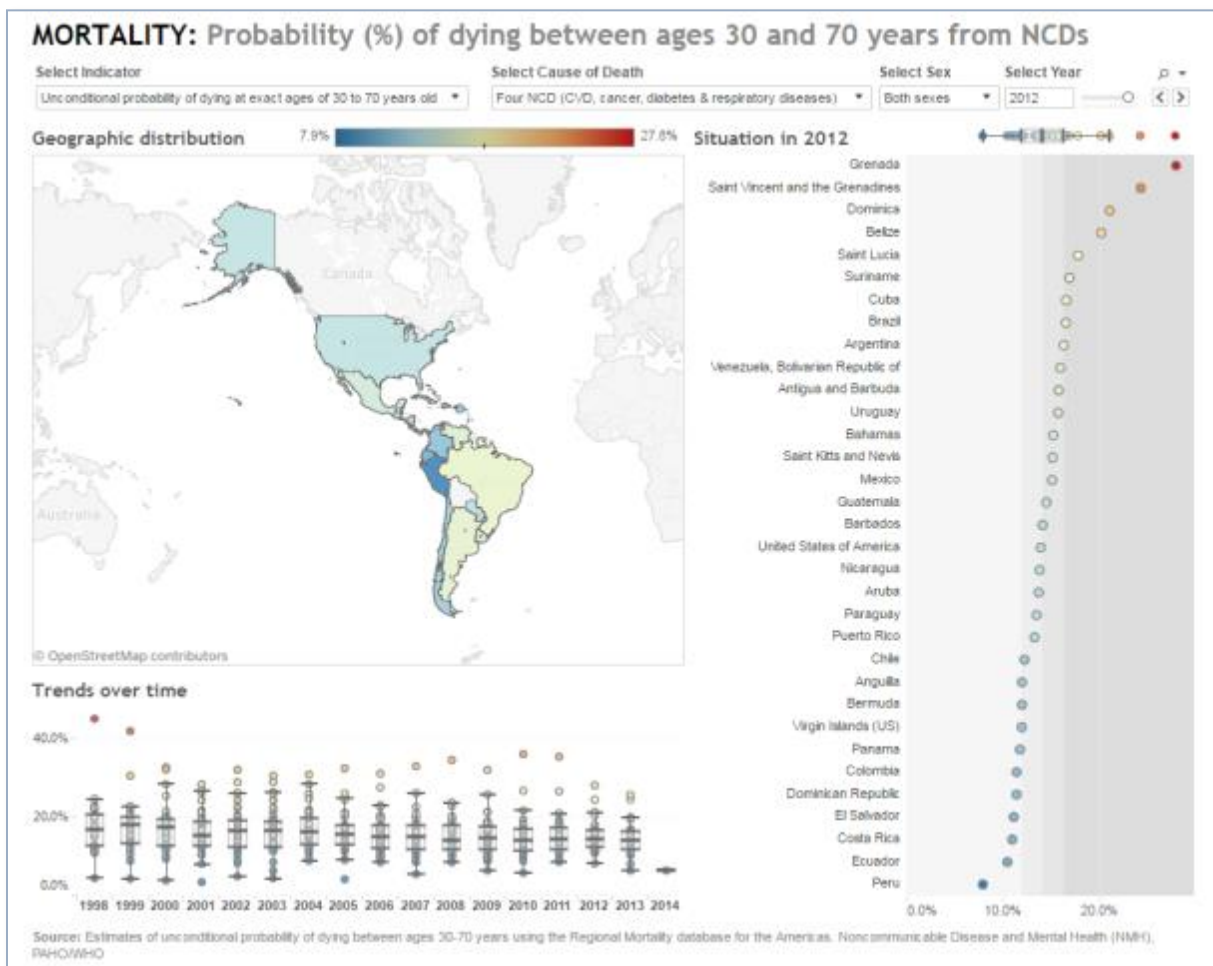
SITUATION AND TRENDS

Key outcome indicator:
Unconditional probability of dying between exact ages 30 and 70 years old (series by country, year, and sex)

- Noncommunicable diseases
- Four Major NCDs
- Cardiovascular diseases
- Cancer
- Diabetes
- Chronic respiratory diseases

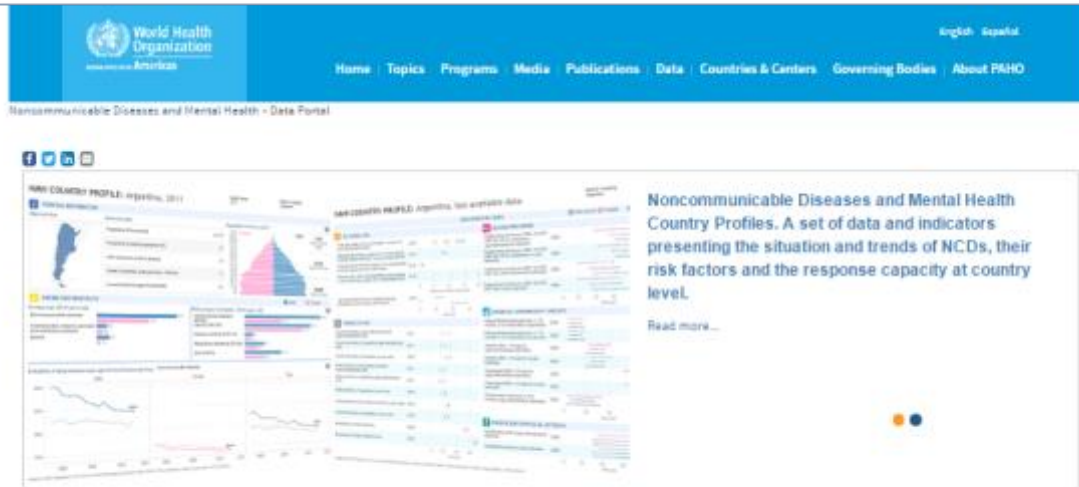
Available online:

http://bit.ly/ncd_premature_mortality





NMH Data portal



NMH Data Portal

Noncommunicable Diseases and Mental Health Data Portal is an entry point to the main set of comprehensive data, indicators, interactive visualizations and compelling information related to Noncommunicable diseases and their risk factors, nutrition, road safety, mental health, substance use, and disabilities in the region of the Americas.

Noncommunicable Diseases



Noncommunicable Disease Mortality



Risk Factors Data on NCD Risk Factors in the Americas



NCD Country Profiles, Countries of the Americas NCD Country Profile. Select a country to explore NCDs, risk factors, and capacity to respond to NCDs

Mental Health



Mental Health Data and interactive visualizations on mental health

Nutrition



Child Malnutrition in countries of the Americas

Road Safety



Road Safety Theme Comprehensive data on road safety in the Americas

Injury



Injury Surveillance: Mortality from external causes of deaths, Countries of the Americas Interactive visualization for exploring level, distribution and trends of injury mortality

Information dissemination and sharing platform:

- data & statistics,
- interactive visualizations
- information products
- technical briefings
- NMH topics

Data and information visualizations are organized by topics

Available online:

<http://bit.ly/1dZXBAM>



NMH Data portal

Available online:
<http://bit.ly/2nDtqsg>



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Noncommunicable Diseases and Mental Health » NMH Data Portal



Noncommunicable Disease Mortality

Noncommunicable diseases (NCD) are leading causes of deaths, causing almost four of every five deaths annually in the Region of the Americas. It is expected that this figure increases in the next decades as a consequence of population growth and aging, urbanization, and longer exposition to risk factors. Four major NCDs -cardiovascular disease, cancer, respiratory diseases, and diabetes- are responsible for the burden of NCD mortality and morbidity. Four common, modifiable risk factors underlie the major NCDs. They include tobacco, harmful use of alcohol, unhealthy diet, and insufficient physical activity.

Data and information about NCD mortality in the Region of the Americas are presented below.

Total NCD deaths

4.8 million

of the 6.2 million deaths in the Americas in 2012 were due to NCDs

Proportion of premature NCD deaths

79%

of NCD deaths in 2012 occurred prematurely between 30 and 70 years of age

Premature mortality (\hat{z})

15.4%

is the probability of dying prematurely (30-70 year of age) from any of the four major NCDs



NCD deaths
NCD causes of death



Premature NCD mortality
Level and trends of premature NCD mortality



Trends of premature NCD mortality
Monitoring and assessing trends



Cardiovascular diseases
Burden of mortality



Cancer
Burden of mortality. Age-standardized death rates x 100,000 pop.



Diabetes
Mortality and prevalence



NMH Data portal

Available online:
<http://bit.ly/2oy0z8f>



Noncommunicable Diseases and Mental Health » NMH Data Portal



Risk Factors

Common, preventable risk factors underlie most noncommunicable diseases. Most noncommunicable diseases are the result of four behavior risk factors -tobacco use, physical inactivity, unhealthy diet, and the harmful use of alcohol- that lead to four key metabolic/physiological changes -raised blood pressure, overweight/obesity, raised blood glucose, and raised cholesterol-.

This topic presents data and visualizations on noncommunicable disease risk factors.

Tobacco use

17.5%

of adults population are current tobacco smokers in the Americas

Alcohol

8.4 Liters

is the alcohol per capita consumption (APC) in adults population in the Americas

Overweight and obesity

62%

is the proportion of overweight and obese people in the Americas



Tobacco use in adults
Level by sex in countries of the Americas



Annual Per Capita Consumption of Pure Alcohol (liters)
Level and distribution in the Americas



Overweight and obesity (BMI ≥ 25)
in adults (18+ years old) in the Americas



Tobacco control policies
Status of implementation in countries of the Americas



Raised fasting blood glucose (≥ 7 mmol/L)
Level and distribution in the Americas



Obesity (BMI ≥ 30)
in adults (18+ years old) in the Americas

Request

- **The NCD Surveillance Team encourages you to:**
 - Visit the NMH Data Portal and use the visualizations
 - Provide any comments about the visualizations. Are they useful?
 - Provide recommendations to improve the data and information products based on country's perspective
 - Let us know about your technical cooperation needs in NCD surveillance and monitoring

Thank you

Keep the conversation and ask further questions on the **CARMEN Forum**

<http://www.paho.org/carmen/foro/index.php/en/>

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