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Health  
Organization



REGIONAL OFFICE FOR THE

World Health  
Organization  

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Americas

# Climate change and Health in the Americas

*Dr Daniel Buss – Advisor on Global Environmental Changes, Washington DC*  
*Presentation at UNFCCC/LEG Regional Training Workshop NAP LA&C*  
*San Jose, Costa Rica*  
*September 6, 2017*



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# Environmental determinants of health

WHO (2016): 12.6 million deaths per year (23% of the total) attributed to unhealthy environments. Many of those situations are exacerbated by climate change.

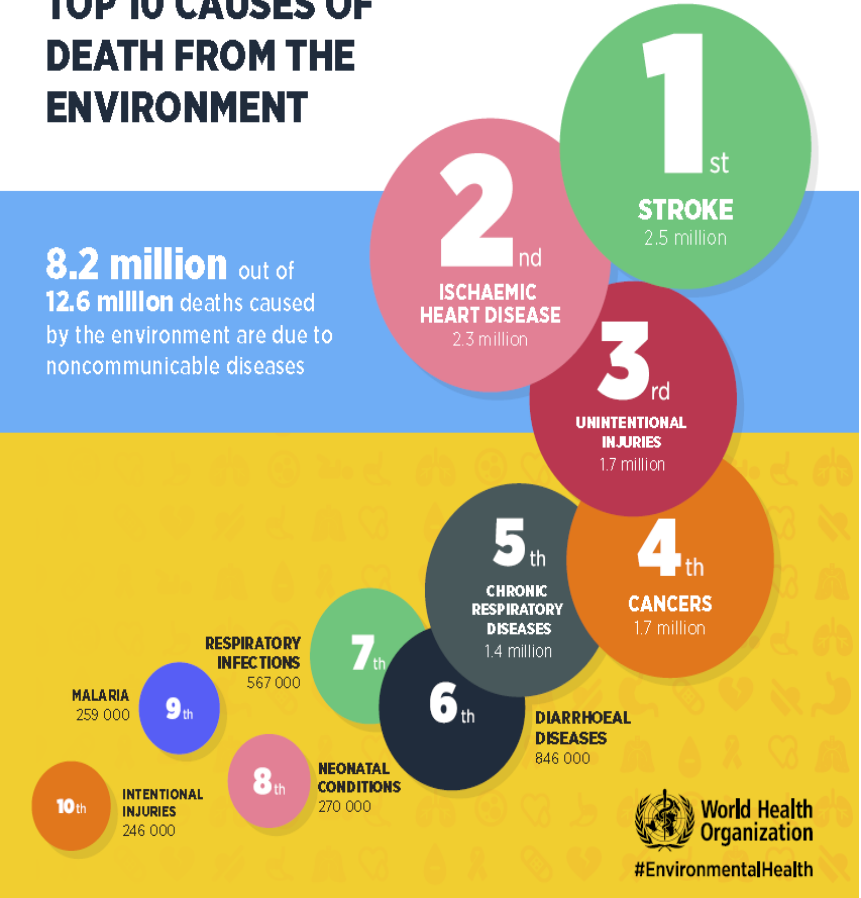


PREVENTING DISEASE THROUGH  
HEALTHY ENVIRONMENTS  
A global assessment of the burden of disease from  
environmental risks



## TOP 10 CAUSES OF DEATH FROM THE ENVIRONMENT

8.2 million out of  
12.6 million deaths caused  
by the environment are due to  
noncommunicable diseases





# Extreme weather events



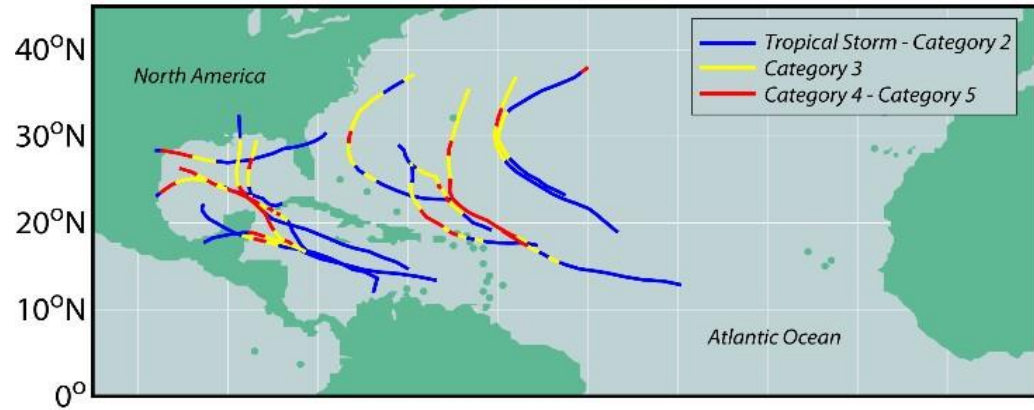
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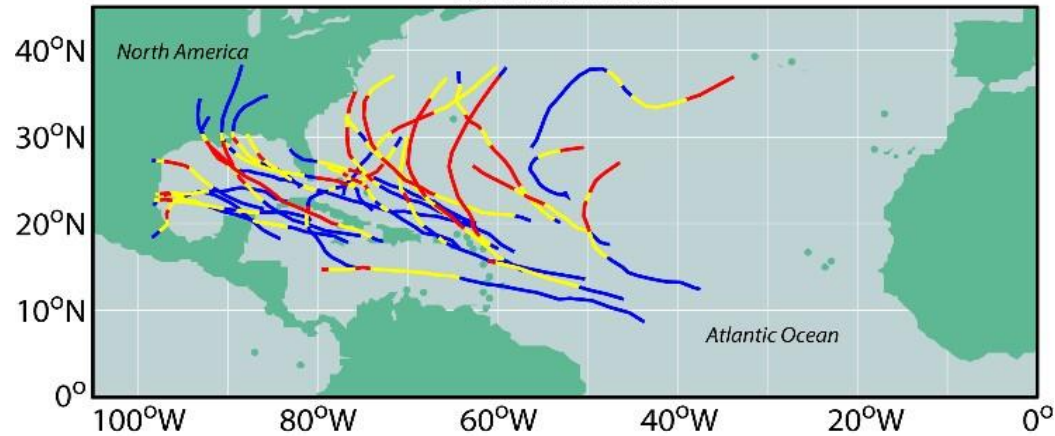
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## Modeled Category 4 & 5 Hurricane Tracks

Present Climate



Warmed Climate



Bender et al 2010. Science

Region affected by 62 tropical storms and hurricanes (2004-2012); projections shows that in 2050 those extreme events will be 2.5 times more frequent and intense

Cases of cholera, leptospirosis, food and water contamination

## Floods, landslides

### Peru – April 2017

>665.000 people affected, 79 deaths

>145.000 houses affected (>18.000 destroyed), 1.245km roads and 159 bridges destroyed



Colombia (> 300 deaths in 2017)

Other countries affected: Ecuador, Brazil, Venezuela, Bolivia

Central America: Guatemala, Honduras

# Vector-borne diseases



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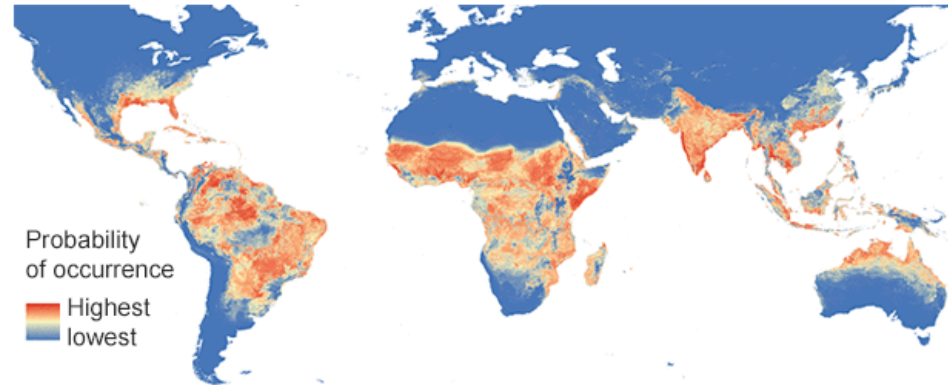
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- Shift in vector distributions (*Aedes* spp., ticks...)
- Recent outbreaks of Zika, Chikungunya and Yellow fever in South America

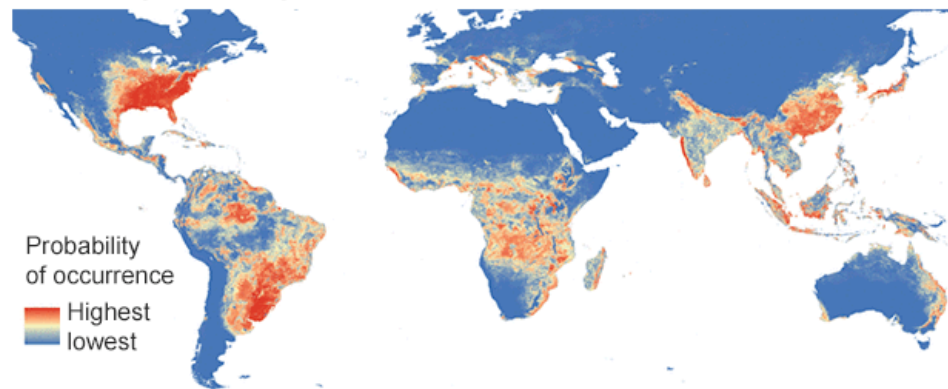
## Global distribution of *Aedes* mosquitoes

*Aedes aegypti* and *Aedes albopictus* can spread the Zika virus if infected with it

### *Aedes aegypti* mosquito



### *Aedes albopictus* mosquito

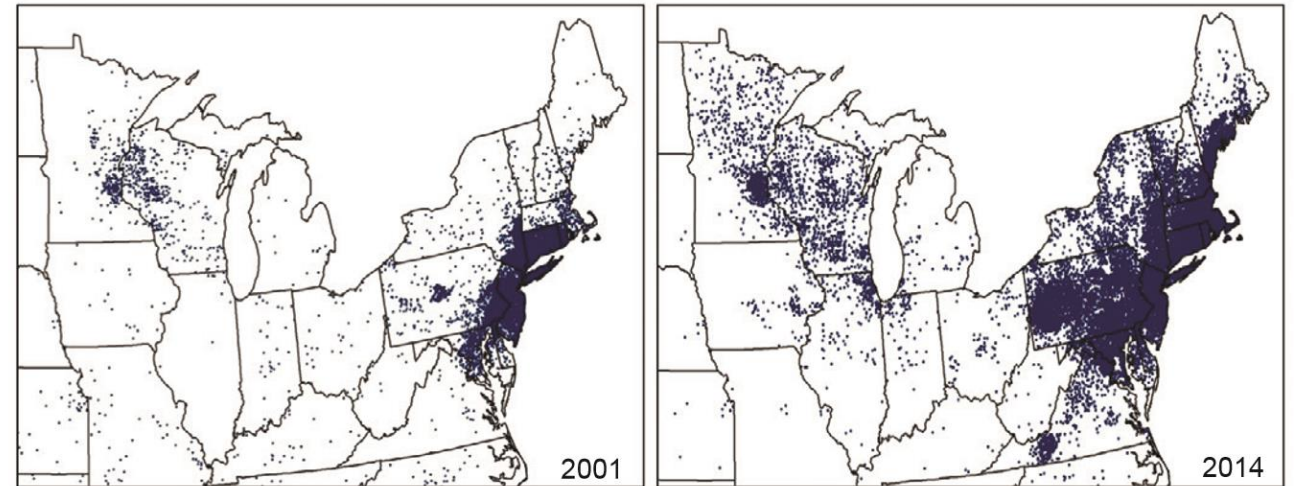


Predicted global distribution of each species based on statistical distribution models

Source: ELife 2015



## Changes in Lyme Disease Case Report Distribution



Maps show the reported cases of Lyme disease in 2001 and 2014 for the areas of the country where Lyme disease is most common (the Northeast and Upper Midwest). Both the distribution and the numbers of cases have increased (see Ch. 5: Vector-Borne Diseases). (Figure source: adapted from CDC 2015)<sup>6</sup>



# Effects of Climate Change on Health



CLIMATE AND HEALTH COUNTRY PROFILES - 2015  
A GLOBAL OVERVIEW



THE LANCET

Volume 373 | Number 9676 | Pages 1529-1724 | May 30-27, 2009 | www.thelancet.com

"Climate change is  
the biggest global  
health threat of the  
21st century."

See The Lancet Commission page 1593

Comment  
Compensation for brain drain  
from developing countries  
See page 1685

Correspondence  
America from cancer (Lancet)  
See page 1677

Articles  
RECORDs: Rationale for  
therapeutic prophylaxis after  
total knee arthroplasty  
See page 1693

Articles  
TACT: sequential treatment as  
adjuvant chemotherapy for  
early breast cancer  
See page 1681

The Lancet Commissions  
Management of health effects  
of climate change  
See page 1693

£5.00 Registered as a newspaper ISSN 0140-6736  
Founded 1823 - Published weekly

## Direct impacts

- Increased frequency and intensity of heat waves
- Increased number and intensity of disasters such as storms, hurricanes, tornadoes and floods
- Increased incidence and/or magnitude of extreme high sea level

## Indirect impacts through natural systems

- Increased risks of food- and water- borne diseases
- Increased risks of vector-borne diseases
- Increased risks of airways diseases and allergens

## Indirect impacts through socioeconomic systems

- Increased risk of under-nutrition resulting from diminished food production and water insecurity
- Reduction of work capacity and labor productivity, and extra risks to vulnerable populations
- Consequences for mental health due to forced displacements

## Context – PAHO/WHO Perspective

- WHO new DG vision and priorities: Climate and Environmental impacts on health
- PAHO: Action on climate change is recognized in PAHO Strategy 2014 – 2019
- Strategy and **Plan of Action on Climate Change** (2012-2017)



### Priorities

- Health for all
- Health emergencies
- Women, children, adolescents
- Climate, environmental change
- A transformed WHO

## The health impacts of climate and environmental change

Climate and environmental change impact many aspects of life that are inextricably linked to health – food security, economic livelihoods, air safety and water and sanitation systems – and WHO estimates that 12.6 million people die each year as a result of living or working in an unhealthy environment. To address this, WHO has a key role to play advancing both mitigation and adaptation strategies for climate and environmental change, working in close partnership with other UN agencies and stakeholders.

[Read more](#)

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**51st DIRECTING COUNCIL**  
63rd SESSION OF THE REGIONAL COMMITTEE

Washington, D.C., USA, 26-30 September 2011

Agenda Item 4.3

CD51/6, Rev. 1 (Eng.)  
30 September 2011  
ORIGINAL: ENGLISH

### STRATEGY AND PLAN OF ACTION ON CLIMATE CHANGE

#### Introduction

1. In 2008, the 48th Directing Council of the Pan American Health Organization, convened a *Roundtable on Climate Change and its Impacts on Public Health: a Regional Perspective* (Document CD48/16) (1) and approved its final report (Document CD48/16, Add. II) (2). The Roundtable participants reviewed the paper titled *Protecting Health from the Effects of Climate Change in the Region of the Americas: Moving from Evidence to Action* (Document CD48/16 Annex A) (3), which proposed the elements and framework for a Regional Plan of Action to Protect Health from the Effects of Climate Change in the Region of the Americas.

2. International experts participated in drafting the Regional Plan at a regional workshop held in Brazil from 9 to 11 April 2008. The document, which considered as input climate change country assessments coordinated by PAHO, was later reviewed by most Member States from North America, Central America, South America, and the Caribbean. The 2008 draft Regional Plan has served as the foundation for PAHO's support of national initiatives on climate change and health and for developing a Strategy on Climate Change and Health for MERCOSUR (Common Market of the South) countries.

3. The present document builds on the 2008 draft Regional Plan and is based on experiences at the national, subregional, and regional levels and on the workplan of the



## Context – PAHO/WHO Perspective

### Second WHO Global Conference on Health and Climate

- Climate and Clean Air Coalition on Short-Lived Climate Pollutants
- Global Framework for Climate Services



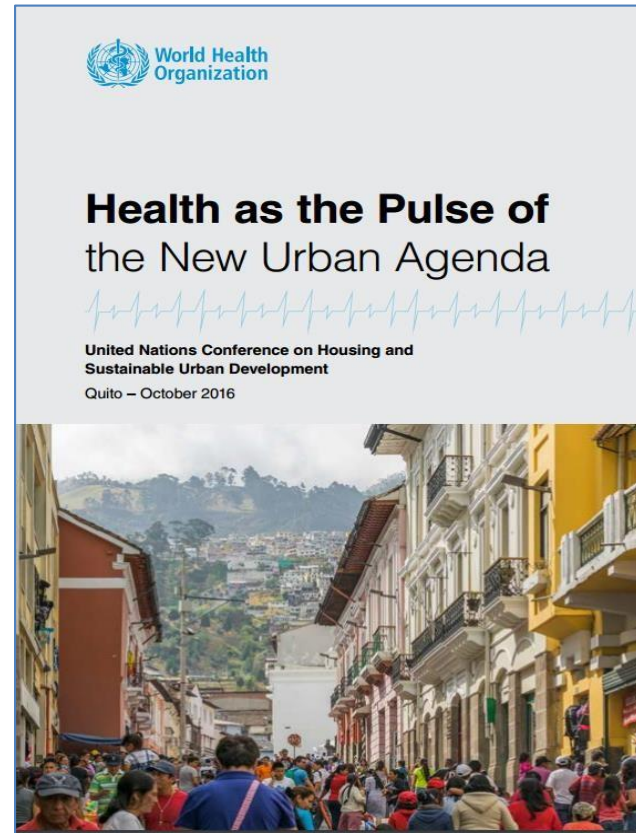
### UN Habitat III – Quito, Ecuador oct/2016



- Health as the “pulse” of the New Urban Agenda

### UNFCCC COP22 – Marrakech, nov/2016

- Global Coalition on Health, Environment and Climate (WHO + UNEP + WMO)
- Ministers Declaration

<http://www.who.int/globalchange/mediacentre/events/sign-form/en/>





Joint WHO UNEP COP22 news update  
15 November 2016

### Health and environment ministers pledge climate actions to reduce 12.6 million environment-related deaths

15 November 2016 | MARRAKECH – Ministers and senior officials responsible for health and environment today committed to reducing the annual 12.6 million deaths caused by environmental pollution.

Gathering at the COP22 climate meeting in Marrakech, over two dozen high level officials from both sectors signed up to the *Declaration for Health, Environment and Climate Change*. The goal is to reduce pollution-related deaths via a new global initiative to promote better management of environmental and climate risks to health.

The World Health Organization (WHO) estimates that some 12.6 million deaths a year are associated with environmental pollution. Of these, an estimated 6.5 million deaths (11.6% of all global deaths) are associated with air pollution, from household and outdoor sources.

“This landmark declaration has raised consensus for better articulation of our efforts to find a solution to the major health, environmental and climate challenges,” said Ms Hakima El Haite, Minister of Environment, Morocco. “Together, we commit to ensuring that people – their livelihoods, wellbeing, and particularly their health – are at the centre of the response to climate change.”

The declaration encourages the health and environment sectors to exchange experiences, technical expertise and best practices to enhance health and protect the environment. Global and comprehensive links between these two sectors does not yet exist.

#### The health impact of environmental pollution

Most environmental pollution-related deaths occur in low- and middle-income countries. However, outdoor air pollution remains prevalent in high-income countries as well, with 9 out of 10 people worldwide exposed to air pollution that exceeds WHO Air Quality guidelines for fine particulate matter.

Ninety-four percent of outdoor air pollution deaths are due to noncommunicable diseases – notably cardiovascular diseases, stroke, chronic obstructive pulmonary disease and lung cancer. Air pollution also increases the risk for acute respiratory infections. Indoor air

# Including climate indicators in health surveillance systems (WHO-UNFCCC)



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- Finished: Brazil, Colombia, Mexico, Peru, USA
- Finalizing: Canada, Panama
- Ongoing: Caribbean countries, overview of the Americas

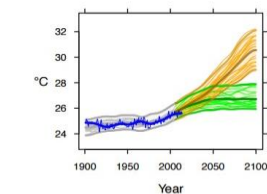
## 1 CURRENT AND FUTURE CLIMATE HAZARDS

Due to climate change, many climate hazards and extreme weather events, such as heat waves, heavy rainfall and droughts, could become more frequent and more intense in many parts of the world.

Outlined here are country-specific projections up to the year 2100 for climate hazards under a 'business as usual' high emissions scenario (in orange) compared to projections under a 'two-degree' scenario with rapidly decreasing emissions (in green).<sup>a</sup> Most hazards caused by climate change will persist for many centuries.

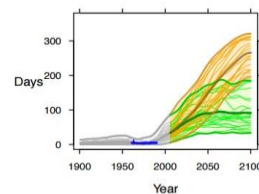
The text boxes below describe the projected changes averaged across about 20 models (thick line). The figures also show each model individually as well as the 90% model range (shaded) as a measure of uncertainty and, where available, the annual and smoothed observed record (in blue).<sup>b,c</sup>

### MEAN ANNUAL TEMPERATURE



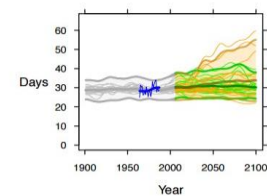
Under a high emissions scenario, mean annual temperature is projected to rise by about 5.4°C on average from 1990 to 2100. If emissions decrease rapidly, the temperature rise is limited to about 1.6°C.

### DAYS OF WARM SPELL ('HEAT WAVES')



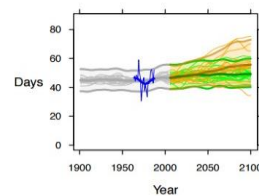
Under a high emissions scenario, the number of days of warm spell<sup>d</sup> is projected to increase from less than 10 days in 1990 to about 265 days on average in 2100. If emissions decrease rapidly, the days of warm spell are limited to about 90 on average.

### DAYS WITH EXTREME RAINFALL ('FLOOD RISK')



Under a high emissions scenario, the number of days with very heavy precipitation (20 mm or more) could increase by about 5 days on average from 1990 to 2100, increasing the risk of floods. Some models indicate increases well outside the range of historical variability, implying even greater risk. If emissions decrease rapidly, the increase in risk is much reduced.

### CONSECUTIVE DRY DAYS ('DROUGHT')



Under a high emissions scenario, the longest dry spell is indicated to increase from an average of about 45 days to about 55 days, with continuing large year-to-year variability. If emissions decrease rapidly, the anticipated changes in the length of dry spells are considerably reduced.

<sup>a</sup> Model projections are from CMIP5 for RCP8.5 (high emissions) and RCP2.6 (low emissions). Model anomalies are added to the historical mean and smoothed.

<sup>b</sup> Observed historical record of mean temperature is from CRU-Ts v3.2; observed historical record of extremes are from HadEX2.

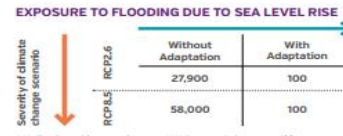
<sup>c</sup> Analysis by the Climatic Research Unit and Tyndall Centre for Climate Change Research, University of East Anglia, 2015.

<sup>d</sup> A 'warm spell' day is a day when maximum temperature, together with that of the 6 consecutive previous days, exceeds the 90th percentile threshold for that time of the year.

2

## 2 CURRENT AND FUTURE HEALTH RISKS DUE TO CLIMATE CHANGE

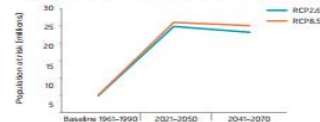
Human health is profoundly affected by weather and climate. Climate change threatens to exacerbate today's health problems – deaths from extreme weather events, cardiovascular and respiratory diseases, infectious diseases and malnutrition – whilst undermining water and food supplies, infrastructure, health systems and social protection systems.



<sup>a</sup> Medium ice melting scenario. <sup>\*\*</sup> Values rounded to nearest '00'.  
Under a high emissions scenario, and without large investments in adaptation, an annual average of 58,000 people are projected to be affected by flooding due to sea level rise between 2070 and 2100. If emissions decrease rapidly and there is a major scale up in protection (i.e. continued construction/raising of dikes) the annual affected population could be limited to about 100 people. Adaptation alone will not offer sufficient protection, as sea level rise is a long-term process, with high emissions scenarios bringing increasing impacts well beyond the end of the century.  
Source: Human dynamics of climate change, technical report, Met Office, 2014; Government, UK, 2014.

### INFECTIOUS AND VECTOR-BORNE DISEASES

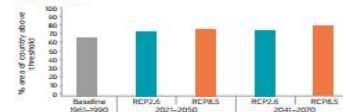
#### Population at risk of malaria in Peru (in millions)



By 2070, approximately 25 million people are projected to be at risk of malaria assuming a high emissions scenario. Projections indicate that if emissions decrease rapidly, this number could be noticeably lower from 2021–2050 and beyond. Population growth can also cause increases in the population at risk in areas where malaria presence is static in the future.

Source: Rieckh, J., Quen, M. et al. 2015.<sup>4</sup>

#### Dengue fever transmission in Peru – % area of the country with 3 months or greater above threshold of suitability for dengue transmission



<sup>4</sup> World Resources Institute, Aqueduct Risk Analysis: Assessing current socio-economic development trends [SSP2] and a 10-year Road plan.

<sup>5</sup> Atlas of Health and Climate, World Health Organization and World Meteorological Organization, 2012.

<sup>6</sup> Quantitative risk assessment of the effects of climate change on selected causes of death, 2030s and 2050s. Geneva: World Health Organization, 2014.

<sup>7</sup> Country-level analysis, completed in 2015, was based on health models outlined in the Quantitative risk assessment of the effects of climate change on selected causes of death, 2030s and 2050s. Geneva: World Health Organization, 2014.

3

### KEY IMPLICATIONS FOR HEALTH

Peru also faces inland river flood risk due to climate change. Under a high emissions scenario, it is projected that by 2030, 137,000 additional people may be at risk of river floods annually due to climate change and 84,900 due to socio-economic change above the estimated annual affected population of 215,000 in 2010.<sup>4</sup>  
In addition to deaths from drowning, flooding causes extensive indirect health effects, including impacts on food production, water provision, ecosystem disruption, infectious disease outbreak and vector distribution. Longer term effects of flooding may include post-traumatic stress and population displacement.

### KEY IMPLICATIONS FOR HEALTH

Some of the world's most virulent infections are also highly sensitive to climate: temperature, precipitation and humidity have a strong influence on the life-cycles of the vectors and the infectious agents they carry and influence the transmission of water and food-borne diseases.<sup>5</sup>

Socioeconomic development and health interventions are driving down burdens of several infectious diseases, and these projections assume that this will continue. However, climate conditions are projected to become significantly more favourable for transmission, slowing progress in reducing burdens, and increasing the populations at risk if control measures are not maintained or strengthened.<sup>6</sup>

Under a high emissions scenario, 80% percent of the geographic area of Peru could exceed the threshold deemed suitable for dengue transmission for at least three months of the year. This is compared to the baseline of 66% percent of the country. If emissions decline rapidly this increase could be limited to about 75% of the geographic area of the country. Co-factors such as urbanization, development and population movements may also modify the disease burdens associated with dengue, and make the disease cross new sub-national borders.

Source: Rieckh, J., Quen, M. et al. 2015.<sup>7</sup>

## Overview

## Key findings

## Opportunities for action

## Current climate hazards

Mean annual temperature

#days with Heat waves

#days with floods

#days with drought

## Current and future health impacts from climate change

Vector-borne diseases

Heat related mortality

## Current exposures to air pollution and health impacts

## Opportunities for health gains through climate change mitigation and adaptation

## Status of national policy response



# Including climate indicators in health surveillance systems

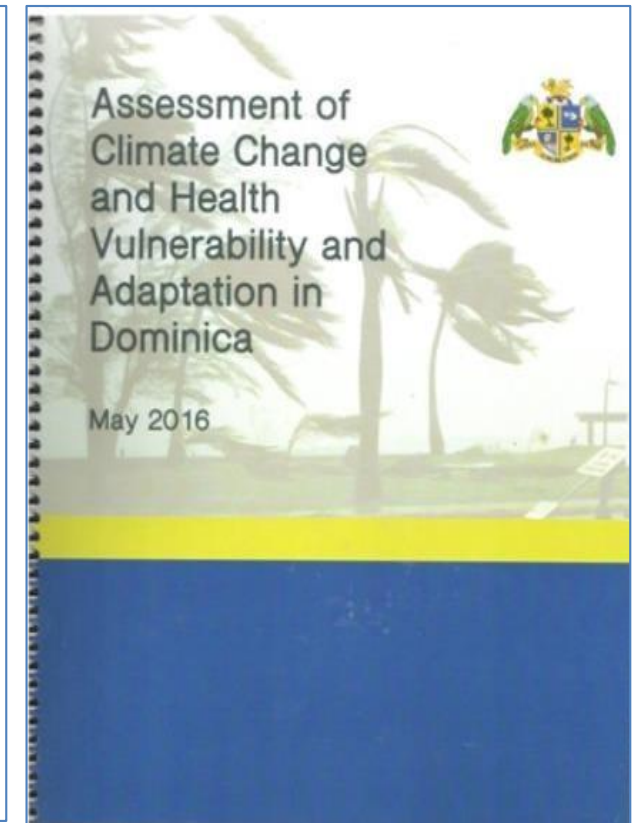
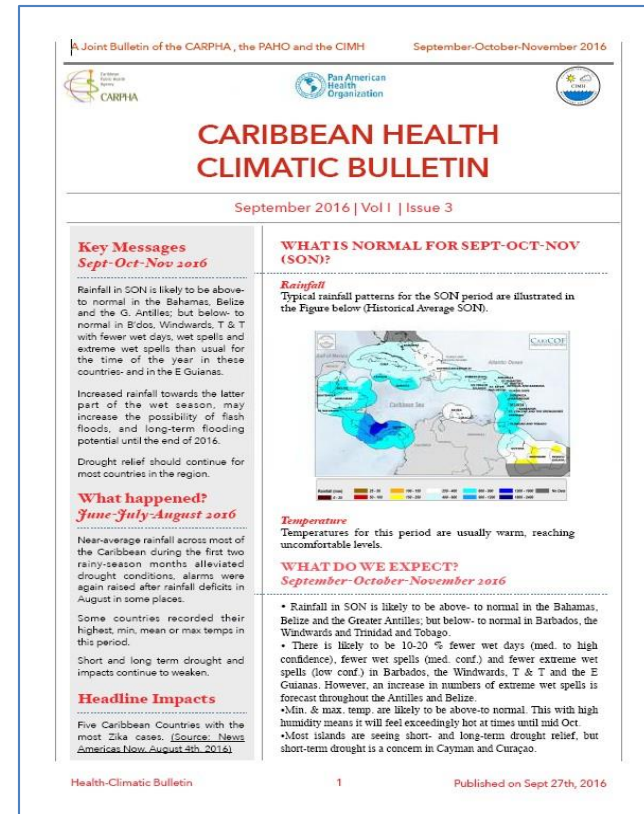


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- **Ongoing projects** in the Caribbean to tackle climate change and health:
  - Cooperation between Caribbean Institute for Meteorology and Hydrology and PAHO
  - Dominica and Grenada finalized their Assessment on the Vulnerability and Adaptation to climate change
  - A Pilot Program for Climate Resilience (PPCR) started being executed in 2015 by the Caribbean Regional Public Health Agency (CARPHA).





- PAHO supported representatives of Ministries of Health to participate in UNFCCC and UNEP-UNDP Regatta NAP trainings
- PAHO is organizing workshops for health representatives and NAP coordinators for the development of the HNAPS (Health NAP chapters)
  - Caribbean: October 30-31, 2017 – St Lucia
  - Central America: February 2018 – venue TBD
  - South America: March 2018 – venue TDB
- WHO “Health Day” during COP23, Nov2017



# Reducing health systems climate footprint to lead by example

US study → health sector contribute to 10% of the GHG emissions (Eckelman & Sherman 2016)

Primum Non Nocere



- Measuring health sector's GHG emissions at country level
- Greening health systems
- Reducing health system's emissions through sustainable procurement

Engaging with suppliers and manufacturers to promote environmentally and socially responsible procurement of health commodities

## Statement of intent

Recognizing the importance of "leading-by-example" as UN and international health development agencies and other organizations that are engaged with procurement of health commodities in the development sector ('the Signatories') in enacting policies and practices that promote sustainable development;

Cognizant of existing international agreements, declarations, and commitments that reaffirm the above<sup>1</sup>;

Understanding that procurement can contribute to sustainable development, particularly where it promotes responsible consumption and production patterns, as called for in Sustainable Development Goal 12, and where it positively influences the application of environmental and social standards to products and services<sup>2</sup>, including in the health sector;

Aware that in leveraging our collective positioning and purchasing power in the international health development sector, we can help advance environmentally and socially responsible procurement principles and practices, including through our engagement with suppliers and manufacturers of health commodities;

Mindful that such engagement is part of our collective commitment to ensuring environmental and social responsibility of our own procurement practices;

We, the undersigned Signatories, agree to align our approach to engagement and communication with suppliers and manufacturers of health commodities in our efforts to collectively advance environmentally and socially responsible procurement;

The approach we will take to this engagement will:

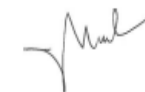
- Take into account compliance by manufacturers with applicable national and international legislation and regulations addressing environmental issues associated with manufacturing;
- Be supportive of wider principles of value for money and effective competition based on equal treatment, transparency and accountability;
- Balance important environmental, social, health, and economic priorities;
- Recognize the different mandates of the Signatories, and opportunities for engagement with suppliers and manufacturers available to each;
- Build upon existing good practice, including relevant ongoing interagency efforts to advance environmentally and socially responsible procurement.<sup>3</sup>

We further agree to make efforts to reflect this common commitment to advancing environmental and social responsibility as part of our engagement with suppliers and manufacturers in our respective, related institutional (or organizational) strategies and policies, as applicable.

Launched in Geneva on 7<sup>th</sup> December 2016,



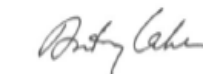
Dr Margaret Chan  
Director-General  
WHO



Dr Mark Dybul  
Executive Director  
The Global Fund




Mr Erik Solheim  
Head  
UN Environment



Mr Anthony Lake  
Executive Director  
UNICEF



Ms Grete Faremo  
Executive Director  
UNOPS



Dr Seth Berkley  
Chief Executive Officer  
GAVI



Ms Helen Clark  
Administrator  
UNDP



Dr Babatunde Osotimehin  
Executive Director  
UNFPA



Mr Leilo Marmora  
Executive Director  
UNITAID

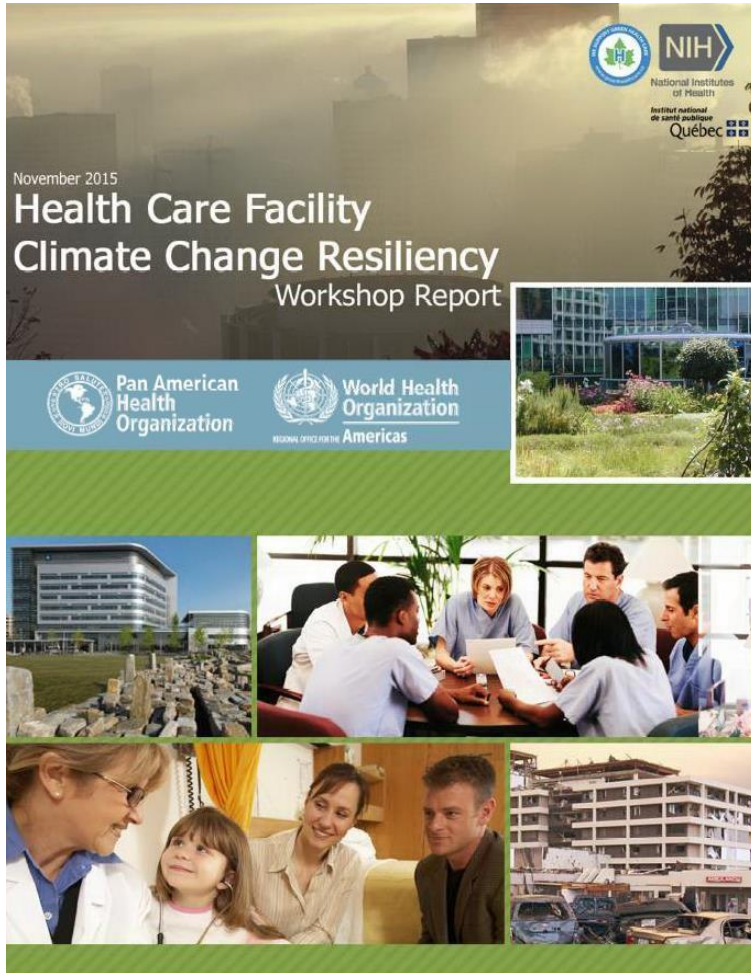
## Reducing health systems climate footprint to lead by example

77% of health facilities in the Americas are located in vulnerable zones for extreme events

The PAHO/WHO “SMART Hospitals” initiative is developed with support of UK Aid funds and implemented following PAHO’s toolkit and ministries of health

A health facility is “SMART” when they are safe, climate resilient and “Green”

2020: At least 50 health facilities in Belize, Dominica, Grenada, Guyana, Jamaica, Saint Vincent and the Grenadines and Saint Lucia will be “smarted”



Georgetown Hospital in Saint Vincent and the Grenadines after being “smarted”.



## Awareness about climate change impacts on health



- More than 4,300 people enrolled, from 34 countries worldwide (status in July 2017)
- Course being updated, and an English version is being developed

<https://mooc.campusvirtualsp.org/enrol/index.php?id=6>

## Breathe Life Campaign 2030

- Air contamination is responsible for 1 in 9 deaths, and responsible for 7 million **preventable** deaths a year
- Only 12% of the cities have air quality levels following WHO's guidelines
- Reducing 'short-lived climate pollutants' – SLCPs (e.g. ozone, black carbon, methane) improves local air quality immediately and promotes benefits for the climate, globally
- How? Through intersectoral cooperation: e.g. sustainable transportation systems, stimulating healthy lifestyles, increasing green urban spaces



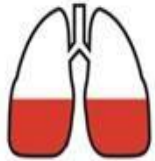
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### EL ASESINO INVISIBLE

Puede que no siempre se perciba, pero la contaminación atmosférica puede resultar letal.



**36%**

DE LAS MUERTES POR  
**CÁNCER DE  
PULMÓN**



**34%**

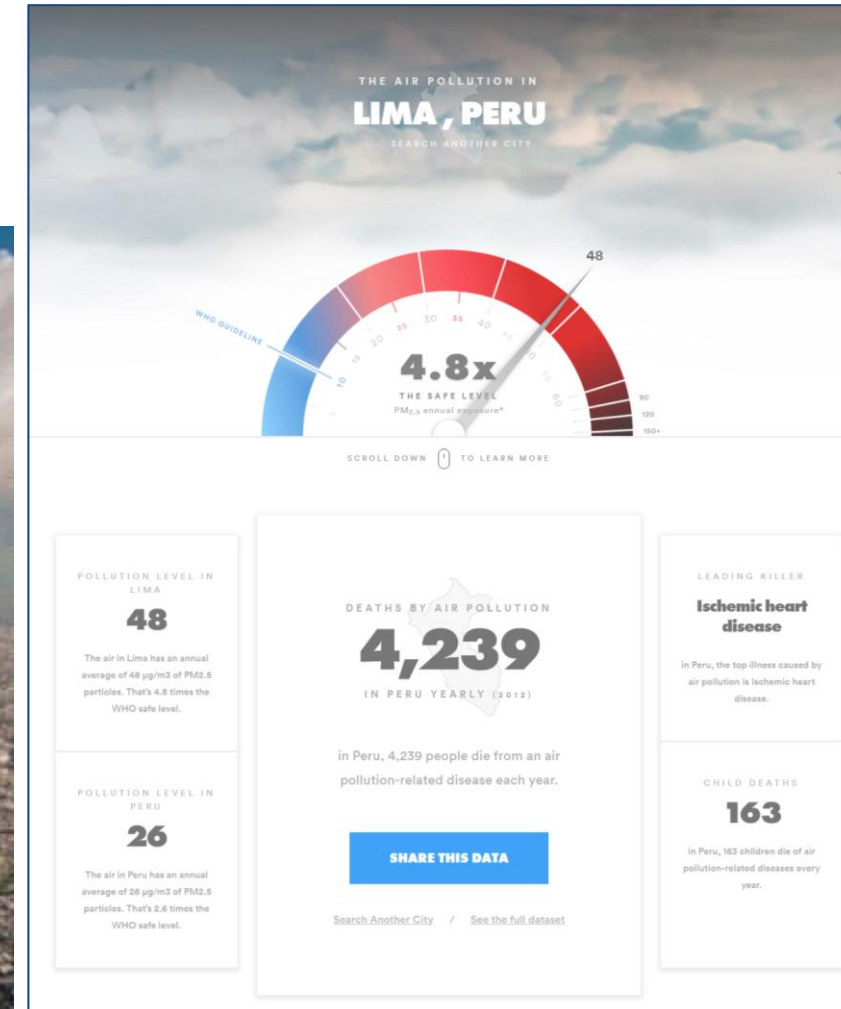
DE LAS MUERTES POR  
**ACCIDENTE  
CEROBROVASCULAR**



**27%**

DE LAS MUERTES POR  
**CARDIOPATÍAS**

**BREATHELIFE.**  
Aire limpio, futuro saludable.





# Tracking the achievement of the SDGs

Sign up for WHO updates



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## Global Health Observatory (GHO) data

Global Health Observatory data

Data repository

Reports

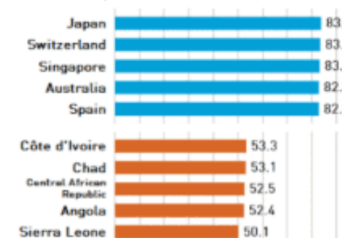
Country statistics

Map gallery

Standards

## World Health Statistics 2016: Monitoring health for the SDGs

### Life Expectancy at Birth, 2015 Top and Bottom 5 countries



The World Health Statistics series is WHO's annual compilation of health statistics for its 194 Member States. World Health Statistics 2016 focuses on the proposed health and health-related Sustainable Development Goals (SDGs) and associated targets. It represents an initial effort to bring together available data on SDG health and health-related indicators. In the current absence of official goal-level indicators, summary measures of health such as (healthy) life expectancy are used to provide a general assessment of the situation.

- [Read the report](#)
- [Read the news release](#)

World Health Statistics 2016

World Health Statistics 2016:  
Monitoring health for the SDGs

Data visualizations dashboard

### Download the report by chapter

Download Cover, contents, executive summary, abbreviations and introduction pdf, 106kb



The 2030 Agenda – a new impetus for health monitoring pdf, 74kb



Implications of the SDGs for health monitoring – a challenge and an opportunity for all countries pdf, 110kb

### Annexes



Annex A: Summaries of the SDG health and health-related targets – PDF format

[http://www.who.int/gho/publications/world\\_health\\_statistics/2016/en/](http://www.who.int/gho/publications/world_health_statistics/2016/en/)

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Thank you