The Role of the Health Sector in an Era of Climate Change

10th Philippine National Health Research System Week Celebration
August 10, 2016 Puerto Princesa, Palawan

Ayesa L. Enrile
Environmental Health Campaigner
Health Care Without Harm - Asia

Health Care Without Harm

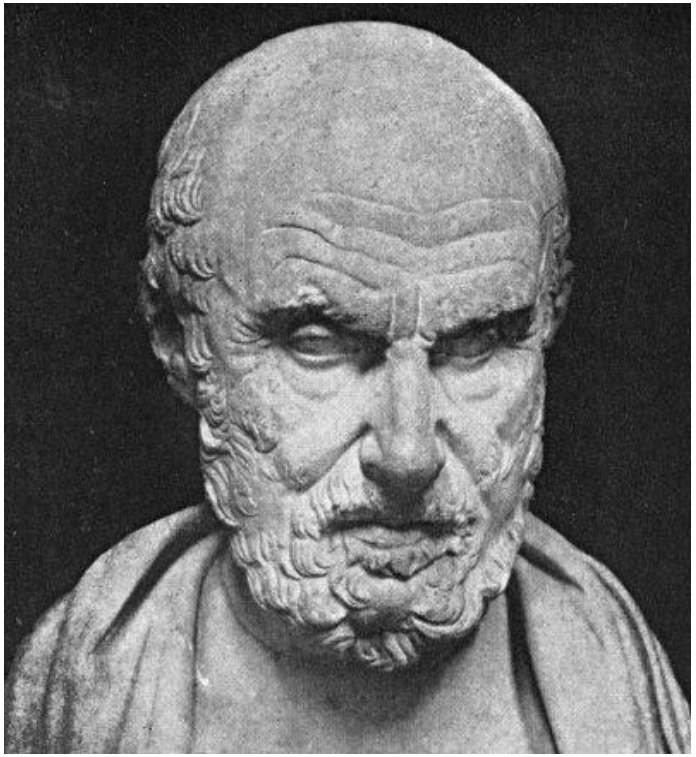
An international environmental and health organization working to transform the health care sector worldwide to become **ecologically sustainable** and a **leading advocate** for **environmental health and justice.**

Two core principles -

- **The right to health**
- **The right to a healthy environment**

*"The physician must ... have two special objects in view with regard to disease, namely, to do good or to **do no harm**..."*

Hippocrates, *Epidemics*



On Air, Water, and Places

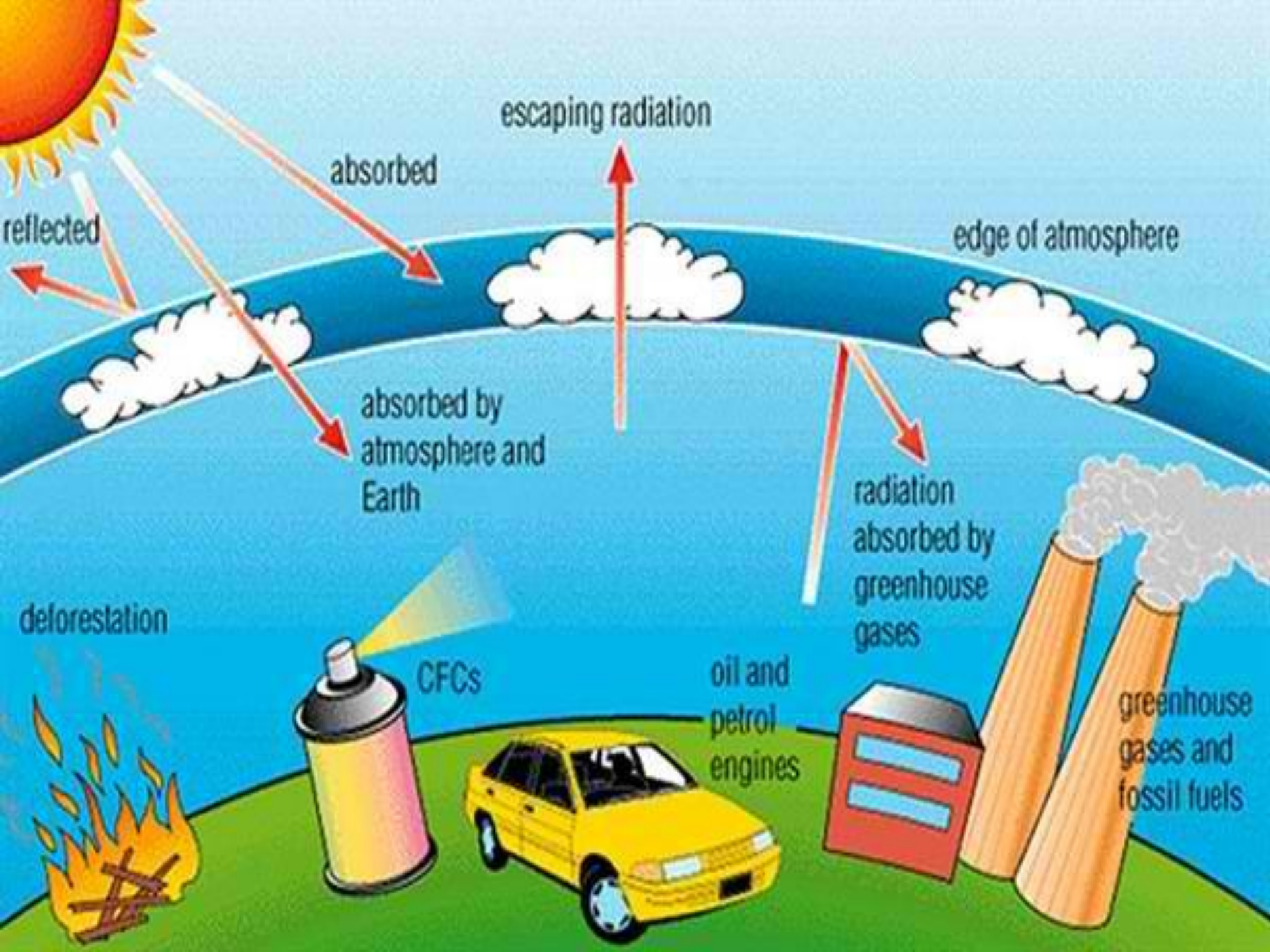
By Hippocrates
Father of Medicine

*Whoever would study medicine aright must learn of the following subjects. First he must consider the effect of the **seasons** of the year and the differences between them. Secondly he must study the **warm and the cold winds**, both those which are in common to every country and those peculiar to a particular locality. Lastly, the effect of **water** on health must not be forgotten.*

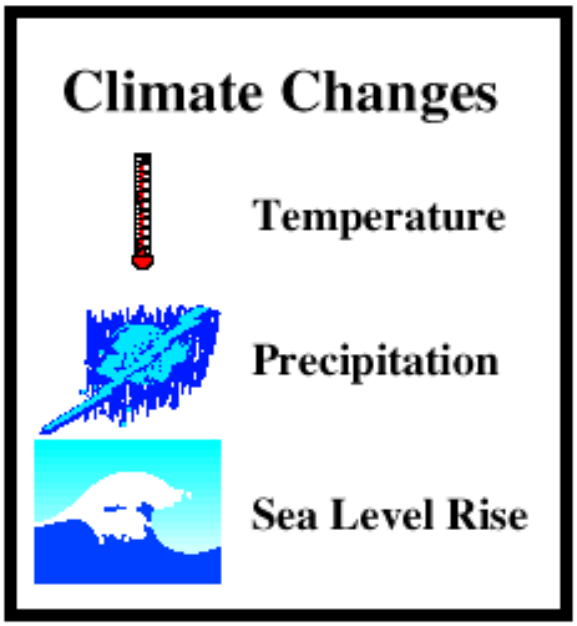
Climate Change

Change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.

UN Framework Convention on Climate Change


escaping radiation
absorbed
reflected
edge of atmosphere
absorbed by atmosphere and Earth
radiation absorbed by greenhouse gases
deforestation
CFCs
oil and petrol engines
greenhouse gases and fossil fuels

Potential Climate Change Impacts



Health Impacts

Weather-related Mortality
Infectious Diseases
Air Quality-Respiratory Illnesses

Agriculture Impacts

Crop yields
Irrigation demands

Forest Impacts

Change in forest composition
Shift geographic range of forests
Forest Health and Productivity

Water Resource Impacts

Changes in water supply
Water quality
Increased Competition for water

Impacts on Coastal Areas

Erosion of beaches
Inundate coastal lands
Costs to defend coastal communities

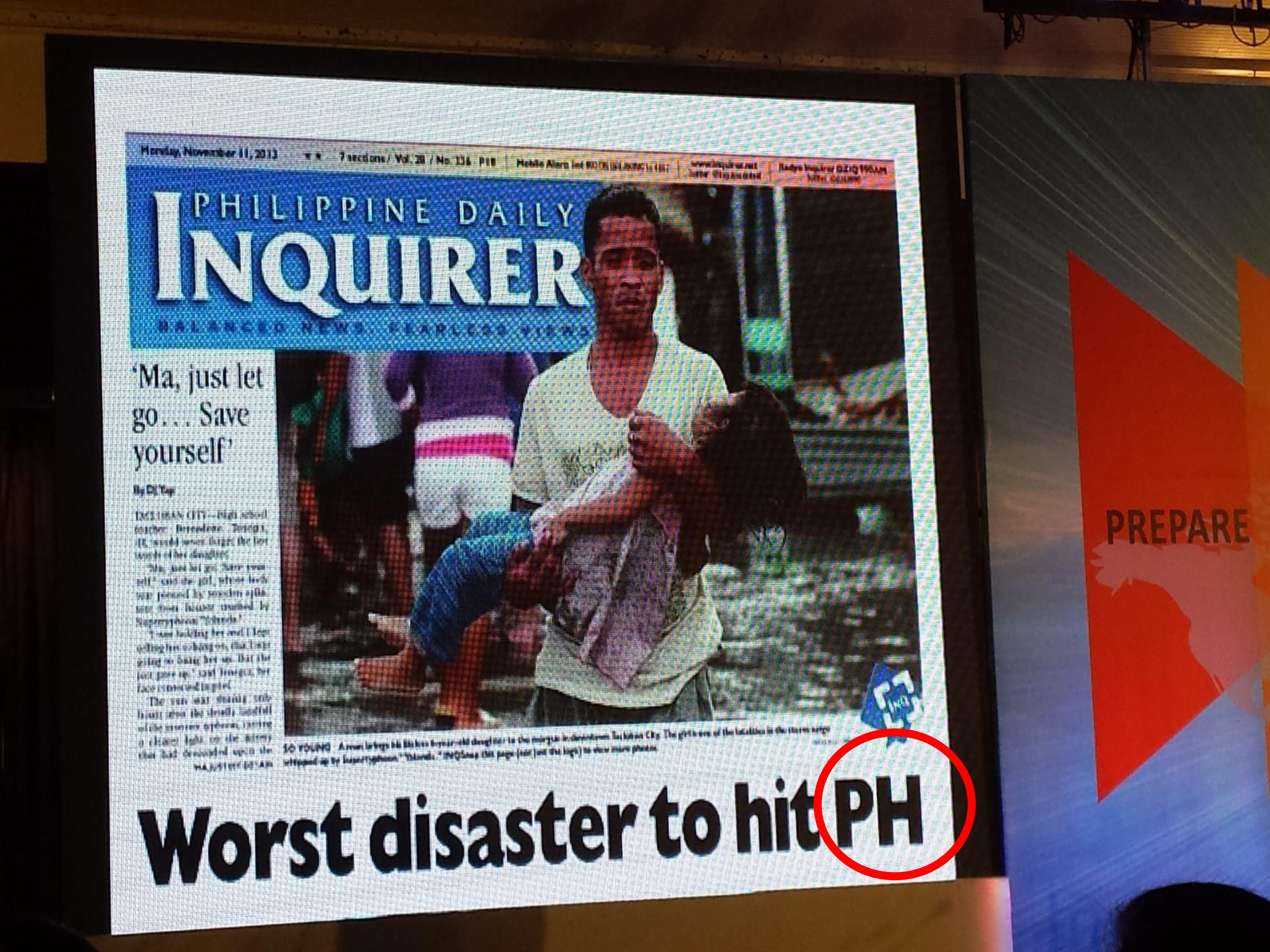
Species and Natural Areas

Shift in ecological zones
Loss of habitat and species

EPA

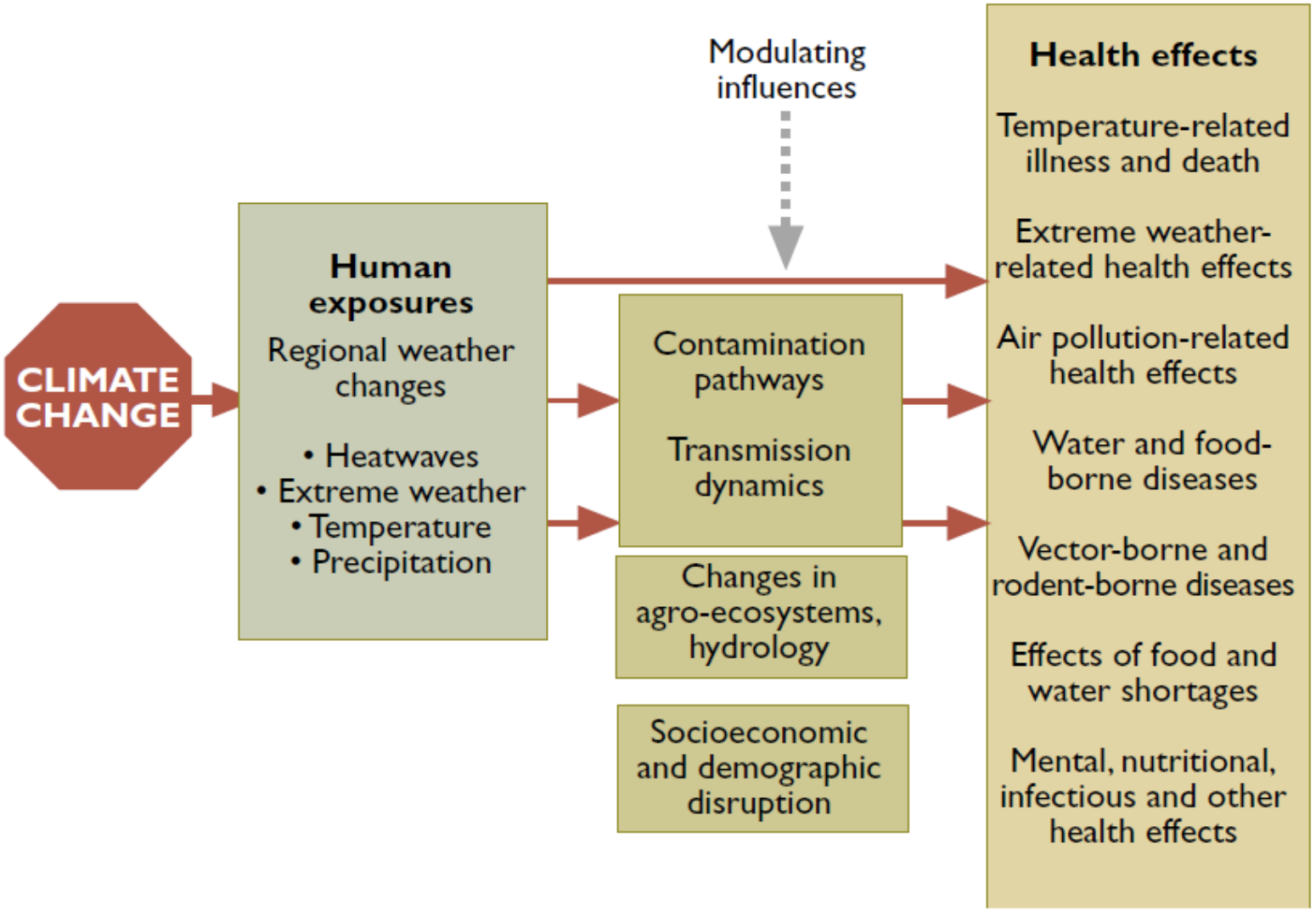

3 in the
World Risk Index, 2013
6 in the
Climate Change Risk Index, 2012

HELP
FOOD
WATER



Monday, November 11, 2013
PHILIPPINE DAILY
INQUIRER
'Ma, just let go.... Save yourself'
By DJ Yap
Worst disaster to hit PH
PREPARE

Health impacts of climate change



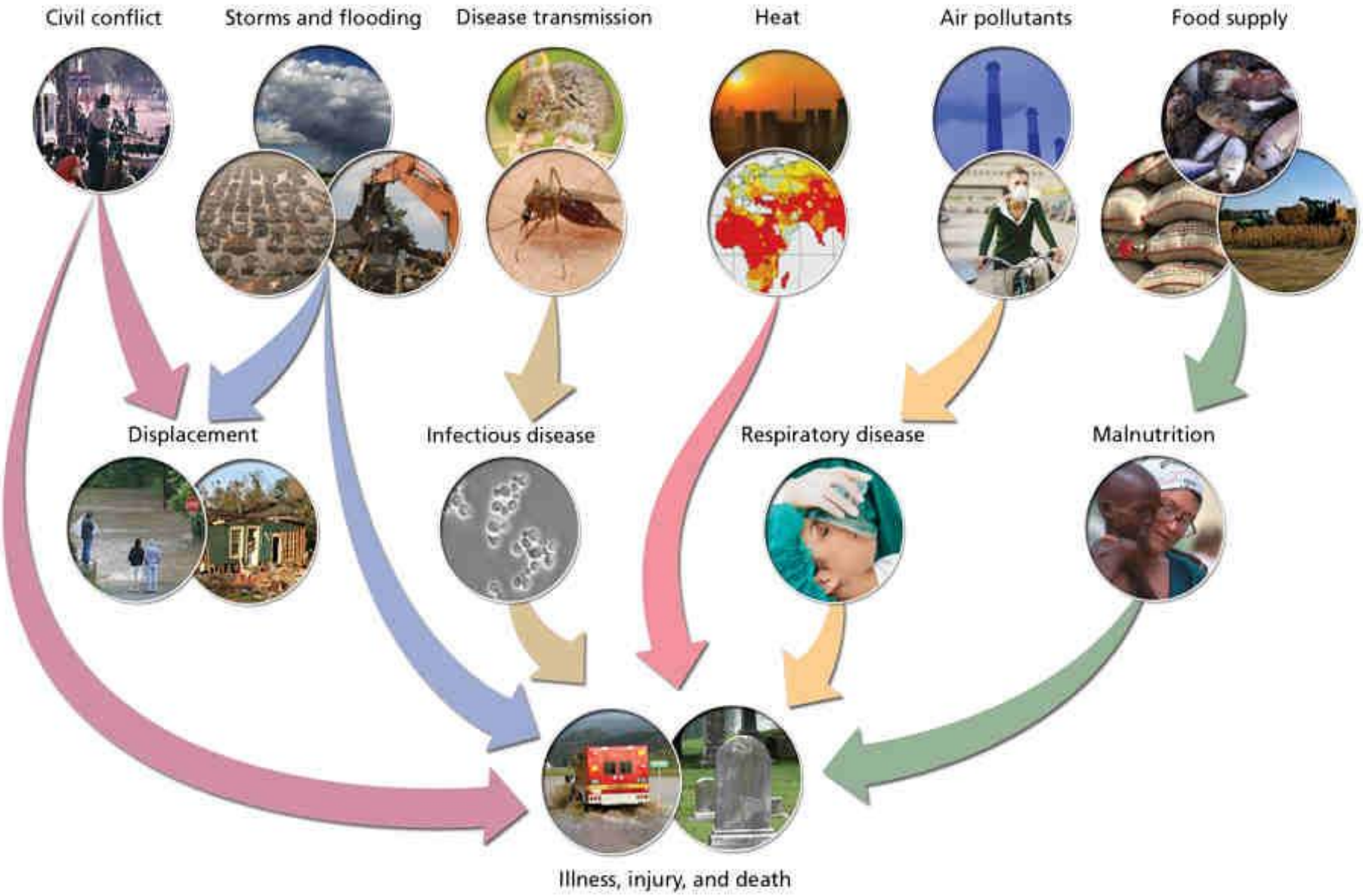

THE LANCET
www.thelancet.com
"Climate change is the biggest global health threat of the 21st century."
See The Lancet Commissions page 1593
Comment
Correspondence
Articles
Articles
The Lancet Commissions


THE LANCET
June, 2015
www.thelancet.com
Health and climate change
"Tackling climate change could be the greatest global health opportunity of the 21st century."
A Commission by The Lancet

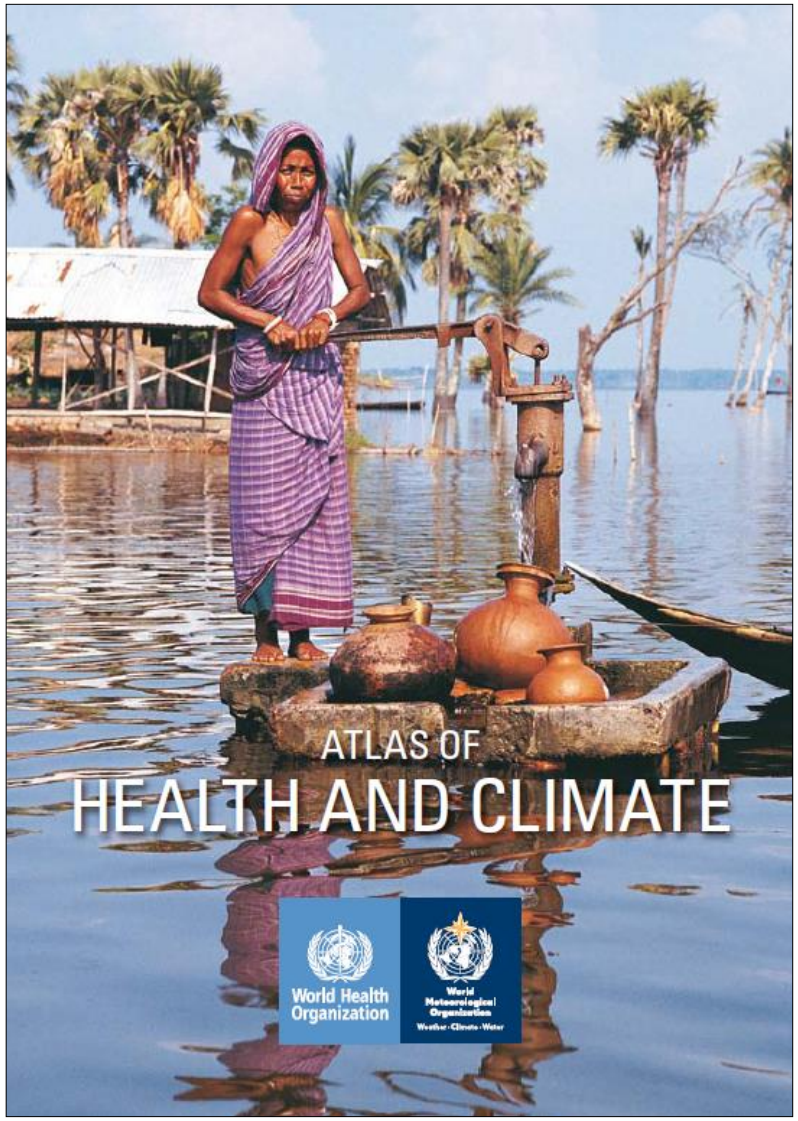
Lancet Commission, 2015

- 2009 conclusions on health impacts not changed and may have even been underestimated
- Climate change will threaten 50 years of gains in global health and development
- Policy responses to climate change with health co-benefits:
  - Rapid phase out of coal-fired plants to protect cardiovascular and respiratory health
  - Encourage a transition to cities that support and promote healthy lifestyles
- The health community has a vital part to play in accelerating progress to tackle climate change, as it did with tobacco and public sanitation

Pathways to Health Effects of Climate Change

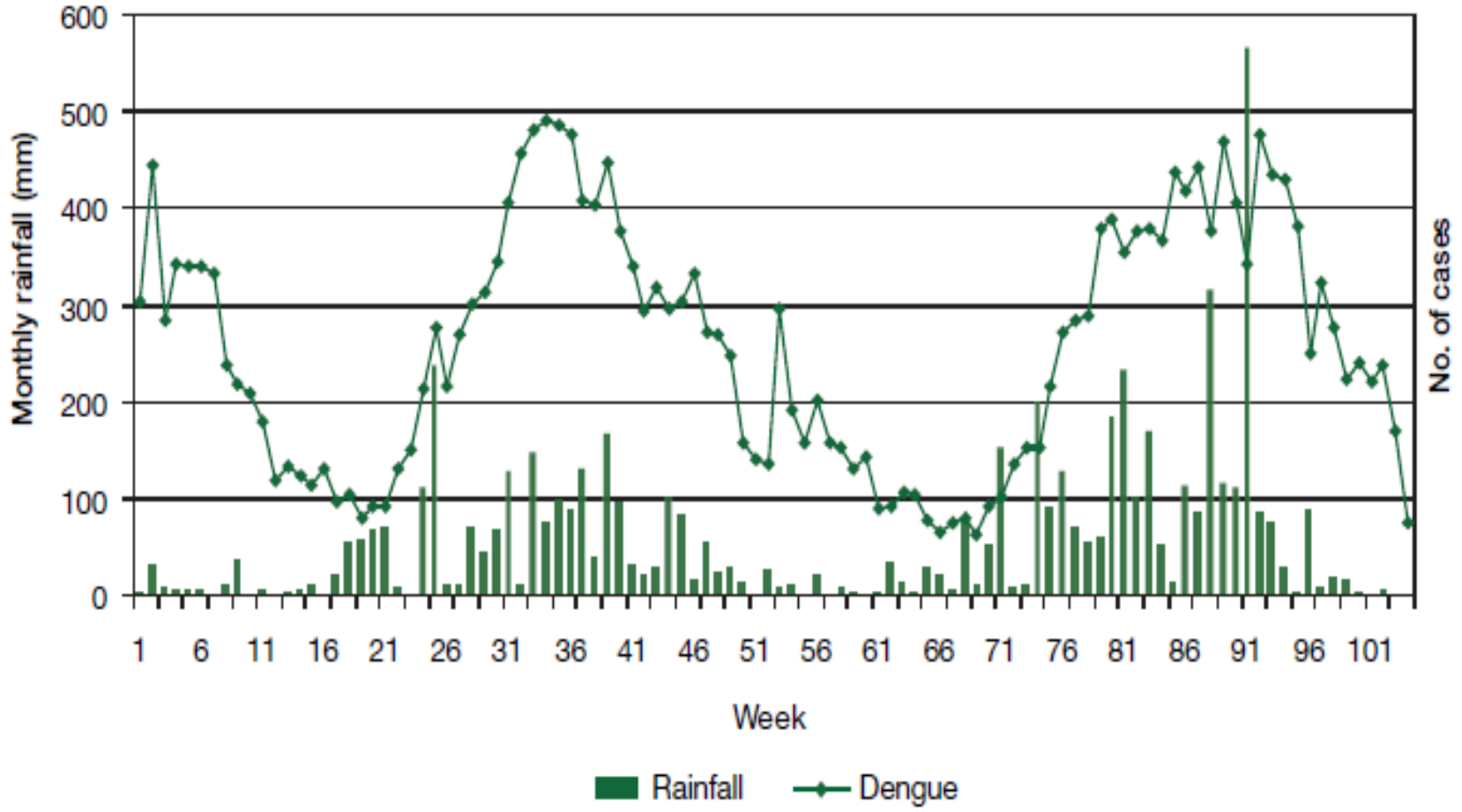


Climate Change and Human Health



- Malaria
- Diarrhea
- Meningitis
- Dengue Fever
- Floods and Cyclones
- Drought
- Airborne Dispersion of Hazardous Materials
- Heat Stress
- UV Radiation
- Pollens
- Air Pollution

Figure 3 Monthly Rainfall and Number of Cases of Dengue Fever in the Philippines, 2008–2009



mm = millimeter, no. = number.

Sources: Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) and Department of Health, Philippines.

Source: ADB

Presentation from the Climate Change Consciousness Week Event
Function Rooms 1 & 2, SMX Convention Center, Pasay City
November 21-22, 2011

National Framework Strategy on Climate Change

CLIMATE CHANGE

- Increasing temperatures
- Changing rainfall patterns
- Sea level rise
- Extreme weather events

CLIMATE PROCESS DRIVERS

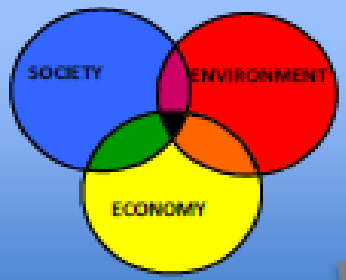
- Energy
- Transport
- Land Use Change & Forestry
- Agriculture
- Waste

IMPACTS & VULNERABILITY

- Ecosystems (River Basins, Coastal & Marine, Biodiversity)
- Agriculture and food security
- Water resources
- HUMAN HEALTH
- Infrastructure
- Energy
- Human society

VISION:
A climate risk-resilient Philippines with healthy, safe, prosperous and self-reliant communities, and thriving and productive ecosystems

SUSTAINABLE DEVELOPMENT



MITIGATION

- Energy Efficiency & Conservation
- Renewable Energy
- Environmentally-Sustainable Transport
- Sustainable Infrastructure
- National REDD+ Strategy
- Waste Management

ADAPTATION

- Enhanced Vulnerability and Adaptation Assessments
- Integrated Ecosystem-Based Management
- Climate-Responsive Agriculture
- Water Governance &Management
- Climate-Responsive Health Sector
- Disaster Risk Reduction &Management
- Climate-proofing of Infrastructure

CROSS-CUTTING STRATEGIES

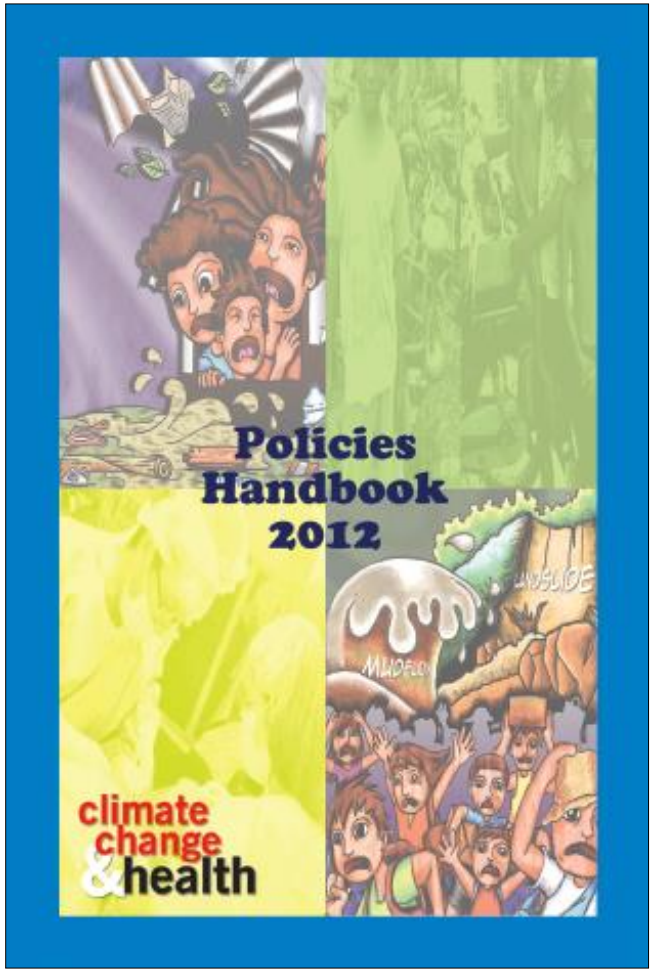
Capacity Development | Knowledge Management | IEC and Advocacy | Gender Mainstreaming | Research and Development Technology Transfer

MEANS OF IMPLEMENTATION

Multi-stakeholder Partnerships | Financing | Valuation | Policy, Planning and Mainstreaming

Source: Dr. Gatan-Magturo, Department of Health

The Philippine health sector has been doing health-related climate efforts



- Department Circular: Adaptation of Climate Change Framework for Health
- Philippine Strategy on Climate Change Adaptation for the Health Sector
- DOH Department Personnel Order No. 2010 – 2977: Creation of a Technical Committee for Climate Change and Health
- DOH Administrative Order No. 005 S. 2012: National Policy on Climate Change Adaptation for Health Sector
- DOH Department Personnel Order No. 2011 – 2458: Creation of a Climate Change Unit

Be part of SPEED!

You can partner with the Department of Health and help SPEED save more lives through initiatives like:

Policy support

Implement SPEED as part of the LGU's early warning system, in accordance with the health information management provisions of Republic Act 10121 (the Philippine Disaster Risk Reduction and Management Law), to hasten the determination of the health conditions and needs of their disaster-affected constituencies

Infrastructure support

Improve telecommunications connectivity of barangays, municipalities, cities, provinces, and regions.

Equipment assistance

Provide the necessary communications hardware for SPEED implementation, especially in health centers and other health facilities.

Human resource / Advocacy / Training support

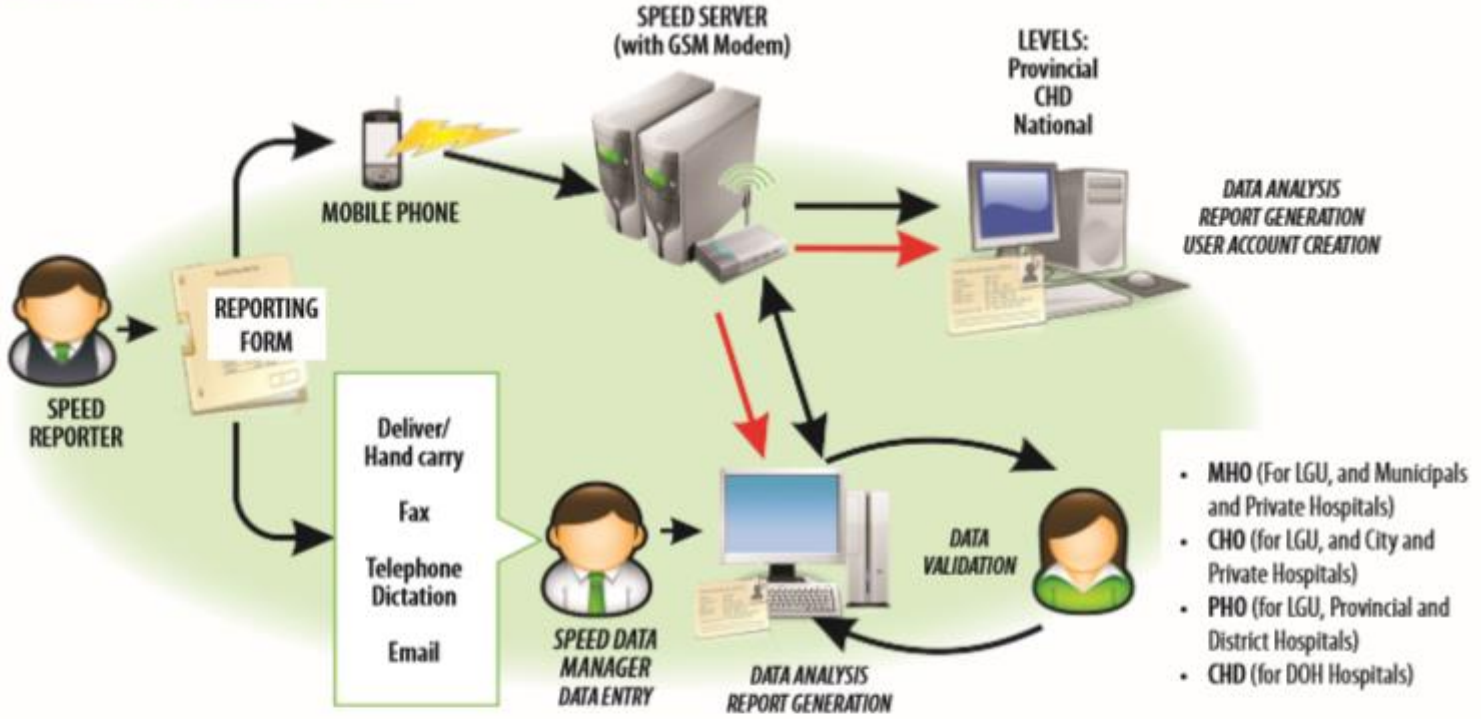
Support trainings and actual use of SPEED in disaster-prone and disaster-affected areas

A COLLABORATION OF:

Department of Health –
Health Emergency Management Staff
and
World Health Organization

SURVEILLANCE IN POST EXTREME EMERGENCIES AND DISASTERS

How does SPEED work?



Note: **MHO** = Municipal Health Office; **CHO** = City Health Office; **PHO** = Provincial Health Office; **LGU** = Local Government Unit; **CHD** = Center for Health Development (DOH regional office); → signifies the sending of Immediate Notification Alert when health conditions with high epidemic potential are seen in health facilities.

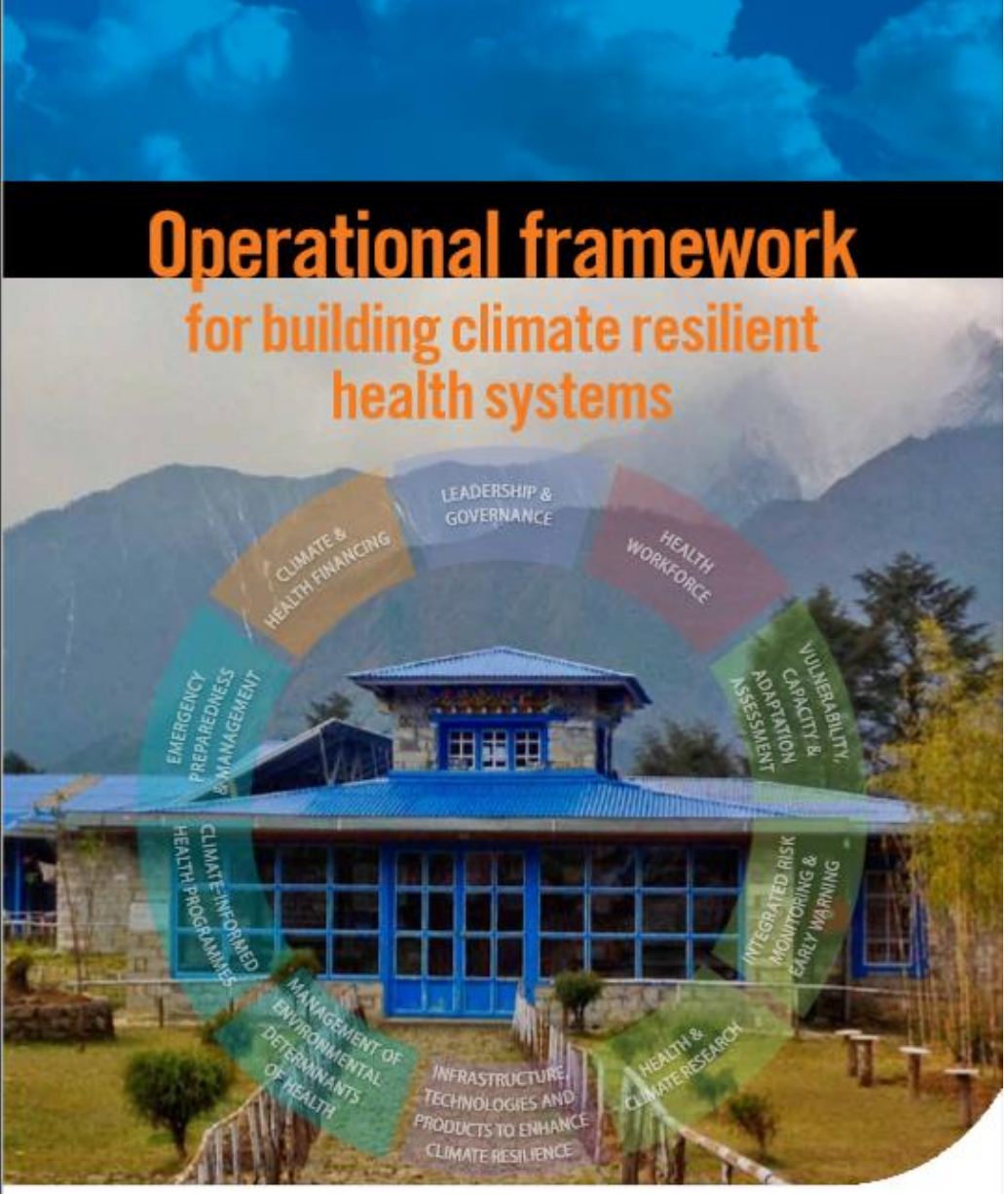
Virtually real-time snapshot of the health status of the affected population

\+

Health information available to stakeholders

=

SPEED, a powerful tool for health emergency managers to prevent or minimize the loss of lives

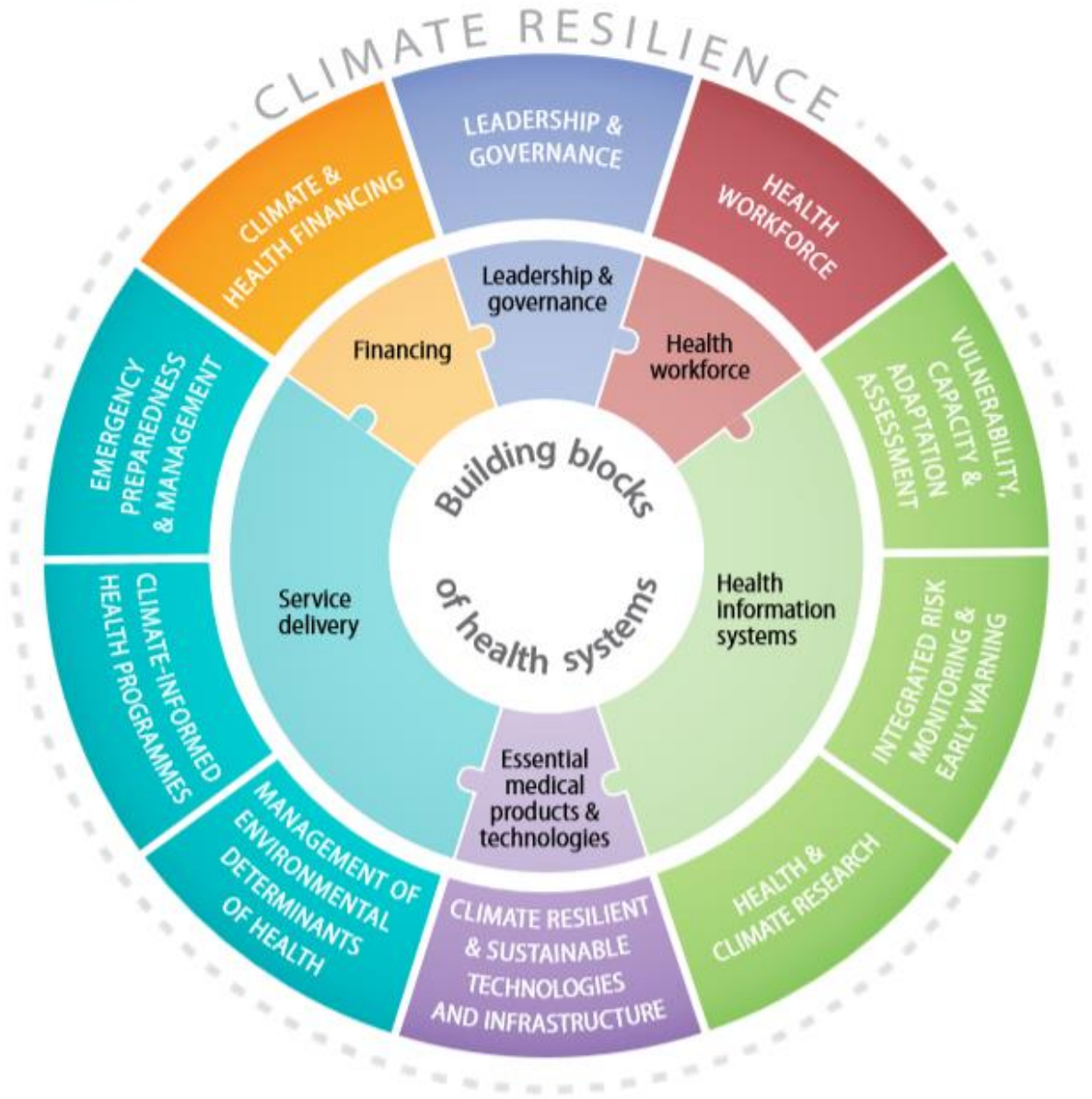


Climate Resilient Health System

One that is capable to anticipate, respond to, cope with, recover from and adapt to climate-related shocks and stress, so as to bring sustained improvements in population health, despite an unstable climate

World Health Organization

FIGURE 3: **Ten components comprising the WHO operational framework for building climate resilient health systems, and the main connections to the building blocks of health systems**



Component	Some Measurable Outputs
Leadership and Governance	C&H focal point/task force; C&H strategy; Cross-sectoral body/inter-agency committee
Health Workforce	Training courses; Contingency plans for deployment; Risk communication capacity
Vulnerability, capacity and adaptation assessment	Baseline of health conditions and existing resources; Identification of vulnerable groups and risks
Integrated risk monitoring and early warning	Early detection and warning; Indicators for surveillance; Periodic reviews
Health and climate research	Research agenda; Access to data; Multidisciplinary research partnerships; Research funding; Evidence to policy

Component	Some Measurable Outputs
Sustainable technologies and infrastructure	Health facilities, energy, water, and sanitation adapted to climate risks; Steady pharmaceutical supply; eHealth; Sustainable design; Green procurement
Management of environmental determinants of health	Integrated monitoring; Strengthening regulations adapted to extreme climatic conditions; Coordinated management
Climate-informed health programmes	Disease programs to consider climate-related stresses; Risk maps; Analysis of seasonal trends; Contingency plans
Emergency preparedness and management	Risk assessments; Contingency plans; Emergency response plans; Community empowerment
Climate and health financing	Climate-tagging; Climate-sensitive universal health coverage

The health sector environmental footprint

Greenhouse gas emissions

- NHS-England represents 25% of the public sector carbon footprint
- U.S. health care industry represents 8% of their carbon footprint nationally

The incineration of medical waste

- Source of dangerous air pollutants: dioxin (carcinogen and endocrine disruptor) and mercury (neurotoxicant, retards development, intelligence)

The use of hazardous chemicals indoors

- Contributes to the high rates of asthma among health care workers
- Reproductive hazards, carcinogens, mutagens

The huge scale of the health care sector results in unhealthy practices

- Poor waste management
- Use of toxic chemicals
- Unhealthy food choices
- Reliance on polluting technologies

From Health Impact to Health Sector Impact

A Four-Point Agenda for Health and Climate

	Adaptation	Mitigation
WITHIN	Build resilient health systems	Reduce health sector's ecological footprint
BEYOND	Monitor the health impacts of climate change	Advocate for mitigation measures for health co-benefits

A FUTURE VISION
Toward Regenerative Health Care

Hospitals can not only sustain life and health, but also repair and restore what has been degraded or lost

Global Green and Healthy Hospitals | Agenda Goals

Leadership

Prioritize environmental health as a strategic imperative

Chemicals

Substitute harmful chemicals with safer alternatives

Waste

Reduce, treat and safely dispose of healthcare waste

Energy

Implement energy efficiency and clean, renewable energy generation.

Water

Reduce hospital water consumption and supply potable water

Transportation

Improve transportation strategies for patients and staff

Food

Purchase and serve sustainably grown, healthy food

Pharmaceuticals

Prescribe appropriately, safely manage and properly dispose of pharmaceuticals

Buildings

Support green and healthy hospital design and construction

Purchasing

Buy safer and more sustainable products and materials

Saint Paul de Chartres Health Care Ministry, Philippines

16-hospitals owned and administered all over the country

- Mercury substitution
- Hospital waste management
- Medical waste management
- Waste water management
- Ozonized laundering
- Vermicomposting
- Biodigester
- Solar energy
- Trash to works of art


MARIA REYNA - XAVIER UNIVERSITY HOSPITAL
Archbp. Hayes OPD
Social Services
PARKING SPACE FOR DOCTORS


SEDNA AIRE

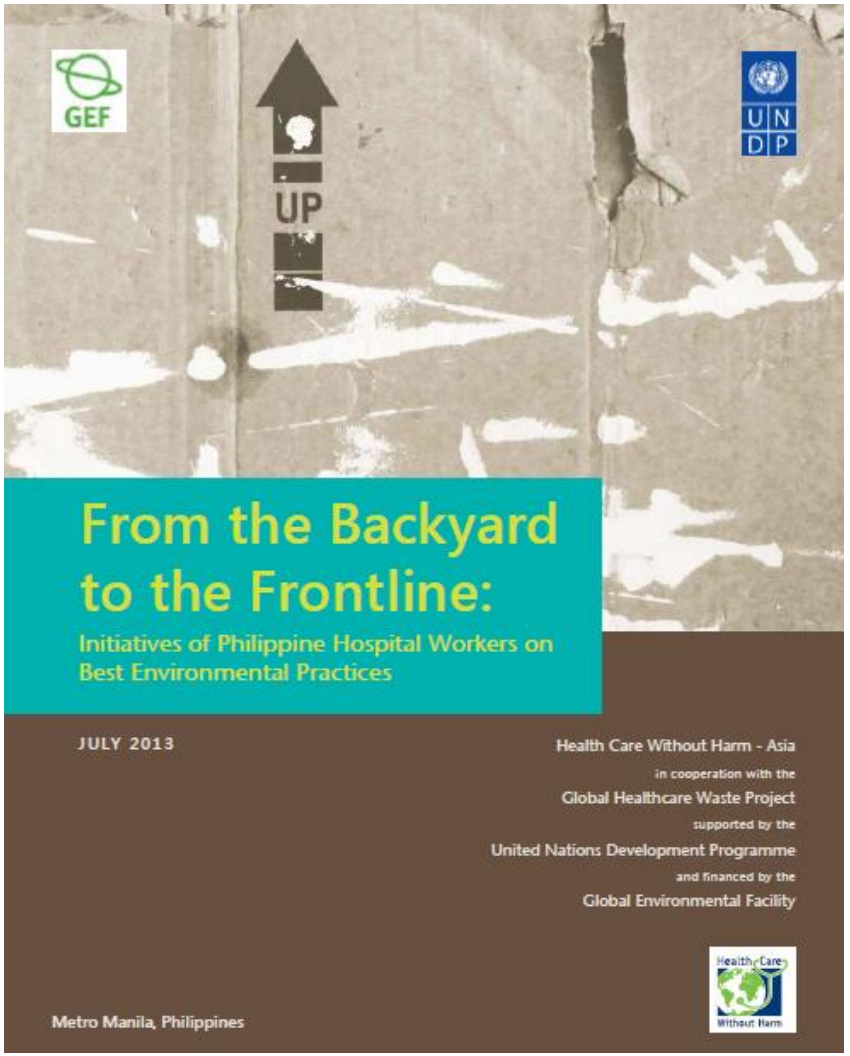

BIO-GAS
AREA
DATE
QTY.
UNIT


The first hospital in the
Philippines to use
SOLAR AND WIND
(RENEWABLE)
ENERGY SYSTEMS (152 KW)
CALAMBA DOCTORS HOSPITAL
CALAMBA DOCTORS HOSPITAL
CDH
1994

Good Practices in Philippine Hospitals

- Waste management
- Chemicals management
- Mercury phase-out
- Waste Water Treatment
- Safer alternatives
- Hospital biodigester

http://web.undp.org/gef/document/From%20the%20Backyard%20to%20the%20Frontline.pdf



Yonsei University Health System

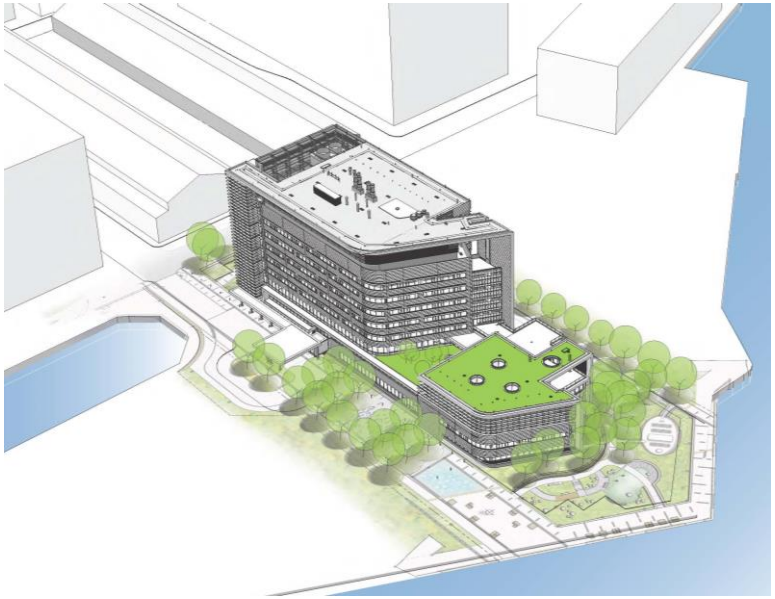
Annual energy savings: 1,901,686,000 won

- Replaced old heating/air conditioning equipment with highly effective/efficient facilities
- Changed all lights at fire exits to LED
- Switched to high efficiency transformer at the Cardiovascular Hospital
- Increased thermal efficiency of boiler and refrigerators
- Installed solar powered streetlights
- Controlled the supply of air conditioning and heating during summer/winter seasons
- Distributed energy reduction guide and regulations
- Air conditioning system renovations

Partners HealthCare (U.S.)

25% reduction in energy consumption
over 5 years on a $100m U.S. annual energy bill

- 230 energy conservation measures
  - Energy reduction of 25%
  - Implementation cost: $61M
  - Average payback 3.7 years
  - 27% annual ROI
- Annual pollutant reduction resulting from
  the energy conservation measures:
  - 21.6 tons of sulfur dioxide, 5 tons of nitrous oxide, 6,332 tons of carbon dioxide and 0.15 tons of mercury.



Hospital Fernandez, Buenos Aires, Argentina

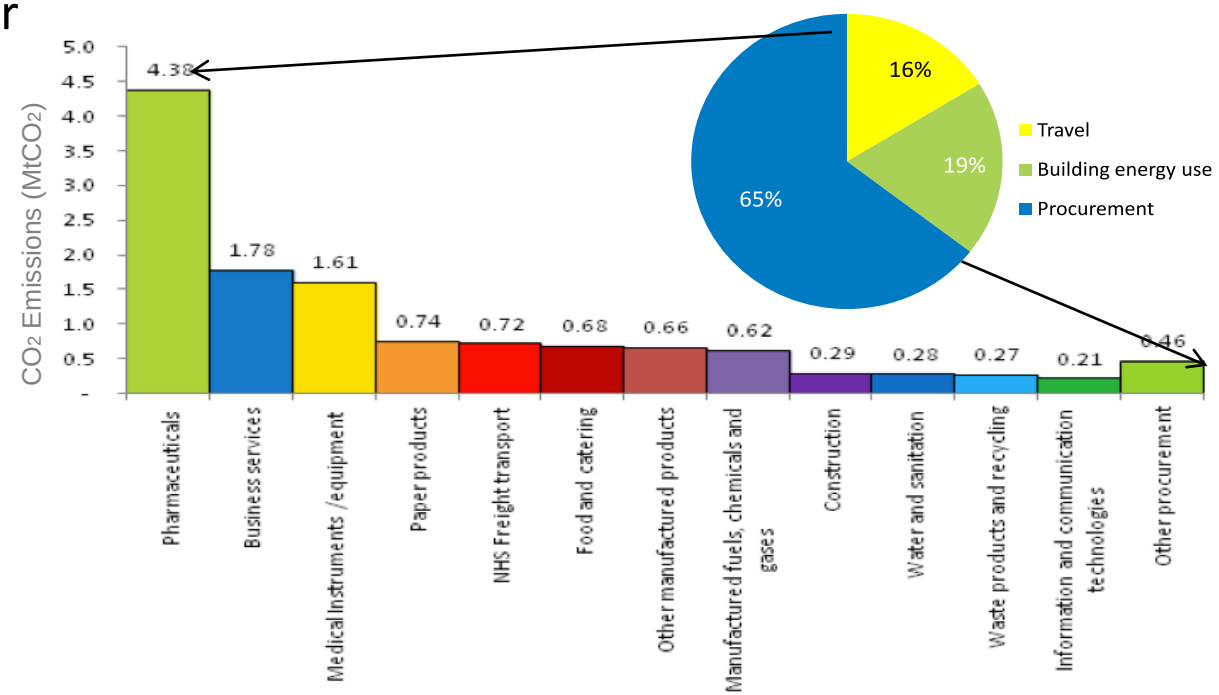
- 400 bed public hospital
- Mercury-free
- Substituting dental amalgam in most cases
- Eliminated hazardous chemicals
  - DEHP-PVC, BPA, glutaraldehyde
- Green cleaning

UK National Health Service (NHS)

Footprint:
18 million tons of CO2 per year, 26% of public sector emissions

CO2 Reduction Targets

- 10% by 2015
- 26% by 2020
- 80% by 2050



Hospital CLVV, San Ramon, Costa Rica

- Mercury free
- Green purchasing policy
- Onsite waste water treatment plant
- Worm composting for food waste
- Butterfly garden for patients and staff
- Waste segregation and autoclaving
- Paper, glass and electronics recycling
- Energy conservation
- Green garden management
- Environmental education for the community

From Health Impact to Health Sector Impact

A Four-Point Agenda for Health and Climate

	Adaptation	Mitigation
WITHIN	Build resilient health systems	Reduce health sector's ecological footprint
BEYOND	Monitor the health impacts of climate change	Advocate for mitigation measures for health co-benefits

INQUIRER.net

UN lauds Philippines' climate change laws 'world's best'

Michael Lim Ubac
@inquirerdotnet

Philippine Daily Inquirer 2:33 AM | Friday, May 4th, 2012

The country's laws on climate change adaptation (CCA) and disaster risk reduction (DRR) are the "best in the world," UN special envoy Margareta Wahlström said Thursday.

Wahlström, special DRR representative of UN Secretary General Ban Ki-moon, praised the Philippines for taking the lead in the global campaign to mitigate disaster risks brought about by global warming.

She commended Senator Loren Legarda, the UN Champion for DRR and CCA for Asia and the Pacific, for ensuring the passage of climate-responsive laws and for mainstreaming

An environmental crusader for two decades now,

'PH can rely on renewable energy as stable power source'

Rappler.com

Published 2:21 PM, Sep 07, 2014

Updated 7:27 PM, Feb 12, 2015

Petilla says the Philippines can rely on renewable energy in the face of fluctuating global oil prices and threats to energy security

HARVESTING SUNLIGHT. This is how the San Carlos Solar Farm will look like when its first phase is completed in March 2014. Photo from San Carlos Solar Energy Incorporated

ENVIRONMENT

Philippines commits to reduce carbon emissions by 70%

In its submission to the United Nations, the Philippines says the carbon emission reductions by the year 2030 will be taken from the energy, transport, waste, forestry, and industry sectors. But this target is conditional on aid.

Pia Ranada
@piaranada
Published 6:24 PM, October 01, 2015
Updated 11:22 AM, October 02, 2015


Coal Plants
17 old
25 new
71 new contracts

INDUSTRIES

Aquino inaugurates AboitizPower's P35-B Davao baseload power plant

President Aquino says while he is an advocate of developing renewable energy, 'right now, we cannot wean ourselves completely from relying on coal'

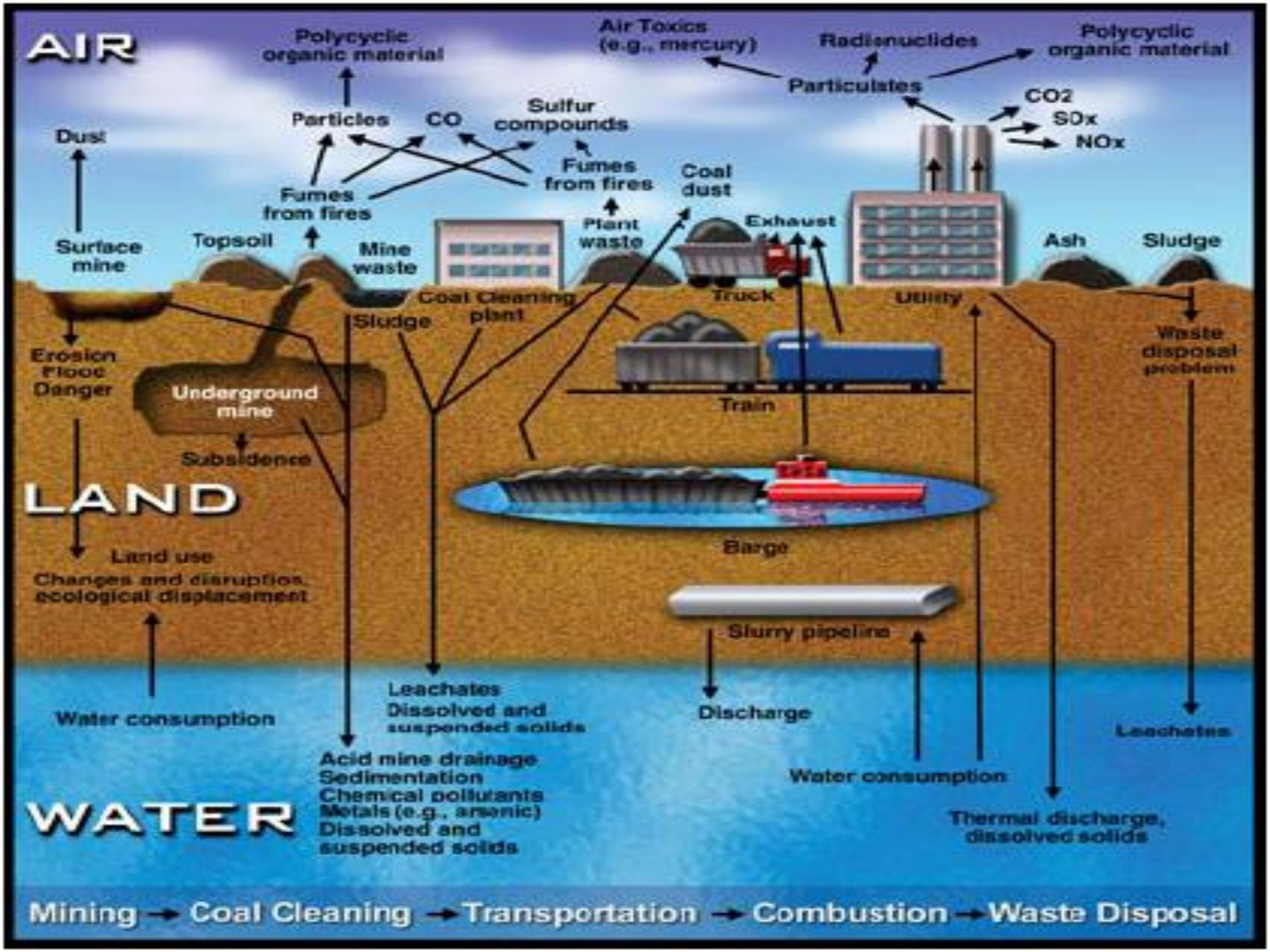
Naga City, Cebu

Limay, Bataan

Mariveles, Bataan

Masinloc, Zambales

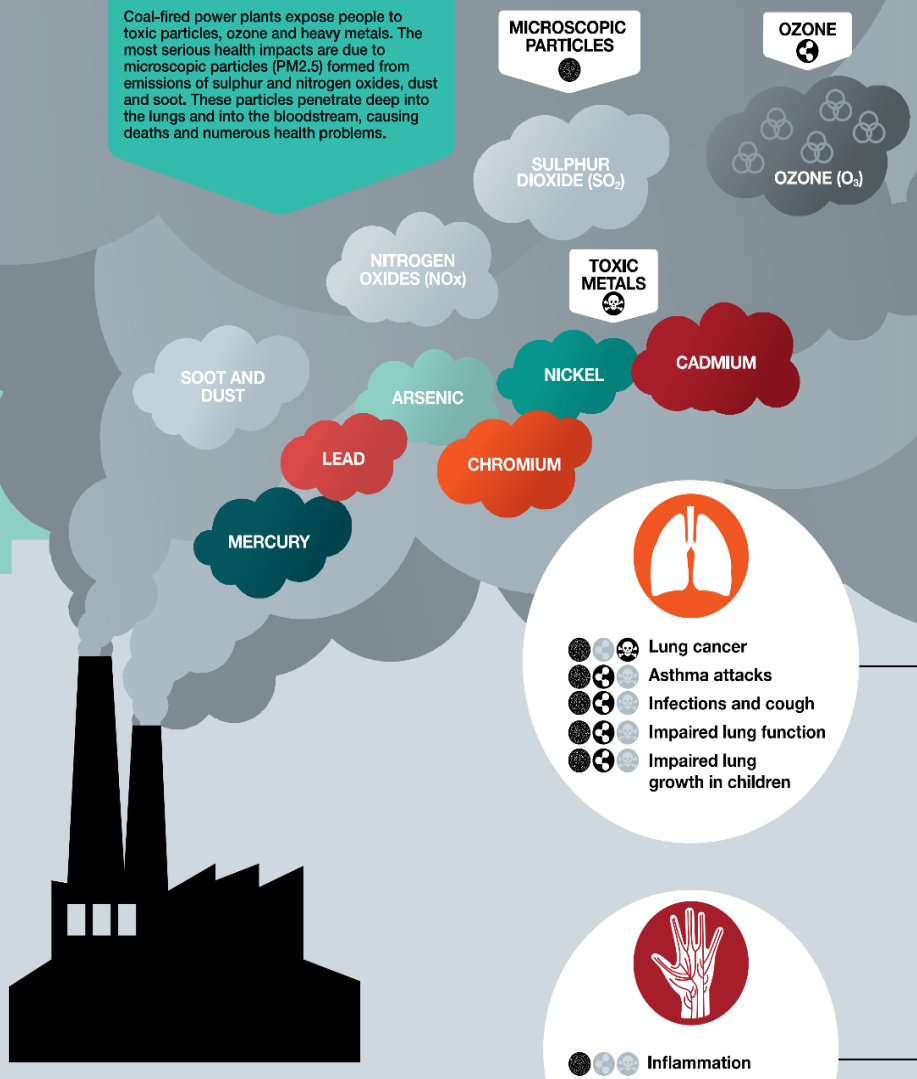

Health Care
Without Harm

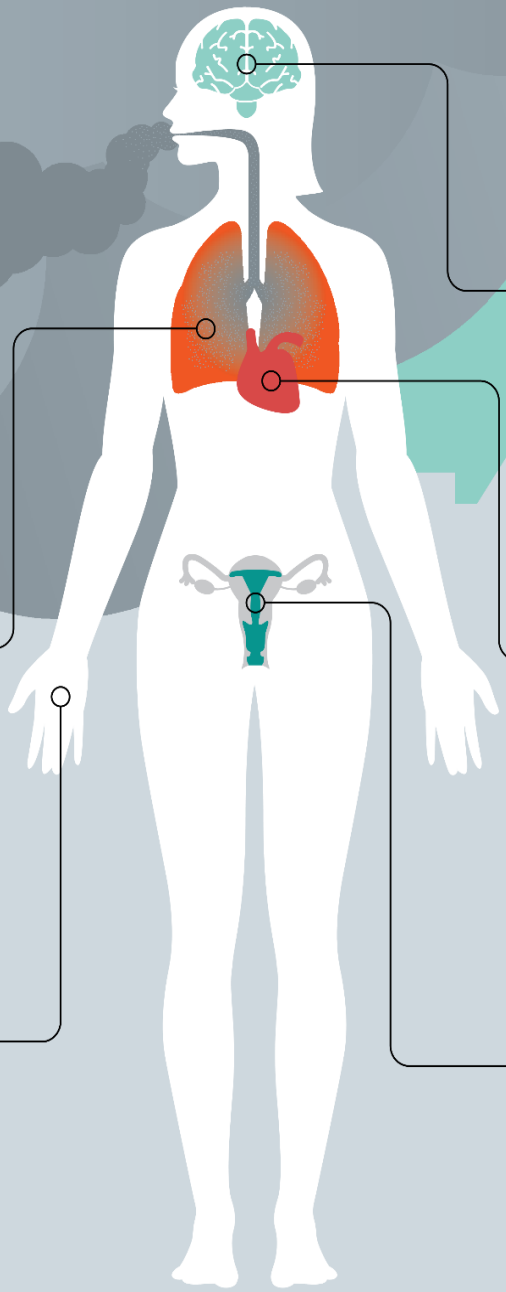

AIR
Polycyclic organic material
Air Toxics (e.g., mercury)
Radionuclides
Polycyclic organic material
Particulates
CO2
SOx
NOx
Particles
CO
Sulfur compounds
Dust
Fumes from fires
Fumes from fires
Coal dust
Plant waste
Exhaust
Surface mine
Topsoil
Mine waste
Coal Cleaning plant
Truck
Utility
Ash
Sludge
Sludge
Waste disposal problem
Erosion Flood Danger
Underground mine
Subsidence
Train
LAND
Barge
Land use
Changes and disruption, ecological displacement
Slurry pipeline
Water consumption
Leachates
Dissolved and suspended solids
Discharge
Leachates
Water consumption
Acid mine drainage
Sedimentation
Chemical pollutants
Metals (e.g., arsenic)
Dissolved and suspended solids
WATER
Thermal discharge, dissolved solids
Mining → Coal Cleaning → Transportation → Combustion → Waste Disposal

executive summary

How coal-fired power plants can make you sick

Coal-fired power plants expose people to toxic particles, ozone and heavy metals. The most serious health impacts are due to microscopic particles (PM2.5) formed from emissions of sulphur and nitrogen oxides, dust and soot. These particles penetrate deep into the lungs and into the bloodstream, causing deaths and numerous health problems.





- Stroke
- Decreased IQ
- Diseases of central nervous system

- Heart attack
- Heart rate variability
- Heart disease

- Lung cancer
- Asthma attacks
- Infections and cough
- Impaired lung function
- Impaired lung growth in children

- Inflammation
- Increased coagulation
- Blood pressure

- Lower birth weight
- Impaired foetal growth
- Premature birth
- Impaired mental and physical development
- Decreased sperm quality

KEY

- Particle pollution
- Ozone
- Toxic metals

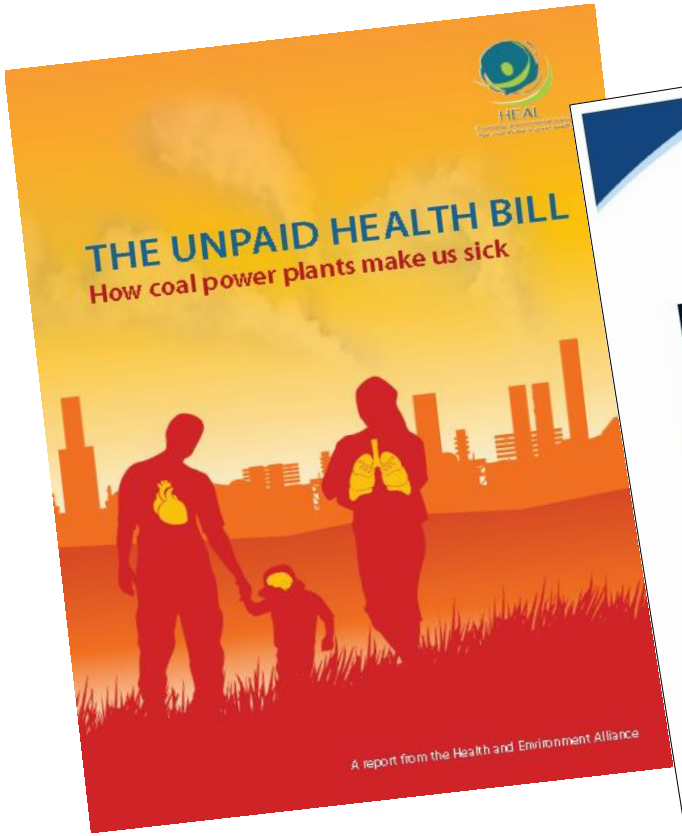
Source: Rückerl R et al (2011). Health effects of particulate air pollution: A review of epidemiological evidence. Inhalation Toxicology 23(10): 555–592; Pope III CA & Dockery DW (2006). Health Effects of Fine Particulate Air Pollution: Lines that Connect. J Air & Waste Manage. Assoc. 56:709 –742; US EPA: Six Common Air Pollutants. www.epa.gov/airquality/urbanair; US EPA: Integrated Risk Information System (IRIS). www.epa.gov/IRIS

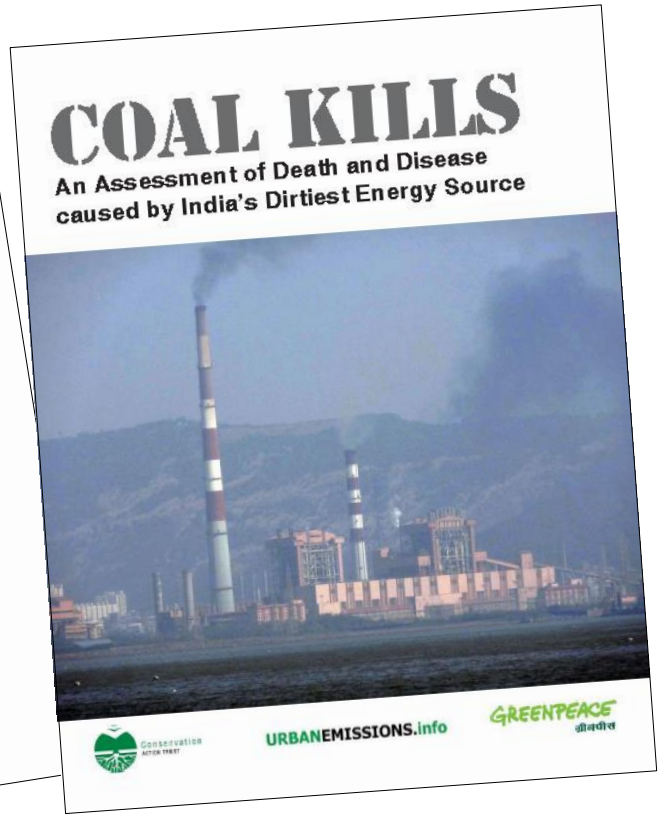
Ann. N.Y. Acad. Sci. ISSN 0077-8923

ANNALS OF THE NEW YORK ACADEMY OF SCIENCES
Issue: *Ecological Economics Reviews*

Full cost accounting for the life cycle of coal

Paul R. Epstein,[1] Jonathan J. Buonocore,[2] Kevin Eckerle,[3] Michael Hendryx,[4] Benjamin M. Stout III,[5] Richard Heinberg,[6] Richard W. Clapp,[7] Beverly May,[8] Nancy L. Reinhart,[8] Melissa M. Ahern,[9] Samir K. Doshi,[10] and Leslie Glustrom[11]





Philippines

Annually:

960 deaths

due to existing coal plants

2,410 deaths

due to existing + proposed coal plants

Health Care Without Harm-Asia: Deaths of workers in Semirara show that coal mining is a health risk too

Press Release posted on **July 21, 2015**

Contact: dianne

Asia | Tags: **coal, coal mining, Semirara**

The death of at least six coal mine workers in Se
mining is another health risk that cannot be igno
Without Harm-Asia.

As of July 20, three remain missing, believed to
result of a landslide. The Department of Energy
largest coal mine site.

"Most of the time, the impacts of coal combustion on human health, such as respiratory diseases resulting from air pollution, receive the greatest attention," stated Dr. Renzo Guinto, campaigner of HCWH-Asia's Healthy Energy Initiative. "However, we should not forget that the earlier phases in the life cycle of coal - such as mining and transport - also have their own health effects that need to be addressed."

Healthy Energy Initiative:
From Health Impacts to Health Sector Impact

- Educate and dialogue within our industry and communities
  - → Increase capacity within health sector
  - → Lend health expertise to community concerns
- Participate in and advocate for HIA and health economic evaluations
  - → Drive decision-making on projects & policies
  - → Further engage the health sector
- Call on policymakers to phase out fossil fuels and prioritize clean, renewable, healthy energy.
  - → Lend health evidence and health voices to energy decisions that affect health

Doha Declaration on Climate, Health and Wellbeing

DECLARATION | SIGN UP | PAST STATEMENTS AND PLEDGES | EVIDENCE AND REFERENCES | CONTACT | MORE...

Health must be central to climate action

COP18, December 2012

Organisations which have signed the Declaration (click to visit):

World Medical Association
International Council of

Health and medical organisations from around the world are calling for the protection and promotion of health to be made the one of the central priorities of global and national policy responses to climate change.

The protection of health and welfare is one of the central rationales for reducing emissions in Article One of the United Nations Framework Convention on Climate Change (UNFCCC). Article Four requires all countries to consider the health implications of climate adaptation and

How to sign up:

Individual?

SIGN PETITION

(Or click here)

Over 1200 signatories so far!

wfpha
WORLD FEDERATION OF PUBLIC HEALTH ASSOCIATIONS

The Kolkata Call to Action 2015

Healthy People – Healthy Environment

- Pledge to advocate for **strong and effective cuts to greenhouse gas emissions** through national and international agreements and programs, and will advocate for a strong and binding agreement in Paris in 2015
- Advocate for a **rapid phase out of coal for electricity production** and **greater investment in renewable energy technologies** as a significant investment in global health and healthy communities
- Commence action to **divest from any assets** held by all public health associations that include investment in fossil fuel projects or infrastructure

Shaping a Common Agenda for Climate, Energy, and Health

- Need for **locally-generated evidence** on climate change and its health impacts
- Reduce the health sector's **ecological footprint**
- Mainstreaming of **health impact assessment** in energy policies and projects
- Emphasize **health co-benefits** of climate mitigation measures including renewable energy transition
- Role of the health sector in **advocating for climate action and renewable energy**
- Promote **intersectoral action for health** – between health and other sectors


SENATE OF THE PHILIPPINES


energy
initiative
healthyenergyinitia
Through education, network-
building, collaborative research,
and advocacy, the Healthy
Energy Initiative is mobilizing
health sector to play a
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power generation—
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Initiative is c
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China, India,
South Africa
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Issue: *Ecological Economics Reviews*

Full cost accounting for the life cycle of coal

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Each stage in the life cycle of coal—extraction, transport, processing, and combustion—generates a waste stream and carries multiple hazards for health and the environment. These costs are external to the coal industry and are thus often considered "externalities." We estimate that the life cycle effects of coal and the waste stream generated are costing the U.S. public a third to over one-half of a trillion dollars annually. Many of these so-called externalities are, moreover, cumulative. Accounting for the damages conservatively doubles to triples the price of electricity from coal per kWh generated, making wind, solar, and other forms of nonfossil fuel power generation, along with investments in efficiency and electricity conservation methods, economically competitive. We focus on Appalachia, though coal is mined in other regions of the United States and is burned throughout the world.

nature climate change

ARTICLES

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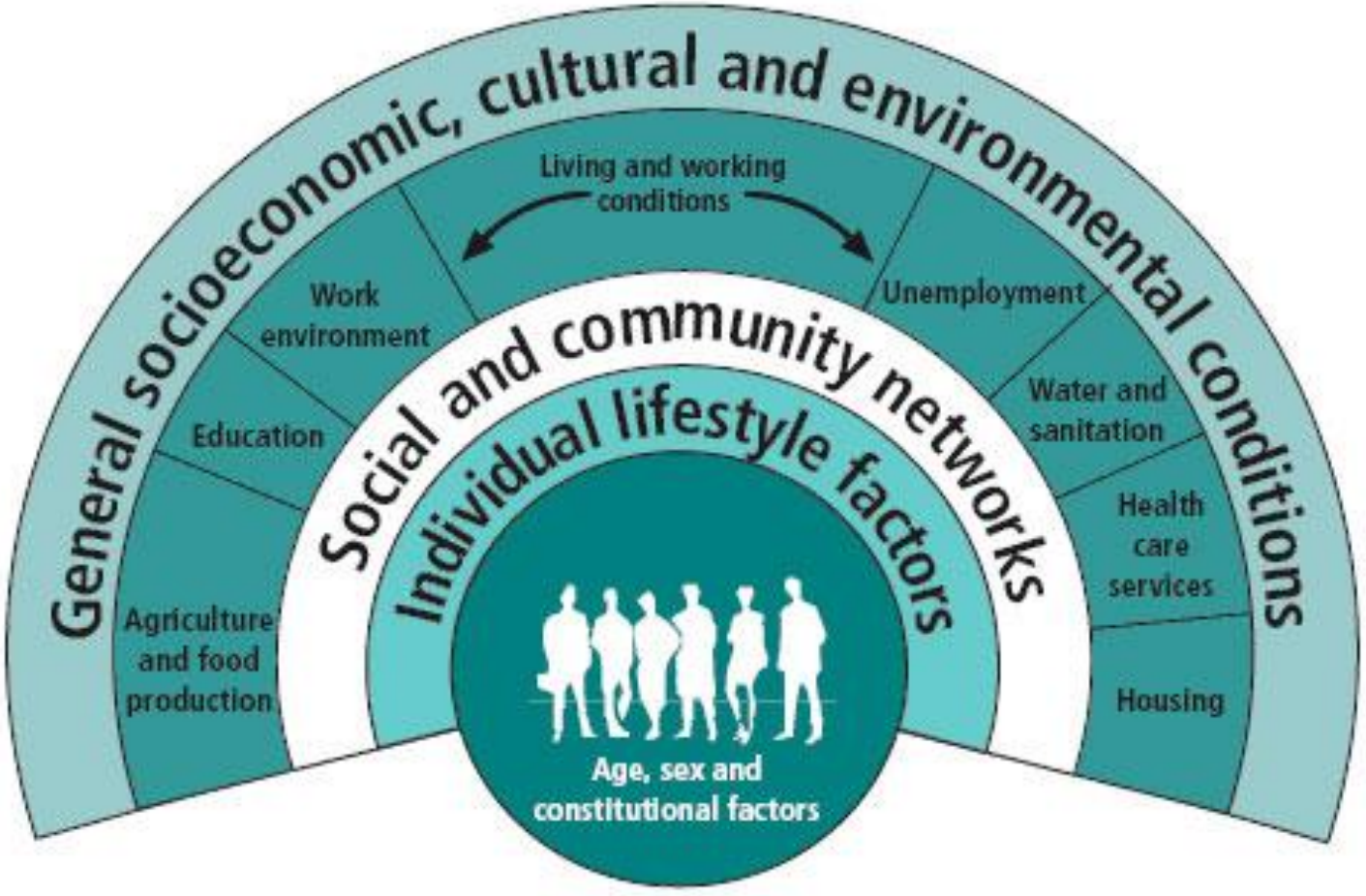
Health and climate benefits of different energy-efficiency and renewable energy choices

Jonathan J. Buonocore[1,2*], Patrick Luckow[3], Gregory Norris[1,2], John D. Spengler[1,2], Bruce Biewald[3], Jeremy Fisher[3] and Jonathan I. Levy[1,2,4]

Energy efficiency (EE) and renewable energy (RE) can benefit public health and the climate by displacing emissions from fossil-fuelled electrical generating units (EGUs). Benefits can vary substantially by EE/RE installation type and location, due to differing electricity generation or savings by location, characteristics of the electrical grid and displaced power plants, along with population patterns. However, previous studies have not formally examined how these dimensions individually and jointly contribute to variability in benefits across locations or EE/RE types. Here, we develop and demonstrate a high-resolution model to simulate and compare the monetized public health and climate benefits of four different illustrative EE/RE installation types in six different locations within the Mid-Atlantic and Lower Great Lakes of the United States. Annual benefits using central estimates for all pathways ranged from US$5.7–US$210 million (US$14–US$170 MWh^{-1}), emphasizing the importance of site-specific information in accurately estimating public health and climate benefits of EE/RE efforts.


2020
HEALTHCARE
Climate Challenge
2015
Health Care
Without Harm

Social Determinants of Health



Dahlgren and Whitehead, 1991

Dr. Rudolf Virchow

Father of Social Medicine

"Medicine is a social science, and politics is nothing else but medicine on a large scale. Medicine, as a social science, as the science of human beings, has the ***obligation to point out problems and to attempt their theoretical solution****.... The* ***physicians are the natural attorneys of the poor****, and social problems fall to a large extent within their jurisdiction."*


What good does it do to treat people's illnesses…
…only to send them back to the conditions that made them sick?

Thank you for listening

Join us in the movement

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