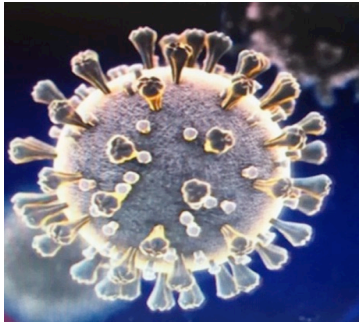
COVID 19 AND ENVIRONMENT
THE NEED FOR NEW PARADIGMS

September 2020



Marilyn Aparicio Effen PhD, MD

Water stress

Changes in ecosystems

Biodiversity loss

Urbanization

Climate Change

Ozone Layer Damage

Desertification

COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE) at Johns Ho

Global Cases

31.186.000

Cases by Country/Region /Sovereignty

6.832.970 US

5.487.580 India

4.544.629 Brazil

1.105.048 Russia

768.895 Peru

Global Deaths

962.343

199.816 deaths US

136.895 deaths Brazil

87.882 deaths India

Global Dea...

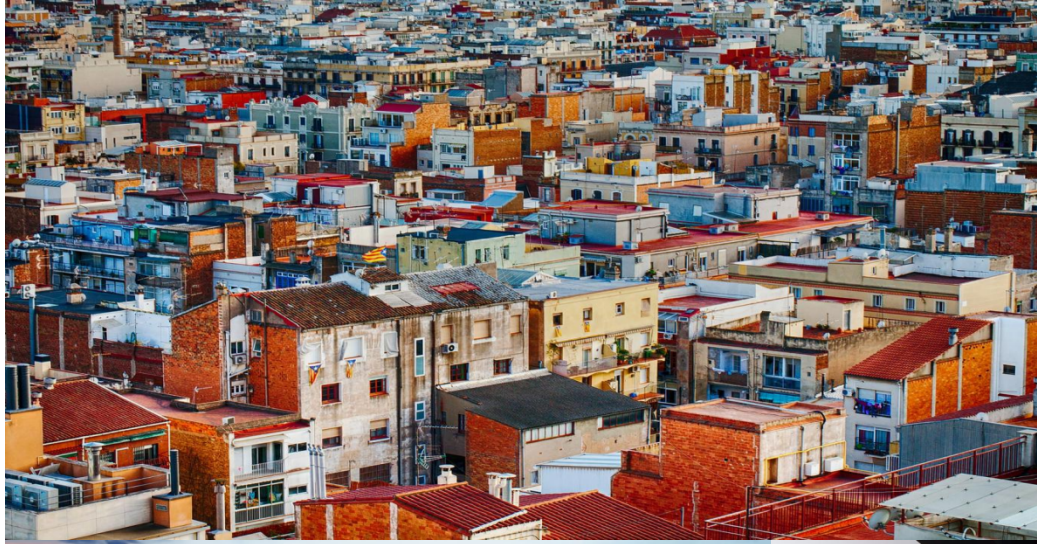
400k

200k

Urbanization

- Today, over 4 billion people around the world—more than half the global population—live in cities.
- A key feature of urbanization is density, which has many benefits in terms of enabling agglomeration economies, access to basic services, and to health care.
- Close to 1 billion people live in slums globally.


ARBEARIA
ZE DO CARMO
Bar e Pizzaria

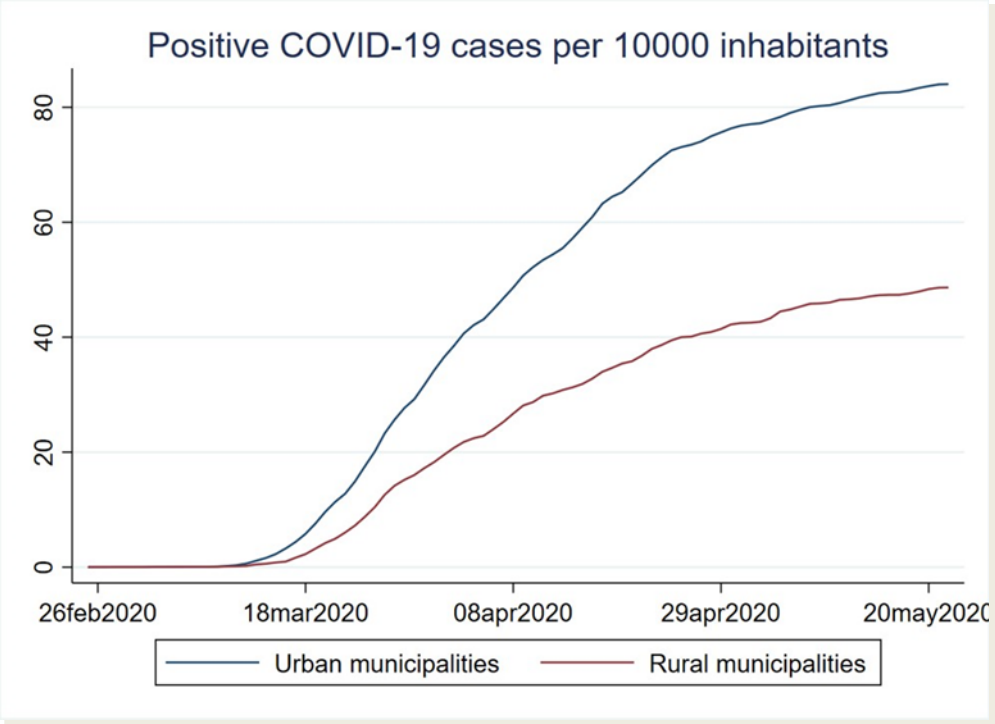


Urbanization

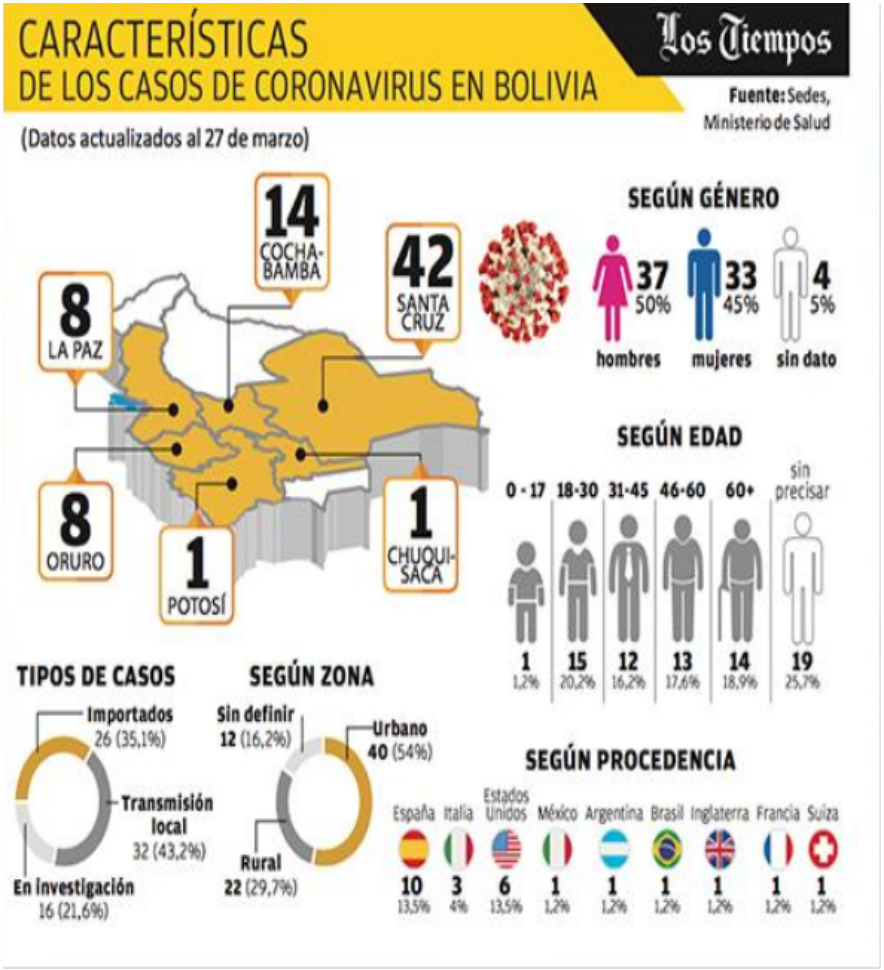
- Without adequate investments in planning and infrastructure, density can have downsides, particularly contagion and congestion.
- The downsides of a city's density are often most visible in its slums
- These neighborhoods often lack access to drainage, roads, streetlights, electricity, water, and sewerage, together with policing, waste disposal, and health care.
- With people tightly packed together, the resulting crowding increases exposure to communicable diseases.

With an estimated 90 percent of all reported COVID-19 cases, urban areas have become the epicentre of the pandemic.

The risks to this population will be among the highest given issues related to density, living conditions, limited access to basic infrastructure and health services, and informal employment



Fuente: Departament de Salut de la Generalitat de Catalunya y AQuAS.



To safely adhere to coronavirus physical distancing and hygiene guidelines, everyone needs access to adequate housing

Environmental Factors in COVID-19 Transmission

Air

Humidity

UVR

Inanimate surfaces

Temperature

Sewage

Food

Water

COVID-19 IN WILD ANIMALS

Tigre en Camboya. Foto: Rhett A. Butler.

- On April 5, 2020, New York Zoo reported that a four-year-old female Malayan tiger had tested positive for COVID-19 and three other tigers and three African lions were showing similar symptoms.
- The cats were infected by a staff person who was asymptomatically infected with the virus or before that person developed symptoms.
- Preventive measures are now in place for all staff who are caring for them, and the other cats in other zoos

https://newsroom.wcs.org/News-Releases/articleType/ArticleView/articleId/14084/Update-Bronx-Zoo-Tigers-and-Lions-Recovering-from-COVID-19.aspx

WCSNewsroom

News from WCS's Zoos, Aquarium and Field Conservation Programs Across the Globe

COVID-19 IN PETS

South China Morning Post News Comment Lifestyle More + Coronavirus

Hong Kong / Health & Environment

Coronavirus: Hong Kong confirms a second dog is infected

- The German shepherd owned by a Covid-19 patient is in quarantine, along with another dog from the same home
- It is 'very likely' the two positive canine cases are examples of human-to-animal transmission, says virologist

https://www.scmp.com/news/hong-kong/health-environment/article/3075993/coronavirus-hong-kong-confirms-second-dog

Ecosystem and biodiversity impacts


88
78


HONDA

2020 W.H.O ASSESSMENT

- The COVID-19 pandemic has revealed **a collective failure** to take pandemic prevention, preparedness and response seriously and prioritize it accordingly. It has demonstrated the fragility of highly interconnected economies and social systems, and the fragility of trust. It has exploited and exacerbated the fissures within societies and among nations.

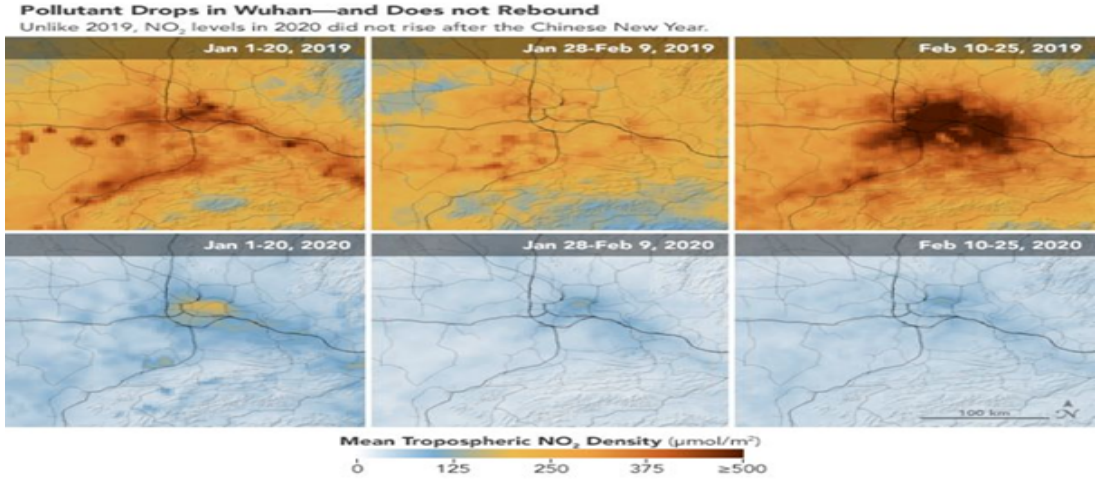
- It has exploited **inequalitie**s, reminding us in no uncertain terms that there is no health security without **social security**. **COVID-19 has taken advantage of a world in disorder**

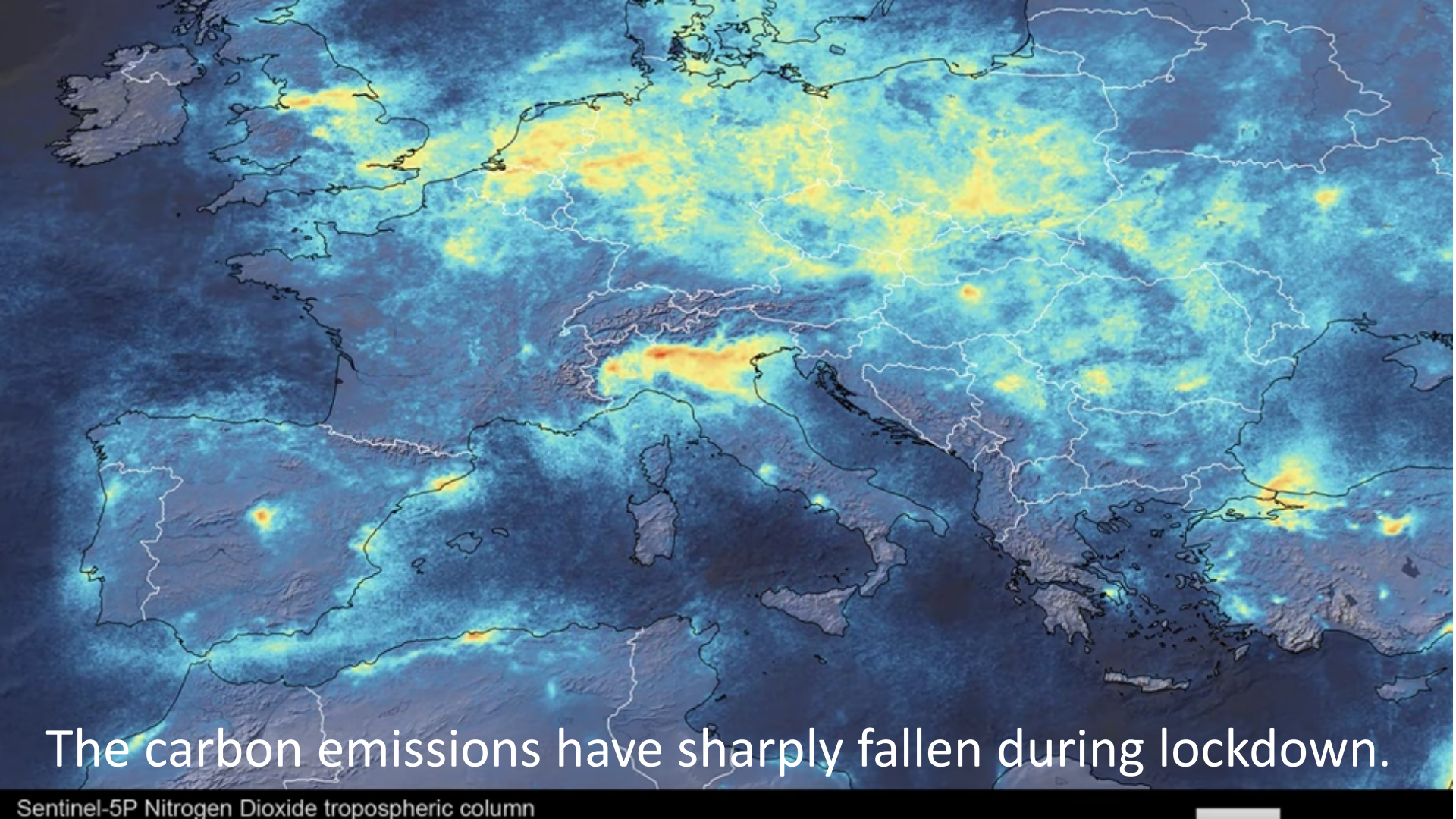
A World in Disorder. Global Preparedness Monitoring Board Annual Report 2020. © World Health Organization 2020

Positive Impact of COVID-19 Lockdown on Environment

- **Air Quality:**

After the lockdown was put in place in many countries, travel decreased, whether by car, train or air. Many industries were closed down and not allowed to function. This, in turn, led to a significant drop in air pollution, as there was a marked decline in nitrous oxide emission




The carbon emissions have sharply fallen during lockdown.
Sentinel-5P Nitrogen Dioxide tropospheric column

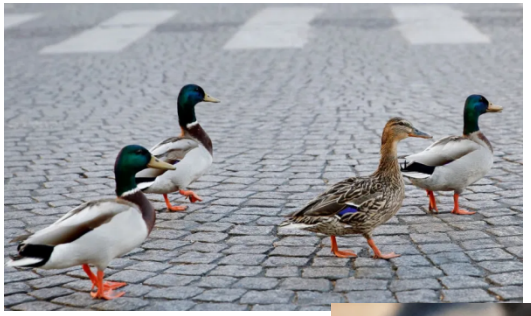
Positive Impact of COVID-19 Lockdown on Environment

- **Water Quality:**

Since there were no boats, whether for fishing or pleasure, plying the rivers and waterways, the water has cleared up.

In Venice, the water became so clear that fish could be seen and there was better water flow.

Positive Impact of COVID-19 Lockdown on Environment



Paris

Toronto

Istanbul

- **Effect on Wildlife:**

Animals have been spotted moving about freely where once they would not dare to go. Even sea turtles have been spotted returning to areas they once avoided to lay their eggs, all due to the lack human interference.

Positive Impact of COVID-19 Lockdown on Environment

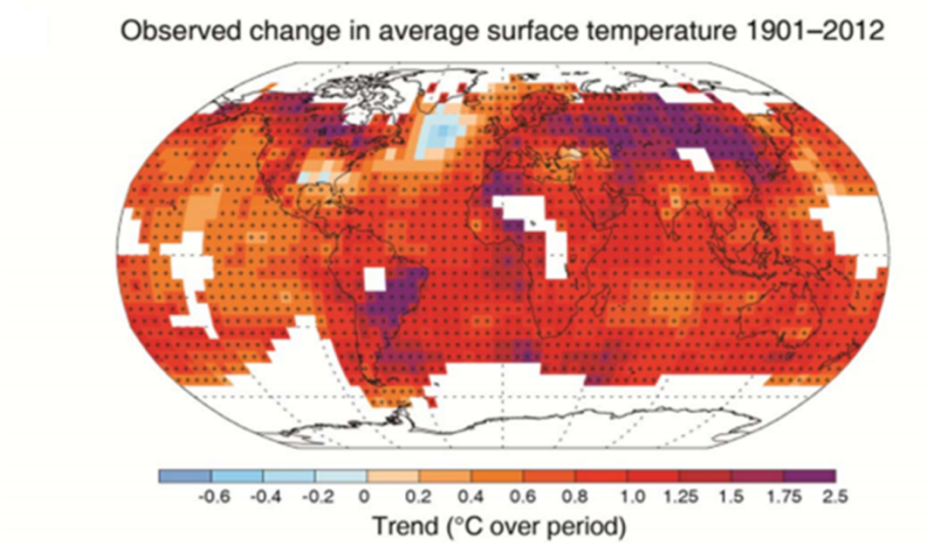
- **Effect on Vegetation:**

Plants are growing better because there is cleaner air and water, and because yet again there is no human interference.

With everything at a standstill, plants are allowed to thrive and grow and produce more coverage and oxygen.

Less litter also means less clogging of river systems, which is good in the long run for the environment.

There has been a positive impact on the environment due to the lockdown, there is fear that once people start travelling again or go back to doing what they have been doing, all the positive impact will also disappear.



RECENT REAPPEARANCE ETIOLOGIES 1980 -1996

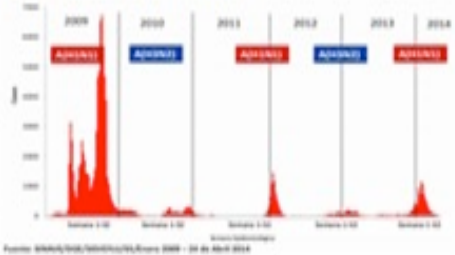
Bacteria	Virus	Parasites
• Legionella pneumophila	• Ébola-Reston/Texas	• Babesia sp. (ningúnmicroti)
• Henselae de bartonella (Rochalimaea)	• Guanarito	• Balamuthiasp.
• La burgdorferi de Borrelia	• VIH	• Ciclospora cayetanensis
• Escherichia coli 0157:H7	• VTLH I y II	• Cryptosporidium parvum
• Ehrlichia chafeensis	• Hepatitis C	• Enterocytozoon bieneusi
• Helicobacter pylori	• Humano vírico de herpes 6	• Encephalitozoon hellem
	• Hantavirus	• Encephalitozoon (=Septata) intestinalis
	• Picobirnavirus	• Isospora belli
	• Virus Sabia	
	• Virus de Sin Nombre	

EMERGING DISEASES SINCE 2013

- Síndrome Respiratorio por Corona Virus de Oriente Medio.
- No se han reportado casos en América.

Covid 19 Pandémico

Influenza A(H5N1)
En América, Canadá reportó el primer y único caso importado 2014.
Potencial pandémico



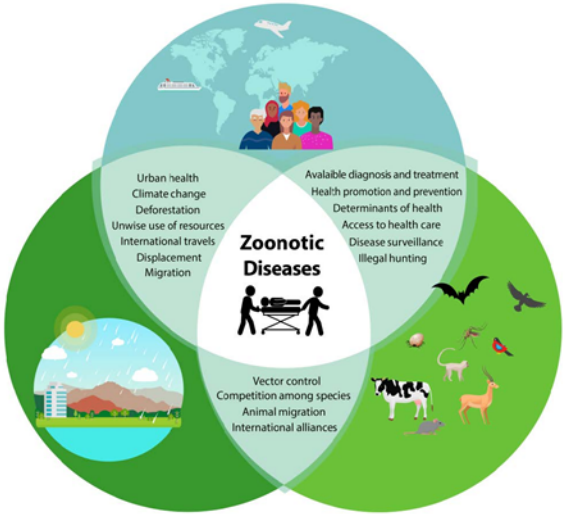
The priority diseases are:

- Crimean-Congo haemorrhagic fever
- Ebola
- Marburg
- Lassa fever
- MERS
- SARS
- Nipah
- Rift Valley fever

Source: World Health Organization

https://www.who.int/activities/prioritizing-diseases-for-research-and-development-in-emergency-contexts

2020



- 75% of reemerging and emerging diseases use some vector or animal host
- Surveillance should extend beyond populations at risk and encompass possible reservoirs for these animals.

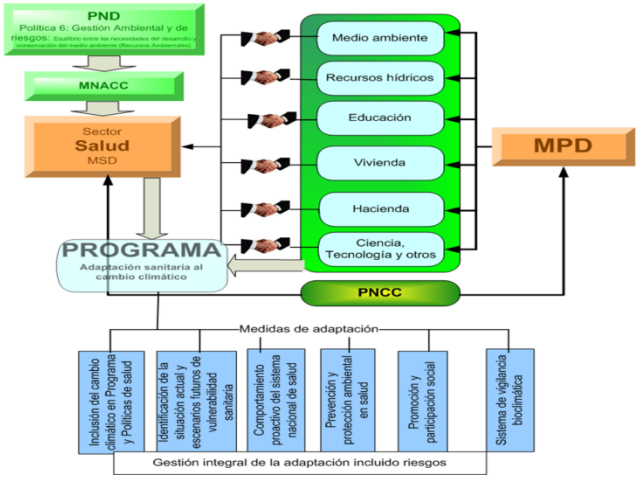
ONE HEALTH

One Health is a collaborative, multisectoral, and transdisciplinary approach — working at the local, regional, national, and global levels — with the goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment.

A NEW DEVELOPMENT MODEL

- The low carbon development has its roots in the UNFCCC adopted in Rio in 1992.
- In the context of this convention, low carbon development is now generally expressed using the term low-emission development strategies (LEDS - also known as low-carbon development strategies, or low-carbon growth plans).

Strategic Objectives - Health

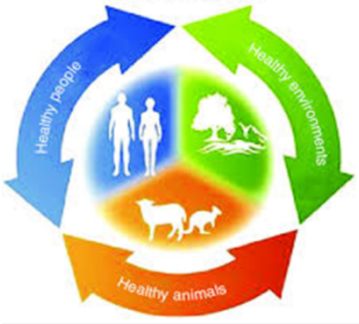


NDCs

Long term

Medium term

Short Term



- Ecosystem-based adaptation
- Community-based adaptation
- Resilient agriculture
- Climate Smart Villages
- "Resilient Infrastructure"




The Green Hospital

- Chooses an environmentally friendly site
- Uses sustainable and efficient design
- Uses green building materials and products
- Thinks green during construction and keeps the greening process going
- **Reduce CO2 generation**
- It is constructed around a facility that recycles, reuses materials, reduces waste and produces cleaner air

ECOSYSTEM ASSESSMENT FOR DENGUE

Proyecto Cambio Climático, Vulnerabilidad y Salud en Bolivia y Colombia
IDRC | CRDI

CLIMATE CHANGE
HEALTH
VULNERABILITY

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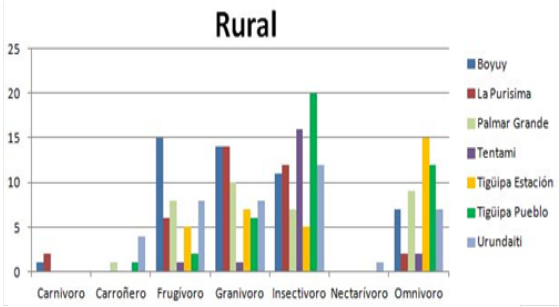

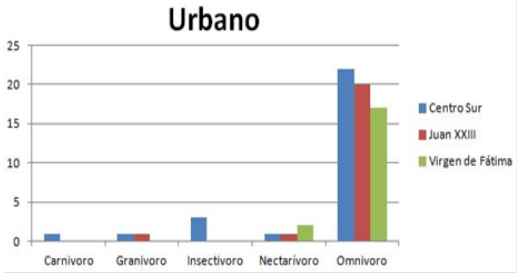

Gran Chaco

The bird species diversity as an indicator of the ecosystem state (1756 observations of 71 species).

Key result.- In urban areas, the homogeneous guild structure disappears

The omnivore is most abundant guild and there are almost no representatives of the other guilds.

Cockroaches, mosquitoes (including *Aedes aegypti*) weevils, moths and other species of arthropods harmful to humans can develop without the control of their natural predators (insectivorous birds).

ECOSYSTEM ASSESSMENT FOR DENGUE

Tyrannus savana, nombre común Tijereta en Guaraní *Guirá-yetapa*
Fuente: foto de Mauricio Ocampo

- ***Tyrannus savana, in Guaraní Guirá-yetapa, (Tijereta)*** insectivorous bird, which is disappearing due to bird hunting by Chaco children
- This guild is Aedes predator and could be used as biological control of Dengue, Chikungunya and Zika
- Protection of insectivorous birds

Aparicio-Effen M, Arana I, Aparicio J, Ramallo C, Bernal N, Nagy GJ, Ocampo . Chapter 14: Climate Change and Variability Health Vulnerability in Bolivian Chaco Ecosystems. eBook ISBN 978-3-319-244660-4_14, Series ISSN 160-2010, DOI 10.1007/978-3-319-24660-4_14, 480 pp, http://www.springer.com/us/book/9783319246581.

Current climate change vulnerability - urban dengue

Dimensions

Hydrological

- PP (+++)
- Caudal (+++)
- T°C (+++)

Epidemiological

- IIV: Home infection rate (+++ / +++ / +++)
- IB: Breteau index
- IR: Container index

Social

- Health services access (+)
- Education (− − −)
- Solid waste (+ + +)

Environmental

- Mosquito net use (−)
- Bird diversity (−)
- Insects Diversity (−)
- Plant Diversity. (−)

Nº Dengue Cases

High vulnerability

Aparicio-Effen M, Arana I, Aparicio J, Ramallo C, Bernal N, Nagy GJ, Ocampo . Chapter 14: Climate Change and Variability Health Vulnerability in Bolivian Chaco Ecosystems. eBook ISBN 978-3-319-244660-4_14, Series ISSN 160-2010, DOI 10.1007/978-3-319-24660-4_14, 480 pp, http://www.springer.com/us/book/9783319246581

CONCLUSIONS

- Increased incidence of endemic, emerging, re-emerging or new pathologies
- The World has to be prepared for when the next pandemic hits.
- We have a planet environmentally at limit of its capabilities
- Cities as human settlements are unsustainable in their current form

CONCLUSIONS

- The goal is to build a society (with its human and natural systems) that is resilient from a health point of view
- **This requires a profound change in development paradigms as well as in the social and economic development of global and local society, for human health benefit**

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