

Medicina
de Família e
Comunidade



FIOCRUZ



Lancet Countdown 2018 Report: Briefing for Brazilian Policymakers

November 2018



Introduction

This briefing, launched in parallel with the 2018 Lancet Countdown on Health and Climate Change report, focuses on the links between climate change and health, and their implications for Brazilian policymakers and medical societies. It has been developed in conjunction with the Brazilian Society of Family and Community Medicine (SBMFC), the Oswaldo Cruz Foundation (FIOCRUZ), and the National Institute for Space Research (INPE), and draws on data provided by the Lancet Countdown to make evidence-informed recommendations for policymakers with the goal of taking advantage of the tremendous health opportunities of an effective response to climate change.

Climate change is the biggest global health threat of the 21st century,¹ and tackling it could be our greatest health opportunity.² The effectiveness of our response to climate change over the coming years will define health and wellness globally for generations to come.

Acknowledgements

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Strategic Partners

THE LANCET



About the Lancet Countdown

The “*Lancet Countdown: Tracking Progress on Health and Climate Change*” is a global, interdisciplinary research collaboration between 27 academic institutions and inter-governmental organizations. It monitors progress on the relationships between health and climate, and their implications for national governments, reporting annually. The *Lancet Countdown* follows in the footsteps of two Lancet Commissions on climate change. The first surveyed the damage climate disruption is having on health, determining that “climate change is the biggest global health threat of the 21st century,” while the second concluded that responding to climate change could represent “the greatest global health opportunity of the 21st century.”¹³ The 2018 report presents data on 41 indicators selected following a consultation process in 2017. These span 5 domains, from health impacts and adaptation, to mitigation and the economic and political drivers of response.²

The Brazilian Society of Family and Community Medicine

The Brazilian Society of Family and Community Medicine (SBMFC), includes the family physicians of the public health system (Sistema Único de Saúde) in the Family Health Strategy (Estratégia Saúde da Família) and other primary care services, who provide general medical care to individuals, families and communities, as well as university professors and researchers.

The Oswaldo Cruz Foundation

The Oswaldo Cruz Foundation (FIOCRUZ), is a federal institution linked to the Ministry of Health. It conducts research and development activities in the biological sciences and is considered a world leader in public health research. FIOCRUZ promotes health and social development, and generates and disseminates scientific and technological knowledge.

The National Institute for Space Research

The National Institute for Space Research (INPE) is a research unit of the Brazilian Ministry of Science, Technology, Innovations, and Communications whose main goals are to foster scientific research and technological innovation and to train personnel in the fields of space and atmospheric sciences, Earth system science, space engineering, and space technology.

Key Recommendations

Policy Recommendation 1

Build health considerations into climate change mitigation and adaptation, consistent with a health-in-all-policies approach, as Brazil transitions to a low-carbon economy.

Policy Recommendation 2

Create a country-wide epidemiologic surveillance system for heat-related illness, with health outcomes related to increased temperatures and heat waves logged with the national registration system, the *Sistema de Informação de Agravos de Notificação* (SINAN).

Policy Recommendation 3

Invest in sustainable urban design to decrease the urban heat-island effect and reduce population heat stress.

Policy Recommendation 4.

Integrate the impacts of climate change on health, including heat impacts, into curricula and capacity-building initiatives for health professionals.

Policy Recommendation 5

Include the development of heat adaptation strategies, improved surveillance for and treatment of dengue fever, and increased access to basic sanitation and clean water in a strengthened primary care and public health system that is attentive to evolving challenges associated with climate change.

Policy Recommendation 6

Commit funds and support to a public education campaign which encourages a transition to plant-rich diets with reduced levels of red meat. This will result in better health for the Brazilian public, improvements in air quality, and reduced deforestation and carbon emissions.

Policy Recommendation 7

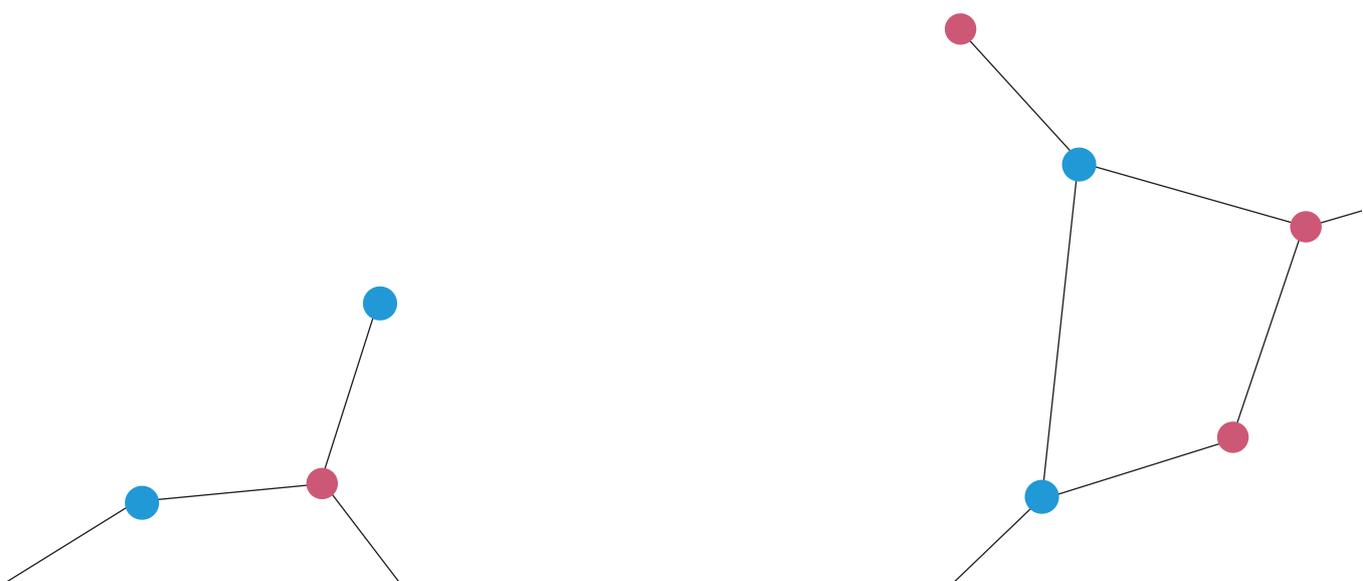
Develop biodiversity-driven economic alternatives to unsustainable deforestation and agricultural expansion in Amazonia.

Policy Recommendation 8

All levels of Brazilian government - municipal, state and federal- should engage with the World Health Organization's Breathelife campaign by 2020, and establish binding air quality guidelines to protect human health.

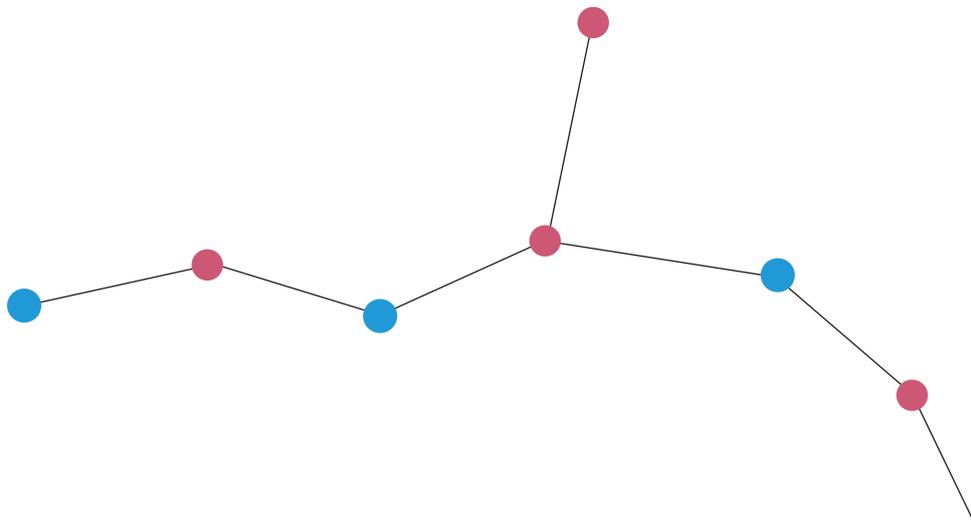
Policy Recommendation 9

A health impact assessment should be conducted into the social, cultural, local health and global health impacts of a zero deforestation policy in the Brazilian Amazon.



Key Findings of the Lancet Countdown's 2018 International Report

- Present day changes in labour capacity, vector-borne disease, and food security provide early warning of compounded and overwhelming impacts expected if temperature continues to rise. Trends in climate change impacts, exposures, and vulnerabilities demonstrate an unacceptably high level of risk for the current and future health of populations across the world.
- A lack of progress in reducing emissions and building adaptive capacity threatens both human lives and the viability of the national health systems they depend on, with the potential to disrupt core public health infrastructure and overwhelm health services.
- Despite these delays, trends in a number of sectors are breathing life in to the beginning of a low-carbon transition, and it is clear that the nature and scale of the response to climate change will be the determining factor in shaping the health of nations for centuries to come.
- Ensuring a widespread understanding of climate change as a central public health issue will be vital in delivering an accelerated response, with the health profession beginning to rise to this challenge.



Impacts, Vulnerabilities and Potential: Climate Change and Health in Brazil.

Brazil is a country of continental dimensions whose widespread social inequalities pose an existing challenge for health, and are likely to become magnified by climate change.^{4, 5, 6}

This policy brief presents key findings and recommendations based on the International *Lancet Countdown* Report in the Brazilian context and highlights the implications of climate change for health-related policy in three main areas:

- The impact of heat on health and work productivity
- Climate-sensitive infectious diseases, specifically dengue fever
- Land use management and deforestation

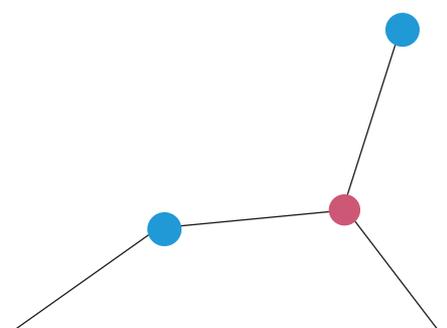
In each of these areas, data demonstrates that there is significant potential for policy action by all levels of government to improve public health.

Although the *Lancet Countdown* does not have an indicator on deforestation due to the current impossibility of measuring its health impacts on a global scale, a case study centred on the Amazon is included in this brief in order to illustrate the interrelationship between global climate change, alterations in local microclimates, and human health. As seen below, the health of the Brazilian people is tied to the status of the Amazon forest ecosystem. Additionally, due to the Amazon's potential to act as a climate tipping point,⁷ this forest is of global significance for health.

Since the 1990s, Brazil has assumed a leading role in international environmental agreements such as the landmark Earth Summit (Rio 92) and Rio+20 in 2012. In December 2015, 195 countries, including Brazil, signed the Paris Agreement, which pledges to keep global mean temperature rise to well below 2°C, aiming for 1.5°C.⁸ It is essential that health considerations are taken into account across sectors as Brazil designs policies to help it meet its mitigation commitments under the Paris Agreement, and its adaptation responsibilities to its population.

Policy Recommendation I

Building health considerations into the mitigation and adaptation of climate change – as described in a health-in-all-policies-approach – is essential as Brazil transitions to a low-carbon economy.



Impacts of Heat on Health and Work Productivity

Headline Finding 1. Brazil is facing increasing temperatures and exposure to heat waves. Estimates suggest that in the coming decades the Amazon region will be more impacted by higher temperatures than other regions of Brazil.

Indicator 1.2 Health Effects of Temperature Change

Heatwaves are associated with increased rates of heat stress and heat stroke, exacerbations of heart failure and acute kidney injury from dehydration.⁶ Preliminary evidence from a recent US study has also linked higher temperatures to rising rates of suicide.⁹

The 2018 International *Lancet Countdown* report found that in 2017 the mean temperature increase relative to the 1986-2008 reference period was 0.3°C, with mean global summer temperature change experienced by humans (ie: weighted by population) more than double, rising to 0.8°C. This discrepancy results largely from the fact that populations are ageing, growing, and migrating in to the areas worst affected by climate change.² Data provided by the *Lancet Countdown* shows that Brazil's mean summer temperature has been above the 1986-2005 baseline every year since 2009. (Figure 1)

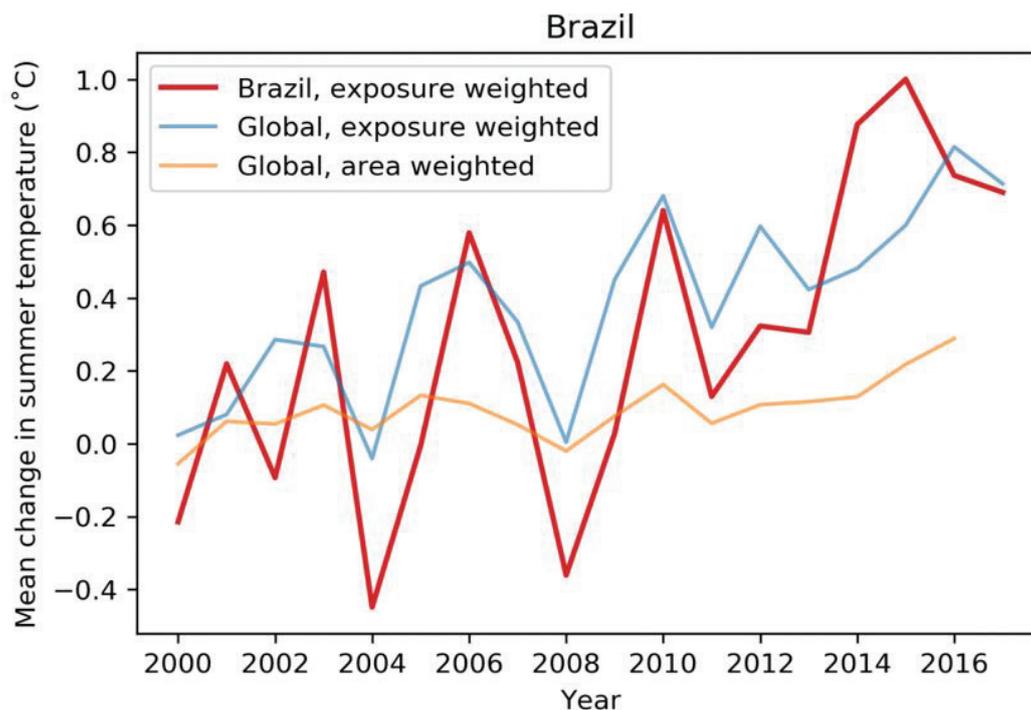


Figure 1. Changes in summer temperature from 2000 to 2017 in Brazil and globally. (Data courtesy of the *Lancet Countdown*)

Temperature rise exposes vulnerable populations to additional heat-related illness. Projections to 2060-80 suggest that the Amazon is likely to warm an additional 1-2°C above the global average surface temperature increase because of intense drought periods and reduced cloud cover, which increase net surface shortwave radiation.¹⁰ As the 21st century progresses, heat waves will be more frequent and of longer duration.¹¹

Policy Recommendation 2

Create a country-wide epidemiologic surveillance system for heat-related illness, with health outcomes related to increased temperatures and heat waves logged with the national registration system, the *Sistema de Informação de Agravos de Notificação* (SINAN).

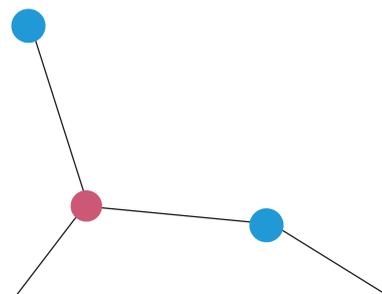
Indicator 1.3 Health Effects of Heatwaves

The International Lancet Countdown report shows that in 2017, 157 million heatwave exposure events occurred globally in vulnerable populations, an increase of 18 million additional exposure events compared with 2016.² Data provided by the Lancet Countdown shows that in Brazil the 2014 and 2015 heatwaves lasted longer than previous years. Increasing temperatures and heat waves are particularly difficult for the elderly, children, pregnant woman, and people with chronic diseases.¹² In Brazil, during the period of 2000-2015, the association between temperature variability and hospitalizations varied not only by duration of exposure, but also by sex, age-group and region.¹³

Greenhouse Gas Emissions (GHGs) emitted today will have warming effects on the atmosphere well in to the future. Hence, even if the world moves to mitigate climate change rapidly over the coming years, impacts in the form of heat and heatwaves will be felt for decades to come. Adaptation interventions such as the “greening” of urban spaces (e.g. expanding parks and placing more trees on streets) are essential to cool urban areas that otherwise contain much heat-absorbing concrete. These efforts have the added effect of reducing local air pollution.^{10, 14}

Policy Recommendation 3

Invest in sustainable urban design to decrease the urban heat-island effect and reduce population heat stress.



1.4 Change in labour capacity

Higher temperatures also affect human labour productivity, particularly amongst people who work outdoors.⁶ In Brazil, agriculture is the most affected sector in terms of hours of labour lost. (Figure 2)

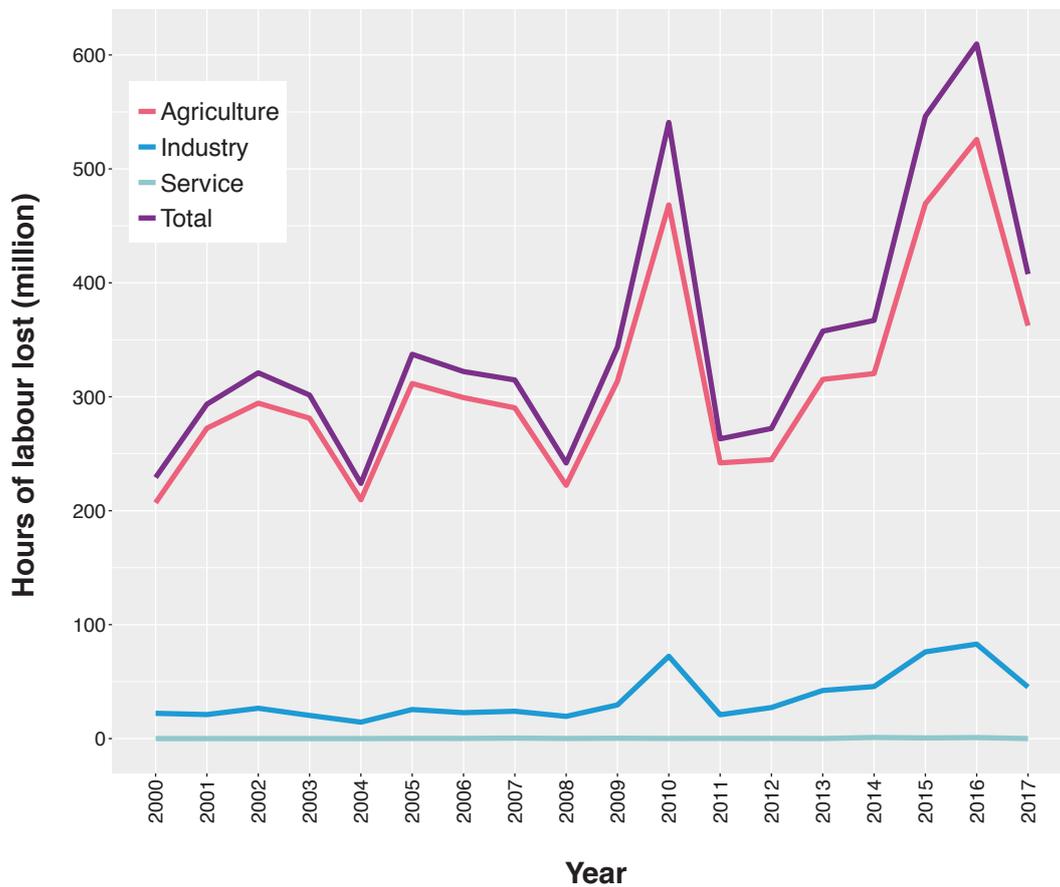


Figure 2. Total hours of labour lost in Brazil due to heat per sector from 2000 to 2017. (Source *Lancet Countdown*)

In addition to the effects of heat on labour capacity, the agricultural sector will face multiple challenges with the potential to impact human and economic health. Alterations in crop productivity, soil fertility, and pollination, as well as modifications to the distribution and dynamics of pests and disease may be expected.^{4,15} These changes have downstream socioeconomic consequences for rural populations, compounding the direct heat-related health impacts. Added to this, rural areas are more vulnerable to such changes, with less reliable access to safe water and healthcare services as compared to urban areas. A well-trained cohort of health and public health professionals is required to respond to heat-related illness when high temperatures are predicted, and to mobilize community resources to protect vulnerable populations.

Policy Recommendation 4

Integrate the impacts of climate change on health, including heat impacts, into curricula and capacity-building initiatives for health professionals.

Lancet Countdown Indicator 1.8: Climate-Sensitive Infectious Diseases

In 2016, the global vectorial capacity of *Aedes aegypti* and *Aedes albopictus* for the transmission of dengue was the highest on record, rising to 9.1% and 11.1% respectively above the 1950s baseline. Brazil saw an increase of 5.8% for the vectorial capacity of *Aedes aegypti*, and 11.2% for *Aedes albopictus* between 1950 and 2010, with the trend since stabilising.

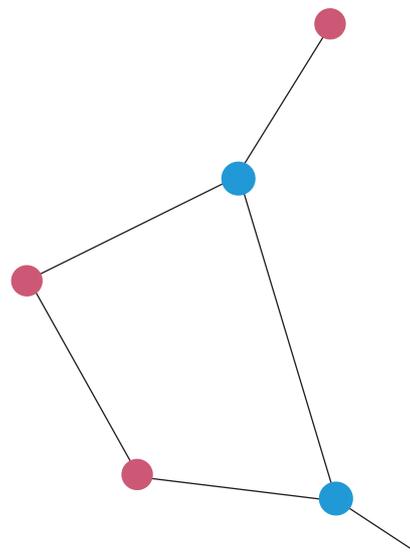
The primary vectors of dengue are *Aedes aegypti* and *Aedes albopictus*, which are also responsible for the transmission of diseases such as yellow fever, dengue, Chikungunya and Zika. The vector's ability to transmit disease to humans is called its Vectorial Capacity (VC).

In 2016, the region of the Americas reported 2.38 million cases of dengue, with Brazil accounting for roughly 1.5 million of these.¹⁶ Dengue distribution is strongly influenced by rainfall, temperature and the degree of urbanization.¹⁷

There is a clear need for an integrated response to the growing threat of dengue fever.¹⁸ This must include vector-control in order to reduce the number of cases.^{11, 14, 16, 19} Adequate sanitation is thus a key tenant of a dengue management program, as is access to potable water, effective public health surveillance, and a robust primary healthcare service.^{16, 20} In Brazil access to sanitation remains incomplete: in 2015 only 86% of the population had access to basic sanitation, with services concentrated in urban areas. In rural areas, only a concerning 58% of the population benefited from basic sanitation.²¹

Policy Recommendation 5

Include the development of heat adaptation strategies, improved surveillance for and treatment of dengue fever, and increased access to basic sanitation and clean water in a strengthened primary care and public health system that is attentive to evolving challenges associated with climate change.



Case study

Health impacts of Amazon deforestation and *Queimadas* (biomass burning)

Key Points

- Total emissions from land cover change--mostly from Amazon deforestation--accounted for approximately 70% of Brazil's total GHG emissions in 2005 and 50% in 2016.
- Cattle production is an important driver of Amazon deforestation and *queimadas* (biomass burning).
- Biomass burning accounts for high rates of hospital admissions, circulatory and respiratory diseases, especially in elderly people over 60 years and children under 5 years.
- Total deforestation of the Amazon basin is currently in the range 15%-17%, close to the tipping point of 20-25% that may lead to irreversible savanization of most of the Amazon forest.

Although the *Lancet Countdown* does not have an indicator on deforestation due to the difficulty of measuring its health impacts on a global scale, this case study is included in order to illustrate the critical interrelationship between climate change, the deforestation of the Amazon, and human health.

The Amazon tropical forest is the largest rainforest on Earth, with the majority of it (60%) located in Brazil, and approximately 27 million people living in the nine Brazilian states encompassing most of the Amazon forest biome.²² The Amazon Forest has efficient water recycling mechanisms, ensuring that approximately half of the rainfall that maintains the forest comes from evapotranspiration from the forest itself: in recent decades, deforestation, the widespread use of fire to eliminate felled trees, and climate change have emerged as factors threatening this hydrological cycle.²³

It has been suggested that synergistic interactions between deforestation, climate change, and the widespread use of fire may lead to a tipping point for the Amazon system, resulting in a non-forest ecosystem.^{24,25} If deforestation exceeds the threshold of 20-25% of total forest area, some studies predict that a degraded tropical savanna could develop in the Eastern, Southern and Central Amazonian basin.²⁶ Currently, estimated total deforestation of the Amazon area is approximately 15%-17%.

This deforestation is intimately related to cattle production: from 1990 to 2006, the cattle herd grew at an average rate of 6.74% per year in the Brazilian Amazon while the average yearly growth rate in other regions of Brazil was 0.57%.^{27,28} Trends towards increased cattle production and beef consumption are unhealthy for both people and the planet: as compared to diets high in red meat, plant-rich diets have been shown to decrease colorectal cancer and cardiovascular disease risk,²⁹ modestly reduce all-cause mortality,²⁹ and improve glycaemic control in people who have Type II Diabetes.³⁰ Shifting to a more plant-based diet was associated with a median decrease of 20-30% in water use, land use and GHGs in a recent review.²⁹

Total emissions from land cover change--mostly from Amazon deforestation -- accounted for roughly 70% of total Brazilian GHG emissions in 2005 and 50% in 2016. (Figure 3)^{31,32}

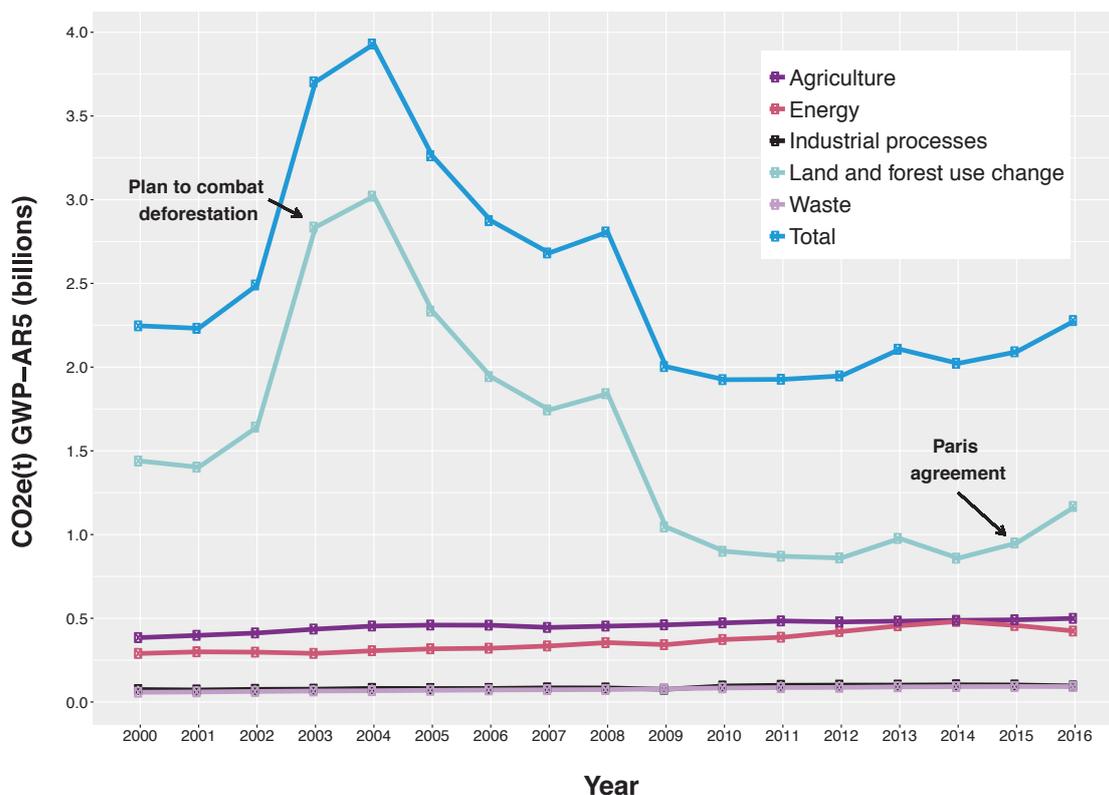


Figure 3. CO_{2eq} emissions in Brazil 2000-2016³²

Air pollution is one of the leading causes of death and disability worldwide, and it is estimated that in 2015 about 52 thousand people died in Brazil from exposure to ambient air pollution.³³ Approximately 10 million people in the Brazilian Amazon live in areas exposed to high levels of air pollutants from *queimadas* and deforestation.³⁴ The smoky *queimadas* season and the presence of fine particulate matter (PM_{2.5}) were positively associated with the occurrence of low birth weight in cities of the Brazilian Amazon³⁵ and are also related to a high risk of respiratory diseases in children and elderly people with pre-existing respiratory disease, high rates of hospital admissions and changes in respiratory performance.^{35, 36, 37, 38, 39, 40, 41} Recognizing the importance of curbing air pollution, the World Health Organization has launched a global “BreatheLife” campaign to encourage cleaner air.¹⁶

Previous government initiatives such as the Brazilian Action Plan for Deforestation Prevention and Control in the Legal Amazon (PPCDAm) that began in 2004 led to a reduction in the deforestation rate in the Amazon, and prevented approximately 400-1,700 premature adult deaths annually throughout South America.⁴¹ Unfortunately, these gains are at risk as a result of recent interventions, which appear to be moving in the wrong direction and threatening the Amazon forest - and by extension, human health. Examples of such policies include attempts to promote mineral exploitation in the National Copper Reserve and its Associates (RENCA)⁴², an area of 46.818,59 km² in the Amazon, and the reduction of protected areas and barriers to development in Indigenous lands demarcation (parecer 001/2017 da Advocacia-Geral da União, AGU).⁴³

A health-in-all-policies⁴⁴ approach to the management and protection of the Amazon forest is critical to prevent both present-day harms to human health and long-term climate change-mediated health impacts. Inspiration can be drawn from a project which integrates healthcare, forest preservation, and economic transition in over 30 villages surrounding a national park on the Indonesian island of Borneo that was being harmed by high levels of illegal logging activity.⁴⁵ Over 400 hours of listening to the concerns of and solutions proposed by local people led to the construction of a hospital

and the development of a series of programs which support the health of both people and forest. In this project, the villages received deep discounts on healthcare at a non-governmental hospital in exchange for reduced logging activity. The transition away from logging is supported by multiple programs, including a small business loan initiative, training in organic farming, and a program that provides goats for widows. Over the course of ten years, this integrated system has yielded improved health outcomes and much-expanded forest cover.⁴⁵

Policy Recommendation 6

Commit funds and support to a public education campaign which encourages a transition to plant-rich diets with reduced levels of red meat. This will result in better health for the Brazilian public, improvements in air quality, and reduced deforestation and carbon emissions.

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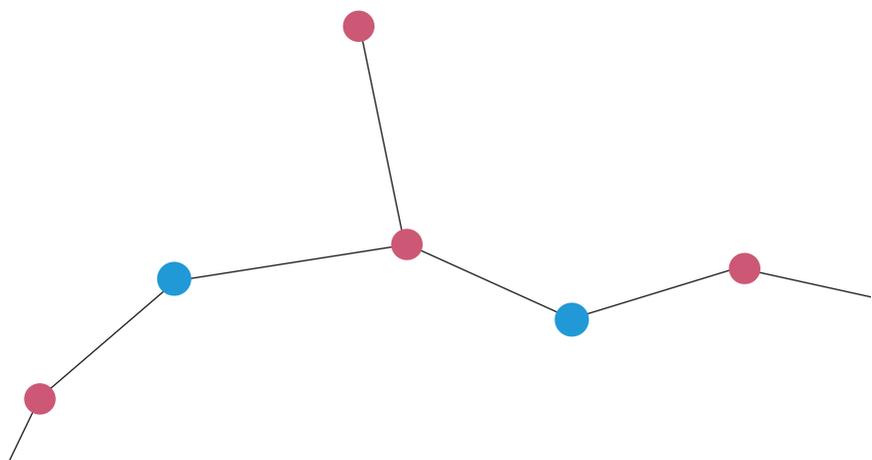
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A health impact assessment should be conducted into the social, cultural, local health and global health impacts of a zero deforestation policy in the Brazilian Amazon.



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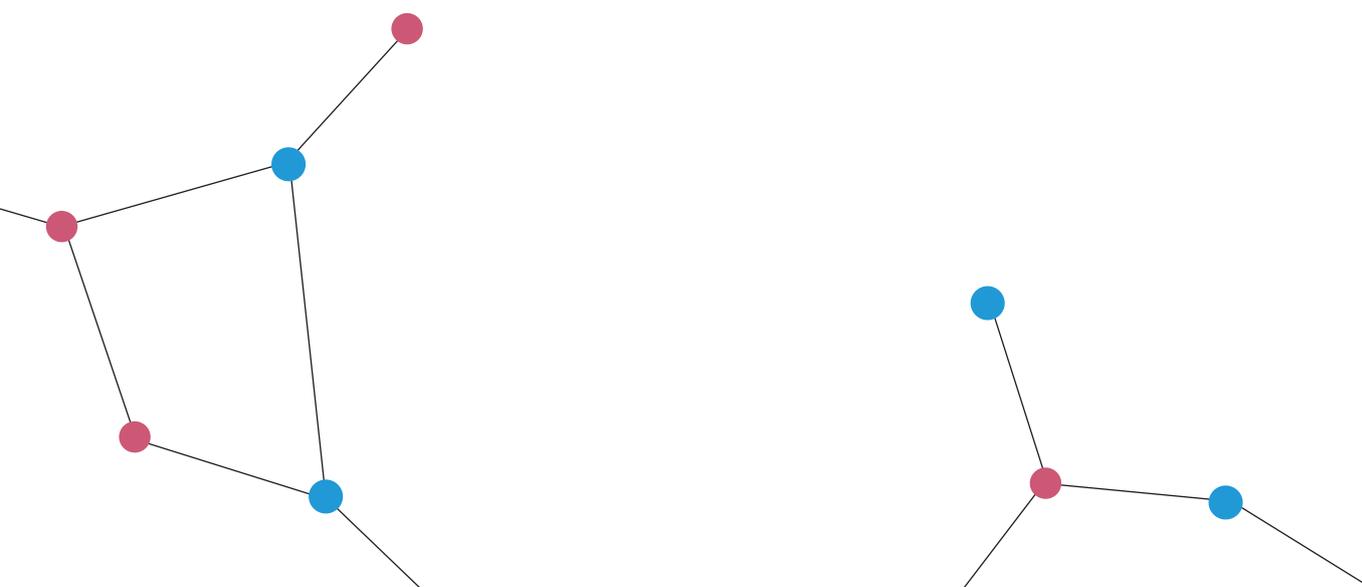
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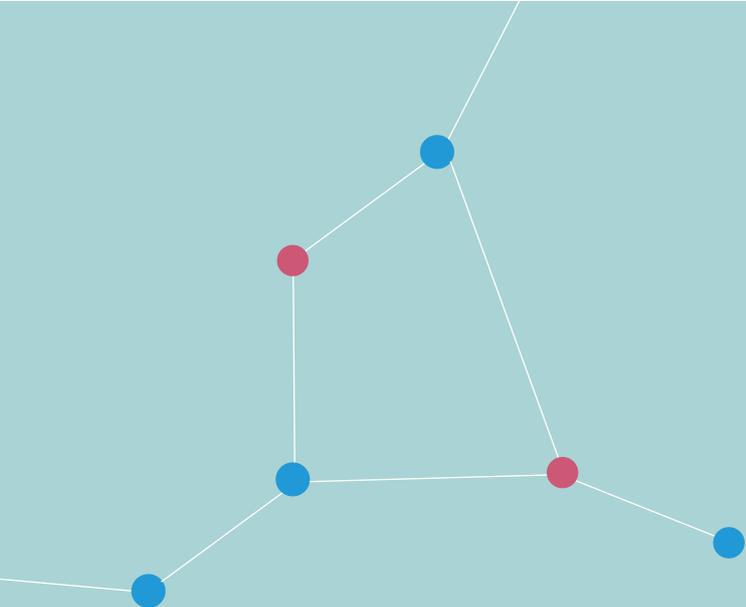
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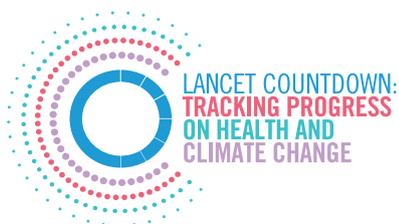
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