

CLIMATE CHANGE AND HEALTH

GRI Standards :

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EXECUTIVE SUMMARY

Human health and the eco-system we live in are interdependent. Current and future climate impacts expose a growing number of people to health threats, as illustrated below in the diagram developed by the US Centers for Disease Control and Prevention.

As a global healthcare company, Sanofi has shown concern about climate change and health, especially for the most vulnerable populations and works to address the challenges with a special focus on two main health consequences of climate change: evolution of vector-borne diseases and indoor and outdoor air pollution and respiratory allergies.

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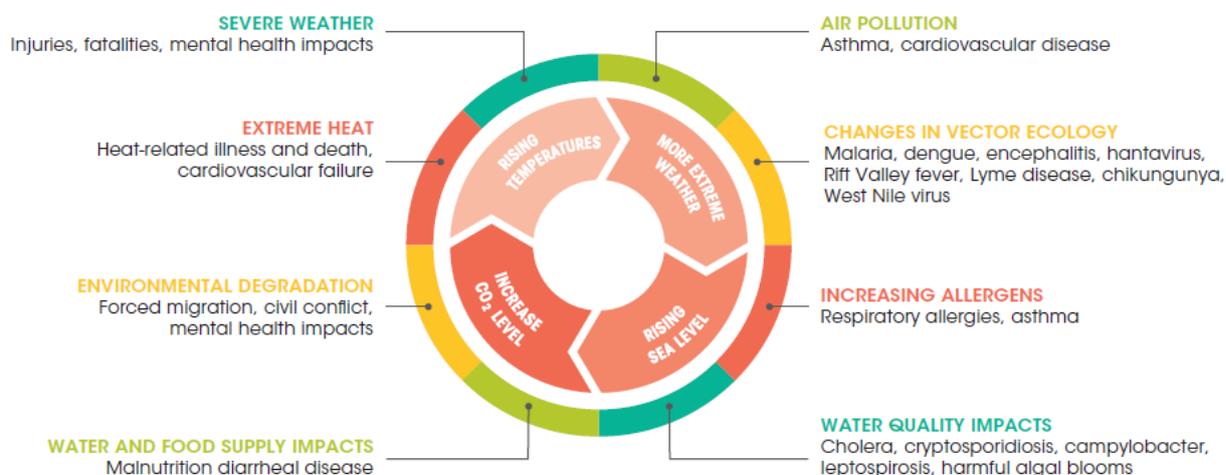
1. BACKGROUND

We believe that the company can play a key role in anticipating these health challenges. During the COP21 conference in Paris, in 2015, Sanofi was an official partner of the meeting and presented several of our commitments on this topic – from R&D about infectious diseases and the development, production and distribution of the dengue vaccine. Sanofi is among the pharmaceutical companies that supported a report published by *The Lancet* concerning climate change and health.

For more information, see our [Document Center](#):

*Sanofi's Risks and Opportunities related to Climate Change Factsheet
Biodiversity and Biopiracy factsheet*

The US Centers for Disease Control and Prevention in Atlanta developed the following diagram to show the direct and indirect impacts of climate change and the consequences on human health.



Source: Center for Disease Control and Prevention (CDC-Atlanta, USA).

This figure presents two of the major health consequences of climate change that Sanofi is following: evolution of vector-borne diseases and exposure to air pollution.

Sanofi is pursuing the efforts of awareness among the employees and this subject was shared with all employees, showing the importance of lowering our environmental footprint and our responsibility on being ready to answer for people health. Currently Sanofi has a vaccine against Japanese Encephalitis, a very dangerous disease in all Asian countries.

2. EVOLUTION OF VECTOR-BORNE DISEASES

Most vector-borne diseases are associated with mosquitos, fleas and ticks: malaria, dengue, Zika and Lyme disease. Several studies indicate that the reservoirs of vectors and consequently vector-borne diseases are subject to changing geographical and temporal patterns due to climate change, primarily different temperature and humidity levels. The increase in risk of disease transmissions is due to reduced land territory (flooding, deserts...), leading to migration of populations, and gatherings in refugee camps or around big cities. Major efforts are being deployed to understand these changes and build awareness among the populations they concern, including healthcare professionals, patients and the public.

2.1. Dengue

The threat of Dengue has grown 30-fold in the last 50 years and today half of the world population is at risk. Epidemics occur on a regular basis in countries in Latin America and Asia. In 2015, Sanofi Pasteur launched Dengvaxia® (CYD-TDV), the first vaccine approved for the prevention of dengue. Today, Dengvaxia® is licensed in 21 countries in addition to Europe. In most countries where the vaccine is approved, the indication is for individuals aged 9 to 45 years of age with prior dengue infection, living in a dengue-endemic area. Nearly 3 million vaccine doses have been distributed worldwide since launch.

Based on new results from a supplemental analysis of Dengvaxia® long-term clinical data reported in November 2017, Sanofi Pasteur has recommended a label update for Dengvaxia® to open its usage to people with prior dengue infection. The public health value of the vaccine for preventing subsequent, potentially more severe dengue has been endorsed by internationally recognized bodies including the WHO, who granted Dengvaxia® prequalification status on March 25, 2020.

Sanofi Pasteur's goal is to make the dengue vaccine available in dengue-endemic area to support the World Health Organization's ambition to reduce dengue mortality and morbidity.

2.2. Malaria

Malaria is the vector-borne disease that seems to be most sensitive to long-term climate change. The disease has a pattern that varies seasonally in highly endemic areas. Recent studies have shown that the malaria epidemic risk increases around five-fold in the years after an El Niño event and in Cambodia, a parallel observation was made between the extended rainy season and the malaria occurrence. As children are strongly impacted by malaria, since years Sanofi has developed the MOSKI Malaria awareness toolbox now digitally available including cartoons, flash video sequences and a memory game with the objective to raise awareness on malaria but also how children can clean their environment to prevent mosquitos proliferation.

2.3. R&D programs

Sanofi is also working on several programs for these climate-sensitive diseases:

- Sleeping sickness with an oral treatment – under review by Health authorities. Objective of sustainable elimination by 2030.
- New vaccine against yellow fever (innovative on cell culture) specially for Latin America.

3. AIR POLLUTION AND RESPIRATORY ALLERGIES

Air pollution is considered to be a major global threat for respiratory and non-respiratory diseases, causing over three million deaths a year. It is estimated that 9,000,000 persons per year die because of air, water, and soil pollution. Death caused by air pollution (ambient and household air pollution) accounts for more than 6,000,000 deaths per year. Of note, most of these disease processes are within either our clinical (asthma, airway disease, and infection) or research (immune response and inflammation) domains. The field of allergy and immunology is poised to bring environmental awareness to clinical practice. This includes ensuring that appropriate medications are being used, reducing use of tobacco and biomass fuel use indoors, and patient education regarding the effect of

ambient pollutants on disease outcomes [Peden D. *J Allergy Clin Immunol* 2018; 141:878-9; Landrigan P.J. *Lancet* 2018; 391: 462–512]. Many studies show the impact of air pollution on the onset and severity of rhinitis and asthma in most areas of the world, including urban areas. However, more studies are needed to better understand the links between allergy and air pollution, and to understand its impact on the prevention and control of allergic diseases.

Through its Global CHC Allergy Medical Team, Sanofi is devoted to contributing to improve awareness of the role of indoor and outdoor air pollution, in aggravating allergic respiratory symptoms, confirming Sanofi's commitment to anticipate the consequences of climate and environmental changes on health.

The Team has recently completed a Phase 3, double-blind, randomized study conducted in Canada, in an environmental exposure unit (EEU) demonstrating that Diesel Exhaust Particulates (DEP) exacerbates allergic rhinitis symptoms provoked by ragweed pollen. The manuscript describing the study results has been accepted for publication in the European Respiratory Journal Open Research(<https://openres.ersjournals.com/content/early/2021/01/21/23120541.00806-2020>)

4. PUBLICATIONS

For more information about the findings of **The Lancet Commission on Health and Climate Change 2015** and **The Lancet Countdown**:

Tracking Progress on Health and Climate Change 2016, see:

[https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(16\)32124-9/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(16)32124-9/fulltext) and 2017, [http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(17\)32464-9/fulltext](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(17)32464-9/fulltext)

For air pollution and respiratory allergies: Peden D. *J Allergy Clin Immunol* 2018; 141:878-9; Landrigan P.J. *Lancet* 2018; 391: 462–512].

For more information on the study about the effects of Diesel Exhaust Particulates on allergic rhinitis symptoms: Ellis AK, Murrieta-Aguttes M, Furey S, et al. Effect of fexofenadine hydrochloride on allergic rhinitis aggravated by air pollutants. *ERJ Open Res* 2021.

Link: <https://openres.ersjournals.com/content/early/2021/01/21/23120541.00806-2020>