**Introduction**— Climate change is a long-term shift in the statistics

of the weather (including its averages). For example,

it could show up as a change in climate normals duction

## (expected average values for temperature and

precipitation) for a given place and time of year,

from one decade to the next.

We know that the global climate is currently changing.

The last decade of the 20th Century and the

beginning of the 21st have been the warmest period

in the entire global instrumental temperature record,

starting in the mid -19th century.

**Causes Of Climate Change-**We think of the climate we enjoy today as normal, however the Earth’s climates are always changing.

At times, Britain has been hot enough for hippos to live in Norfolk. At other times [ice has covered the country](http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/iceAge/home.html) for tens of thousands of years.

Global climate change has usually occurred very slowly over thousands or millions of years.

Today our climate is changing quickly by comparison.

**Here are some of the many factors that can cause the Earth's climate to get hotter or cold**

**Strength of the sun**

Only about 40 per cent of the solar energy intercepted at the top of the atmosphere passes through to the Earth’s surface.

Almost all of the energy that affects the climate on the Earth originates from the Sun.

The energy emitted by the sun passes through space until it hits the Earth’s atmosphere.

The rest is reflected or absorbed by the atmosphere. The energy output of the sun is not constant, it varies over time and it has an impact on our climate.

**Effects of climate change-**

The planet is already suffering from some impacts of global warming.

* Ice is melting worldwide, especially at the Earth’s poles. This includes mountain glaciers, ice sheets covering West Antarctica and Greenland, and Arctic sea ice
* Many species have been impacted by rising temperatures. For example, researcher Bill Fraser has tracked the decline of the Adélie penguins on Antarctica, where their numbers have fallen from 32,000 breeding pairs to 11,000 in 30 years.
* The sea level has been rising more quickly over the last century.
* Some butterflies, foxes, and alpine plants have moved farther north or to higher, cooler areas.
* Precipitation (rain and snowfall) has increased across the globe, on average.
* Some invasive species are thriving. For example, spruce bark [beetles have boomed](http://ngm.nationalgeographic.com/2015/04/pine-beetles/rosner-text) in Alaska thanks to 20 years of warm summers. The insects have chewed up 4 million acres of spruce trees.

**Public health and health care context for conducting an adaptation assessment**

There is an urgent need for public health and health care to develop adaptation strategies for

the impacts of climate change on infectious diseases (Ebi

2008

; Lafferty

2009

; Paaijmans et

al.

2010

; Zhang et al.

2008

). The health sector is not a single entity, and adaptation options

may need to be coordinated across institutions and agencies. In many countries, the health

sector is comprised of, at the least, a ministry of health, health care services managed

separately, and, particularly in low-income countries, non-governmental organizations help-

ing both to achieve their goals. Ministries of health typically focus on public health policies

and measures, where public health is defined as efforts at preventing disease, prolonging life,

and promoting health through the organized efforts and informed choices of society,

organizations, public and private, communities, and individuals (Winslow

1920

). Public

health aims to prevent epidemics and the spread of disease; protect against environmental

hazards; prevent injuries; promote and encourage healthy behaviors; and respond to disasters

and assist communities in recovery (Public Health Functions Steering Committee

1994

Individual health care is often organized through local and national health services, and

includes nurses, doctors, and other health providers. Their focus is on identifying and

treating causes of ill health. Particularly in low-income countries, non-governmental organ-

izations, such as the International Federation of Red Cross and Red Crescent Societies, often

fill gaps in human and financial resources for ministries of health and health care providers.

**Public health policies and measures to manage the infectious disease risks of climate**

**change**

As with other sectors, effectively managing the risks of climate change requires policies and

programs to explicitly include processes to address risks that are changing over time and

space. For the health sector, these include risks from a changing climate and from changes in

other factors that determine the distribution and incidence of climate-sensitive infectious

diseases.

Current policies and programs to control climate-sensitive infections fall within basic

public health functions, including surveillance and interpretation of data related to the

impacts of climate change, outbreak investigation and response, regulations, education,

enhancing partnerships, and conducting research (Frumkin et al.

2008

; Semenza and

Menne

2009

). These can be modified to incorporate projections of changes in the climate

as well as other risk factors for infectious diseases (Ebi

2011a

).

Surveillance is the core activity for identifying the current incidence and distribution of

infectious diseases, and the factors responsible (Last

2001

). Surveillance is designed to keep

local, regional, national, and global public health departments and ministries of health

informed about the health status of the populations they serve, and the real and potential

problems they face (Wilson and Anker

2005

). Surveillance involves systematically collect-

ing data, including on risk factors and potential exposures that affect the incidence and

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distribution of a disease, and interpreting and distributing information to all relevant actors

(including public health decision makers, health care providers, and others) so that informed

decisions can be taken. Surveillance is one of the key responses for controlling

climate-

sensitive infectious diseases (Table

1

).

In addition to traditional public health approaches, possibilities for integrating environ-

mental variables into the surveillance of infectious diseases are under development. The

predictive capacity of models based on satellite imagery of environmental changes and how

these correlate to disease outbreaks has improved markedly in recent years, even if more

work is needed to leverage satellite data relevant for infectious disease spread, such as

temperature, sea surface temperature, vegetation indices, precipitation, and water quality

data. Early examples of these systems include malaria early warning systems and the

implementation of an European Environment and Epidemiology (E3) Network (Semenza

and Menne

**Conclusion**

Public health has a long and impressive history of preventing and controlling outbreaks of

infectious diseases. Increasing concern about the infectious diseases changing their geo-

graphic range or incidence with climate change is one factor driving national and regional

assessments of the possible health impacts of and responses to climate variability and change

(Confalonieri et al.

2007

). Ministry of Health professionals, university and NGO-based

researchers, and others are being asked to conduct these assessments, often because of their

expertise in one or a few climate-sensitive infectious diseases (Semenza et al.

2012b

).

However, expertise in climate variability and change is infrequently included in these

assessments. Development of consistent guidelines for conducting such assessments can

help ensure the products are informed and useful, and can facilitate consistency across

assessments so that comparisons can provide lessons learned for the next iteration. To this

end, ECDC developed a handbook intended as a resource to encourage planning activities

that anticipate and address the possible impact of climate change on communicable disease

spread (ECDC

2010

vary from country to country and region to region, the process is essentially similar. This

handbook stresses a strategy that involves as many different stakeholders as is feasible, is

iterative in nature, and is carefully managed throughout all phases.

**Reference-**

**Confalonieri U, Menne B, Akhtar R, Ebi K, Hauengue M, Kovats R, Revich B, Woodward A (eds) (2007)**

**Human health. Cambridge University Press, Cambridge References**