CLIMATE CHANGE AND NON-COMMUNICABLE DISEASES IN EGYPT AND ARAB REGION

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Definition of non communicable diseases and risk factors.

Examples of some non communicable diseases.

Link between non communicable diseases and climate change.

Strategies to mitigate the effects of climate change on non communicable diseases.
A non-communicable disease: is a medical condition which is non-infectious and non-transmissible among people.

NCDs may be chronic disease of long duration OR slow progressive.

They may result in more rapid death e.g. some types of sudden stroke.
Types of NCDs:-

- They include autoimmune diseases, heart disease, stroke, most cancers, asthma, diabetes, chronic kidney disease, osteoporosis, Alzheimer's disease, cataracts, and more.

- NCDs include many environmental diseases caused by external factors e.g. sunlight, nutrition, pollution, and lifestyle choices, Such as:
  
  Many types of cardiovascular disease (CVD), chronic obstructive pulmonary disease (COPD) caused by smoking tobacco and other factors.
Diabetes mellitus type 2.

Lower back pain caused by too little exercise.

Malnutrition caused by too little food, or eating the wrong kinds of food e.g. scurvy from lack of Vitamin C

Skin cancer caused by ultraviolet radiation exposure from the sun.

Obesity.

N.B : The rapid growth of non communicable diseases (NCDs), in low- and middle-income countries & their unfair social distribution pose major challenges to health and social systems and to development in general.
The WHO reports that NCDs are the leading cause of death in the world, representing over 60% of all deaths. Out of the 36 million people who died from NCDs in 2005, half were under age 70 and half were women.

In Egypt and Arab countries, according to the results of the Global Burden of Disease Study 2010, the burden of non-communicable diseases in the Arab world has increased.

By 2020, it is predicted that these diseases will cause 7 out of every 10 deaths in developing countries.
As Earth's surface temperature rises, a consequence of increased atmospheric concentrations of greenhouse gases particularly CO2, methane, and nitrous oxide, incidences of severe heat waves, droughts, storms, and floods will increase and become more severe.

Much of the climate change and health researches have focused on: infectious diseases, deaths and injuries from extreme weather events, the adverse health effects of heat extremes, and risks of under-nutrition due to declines in food yields.
In general, the range of possible impacts on NCDs has received little attention despite the strong evidence that climate changes will bring heightened risks to human survival & will likely exacerbate the incidence of some NCDs.

There are two challenges to improve global health:

- **To control the NCDs**
- **To protect people from the effects of climate change**

  >> which would be beneficial in alignment of their policy agendas, offering synergistic opportunities to improve population health.
A) **Direct effect of global warming** :-

I. **Heat stress**: in every person exposed to environmental temperature **above the comfortable zone** (18-21°C)

II. **Heat syncope**: -

Heat Syncope = Heat stress + psychological stress

Vasodilatation & decrease blood pressure
III. Heat rash (prickly heat): sweating in dusty environment causing closure of sweat glands

IV. Heat cramps: Painful spasm of voluntary muscles following hard physical work in hot environment

V. Heat edema:
Heat stress → Vasodilatation of blood vessels → edema of dependent parts of the body.
Heat exhaustion: Occurs in situations where **water intake is not sufficient** *(Water depletion heat exhaustion)* **OR** salt intake isn’t sufficient *(Salt depletion heat exhaustion)*.

Heat stroke: Essential triad of diagnosis:

- **Hyperpyrexia**
- **Loss of consciousness**
- **Red hot dry skin**

“Heat stroke is an emergency which needs rapid treatment”
B) *Indirect effects* :-

I. “The Cardiovascular system”

Climate change may increase the risk of cardiovascular disease (CVD) through **2 main exposure pathways** :-

- **Directly** via >> extreme temperatures and air pollution
- **Indirectly** via >> changes to dietary options.
Heat-related mortality and morbidity arise from overloading the cardiovascular and respiratory systems.

The physiological reactions to increased heat exposure include:

- Increased core body temperature
- Increased heart rate
- Shift of blood flow from central organs to skin
- Increased sweating & associated dehydration if sufficient replacement liquids is not provided.

Cardiovascular effects due to combined exposure to heat and air pollutants during hot seasons have been reported in many cities of the region.
II. “The respiratory system”

- Increasing tropospheric Ozone exposure will contribute to increased respiratory tract irritation, chronic pulmonary disease hospitalizations, and lung disease mortality.

- The fine-particle air pollution arising from fossil fuels combustion not only causes climate change but also increase the risk of acute respiratory infections.
Extraordinary spring pollen counts and the early arrival of spring is extending the spring allergy and asthma seasons, with implications for increased risk of respiratory and allergic diseases.

Warmer and drier climates will result in an increased area burned by bushfires >> greater air pollution & increasing the risk of respiratory illness (and also cardiovascular events), particularly among susceptible groups e.g. asthmatics, children, and the elderly.
Global climate change will alter stratospheric ozone as well as sun exposure behavior resulting in change in ambient ultraviolet radiation (UVR) exposure patterns.

Thus, it has the potential to change the risk of UV-related health outcomes, including skin cancers.
III. “Cancers (cont.)”

- Also, climate change may bring new pests, diseases, and weeds into the agricultural system, increasing use of herbicides and pesticides which could lead to greater contamination of some foods and greater human exposure raising the risk of cancers.
iv. “Mental health”

- Increase in stress and anxiety can result from increasing frequency and intensity of extreme temperatures and weather events, the perception and fear of climate change may threaten mental health.

- Populations exposed to extreme weather events such as tornados, floods, fires, and tsunamis may experience immediate mental health consequences as moderate or severe symptoms of *post-traumatic stress disorder*. 
Droughts which are predicted to become more frequent and severe in many subtropical regions cause displacement and hunger.

Consequently, farming jobs are lost, and anxiety, depression, and suicide rates, especially in farmers, often rise.
V. “Accidents”

VI. “Injuries”

VII. “Disability and Handicapping”

- All may result from extreme weather events and environmental disasters.
- Extensive episodes of flooding, increased frequency of severe storm surges and damage to coastal infrastructure all pose direct risk of injury.
Temperature extremes affect physiological functioning and accident occurrence.

Outdoors workers and those working in poorly ventilated hot conditions may be at increased risk of injury.
Food systems are affected by climate change, droughts, increasing frequency of flooding and other risk factors resulting in hunger-prone and chronic food insecure situations.

This results, in turn, to increased susceptibility and reduced resilience to NCDs and infectious diseases.
OTHER NON COMMUNICABLE DISEASES

- Autoimmune diseases.
- Cataract.
- Low birth weight babies.
- Chronic kidney disease.
- Blindness.
- Arthritis and other musculo-skeletal disorders.
- Reproductive health problems.
Well-designed climate change policy can reduce the incidence of major NCDs in local populations.

Measures for personal protection especially vulnerable groups

Considering the mitigation and adaptation of effects of climate change within the national strategy of health authorities
Thank you