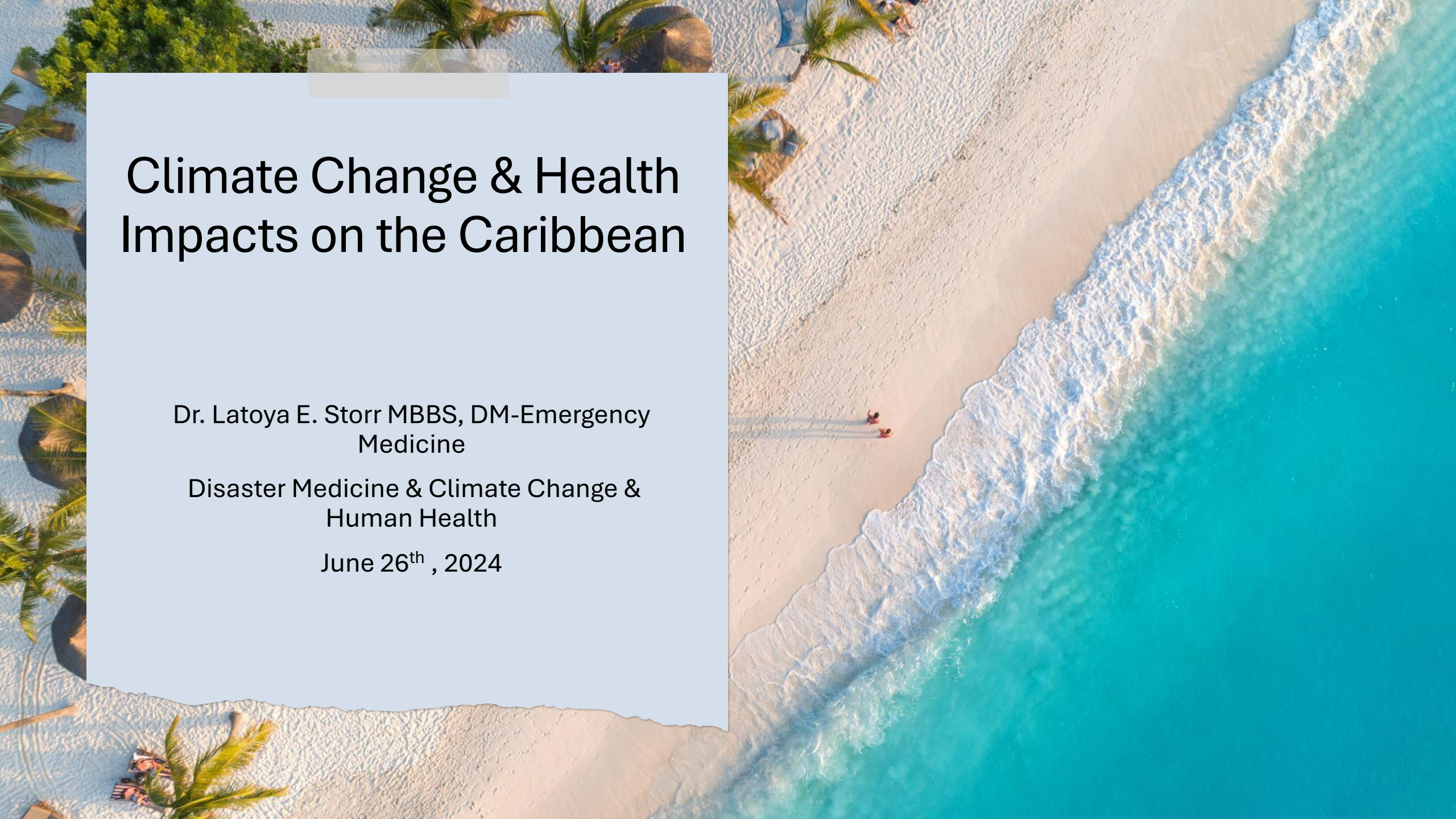


Climate Change & Health Impacts on the Caribbean

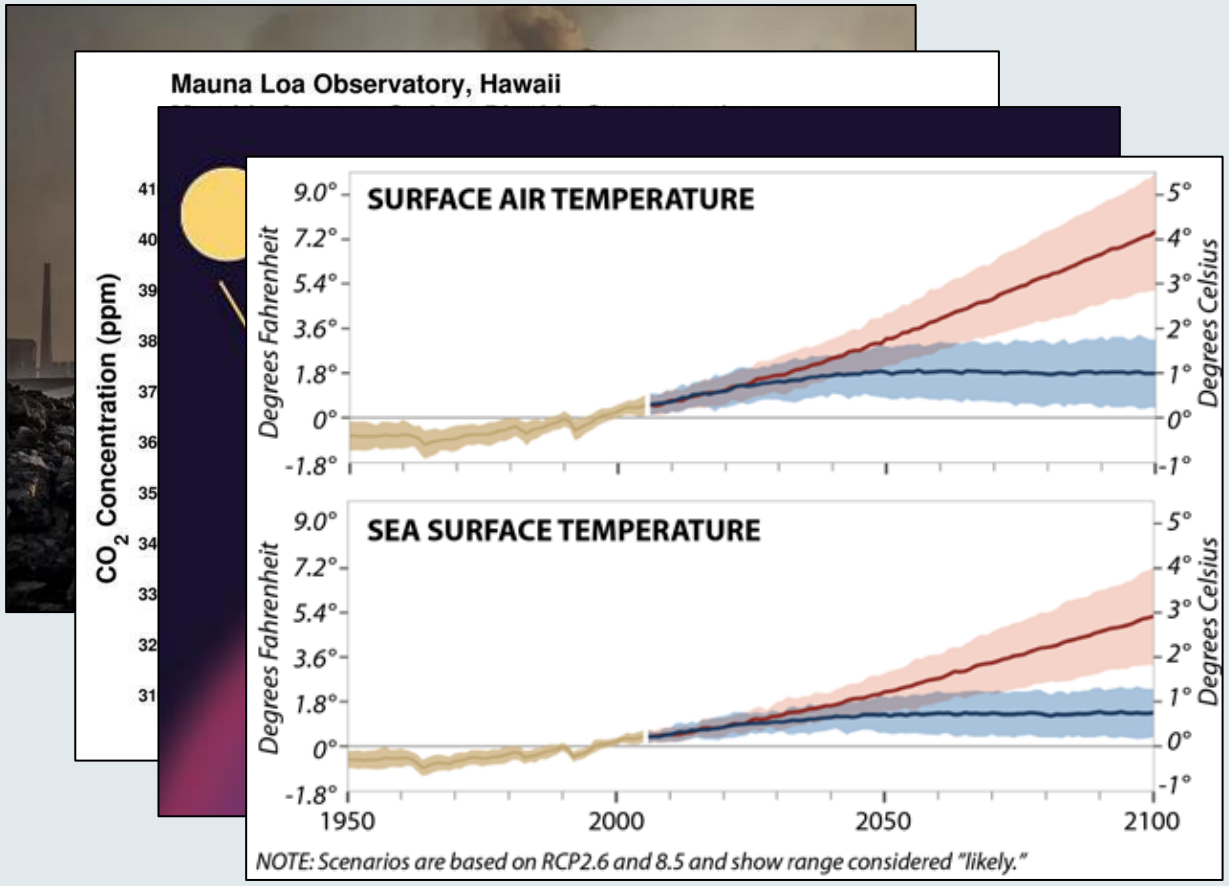
Dr. Latoya E. Storr MBBS, DM-Emergency Medicine

Disaster Medicine & Climate Change & Human Health

June 26th , 2024

No Disclosures

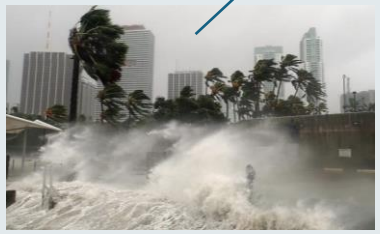
Climate Change: Physical Science Basis



- Regional Warming
  - Heat waves
  - Biome alteration
- Extreme Weather
  - Flooding
  - Drought
- Hurricanes
  - Intensity
  - Rainfall
- Wildfire
- Sea Level Rise
- Ocean Acidification
- Plant impacts

Disaster Risk, Climate Change, and Societal Context

Risk = Hazard x Exposure x Vulnerability / Capacity



Climate Change

Social, Societal, and Geographic Factors

Social Capital, Policy, Infrastructure, Technology, etc.

Impact of Climate Change on Human Health

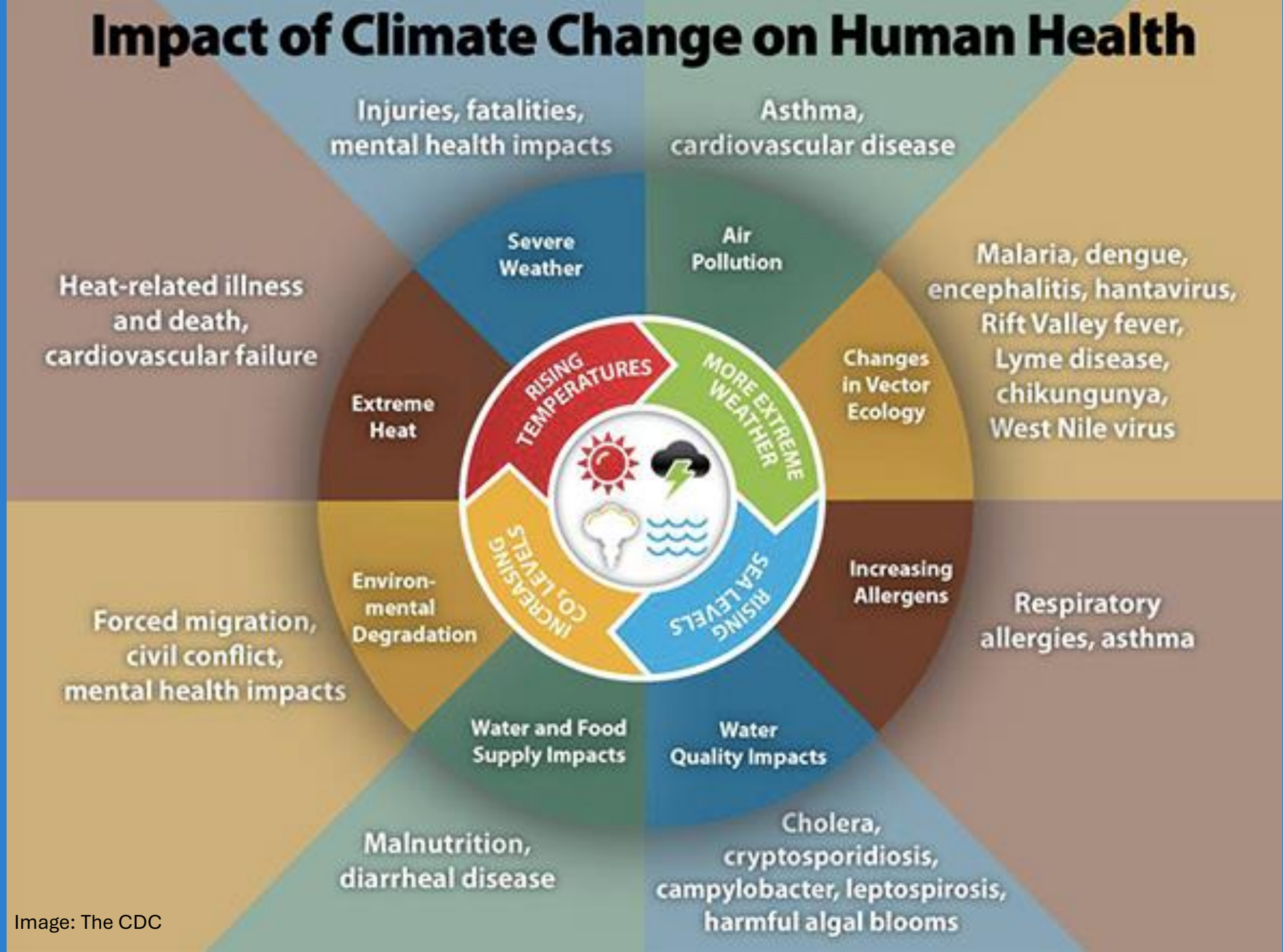


Image: The CDC

Extreme Heat

High Summer Temperatures

Geographic, Social, and Housing Factors

Dangerous Heat

Increased AC Use

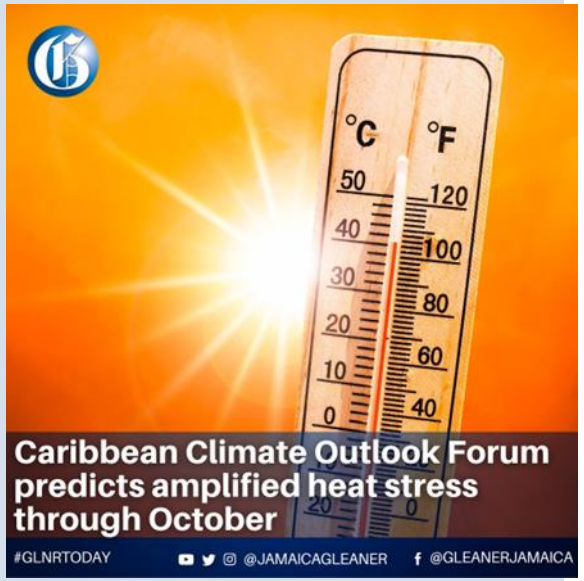
Increased Risk of Power Outages

← Post

Extreme Temperatures Around The World
@extremetemps

[1] HISTORIC CARIBBEANS HEAT WAVE
Most extreme heat wave in Caribbeans history,specially for the HIGHEST MINIMUM TEMPERATURES (for October and many for any month)

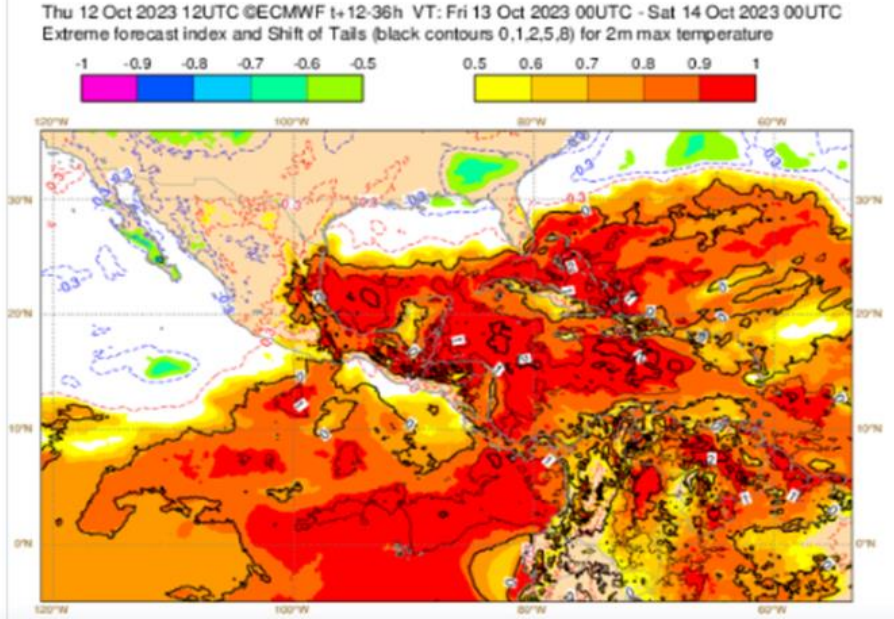
BELIZE 30.6C hottest night in Caribbean history
CUBA [Playa Giron] 29.3C
BAHAMAS [Freeport] 29.2C
CAYMAN IS. 29.1C



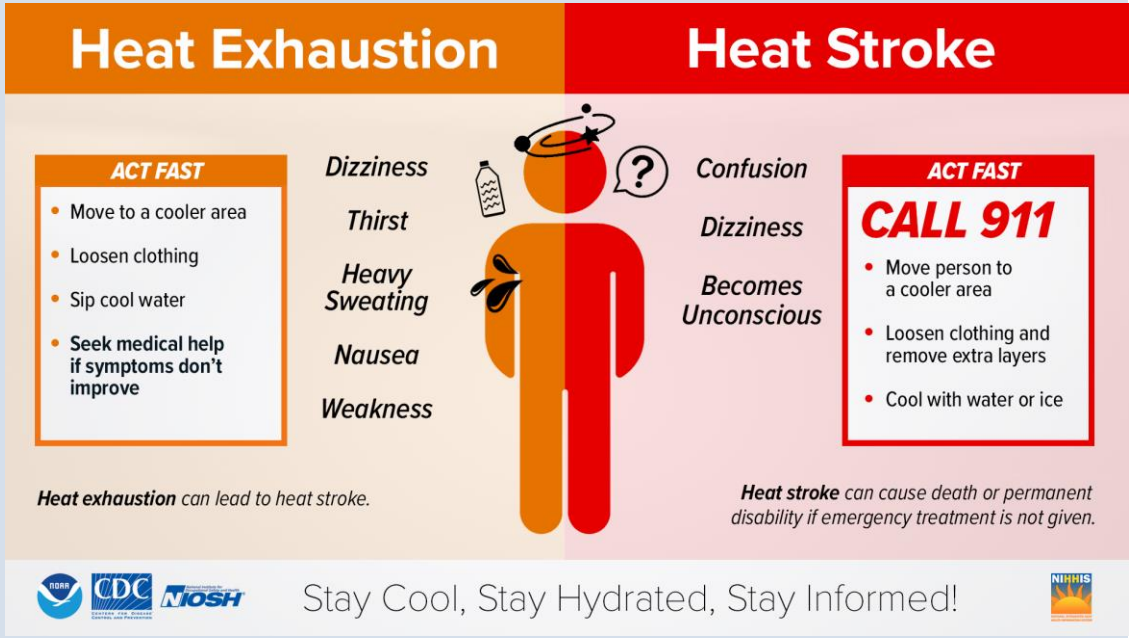
← Post

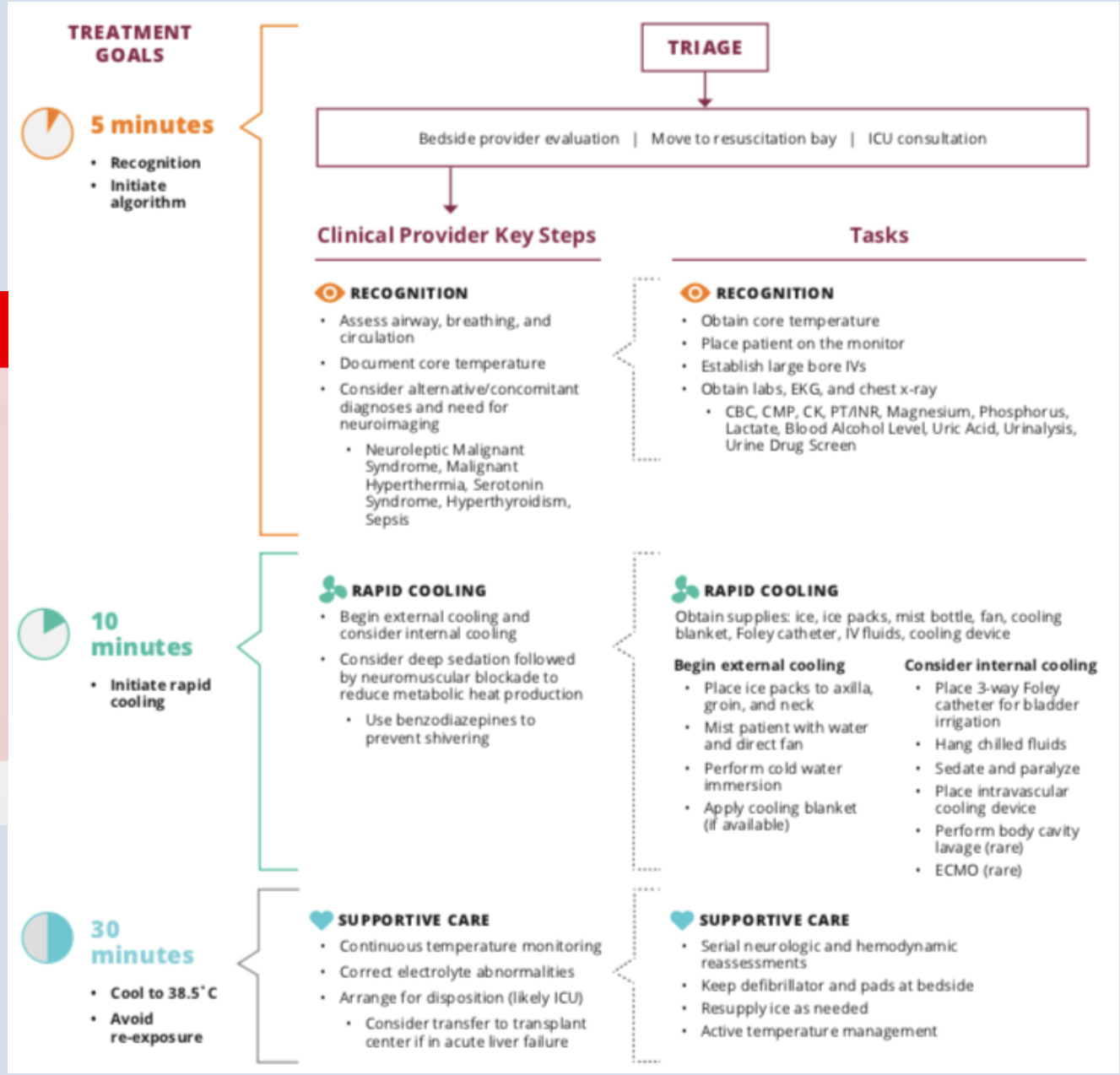
Extreme Temperatures Around The World @extremetemps · Oct 12, 2023

Extraordinary heat from Florida with record Tmins of 85F, to Caribbeans, Mexico ,Central and South America: Hundreds of records are being smashed in which is arguably the most extreme heat event in the Americas area wise
Records are falling allover the 2 Continents
Updates later



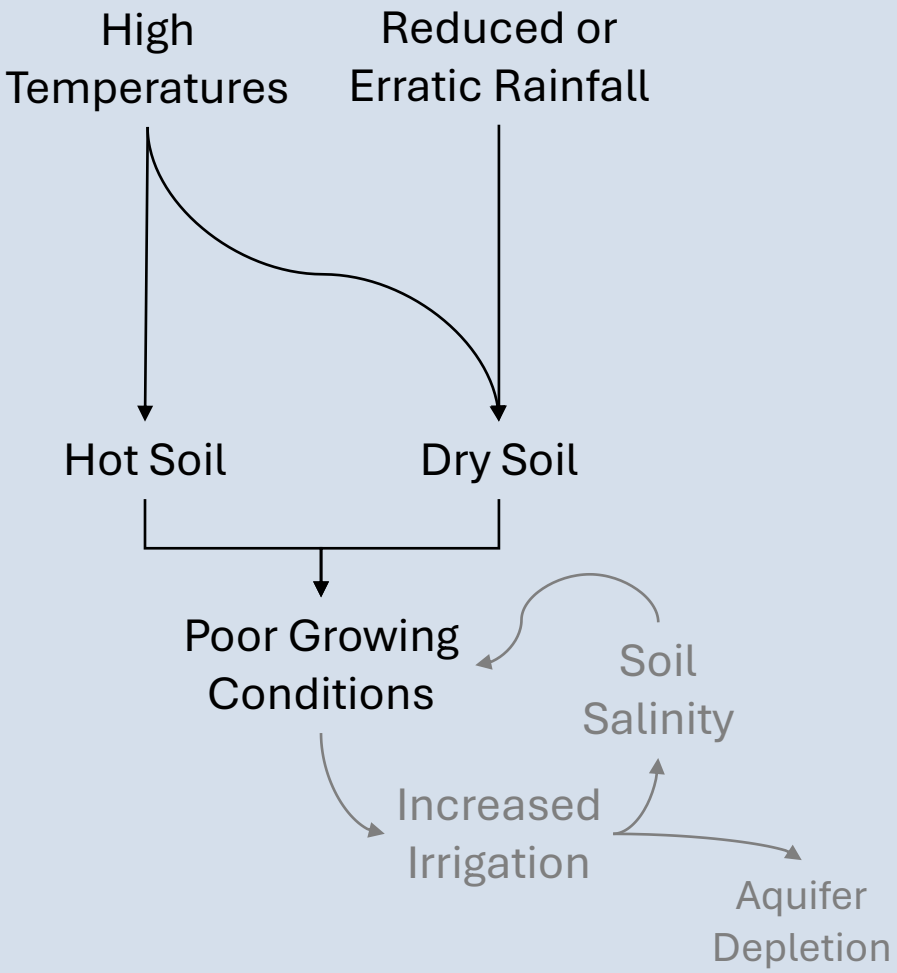
Heatstroke





BIDMC -ED

Drought



Source: Caribbean Community Climate Change Center

Wildfire

Wet Winter Conditions → Growth of Vegetation

High Summer Temperatures → Desiccated Vegetation

Growth of Vegetation + Desiccated Vegetation → Dangerous Fuel Conditions

Human Activity → Wildfire Ignition

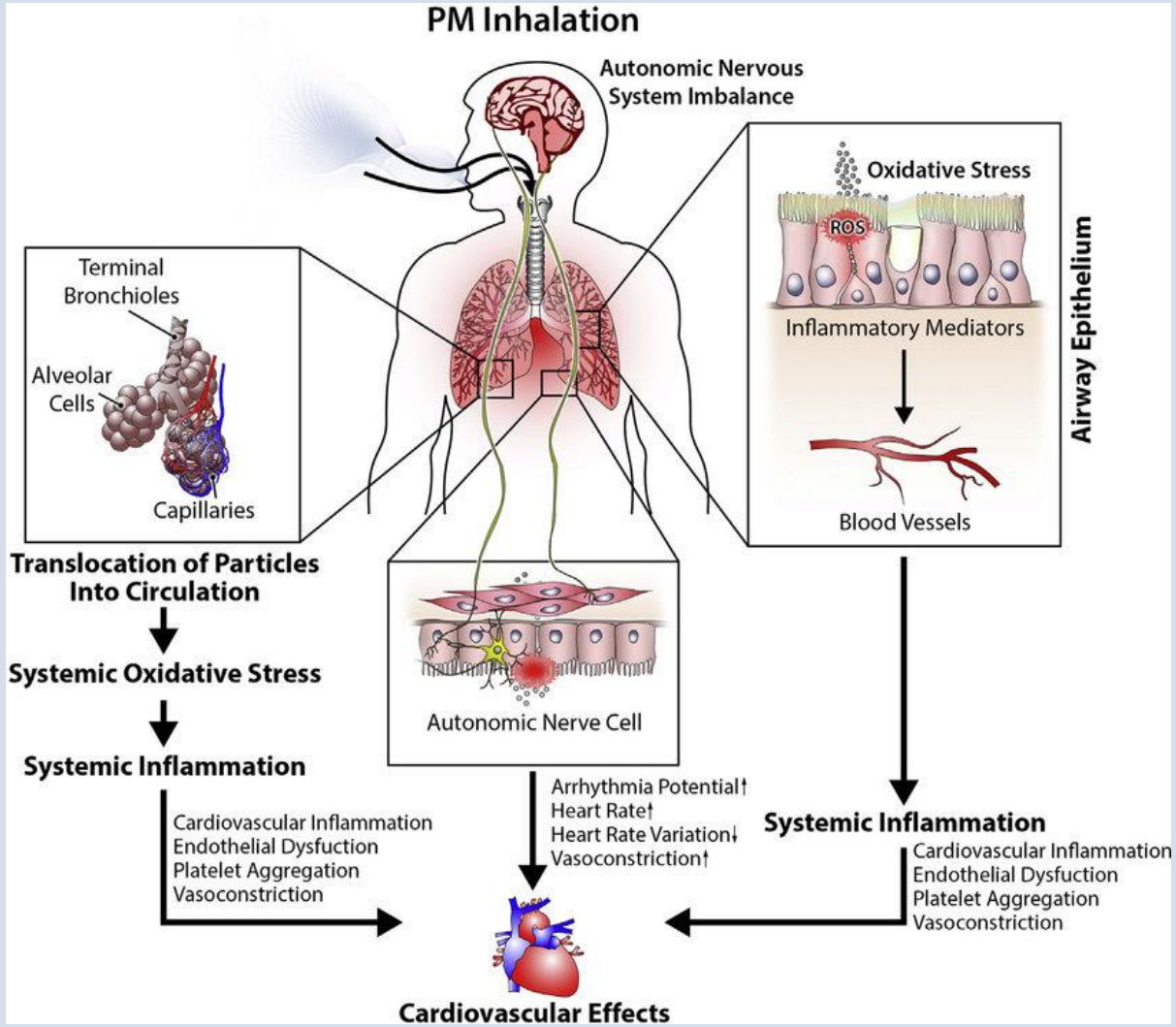
Lightning → Wildfire Ignition

Dangerous Fuel Conditions + Wildfire Ignition + High Winds → Increased Fire Activity

Increased Fire Activity → Smoke

Wildfire Ignition → Public Safety Power Shutoffs

Health Implications of Wildfires



Clinical reviews in allergy & immunology

Flame Exposure	Smoke Inhalation	Evacuation & Reconstruction
• Burns	• COPD exacerbation • Asthma exacerbation • Stroke • Myocardial Infarction	• Minor Trauma • Myocardial infarction • Loss of continuity of medical care

Severe Storms & Flooding

Increased Energy Available → Higher Wind Speeds → Wind Damage

Warmer Air → Increased Moisture Carrying Capacity → Heavy Rainfall

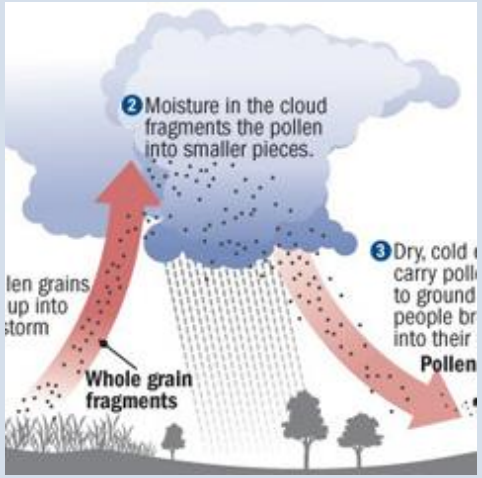
Atmospheric Rivers → Heavy Rainfall

Heavy Rainfall → Flooding

Societal and geographic factors → Flooding

NBC

Health Impacts of Heavy Precipitation & Local Storms



Storm-blown Pollen

- **Asthma exacerbations**

Sewer Overflow

- **Infectious diarrhea**
- **Soft tissue infections**

Housing Impacts

- **Homelessness**
- **Toxic & allergic molds**

Power Outages

- **Impacts on electricity-dependent medical equipment**
- **Refrigerated food and medicine spoilage**

Tropical Cyclone (Hurricanes)

Warm Air → Increased Moisture Carrying Capacity → Heavier Rainfall → Flooding

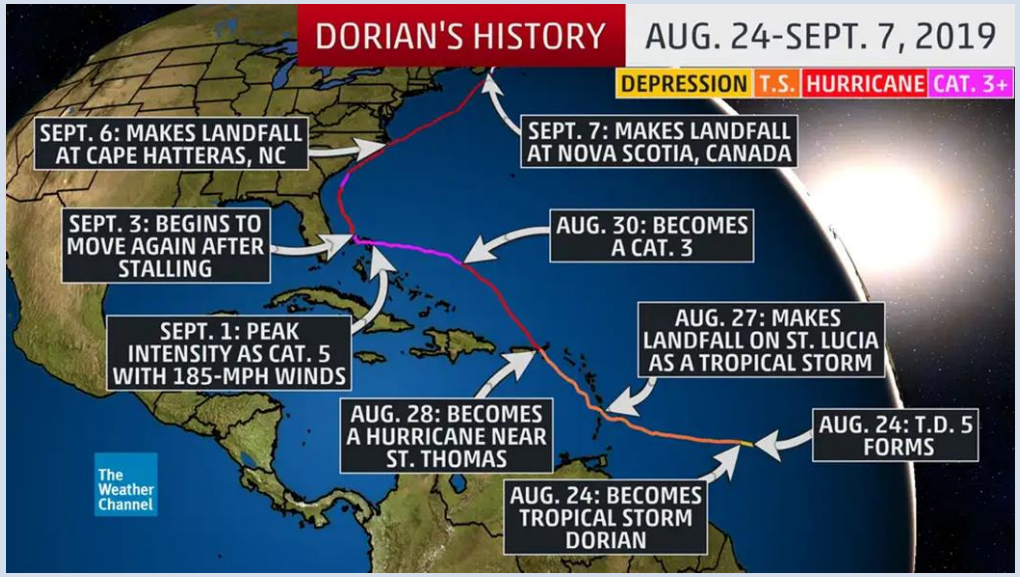
Warm Sea Surface → Increased Available Energy → Higher Wind Speeds → Wind Damage

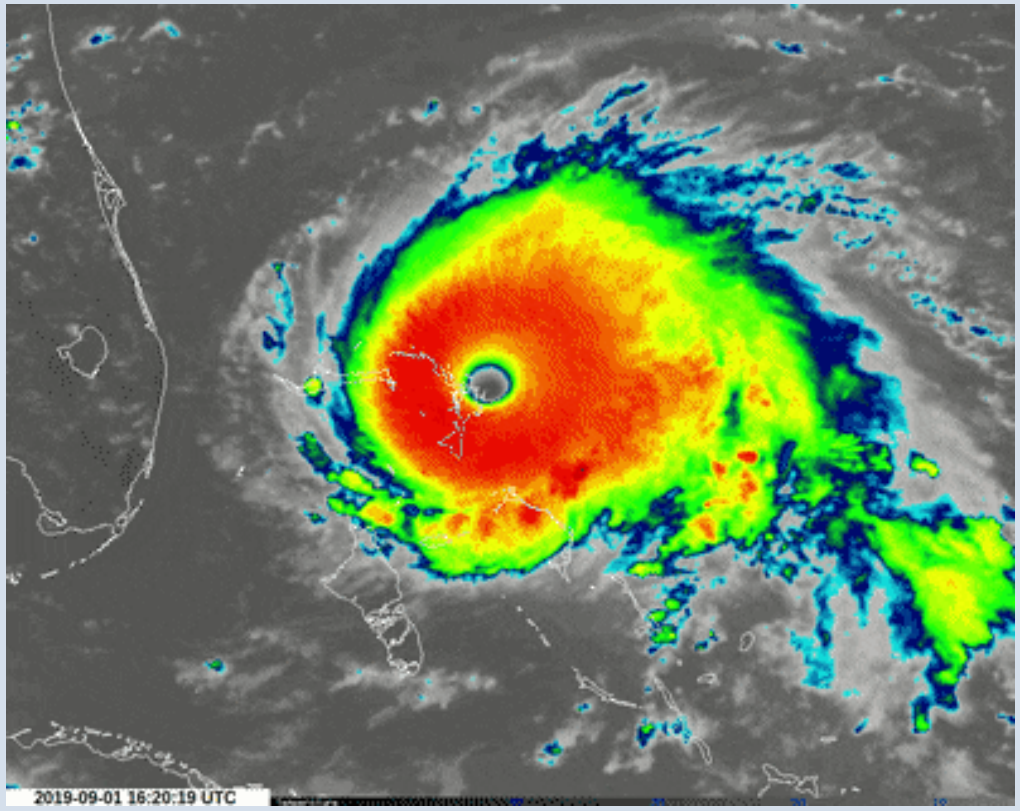
Warm Sea Surface → Increased Available Energy → Rapid Intensification → Reduced Warning

Sea Level Rise → Increased Storm Surge → Flooding

Also:

- Lower translocation speeds
- Risk of stalling
- Poleward shift





Vector-borne Disease

1. More places will become suitable for vectors.
2. Warmer climates extend the disease transmission season.
3. Temperature change can affect the behavior of vectors.

Socioeconomics & Health Impacts

CDC

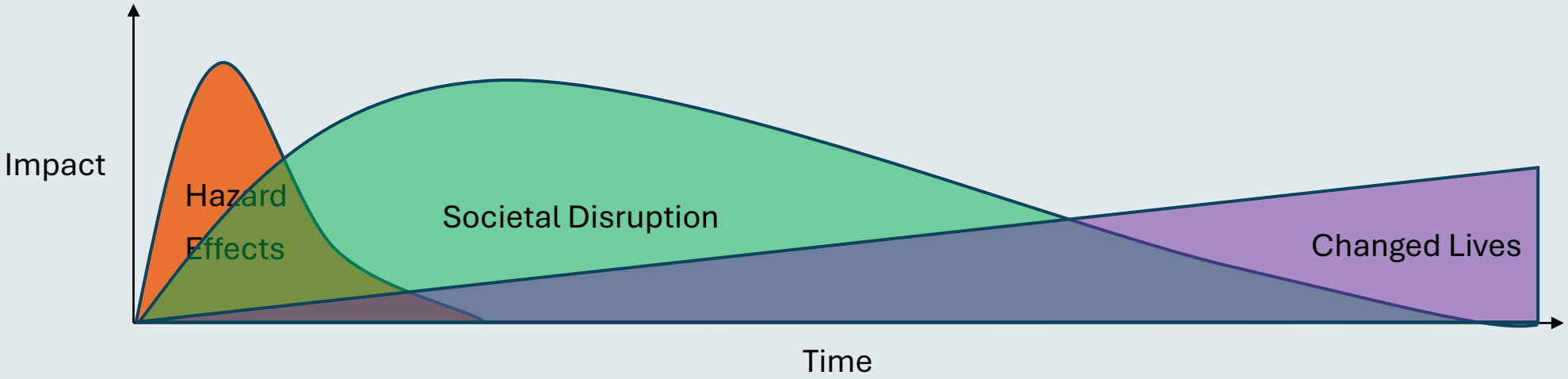
Disaster Health Impact Timeline

Impact Phase

Aftermath (days to weeks)

Recovery

Long-term



Disaster Health Impact Timeline

Impact Phase

- Burns
- Smoke inhalation
- Drowning
- Trauma
- Heatstroke
- Exacerbations of chronic conditions
- Lack of access to healthcare

Aftermath (days to weeks)

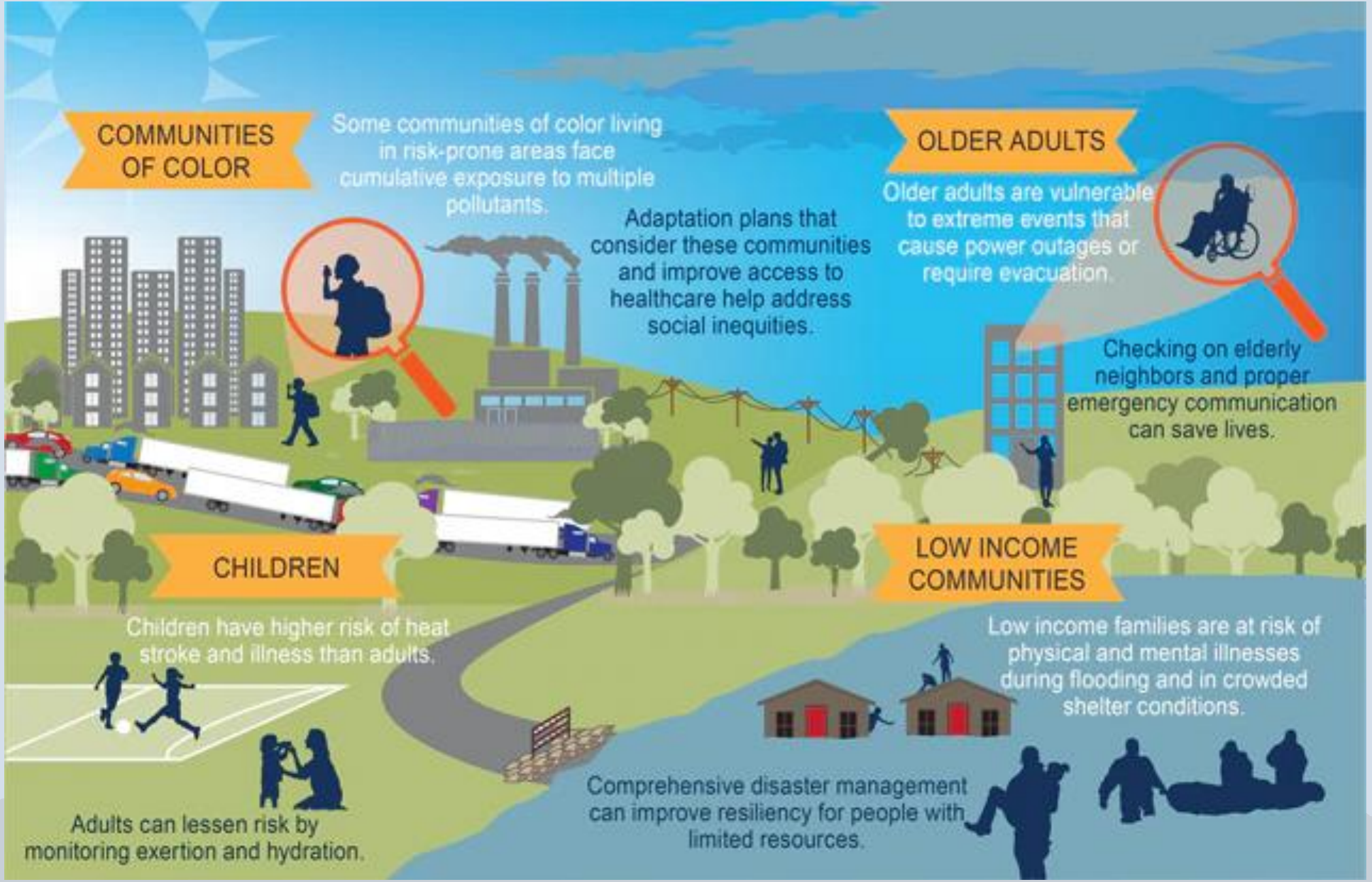
- Healthcare interruptions (chemotherapy, dialysis, etc.)
- Problems obtaining prescription medications
- Short-term displacement
- Stress / emotional trauma
- Risk of interpersonal violence

Recovery

- Reconstruction-related electrocutions and other injuries
- Difficulty following up with existing healthcare team
- Financial stress
- Food insecurity
- Mental health impacts
- Toxic exposures

Long-term

- Permanent displacement or migration
- Altered healthcare landscape; permanent demise of some institutions
- Loss of livelihoods
- PTSD, anxiety, depression
- Chronic health impacts



Disproportionate Impacts

Image: The 4th National Climate Assessment

Who is at Disproportionate Risk?

- Living with poverty or limited financial means
- People living with homelessness
- Indigenous, and People of Color
- Sexual and gender minorities
- Women
- Pregnancy
- Children
- The elderly
- Non-Native language speakers
- Undocumented individuals
- The chronically ill
- People living with disabilities or limited mobility
- People who use medical devices
- And many others…

No safe place to go

Limited resources

Racism & racist policies

Historical disinvestment

Distrust of the system

Risk of sexual or gender-based violence

Living in a place that is at high risk of flooding or heat

Unsafe housing

Frailty

Difficulty accessing aid / resources

Unable to access government services

Limited physiologic reserve

Lack of access to medications

Difficulty traveling or evacuating

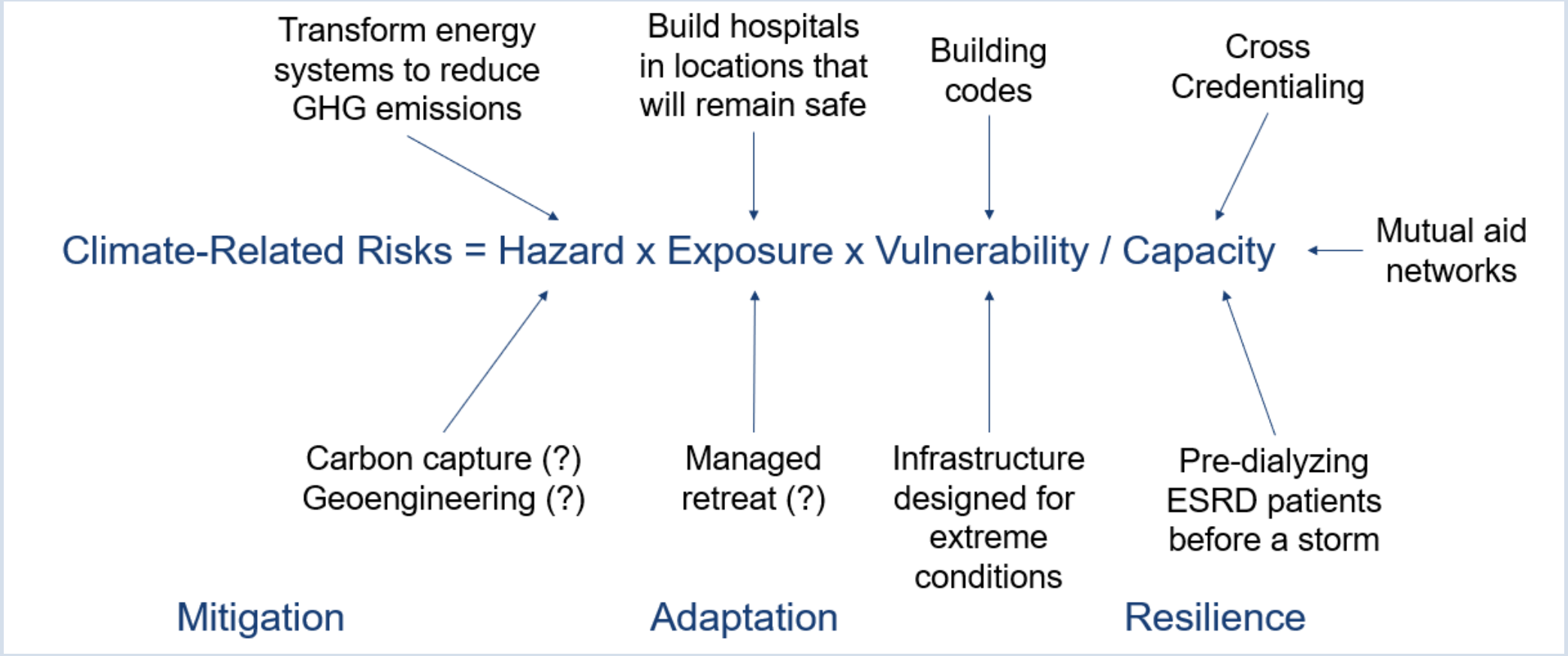
Interruptions in essential medical care

Dependence on electricity

And much more…

How can we achieve Climate Readiness from the standpoint of Disaster Risk Management?

Achieving Climate Readiness Through a Disaster Risk Framework



Heat Readiness – Community Health

Risk = Hazard x Exposure x Vulnerability / Capacity

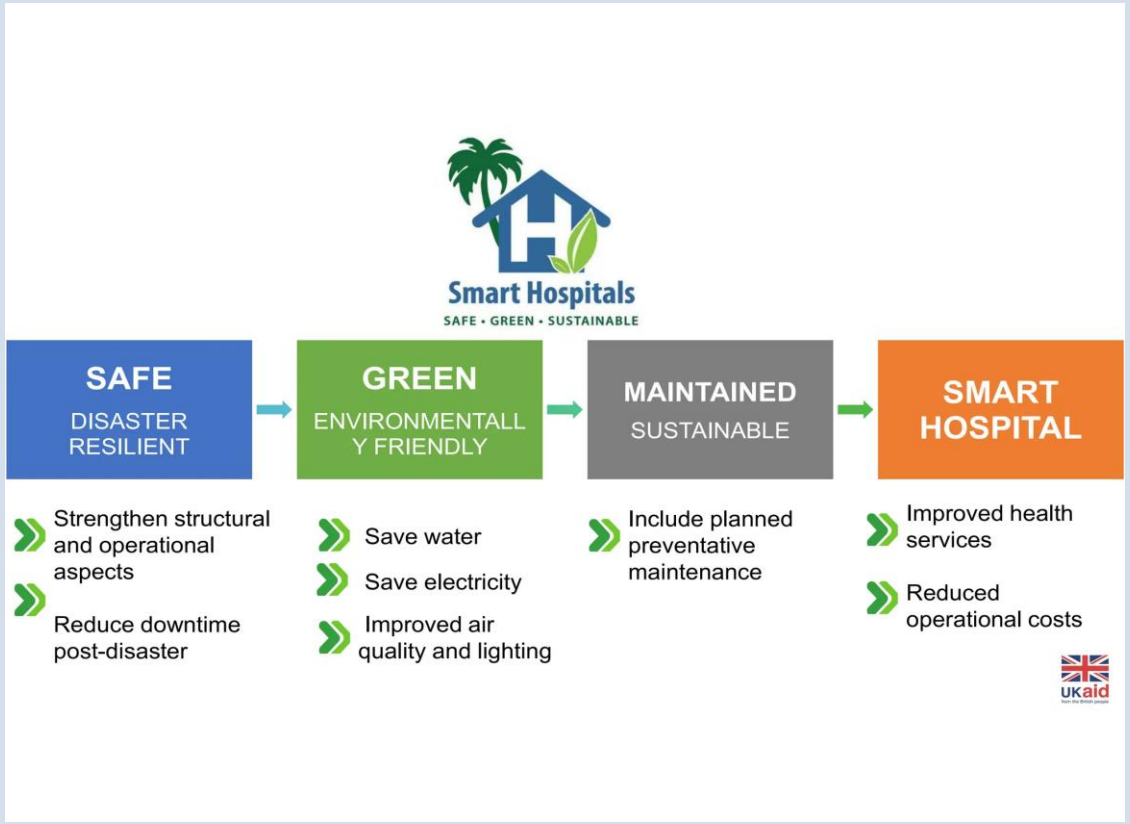
"invest in energy systems that reduce future global warming and severity of future heat waves"

"painting roofs white means less urban heat"

"residential cooling keeps people cool during a heat wave"

"If my AC fails, I'll go stay with my cousin for a few days and then come back home"

Business Insider



Extreme Weather & Flooding Readiness- Hospitals

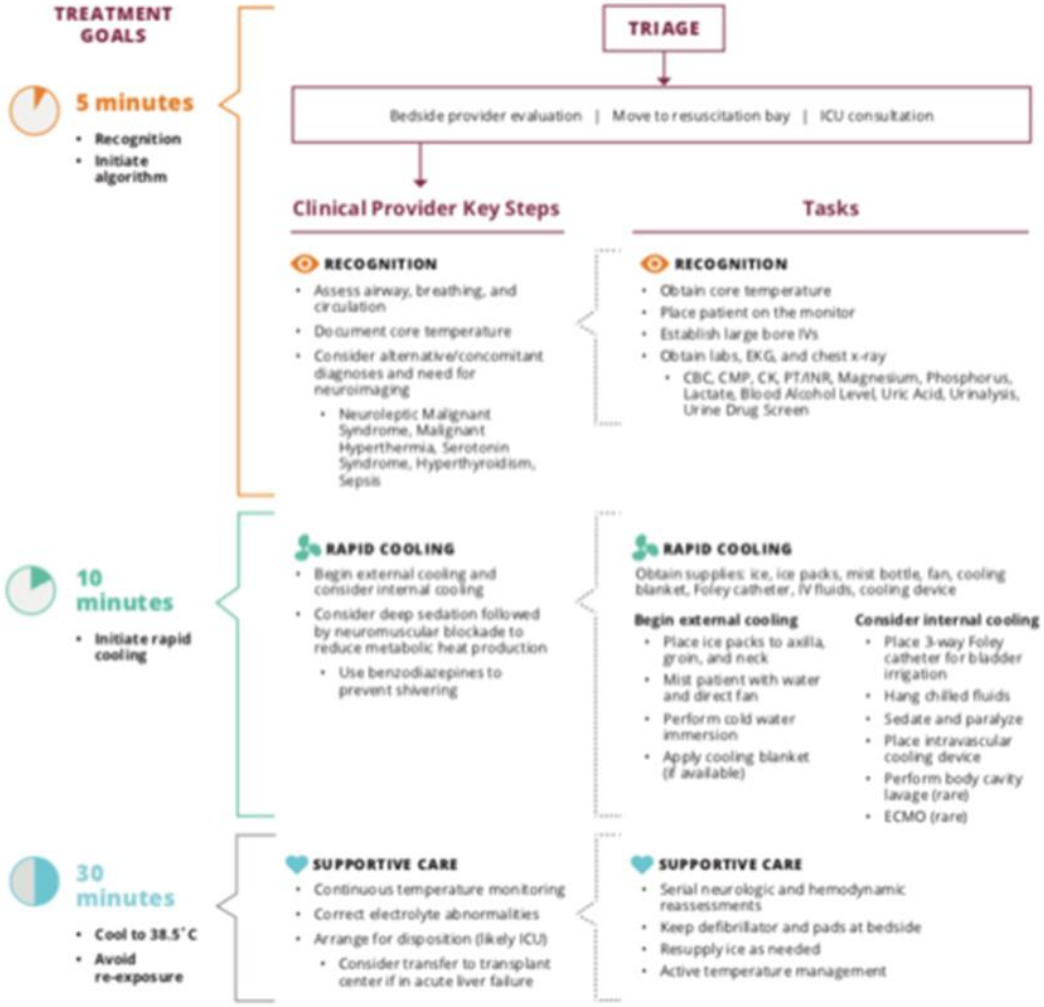
Wildfire Readiness

NBC

Creation of a Climate Ready Healthcare System

Clinical Solutions

- **Management of Climate-Related Diseases**
  - Heatstroke
  - Infectious diseases
  - Any many more…
- **Preventative Medicine**
  - High-risk conditions or social factors
  - Medical device users
  - Disaster plans
- **Care of Displaced Populations**
  - Distress migration
  - Complex humanitarian emergencies



Institutional Solutions

Physical Infrastructure Resilience to Climate Hazards

- Cooling plants, flood protection, backup power, backup water, wildfire protection…

Human Resources Resilience to Climate Hazards

- Transportation, housing, cross-system credentialing, surge capacity

Proactive Approaches to Climate-Related Hazards

- Pre-hurricane dialysis, medical device user outreach, focused community health programs

2015 WHO Operational framework for building climate resilient health systems

Educational Solutions

- Integration of clinically relevant climate change content into **Medical School** and **Residency** educational curricula
- **Fellowship** programs to train leaders who will develop and implement solutions
- **Professional** education on climate hazards, healthcare sustainability, and integration into existing practice
- **Executive** education on implications of climate change and climate readiness for managers of healthcare systems
- Education of **community and in-home health workers** on steps they can take to improve resilience and recognition of climate threats

Policy Solutions

Mitigation

- Incentives for solar and other low-emissions energy sources
- Regulatory approaches
- Health Co-Benefits

Adaptation

- Investment in preparedness
- Investment for prevention
- Investment in critical infrastructure
- Investment in community adaptation

June UN Climate Meetings (SB 60) Bonn, Germany

Climate and Health Foundation & Global Climate Health Alliance at SB60 Bonn, Germany 2024


Thank you

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