South African Weather Service is an Authoritative Voice of Weather Warnings.

Integrating weather to LIFE!

International Strategy for Disaster Reduction (ISDR), 14-15 October 2009, Welkom

Mnikeli Ndabambi,

South African Weather Service

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“Hospitals Safe from Disasters”

- The theme “Hospitals Save from Disasters” probed an in-depth thought to me….
  - Are we making use of the available weather and climate information for decision making?
- The following two slides indicate possible answer…see how hospital structures can be destroyed within hours

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When the sea comes to collect sand.

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Settlement in flood prone areas is it wise?

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Predictability of weather (is it a major concern? Ans = NO

- Infrastructure (Meteorological Observation Network connects the world)
- Numerical Weather Prediction models (Significant improvements over the recent years)
- Technological advancement (State of the art technology, super computers etc
- Remote sensing (Radar network, Lightning Detection Network, hi resolution satellite)
- Global collaborations and information sharing
- Major concern is: Are we using weather information to our benefit? **Ans = NO**

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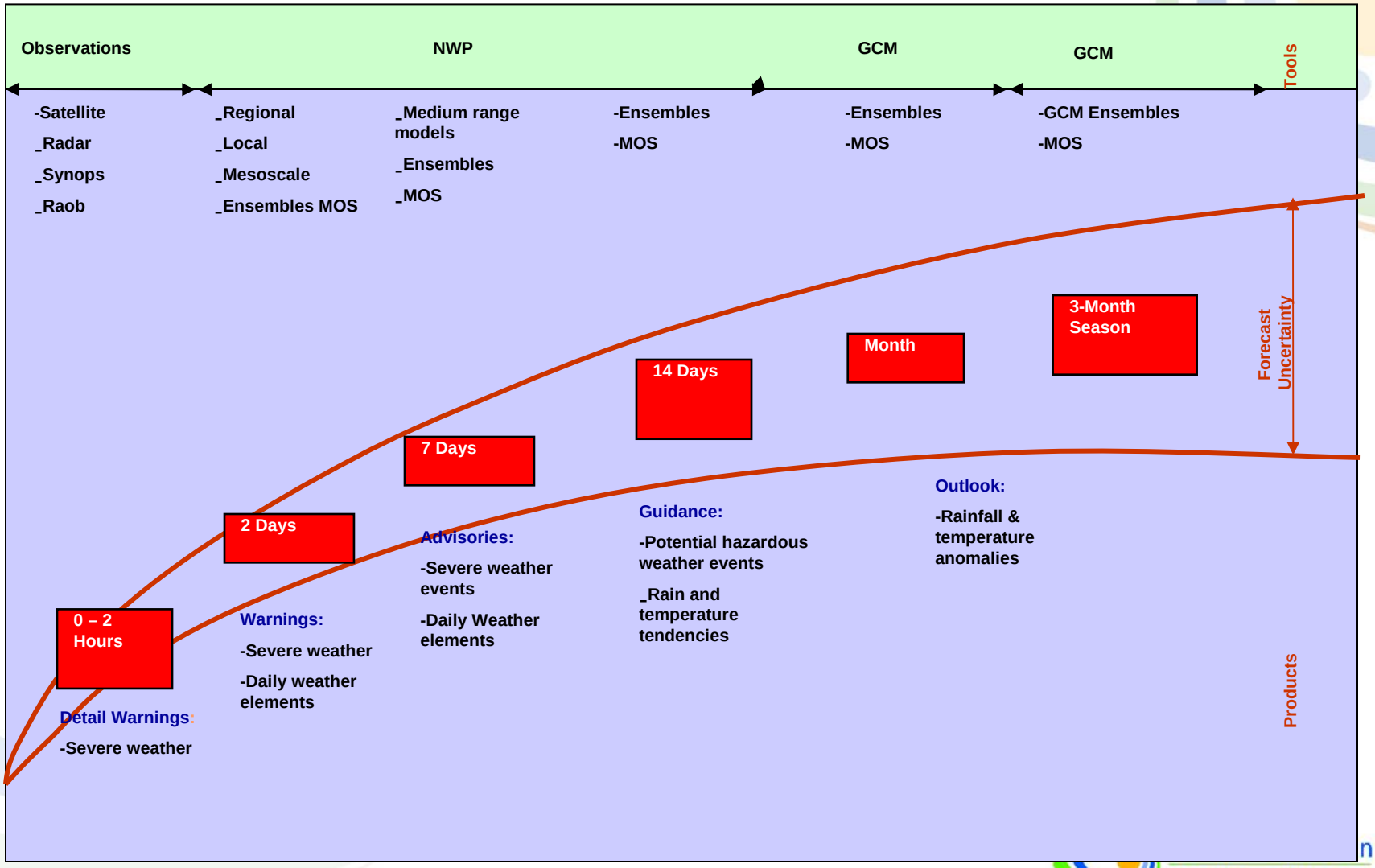
Seamless approach in forecasting-all time scales



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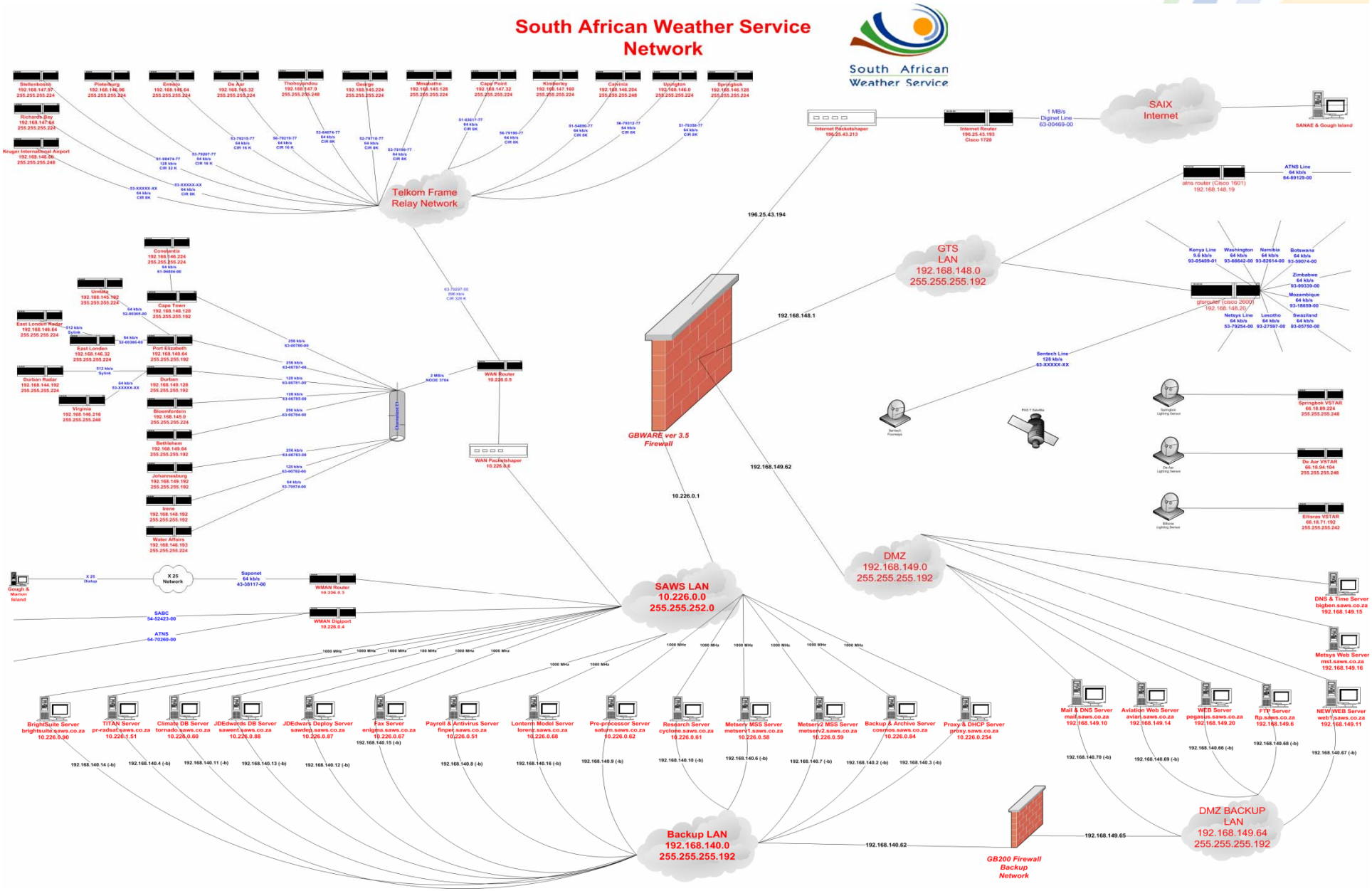
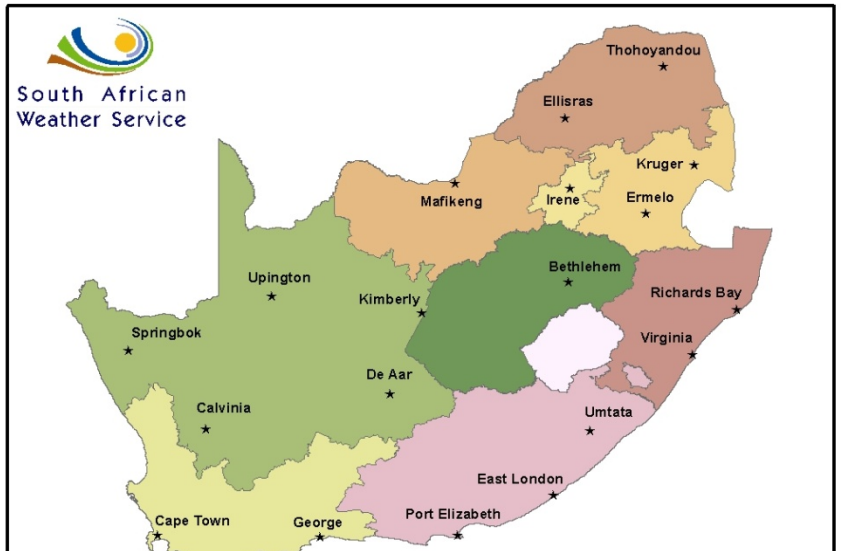
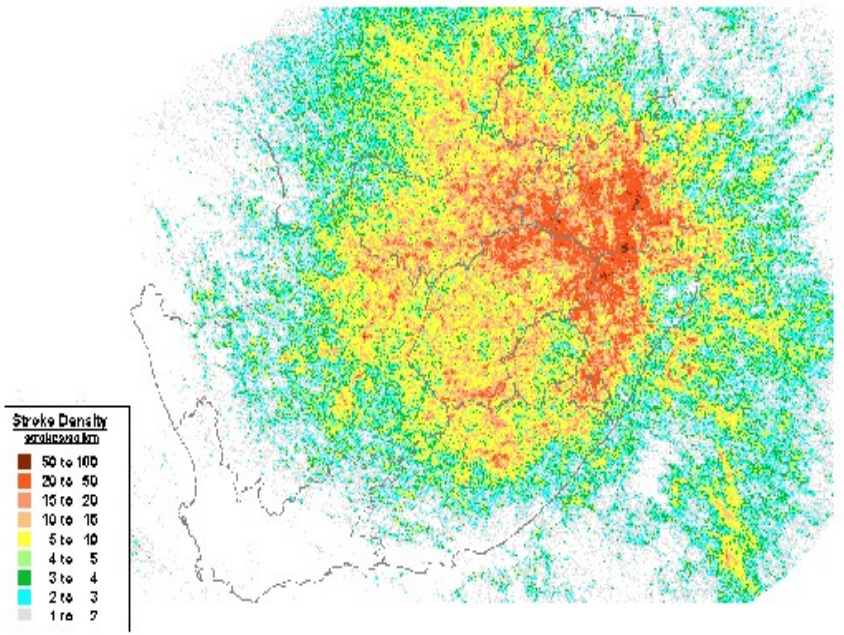


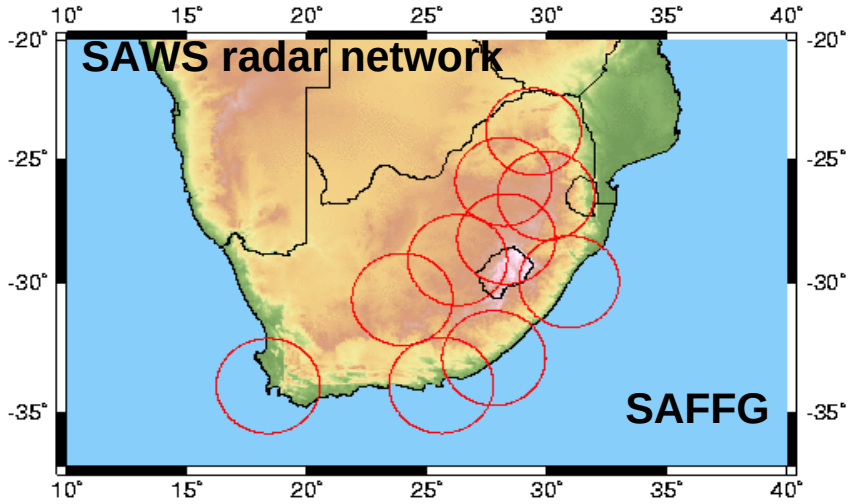
lead time challenges and how the information is used within such short warning lead time

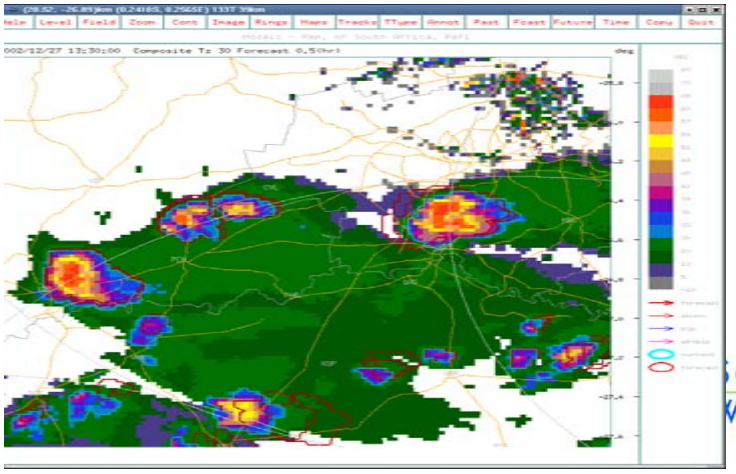
SAWS LIGHTNING DETECTION NETWORK



Lightning Stroke Density Map for 1 December 2005 to 31 August 2006







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“Hospitals safe from disasters”

- Do the hospitals received Severe Weather Warnings when they are under threat?
- Do they know who receives weather warnings in their vicinity?
- Do they know what actions to take in case of certain warnings that threatens their service/ power supply/ number of personnel needed/destroying building/ life (both sick and working people) etc
- Think of number of accidents when raining.
- Number of hospital beds when cold spell is expected (UK make use of weather forecast)

**Disaster Risk Reduction require an integrated approach

Climate, weather and health

- Climate and health are linked in a number of ways.
- Climate and weather affects some of the most fundamental determinants of health: air, water, food, shelter and disease.
- Climate plays a powerful role

✓ in the occurrence and spread of diseases worldwide,

✓ in regional air quality

✓ and in weather extremes that dramatically change day to day living.

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Linkages between Climate and Infectious Diseases

- The change in weather conditions can lead to the appearance of epidemic disease.
- The abilities to detect and predict climate variations such as El Niño, coupled with mounting evidence for global warming, have sparked a growing interest in understanding the impact of climate and weather on the transmission of infectious disease agents.
    - Malaria as well as foot and mouth disease.
    - The characteristic geographic distributions and seasonal variations of many infectious diseases that occurs can be linked with weather and climate.

Linkages continue…..

- Studies have shown that factors such as temperature, precipitation, and humidity affect the life cycle of many disease pathogens and vectors (both directly and indirectly), through ecologic changes
- The animal health also suggest that when cattle are exposed to severe floods and high humidity this brings the animals immunity and temperature down to a level that enables infection to take place resulting in diseases such as foot and mouth to emerge.
- There are other factors such as basic hygiene that should be taken into consideration

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Climate Change and the Evolution and Emergence of Infectious Diseases

- Another important but highly uncertain risk of climate change is its potential impact on the evolution and emergence of infectious disease agents.

- Ecosystem instabilities brought about by climate change and concurrent stresses such as land use changes, species dislocation, and increasing global travel could potentially influence the genetics of pathogenic microbes through mutation and horizontal gene transfer, giving rise to new interactions among hosts and disease agents. (H1N1..)

Facts on climate, weather and health

- As the global climate changes are experienced, people in many areas are at an increasing risk of vector-borne diseases,
  - such as malaria,
  - West Nile virus and
  - dengue fever.
- The mosquitoes that carry many of these diseases tend to thrive in warmer, wetter climates.

Facts on climate, weather and health continue-

- Scientists are concerned about a heightened risk of water-borne diseases due to
  - warmer temperatures that may change the survival rates of pathogens,
  - coupled with increased rain and flooding, which mobilize contaminants.
- Warmer ocean water can trigger
  - toxic algal blooms and
  - cholera epidemics, for example,
- while increased runoff
  - can overtake sewage systems and release pathogens into the water supply.

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Facts on climate, weather and health-continue-

- Heatwaves and urban pollution events pose air quality risks, particularly to children, the elderly and people with vulnerable immune systems.

- Many of the climate-change-inducing particles and chemicals emitted into the atmosphere by human activities also pose severe health risks.

Facts on climate, weather and health-continue

- Aerosols, such as road dust for example, both absorb heat from the atmosphere and cause respiratory illness.
- Meanwhile, a warmer climate increases the frequency of sand and dust storms, which trigger respiratory and cardiovascular problems.
- Other weather and climate extremes,
  - such as droughts,
  - wildfires (Veldfires) and
  - floods,
- are very likely to increase in frequency and intensity in the future. Such extremes endanger people's immediate safety, as well as their long-term health through a variety of effects on the food and water supplies.

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Botswana case on use of climate change and weather information to fight Malaria

- Botswana has an innovative weapon on its side in the country's fight against malaria.

- This weapon is not a new drug or mosquito net but rather climate information.

- An early warning system that integrates a seasonal rainfall forecast with population and health information.

- The use of the seasonal rainfall forecasts has added a four-month lead-time over previous malaria epidemic warnings.

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Botswana case on use of climate change and weather information to fight Malaria continue

- The success of the malaria early warning system in Botswana hinges on the well-established link between malaria and climate variability, particularly rainfall.
- Although many factors contribute to the spread of malaria in a region,
  - the timing and quantity of precipitation

can be particularly important in predicting outbreaks of the disease, as these factors determine both the mosquito migration patterns and rate of parasite development.

Concluding remarks

- Looking at selected health issues, the WHO estimated that climate change caused 150 000 deaths in the year 2000 (using 1961–1990 as the climate baseline period).
- In general, these climate-related health risks have the greatest impact on developing countries
- Linkages between climate and infectious diseases are often poorly understood, and research to understand this relationships is necessary.
- Early-Warning Systems for Infectious Disease is necessary.
  - A close collaboration between the national weather services and health is necessary in order to come up with the system that can be used to alert the health department in advance in case there could be condition favorable for an outbreak of a pandemic.

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Acknowledgement

- World Meteorological Organisation (WMO)
- World Health Organisation (WHO)
- Other partners and
- Fellow National Weather Centres (National Meteorological and Hydrological Services)

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South African Weather Service is an Authoritative Voice of Weather Warnings.

Thank you!

Kamnandi!

END!

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