INTEGRATING WEATHER CLIMATE AND ENVIRONMENTAL INFORMATION FOR HEALTH
Using environmental information
Weather and Climate Informed Decisions
Climate Information for Health Sector

- Decisions - <10 days
  - Emergency response
  - Capacity to cope with casualties
  - Aeroallergens, heat waves, poor air quality
Climate Information for Health Sector

Decisions – Weeks to Seasons

- Vector-borne diseases; e.g. Malaria, dengue, hanta virus
- “Seasonal diseases” e.g., Men A Meningitis, cholera
Climate Information for Health Sector

§ Decisions – Inter-annual and longer

- Anticipating climate threats to prerequisites for public health – food, water, shelter
Advances in Climate & Weather Prediction

- Global 5-day forecasts are as good as 2-day forecast of 25 years ago
- Greater understanding of forecast uncertainty permits more useful seasonal predictions
- Distinction between weather and climate is disappearing
Satellite and in situ data

**Satellite data**

- Assimilation of advanced satellite observations

**In situ data**

- Access to in situ environmental and health observations and information
Early Warning Systems

Advances in Health Forecasting
Key Steps to Improving Health Early Warning Systems

- Surveillance systems
- Use of GIS tools
- Assess the predictive accuracy of the system
- Measure all relevant factors for which information is available
- Include health policy makers in all stages of system design and implementation
- Early warning system implementation should be based on cost-effectiveness of including climate and non-climate information

Kuhn, K., D. Campbell-Lendrum, A. Haines, and J. Cox, 2004

Operational since summer 2004,
Météo France / Ministry of Health

Jean-Claude Cohen, Météo France, WMO, July 2009
Predictive Modeling of Health

Motivation

- Policy makers need to understand future changes to the environment and the impact of these changes;
- Healthcare systems need to be more effective and efficient, particularly against the backdrop of the rising cost of healthcare provision;
- Inform and therefore better protect populations from the impacts of the environment;
- The prospect of a rapidly changing climate.
Predictive Modeling of Health

Emerging Capabilities

- Detailed health information, such as GP records, hospital admissions
- Technologies to deliver information at the right time to the right people
- Customized approach to health care
- Downscaling of weather and climate prediction to local scales
Health forecasting is about moving from...

This is the weather

This is the impact on health

Reaction to impact

This is the relationship between weather & health

This is the forecast of weather and risk to health

Prevention of impact
Predictive Modeling of Health

Provides services to Health care providers and individuals with certain conditions, such as COPD.
Medixine software on NHS Server

Interactive voice response system

Met Office forecaster

NHS Network

Call logs

Patient name and tel no, changes to patient status

Automated telephone call

GP practice

Medical software administrator

Health Forecasts

Patient responses

Telephone numbers

Monitoring

Celebrity with COPD

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Predictive Modeling of Health

Factors influencing COPD – Bayesian network allows testing of the relative importance of each factor as well as predictions of the health implications of the changes in any factor.
Can this approach work in Dev Countries?

Malaria Eradication Strategy
From Climate Outlooks to Health Warnings

Regional Climate Centers / NMHSs

Regional Climate Outlook Forums

Malaria Outlook Forums

Joint malaria detection and response

Health Services
Global Malaria Action Plan

Opportunity for greater cooperation between health, climate and satellite communities to enhance surveillance and early warning

Malaria elimination
- Strengthening health systems
- Cross-border collaboration
- Rigorous surveillance

Prevention of re-introduction
- Surveillance needed to monitor areas with high potential for malaria
- Behaviours, activities, migration, climate variability and climate change
Summary
Key points

- Integration of satellite and in situ environmental and health information – make it easier to exchange data
- Shift from reaction to impact to prevention of impact
- Transfer capability from developed to developing countries