Improving health with climate information
Climate impacts on health through direct and indirect pathways
Many climate impacts on health

Adapted from Borowski 2008

Illness, injury and death

Displacement

Respiratory disease

Malnutrition

Heat

Air pollution

Food supply

Civil conflict

Storms and floods

Disease transmission

Infectious disease

Infectious disease

Illness, injury and death

Adapted from Borowski 2008
Advances in climate and weather over recent decades
Why is climate a unique data source for the health sector?

- climatology
- seasonality
- day-night rhythm
- potential predictability at multiple time scales (weather, seasonal, decadal and climate change)
- measured routinely by others, outside of the health sector
Scale matters: global scale
Global meets local

GOING UP
Malaria incidence and temperatures have risen near Kericho in Kenya over the past 30 years; health experts are keen to know whether they are linked.

Lags matter: Lags between climate indicators and health outcomes provide the basis for early warning

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<th>INITIAL CONDITIONS</th>
<th>MOSQUITO DEVELOPMENT</th>
<th>INFECTED ADULT FEMALE MOSQUITO</th>
<th>INFECTED HUMAN HOST</th>
<th>SICK HUMAN HOST</th>
<th>CASE</th>
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<tbody>
<tr>
<td>• Vector breeding sites</td>
<td>• Degree days</td>
<td>• Degree days</td>
<td>• Intrinsic incubation period</td>
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<td>• Gametocyte carriers</td>
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<td>• Specific temperature range</td>
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<td>• Human blood index</td>
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<td>• Susceptible people</td>
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<td>• Extrinsic incubation period</td>
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<td>• Mosquito survivorship</td>
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Catastrophic death-rates in North Eastern Kenya following malaria epidemic associated with 1997/8 El Niño

Catastrophic deaths, approximately 5% of the population, during the 1997–1998 epidemic

Climate information and health decision-time-frames
Changing malaria risks as temperatures rise

6 million more people exposed to malaria

Lyon et al., 2017. Temperature Suitability for Malaria Climbing the Ethiopian Highlands. Environmental Research Letters 12: 064015
Getting the climate right for malaria impact assessments

How can climate information improve climate sensitive health outcomes?

• improve our understanding of the mechanisms connecting climates variables to health outcomes
• estimate populations at risk (risk mapping)
• estimate seasonality of disease and timing of interventions
• monitor and predict year-to-year variations in incidence (including early warning systems)
• monitor and predict longer term trends (climate change assessments)
• improve assessment of the impact of interventions (by removing climate impact) estimate populations at risk (risk mapping)
Getting climate and health research into operational decision-making
Policy and stakeholder perspectives
Practitioner experiences and capacity
Links

Book – including FREE EBOOK - Climate information for public health action

Supplementary materials

Additional publications https://www.researchgate.net/profile/Madeleine_Thomson

WHO/WMO Case Studies Report
https://public.wmo.int/en/resources/library/climate-services-health-case-studies

ENACTS sites
https://iri.Columbia.edu/ENACTS

Consortium of Climate Change and Health Education
When connecting climate to health outcomes – data quality matters (a lot)