

# Climate change and health in the Pacific: New research and the role of WHO

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## Outline

- History of WHO work in CC&H
- New evidence from “Vulnerability and adaptation capacity (V&A) assessment” project in 11 PICs
- New evidence from “Piloting CCA to protect human health (PCCAPHH)” project in Fiji
- Role of WHO and way forward

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## History of WHO work on CC&H

- **1989:** WHO publishes “Potential health effects of climate change”
- **1990:** First Assessment Report (AR1) from the Intergovernmental Panel on Climate Change (IPCC)
- **1996:** WHO, WMO & UNEP publish “Climate Change and Human Health”
- **1996 & 2001:** Chapters on “Risks of climate change to human population health” included in AR2 and AR3 (IPCC)
- **2003:** WHO, WMO & UNEP publish “Climate change and human health – risks and responses”
- **2004:** WHO estimates CC-attributable mortality at 150 000 deaths per year based on available evidence on four outcomes (**malaria, diarrhoea, malnutrition, extreme weather events**)

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- **2008:** World Health Assembly adopts *Resolution on Climate Change and Health*
- **2008:** WHO WPRO Regional Committee endorses *Regional Framework for Action to Protect Human Health from the Effects of Climate Change in the Asia Pacific Region*
  - assess vulnerabilities of member countries to CC&H risks
  - develop national strategies and plans to manage those risks
  - support countries with technical guidance on CC&H adaptation and mitigation
- **2009:** *Madang Commitment* - Pacific Health Ministers highlight vulnerability of PICs to health impacts of climate change and commit to action aimed at:
  - assessing vulnerabilities and planning adaptation measures
  - increasing awareness and mobilizing communities
  - strengthening national capacity to manage CC&H threats
  - assessing health implications of decisions related to CC made by other sectors
  - ensuring coordinated, regionally relevant responses

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## Current WHO work in the Pacific

- **2010-2014:**

- *Vulnerability Assessment and Adaptation Capacity (V&A) project* (WHO/KOICA/JICA)
- Eleven PICs: FSM, RMI, Palau, Kiribati, Tonga, Tuvalu, Cook Islands, Niue, Solomon Islands, Vanuatu, Nauru

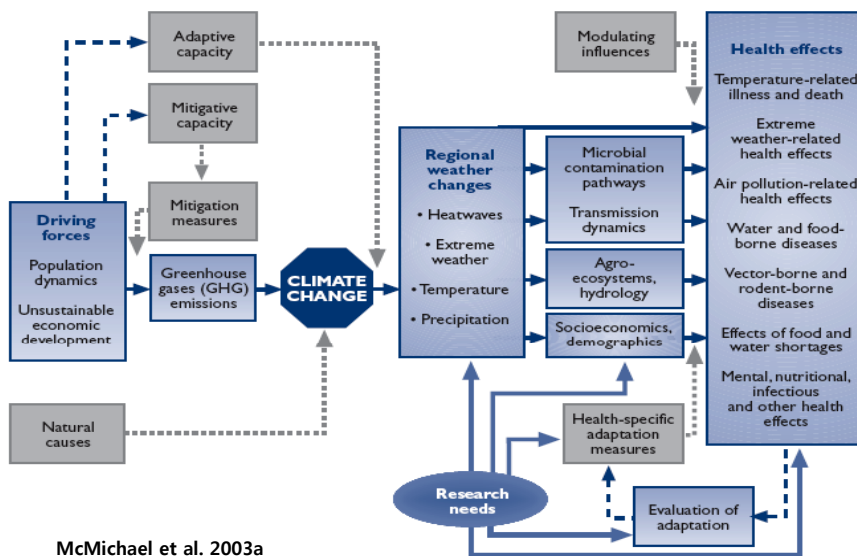
- **2011-2015:**

- *Piloting Climate Change Adaptation to Protect Human Health in Fiji* project (Fiji MoH/GEF/WHO/UNDP)
- Seven partner countries: Barbados, Bhutan, China, Fiji, Jordan, Kenya and Uzbekistan

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## Climate change & health: exposure-impact pathways



## Who are vulnerable?

(Balbus and Malina, 2009)

CLIMATE-SENSITIVE HEALTH OUTCOME	PARTICULARLY VULNERABLE GROUPS
Heat stress	Elderly, chronic medical conditions, infants and children, pregnant women, urban and rural poor, outdoor workers
Air pollution	Children, pre-existing heart or lung disease, diabetes, athletes, outdoor workers
Extreme weather events	Poor, pregnant women, chronic medical conditions, mobility and cognitive constraints
Water- and food-borne diseases	Immunocompromised, elderly, infants; specific risks for specific consequences (e.g., Campylobacter and Guillain-Barre syndrome, E. coli O157:H7)
<b>Vectorborne and zoonotic diseases</b>	
<b>Malaria</b>	Children, immunocompromised, pregnancy genetic (G6PD status), non-immune populations
<b>Dengue</b>	Infants, elderly
<b>Other</b>	Poor, children, outdoor workers, others

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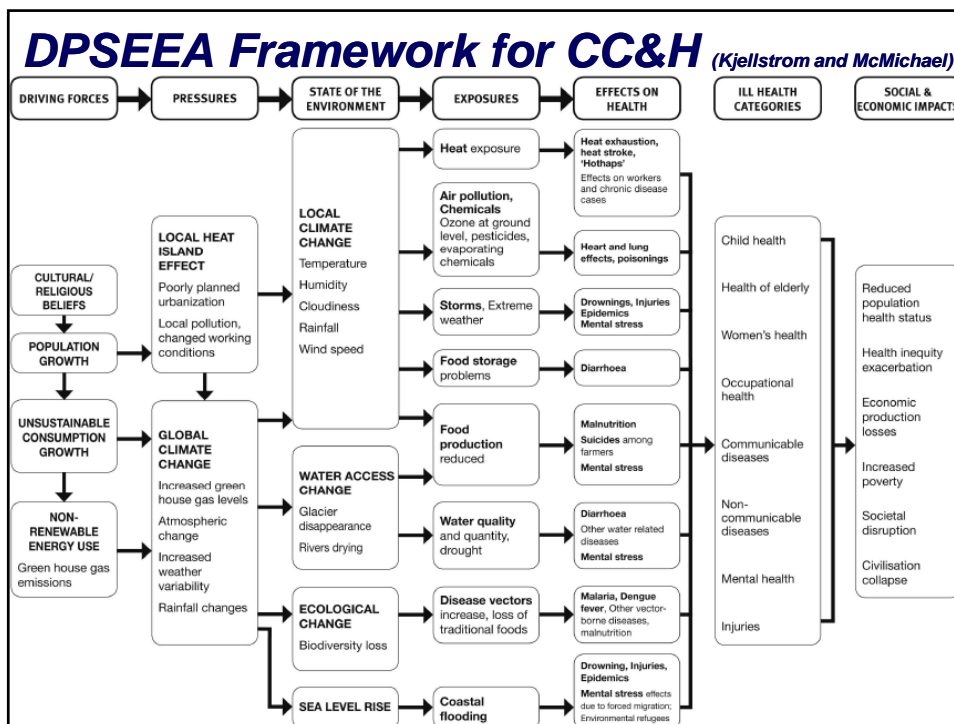
## Burden of disease due to climate change being considered by WHO

(Kjellstrom and McMichael 2013)

1. Malaria
2. Dengue
3. Schistosomiasis
4. Coastal flooding
5. Burden of disease related to water and sanitation
6. Diarrhoeal disease (temperature driven)
7. Direct impacts of temperature on work ability
8. The direct impacts of heat on mortality
9. Malnutrition
10. Health effects of economic damages
11. Impacts on outdoor air pollution
12. Co-benefits and harms from mitigation and adaptation

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### Climate-sensitive health risks in PICs (McIver 2012)

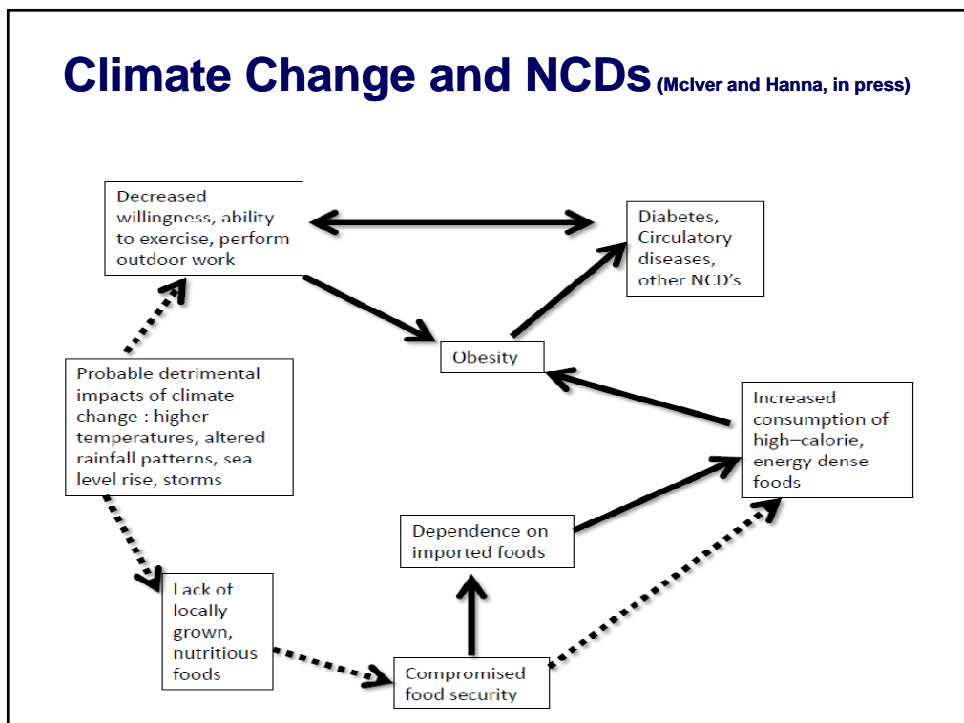
Country*	Main climate-sensitive health issues**
Cook Islands	Dengue fever, diarrhoeal disease
Federated States of Micronesia	Water- and mosquito-borne diseases, malnutrition
Fiji	Dengue fever, typhoid fever, leptospirosis, diarrhoeal disease
Kiribati	Food (safety, security, food-borne diseases), water (safety, security, water-borne diseases) and vector-borne diseases
Nauru	Air quality, food security, non-communicable diseases (NCDs)
Niue	Vector-borne diseases, ciguatera, diarrhoeal disease, respiratory disease, heat-related illness, NCDs, trauma from extreme weather events

Palau	Vector-borne diseases, zoonotic infections, gastroenteritis, respiratory disease, NCDs, trauma from extreme weather events, mental health issues
Republic of the Marshall Islands	Food-, water- and vector-borne (dengue) diseases, respiratory diseases, malnutrition
Solomon Islands	Vector-borne diseases (malaria), respiratory diseases
Tonga	Diarrhoeal diseases, vector-borne diseases (dengue), food security/nutrition, non-communicable diseases, injuries and deaths from extreme weather events
Tuvalu	Diarrhoeal disease, respiratory disease, compromised food security and impacts on NCD's
Vanuatu	Food- and water-borne diseases

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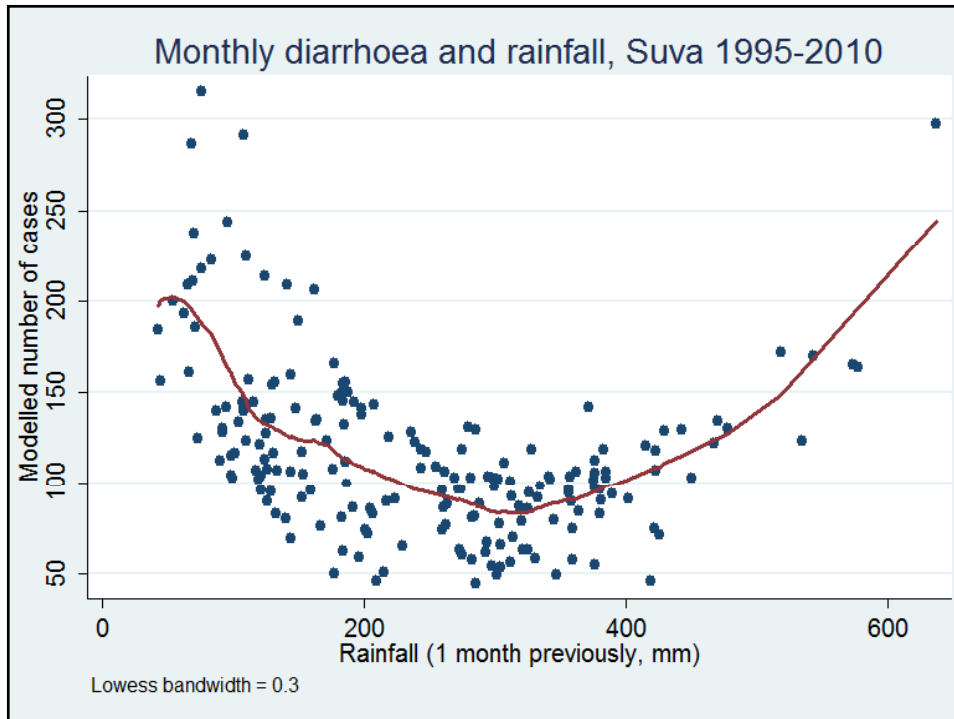


World Health Organization  
 Western Pacific Region



**Relationship between monthly climate variables (rainfall, maximum temperature, minimum temperature and humidity) at lags of up to three months with monthly cases of CSD's (1995-2009) (McIver et al, 2012)**

Disease	Subdivision	Climate variables/model*	Strength of association (pseudo-r2 value)**
Dengue	Ba	Rainfall- lag 1,2,3	0.3, 0.27, 0.32
		Maxtemp- lag 0,1,2,3	0.29, 0.38, 0.32, 0.29
		Mintemp- lag 2	0.25
		Humidity- lag 1	0.34
	Model: rainfall, maxtemp, humidity at lag-1	<b>0.39</b>	
	Bua	Rainfall - lag 0,1,2,	0.4, 0.3, 0.37
		Maxtemp- lag 0,2,3	0.37, 0.33, 0.31
		Mintemp- lag 0,1,2,3	0.35, 0.30, 0.32, 0.31
		Humidity- lag 0	0.33
	Model: rainfall, maxtemp, mintemp at lag-0	<b>0.52</b>	
	Lautoka	Rainfall- lag 1	0.42
		Maxtemp- lag 1	0.53
Mintemp- lag 1		0.27	
Model: combination of three lagged climate variables above		<b>0.54</b>	
Suva	Rainfall- lag 2	0.47	
	Maxtemp- lag 3	0.50	
	Mintemp- lag 0,2	0.57, 0.52	
	Humidity- lag 2	0.47	
Model: all four climvar's at lag-2	<b>0.6</b>		



**Odds ratios of CSD outbreaks in the month following extreme weather events in Ba subdivision (all p<0.05)**

Extreme weather event	Odds ratio (OR)* of CSD outbreak in the month following the event
Drought	Dengue fever: OR = 5.17 Diarrhoeal disease: OR = 9.0
Floods caused by tropical depressions	Dengue fever: OR = 10.57
All Floods	Diarrhoeal disease: OR = 3.5

Country	NCCHAP	Finalised	Endorsed
American Samoa	?		
CNMI	?		
Cook Islands	Yes	Yes	?
FSM	Yes	Yes	Yes
Fiji	No		
French Polynesia	?		
Kiribati	Yes	Yes	Yes
Marshall Islands	Yes	Yes	?
Nauru	Yes	No	?
New Caledonia	?		
Niue	Yes	Yes	?
Palau	Yes	Yes	?
Samoa	?		
Solomon Islands	Yes	Yes	Yes
Tokelau	?		
Tonga	Yes	Yes	?
Tuvalu	Yes	Yes	?
Vanuatu	Yes	No	?



## Aims of WHO work in CC&H

- WHO's work in climate change and health aims to:
  - support health systems in all countries, in particular low- and middle-income States and small island States, in order to enhance capacity for assessing and monitoring health vulnerability, risks and impacts due to climate change;
  - identify strategies and actions to protect human health, particularly of the most vulnerable groups; and
  - share knowledge and good practices.

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## Priorities and future direction

- **Priorities**
  - Advocate and raise awareness
  - Strengthen partnerships
  - Enhance scientific evidence
  - Strengthen health systems
- **Future direction - *Integrated approach***
  - CCH + WASH + DRM + Health System Development
  - Strengthening surveillance program in Public Health Services
  - Role of Primary Health Care in health sector's adaptation
  - Target vulnerable population and least developed countries

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## Conclusion

- WHO has long been documenting evidence and engaged in CC&H issue to influence the national and international CC policies
- WHO Suva office performed V&A assessments:
  - Documenting statistical evidence on CC&H; and
  - Supporting health ministries to develop, adopt and implement evidence-based national action plans.
- Among 12 participating countries, 9 countries finalized, and 3 countries adopted National CC&H Action Plans.
- WHO will adopt integrated approach to CCA in 2014-17.

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*Thank you very much for your attention.*



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