

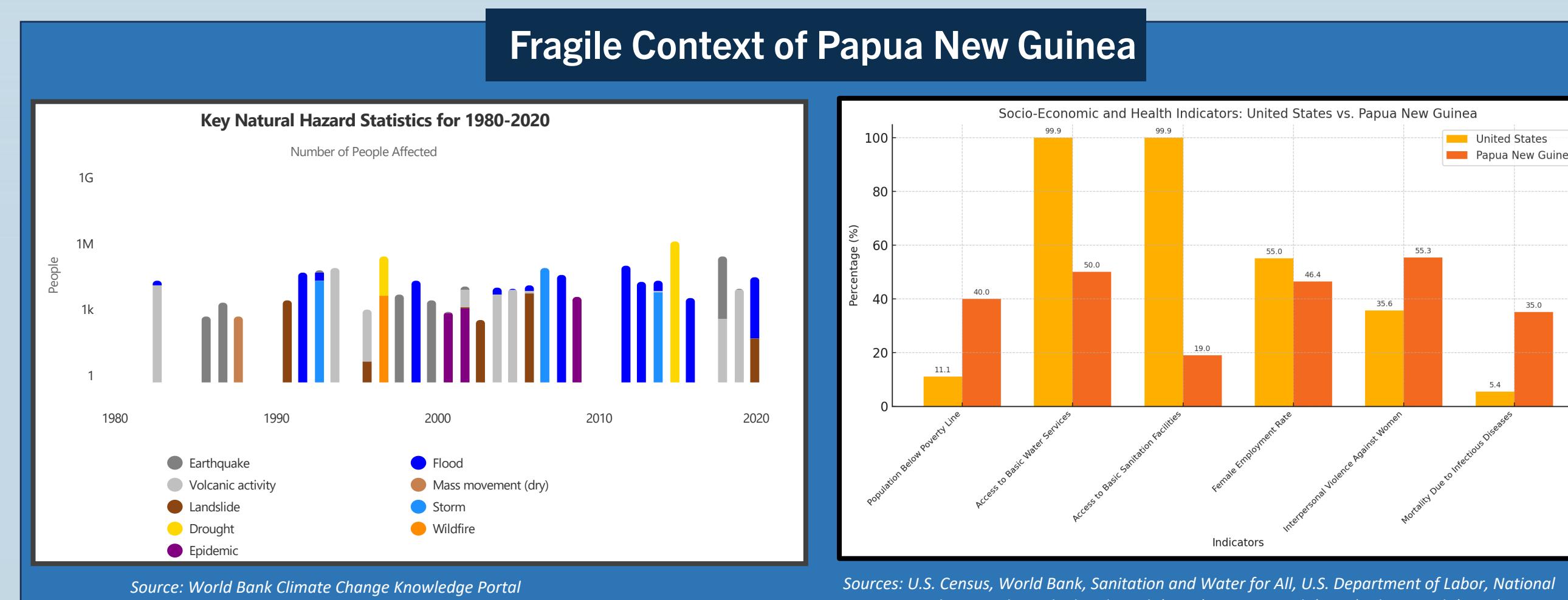
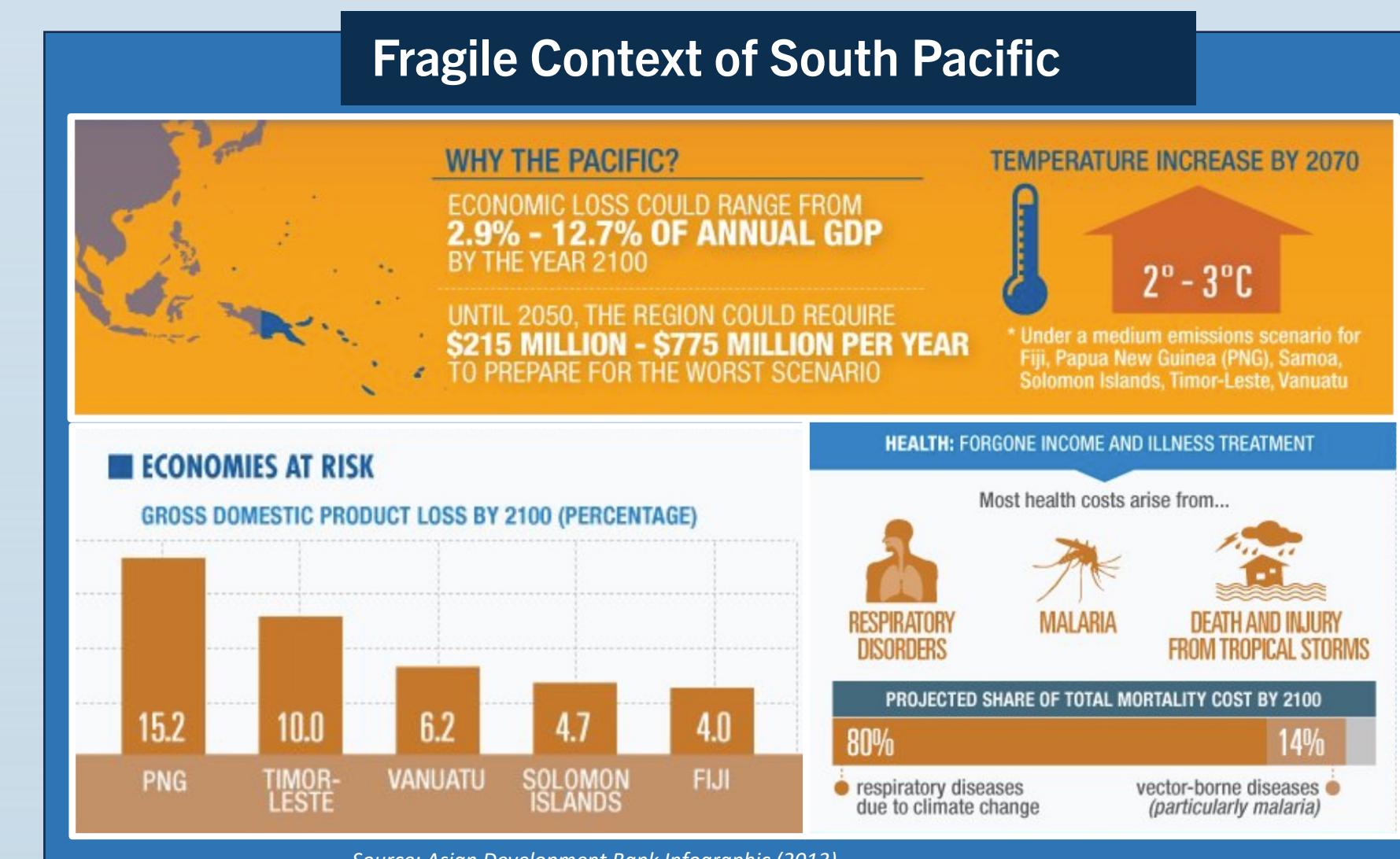
MITRE | ADAPT™: Supporting Climate Change Adaptation Decisions in Fragile Contexts

Applying a Novel Data-efficient Analysis Tool for Papua New Guinea

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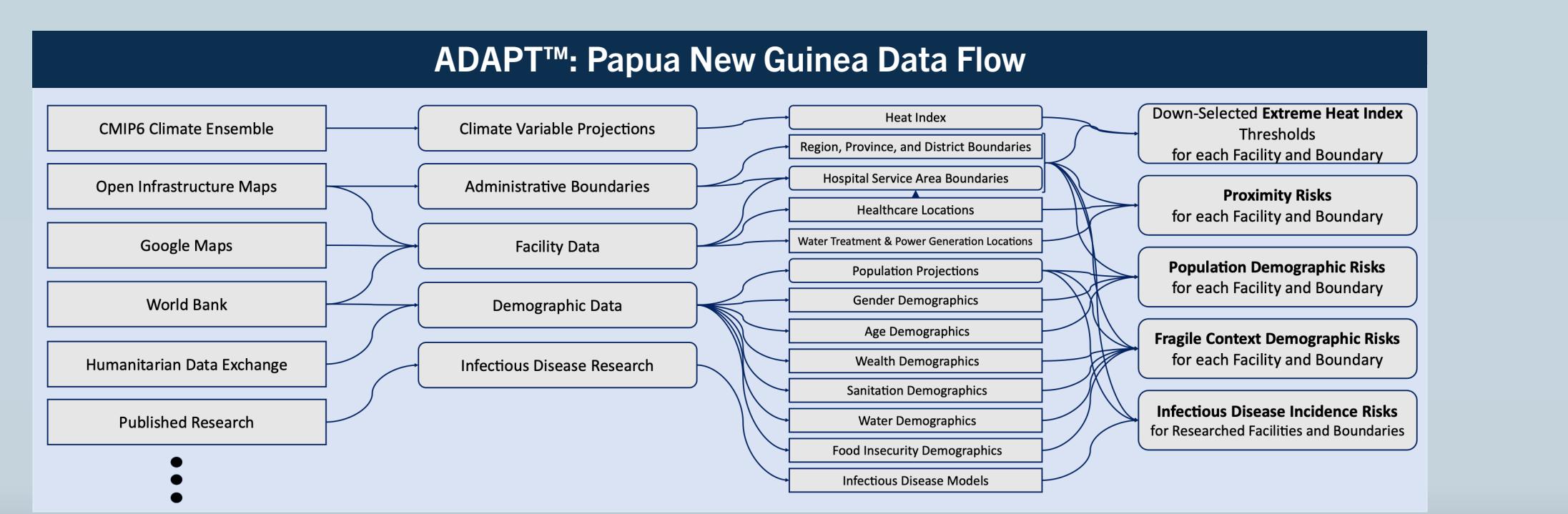
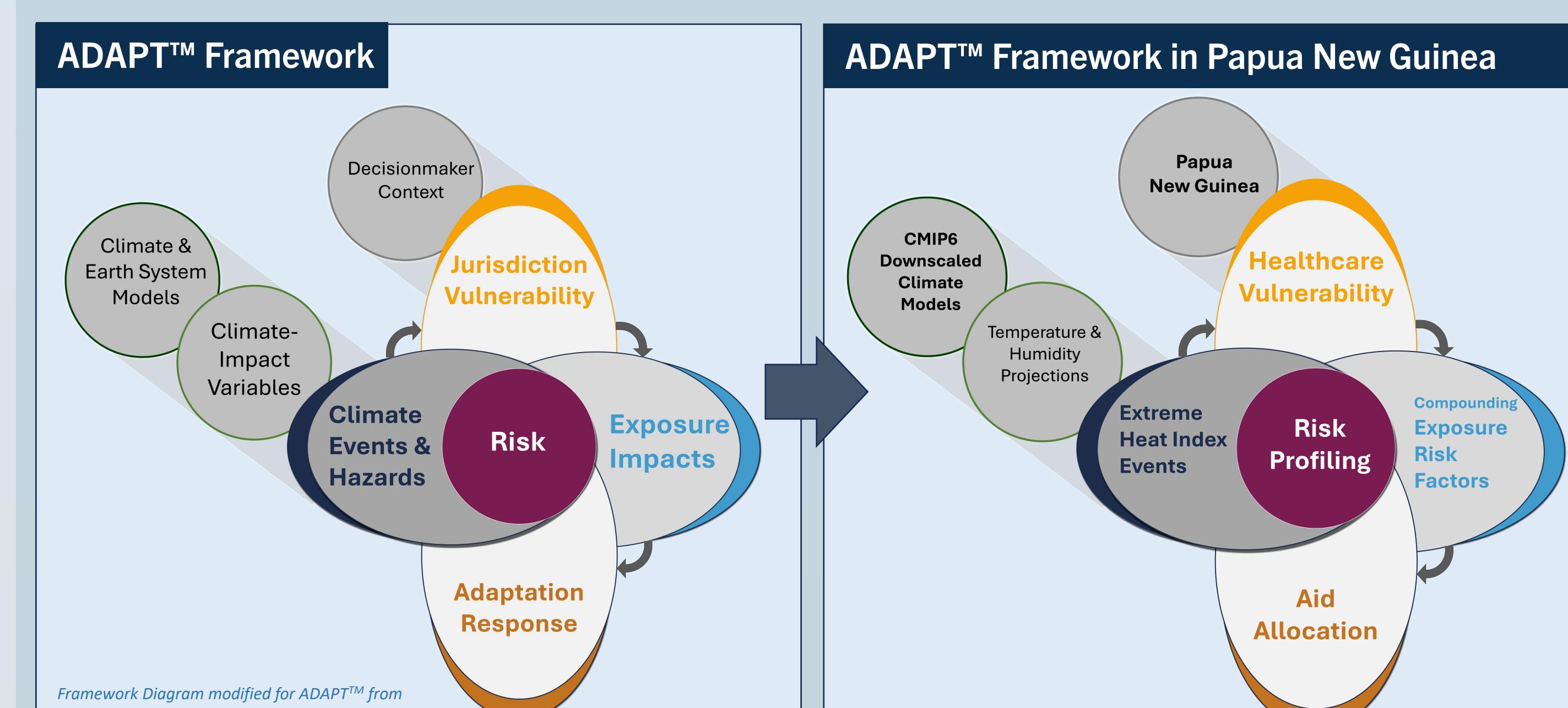
Climate Change Deeply Impacts Fragile Regions

Climate change poses acute challenges for fragile regions like Papua New Guinea (PNG), where extreme weather, resource limitations, and socioeconomic vulnerabilities strain healthcare systems. Factors such as extreme heat and heavy rainfall disrupt access, worsen health conditions, and overwhelm facilities. Scalable solutions to prioritize aid can strengthen resilience and prepare communities for future impacts.



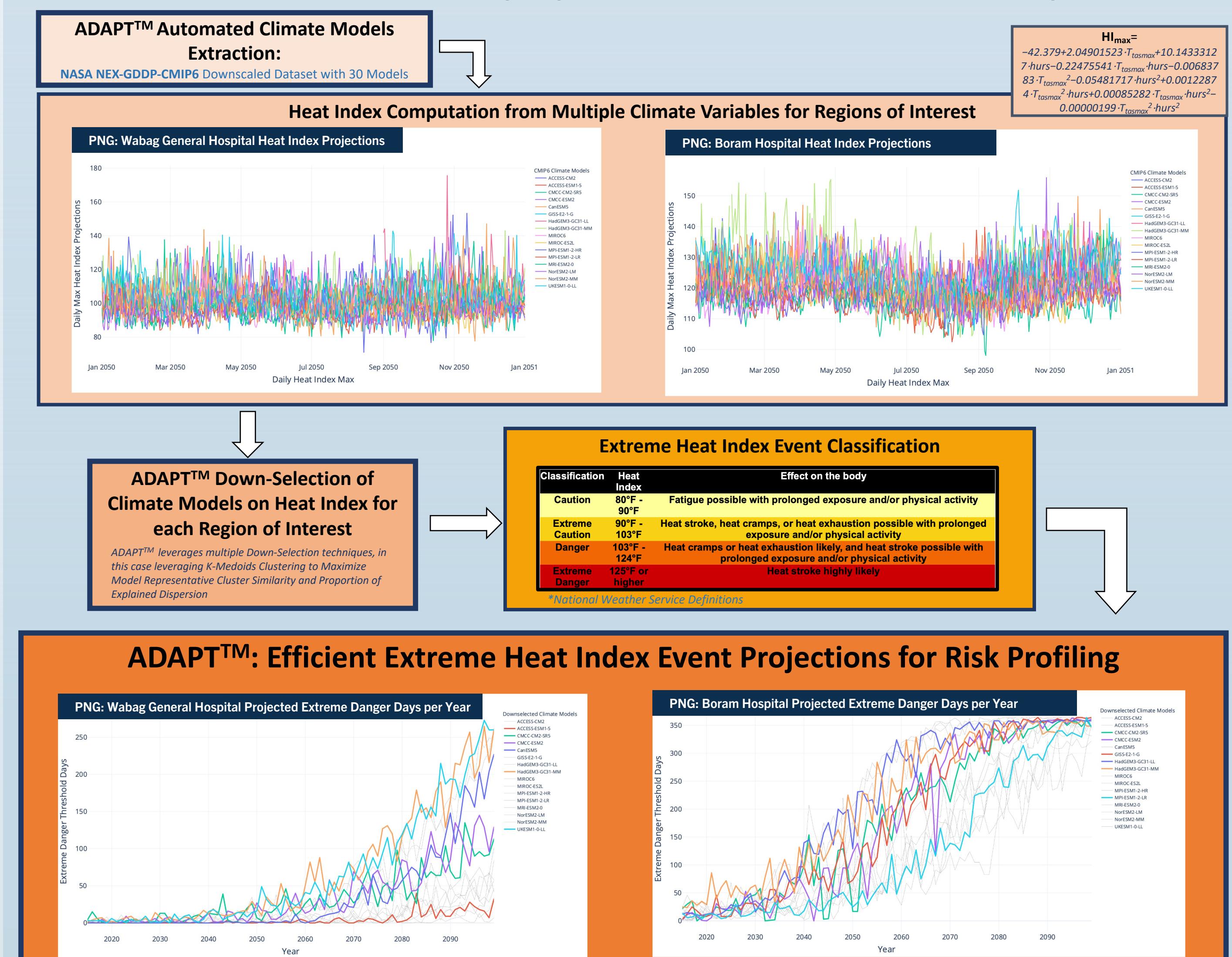
MITRE | ADAPT™ Framework and Solution

The MITRE ADAPT™ solution streamlines climate risk assessment for healthcare in fragile regions. It integrates data from downscaled climate models and local demographics to generate customizable risk factors tailored to stakeholder needs. ADAPT provides actionable insights to support proactive aid decisions and address climate impacts on healthcare in regions like PNG.



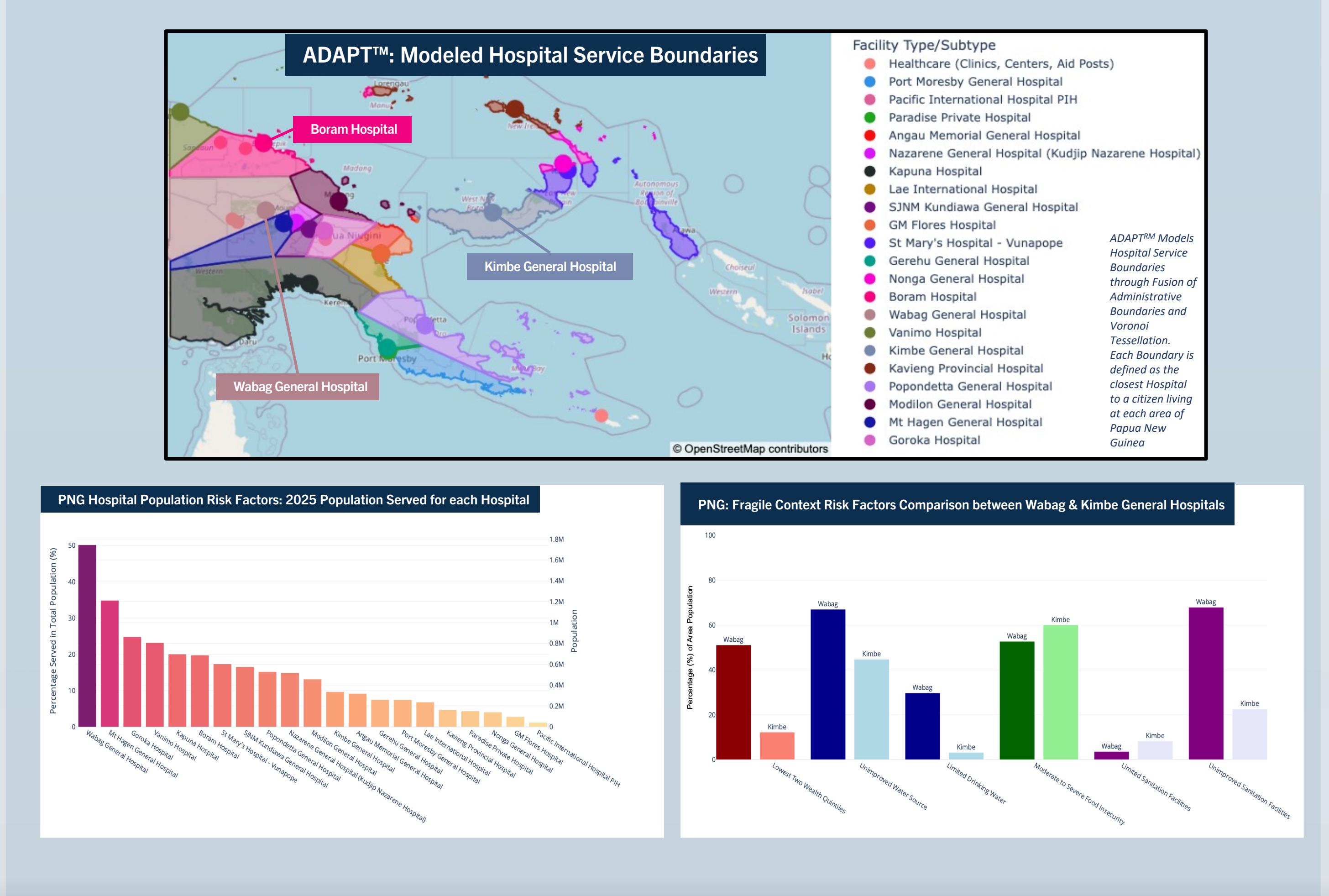
Harnessing Global Climate Data Efficiently

The ADAPT framework automatically converts extensive climate data into localized, actionable insights for fragile contexts like PNG. By curating relevant projections, such as extreme heat events, it enables users to focus on healthcare-related impacts. This streamlining reduces cognitive and computational load for users, supporting targeted, informed, efficient decision-making.



Extracting Local Data in Fragile Contexts

ADAPT employs automated advanced techniques to integrate openly available local facility data—such as capacity, location, and historical performance—into its climate risk framework. Combined with climate projections, this approach models the impacts of extreme weather on individual healthcare facilities, enabling targeted interventions and resource allocation. By addressing unique vulnerabilities, ADAPT enhances facility resilience and planning.



Tailored Climate Risk Profiles for Decisionmakers in Fragile Contexts

ADAPT delivers tailored climate risk profiles for healthcare facilities, combining climate projections with local demographic and health data. These profiles highlight facility-specific vulnerabilities, such as heat impacts, and supports using context-specific thresholds to prioritize high-risk areas. This targeted approach bridges broad climate data with actionable, facility-level interventions in fragile settings.

Hospital Scale: Compounding Risk Profiles

Climate Risk Profile : Wabag General Hospital		Service Area in 2050		
Service Population Risk	Fragile Context Risk	Proximity Risk	Climate Projection Risk	Health Risk
Population Served	Limited Water Availability	Nearby Healthcare Facilities	Extreme Heat Index Thresholds	Malaria Incidence
Population Served Increase from 2025 (%) (%) Women (%) Above Age 50	Population Limited Water Availability (%) of Population Served Center 1 52.3% Clinic 1 12.4% Aid Post 0 -	Healthcare Facility Type Count Nearest Distance (km)	Heat Index Threshold Range of Days in 2050 Extreme Caution 319 - 362 Danger 67 - 206 Extreme Danger 0 - 27	Increase in Malaria Incidence attributed to Climate Change Max Cases 5174 Min Cases 1230 CMCC-ESM2 ACCESS-ESM1-S
			Heat Index Threshold Increase from 2025 Extreme Caution 7 - 45.8 % Danger 15 - 38.3 % Extreme Danger 0 - 6.9 %	

*Bridgeman Estimations from "Time trend of mailing in relation to climate variability in Papua New Guinea", 2013. Used to show potential and extensibility of ADAPT™ Risk Profiling

Climate Risk Profile : Boram Hospital		Service Area in 2050		
Service Population Risk	Fragile Context Risk	Proximity Risk	Climate Projection Risk	
Population Served	Limited Water Availability	Nearby Healthcare Facilities	Extreme Heat Index Thresholds	Extreme Heat Index Thresholds
Population Served Increase from 2025 (%) (%) Women (%) Above Age 50	Population Limited Water Availability (%) of Population Served Center 2 51.1% Clinic 0 12.4% Aid Post 0 -	Healthcare Facility Type Count Nearest Distance (km)	Heat Index Threshold Range of Days in 2050 Increase from 2025 Extreme Caution 358 - 365 0 % Danger 358 - 365 0 - 35.6 % Extreme Danger 17 - 188 5 - 32 %	Models Projecting Max CMCC-CM2-SR5 HadGEM3-GC31-LL HadGEM3-GC31-MM CMCC-CM2-SR5
			Heat Index Threshold Increase from 2025 Extreme Caution 358 - 365 Danger 358 - 365 Extreme Danger 17 - 188	Models Projecting Min HadGEM3-GC31-LL

Regional Scale: Comparative Risk Profiles

Climate Risk Profile : Highlands Administrative Region in Papua New Guinea		2055	
Service Population Risk	Fragile Context Risk	Proximity Risk	Climate Projection Risk
Population Served	Limited Water Availability	Nearby Healthcare Facilities	Extreme Heat Index Thresholds
Population Served Increase from 2025 (%) (%) Women (%) Above Age 50	Population Limited Water Availability (%) of Population Served Center 2 51.1% Clinic 0 12.4% Aid Post 0 -	Healthcare Facility Type Count Nearest Distance (km)	Heat Index Threshold Range of Days in 2055 Increase from 2025 Extreme Caution 342 - 363 0 % Danger 364 - 365 0 - 35.6 % Extreme Danger 364 - 365 5 - 32 %
			Heat Index Threshold Increase from 2025 Extreme Caution 342 - 363 Danger 364 - 365 Extreme Danger 364 - 365

Extensibility and Next Steps

Integrate Local Data: Replace default datasets with local facility data to improve model accuracy and regional relevance.

Expand Applications: Extend risk projections to include additional climate events and expand coverage to other regions and facilities.

Refine Adaptation Insights: Use decision-maker input to transform risk assessments into cost projections and optimal adaptation pathways.

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