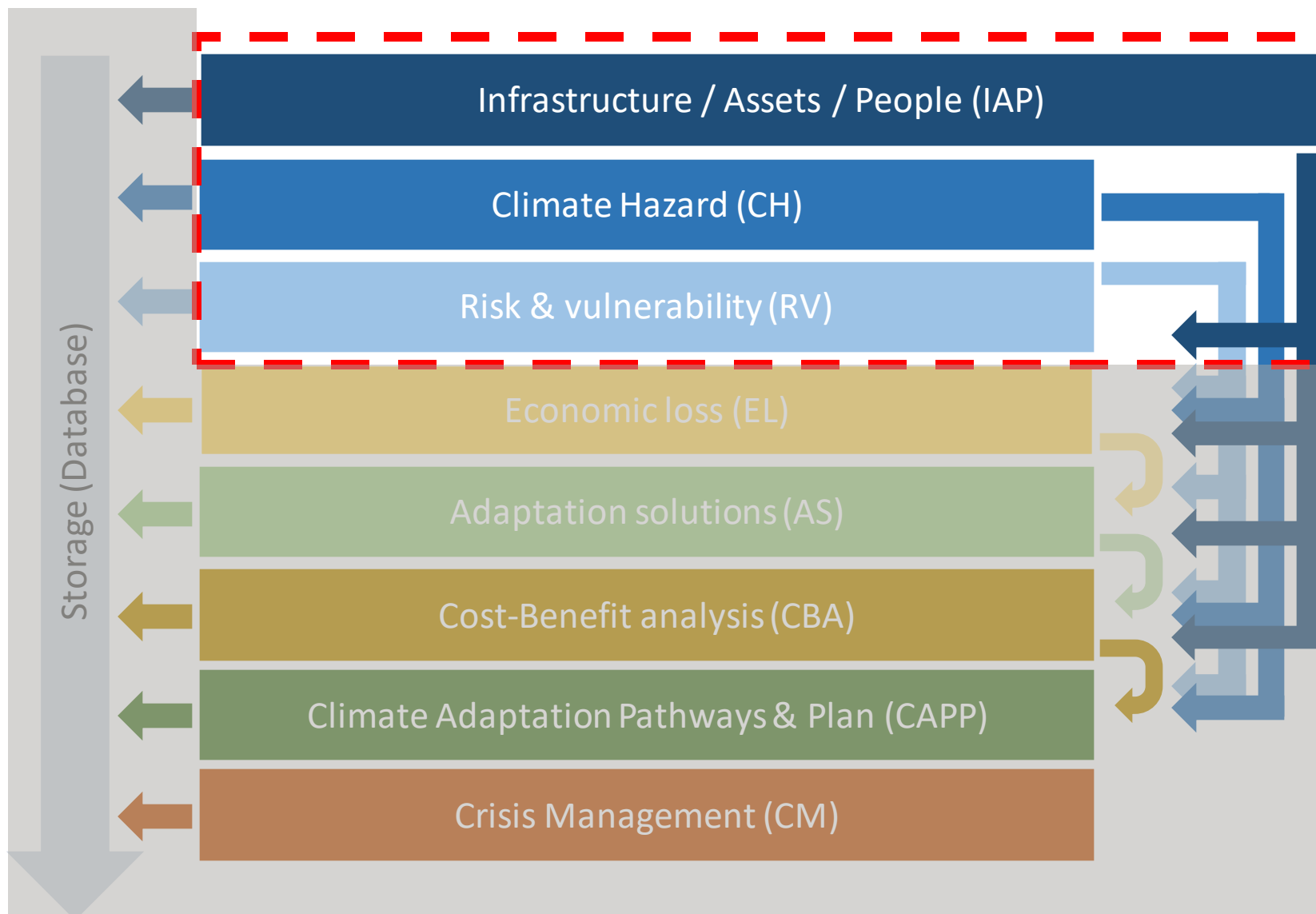


# MODULE 0, 1, 2

Stelios KAROZIS



## Infrastructure / Assets / People (IAP)

### In a nutshell

Description of the health facility. This comprises the asset registry and the location characteristics of the facility. As such, the infrastructure can be distinguished in various parts of the that have properties and characteristics. Moreover, location characteristics are essential, such as the latitude and longitude, the height in meters or floor building, building orientation etc., to be considered in the assessments.

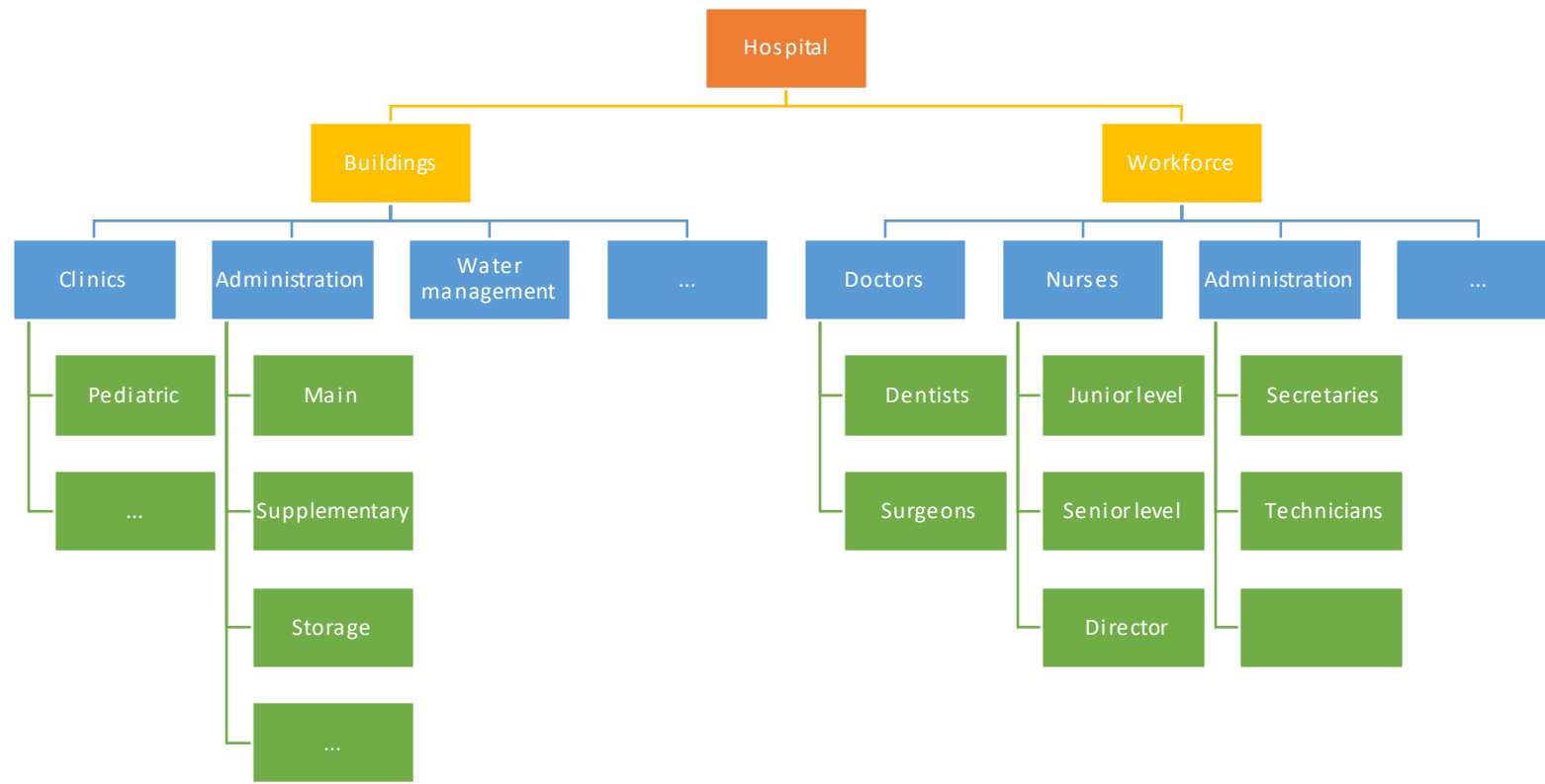
# METHODOLOGY

*Health infrastructure*

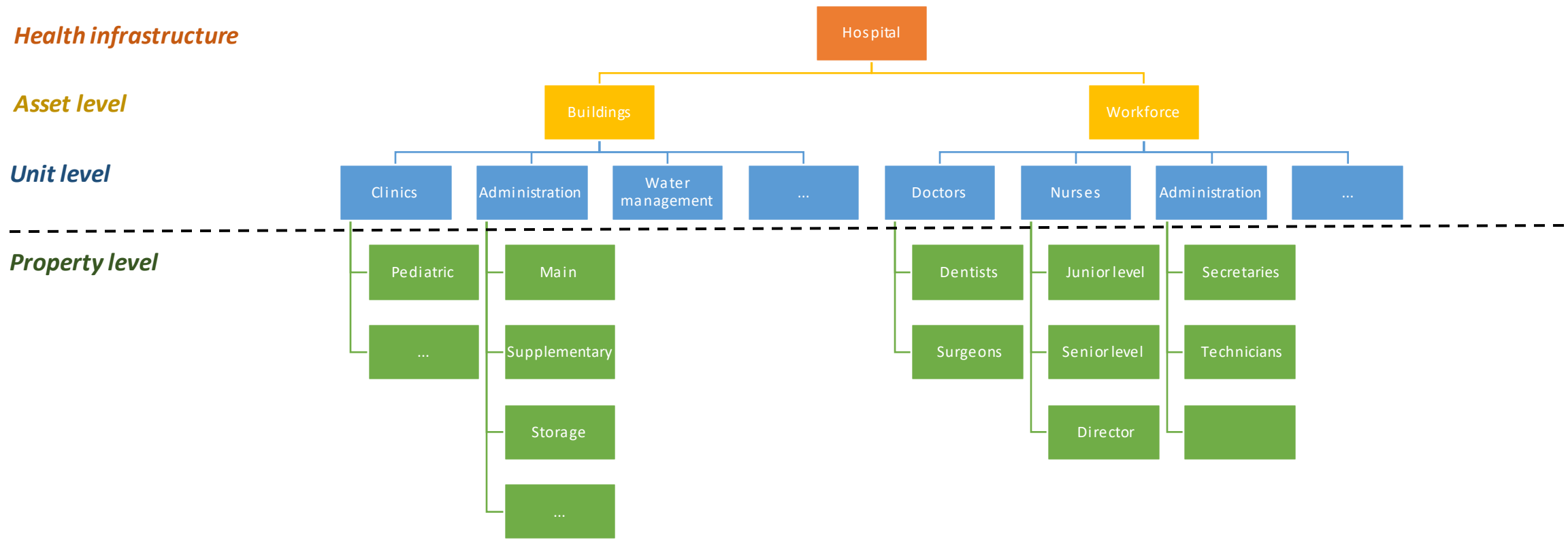
*Asset level*

*Unit level*

*Property level*

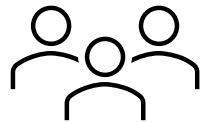


# METHODOLOGY



## Infrastructure / Assets / People (IAP)

### INPUT

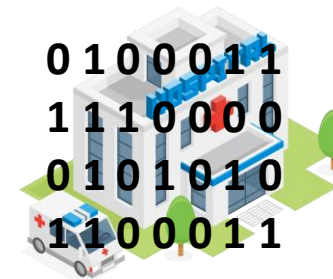


- User input
- Assets
- Attributes
- Properties



### OUTPUT

Database of hospital characteristics under study



## Climate Hazard (CH)

### In a nutshell

The scope of module 1 is to build a climate scenario based on the user parametrization. The user defines type of hazard, timespan, socio-economic/ climate scenario. Statistical analysis over the data is performed to calculate the return period of the event, probability of occurrence.

# METHODOLOGY



User input

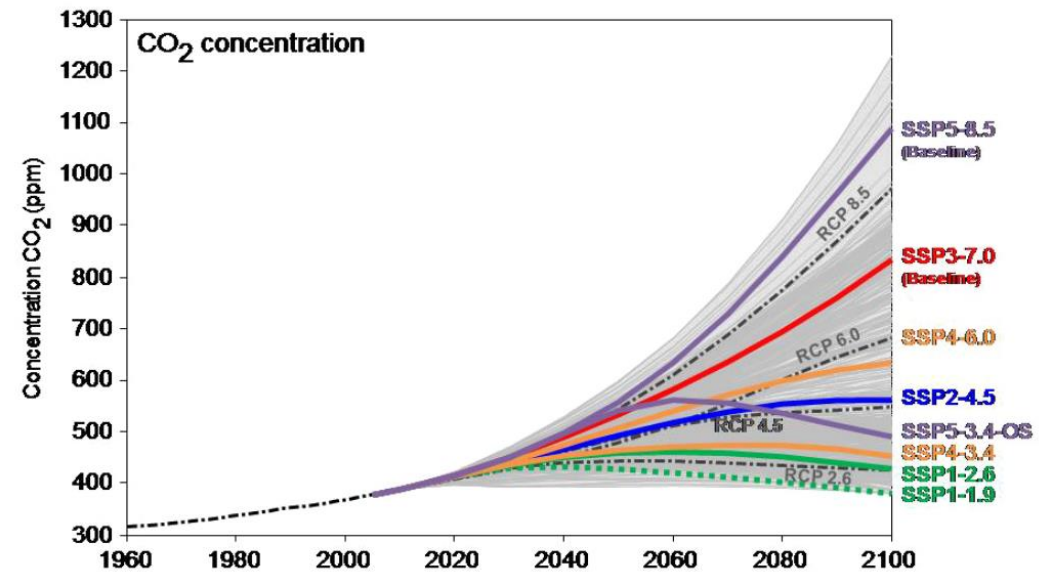
Hospital



Type of hazard

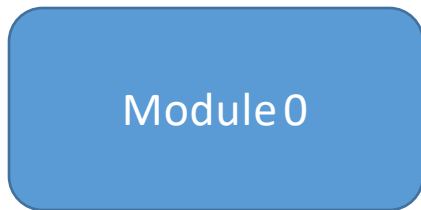
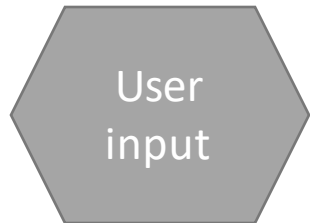


Socio-economic climate scenario & 30-year timespan

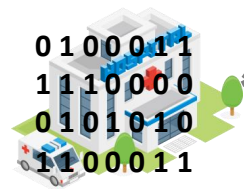




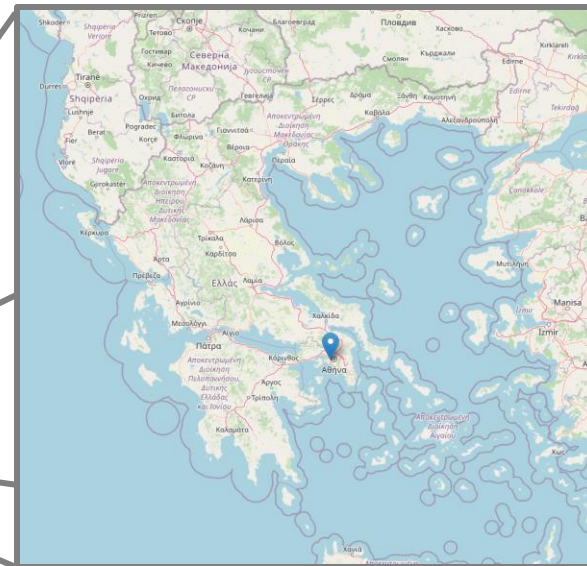
# METHODOLOGY



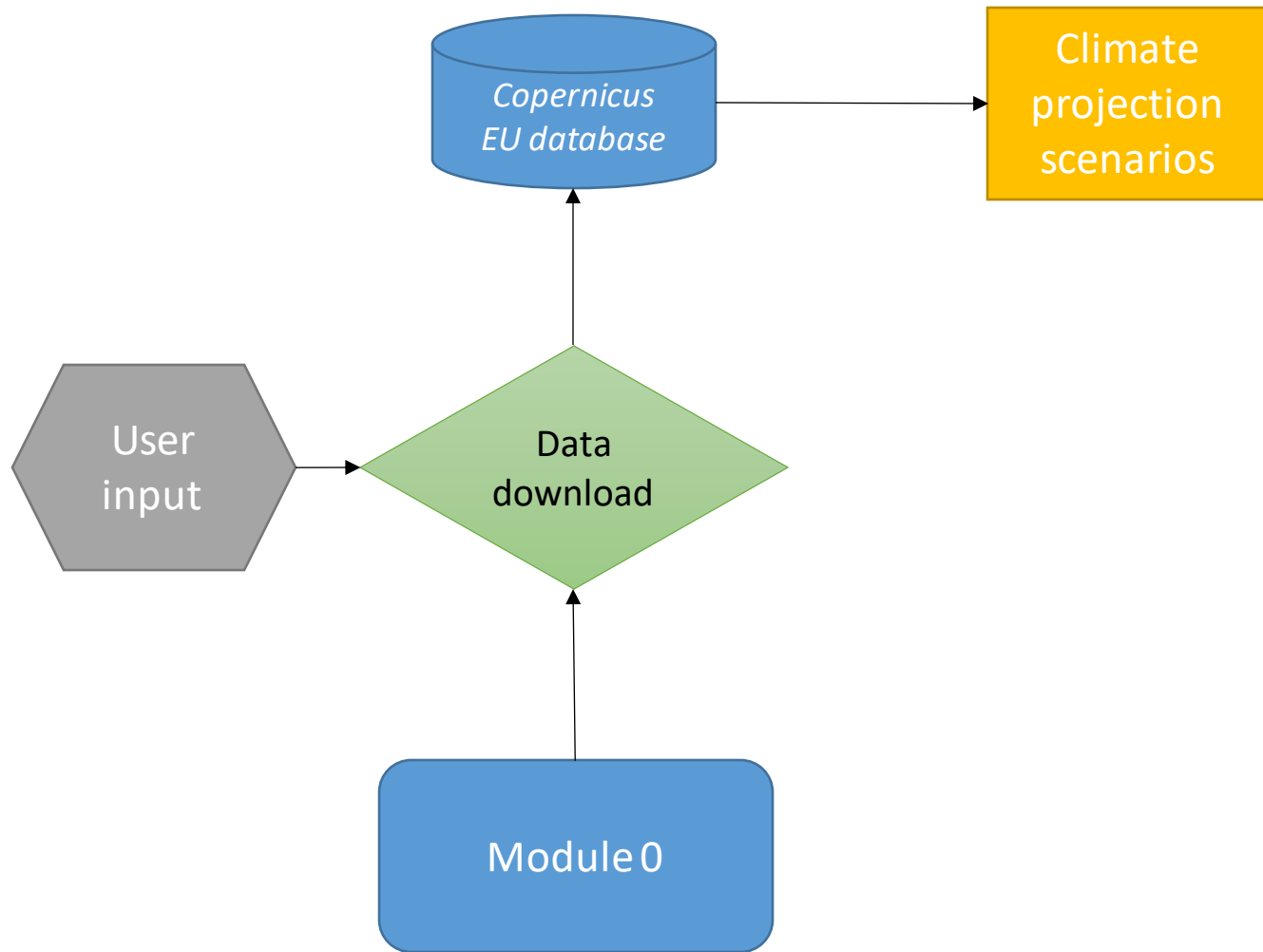
Hospital location

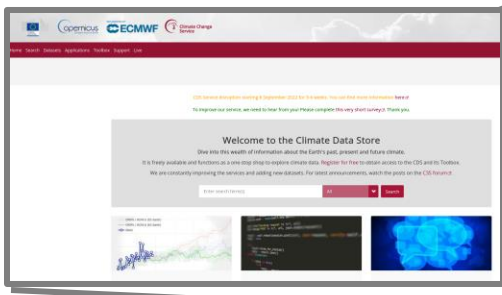


Module 1

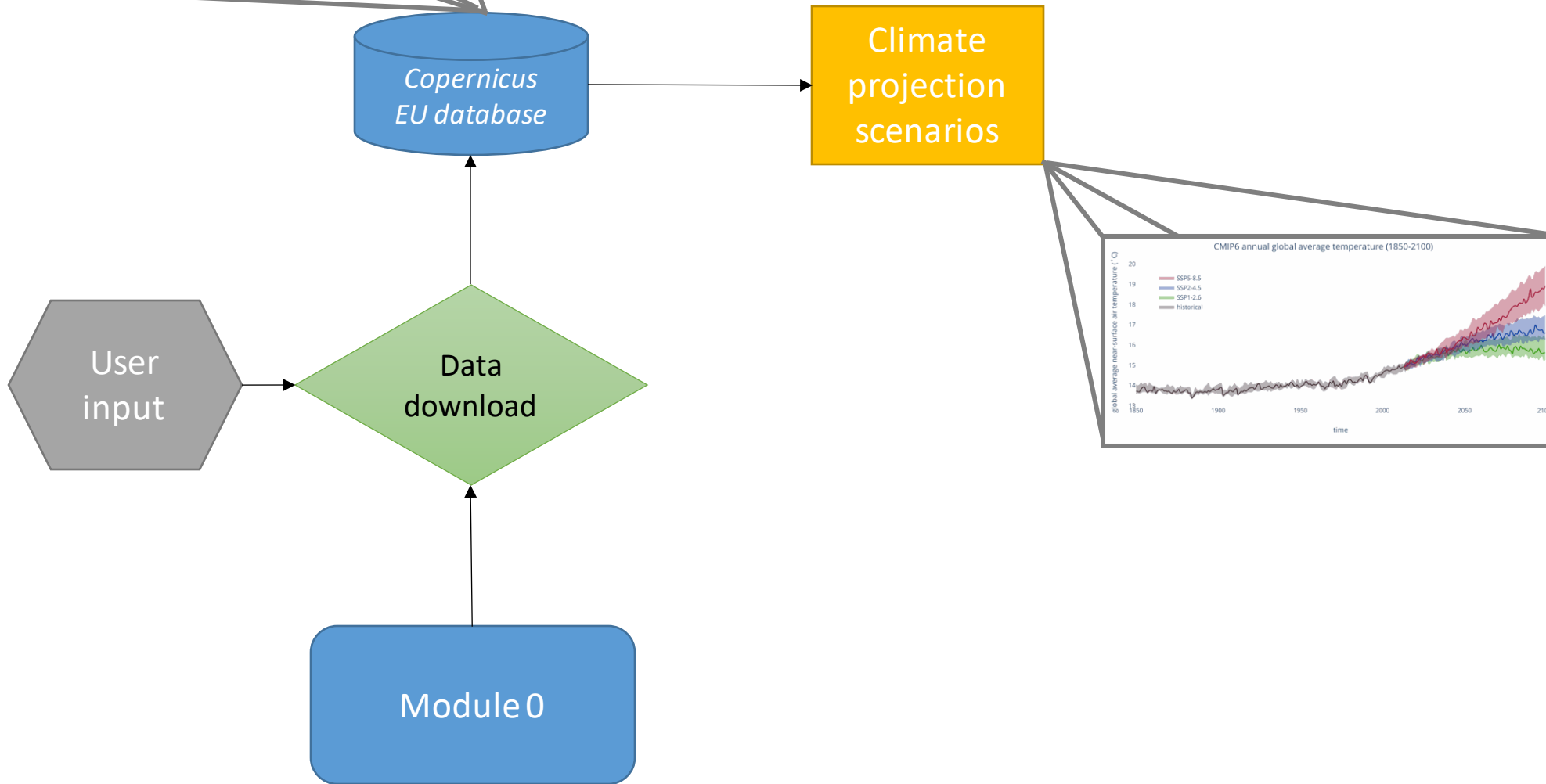


# METHODOLOGY

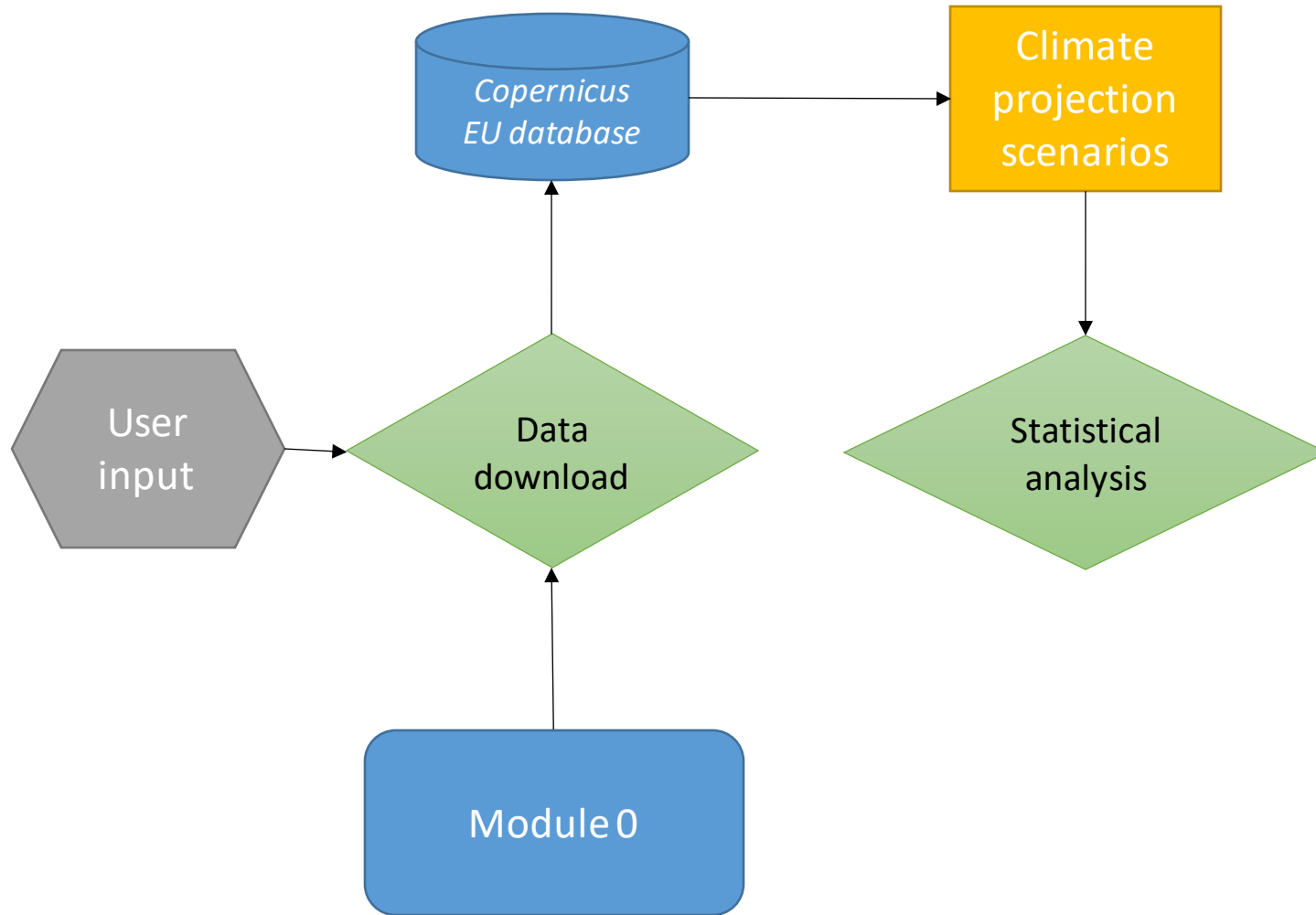




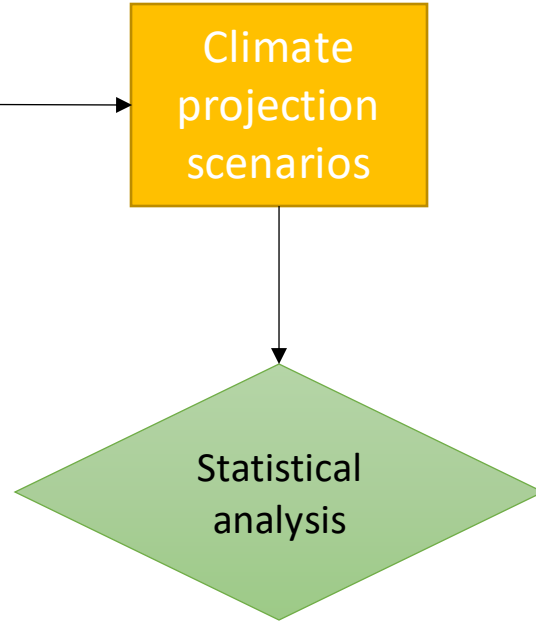
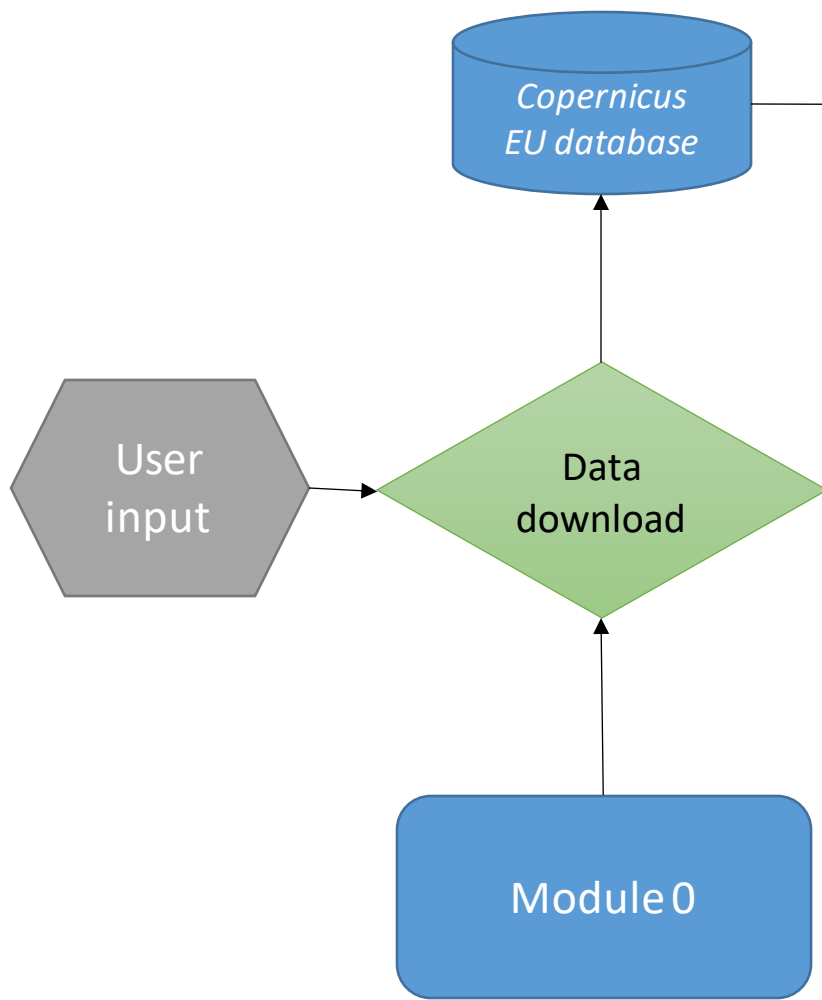
# METHODOLOGY



# METHODOLOGY



# METHODOLOGY



Module 1

Choose another request:

**Request Information**

Name: Test1

Latitude Minimum: 34.5247

Latitude Maximum: 41.5

Longitude Minimum: 19.1595

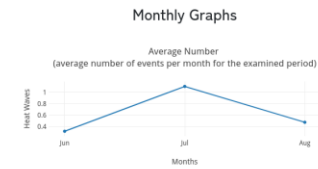
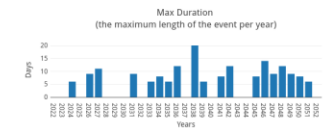
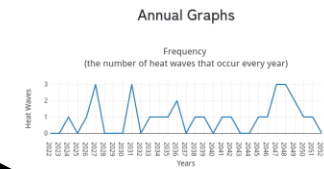
Longitude Maximum: 29.0015

Experiment: ssp2\_4\_5

Type of hazard or climate pressure: Heat wave

Timespan: 2022 - 2052

Choose pilot:

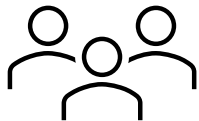


return period (years)	return value (C°)
5.0	33.5097
10.0	34.2057
25.0	35.0851
50.0	35.7375
100.0	36.3851
250.0	37.2377
500.0	37.8815
1000.0	38.5248

## Climate Hazard (CH)

### INPUT

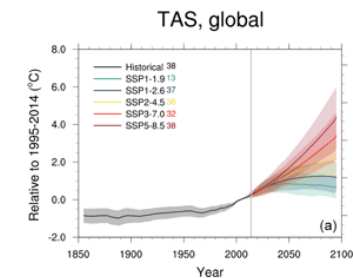
Infrastructure / Assets /  
People (IAP)



- Module 0 point of hospital
- Type of hazard
- Timespan
- socio-economic/ climate scenario

### OUTPUT

- Contour map of average frequency of the hazard in the area
- Statistical analysis per year & per month
- Return period at point

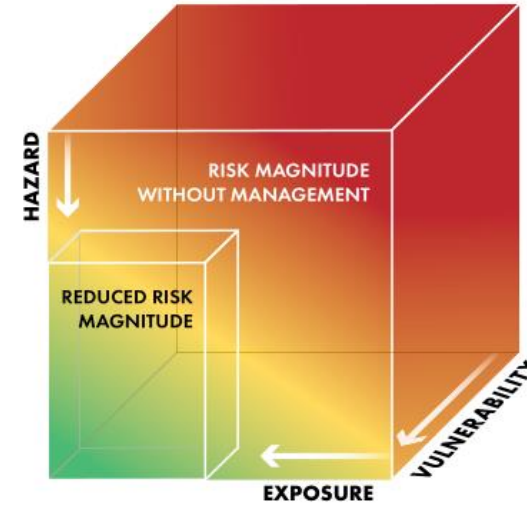


## Risk & vulnerability (RV)

### In a nutshell

A series of steps can be followed to assess the vulnerability and risk under climate pressure of a health facility. The process incorporates direct and indirect actors, such as experts and stakeholders, engineers etc., via the Community of Practice (CoP) concept

# TERMINOLOGY



## Vulnerability

The conditions determined by physical, social, economic and environmental factors or processes, which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards. This implies that vulnerability extends beyond climate change and may exist before a climate hazard manifests.

## Exposure

Relates to the presence of health care workers, patients, services and infrastructure in the location of current or future climate hazards. Understanding exposure requires knowledge of whether people, housing, production capacities and other tangible human assets are located in hazard-prone areas

## Impacts

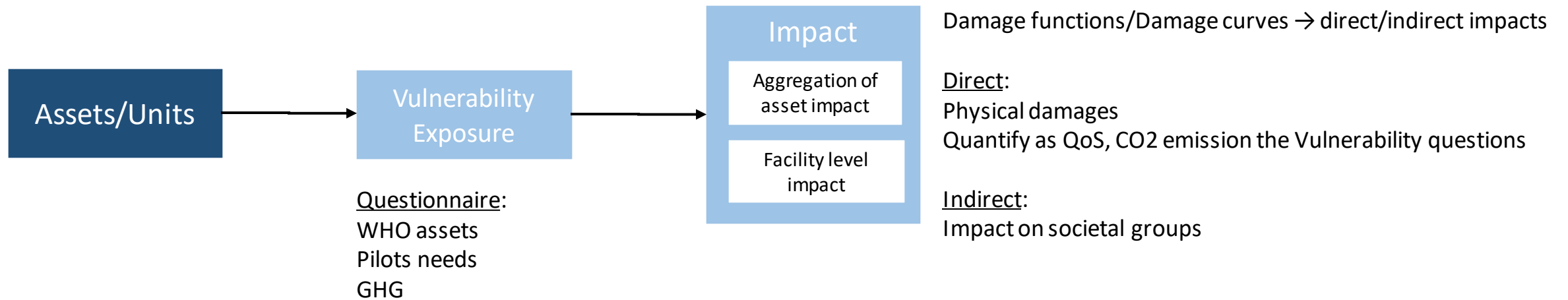
The consequences of realized risks on natural and human systems, where risks result from the interactions of climate-related hazards (including extreme weather and climate events), exposure, and vulnerability. Impacts generally refer to effects on lives, livelihoods, health and wellbeing, ecosystems and species, economic, social and cultural assets, services (including ecosystem services), and infrastructure”



# METHODOLOGY



# METHODOLOGY



# METHODOLOGY

## CHECKLIST FOR ASSESSING VULNERABILITY TO HEATWAVES

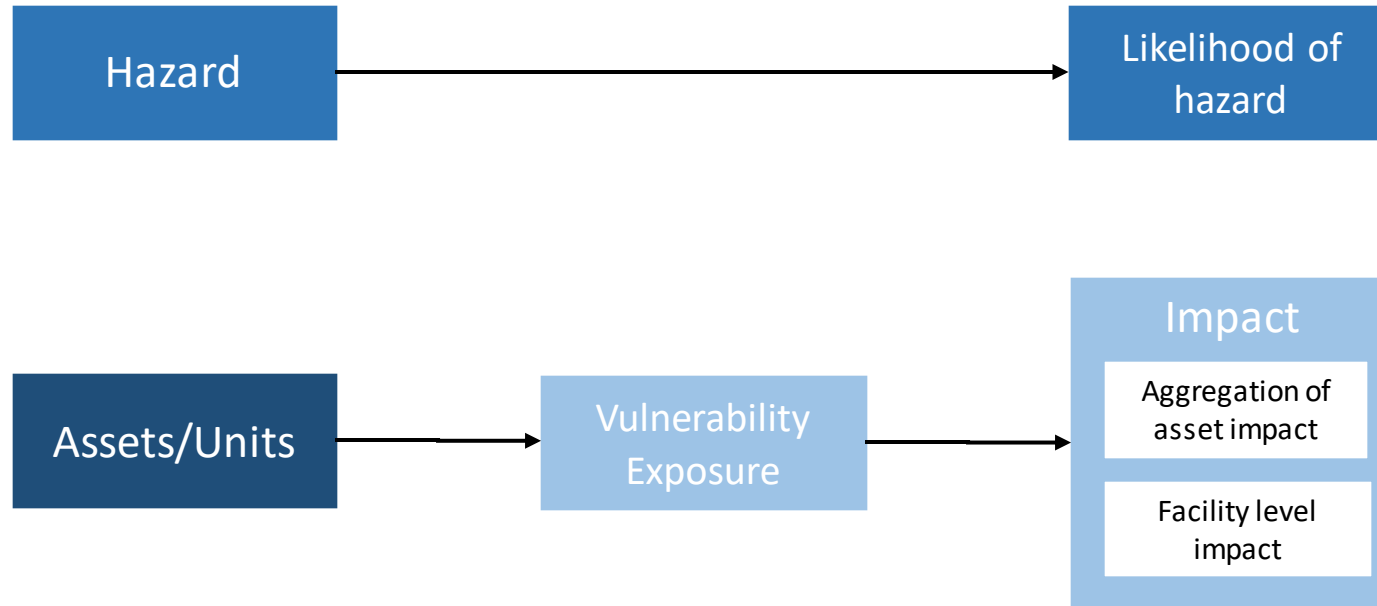
HEATWAVES		Vulnerability level		
<p><b>High:</b> unprepared; unable to respond (Higher risk)</p> <p><b>Medium:</b> basic or incomplete preparation; low level of response (Medium risk)</p> <p><b>Low:</b> prepared; able to respond (Lower risk)</p>		High	Medium	Low
HEALTH WORKFORCE	<b>Is the health workforce,</b>			
	<i>(Human resources)</i>			
	equipped with a plan to identify and protect health workers at risk of heat stress?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	provided with appropriate clothes (e.g. light, loose-fitting cotton clothes, and when necessary, a hat)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	provided with sunscreen, hat and plenty of drinking water for staff carrying out outdoor activities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	provided with safe water during a heatwave event and stimulated regularly for appropriate water intake?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	provided with a cool space or a shower room for staff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	provided with an information system to manage occupational safety and health in the facility during a heatwave, including rest for staff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<i>(Capacity development)</i>			
	trained on public health and climate change hazards, including health impacts related to heatwaves?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	trained to manage hazardous waste (chemical, biological, radiological)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	prepared and able to follow-up a contingency plan for emerging health workforce heat stress, water- and air-borne diseases, and cardiovascular and respiratory problems?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	able to implement a contingency plan for public health emergencies, in case of high temperature effects, and water and food contamination?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	trained and have specific and clear guidance on actions to reduce heat risk factors for staff?*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	aware of the need for an alternative action plan for the health workforce with outdoor functions to limit their activity to morning and evening hours or reduce their activity demands during the hottest part of the day or try alternate work and rest periods, with rest periods in a cooler area? (more frequent work-rest cycles are better)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<i>(Communication and awareness raising)</i>			
	aware about impacts of hot temperatures on human health via water quality and quantity (including water- and food-borne diseases) and air quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	aware of the type of patients and symptoms expected during a heatwave?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## IMPACTS CHECKLIST FOR HEATWAVES

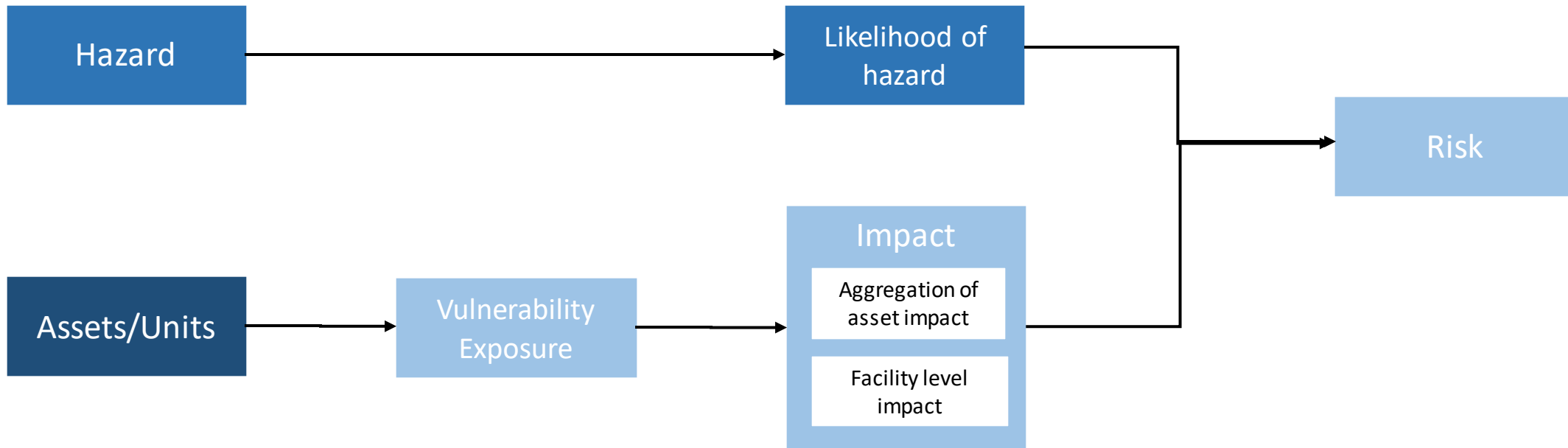
HEALTH WORKFORCE		
LEVEL OF IMPACT		
MAJOR	MODERATE	MINOR
<input type="checkbox"/> Danger of life-threatening heat stroke <input type="checkbox"/> Increased likelihood of heat stress effects (heat exhaustion and heat stroke) <input type="checkbox"/> Increased threat to staff with pre-existing health conditions such as heart conditions, cardiovascular diseases, diabetes, lung diseases, respiratory diseases, fluid/electrolyte disorders and some neurological disorders <input type="checkbox"/> Increase in number of respiratory diseases due to elevated ozone levels <input type="checkbox"/> Loss of work capacity and reduced productivity <input type="checkbox"/> Increased workforce absenteeism <input type="checkbox"/> Increased hospital admissions and emergency services overwhelming health workers	<input type="checkbox"/> Increased heat stress effects (heat syncope, heat cramps) <input type="checkbox"/> Increased threat to health workforce due to individual level risk factors (age, sex, culture, body weight; fitness; behaviour; drug treatment; body acclimatization) <input type="checkbox"/> Excessive heat exposure resulting in effects related to cardiovascular and renal systems, and dehydration <input type="checkbox"/> Diseases requiring medical treatment, specifically for those with pre-existing health conditions such as asthma, COPD, respiratory tract infections, diabetes, heart conditions, renal conditions <input type="checkbox"/> Significantly reduced performance capacity <input type="checkbox"/> Increased heat affecting day and nocturnal conditions that heighten health workforce exposures	<input type="checkbox"/> Increased thirst and headaches <input type="checkbox"/> Increase in infectious disease cases among the health workforce from water and food contamination <input type="checkbox"/> Reduction of health workforce functions

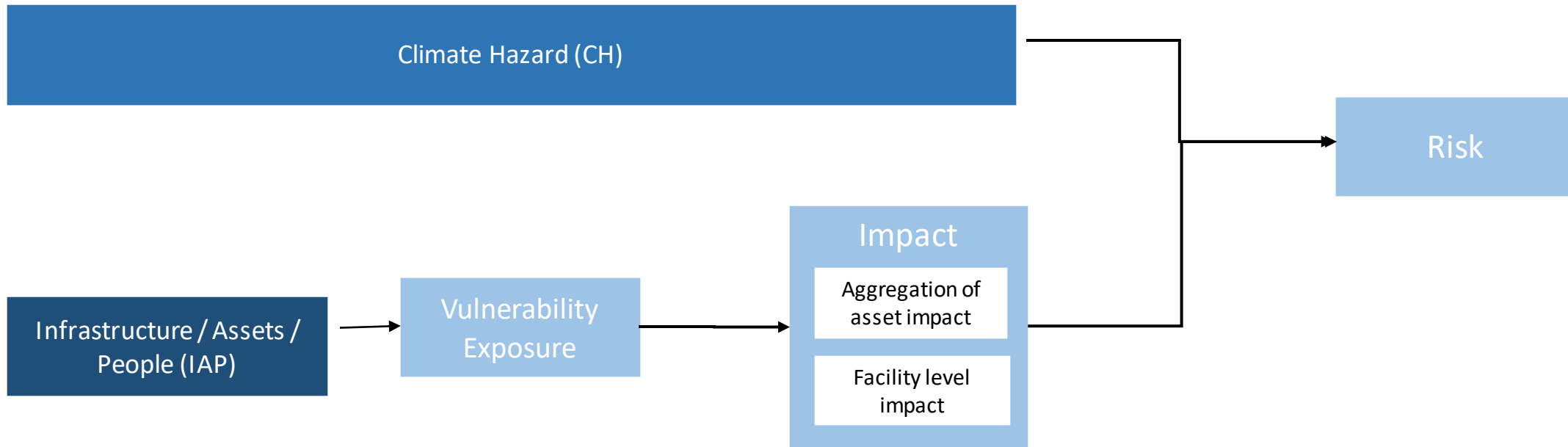
WASH AND HEALTH CARE WASTE		
LEVEL OF IMPACT		
MAJOR	MODERATE	MINOR
<input type="checkbox"/> Increased water demand <input type="checkbox"/> Water source contamination <input type="checkbox"/> Shortage of safe water <input type="checkbox"/> No access to drinking water in the premises <input type="checkbox"/> Reduced effectiveness of chemicals used for water treatment	<input type="checkbox"/> Reduced capacity to provide sanitation and hygiene services (floor, toilets, patient rooms, emergency room and other health care facility rooms) <input type="checkbox"/> Reduced capacity to provide water for drinking and cooking <input type="checkbox"/> Reduced capacity to use laundry and dishwashing machines	<input type="checkbox"/> Reduced function of sanitation systems and hygiene practices (flush toilets, showers, sewerage, treatment, hand washing, medical procedures, etc.) <input type="checkbox"/> Increased demand for drinking water from health workers engaged in outdoor activities

# METHODOLOGY



# METHODOLOGY



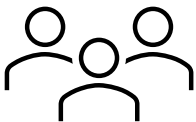


# Risk & vulnerability (RV)

## INPUT

Infrastructure / Assets /  
People (IAP)

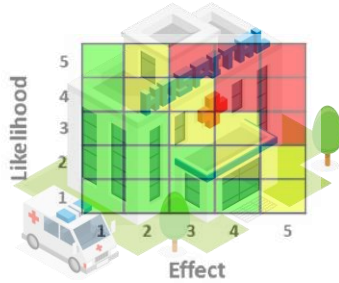
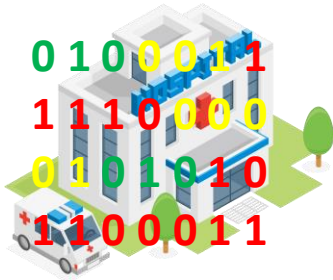
Climate Hazard (CH)



- Module 0 type of hazard
- Module 1 likelihood of hazard
- User answer to questionnaire

## OUTPUT

- Vulnerability of hospital
- Level of impacts of hospital
- Risk matrix of hospital



### Data sources

### Vulnerability & Risk

