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Global Facility for Disaster Reduction and Recovery



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TAFF

Technical Assistance Financing Facility
for Disaster Prevention and Preparedness



Disaster resilient infrastructure

Jun Rentschler jrentschler@worldbank.org
TAFF Workshop | Brussels, October 2-3, 2025

Critical infrastructure



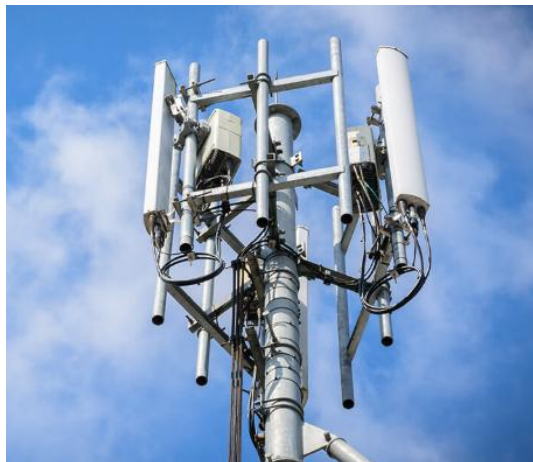
Transport



Energy



Water



Tele-comms



Healthcare



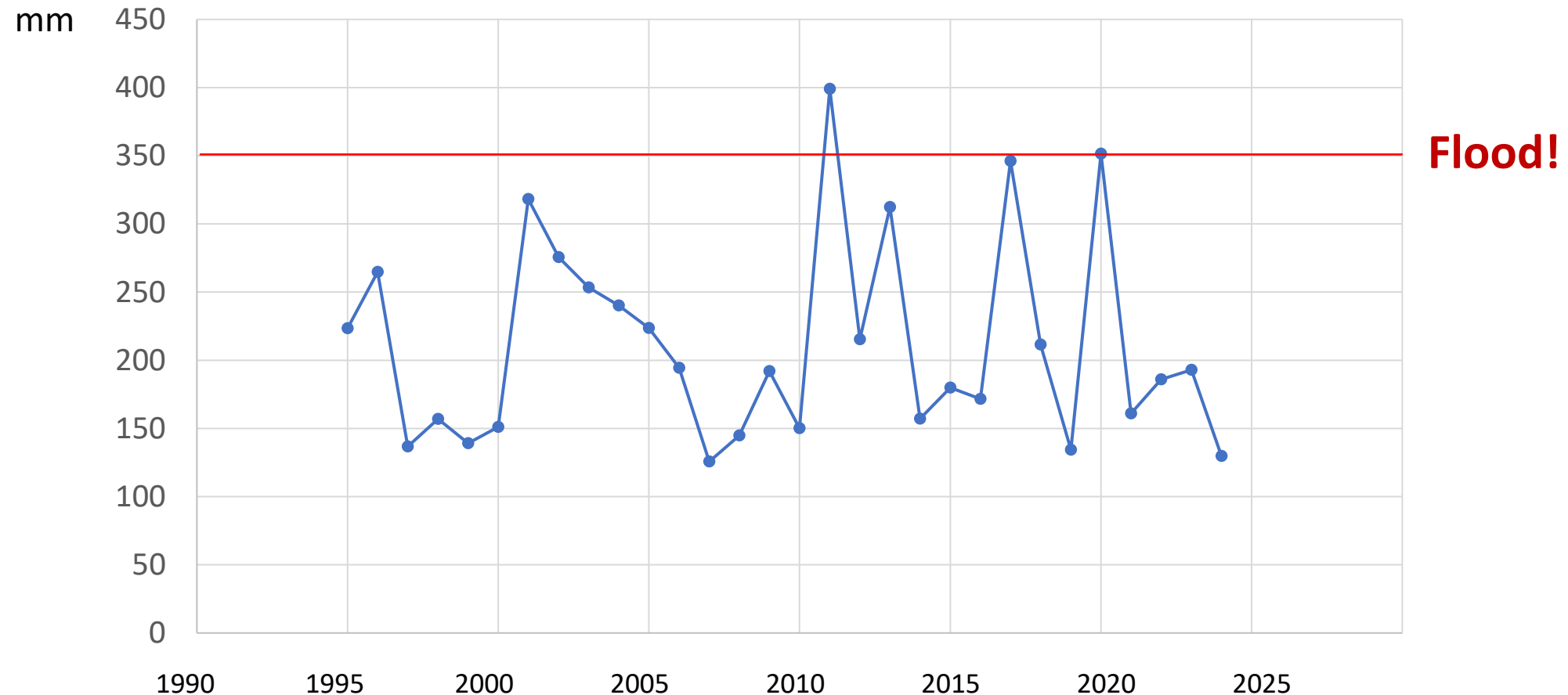
Firefighting

Your task:

Implement
**disaster
prevention
measures**
to protect key
**civil protection
infrastructure.**



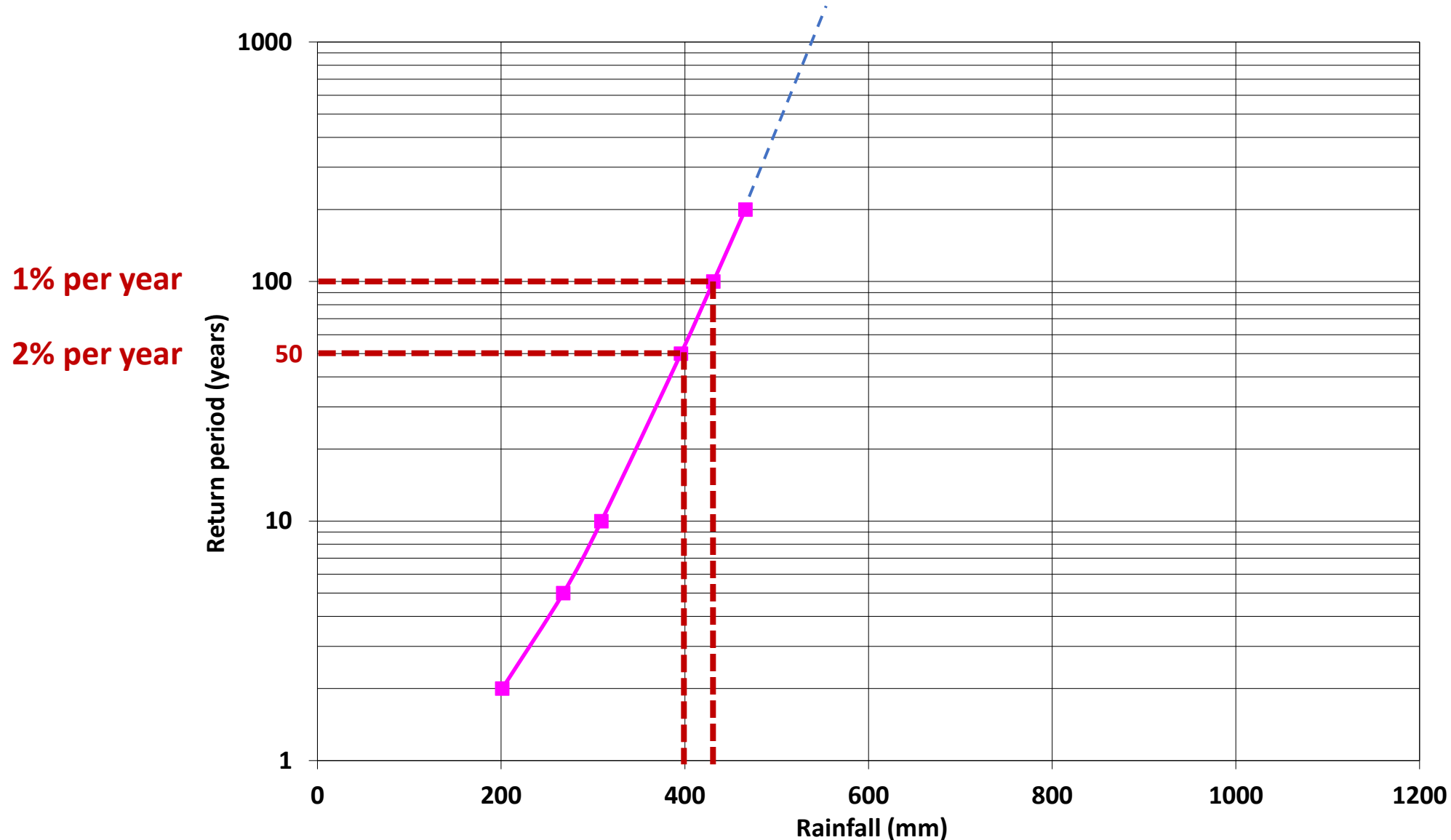
Good news: You get 30 years of data on max daily rainfall



>>> What is the maximum rainfall we should prepare for?

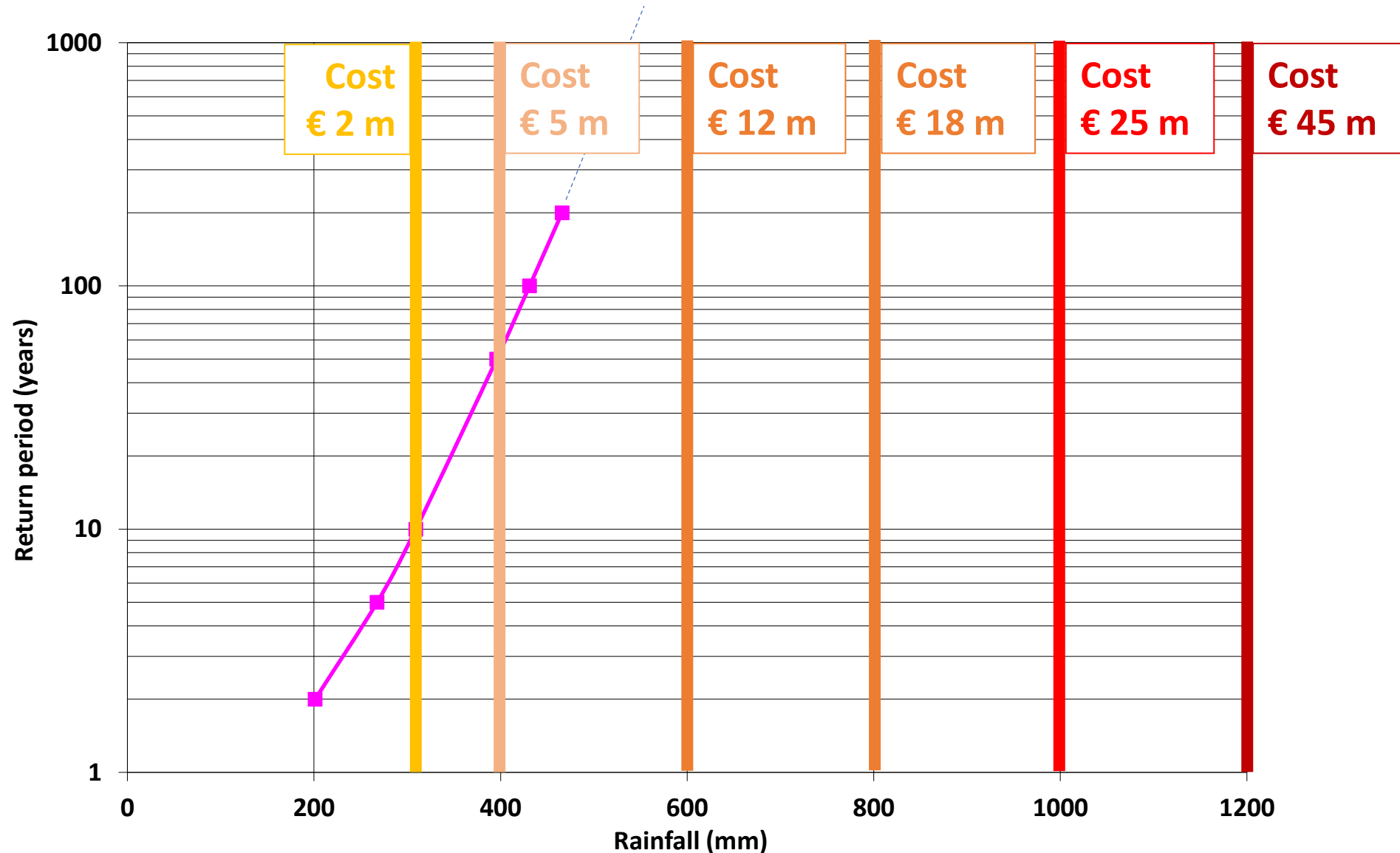
Let's do some serious analysis:

Application of the WXGEN weather generator to calculate the full distribution based on generalized extreme value theory



Time to decide... and pay!

Your engineers propose a few possible packages. Which one do you want?



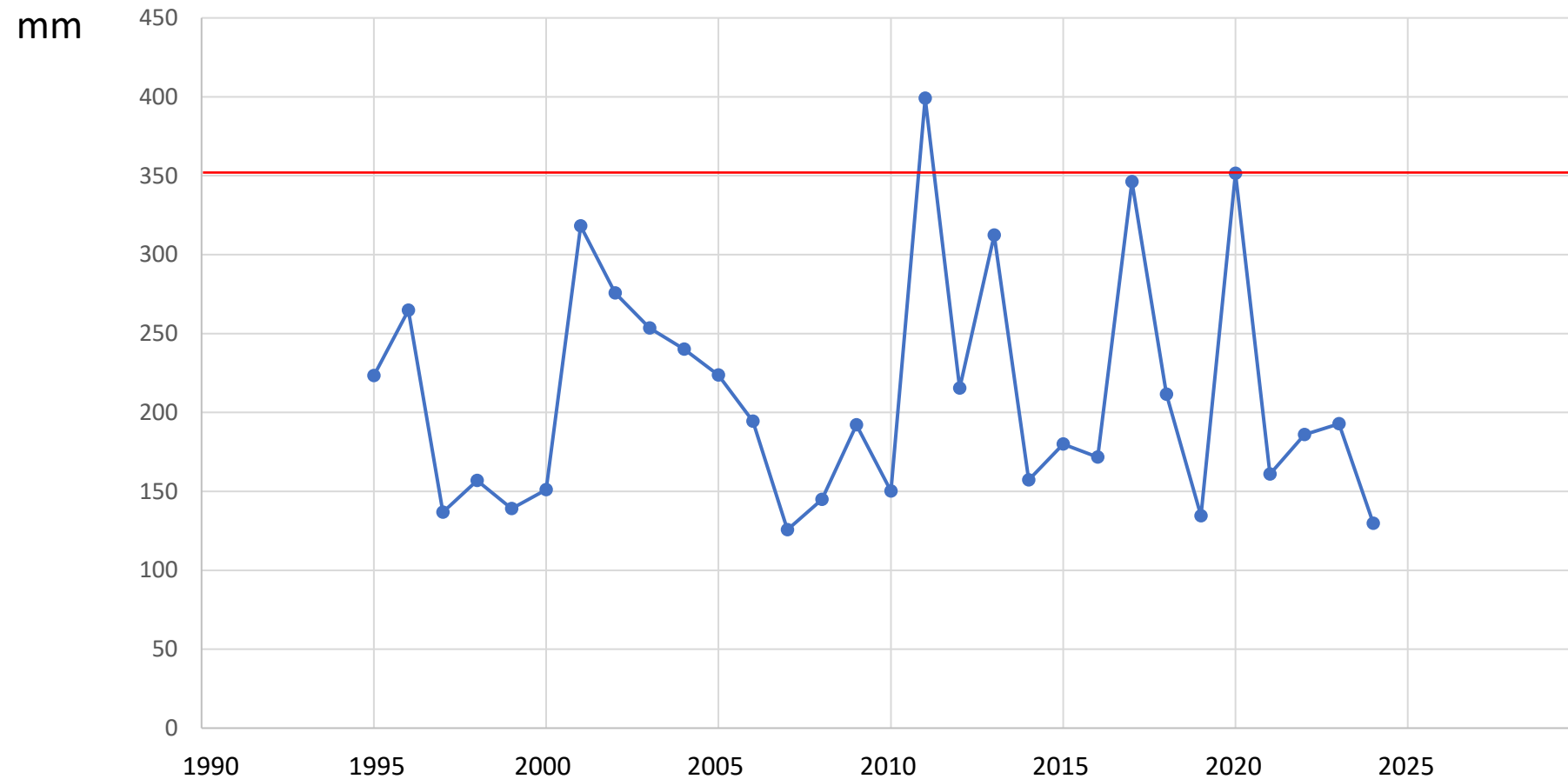
It's now built !



Let's see what happens...

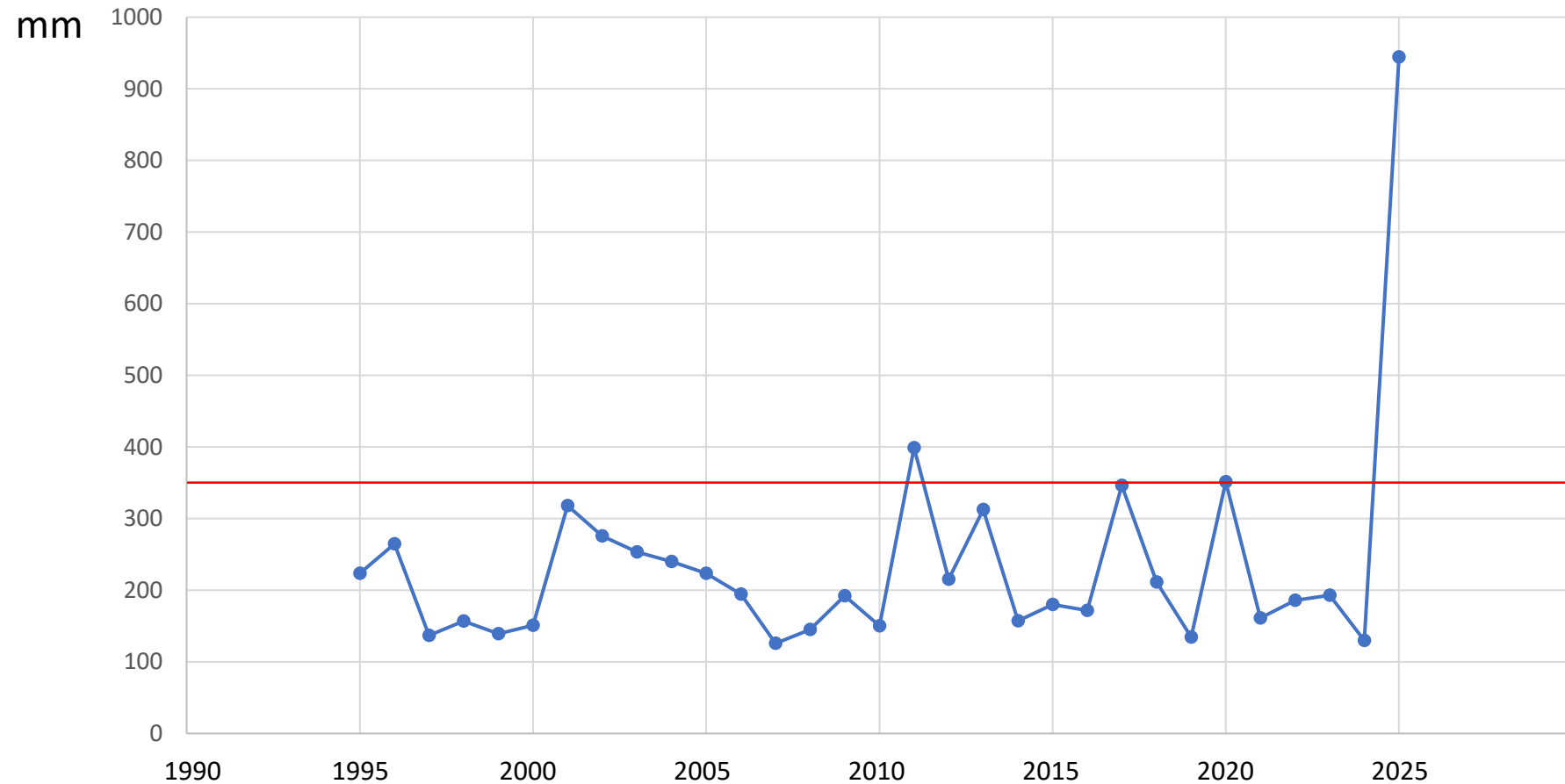
Past years...

1995-2024 maximum daily rainfall



This year...

1995-2025 maximum daily rainfall (yes, this is real data)

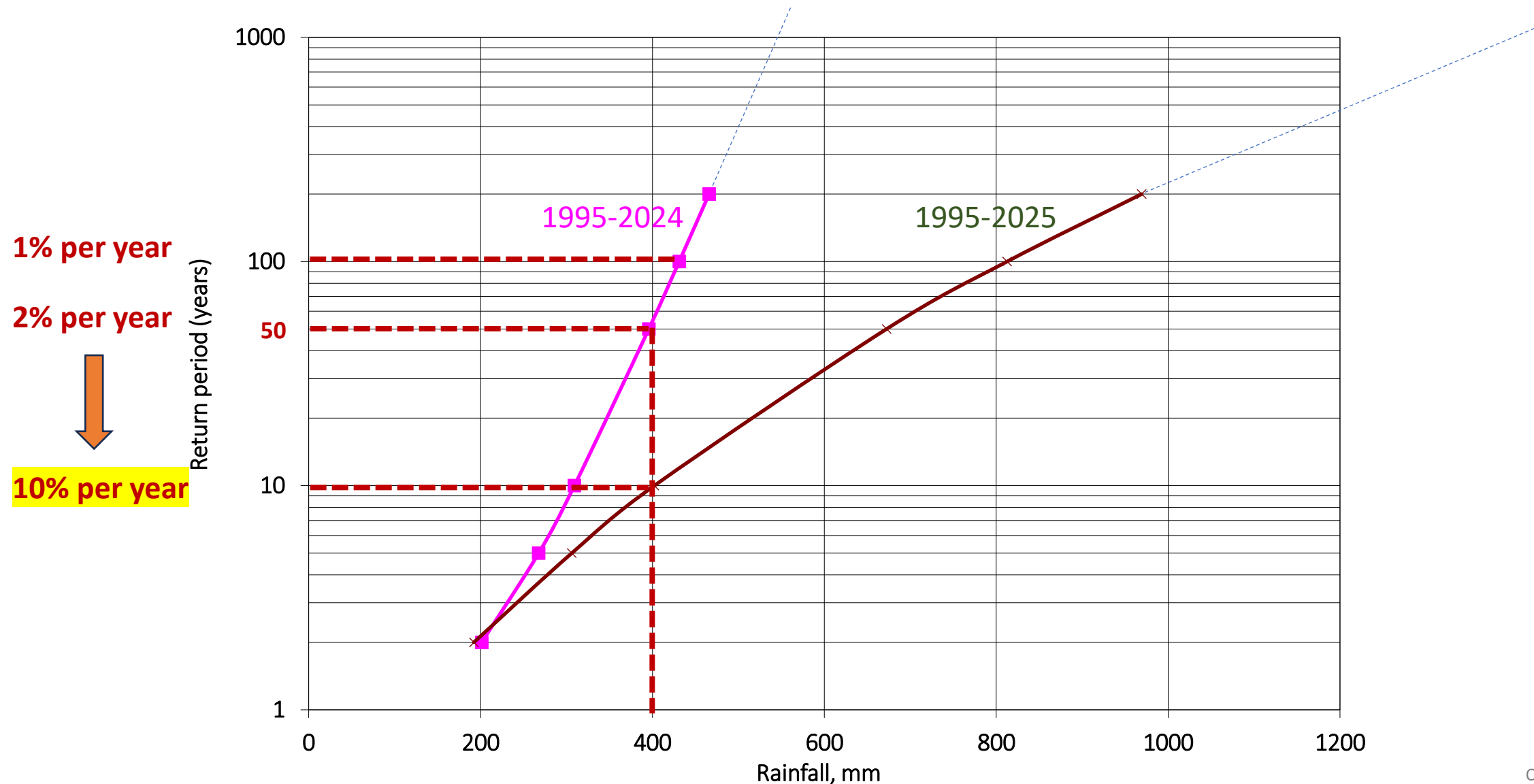


The outcome



Repeating the serious analysis:

Application of the WXGEN weather generator to calculate the full distribution based on generalized extreme value theory, with one more year of data



The outcome

- Equipment destroyed
- Response vehicles stuck
- Staff cannot access the station
- **Effective disaster response impossible**



We forgot about wild fires!



The risks to critical infrastructure are real and wide-spread



Austria, 2024
flooding of fire station Waidhofen



Türkiye, 2023



Romania, 2021



Greece, 2023
evacuation of hospital in
Alexandroupolis



Germany, 2021
flooding of fire station Dernau



City of Dubrovnik
facilities built 1880-1918

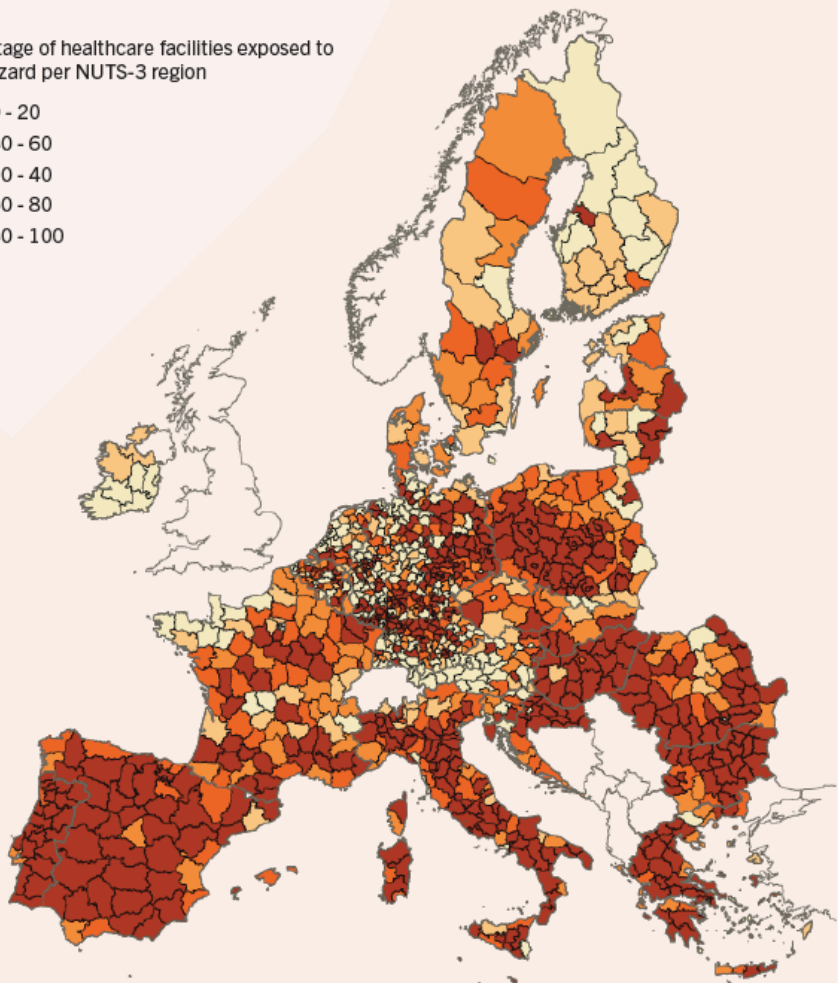
Hazard exposure of critical infrastructure



SPOTLIGHT ON CRITICAL INFRASTRUCTURE

EXPOSURE OF HEALTHCARE FACILITIES TO WILDFIRES IN THE EU

Percentage of healthcare facilities exposed to high hazard per NUTS-3 region



EU-WIDE, CIVIL PROTECTION AND EMERGENCY RESPONSE-RELATED FACILITIES, ROADS AND POWER LINES



40%

of critical emergency assets are in areas of high wildfire hazard



3,500

of critical assets exposed to floods with a return period of 1-in-10 years

IN SOME COUNTRIES, HIGH EXPOSURE HOTSPOTS



88%

of fire and police stations in 4 EU MS exposed to strong seismic shaking



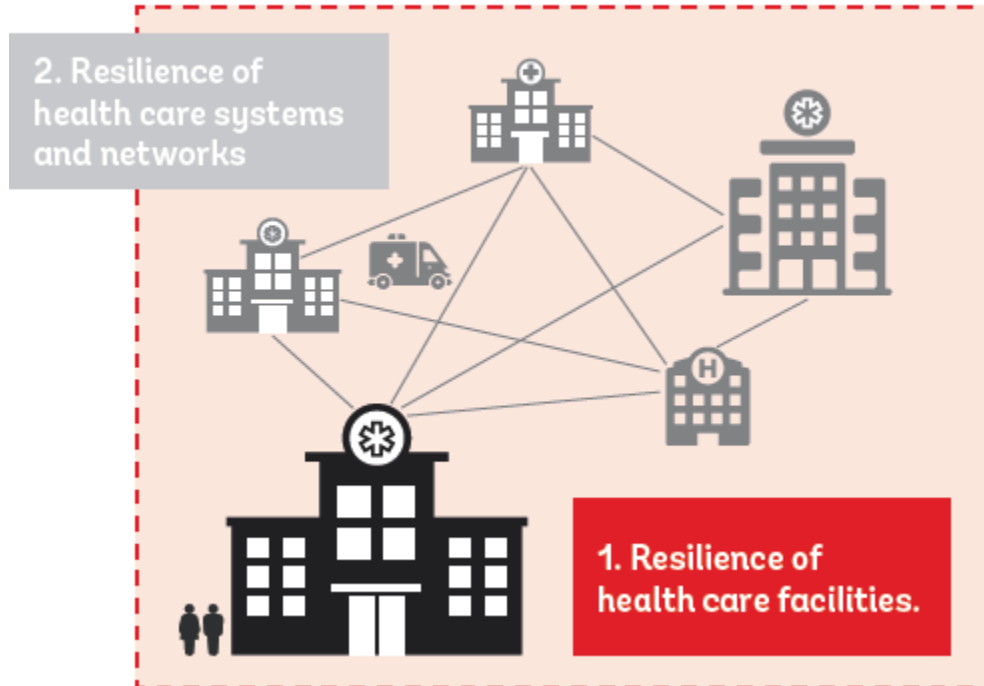
80%

of roads in 5 EU MS are in areas of high to very high landslide hazard



From assets to systems | Resilient health systems

Health care system



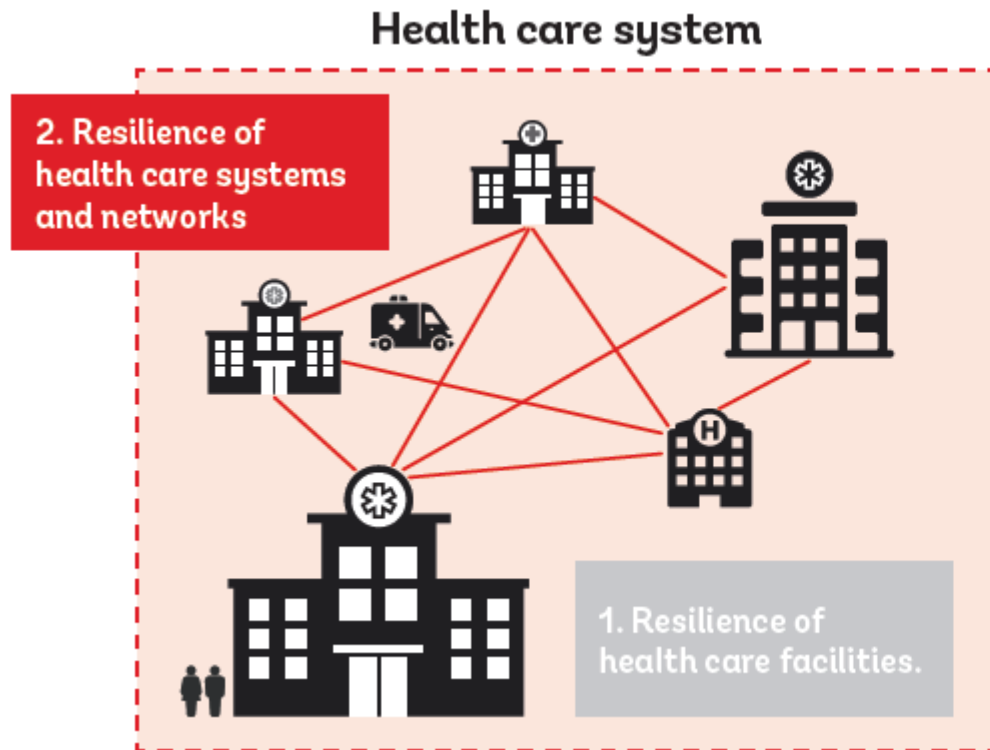
Emergency response agencies



Quality infrastructure systems



From assets to systems | Resilient health systems



Emergency response agencies



e.g., fire fighters, military, security, community preparedness groups

3. Collaboration with emergency management and civil protection agencies.

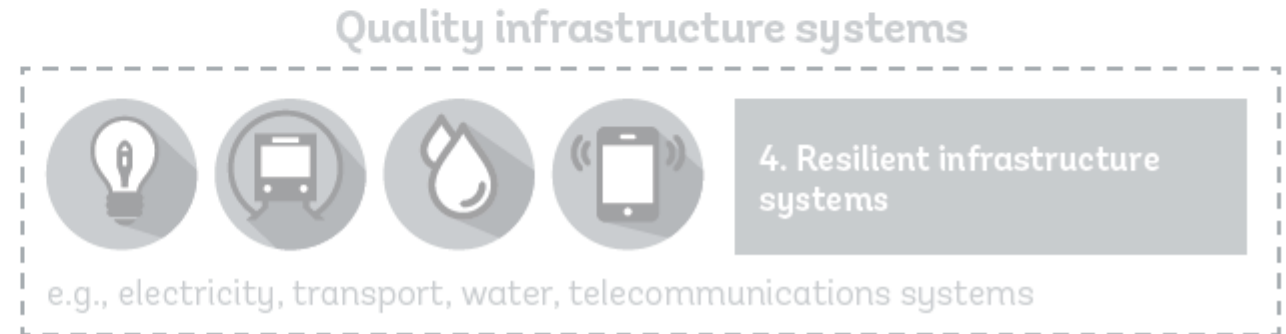
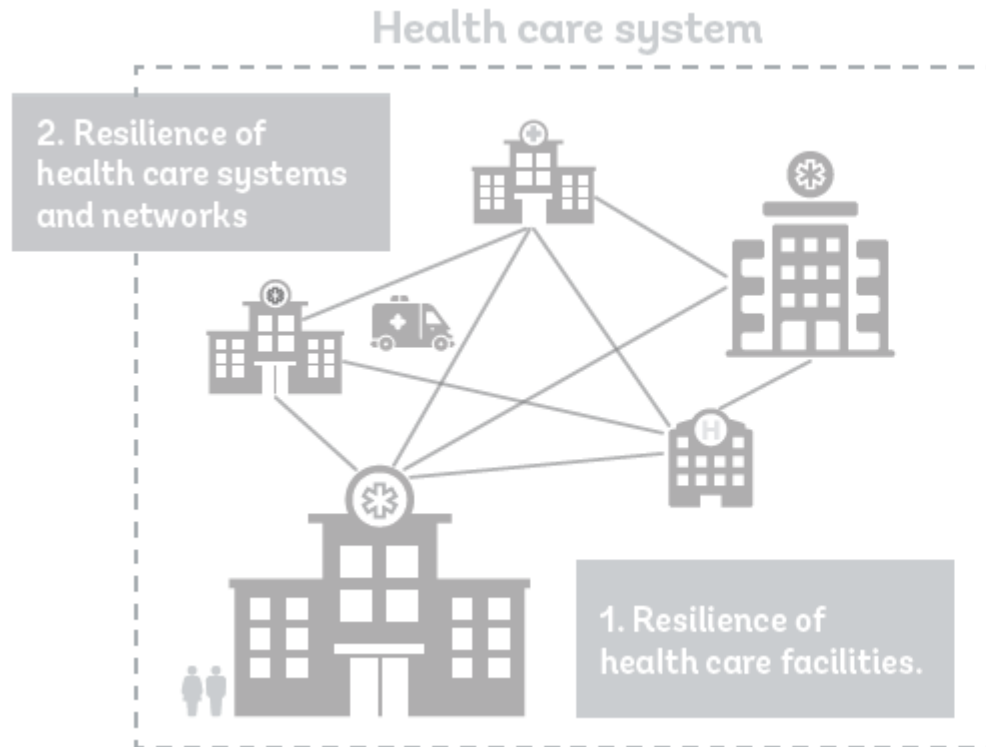
Quality infrastructure systems



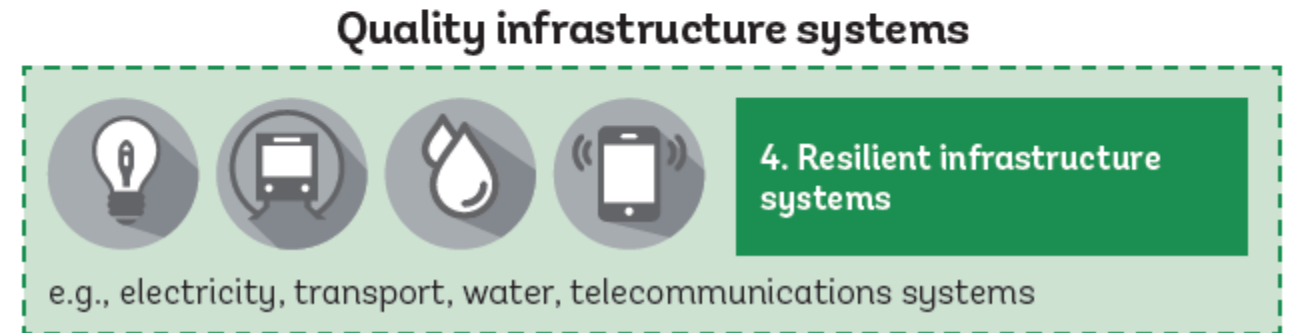
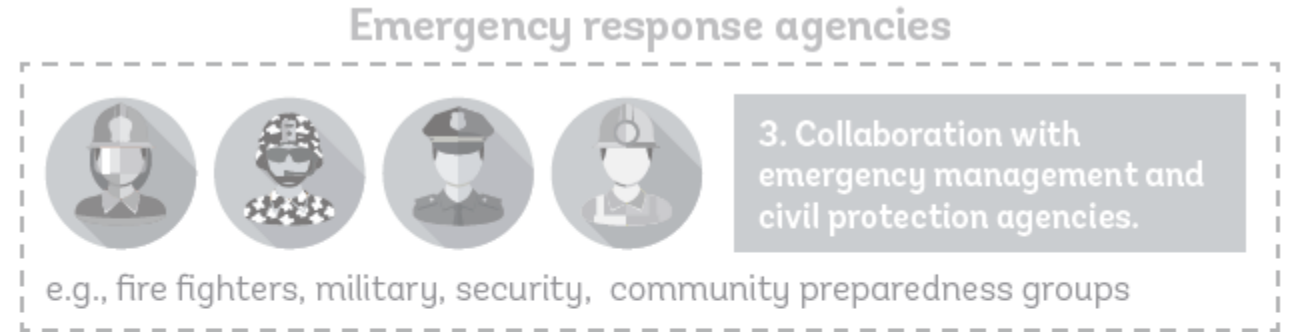
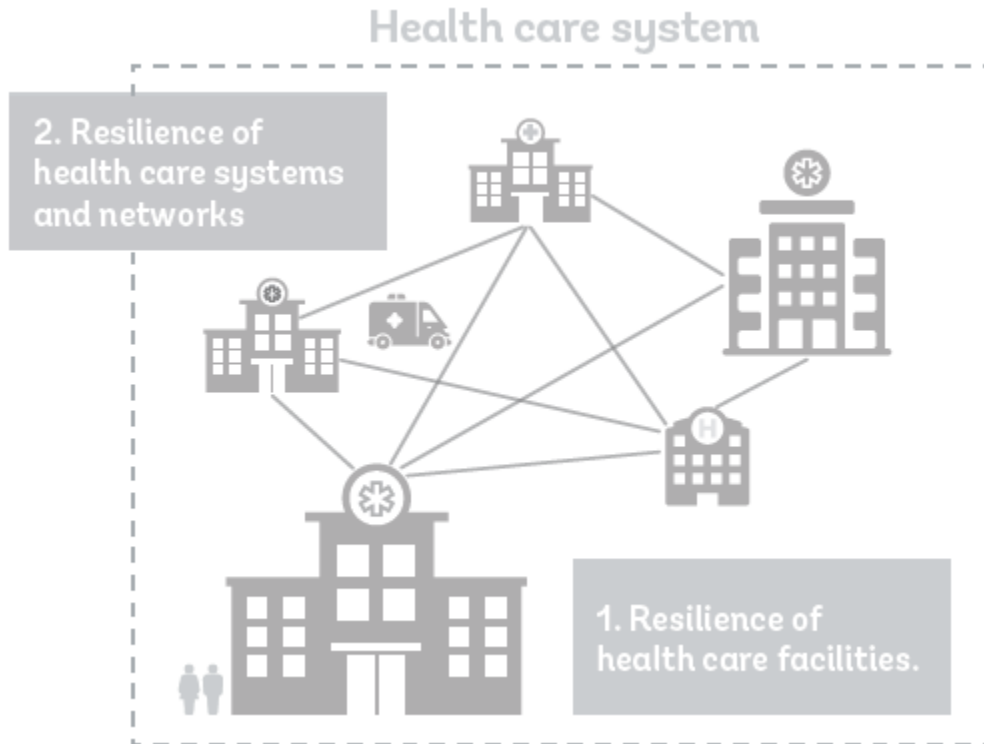
e.g., electricity, transport, water, telecommunications systems

4. Resilient infrastructure systems

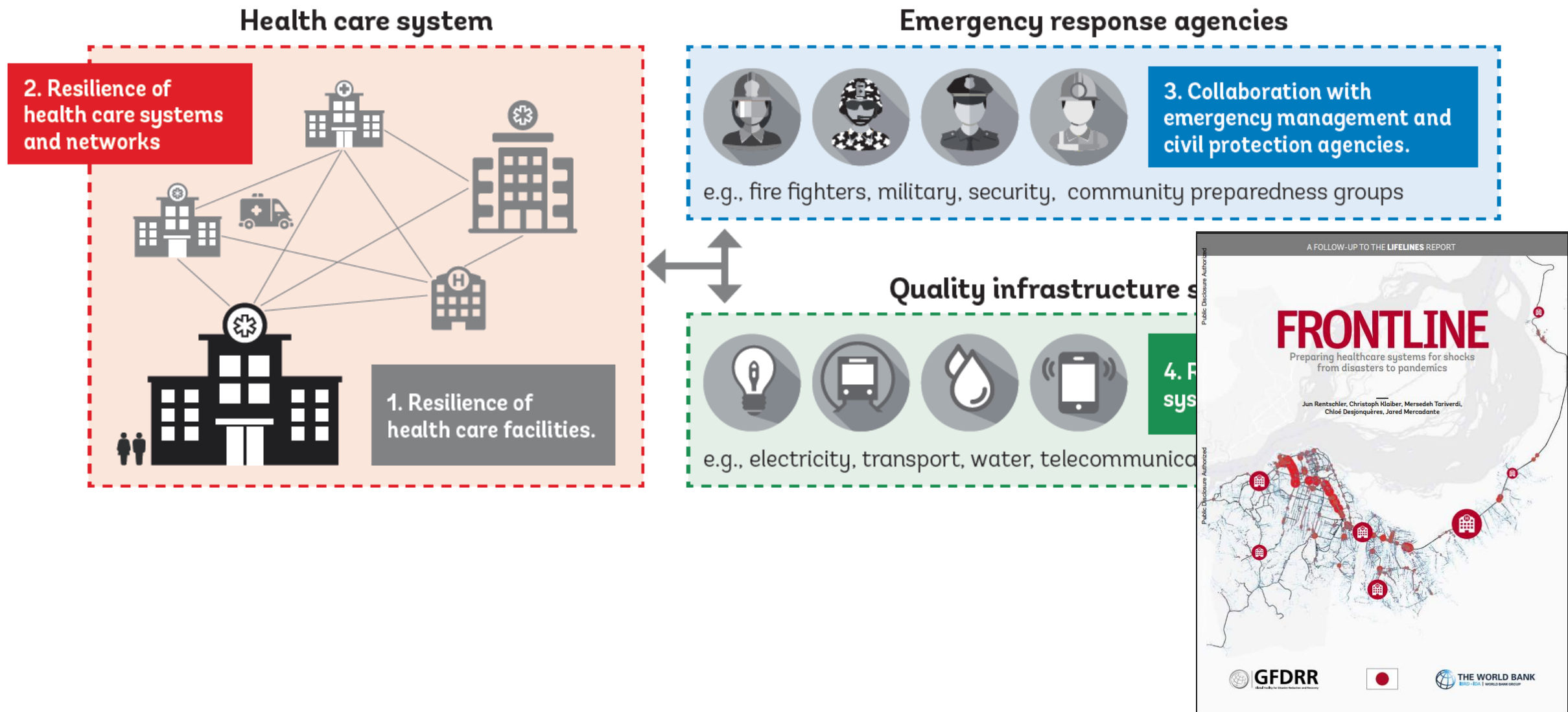
From assets to systems | Resilient health systems



From assets to systems | Resilient health systems

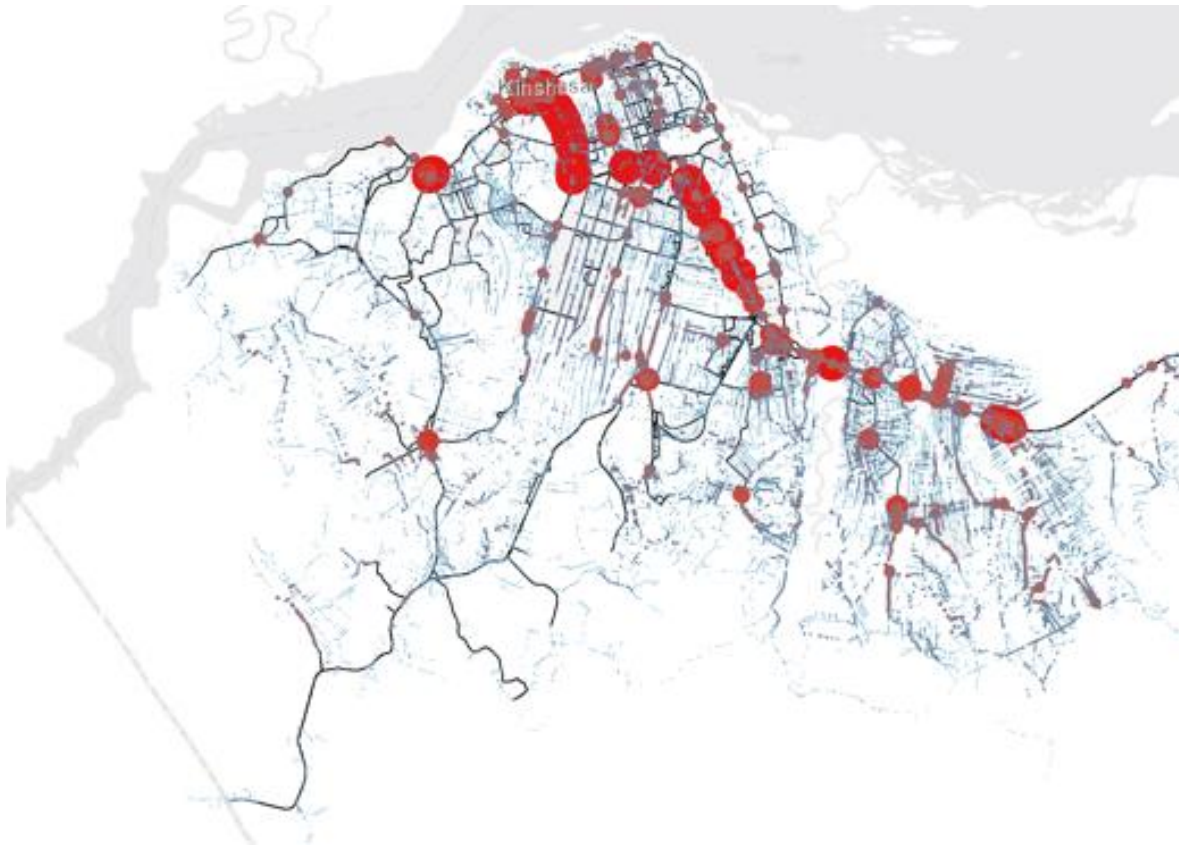


From assets to systems | Resilient health systems

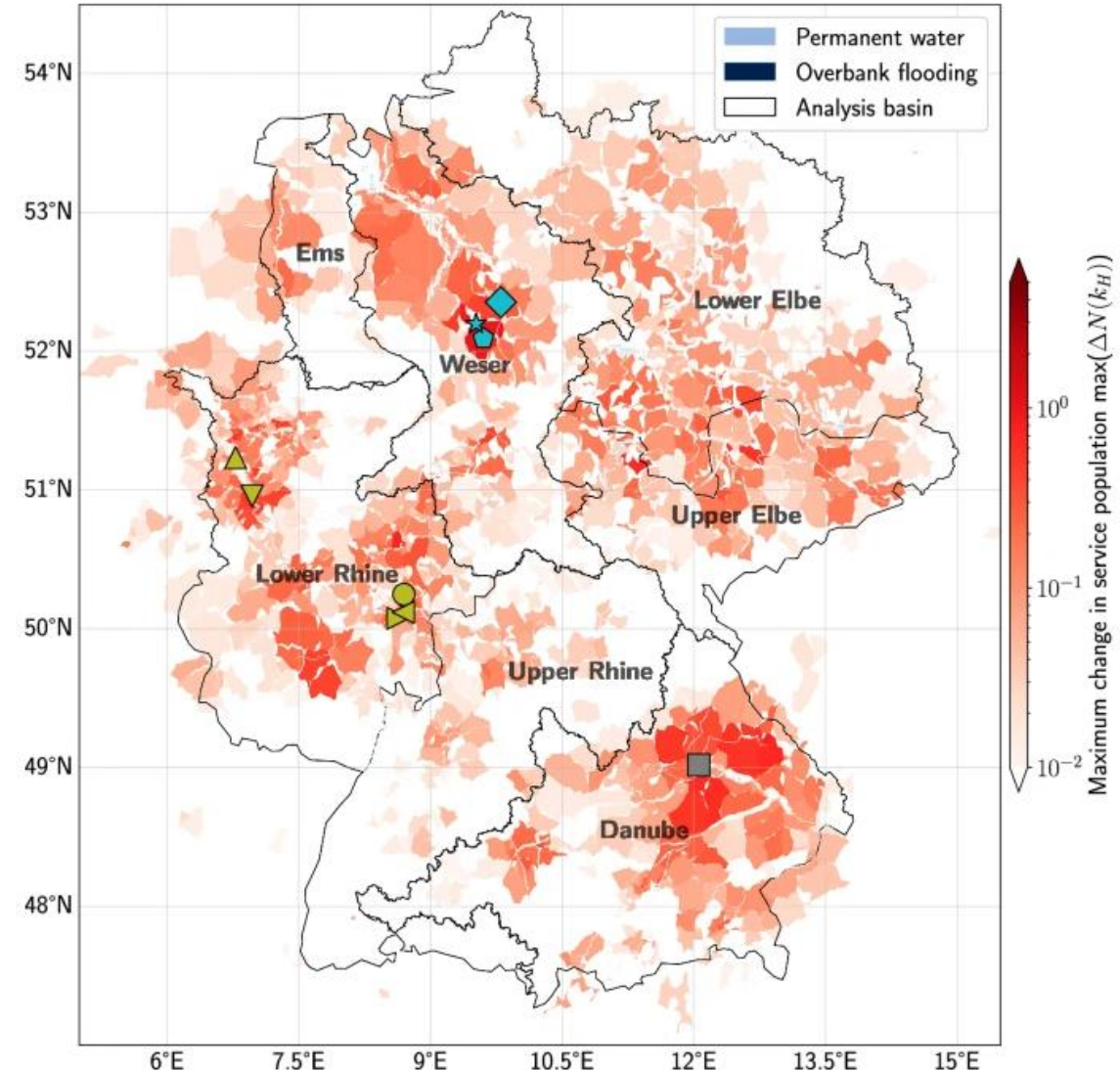


Access and mobility

Road networks connect...
... disasters disrupt.



Germany: Flood-induced changes in hospital accessibility and service populations



Managing residual risk



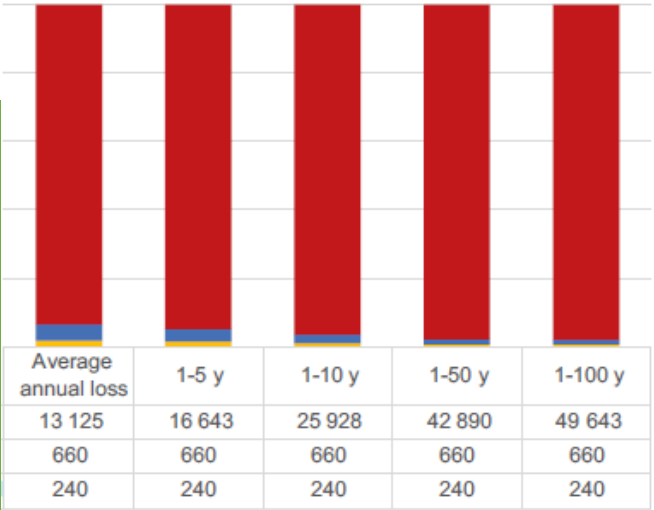
Rapid detection, reporting and recovery of infrastructure systems is crucial

Back up capacity
(incl. generators)



Potential funding gap

Reserve budgets, risk transfers for private and public assets, contingent lines of credit, solidarity funds



96%

of liabilities covered with ad-hoc instruments



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Open floor:

- How important are resilient infrastructure systems to your operations?
- How do you coordinate with infrastructure agencies?
- What data and information gaps are limiting effective planning decisions for you?
- Lessons, experiences, questions?

Disaster losses are mounting...

From **1980 to 2022**,
weather and climate shocks
caused total losses across
the EU
of about €650 billion,
or around **€15.5 billion per
year**.



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