# WELLBEING IMPACTS FROM DISRUPTIVE EVENTS

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QuakeCoRE IP4: Harnessing Disruptive Technologies
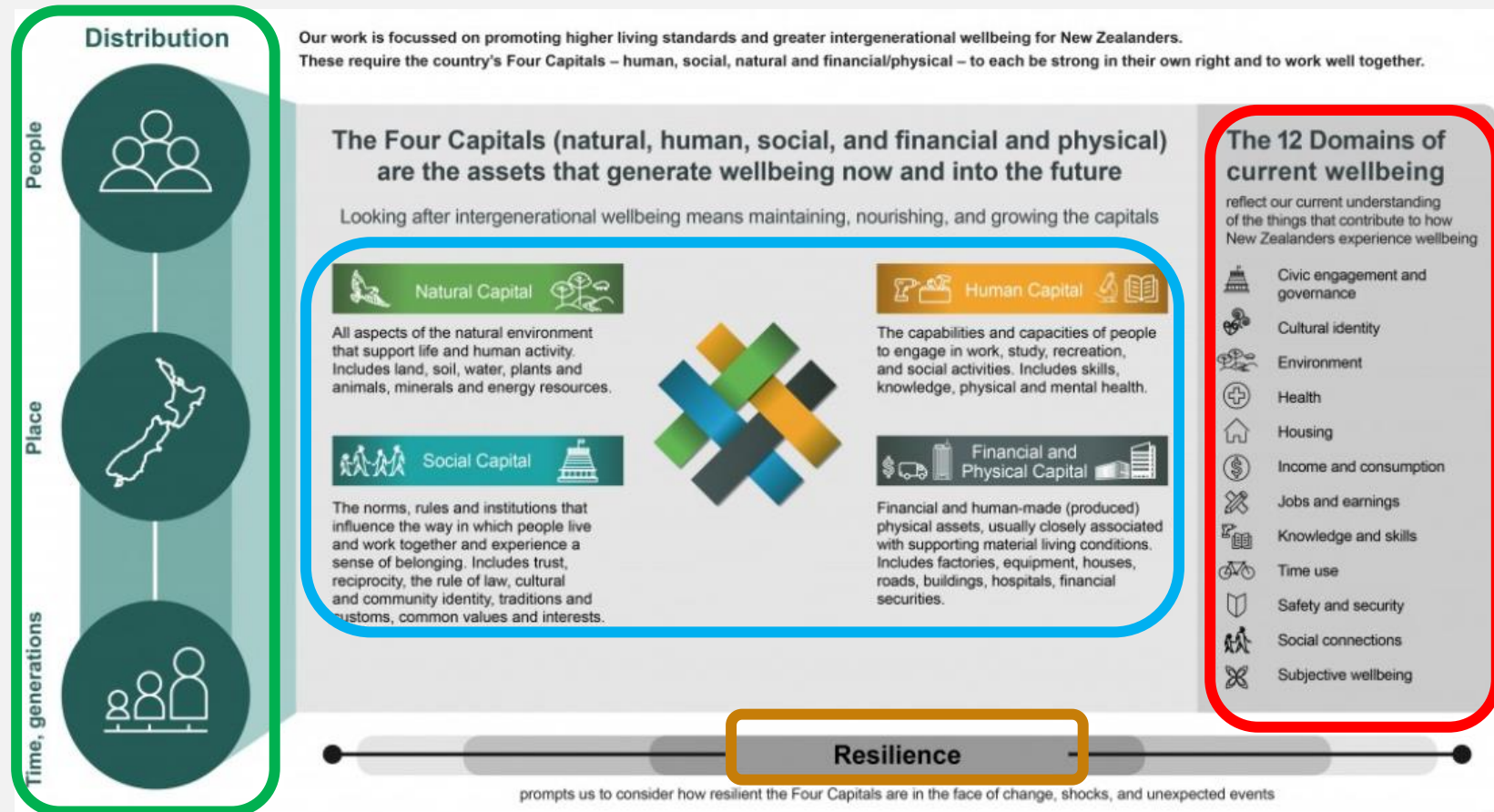
m.e research

# OUTLINE

- Wellbeing in a nutshell

- Use of graphical methods

- Review of graphical methods to link hazards to wellbeing

- Plans to include distributional impacts on economy-wide models
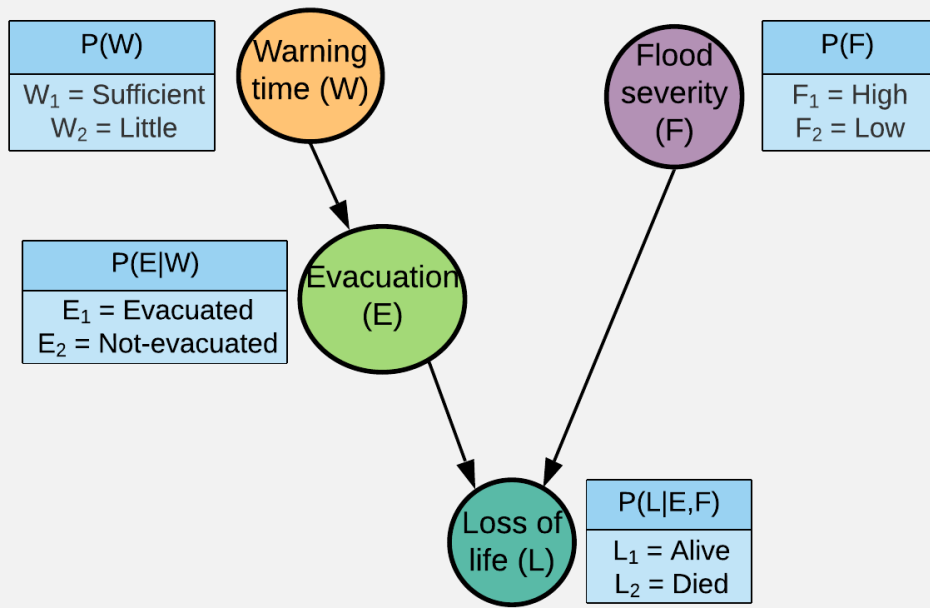
# WELLBEING IN A NUTSHELL

- The NZ Living Standards Framework:

- Multi-dimensional well-being (12 domains)

- Distributional issues and implications
  - Intra-generational
  - Inter-generational

- Long-term issues and implications (4 capitals, risk and resilience)
  - Capitals are natural, social, human, and financial and physical

Current well-being  →  Distributional impacts
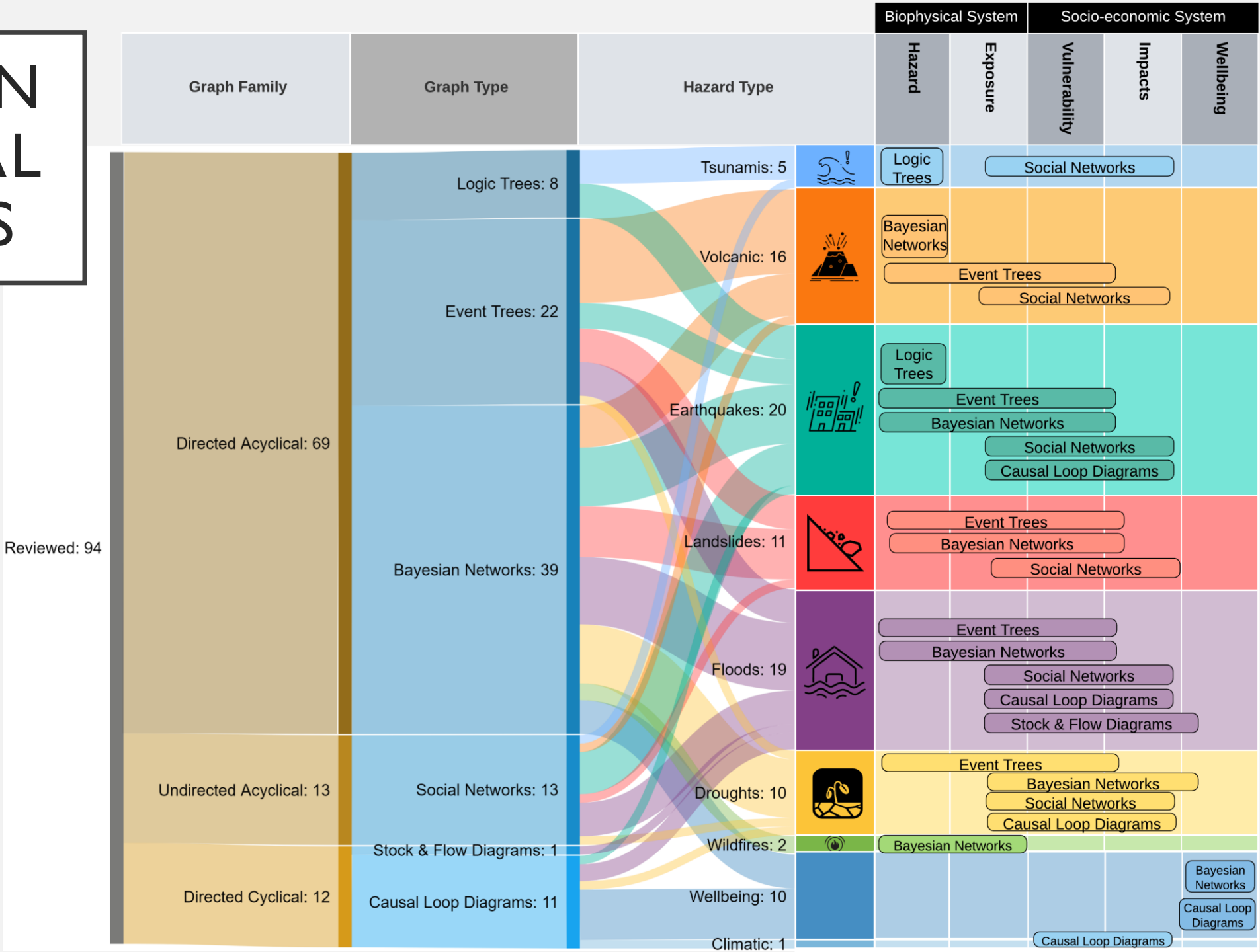
Future well-being  →  Risk and resilience



**Distribution**

People

Place

Time, generations

Our work is focussed on promoting higher living standards and greater intergenerational wellbeing for New Zealanders. These require the country's Four Capitals – human, social, natural and financial/physical – to each be strong in their own right and to work well together.

**The Four Capitals (natural, human, social, and financial and physical) are the assets that generate wellbeing now and into the future**

Looking after intergenerational wellbeing means maintaining, nourishing, and growing the capitals

**Natural Capital**
All aspects of the natural environment that support life and human activity. Includes land, soil, water, plants and animals, minerals and energy resources.

**Human Capital**
The capabilities and capacities of people to engage in work, study, recreation, and social activities. Includes skills, knowledge, physical and mental health.

**Social Capital**
The norms, rules and institutions that influence the way in which people live and work together and experience a sense of belonging. Includes trust, reciprocity, the rule of law, cultural and community identity, traditions and customs, common values and interests.

**Financial and Physical Capital**
Financial and human-made (produced) physical assets, usually closely associated with supporting material living conditions. Includes factories, equipment, houses, roads, buildings, hospitals, financial securities.

**The 12 Domains of current wellbeing**
reflect our current understanding of the things that contribute to how New Zealanders experience wellbeing

- Civic engagement and governance
- Cultural identity
- Environment
- Health
- Housing
- Income and consumption
- Jobs and earnings
- Knowledge and skills
- Time use
- Safety and security
- Social connections
- Subjective wellbeing

**Resilience**

prompts us to consider how resilient the Four Capitals are in the face of change, shocks, and unexpected events

# WHY GRAPHICAL METHODS?



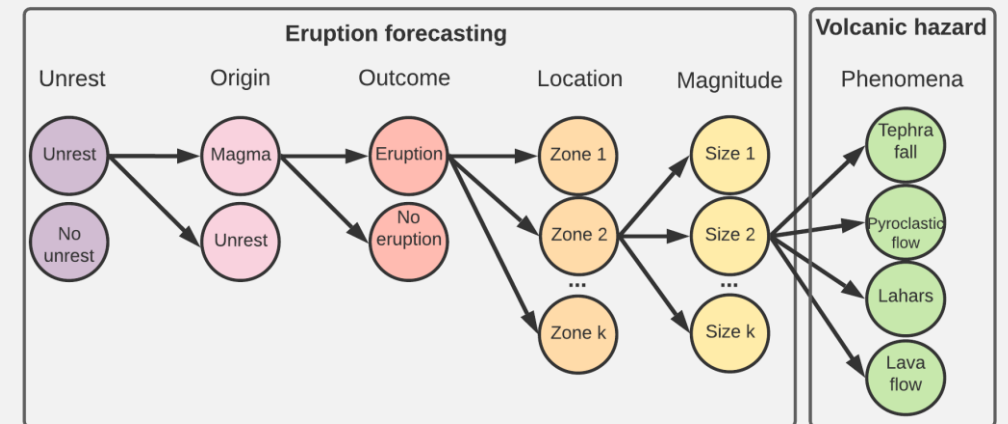Source: Peng and Zhang (2012)

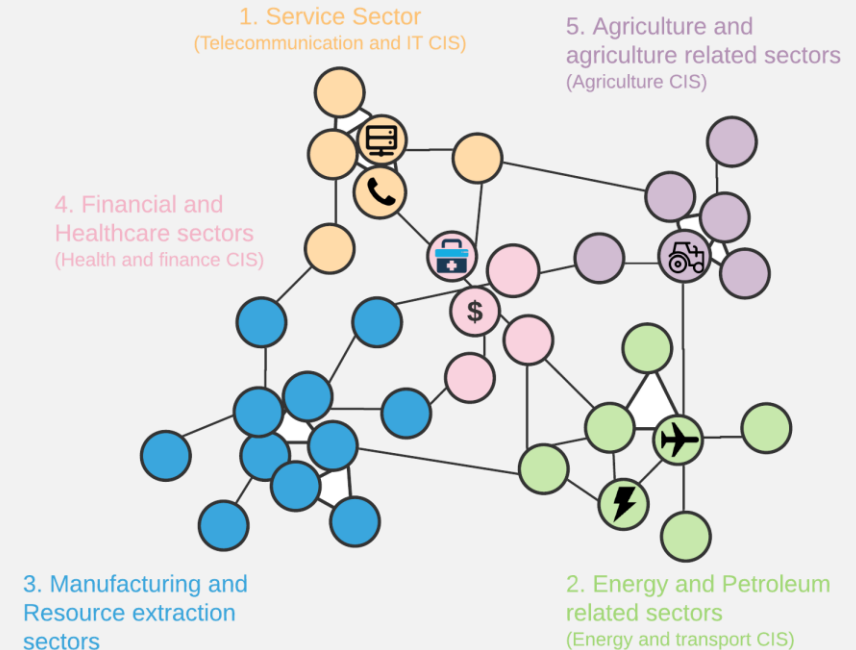REVIEW ON GRAPHICAL METHODS

# REVIEW ON GRAPHICAL METHODS

- Biophysical systems

  - Graphs based on probabilistic

  - Hazards → direct impacts on infrastructure

- Social systems

  - Graphs based on wider socio-economic linkages and dynamically adaptive behaviours

  - Direct impacts → indirect impacts



Source: Marzocchi and Bebbington (2012)



Source: Di Baldassarre et al., (2015)



Source: Chopra and Khanna (2015)

# DISTRIBUTIONAL IMPACTS IN ECONOMY-WIDE MODELS

- Vast literature on climate change impacts

- Through the representation of households (HHs):
  - As the labour force in the economy
  - As consumption agents

- Methods identified in the literature:
  - Multiple HHs in the macro model (MHM)
  - Coupling macro-micro simulators (MSH)
  - Modelling income distribution (MID)