# An introduction to systems thinking to address complex problems

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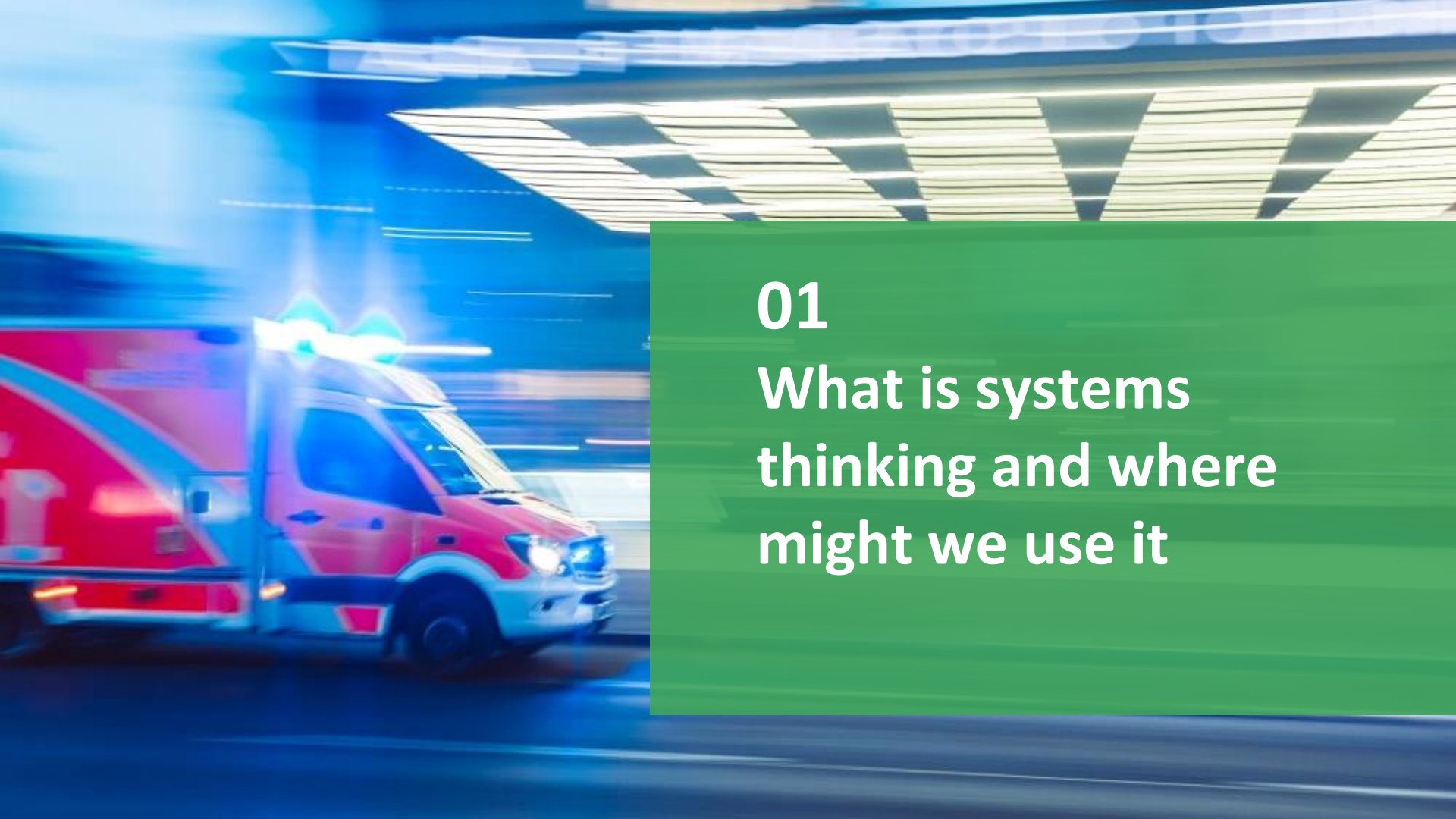
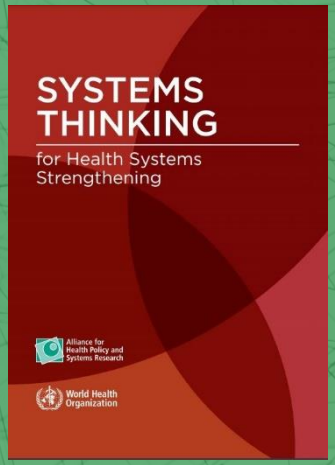


# 01
# What is systems thinking and where might we use it




Systems thinking works to decode the complexity of a health system, then applies this understanding to design and evaluate interventions that maximize health and health equity.

The Alliance 2009 Flagship Report: Systems Thinking for Health Systems Strengthening

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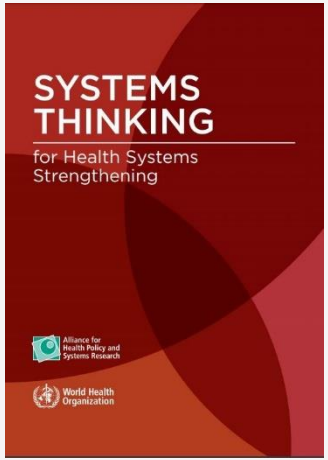
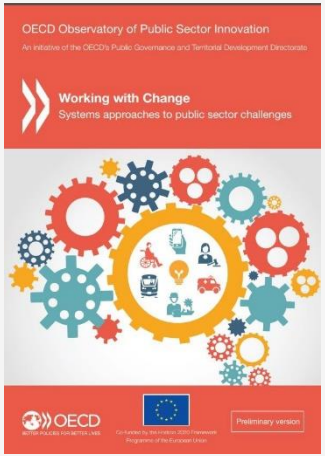
# International agencies and public sector organizations are moving towards systems thinking …..




**To deal with complex (or 'wicked') problems which:**

- Go beyond range of any one team, department or organization to manage them
- Are often characterized by disagreement about causes, and how to tackle them
- Recognize the need to change behavior or practice at multiple levels and scales (individuals to organizations)
- Require innovative solutions that can be adapted in the light of experience and feedback

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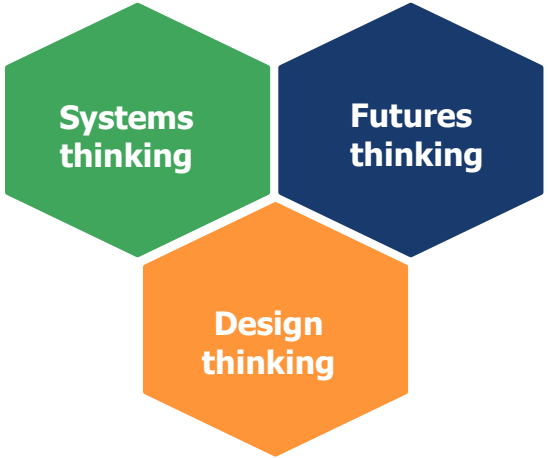
# Start by clarifying where you are going – and involve the right people in that process




Futures thinking helps chart your vision. Your vision is your why! It describes the change you and your "team" believe you can make in the world.

Systems thinking provides a framework for understanding the issue and the wider context in which it is sited – including inquiring into how the different stakeholders involved experience things.

Your design process guides the specific work that you believe will organize and activate your people – goals/outcomes, objectives, measures, etc.

Don't start systems thinking in a vacuum. It's important to acknowledge your "framing" perspective. Link across futures, systems, and design thinking to help provide collective responses to developing constructive change.

# Systems thinking enables us to:

Change our thinking to match the interconnected, dynamic complexity of our communities and their environments

Communicate with others to create new ways of thinking and seeing - and develop shared understanding

Change our behavior to work with the complex forces in the system (instead of against them) to realize our vision

Identify and test a wider variety of possible actions and solution pathways

Become more aware of the potential for unintended consequences of our actions

Harness social learning processes to help us develop a shared understanding and take action collectively

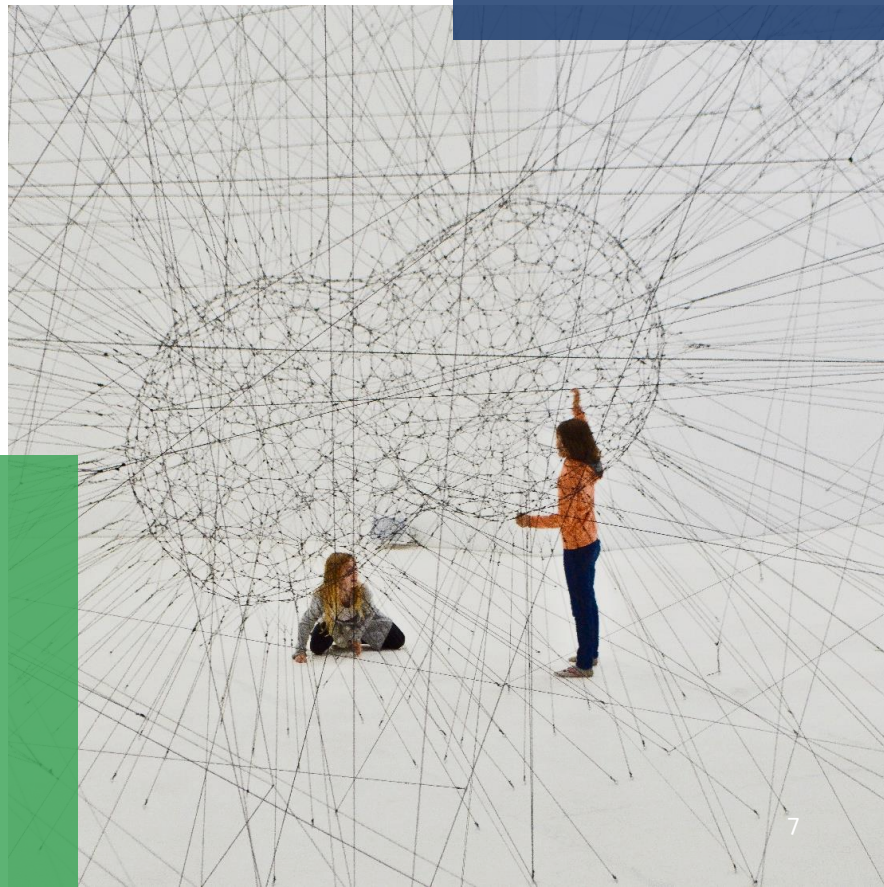
Expand the choices available to us and identify those choices where we can develop significant leverage

# We are all systems thinkers

We all grew up exploring our natural and social worlds and asking questions born of curiosity. We can look at problems, see beyond the obvious, and explore otherwise hard to see connections.

But in many school and workplace settings today knowing the "right answers" is often rewarded over systems-based inquiry and creativity.

Yet in today's more crowded, and rapidly changing, world there are fewer instances where all that is needed is a "right answer" – rather there are more perspectives, interconnections and interdependencies to consider!



# Of course - not all systems are the same!

## There are different kinds of systems …

Simple / complicated

Complex and adaptive

We need to understand the difference and use appropriate management styles for each

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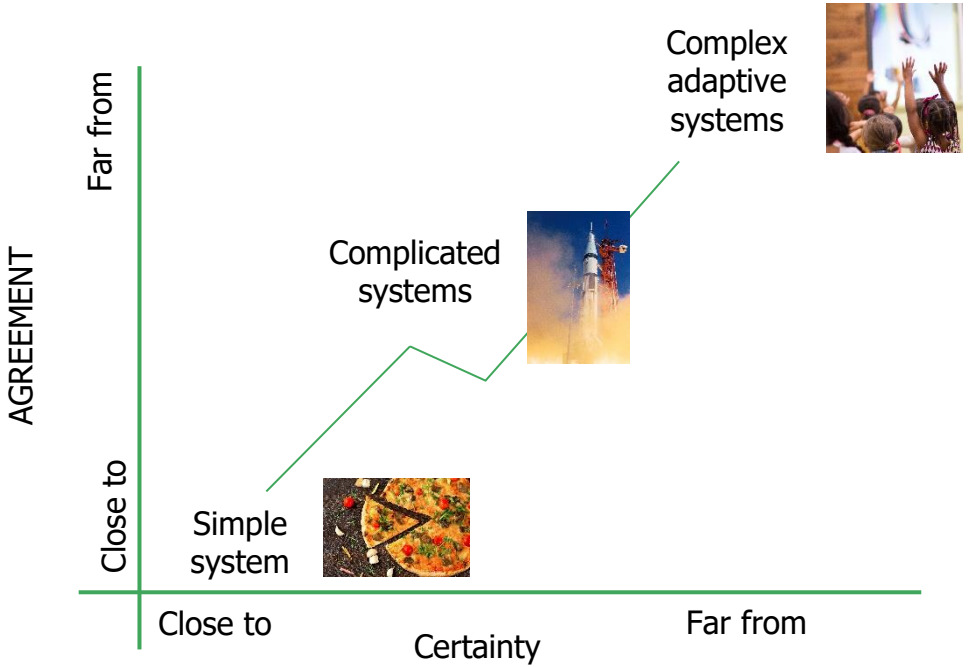
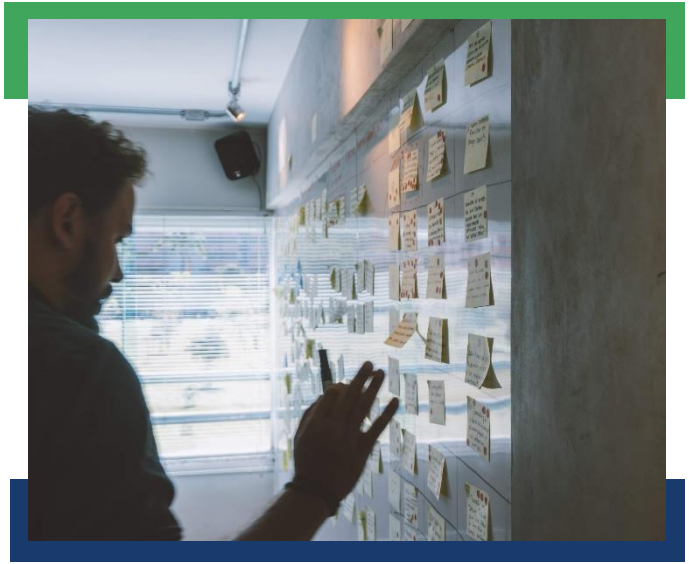
# A typology of systems



* Glouberman, S., & Zimmerman, B. (2016). Complicated and Complex Systems: What Would Successful Reform of Medicare Look Like?

# Simple systems

* … like a recipe

- Call for generic solutions (or recipes) that work every time.
- No requirement for  new skills or infrastructure

# Complicated systems

* … like a rocket

- Can be designed and built! (e.g., a hospital building]
- Require new skills and co-ordination
- Formulae are necessary
- There is a high degree of certainty of outcome

# Complex adaptive systems

* … like bringing up a child

- Every system is unique. [e.g., a working hospital system]
- Are adaptive ( the capacity to change & learn)
- Uncertainty of outcome remains.
- Expertise can help - but is not sufficient.
- Quality of relationships are crucial!

# 02
# Some underpinning concepts and systems thinking tools

# Many systems definitions …

- A configuration of interacting, interdependent parts that are connected through a web of relationships, forming a whole that is more than the sum of its parts (e.g., Holland 1998)

- Systems are overlapping, nested, and networked - they have subsystems and operate within broader systems (e.g., Midgely 2006)

# Systems thinking

A way of seeing and understanding a situation that emphasizes both the parts and the relationships among the parts rather than the parts in isolation.

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# Key systems thinking components

**KEY SYSTEMS THINKING COMPONENTS**

## Multiple Perspectives

- World views
- Voices
- Knowledge systems

## Interconnections

- Relationships
- Feedback
- Patterns

## Influences

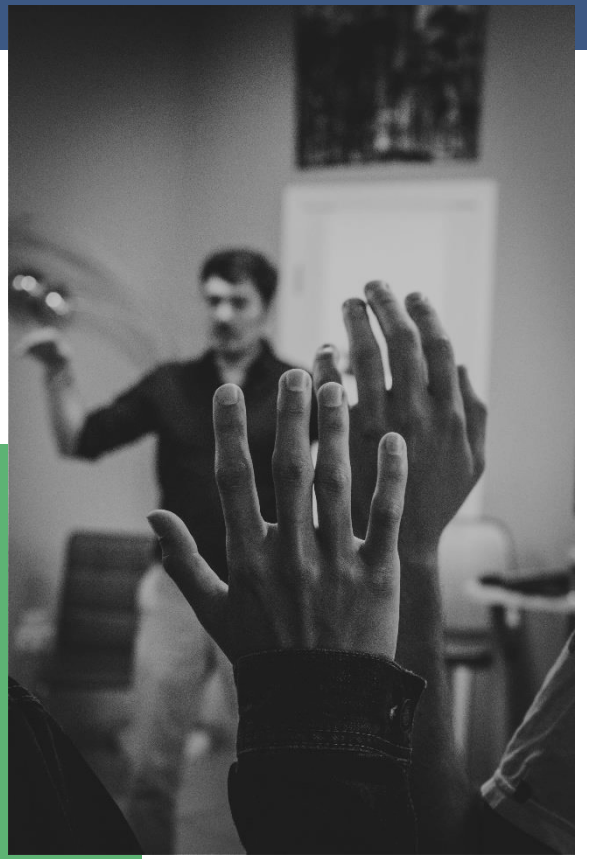
- Blocks
- Leverage points
- Drivers

## Boundaries

- Communities
- Systems within systems
- Scope

# Multiple Perspectives

- Who or what are the key stakeholders in this situation?
- What stakes (individual values and motivations) do they have?
- What are the different ways in which the situation can be framed or understood – by whom?
- What stakes (individual values and motivations) do they have?



# Interconnections

- How do the elements within the situation (components, stakeholders, knowledge, etc.) interconnect?
- What patterns emerge from these relationships in action - with what consequences, and for whom?

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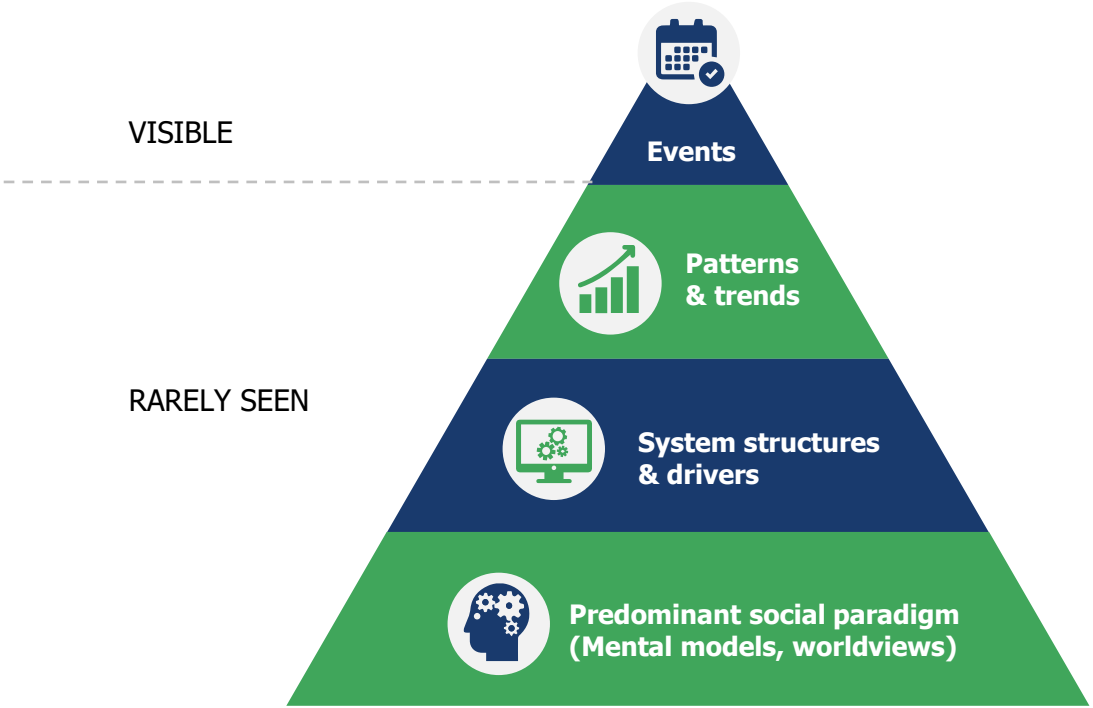
# Boundaries

- Define scope and scale (and from what/whose perspective is this developed.)
- Are other boundaries possible – and feasible?
- Agree on how to structure the problem situation
- Discuss what constitutes an improvement – and how this might be different for different stakeholders?

# Influences

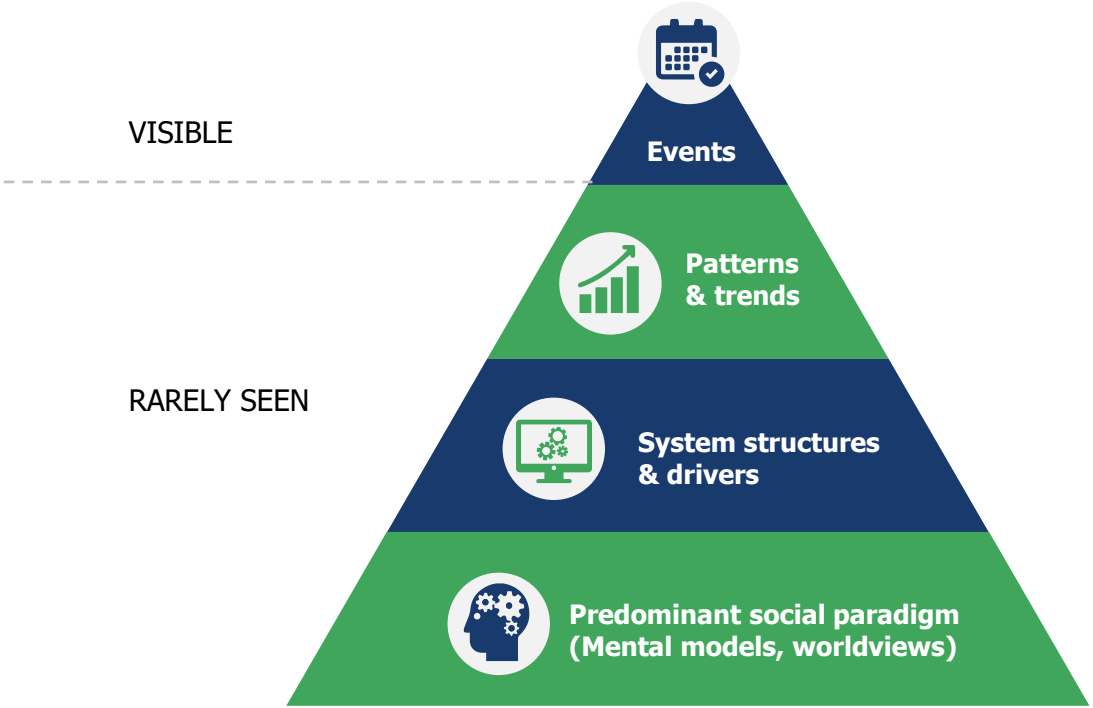
- What drives the systems in question in particular directions
- Identify …. drivers, trends, enablers, blocks, leverage points
- Leverage points are seen as key points with which to intervene in complex systems

# The iceberg model for systems thinking




The iceberg model is a systems thinking tool designed to help an individual or group discover the patterns of behaviour, supporting structures, and mental models that underlie a particular event.

# The iceberg model for systems thinking



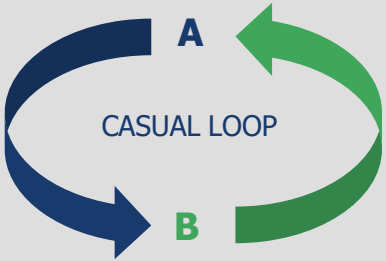

- What is the fastest way to react to this event NOW?
- What trends and/or patterns are occurring?
- What mental/organizational structures create the patterns?
- What are the stated/unstated visions that generate this structure?

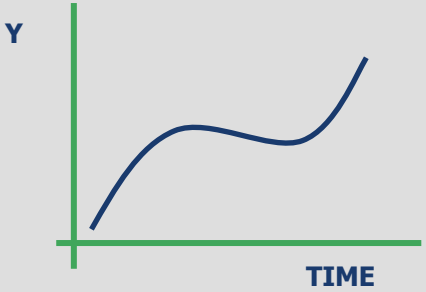
# Understanding the system …
# Tools for seeing and structuring

- Relationship building
- Facilitation
- System archetypes
- Rich pictures
- SWOT analysis
- Concept mapping
- etc.

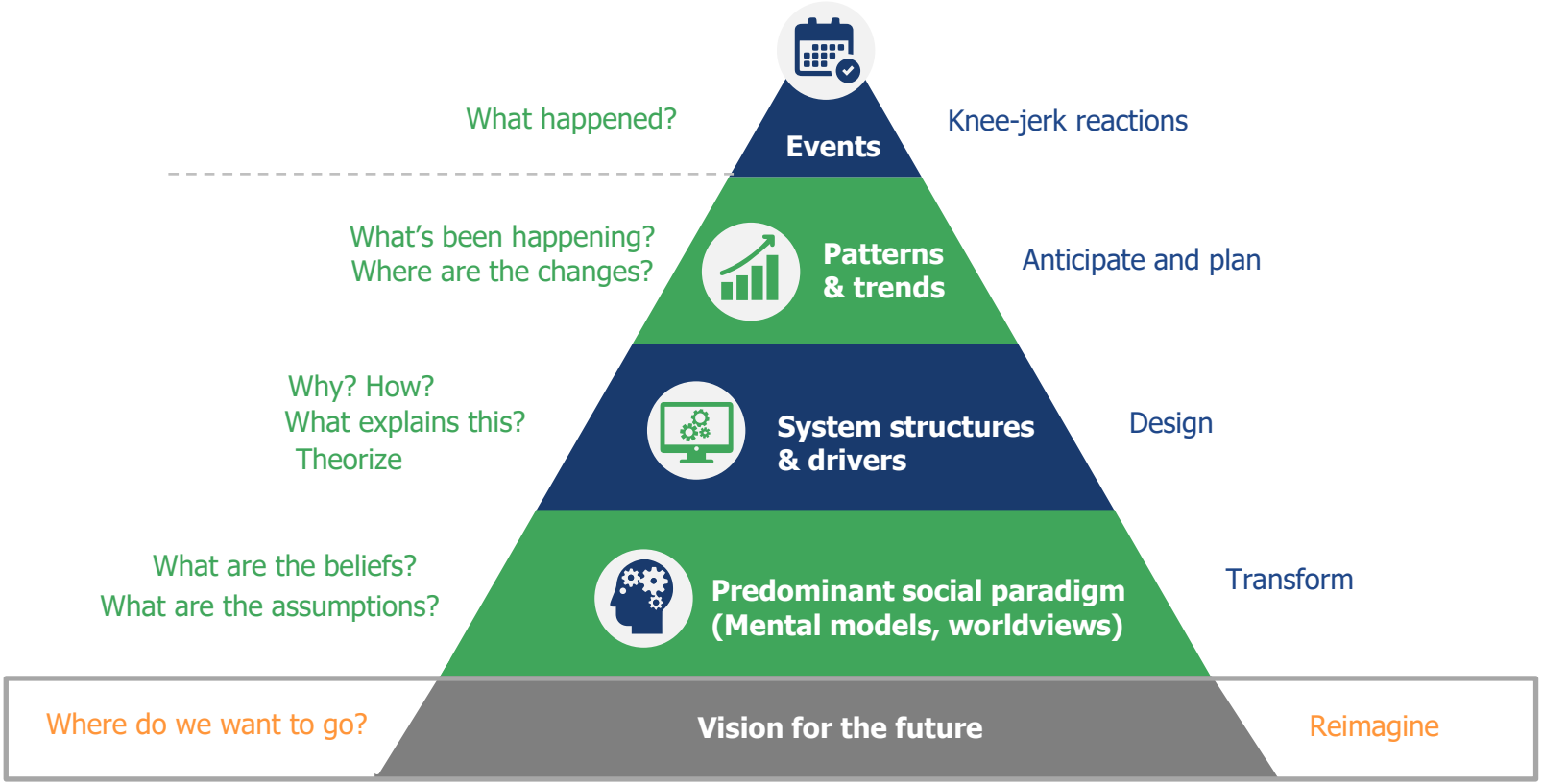
- Social network analysis
- Causal loop diagrams
- Bayesian belief networks
- Trend analysis
- Computer models
- Timelines
- etc.

There is no one tool or method that supports systems thinking – mix and match among a range of methods to explore a complex situation.

# “Redesigning for a Sustainable Future”




Link across futures, systems, and design thinking to help provide collective responses to developing constructive change.

# For more information

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- Dr Margaret Kilvington – margaret.kilvington@gmail.com
  - Independent Social Research, Evaluation & Facilitation

Annotated links to a wide range of related on-line material can be found via the Learning for Sustainability clearinghouse - https://learningforsustainability.net/

Based on a plenary presentation titled "An introduction to systems thinking – concepts and tools". to the UN Summer Academy: "Redesigning for a Sustainable Future" post-COVID on Tuesday 24 August 2021.

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