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Acknowledgements

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Interactive systems training for healthy food environments

Workshop 1 – 28th November 2022

Facilitators:

Deakin University: Tari Forrester-Bowling, Tara Boelsen-Robinson, Miranda Blake

Amsterdam UMC: Joreintje Mackenbach, Cédric Middel, Josine Stuber, Jillian O'Mara, Naomi de Pooter, Coosje Dijkstra

Contact: Josine Stuber j.stuber@amsterdamumc.nl or Tara Boelsen-Robinson tara.b@deakin.edu.au

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Agenda

- Facilitator introductions and workshop overview
- Introduction to systems thinking and system dynamics modelling
- Tools for system dynamics modelling
- Tool 1: Behaviour over time graphs
- Activity (breakout rooms) – Behaviour over time graphs
- **Break (10 min)**
- Tool 2: Connection circles
- Activity (breakout rooms) – Connection circles
- Present and reflect
- Live survey
- Closing

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Activity: Hopes and fears

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Answer two questions

- What do you hope to get out of the workshops?
- What do you fear will happen?

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Workshop overview

Purpose:

- Introduce the concepts and tools of systems thinking and system dynamics modelling
- How to apply these to planning, implementation and resourcing of initiatives/policies

Process:

- Learn by doing
- Key steps to develop a system map that addresses a problem through group activities

Outcomes:

- System maps (causal loop diagram) produced during the workshops
- Resources to replicate this process in your own work to model a problem and identify solutions (‘tools in the toolbox’)

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Introduction to systems thinking and system dynamics modelling

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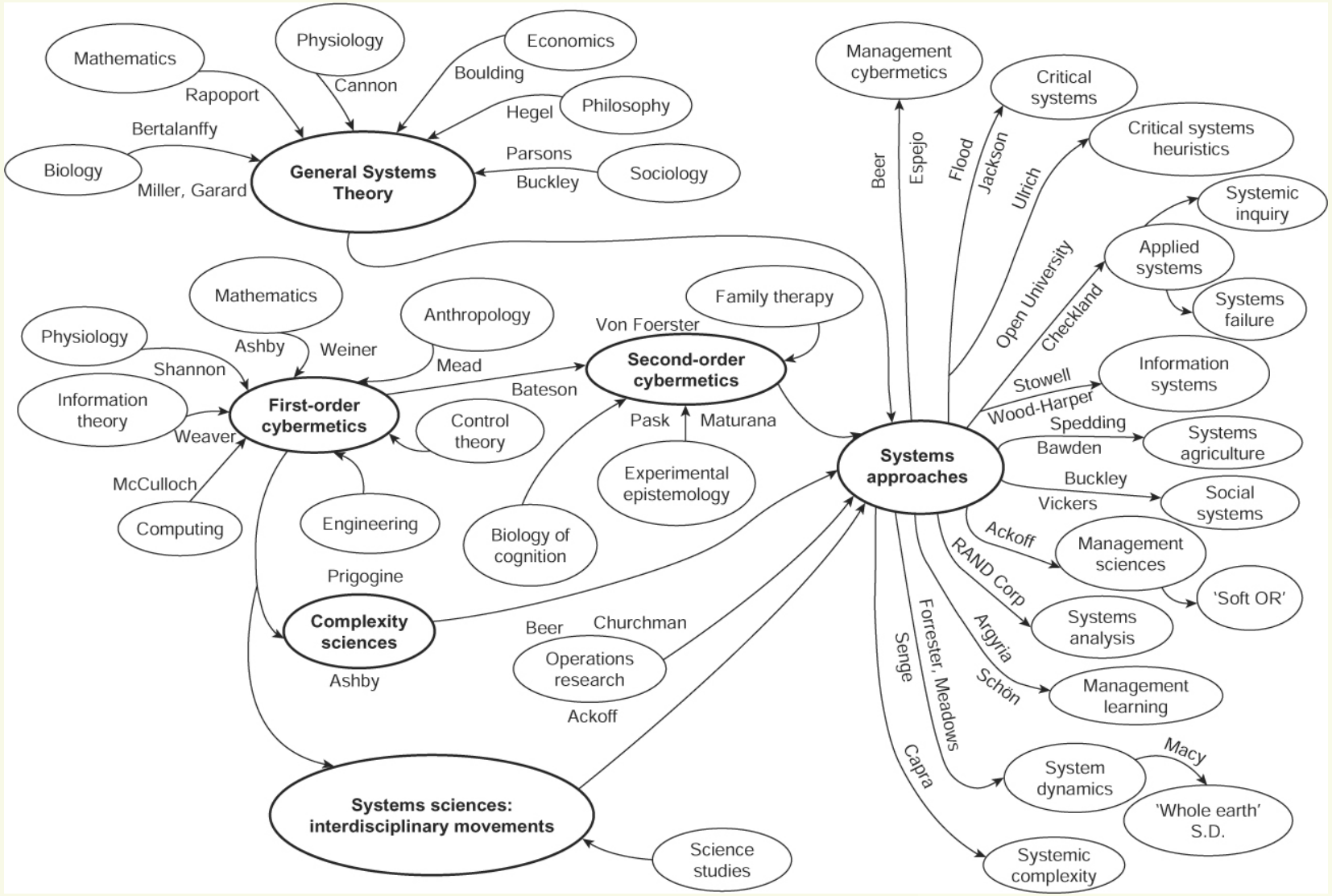
A note on “doing systems thinking”

Lots of ways to do systems thinking



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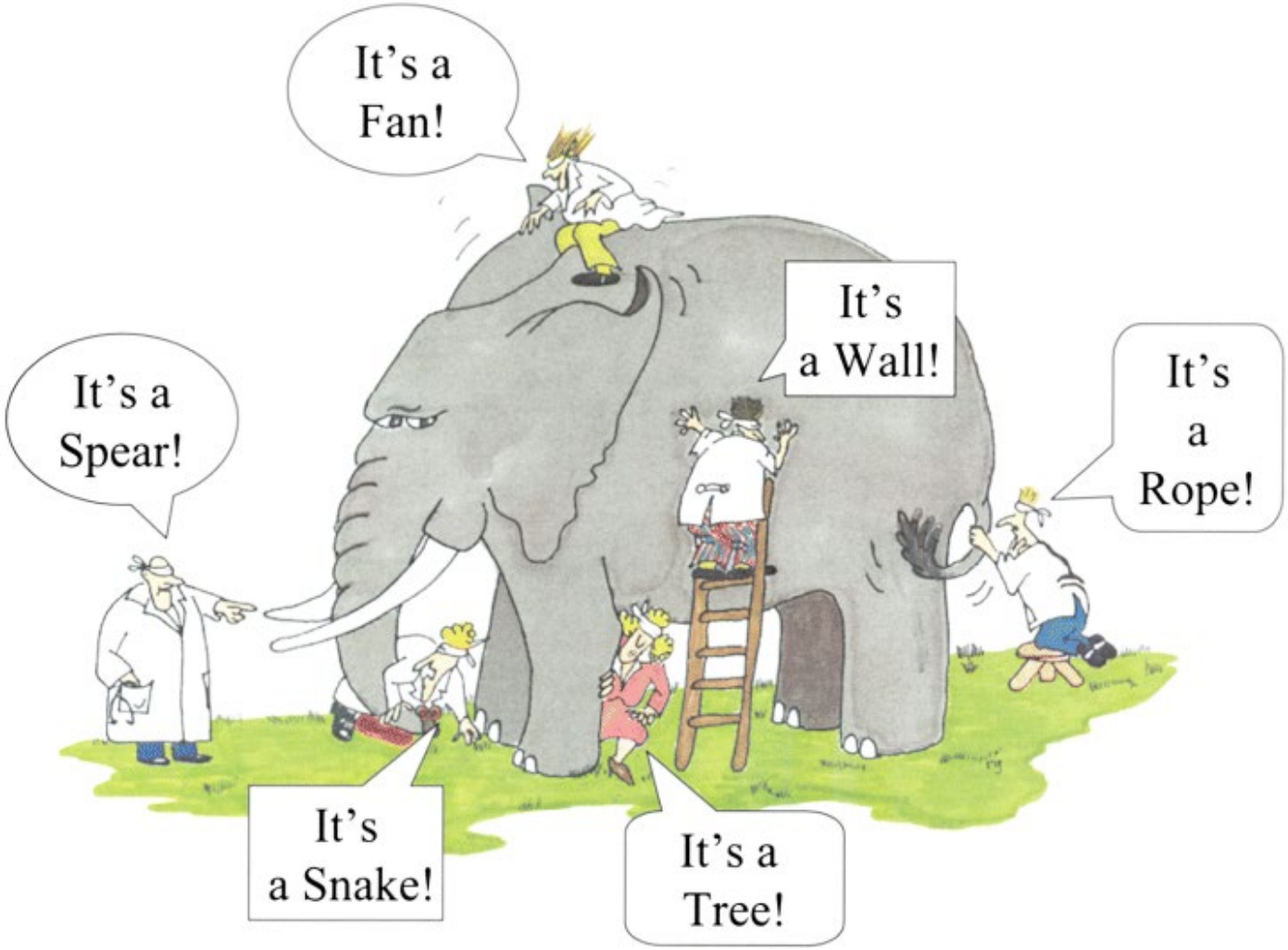
What is a system?

Inter-related or inter-dependent parts that interact with each other to form a whole 'system' that has a specific purpose. [1]

"*A system is **not** the sum of its parts, but rather the **product** of their interaction*."[2]

Can be - people, beliefs, characteristics, actions… that are **complex** and **change over time**

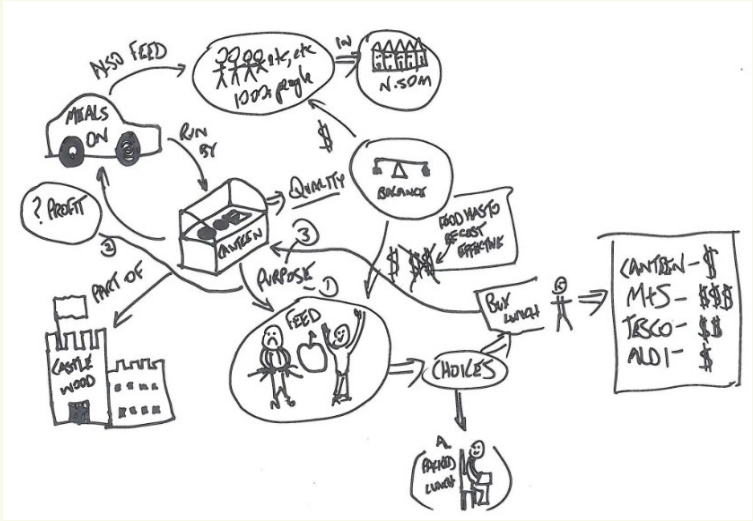


(Cartoon by G. Renee Guzlas)

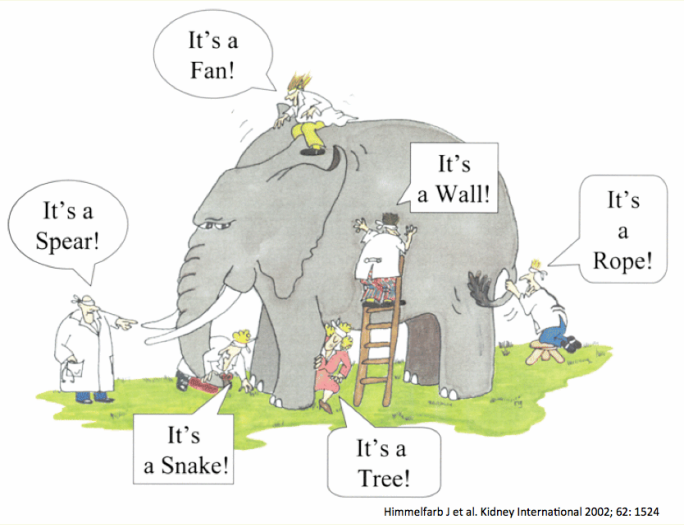
1 Kim D. (1999). *Introduction to systems thinking.* Vol 16. Pegasus Communications Waltham, MA.
2 TAPPC. (2014). *What is systems thinking and how does it apply to prevention in TAPPC?* Discussion paper. The Australian Prevention Partnership Centre.

Why systems thinking?

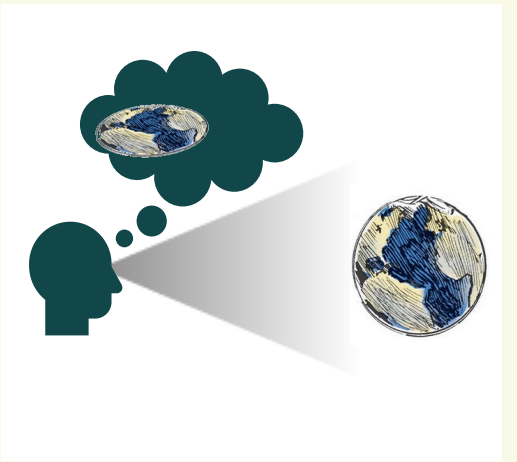
- Understand non-linear behaviour
- Complex issues and unpredictable system behaviour
- Captures complexity of the system
- Integrates multiple perspectives
- Holistic approach to analysis
- Identifies policy leverage points
- Challenges the way we think things work (our mental model)
- Potential unintended consequences and pathways to success
- Iterative and responsive to change



systemsthinkersanonymous.com/week-25/



(Cartoon by G. Renee Guzlas)



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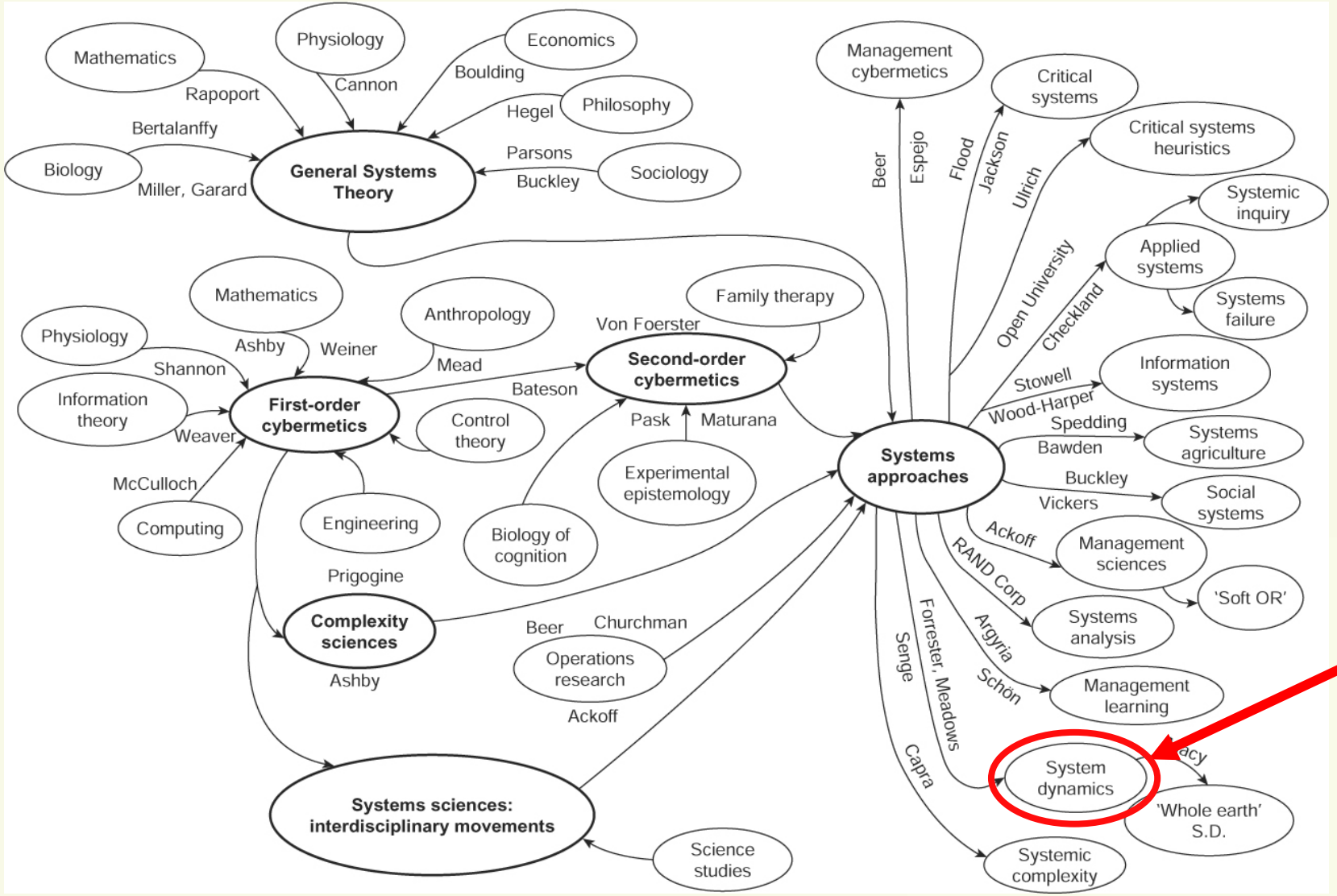
System Dynamics

- One approach to non-linear behaviour of complex systems.
- Relationships between things, events and ideas.



We are here

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Why System Dynamics?

- Understanding all of the influences of a problem and how they are interconnected
- Captures diverse stakeholder knowledge through a participatory workshop process (group model building) designed to include participants in the process of mapping a system, and decide what to do about it.

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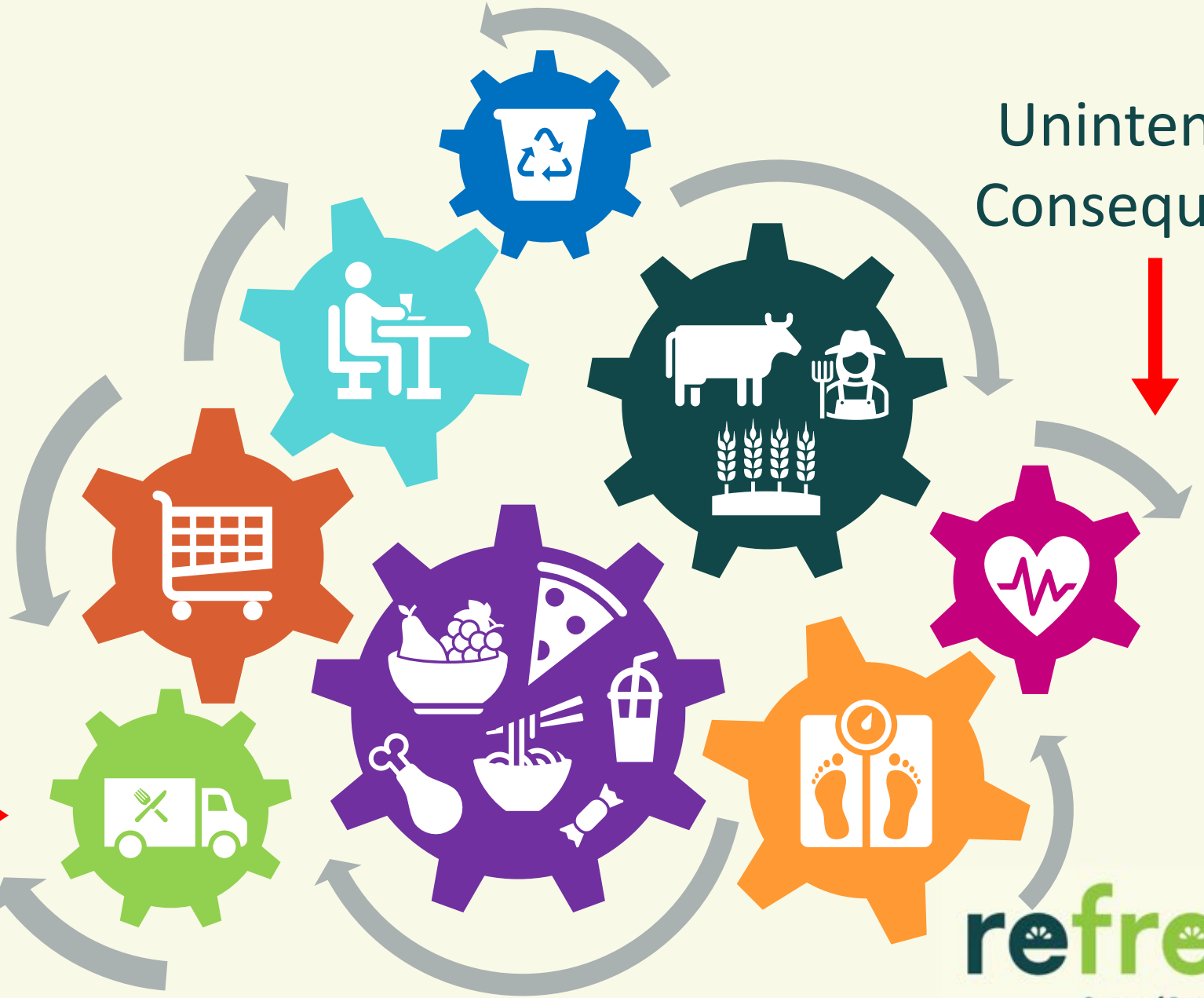
Healthy & sustainable food environments

Unintended Consequence



Action

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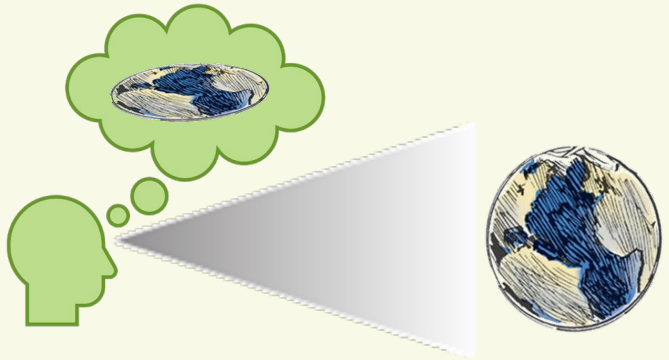
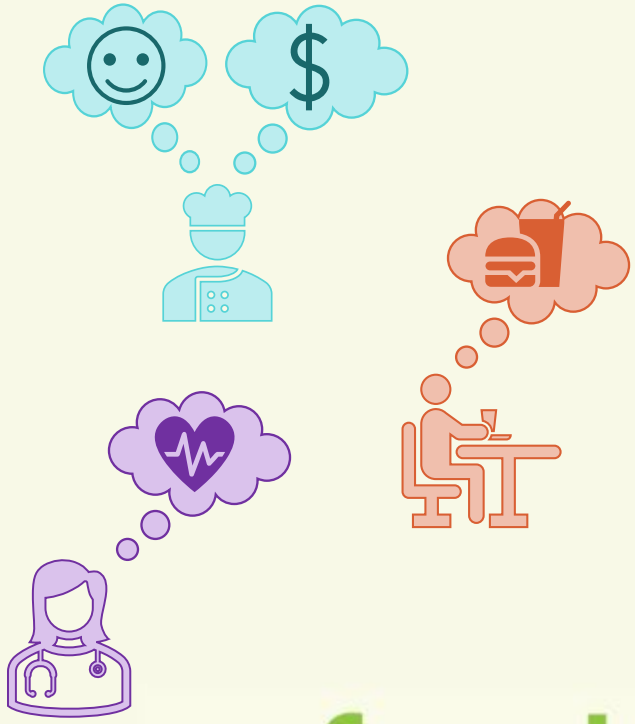
Mental models

- How we see things / perspective
- Based on beliefs, values & assumptions
- Perspectives differ
- Systems thinking helps us understand stakeholders mental models
- Identifying mental models helps us understand motivators for change





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Tools for system dynamics modelling

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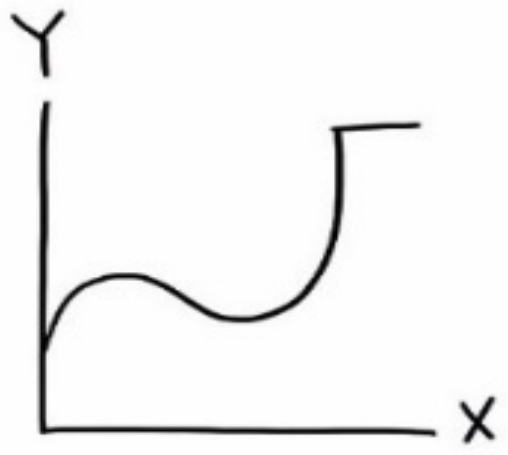
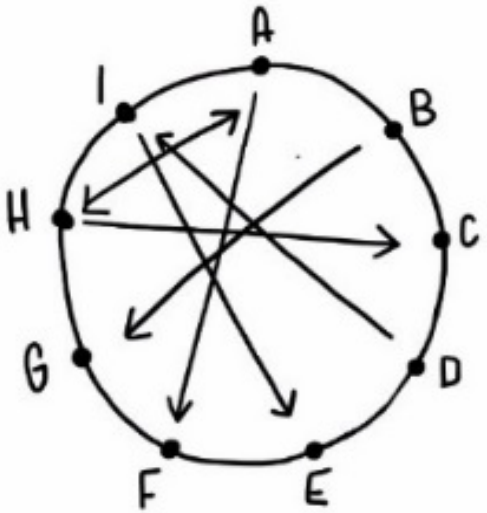
System mapping tools

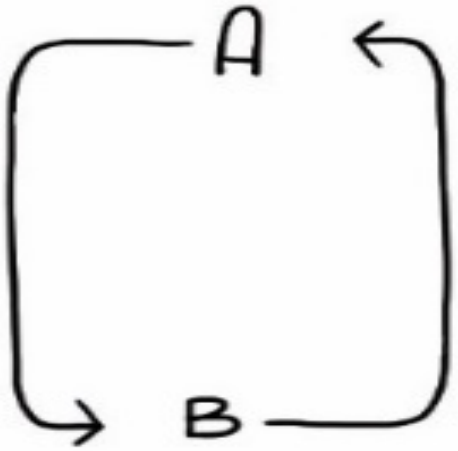
- enhance learning in complex systems,
- understand connectedness and interactions, and
- understand feedback and dynamics (behaviour over time)
- model problems, not systems
- model to advance a solution to a problem



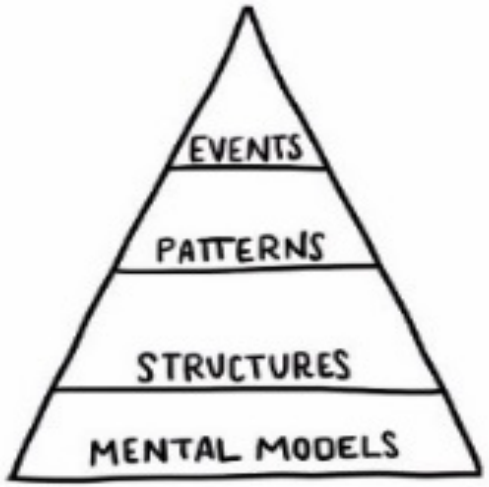
BEHAVIOUR OVER TIME GRAPHS



CONNECTED CIRCLES



CAUSAL LOOP DIAGRAMS

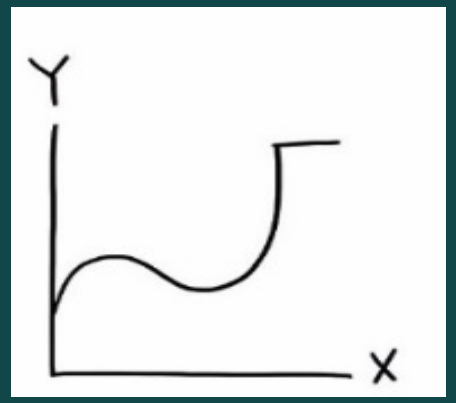


ICEBERG MODEL

Sterman, J. D. (2001). System Dynamics Modeling: Tools for Learning in a Complex World. *California Management Review, 43*(4), 8-25. doi:10.2307/41166098

Tool 1

Behaviour over time graphs



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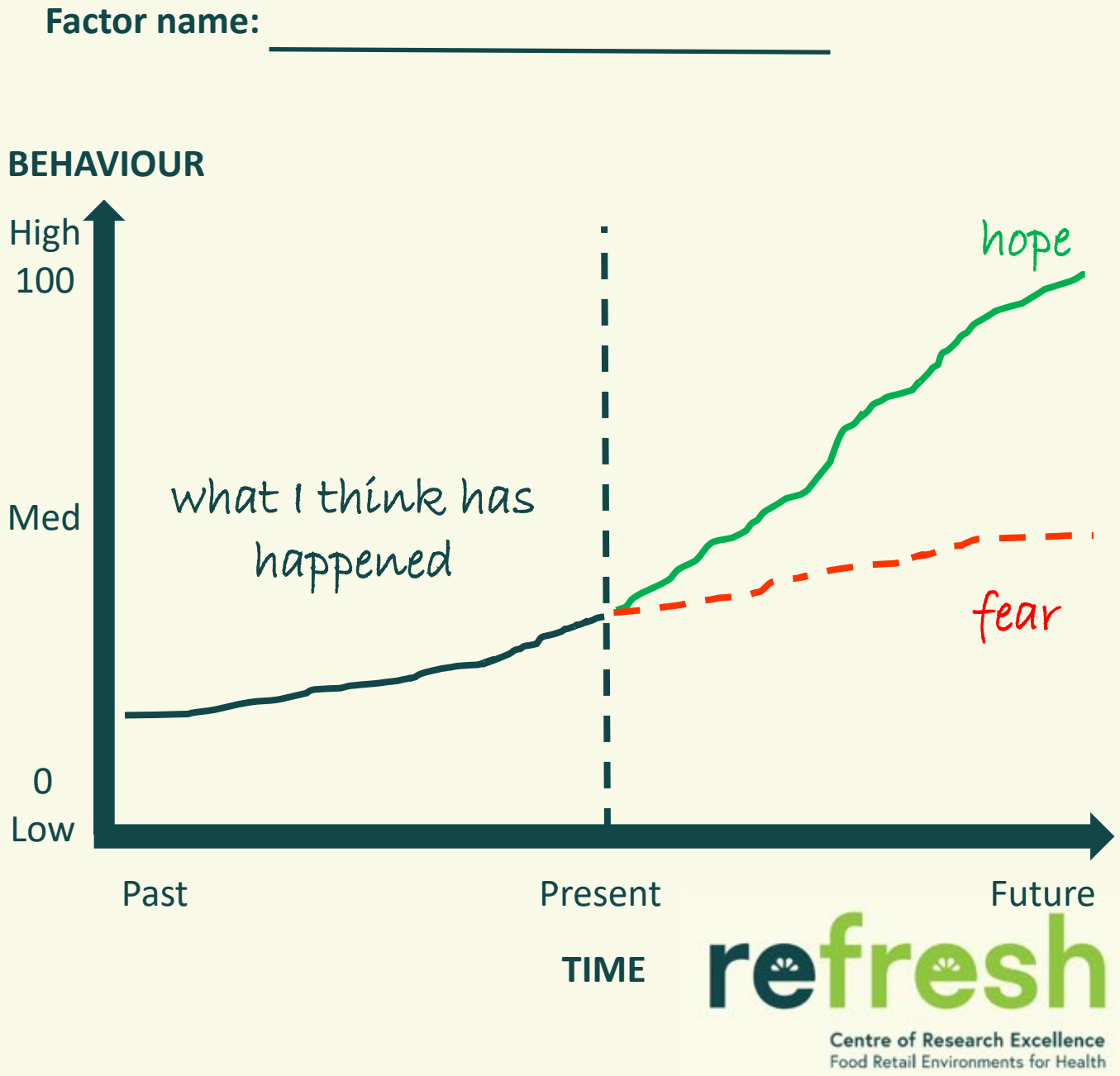
Behaviour over time graph

- Shows trends or pattern of change, of a variable, over time
- Shows how and why a factor is changing
- Time = year, decade, seasonal, age



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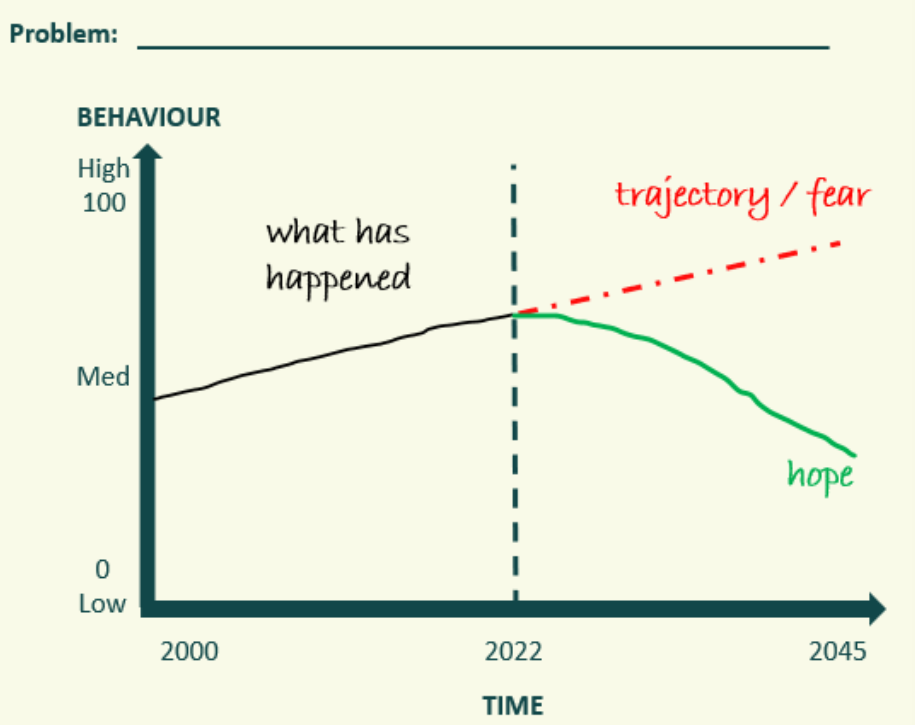
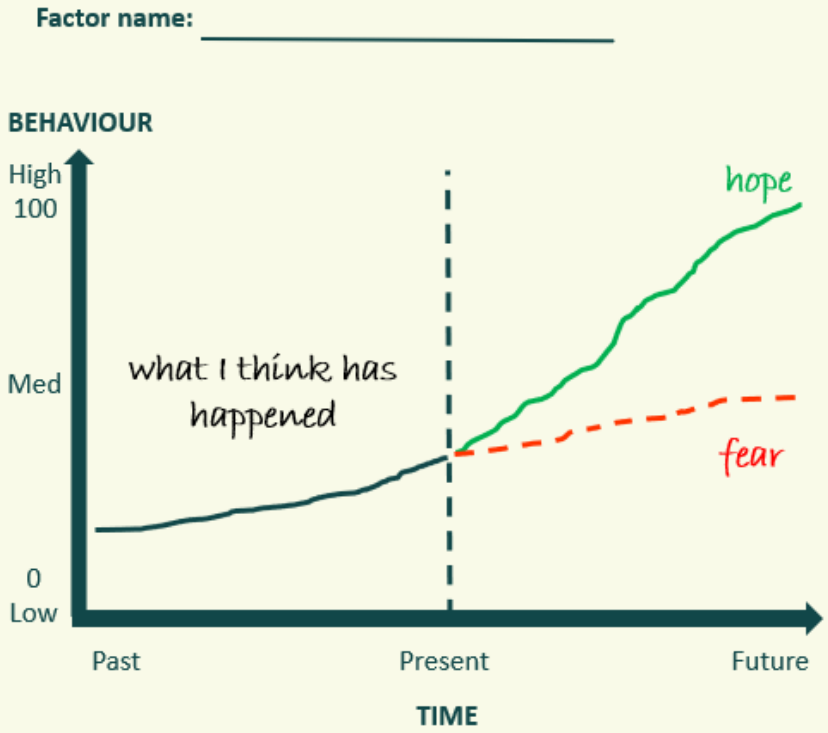
Behaviour over time graphs

Problem statement (reference mode)





Mental models

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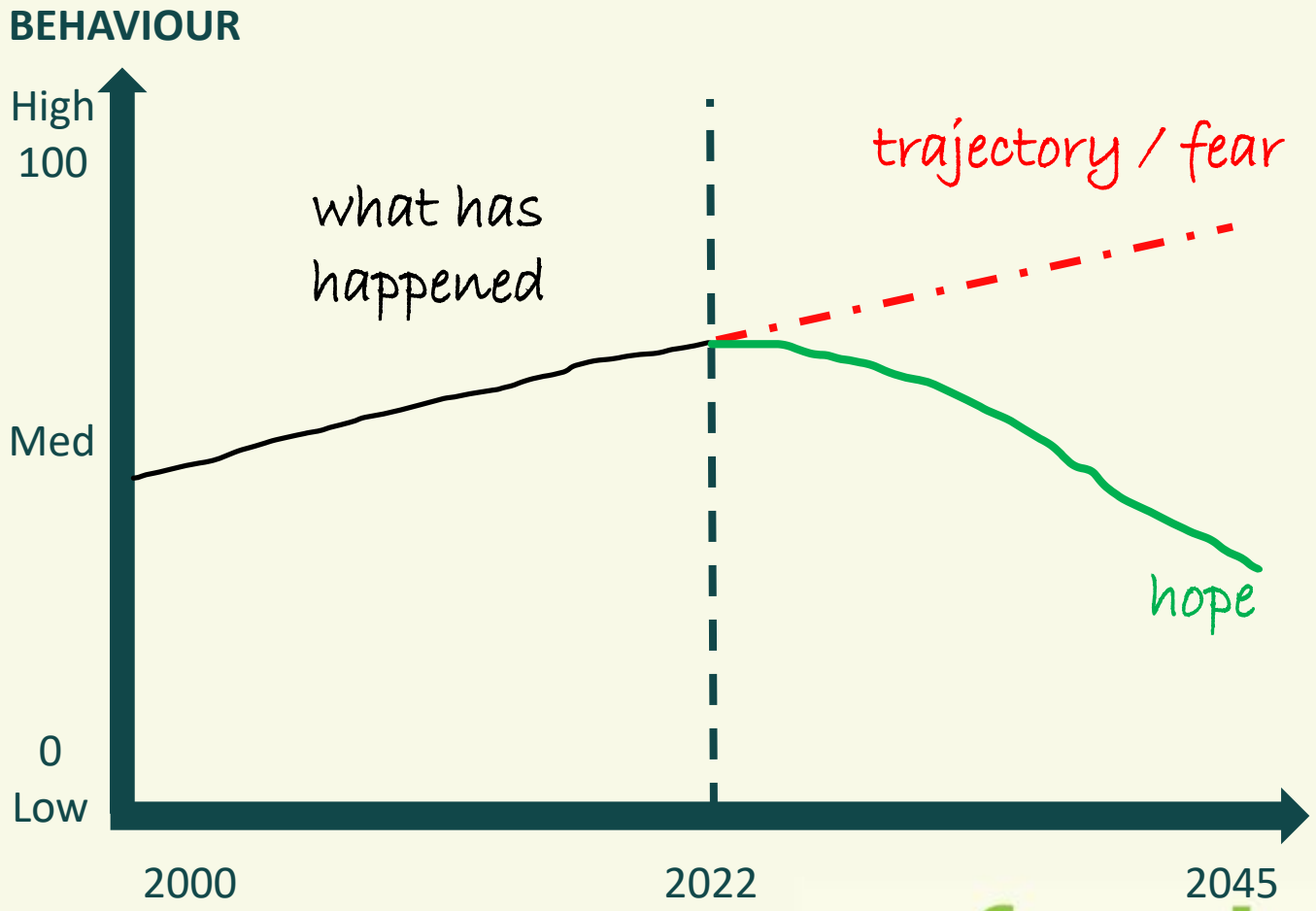
Problem statement

Problem: Adult population overweight in Netherlands

- aka "reference mode"
- Shows the behaviour of the problem
- Based on historical data (if available) & future trajectory



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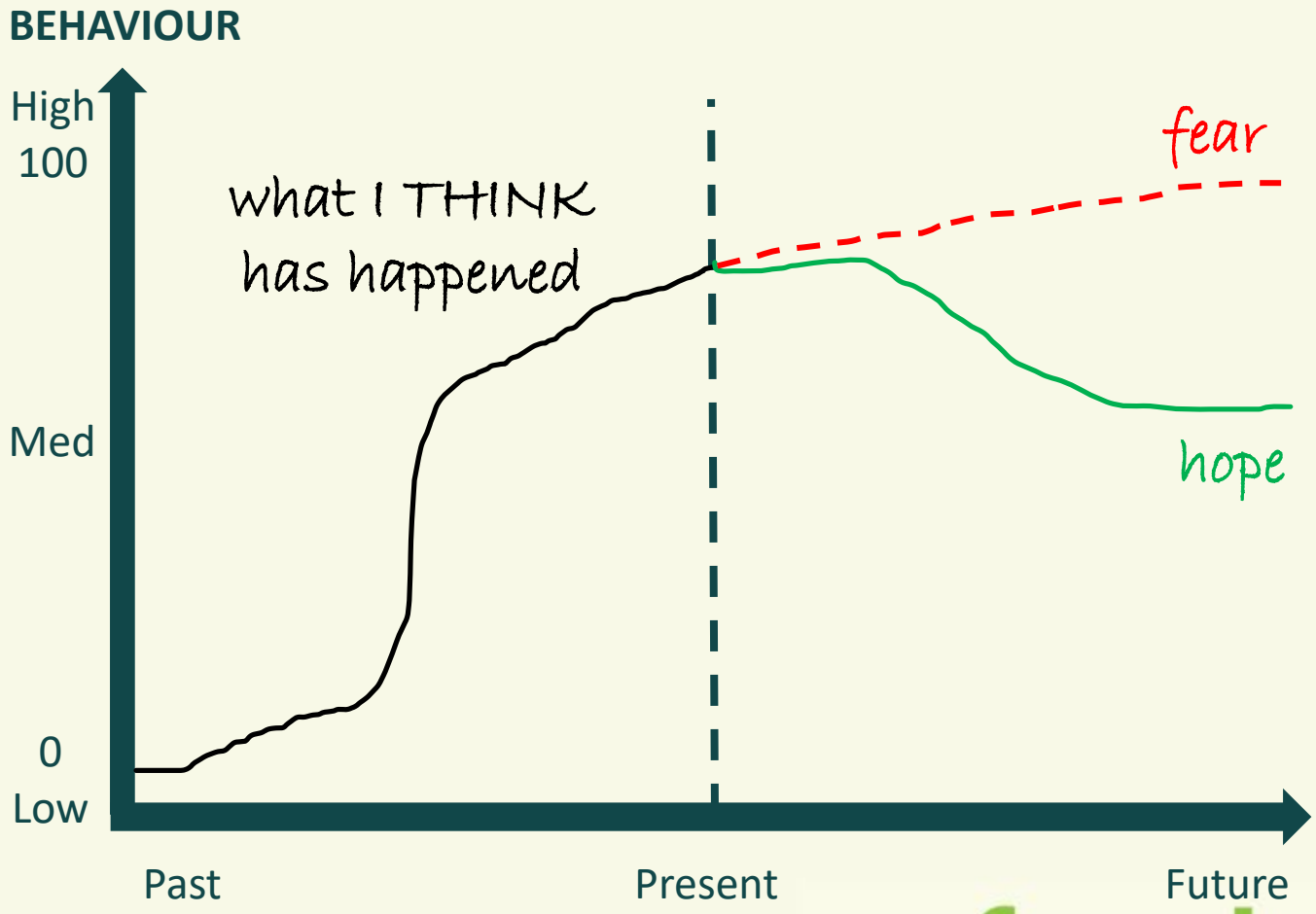
Behaviour over time graph

- Factor name
- What you think has happened (past to present)
- What you hope will happen
- What you fear will happen
- One factor per BOTG

Factor name: use of online food delivery apps



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Resources for behaviour over time graphs

Here are some suggested further readings:

- Saeed, Khalid. (1998). Defining a Problem or Constructing a Reference Mode.
- https://www.youtube.com/watch?v=wg85-sBQQbM – YouTube tutorial produced by BC SUPPORT Unit on reference modes to define a problem.
- https://thesystemsthinker.com/behavior-over-time-diagrams-seeing-dynamic-interrelationships/ - the Systems Thinker includes a range of articles to expand the use of systems approaches. This article discusses how BOTGs can be used to see interrelated patterns of behaviour and build theory.
- https://www.youtube.com/watch?v=hUb7SmgDE1Q – YouTube video produced by CLExchange showing the basics of creating and using a BOTG.

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Activity: Behaviour over time graphs

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Activity Objectives & Output

Objectives: To initiate mapping by generating multiple variables as potential drivers of the problem; begin to generate rich narratives explaining the current community conditions, based on historical trends, and; elicit hoped and feared trends for future system behaviour.

Outputs: Generates variables for Connection Circle activity

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Activity Instructions

1. Choose your problem scenario from options 1 to 4
2. Read through the problem scenario background, behaviour seen, reference mode and activity question
3. Individually draw as many BOTGs as you can
4. As a group share BOTGs – variables and stories

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Problem Scenario 1

Declining engagement in the Healthy Neighbourhood project

Problem background:

- Obesity rates disproportionately increased in socially disadvantaged neighbourhoods in urban areas.
- Food outlets provide predominantly unhealthy products.

Behaviour seen:

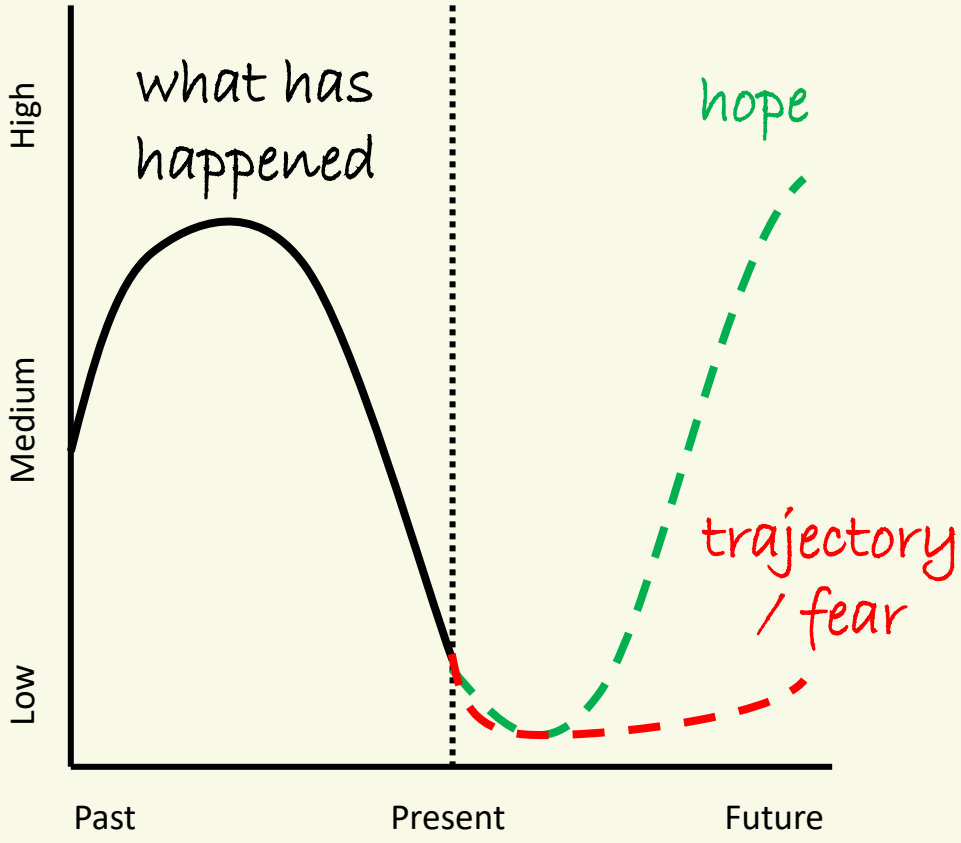
- Municipality introduced the 'Healthy Neighbourhood project' to work with food retailers and outlets to shift their product availability towards increased availability and promotion of healthier products.
- Retailer engagement increased initially before dropping.

Hopes and fears/trajectory:

- Municipality **hopes** to increase the number of retailers engaged in the project, but the **fear** engagement will continue to drop and the Healthy Neighbourhood project will fail.

Group activity question:

- We want to identify the best approach to **motivate** the current retailers to **make changes** and demonstrate **how these changes could benefit them**.
- Identify what factors are / could affect the level of engagement in the healthy neighbourhood project, i.e. what factors are responsible for the behaviour seen in the reference mode?



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Problem Scenario 2

Increasing purchase of unhealthy convenience foods

Problem background:

- Food retailer in a poor neighbourhood in the north of the Netherlands observes unhealthy convenience foods sales have kept rising since the opening of the store, 30 years ago.
- Retailer wants to **contribute to the vitality of the community**, by starting to promote the healthy food purchases e.g. via additional placements of healthy products.

Behaviour seen on the graph:

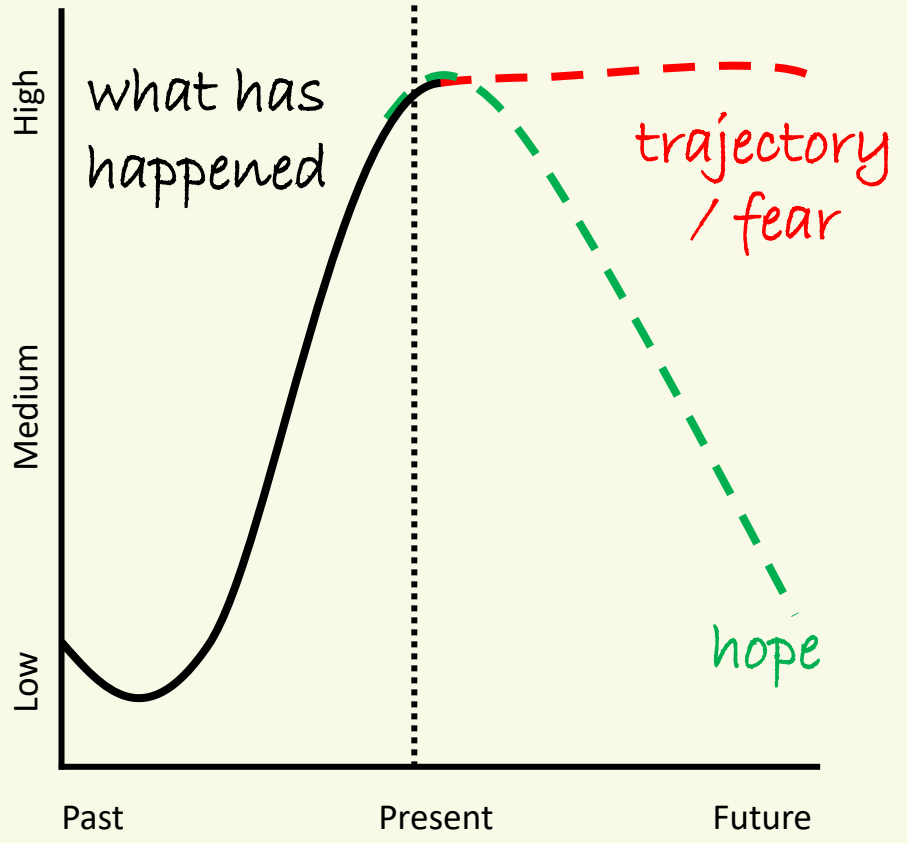
- Retailer is making money, but is frustrated to see an **increasing number of customers** choose **unhealthy convenience foods**.
- The retailer believes this is because **more convenience products are entering the market;** people are **less used to home cooking** fresh meals; inflation pushing customers to **cheaper convenience products**.

Hopes and fears / trajectory:

- Retailer **hopes** that customers will appreciate extra promotion on healthier products and that they start to purchase more of healthier products, but the **fear** is that customers may disapprove and that they will do their grocery shopping elsewhere, harming his business revenue.

Group activity question:

- We want to identify the best approach to **promote healthier product purchases** in such a way that is **approved/accepted by customers** and there are **no harms for retailer revenue.**
- Identify what factors are / could affect customer behaviour and opinion, i.e. what factors are responsible for the behaviour seen in the reference mode?



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Problem Scenario 3

Declining sustainable food sales in the company canteen

Problem background:

- Food production and consumption is a major burden on natural resources.
- A **sustainability manager** at a large employer in Utrecht is tasked with **promoting sustainable employee behaviours** across the organization, including **sustainable food consumption**.
- An **independent food service company** runs the **canteens**. Last year they ran organization-wide campaigns to promote sustainable food consumption.

Behaviour seen:

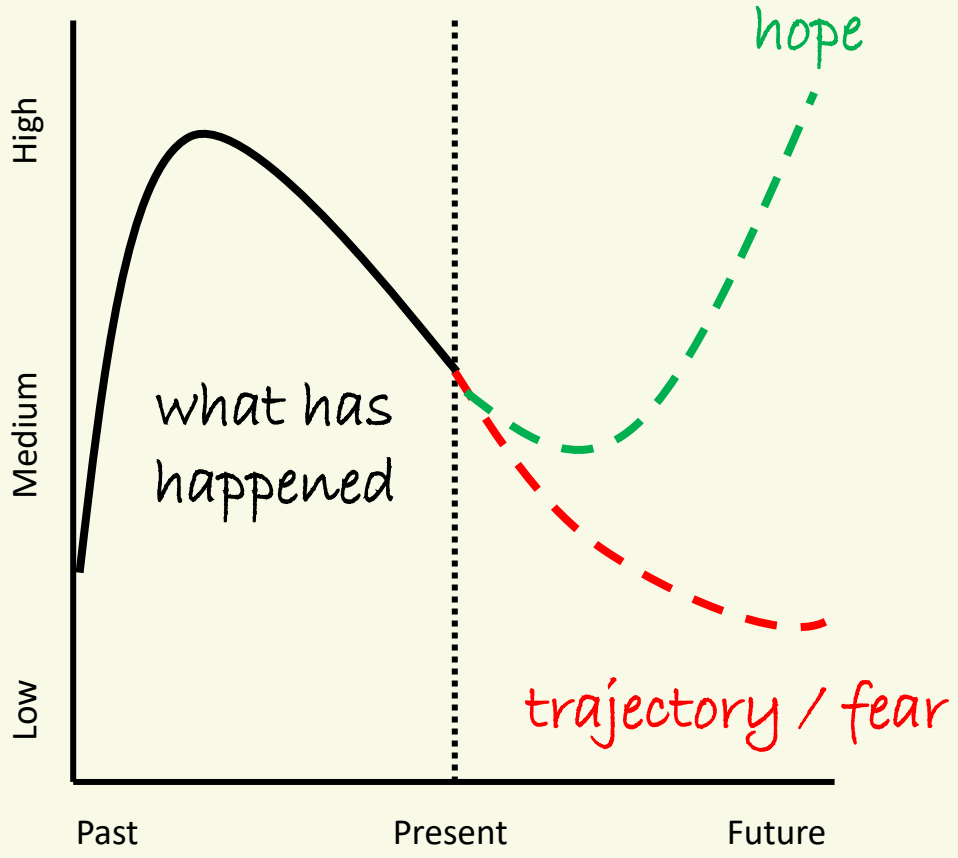
- The campaigns initially led to **increased sales** of sustainable foods.
- Current canteen sales data shows a **decrease in sustainable food consumption**.
- **Canteen staff believe** that sustainable foods are **not in sufficient demand,** and therefore **commercially unviable,** leading to **resistance to these changes** and **limited promotion** of sustainable products.

Hopes and fears/trajectory:

- Sustainability manager **hopes** the decline in sustainable food sales can be halted and turned towards increased sales. The **fear** is that sustainable food sales will continue to decline.

Group activity question:

- We want to identify the best approach to **make sustainable food choices** in the canteens **easier** for the employees **and thus more common**.
- **I**dentify what factors are / could affect employees purchase behaviour, i.e. what factors are responsible for the behaviour seen in the reference mode?



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Problem Scenario 4

Increasing snack purchases from other food outlets around school

Problem background:

- **Unhealthy dietary intake** among **adolescents** is a major public health threat.
- A high school director wants to promote healthier dietary choices for students.
- Last year they implemented healthier foods and beverages provided by the school canteen at affordable price rates.

Behaviour seen:

- After implementation of healthier foods and beverages, students **enthusiastically tried the new products**.
- After some weeks, students shifted their purchases towards **increased purchase of snack foods from other food outlets and retailers** around the school.

Hopes and fears/trajectory:

- High school director **hopes** to motivate students to purchase more of the healthier canteen products, but **fears** that students will continue to buy unhealthy snack foods at other food outlets surrounding the school.

Group activity question:

- We want to identify the best approach to **motivate** students to purchase more of the healthier canteen products.
- Identify what factors are / could affect **student behaviours**, i.e. what factors are responsible for the behaviour seen in the reference mode?

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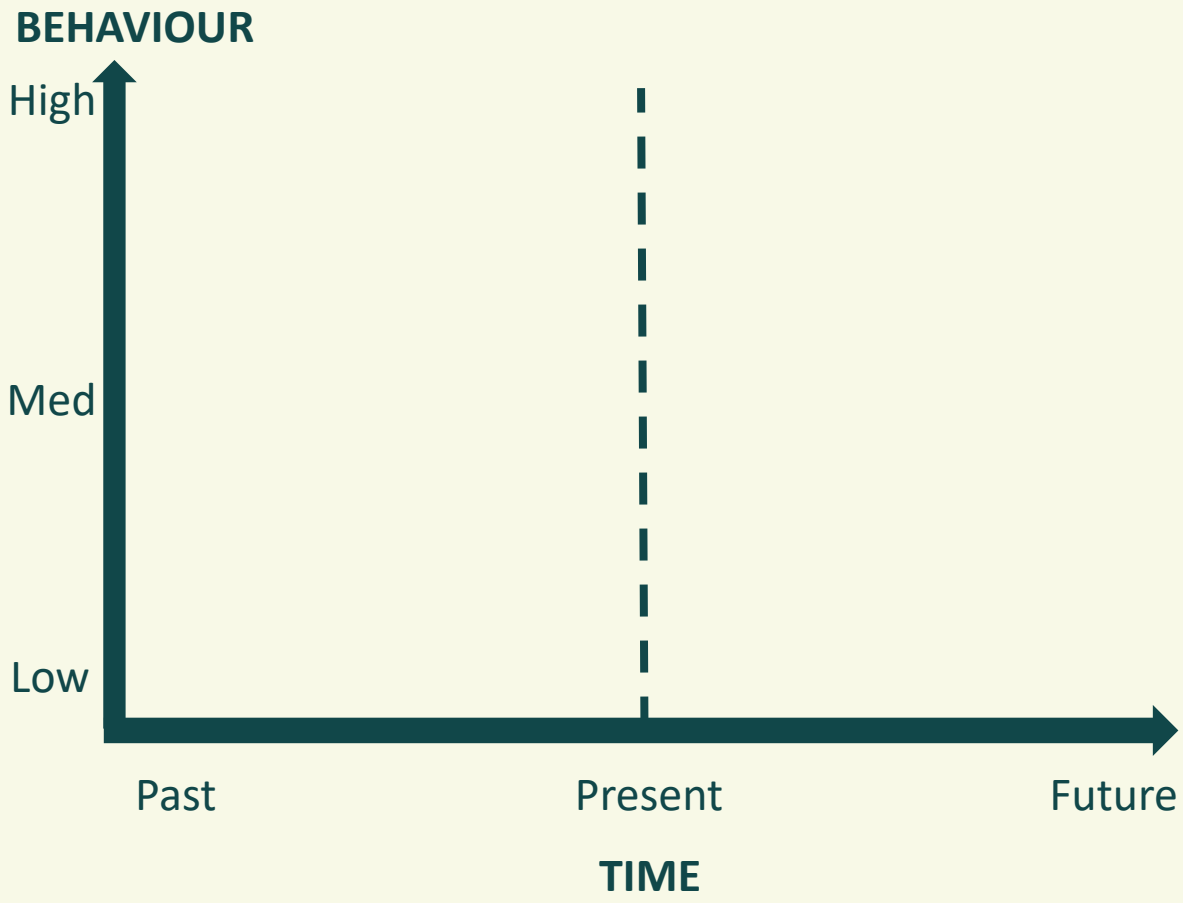
Behaviour over time graphs

Factor name: _____



Instructions:

- Draw as many BOTGs as you can for factors that affect the problem scenario
- What you ***think*** has happened
- What you ***hope*** will happen
- What you ***fear*** will happen
- 1 factor per graph

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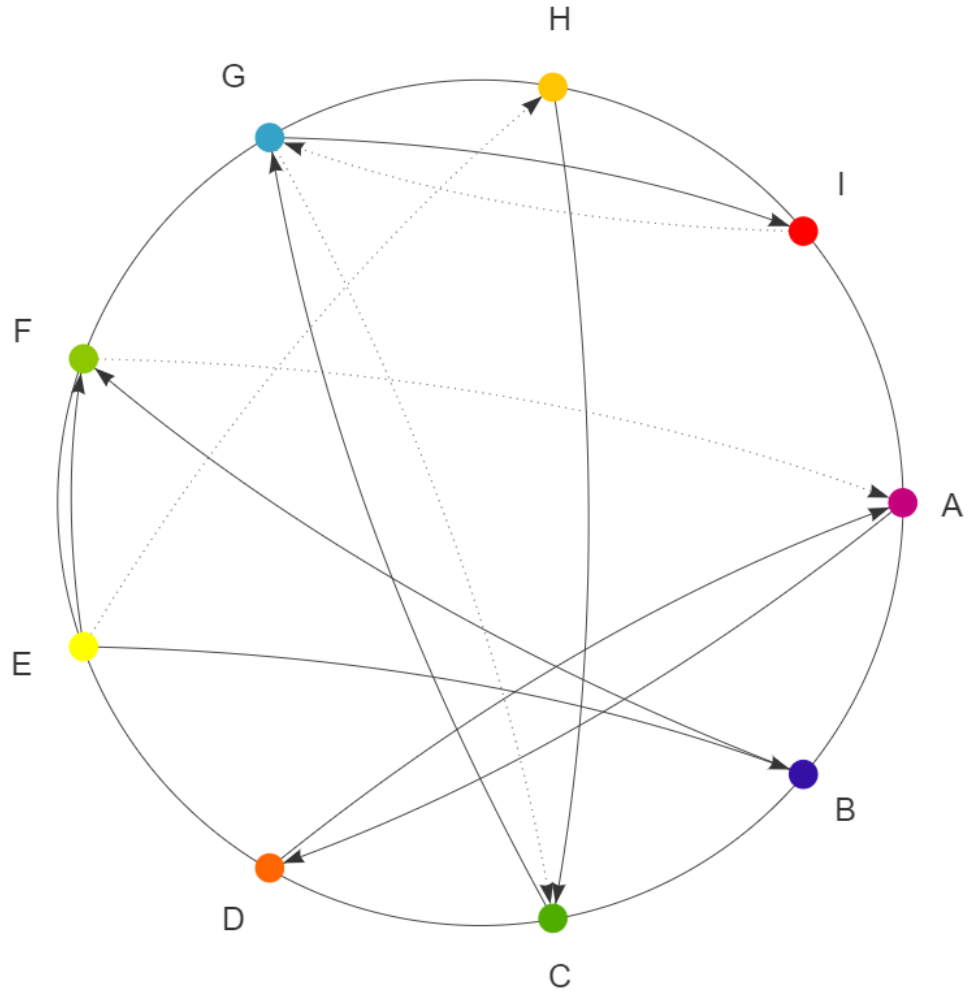
This activity used **STICKE**. STICKE is an application developed by the Institute for Intelligent Systems Research and Innovation, Deakin University in collaboration with the World Health Organization Collaborating Centre for Obesity Prevention. This application aims to facilitate community knowledge exchange to foster shared understanding of complex problems. More information can be found at www.sticke.deakin.edu.au.

To explore options for obtaining a licence email sticke@deakin.edu.au

Activity Note: If you do not have STICKE or other mapping software you can use paper and pen. Add variable names (verbatim) around the circle in preparation for the 'Connection Circles' activity. Do not make any connections at this point.

Other software: Vensim https://vensim.com/, Stella https://www.iseesystems.com/



STICKE
SYSTEMS THINKING IN COMMUNITY KNOWLEDGE EXCHANGE

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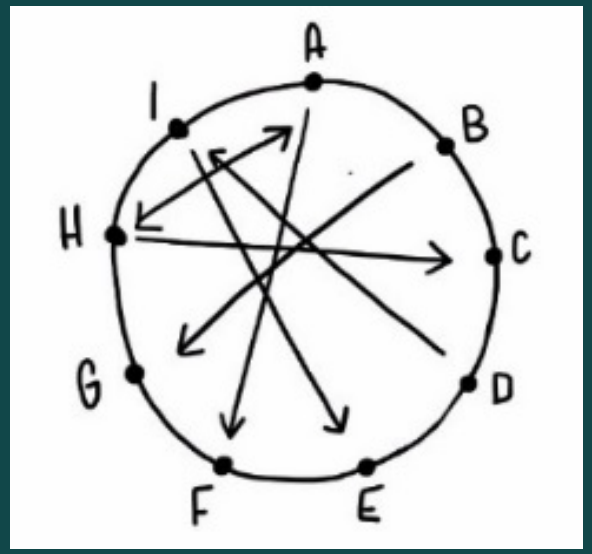
Tool 2

Connection circles



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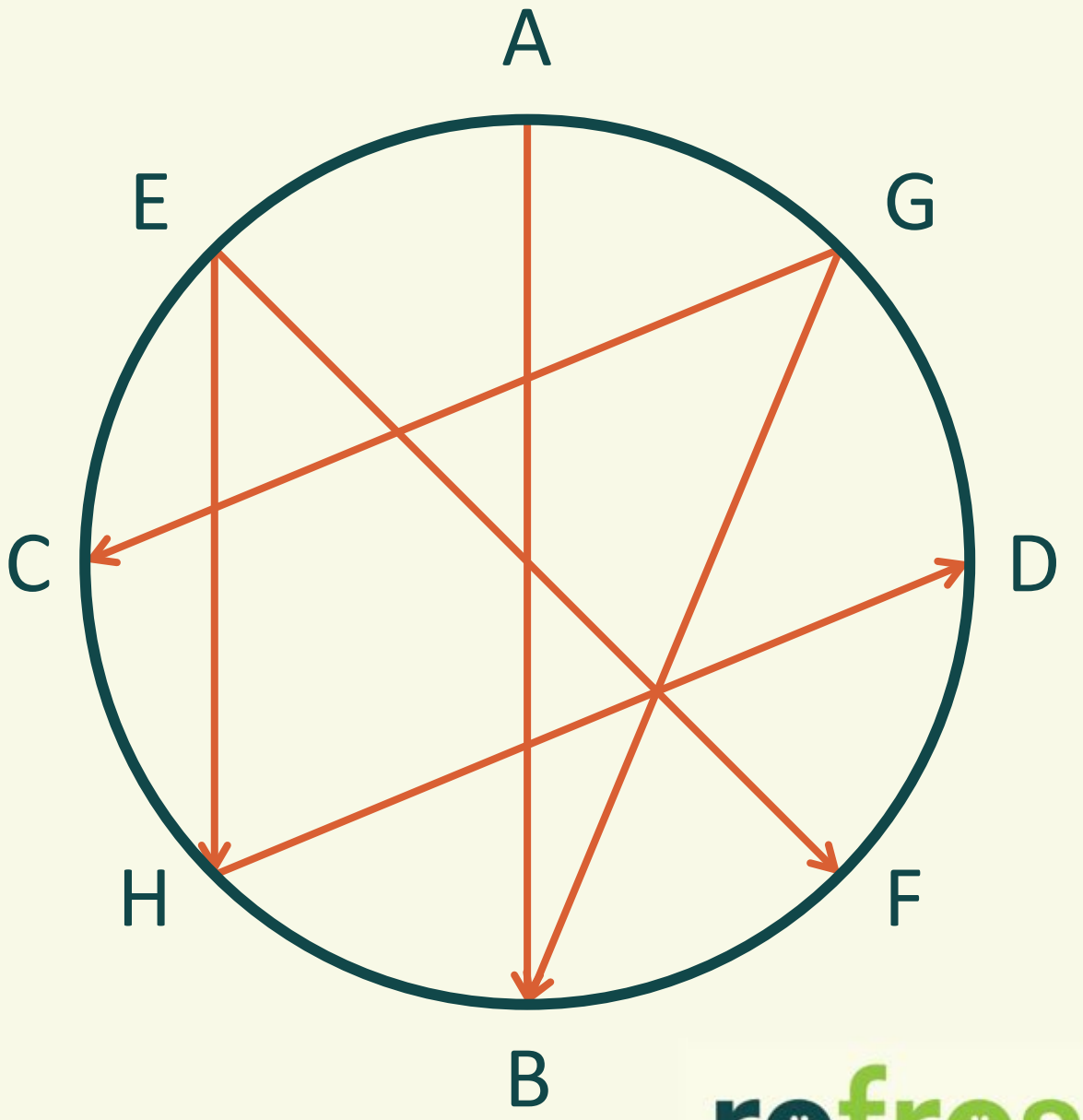
Connection circles

- Elements that are the most important to your story
- Draw arrows to show cause-and-effect relationships
- Intermediate step to creating causal loop diagrams (CLD)



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Resources for connection circles

- https://untools.co/connection-circles - collection of thinking tools and frameworks for problem solving, decision making and understanding systems
- https://thesystemsthinker.com/learning-about-connection-circles/ - the Systems Thinker includes a range of articles to expand the use of systems approaches. This article on connection circles provides a step by step process on how to use connection circles to understand a published article on health risks associated with rising french-fry consumption.
- https://www.youtube.com/watch?v=hUb7SmgDE1Q – YouTube video produced by CLExchange showing the basics of how connection circles can be used to explore concepts.

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Activity: Connection circles

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Activity Objectives & Output

Objectives: Links up individual variables identified in the BOTGs to show relationships. It is the step between the identification of variables and the development of a system map.

Output: A visual representation of all the variables identified by participants. The beginning of the system map. Participants will be provided with a PDF copy of the connection circle and initial system map. Group maps will be combined before the second workshop to form one system map.

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Food Retail Environments for Health

Deakin - Restricted to Staff

Activity Instructions

1. Make sure all variables from the BOTGs activity are written down around the circle.
2. Clarify the nature of relationships between pairs of variables (direction and polarity). Draw the appropriate connections.
3. Continue to ask for connections, focusing on extending the story captured in the first connection. E.g. *"We have just made a connection between A and B – what else do we know about this story? Is there anything that contributes to A, or can we think of anything that changes because of B?"*
4. You may pause to reflect on how stories are emerging from the discussion.

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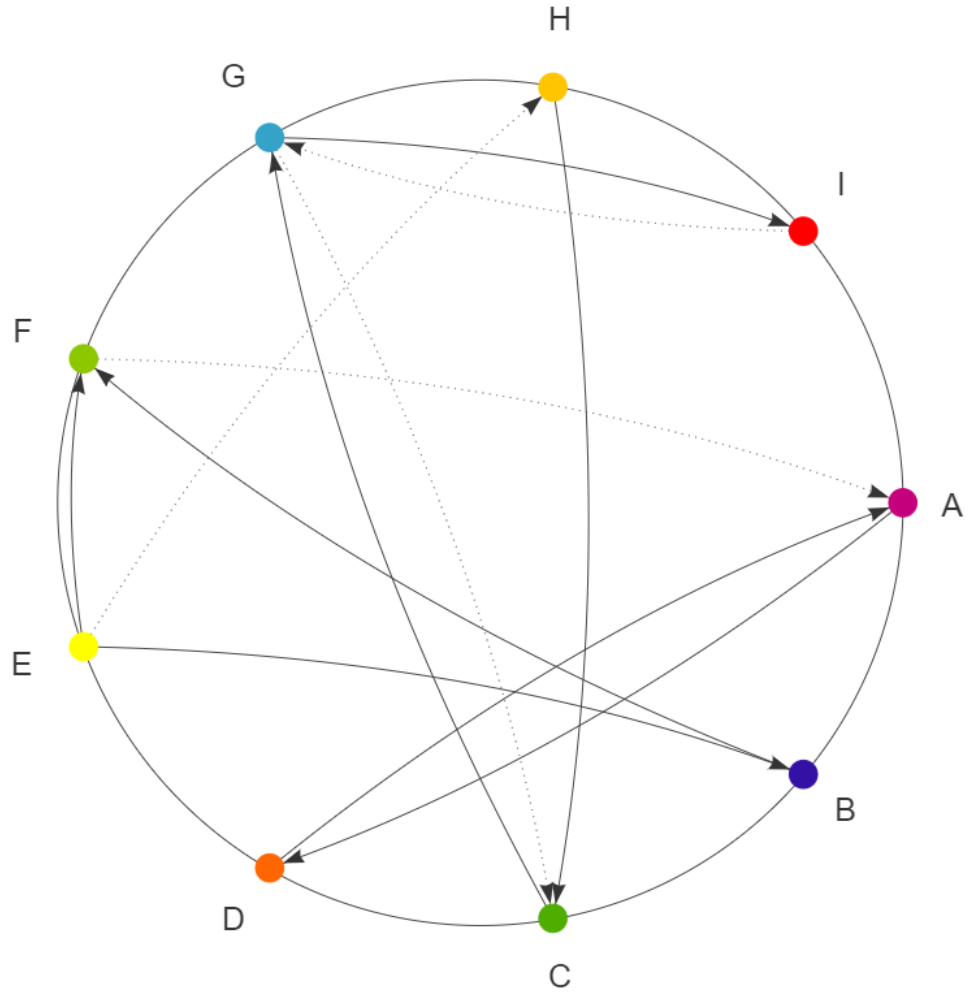
This activity used **STICKE**.

Activity Note: If you do not have STICKE or other mapping software you can use paper and pen. Add variable names (verbatim) around the circle in preparation for the 'Connection Circles' activity. Do not make any connections at this point.

More information can be found at www.sticke.deakin.edu.au

To explore options for obtaining a licence email sticke@deakin.edu.au

Other software: Vensim https://vensim.com/, Stella https://www.iseesystems.com/



STICKE
SYSTEMS THINKING IN COMMUNITY KNOWLEDGE EXCHANGE

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Debrief & reflect

- Does the progression from behaviour over time graphs to the connection circles make sense?
- How did your thought process evolve?
- Were there differences of opinion on relationships between variables?

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End of Workshop 1

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