

Systems Thinking to Advance Population Health

Alan Shiell

Peter Quail Oration 2011

Deakin / DHS / DH Strategic Alliance

Deakin University Waterfront Campus





2011 PREMIERS



Feel the difference



The Challenge

‘Weak Prevention’

that exists alongside

Failure to scale up and sustain prevention programs of demonstrated effectiveness

Weak Prevention ...

“the findings of the review suggest that there is *limited quality data* on the effectiveness of obesity prevention programmes”

“ most studies were *too small* to be informative, and *none provided evidence* on long-term weight control”

“Multicomponent interventions ... were *not effective*”

“Although some of the studies found statistically significant improvements in the intervention group, *most improvements were very modest*”

PEDIATRIC HIGHLIGHT

Reducing unhealthy weight gain in children through community capacity-building: results of a quasi-experimental intervention program, Be Active Eat Well

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Background: Be Active Eat Well (BAEW) was a multifaceted community capacity-building program promoting healthy eating and physical activity for children (aged 4–12 years) in the Australian town of Colac.

Objective: To evaluate the effects of BAEW on reducing children's unhealthy weight gain.

Methods: BAEW had a quasi-experimental, longitudinal design with anthropometric and demographic data collected on Colac children in four preschools and six primary schools at baseline (2003, $n=1001$, response rate: 58%) and follow-up (2006, $n=839$, follow-up rate: 84%). The comparison sample was a stratified random selection of preschools ($n=4$) and primary schools ($n=12$) from the rest of the Barwon South Western region of Victoria, with baseline assessment in 2003–2004 ($n=1183$, response rate: 44%) and follow-up in 2006 ($n=979$, follow-up rate: 83%).

Results: Colac children had significantly lower increases in body weight (mean: -0.92 kg, 95% CI: -1.74 to -0.11), waist (-3.14 cm, -5.07 to -1.22), waist/height (-0.02 , -0.03 to -0.004), and body mass index z-score (-0.11 , -0.21 to -0.01) than comparison children, adjusted for baseline variable, age, height, gender, duration between measurements and clustering by school. In Colac, the anthropometric changes were not related to four indicators of socioeconomic status (SES), whereas in the comparison group 19/20 such analyses showed significantly greater gains in anthropometry in children from lower SES families. Changes in underweight and attempted weight loss were no different between the groups.

Conclusions: Building community capacity to promote healthy eating and physical activity appears to be a safe and effective way to reduce unhealthy weight gain in children without increasing health inequalities.

International Journal of Obesity (2008) 32, 1060–1067; doi:10.1038/ijo.2008.79; published online 10 June 2008

Keywords: community capacity building; longitudinal; healthy eating; physical activity; children; social gradient

A common cause - the failure to think 'system'

- Fragmented prevention system: - pockets of excellence with inadequate infrastructure and limited ability to institutionalise effective programs
- Prevention programs designed with limited understanding of a system's dynamics, or theories of system-level change, or of systems-informed science of implementation



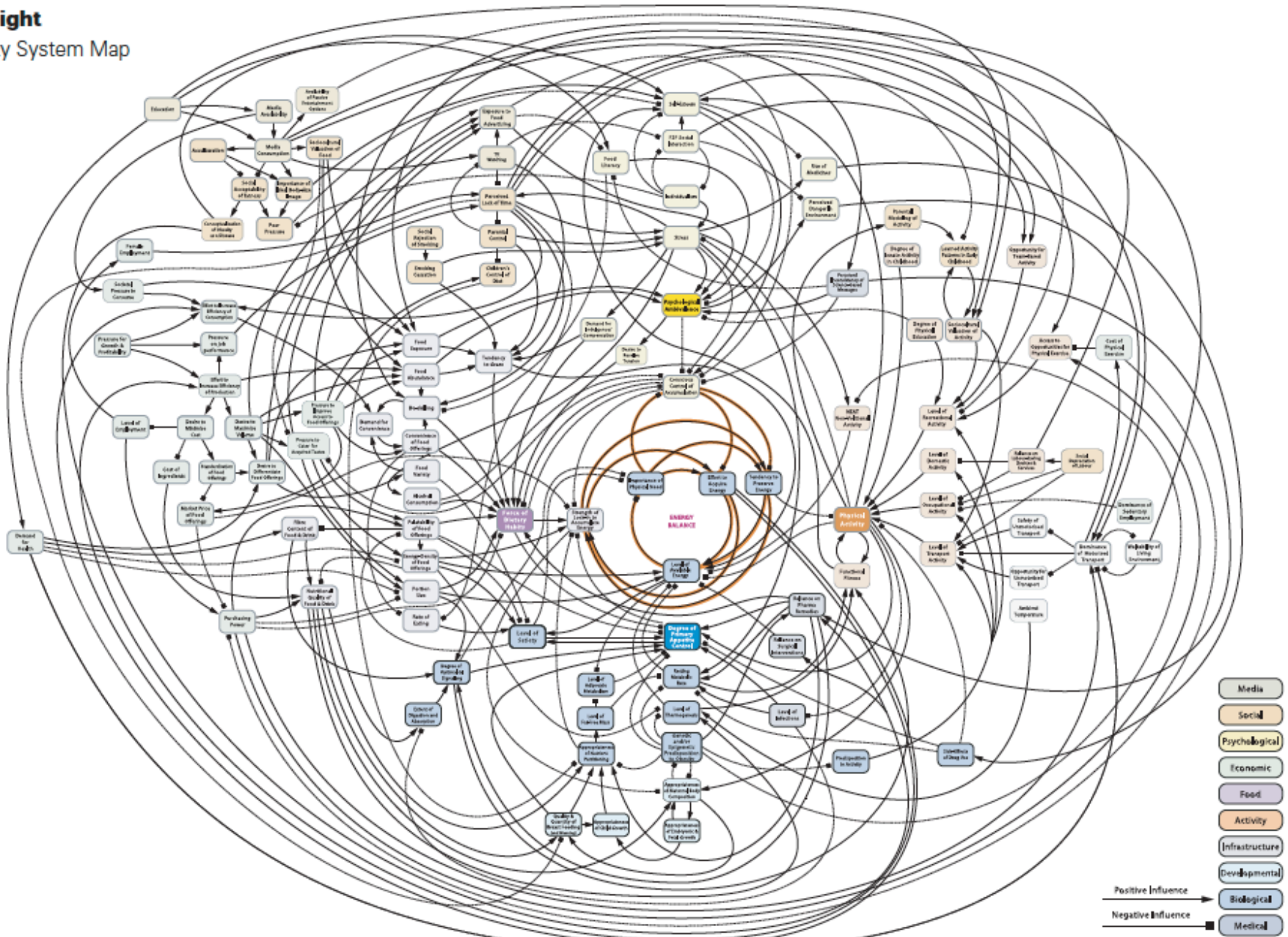
FORESIGHT

Tackling Obesity:
Future Choices –
Obesity System Atlas

Government Office for Science

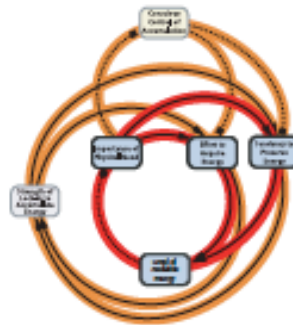
Foresight

Obesity System Map



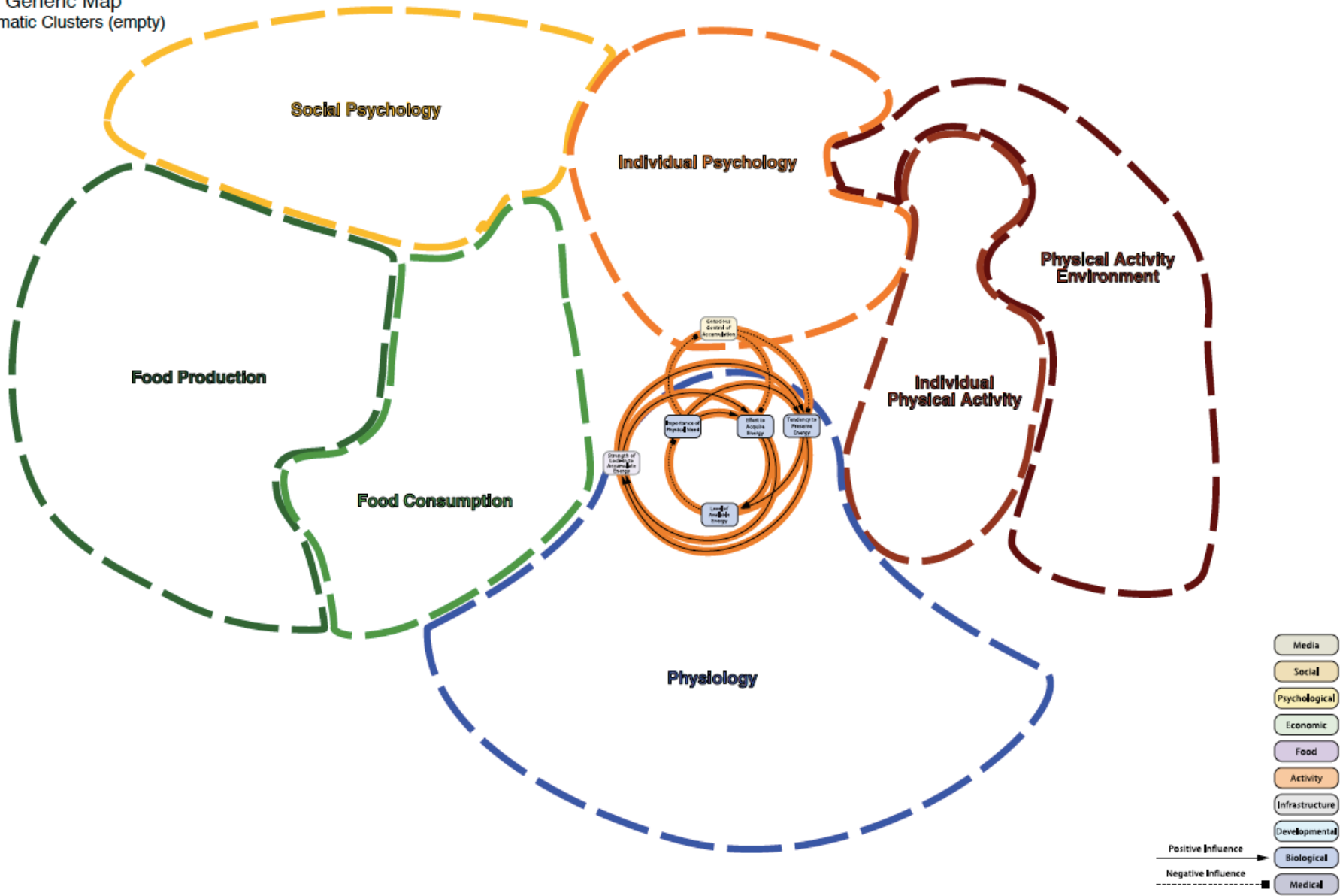
Map 1

System Engine Foundational Loop



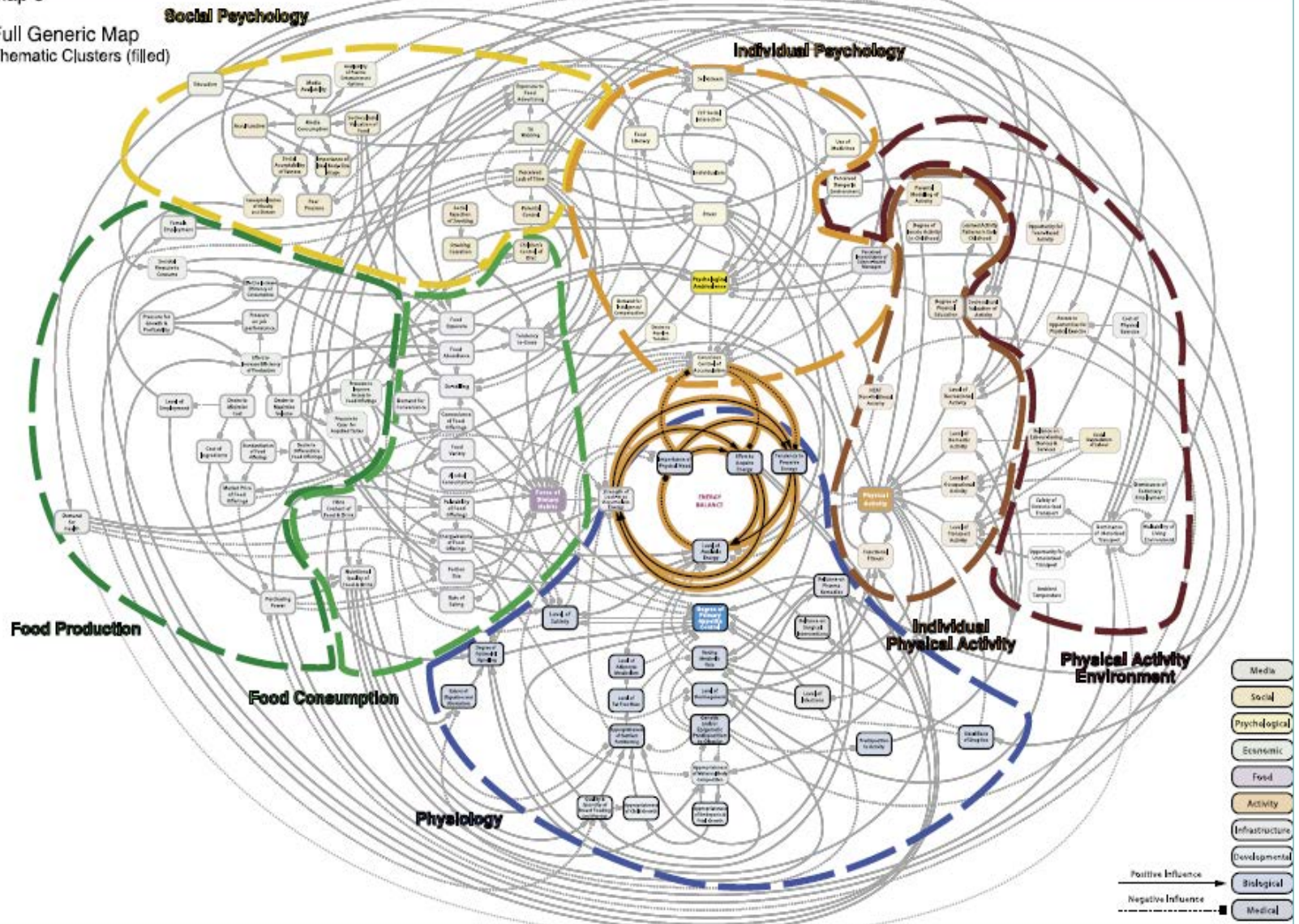
Map 4

Full Generic Map
Thematic Clusters (empty)

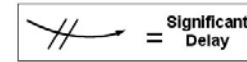


Map 5

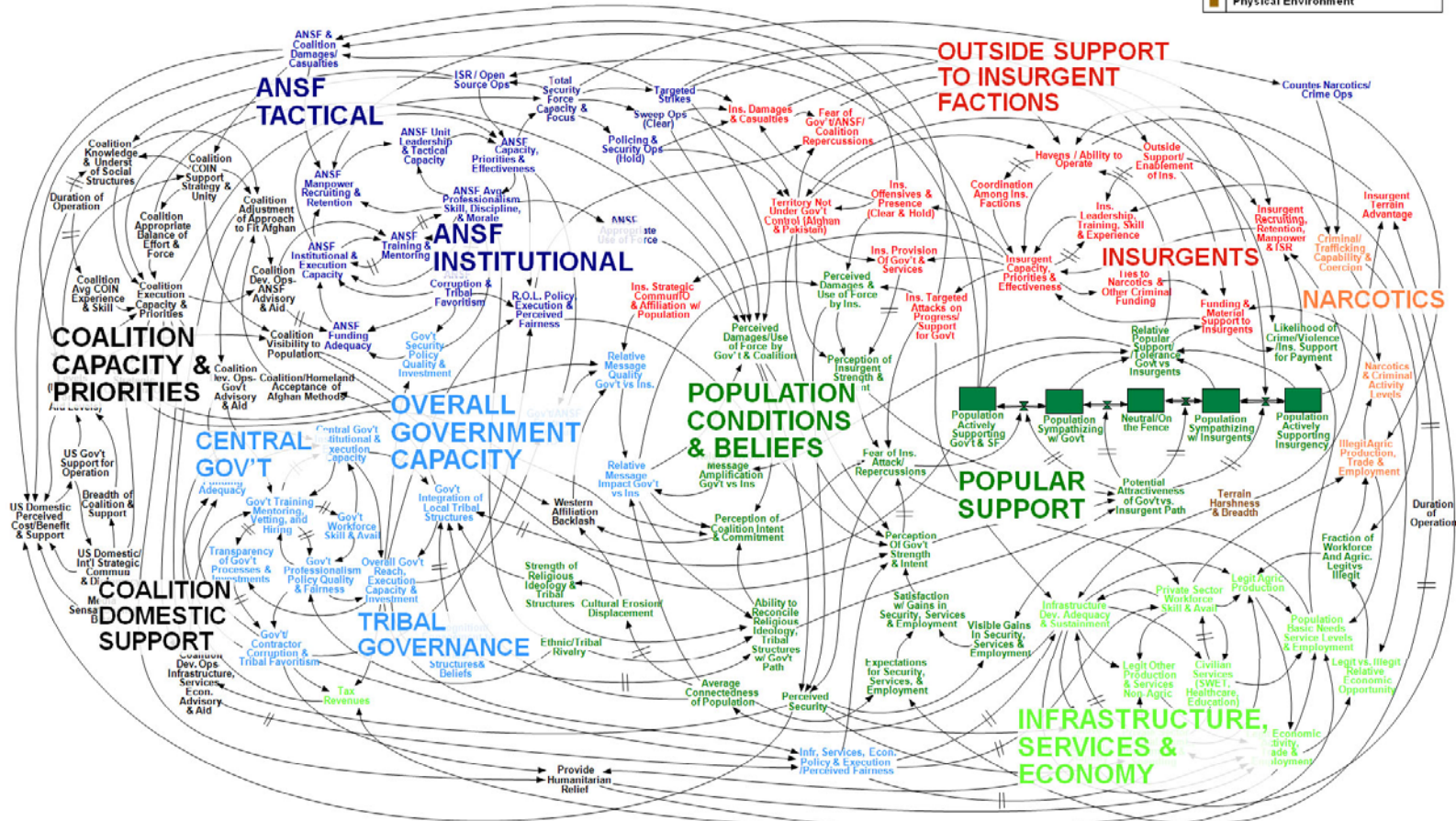
Full Generic Map
Thematic Clusters (filled)



Afghanistan Stability / COIN Dynamics



- Population/Popular Support
- Infrastructure, Economy, & Services
- Government
- Afghanistan Security Forces
- Insurgents
- Crime and Narcotics
- Coalition Forces & Actions
- Physical Environment



WORKING DRAFT - V3

Some Characteristics of a System ...

- Systems are made up of people purposively pursuing goals
- They have a natural dynamic that displays a pattern over time
- Systems REACT to anything we might do to them
- Inertia or resistance (opposition?) often counteracts the impact of any policy intervention

.. and three important considerations

- Public health problems are typically 'wicked' ones
- Cannot avoid local (distributed) decision-making (agency)
- Systemic does not mean *endemic* or *intractable* but it does mean we have to think about how to *harness* its natural dynamic

Harnessing the System

- Public health problems are typically 'wicked' ones
- Cannot avoid local (distributed) decision-making (agency)

Harnessing the System

- Public health problems are typically 'wicked' ones ... the solution to which frequently requires local problem solving capacity, experimentation, reflective practice and an organisation that is willing to learn!
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Harnessing the System

- Public health problems are typically 'wicked' ones ... the solution to which frequently requires local problem solving capacity, experimentation, reflective practice and an organisation that is willing to learn!
- Cannot avoid local (distributed) decision-making (agency) ... but we can support it, harness it, coach it, nudge it, work with it to help steer energies towards where the greatest leverage over the system can be gained

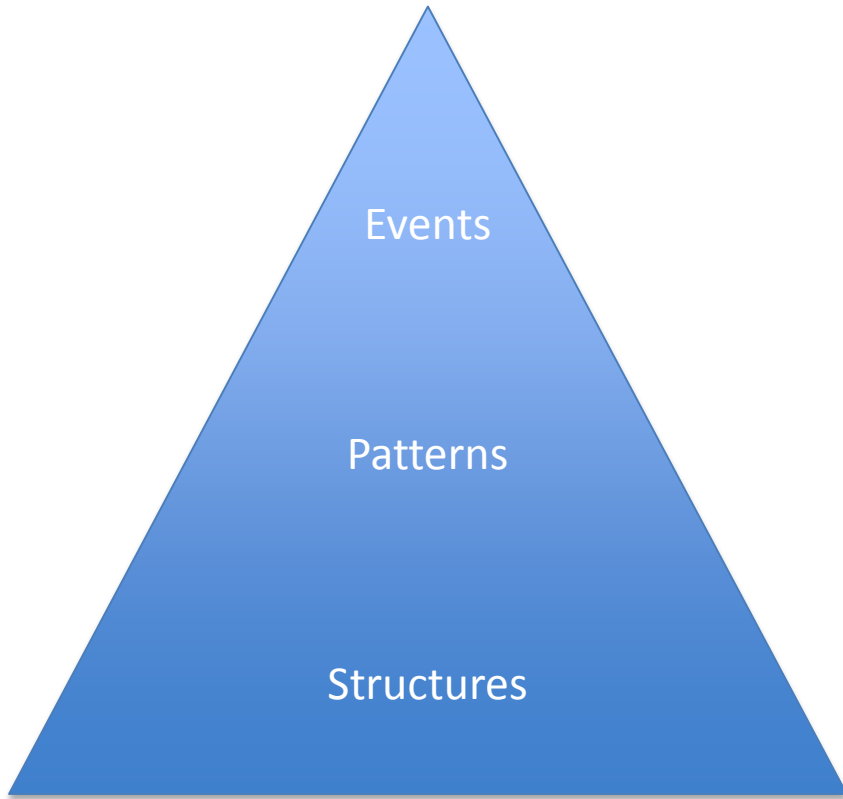
Lesson 1

Partnership is critical ...

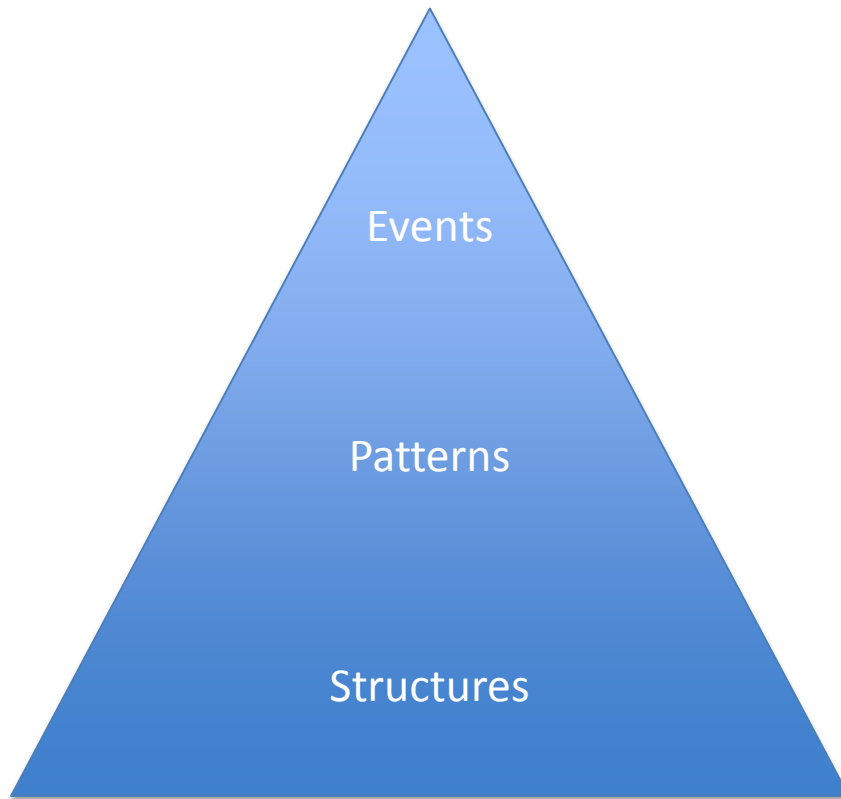
... but not one that starts with the evidence and worries about how to translate it into practice ...

but rather one that starts with the problem and supports efforts to address it

Systems thinking and Inequalities in Health



Systems Thinking and Inequalities in Health



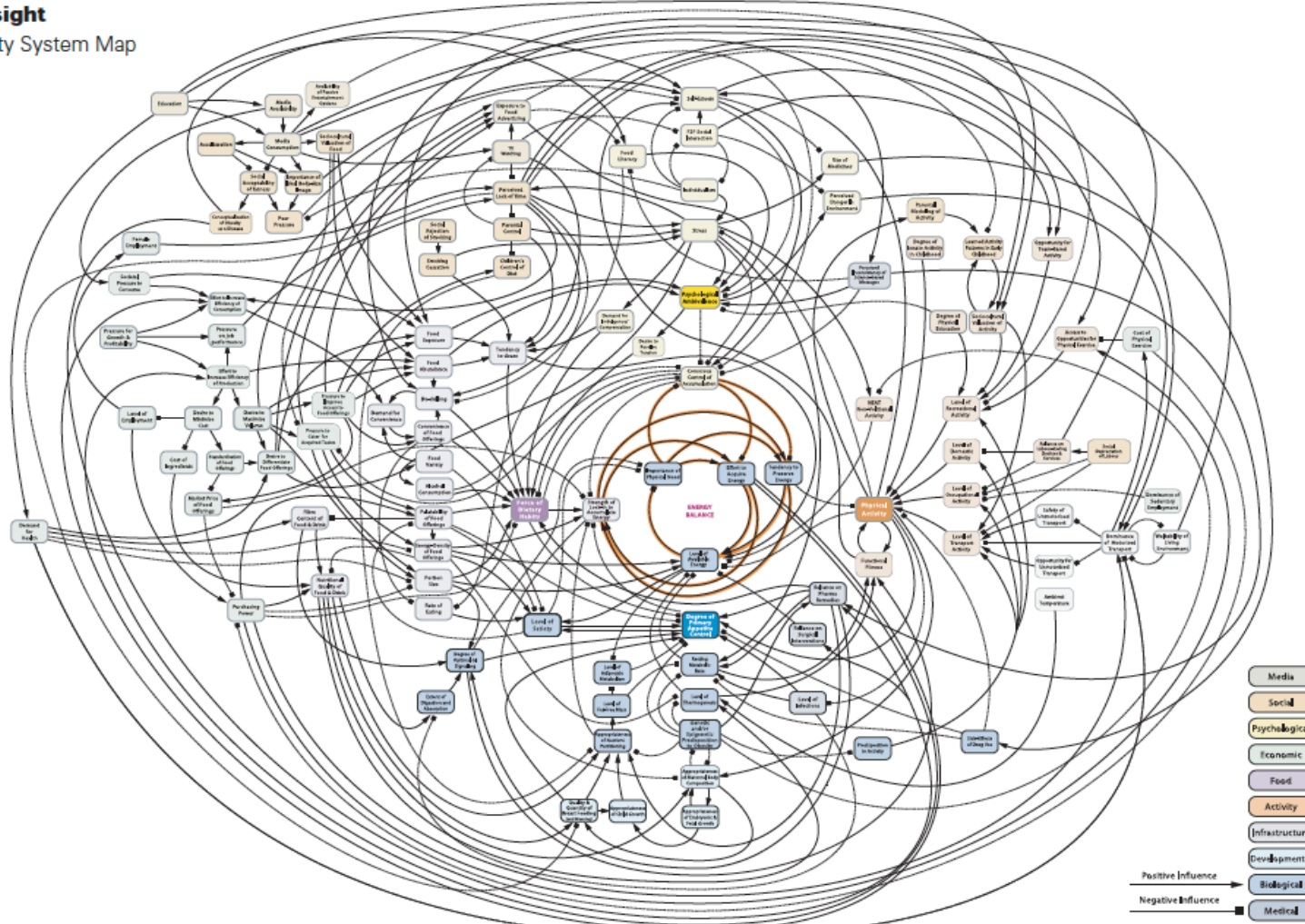
Poor diet / inactivity / tobacco use

Social patterning of risk by any measure of social or economic circumstance

What structural features of the system drive this pattern?

Systems Thinking and Inequalities in Health

Foresight
Obesity System Map

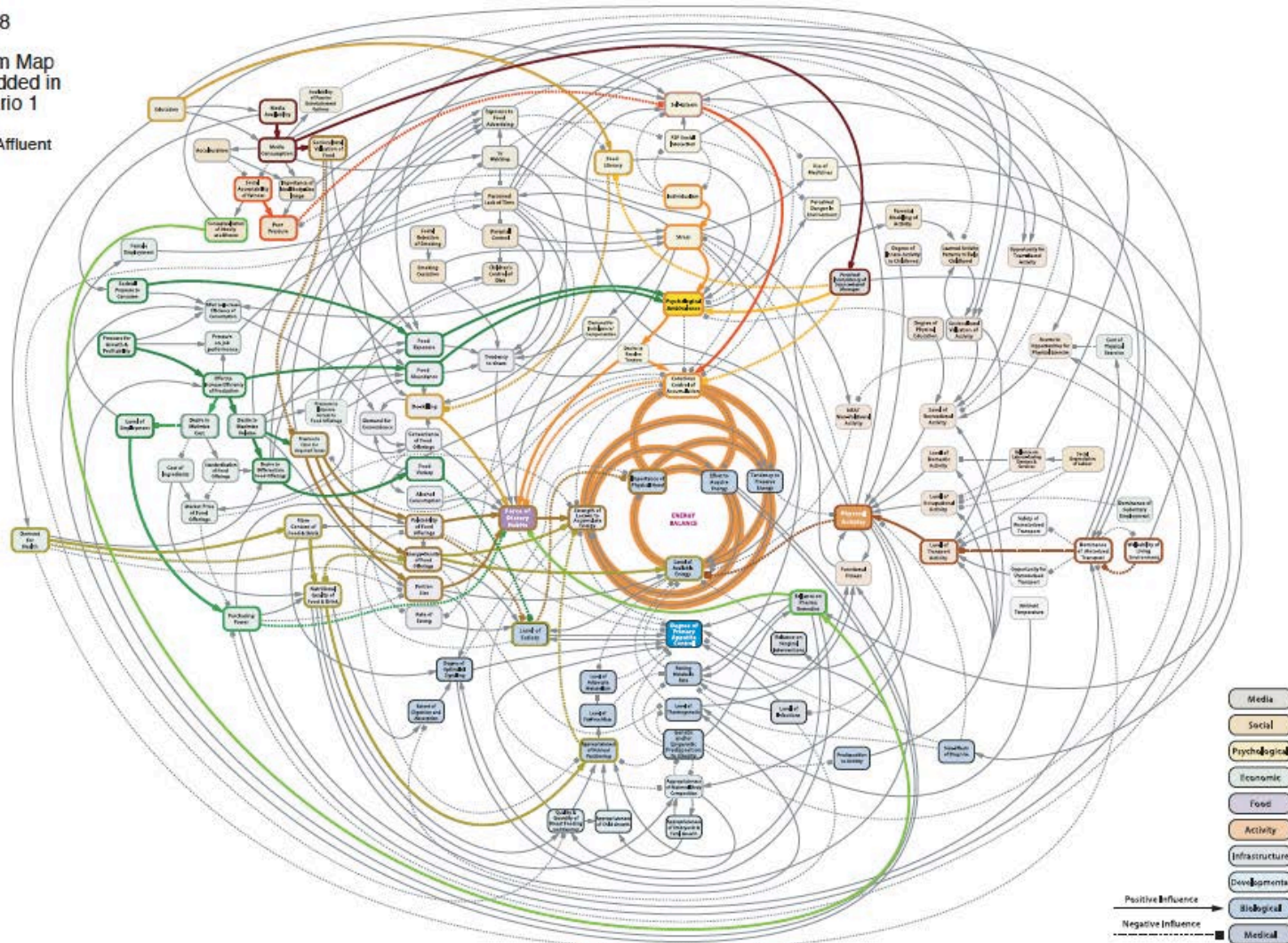


Systems Thinking and Inequalities in Health

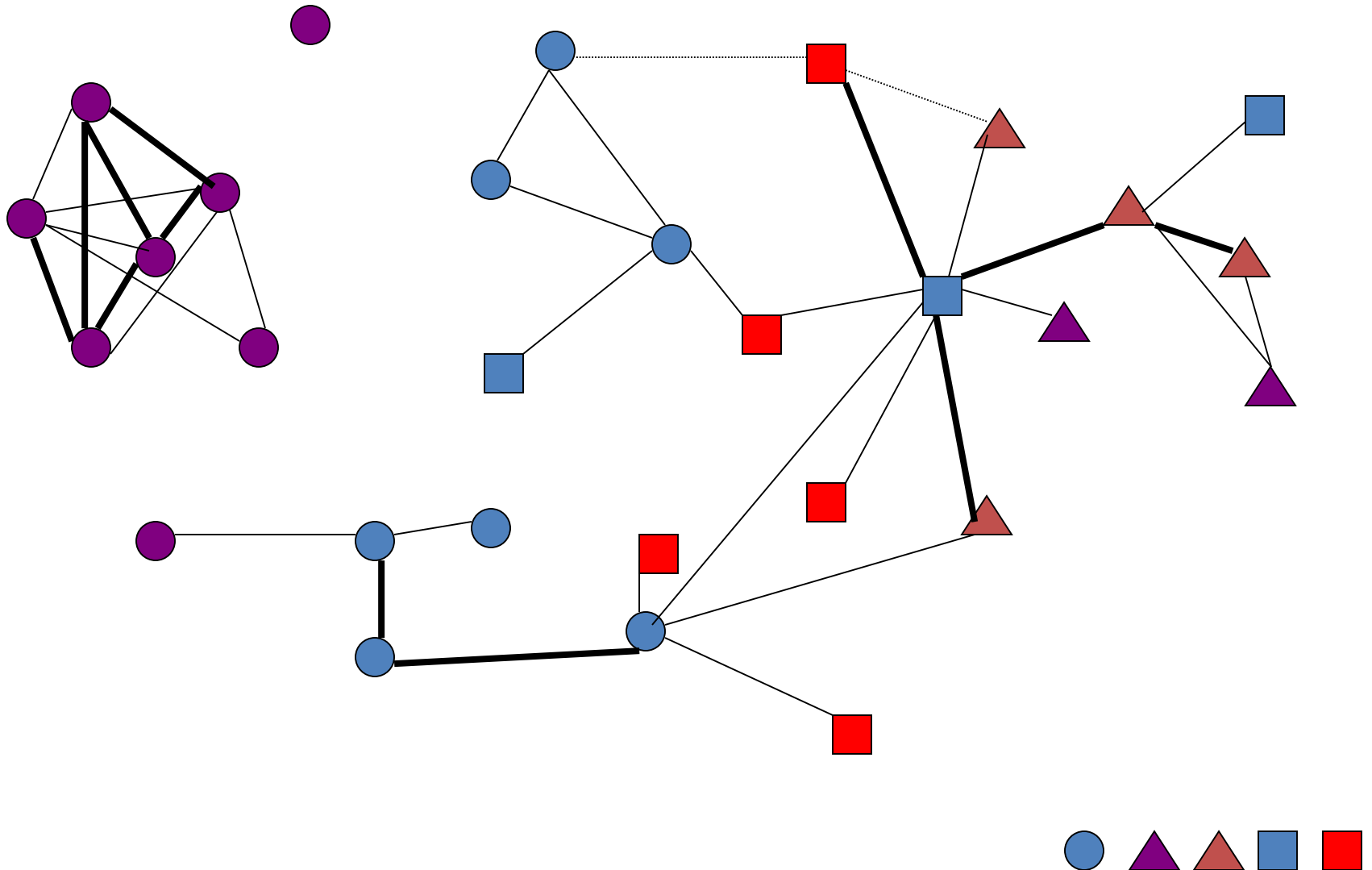
Map 28

System Map Embedded in Scenario 1

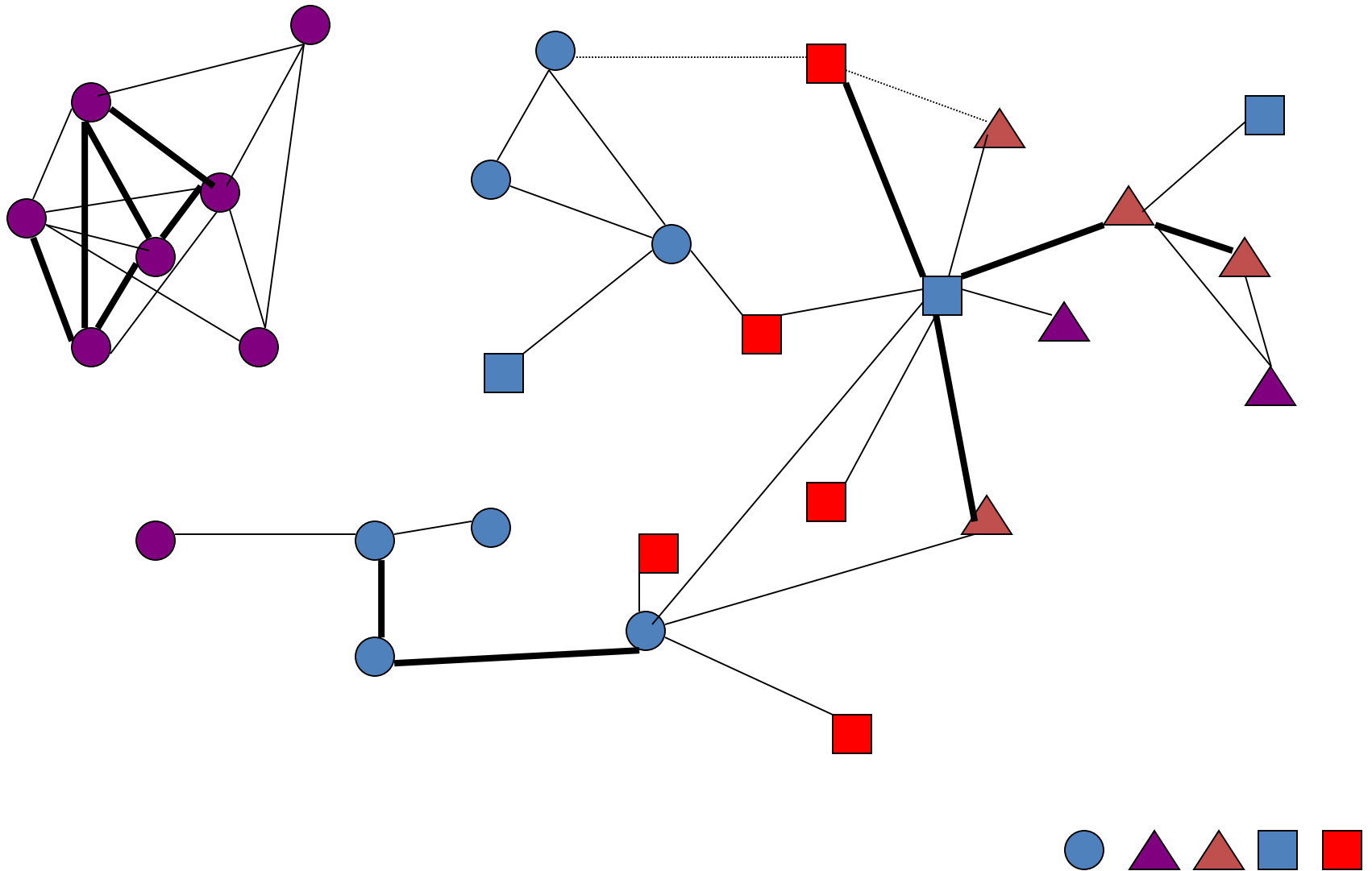
a. The Affluent



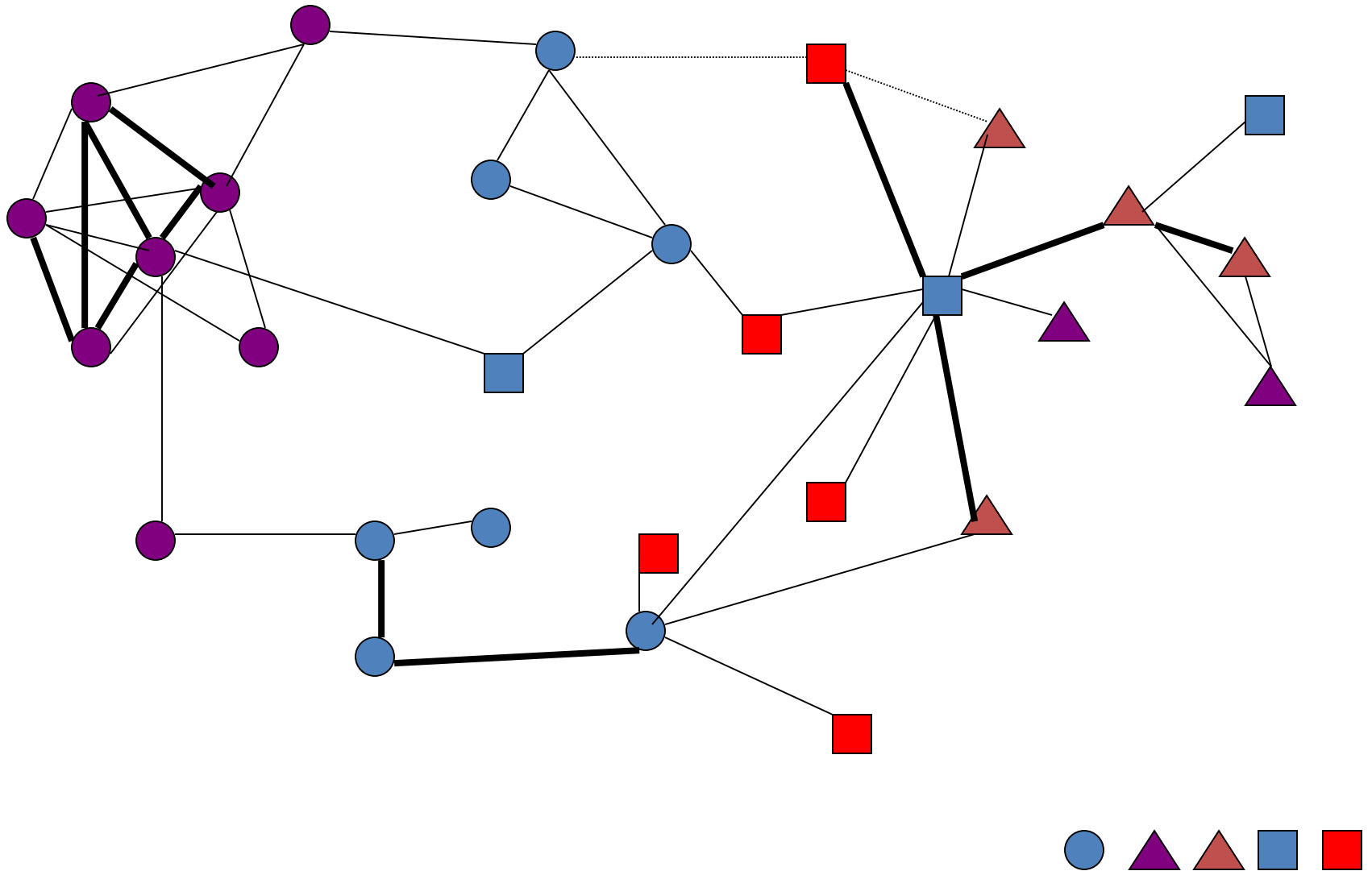
ADDING VALUE TO SOCIAL NETWORKS



... BY NETWORK CLOSURE (BONDING)



... BY BRIDGING 'STRUCTURAL HOLES'



But what is exciting?

The National Partnership Agreement on Preventive Health is an \$80 million injection of funds over 4 years to promote healthy weight ...

... with the same amount again (and more) being provided by Victoria to build a prevention system

Victoria's Systems Approach

- Investment in essential building blocks / infrastructure
 - A new prevention workforce
 - New Leadership and governance
 - Partnership approach
 - Embedded research and evaluation capacity
 - New funding model (possibly)

Victoria's Systems Approach

- Investment in essential building blocks / infrastructure
- Support (harness) de-centralised decision making
 - Facilitate networking and flow of resources (information/ status)
 - Support key agencies, individuals etc according to role in network
 - Speed up data collection/ feedback/ review/ action cycles
 - Align incentives / synchronise cycles (e.g., of performance review)
 - Increase awareness of system drivers / leverage points (system maps)
 - Create new system drivers (e.g., public demand for health promotion)

Victoria's Systems Approach

- Investment in essential building blocks / infrastructure
- Support (harness) de-centralised decision making
- Evaluation to ensure public accountability for the \$\$ spent



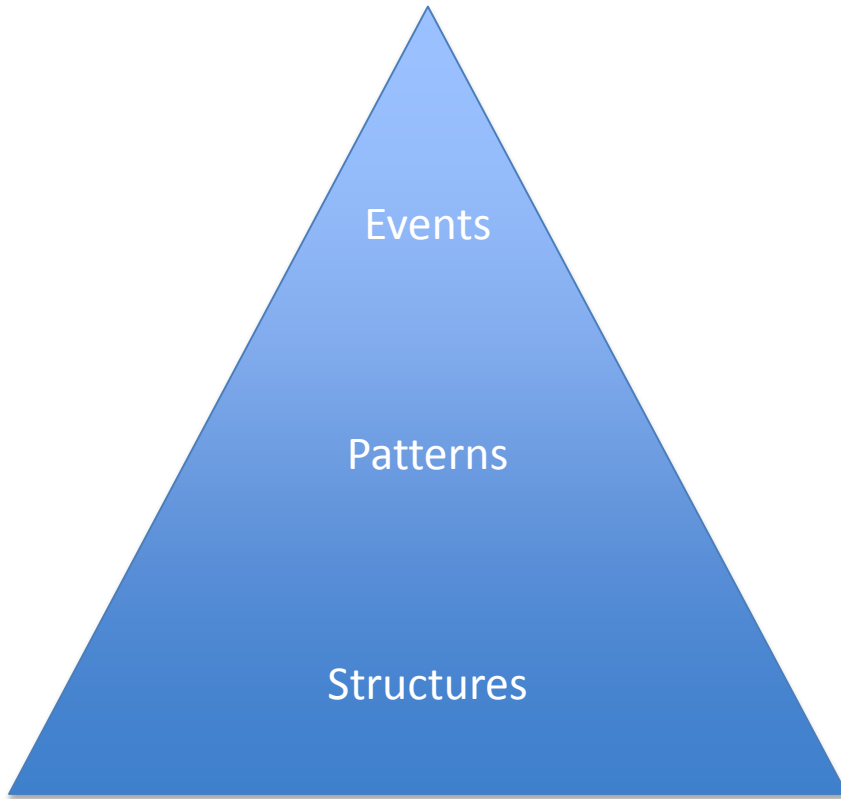
2011 PREMIERS



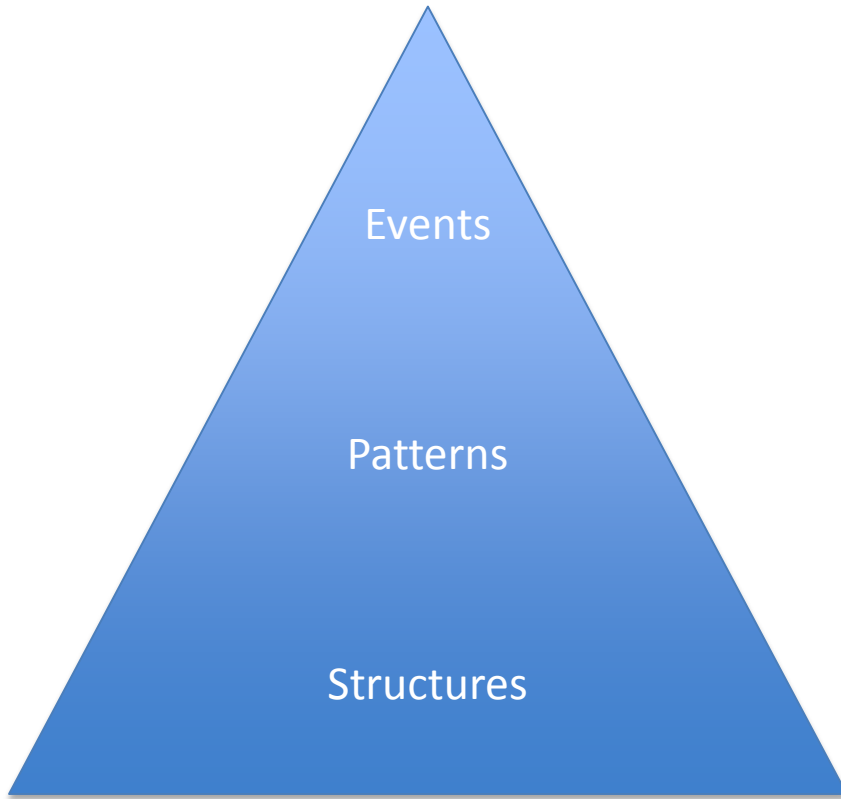
Feel the difference



Geelong Premiers and Systems Thinking

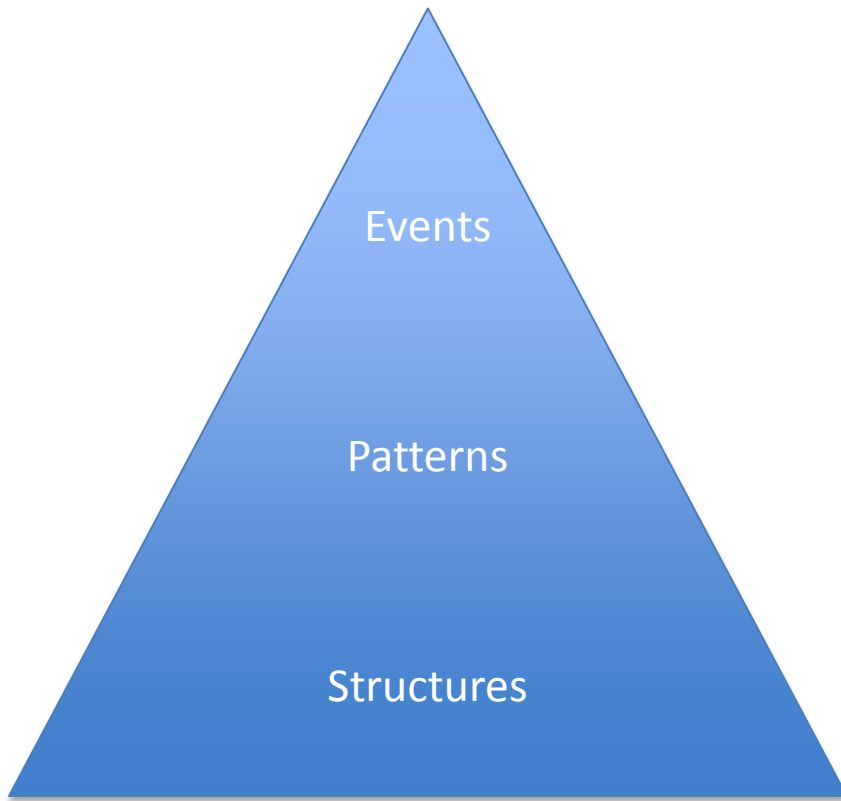


Geelong Premiers and Systems Thinking



Geelong wins the 2011 premiership

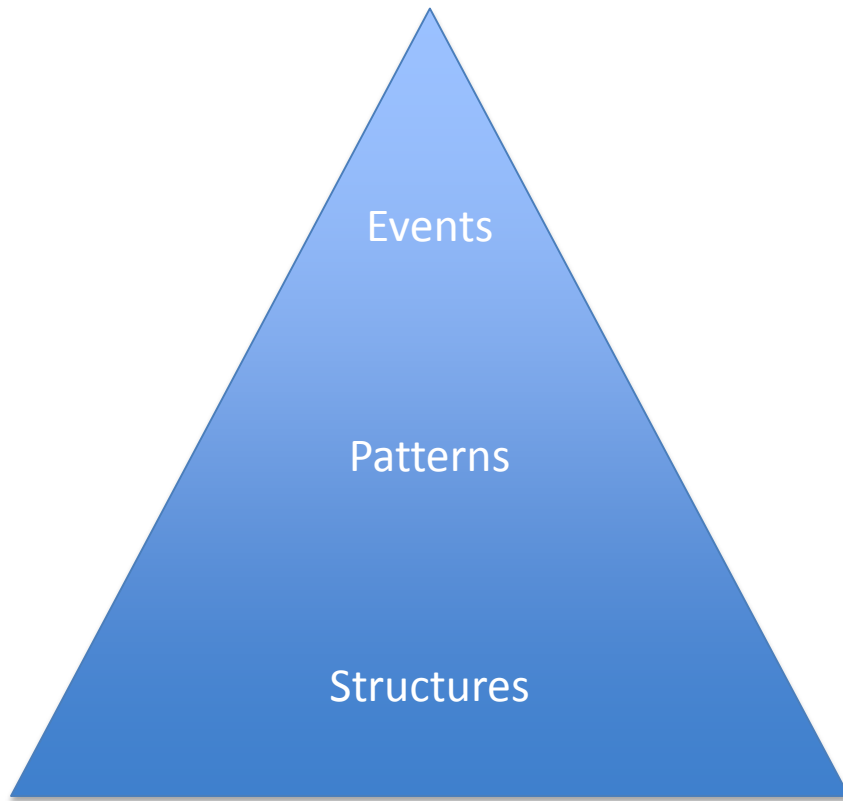
Geelong Premiers and Systems Thinking



Geelong wins the 2011 premiership

... It's third in five years ...

Geelong Premiers and Systems Thinking



Geelong wins the 2011 premiership

... It's third in five years ...

Attributed (by its new coach) to the Geelong *organisation*

Thank You

*GO
Swans*

Systemic Leverage Points (after Meadows)

- System Elements (programs, projects, people)
- Relationships (connections)
- Structures (Networks)
- Values and norms (risk taking, use of evidence)
- Paradigms (obesity is a personal issue / nanny state)

SOURCE: Finegood DT. The complex systems science of obesity. In: Cawley JL, editor. *The Oxford Handbook of the Social Science of Obesity*. New York: OUP, Forthcoming.

Principles guiding systems thinking interventions

- Enable local decision making (agency)
- Predictive modelling – what if, what could be
- Monitor policy enforcement + review performance against objectives (outcomes)
- Rapid feedback on activities & performance
- Stakeholder deliberation and participation
- Encourage and support networking

System Activation Strategies

- Create & support networking opportunities to rewire the local system
- Coach key people and organisations (identified through the network analysis) as diffusion agents (bridge gaps, redistribute power)
- Speed up the cycle of data collection and feedback on implementation, reach and effect of programs and policies to inform planning
- Synchronise cycles (e.g., data collection, performance review) within the system to align incentives, enable local capacity, enhance performance
- Increase awareness of the 'whole of system' maps and causal loop logics - to focus energy on high-level system drivers (causes) not the latest 'fire'
- Create new system drivers (e.g., activate public demand) through publication of system performance measures & a communications strategy