Julian Pratt and Diane Plamping – testimony to PDG 1st September 2010

Whole system approach

1. Introduction

The scope for this NICE guidance is 'Preventing obesity using a 'whole system' approach at local and community level'. It draws on the obesity systems map developed by Foresight[1]. In preparation for this work the Programme Development Group (PDG) commissioned a report from PenTAG on the Whole System Approach[2].

The testimony presented in this paper is intended to clarify the different ways in which the term 'Whole System' is currently used and to suggest that NICE should make use of all of these usages in the development of its guidance.

2. Systems and theories of change

Systems

We take as a working definition of a system anything that can be conceptualised both as a whole and as a set of interconnected parts.

Complex Adaptive Systems and Designed Systems

Given this very inclusive definition of 'system', there are many different sorts of thing that can lay claim to being a system and many ways of classifying systems. One distinction that is becoming increasingly helpful in a range of application areas is between simple systems and complex systems.

Simple systems are those in which the behaviour of the whole can be predicted from knowledge of the behaviour of the parts and their connections. A single planet orbiting a sun is a simple system, and other examples are systems that have been designed by people – machines, buildings, devices. The parts of a simple system are themselves simple. The underling mental model is of a design – a set of plans, a scale model which may be static or moving. A simple system can be incredibly complicated (literally 'folded with'), and its behaviour can be very difficult to understand from the behaviour of the parts – but this understanding is always in principle possible. Simple (and complicated) systems tend towards disorder, their entropy increases, and if we design a system we know that we will have to put energy into its monitoring and maintenance.

The term 'complex' carries, in addition to a sense of the complicated, the sense of an indivisible whole – as in its usage to describe a building complex. The behaviour of each part, and of the whole, depends on the interactions of all the parts, so it is not possible to build up an understanding of the whole other than by engaging with the system as a whole. An example is the 'three body problem' – the orbits of two planets around a sun are governed by no soluble set of equations and can only be predicted by iterative

approximations. These planets do not follow a predictable path, like an ellipse, but a constantly shifting orbit that does not repeat itself.

The prime examples of complex systems are living systems, ecosystems, evolving systems. The underlying mental model of complex dynamic systems is of computer simulations that play out over time. The parts of a complex system are usually themselves complex systems, for example cells that are parts of an organism. Complex systems, which are generally open to a flow of energy and so described as dissipative structures, do not degenerate into disorder but actually create their own order – for example the order of a vortex created by water leaving a bath and dissipating its potential energy. Complex systems generally have the capacity to be self-ordering, or self-organising, though these patterns of order may disappear when conditions are not supportive.

Boundaries

The boundaries of a designed system are created by its designer. The boundaries of a complex system are created by its own internal dynamics, in interaction with its environment. The boundaries of a vortex are shaped by the energy and viscosity of the fluid, the boundaries of a cell are created by its own metabolism.

Everybody is part of many human systems – for example a couple, a family, a neighbourhood, a work group, the supporters of a football team. We suggest that human systems organise around purpose (what is important to them) and meaning (why it is important). If you are connected to others who share the same purpose, you are part of a human system organised around that purpose.

Systemic approaches

We think of an approach as systemic, as a systems approach, if attention is given to a whole, to its parts and to the interconnections. Inevitably one of these will be in the foreground at any particular moment, but an approach is only systemic if all are held in the attention.

Theories of change

Anybody who wants to take action to make a difference in the world will employ a theory of change, even if this is not explicit.

Designed systems, machine metaphor

The dominant theory of change in our culture is derived from a view of the world, including human systems, as a simple (though complicated) system. Order has to be designed in. A designer has to take responsibility for analysing the current situation from a position of objectivity and for proposing an intervention that will have the desired effect – either because it is so persuasive that people change their behaviour or because it is possible to coerce them to do so. This is a designed systems approach and the interventions can be described using the metaphor of a machine – re-design, re-engineering, leverage. It is a sequential approach in that analysis leads to policy, which leads to action.

The designed systems approach is a powerful way of understanding and describing but its great weakness is that there is so often a disconnect between policy analysis and making a difference. A lot of energy has to go into motivating people to carry out the policy which they have had no part in developing.

An example of this sort of designed structure is a firm that decides what to produce, whom to employ, what roles each will play and what will be the sanctions and rewards.

The Foresight report on obesity is implicitly rooted in this theory of change, and the obesity map is a very sophisticated analysis of the problem. It recognises the multiplicity of interacting causative factors and the significance of these interactions, but the policy prescriptions are for the parts.

Adaptive system, living systems metaphor

An alternative theory of change is derived from a view of human systems as complex dynamic systems that are capable of self-ordering or self-organising. When such a system is not acting as you would want it to, it is likely either that it is organising to achieve something other than its stated purpose or that it is being constrained by its environment. As there is no external designer, any actor in the system (individual, team, group, organisation, community) may take on the role of 'animateur' and perturb the system in the hope that it self-organises to achieve a different purpose.
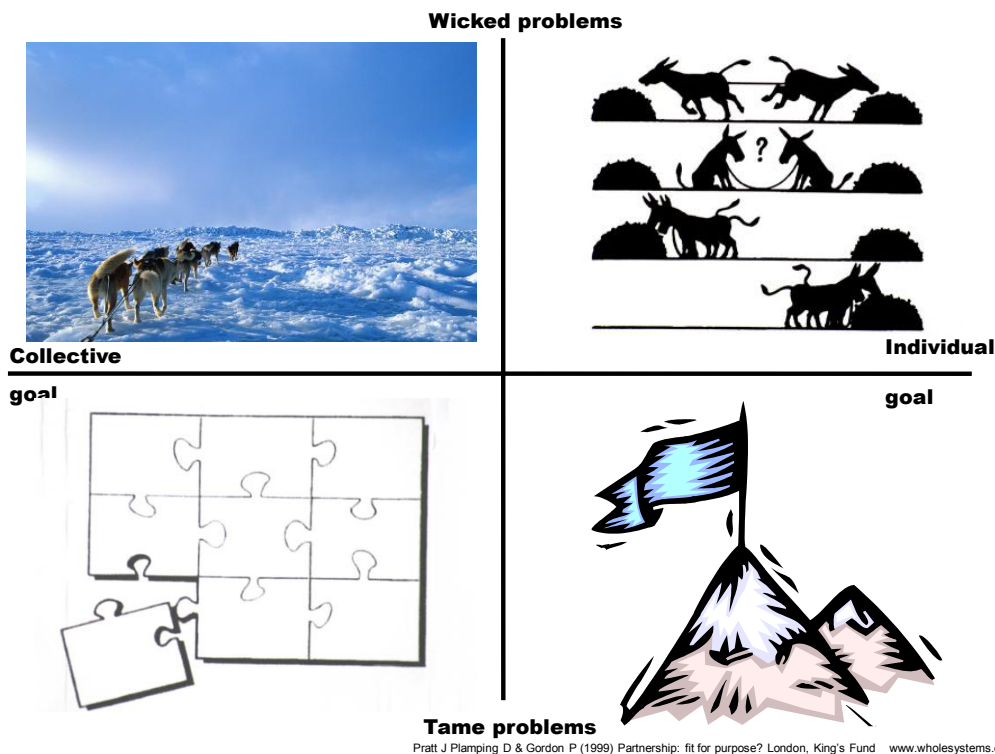
This is an adaptive systems approach and the interventions can be described using the metaphors of living systems and ecosystems – interconnection, interaction, identity, patterns, flows of energy. It is an holistic approach in which the sharing of understanding and purpose is not a precursor of action but an integral part of it.

An example of this sort of adaptive structure is a social network that influences an individual's diet, exercise and weight.

Landscapes Framework

Rittel and Webber[3] made a very helpful distinction between 'tame' problems that can be defined, broken into manageable chunks and solved; and 'wicked', policy-resistant problems where, even with a goal they are agreed on, a group of people will have quite different views on the nature of the problem, what may be causing it and how to resolve it.

We have used this distinction to describe a simple two by two matrix that many people have found helpful when orientating themselves in a situation where they want to take action to make a difference in a human system[4]. In what we have come to call the Landscapes Framework[5], wicked problems are above the line and tame problems are below the line. On the right each actor in the system (individuals, teams, communities, departments, professions, organisations) pursue just their own goals; while on the left they also have some shared goals.

Wicked problems

Collective goal · **Individual goal**

Tame problems

Pratt J Plamping D & Gordon P (1999) Partnership: fit for purpose? London, King's Fund   www.wholesystems.co.uk

In the bottom left people share a goal that they know how to achieve – building a bridge, for example. A productive approach when you believe yourself to be in this landscape is co-ordination. There has to be an understanding of what the goal is, how to achieve it, how to break it into manageable parts, what sequence to carry them out in and who is responsible for each part of the jig-saw. This is a designed systems approach based in analysis and planning that is entirely appropriate for tackling tame problems.

In the top left people share a broad goal, but the detailed steps that would take you there are not knowable at the outset. They have no option but to explore together, to co-evolve, and the ice-field is constantly shifting with new possibilities and new obstacles constantly appearing. When people tackle this landscape together they trust that they are capable of self-organisation. This is an adaptive systems approach that is appropriate in tackling a wicked problem; and this is the approach that the PenTAG report identifies as an 'authentic' whole systems approach.

Both are systems approaches – designed and adaptive – but the underlying mental model of how systems organise is different. It is possible to take a systems approach in all four quadrants, and we believe that co-operation (top right) and competition (bottom right) are also likely to be relevant to tackling obesity.

3. Whole systems

The term 'whole system' does not have a single agreed meaning, but it has nevertheless proved to be fruitful. In this section we briefly describe its history, and distinguish between two of its meanings – system-wide analysis on the one hand, and a way of working that animates the self-organising capacity of complex adaptive systems on the other.

History

The term 'whole system', which had some currency in environmental and spiritual groups in the 1980s, was taken up in the 1990s by Organisation Development consultants working in the USA with multinational corporations in a way that drew to a greater or lesser extent on the theory of complex adaptive systems[6]. Building on this body of theory and practice in our work at the King's Fund for the London and Northern Health Partnerships, we first used the term 'Whole System Event' in 1995 to describe events that brought together a rich variety of participants from across the health and social care system to work together on issues that concerned them. The issues that they chose to work on were clearly located in the top left landscape (e.g. 'how can we improve the health and wellbeing of older people around here?') and the events were designed to support co-evolution through exploration and dialogue. We thought of these the events as one visible moment in a longer process, but we rapidly realised that participants were being seduced by the power of the events into ignoring the planning and follow-up. We therefore shifted our emphasis from talking about Whole Systems Events to describing a Whole Systems Approach[7] that was adaptive, co-evolutionary and located in the top left.

In the 1990s people responded to the term 'whole systems' as an invitation to think beyond the limitations of a competition-based NHS and would say things like 'we don't know what a whole systems approach is, but it sounds interesting'. When New Labour came to power in 1997 they brought a language, indeed a duty, of partnership in the public sector and a commitment to joined-up government. It seems clear from the form that they prescribed for Action Zones and Local Strategic Partnerships that they intended these partnerships to follow a designed systems co-ordinating approach. The term 'whole systems' was rapidly appropriated by the NHS and used to refer to a bottom left designed systems approach, and within a year or two planners were being re-named directors or co-ordinators of whole systems.

Since 2000 the term 'whole systems' has in practice been used to refer both to approaches in the top left (adaptive) and to approaches in the bottom left (designed).

It is interesting to speculate why PenTAG's literature review has identified so clearly just one of these meanings as 'authentic'. Our hypothesis is that the use of 'whole systems' to refer to activity in the bottom left is under-theorised because it implicitly draws on the theory of planning, while its use in the top left has been theorised as part of a struggle to introduce a radically different way of working into public services in the UK.

'Whole systems approach' used to signify 'system-wide analysis'

The Foresight report uses 'whole systems approach' to refer to a system-wide analysis of the causes of obesity (bottom left). This usage is consistent with one of the widely-used meanings of 'whole systems' i.e. system-wide.

While the analysis of complex systems has progressed dramatically over the last quarter of a century, the prescriptions for action to which it leads have not moved far beyond those derived from familiar approaches to analysis and planning.

'Whole systems approach' used to signify an approach to complex adaptive systems

The PenTAG report[2] has provided a summary of a whole systems approach rooted in the theory of complex adaptive systems. It is an approach that is simultaneously so obvious that

it barely warrants a description, while so radical in organisational life and academic thought that it is difficult to imagine putting it into practice. It can be understood though experience, but less easily through words. We do not attempt to describe it in this paper, but have done so in *Working Whole Systems: putting theory into practice in organisations*[4].

It is distinguished from a designed systems approach in several major ways:

- it is an approach to action not a method of analysis

- it tackles complex wholes without aiming to break them into manageable chunks

- it pursues multiple courses of action in parallel rather than following a sequential process

- it treats human systems as adaptive and self-ordering, comprising agents that are meaning-seeking and purposeful.

4. Issues for the Programme Development Group (PDG)

Designed and adaptive whole systems approaches

We believe that the PDG is in a position to interpret the term 'whole systems approach' in whatever way is most conducive to the prevention of obesity. Our view is that the PDG would be unwise to limit its use of the term to the adaptive top left sense that PenTAG have described as 'authentic'. This leaves two options – either

(a) to use the term, as the Foresight report does, to refer to a bottom left designed systems approach, or

(b) to acknowledge that both designed and adaptive approaches are worth considering.

(a) Interpret 'whole systems' as 'system-wide'

There are several reasons why the PDG might decide to limit its recommendations to a designed systems approach which provides, from the perspective of an external observer, a sophisticated description of the complex system that influences the incidence of obesity. It can be based on the sort of evidence that is persuasive to others and consistent with the analytical mental model that NICE employs. And the prescriptions for action can be shaped so that they tackle tame aspects of the overall wicked problem of obesity.

The disadvantage of this choice is that it would exclude from consideration the additional use of top left adaptive whole systems approaches.

(b) Acknowledge both designed and adaptive systems approaches

We hope that the PDG will acknowledge that both designed and adaptive approaches to obesity have their own merits. The reason for including the adaptive systems approach is twofold: that it is capable of enabling things to change when understanding a causal map is not enough on its own; and that when an analytical model is imperfect (e.g. the interactions in a cognitive map cannot be expressed quantitatively) a group of people acting adaptively may be able to reach a better understanding of what will work using their tacit knowledge than a computer model can using explicit knowledge.

A disadvantage of this choice is that the evidence base for adaptive whole systems working is much less robust than the evidence that underlies the Foresight report. Some whole

systems working has been evaluated[8], but evaluation is very challenging with an approach in which the consequences of an intervention cannot be predicted in advance.

A challenge is that, when taking an adaptive whole systems approach, it is to be expected that local action will be different in each place.

Local and central

Most of our work that has taken an adaptive, co-evolutionary whole systems approach has been at local level – typically at the level of a city or a London borough, sometimes at the level of an organisation or a region – though we have also taken the same approach in a policy system at national level. What can be achieved at each of these levels is almost always constrained by the absence of the involvement in the conversations of people from other levels.

When working at a national level we have been keenly aware of the value contributed by a whole systems approach that draws in several government departments and connects them to those who implement policy.

We believe that an ideal model for adaptive whole system working is for it to take place simultaneously at local and national levels. When a local system recognises the need to include participants from the national level there is then a national group that is hungry to inform itself about the realities on the ground by sending members to learn from, and inform, the local work.

Is there a passion for tackling obesity?

Adaptive human systems organise themselves around meaning, and are driven by the passion of the participants to make a difference. In practice, the development of an adaptive whole systems approach begins with the development of an inquiry question that taps into participants' passion and releases energy for change. It is the agents (people, organisations) that are drawn to the inquiry question who constitute the system. The question supports the development of connections between the parts and enables the emergence of new ways of organising in the system.

We have therefore tried to imagine what sort of inquiry question would bring together an adaptive system to prevent obesity. Clearly there are a small number of enthusiasts and people with a special interest – such as the members of the PDG – who would be drawn to an inquiry question along the lines of 'what can we do to prevent the expected rise in obesity in this area?' But, as the members of the PDG began to identify, people they have talked to about preventing obesity have not demonstrated any obvious organising passion that might lead to action.

Inquiry questions that seek to solve a problem (e.g. how to improve hospital discharge) have proved to be much less compelling as the basis for an adaptive whole systems approach than questions that seek solutions (e.g. how to make going home from hospital a positive experience). But even if a more positive obesity question could be identified it is difficult to imagine that it would draw in food suppliers, providers of transport and leisure facilities, planners, architects, TV chefs, fashion leaders, Treasury advisers and people of all sorts who make decisions every day about what to eat and what exercise to take. On the other hand, inquiry questions that focus on eating well, on doing more walking, on vigorous exercise, on

living longer and well or on feeling and looking good would each have the potential to draw in and energise people with a wide range of perspectives.

It may well be that an attempt to promote an adaptive whole systems approach to obesity would rapidly fragment into separate adaptive whole systems approaches to food, transport, exercise, self-image and locus of control. Indeed there are already the beginnings of whole systems approaches (though not using this name) to local healthy food production and to a mix of transport that includes more human effort in the Transition Towns movement – in response not to obesity but to climate change. These may be the sort of adaptive whole systems approaches that the PDG could consider advocating, alongside an analytical and designed approach.

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