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Working with local communities to prevent obesity: a whole of system approach

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Obesity is a national priority for Australia because it is a major determinant of type 2 diabetes, coronary heart disease, diabetes, many cancers, musculo-skeletal and psychosocial problems and costs more than \$8bn annually (Access Economics 2008).

The World Health Organization Collaborating Centre for Obesity Prevention (WHOCC), has achieved, when compared to controls, reductions of; 2% and 3% overweight/obese among 2 and 3.5 year olds (Bell et al., 2008); 3cm in waist circumference and 1kg of weight among primary school children (Sanigorski et al., 2008); and 6% in overweight/ obese among adolescents (Millar in press, Allender in press). Each intervention was set in the 'testing ground' of the Barwon South West (BSW) region of Victoria, involved more than 3,000 children and used participatory, capacity building approaches over an intervention period of at least 3 years. The success of these interventions has been tempered by the difficulties in 'scaling up' by simply duplicating demonstration project approaches to a population level (Sanigorski et al 2010).

The National Institute of Health and Clinical Excellence review of system based approaches found that two of these interventions, Romp n Chomp (2 and 3.5 year olds) and BE Active Eat Well (primary school aged children) met all but one of their predetermined criteria for whole of system intervention. The other intervention, It's Your Move, which targeted adolescents was not published in time to be included in this review. The NICE review concluded that these interventions most closely intimated a whole of system approach out of all interventions identified in the literature. The element which was missing from each of these interventions was that they did not explicitly recognise or use knowledge of the existing system as a part of the intervention design.

The challenges of how to ‘translate to scale’ from these successful interventions and the dearth of successful interventions elsewhere (Summerbell et al., 2005) echo growing agreement that obesity intervention must address the complex and interconnected mix of etiological factors from behaviours to social, built, natural and economic environments. This ‘next generation’ of intervention must apply knowledge of dynamics of social, community and political existing systems to optimize prevention outcomes (Finegood et al., 2010). A retrospective analysis of success in reducing smoking prevalence in the second half of the 20th century demonstrated that intervention across the full complexity of determinants, a ‘whole-of-system’ approach, was critical (NCI 2007). System means an interconnected set of elements that is coherently organized in a way that achieves something (such as an education system) (Meadows 2008). Taking a systems perspective stresses the importance, among other things, of linkages, relationships, feedback loops and interactions among the system’s parts (Hawe 2009).

The WHOCC team are developing an explicitly systems-based approach to creating a preventive health system with the BSW region serving as the ‘testing ground’ for this work. To develop a whole of system approach five questions need to be considered; what is the current state of the system?; what needs to be in place to create the optimal obesity prevention system?; What are the indicators of the right process for systems change?; Has the shift in the system resulted in a change in obesity?; How does this approach need to be modified to work in national and international contexts?

Measuring the current state of the system

To understand the current state of the system locally validated, detailed maps of the existing system can be used as a baseline preceding system change. Mapping the current system means working within the WHO system framework (WHO 2007) and extending the framework for measuring systems change within an evaluation combining the nested hierarchies of micro, mezzo and macro level (Glass and McAtee 2006) with the four elements of systems proposed by the NCI (2007); systems dynamics, systems networks, systems organizing, and; systems knowledge. The basic framework is adapted from WHO work on Health Systems for understanding the system building blocks and system elements are as follows:

Table 1 Framework of system building blocks and system elements (adapted WHO 2007)

		Systems thinking elements			
System building blocks		System Organizing	System Knowledge	Systems Networks	System Dynamics
	Governance				
	Information				
	Financing				

	Service delivery				
	Human resources				
	Technologies				
	Physical environment				
	Socio-cultural factors				
	Other				

Identifying what needs to be in place to create the optimal obesity prevention system

Agreeing the building blocks for system change provides indicators to represent systemic change. These building blocks are identified and elucidated through concept mapping; a systematic grounded approach for identifying and organising ideas from stakeholders (Reavley et al., 2010). This process builds from the application of an appropriate seeding question to; generation of statements through nominal group techniques; statement sorting; factor analysis of statements; and, concept mapping.

What are the indicators of the right process for systems change?

The identification of key indicators will be as part of the basis for a community capacity development approach extending previous work by the WHOCC group using a variation of the ANGELO (Analysis Grid for Elements Linked to Obesity) Framework (Swinburn et al., 1999). This framework represents one of the real strengths in the previous intervention design as it combines stakeholder engagement workshops with knowledge of environmental barriers, targeted behaviours, gaps in skills and knowledge to create action plans for obesity prevention within specific settings. The approach has been replicated worldwide (Simmons et al., 2009) and is a key tool for many community based interventions. The ANGELO framework and associated processes will be adapted to include the systems elements mapped under the previous stages and key change indicators to create the SYSANGELO process; an efficient, stakeholder driven means to identify the key areas for, and indicators of, system change to prevent obesity within settings.

This process in turn results in a fully specified action plan for implementation by the community towards shifting existing systems (such as the education system, health system) and in so doing creating a new preventive health system which will optimize the possibilities for obesity prevention.

Has the shift in the system resulted in a change in obesity?

The initial stages identified above will establish baseline data for the existing system and obesity prevalence in early childhood settings in BSW. The development of existing, validated tools to define systems will provide an efficient process for regular data collection on the state of the system. System audits will be collected regularly over the four years of the program to assess the level of change (system dynamics) resulting from state level intervention.

Efficiently collected system maps will provide the basis for assessing the effectiveness of system change in preventing obesity at a population level. Change in weight status across the region will be analysed from; the Victorian Population Health Survey; computer aided telephone interviews (CATI) specific to the Healthy Children initiative; maternal and child health data; and, through a new monitoring system for childhood obesity.

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