Linking sectors in a systematic approach to health

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INTRODUCTION

Science has been very effective in contributing to human benefit by using a targeted, focused, disciplinary approach. There is growing realisation, though, that the next generation of ideas, the new and major advances, are likely to stem from linkages between the disciplines, rather than continued focus on improving knowledge within particular fields of knowledge. In some areas of classical reductionist science, such as molecular biology, many great advances of today are being made by linking its disciplines directly with mathematics; the conjugation of mathematics and biology is becoming enormously powerful. Further, some commentators believe that generation of scientific knowledge will increasingly move from the big laboratories and institutions — traditionally the locus of such research — into a much more diverse and non-traditional arena.[1]

Our paper is written with this view in mind. We believe that science faces a fascinating challenge and opportunity in contributing to inter-disciplinary arenas, particularly those linking the social and economic disciplines with the natural sciences. In particular, our own intellectual backgrounds are as ecologists interested in environmental and land management, and increasingly in understanding the systems of natural and human resource use in regional communities. For us, the intellectual challenge is one of building up a much better picture of the system into which disciplinary-based approaches traditionally are fed. Can we do better at creating sustainable human communities, at managing the full suite of resources available to us, through better understanding of the systems in which we are embedded? And if we can do so, surely one of the greatest challenges lies in human health, perhaps the ultimate arbiter of the effectiveness of science. Our paper is one small contribution to the exploration of the possibility that the maturing fields making up systems science may provide new and useful approaches to wider issues of human well-being.

Of course, systems approaches can also become bogged down in such complexity that everything seems inextricably connected to everything else. We need to say right at the beginning of this paper that we're not proposing to provide all the answers. What we can say, though, is that many other researchers and professionals recognise the challenge and opportunity of wider approaches to human health. Wakerman and Mitchell write that "improved health outcomes are largely defined by factors outside the health sector".[2] Similarly, in relation to Indigenous health, Burgess et al[3] state that "effective interventions will require trans-disciplinary holistic approaches". So it is that we share some ideas emerging from the experiences of CSIRO and its partners, especially through the Cooperative Research Centres.

THE PREVENTATIVE HEALTH NATIONAL FLAGSHIP PROGRAM

CSIRO's National Flagship Programs aim to be inter-disciplinary research partnerships that align capabilities across CSIRO and external agencies to tackle big, audacious goals in areas of major national significance. Compared to conventional research projects, their larger scale,

longer timeframes and focus on adoption are designed to maximise impacts of R&D. Each of the six Flagship Programs involves several of CSIRO's research Divisions, thereby marshalling many disciplinary skills, and each involves partners in other research agencies and user groups. The scale of the investment is about $25M per Flagship.

The Preventative Health Flagship Program aims to improve the health and well-being of Australians, and save $2 billion in annual direct health costs by 2020 through the prevention and early detection of chronic diseases.[4] The Flagship's research, led by Richard Head, is organised around five streams: health data integration and statistics; colorectal cancer; neurodegenerative diseases; cardiovascular disease; inflammatory diseases; and finally environment and health. Richard Head informs us (personal communication) that even though the direct influence of environment on health is readily grasped, he is unable to locate among Australia's extensive health statistics information that would allow quantitative analysis of the relative importance of the various environmental effects. Clinicians have a clear understanding of the individual impacts of sunlight, latitude, temperature season, air quality, water quality, and so on, but there is no systemic view which allows for the setting of priorities for preventative treatment or research effort. The Flagship Program, therefore, is setting out to identify those key issues before investing in any particular one of the obvious environmental effects on health, in order to provide a framework for more systematic investigation.

The major reason for mentioning these experiences is this: if it is impossible even to understand the systemic links between direct environmental influences on human health, think about how much more difficult it is to grapple with the broader and indirect influences on human well-being mentioned earlier by commentators such as Wakerman[2] and Burgess.[3] We now proceed to discussion of potential approaches to that wider challenge.

THE RELATIONSHIP BETWEEN WELL-BEING AND ENVIRONMENT IN INDIGENOUS AUSTRALIA

Professionals working in Indigenous health have long understood that indirect relationships between Aboriginal people and their country have a dramatic influence on individual's sense of well-being. An Indigenous perception of well-being connects people, place and law in a whole-of-life view, placing emphasis on social and spiritual dysfunction as causes of ill-being.[5] Regrettably, such understanding to some extent springs out of attempts to help with the dysfunction that plagues many Indigenous communities, a problem that is clearly not just a medical issue. We mention below two examples of efforts to examine systemic relationships between well-being and country.

First, Burgess et al[3] describe clear links between biomedical problems and the overtly stressful conditions of life in Aboriginal townships. On the reverse side, there are positive relationships between physical and mental health of Aboriginal people and residency away from major settlements (of course, there are downsides to life in outstations, too, which must be balanced against these benefits). In particular, Burgess and his colleagues make the point that work by individual Aboriginal people in land-management practices contributes not just to ecosystem health but just as importantly to human health. They describe the combination of physical activity, the sense of autonomy and mastery over life, and of social cohesion, as contributing beneficially as elements of individual and community well-being. Their conclusion is that "the resumption of customary natural resource management clearly delivers increased physical and mental health".

But Burgess et al[3] go further by referring to Hunter, who writes[6]: "the construction of problems to fit solutions is particularly seductive for health, where the medicalisation of social problems

appeals to both political and health care delivery systems". The radical nature of this suggestion pushes us even further along the path towards more systemic solutions; it seems likely that the phenomenon being described here is not confined to Indigenous health.

Secondly, our colleague Romy Greiner and her co-workers[7] are undertaking a project, together with the Nywaigi people of the coastal lowlands north of Townsville in Queensland, which is investigating how the relationship with country influences a sense of well-being. As with Burgess[3], Greiner and her colleagues report difficulties in obtaining relevant data — even economic data specific to Nywaigi people are difficult to obtain, much less information concerning wider influences on health and well-being. The approach being adopted is to use focal discussion groups. Within such groups, individual members of the community are themselves able to define the parameters of the system in which they see themselves living, and which have an influence on their sense of well-being. The focus groups are conducted with from 6 to 12 people, with their consent and understanding, and stratified among age and gender. The striking result from Greiner et al's preliminary report is the sense of the broad system in which people see themselves as embedded; in this system, well-being has numerous 'domains' such as country and culture, the family and community relations, employment and income, crime and justice, recreation, education and training, housing and infrastructure, and of course health. Greiner and her colleagues are now setting out on the task of teasing out relationships between those domains. It is not difficult to see how such approaches built around systemic frameworks could in future assist the delivery of health-related services.

SYSTEMIC APPROACHES TO COMMUNITY DEVELOPMENT

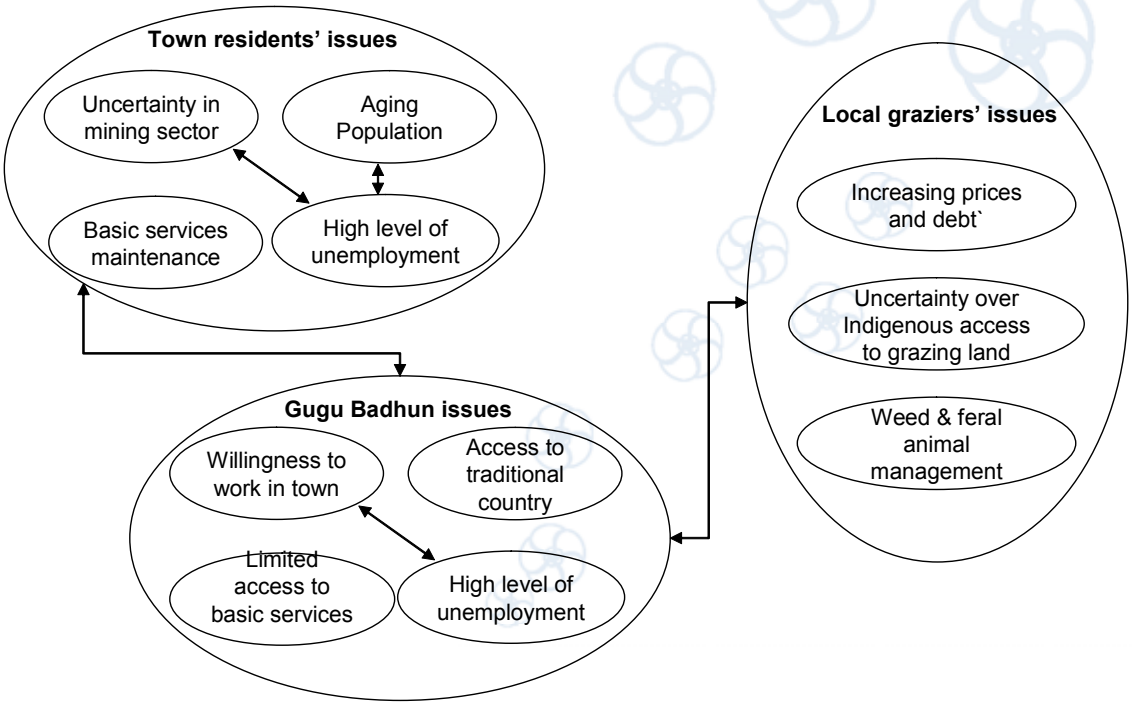
Our approach to systemic analysis attempts to reflect the realities of human actors making choices about the world in which they perceive themselves to be inhabitants. It is important to point out our recognition of the fact that, in making particular choices, people may deliberately or subconsciously accept higher health risks in order to achieve related goals. Remote pastoralists choose a style of life that inevitably carries with it some substantial health consequences, for example in terms of readiness of access to health services in an accident. In another concrete case, the Desert Knowledge CRC, the Commonwealth Department of Family and Community Services and the Centre for Appropriate Technology, are jointly investigating a risk-management approach to water quality.[8] High nitrates in water constitute a major health problem for some remote communities: if World Health Organisation guidelines were strictly applied then there would be little choice but to close down several such communities. However, if high nitrates are principally a problem for very young people, a risk-management approach could well produce a tolerable outcome — for example, if people are aware of the danger to babies, and do not take them to such communities, perhaps the problem could be resolved. People might choose to manage their risks in exchange for the benefits of their lifestyle. In short, systemic cross-disciplinary approaches can incorporate multiple goals and risk management.

With this in mind, our final example of a systemic approach comes from outside the health arena. Measham et al[9] examined the perspectives of several distinctive elements of a rural community, with the aim of determining the most effective points of intervention in support of community development. Measham and his colleagues adopted similar tactics to those described above in relation to Romy Greiner's work; that is, structured community consultation to uncover the framework used by individuals to analyse and understand their world. Their method was to collect key indicators of a 'healthy region' from different actors' points of view; to identify the five or so most important factors from each stakeholder group, to seek the systemic connections among them; and finally to decide for which elements data needed to be collected or tracked. Measham and his colleagues consciously decided on system-

development first and data-collection second because of their sensitivity to the point noted earlier from Burgess et al: that it is essential not to fall into the traps of allowing the problem to be constructed according to pre-existing power relationships, or of confining the investigation to elements for which data are presently available (which, in turn, naturally reflect existing structures of power and influence in society).

The resulting "Outback Livelihoods Project" has obtained a preliminary systemic understanding of how people in different groups of society perceive a healthy region (Fig 1). Some preliminary work was carried out at Greenvale in north Queensland. Three sets of actors in the community were consulted — town residents, the Gugu Badhun Indigenous group, and local graziers. The analysis allows the observer to see the key features identified by each group as major contributors to the health of their region, and most importantly the links between those features that are of greatest importance from the point of view of each group. Further, the analysis allows the observer to consider which indicators of a healthy region could be measured or tracked, be it qualitatively or quantitatively, in order that all groups of actors can partake equally in the debate about the future of their region.

Figure 1 **Some examples of issues raised by different actors in a regional society, some but not all of which have links between each other**



Outback Livelihoods – Measham, Maru & Murray Prior, 2004

Our ambition is to use this sort of work to make progress in understanding the systemic context in which all sorts of services — including but not confined to health services — are decided upon and delivered. Such approaches have been hard to tackle in the past because they often require flexible and substantial computing capacity, which has not always been available. In addition, increasingly sophisticated and theoretically sounder models for analysing the ways in which different parts of society interact and deal with each other are becoming accessible. There is substantial potential here, and the promise of great progress. Let us end, though, by emphasising the word 'promise'. We are not suggesting that the capacity to link sectors and to avoid the pitfalls of silo-driven analysis and service delivery is immediately

at hand; rather, we see this potential in the process of being more fully realised in the coming decade.

CONCLUSION

- Science is striving to contribute to holism after a long period of reductionism. Our paper stems from a desire to see science apply newer techniques to the fields of health and well-being.
- It is easy to identify direct influences of environment on health, but it is difficult to rank them effectively, even in the one region, much less Australia wide. Without understanding of the inter-relationships by which humans experience environmental influences on their well-being, it will remain hard to tease out the important and intriguing interactions among such effects.
- Understanding of the relationship between country and culture in Indigenous communities has led to early recognition of the benefits of a wider view of health and well-being.
- In a growing number of studies, scientists are attempting to grapple with a systems view of community development. A systems view is not just putting sectors together: it rests upon analysis of intersections, interactions, linkages, synergies and feedbacks. There is a wonderful challenge here in realising benefits of wider approaches to health and well-being, both scientifically and in terms of service delivery.

REFERENCES

1 Gibbons M, Limoges C, Nowotny H, Schwartzman S, Scott P, Trow M. The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies. 1994. Sage Publications.

2 Wakerman J, Mitchell J. Intersectoral collaboration: what are the factors that contribute to success? Final Project Report to Desert Knowledge CRC, 2004. Centre for Remote Health, Alice Springs.

3 Burgess P, Johnston F, Bowman, D, Whitehead P. Healthy Country — Healthy People: exploring the health benefits of Indigenous natural resource management. Paper presented to the 8th National Rural Health Conference, March 2005.

4 http://www.csiro.au/index.asp?type=blank&tid=pHealth_Home

5 Anderson I, Sanders W. Aboriginal health and institutional reform within Australia federalism. 1996. CAEPR Discussion Paper No 117.

6 Hunter E. Aboriginal health and history: power and prejudice in remote Australia. 1993. Cambridge University Press.

7 Greiner R, Larson S, Herr A, Bligh V. Wellbeing of Traditional Owners: conceptual and methodological approach. Paper presented to the 49th Annual Conference of the Australian Agricultural and Resource Economics Society, February 2005.

8 Gibson, R, Grey-Gardiner, R. 2004 *Project proposal to Desert Knowledge CRC: Remote community water management.* Alice Springs. (see www.desertknowledge.com.au/crc for further information).

9 Measham T, Maru Y, Murray-Prior R. 2004. *Outback Livelihoods Sample Discussion Paper — Project Report to Desert Knowledge CRC.* Alice Springs. (see www.desertknowledge.com.au/crc for further information).