

Attributing outcomes to outputs: Intervention logic and contribution analysis

Paul Killerby¹

13 May 2006

Summary

Local and central government strategic planners in New Zealand are considering the challenge of how to communicate and cooperate more effectively across agency and geographic boundaries and align their planning towards shared community outcomes. Parallel efforts are under way to compile more extensive and accessible data at the local, regional and national levels to promote more evidence informed policy and planning. Both initiatives stem from a central government move towards managing for shared outcomes, including new provisions in the Local Government Act (LGA) 2002 obliging councils to identify, monitor and promote local community aspirations as a planning and resource allocation framework.

Many territorial authorities are considering a dual reporting approach, with councils' own performance documented through their annual reports while community progress is documented through a separate community outcomes report. Thought is also being given to how these two pieces of information could fit together, and how community outcomes reports can be used as a basis for decision-making around outputs and levels of service.

¹ Paul Killerby is a local government strategic planner based at South Waikato District Council. This paper was prepared in response to a request from the Waikato regional group of local government strategic planners called MARCO (Monitoring and Reporting Community Outcomes). The author acknowledges ideas and contributions towards parts of this paper from Gavin Thomas (International Global Change Institute), Cameron Cowan (Rotorua District Council), David Hammond (South Waikato District Council) and Beat Huser (Environment Waikato). The paper also benefited from earlier ideas developed with Dorian Owen and Stephen Knowles (Economics Department, University of Otago). Any errors or omissions remain the responsibility of the author. E-mail address: paulkillerby@gmail.com.

This paper discusses issues relating to measuring the links between council performance and community outcomes. These issues are generic to most causal modeling problems and can be phrased as an attribution problem: To what extent can measured changes in a community outcome be attributed to a change in outputs? A theoretical solution is to define the intervention logic of the relationship, collect sufficient data on each variable of interest and estimate a structural equations model. The paper concludes that less statistical approaches would be better suited for translating community outcomes information into a basis for improved decision-making. It stresses the importance of defining intervention logic as a key first step and collecting robust information as the basis for telling the “performance story” (Mayne, 2001, cited in Ruffner, 2002).

Introduction

“Cause and effect, means and ends, seed and fruit cannot be severed; for the effect already blooms in the cause, the end preexists in the means, the fruit in the seed” – Ralph Waldo Emerson

This paper discusses measurement issues relating to cause and effect relationships between agency outputs and community outcomes. It begins with an overview of the managing for outcomes (MfO) framework in New Zealand and how this is manifested at the central and local government levels. It then discusses issues relating to the measurement of progress towards community outcomes with an emphasis on the attribution problem. This is followed by an introduction to intervention logic and contribution analysis. The paper concludes that care should be taken not to treat indicators as anything more than indicative, or to read too much into correlations (or lack thereof) between outcome and output indicators.

Managing for Outcomes

According to Gray (2005), public sector reform in New Zealand has shifted from efficient output production based on theories of new public management, to a broader focus on managing for outcomes. This appears to follow a trend that began in the early 1990s amongst OECD Member countries to improve the quality of public service performance (Ruffner, 2002).

The purpose of the MfO performance framework is to help fill gaps not addressed by individual agencies and improve overall public sector accountability. “We need to be able to describe what we want to achieve – our outcomes, then, what we plan to do to make that happen. Chief executives are accountable not for the result – the outcome – but for their contribution to the outcome” (Gray, 2005, p 4). New Zealand’s approach parallels similar public sector policy transitions in the United Kingdom (e.g. Kelly, Mulgan and Muers, 2002), Australia (e.g. Queensland Treasury, 2003) and Canada (Treasury Board of Canada, 2005). According to Ryan (2005) the second stage of public sector reform represents a shift “from thinking about ‘what does government do?’ or ‘what is government saying it’s going to do?’ to ‘does government achieve anything?’”

The MfO initiative was formally agreed by New Zealand’s Government in December 2001 and has since been progressively implemented across the public service (Controller and Auditor General, 2006). All public service departments and Offices of Parliament are now part of the MfO initiative, which is reflected to varying degrees in departments’ Statements of Intent (SOI). The requirement to prepare an SOI is a legislative requirement under the 2004 Amendment to the Public Finance Act 1989. A similar initiative called Managing for Results is currently being introduced for Crown entities.

As described on the State Services Commission website (accessed 7 May 2006), “managing for outcomes and results is about State agencies working to

maximise results for New Zealanders”. This includes setting clear desired results, implementing plans based upon these results and learning about ‘what works’ in the process. Ongoing work at the national level around managing for outcomes includes identification of each agency’s “vital few” outcomes, exploring opportunities for enhanced sector-based coordination and ensuring that the governance design of the public sector supports and promotes coordination as appropriate. Considerable guidance has been prepared as part of the roll-out of the MfO framework, including results from the Pathfinder Project (<http://io.ssc.govt.nz/pathfinder>) and the Managing for Outcomes Programme Office.

Planning for Shared Community Outcomes

Sections 91 and 92 of the LGA 2002 introduce new obligations for territorial authorities to identify, monitor and report on progress towards “community outcomes”. These are defined in the Act as “the outcomes for that district or region that are identified as priorities for the time being through a process under section 91” including any additional outcomes subsequently identified through community consultation.

Schedule 10 of the LGA 2002 requires territorial authorities to describe in their long term plans how their activities will contribute to furthering community outcomes, including a description of how the council will work with other organisations. While the Act does not specifically oblige councils to take a coordinating role, and there is no supplementary legislation requiring central government and other agencies to adopt community outcomes as a shared accountability framework, there is an expectation from central government that community outcomes will be a basis for future shared planning by public sector organisations.

The community outcomes provisions of the LGA 2002 have many synergies with the MfO initiative at a central government level. In addition, the Pathfinder

Project (2003a) summarises key differences from the central government approach, including the more prescriptive nature of local government's obligations. It also discusses challenges and opportunities for better alignment between central government and territorial authority planning.

Looking forward, strategic commentators such as McKinlay (2004) and Craig (2004) emphasise the importance of subsidiarity discussions and partnering processes as a means of getting from the 'mess to the mesh'. Duirs (pending) emphasises the importance of adopting a 'strategic thinking' rather than 'strategic planning' approach to collaboration. "Strategic thinking is better understood as the facilitation of opportunities for a broad section of stakeholders and communities to contribute new ideas to program development and planning. Strategic thinking produces inclusive innovative approaches to problem solving and visioning". Cook (2004) argues that considerable changes are need to structural, financial, strategic and performance management elements of New Zealand's public management system to better support a general cultural change towards an outcomes focus.

Monitoring and Reporting Community Outcomes

In parallel with councils' efforts to identify community outcomes and facilitate more joined-up responses, all territorial authorities are engaged in compiling data across a broad spectrum of community wellbeing in order to fulfill their s. 92 obligations to report against community outcomes. Specifically, the LGA 2002 requires that: "A local authority must monitor and, not less than once every 3 years, report on the progress made by the community of its district or region in achieving the community outcomes for the district or region". The Act gives little further guidance on this provision other than a requirement to secure agreement and information from other organisations and groups capable of influencing the identification or promotion of community outcomes.

While the purposes of the s. 92 obligations are undefined in the LGA 2002, it is reasonable to assume they would be similar to the final two purposes for identifying community outcomes as defined in s. 91(2):

- To promote the better co-ordination and application of community resources
- To inform and guide the setting of priorities in relation to the activities of the local authority and other organisations.

In keeping with other OECD member countries, New Zealand's strategic management framework has a focus on "what works". Local government's s. 92 requirements are mirrored by non-statutory monitoring and reporting initiatives at a national level such the Ministry of Social Development's annual Social Report. Efforts are currently under way, through cross-boundary and cross-agency initiatives throughout New Zealand, to achieve a more comprehensive and integrated system of community well-being monitoring (e.g. MARCO, 2005).

Thought is currently being given to a number of aspects of monitoring reporting, including the frequency and timing of reports, how to fill existing data gaps, and interpretation of results as input into policy making. The latter is the focus for much of the remainder of this paper. In particular, decision making based on outcomes analysis requires identifiable causal links from agency performance to community results (i.e. attribution). In practice, attempts to attribute changes in well-being to changes in levels of service need to be considered alongside other proximate causes as well as remote, superceding and concurrent causes (refer Appendix 1).

Some territorial authorities are considering a dual reporting approach, with councils' own performance documented through their standard annual reports and community progress documented through a separate community outcomes report, while other councils are considering how to combine both types of monitoring into a single report. In either case territorial authorities will want to make optimal use of the information collected through their s. 92 obligations. A

key first step for such analysis is to define the intervention logic from inputs to outputs and outcomes.

Intervention Logic or Results Chains

Pathfinder Project (2003b) is one of many sources of guidance for developing intervention logic, or results chains (Ruffner, 2002), linking inputs to outputs, to intermediate outcomes and ultimate outcomes. In brief (Pathfinder Project, 2003b, p 1): “Intervention logic starts with a clear definition of an outcome and uses logic and evidence to link outcome goals to departmental outputs. A well developed intervention logic helps justify the choice of outputs and to improve [sic] outcomes on the basis of evidence of effectiveness. When evaluative information can be produced on the outputs, coverage, near-term results and impacts, intervention logic can be used to prioritise outputs so as to maximise departmental outcomes, and confirm outputs delivered by the department work as planned.”

The intention is that a well defined results chain can be used as the basis for a cascading set of results targets. In practice, intervention logic is relatively easy to develop for agencies with tightly specified outcomes (e.g. Department of Corrections) but difficult for agencies contributing to multiple outcomes (Webber, 2004). Some commentators (e.g. Baehler, 2003) argue this provides justification to reduce the focus on accountability for deliverables, “in order to pursue outcomes more vigorously”.

While central government departments’ Statements of Intent are required to specify intervention logic, the Controller and Auditor General (2006), commenting on the results of the 2005-05 audits, is critical that: “Departments’ SOI commentaries on attribution (that is, the extent to which their outputs are contributing to the desired outcomes) needed to improve, as did departments’ use of evaluation, research, and monitoring.” The Office of the Auditor General (OAG) is giving a very strong message that it wishes to see improved attribution

of outcomes to outputs as part of central government agencies' performance reporting. In the absence of any legislative requirement for separate community outcomes reporting, the OAG is pushing for this to be included in the agencies' own annual reports. According to Controller and Auditor General (2006, p 74): "Departments should seek to continually refine their output and outcome indicators.... we continue to see a distinct separation of outcome and output reporting in annual reports (with the audited financial statements almost exclusively containing output reporting). We expect the gradual introduction of some outcome reporting into departments' audited financial statements."

An issue with the approach suggested above is that no single organisation is responsible for achieving community well-being (outcomes). When things are going well or badly in society, no one organisation can take responsibility. Community well-being is affected by a vast range of pressures, some of which require a whole-of-community response in order to be effective (MARCO, 2005). This creates a challenge for communities wishing to set community outcomes targets, since no single agency can meaningfully be accountable for achieving these targets.

A parallel push by the OAG appears to be in the early stages with regard to territorial authorities' long term plans. In the absence of a mandatory or advised separate reporting process, councils are being encouraged by their auditors to report the results of community outcomes monitoring through their own planning and reporting documents. At present the intervention logic between most council's levels of service and their respective communities' outcomes has been only identified only at a narrative level. Due to the complexity of relationships between multiple levels of service and multiple community outcomes, the audit expectation of developing a comprehensive logic model at the territorial authority level represents a daunting task.

The Pathfinder Project recommends a blended intervention logic that combines a narrative description with a structured model. This means describing not only in

words the links between agency activities and expected outcomes, but also using flow diagrams, matrices of indicators, risks and resource requirements, and disciplined logic and assumption testing. “Once a stable intervention logic has been produced, assumptions need to be tested, and a performance monitoring regime put in place to *prove* it works as it was designed to” (Pathfinder Project, 2003b, emphasis added). At present the majority of territorial authorities are only at the stage of providing a narrative description (e.g. South Waikato District Council’s Long Term Plan 2006-2016). There have been some attempts at innovation to introduce a quantitative element, such as Rotorua’s District Council’s Ten Year Plan 2006-2016 (p 48) which estimates a quantum of service to each high level community outcome from each of Council’s significant activities.

Attribution: Theory vs pragmatism

Ruffner (2002, p 4) points out that outcomes are much more difficult to measure and monitor than activities or outputs. “By their very nature, frequently they would not be expected to be manifested until some time after the programme intervention, generally not in sync with the same budgeting cycle. And outcomes typically come about not just as the result of a single intervention by one programme in isolation, but by the interaction of a number of different factors and interventions, both planned and unplanned.”

In theory, assuming sufficient data and a robustly specified model, it is possible to estimate causal statistical linkages from changes in levels of service to changes in community outcomes, for example by estimating a structural equations model with multiple indicators and multiple causes around the latent variable “community well-being” (refer Jöreskog and Goldberger, 1975 regarding a general methodology). However such a complex model would be spurious and difficult to justify. The nature of modeling involves simplification of complex relationships into a smaller set. Technical solutions are available to guide variable selection, such as the GETS general-to-specific model specification

algorithm (Hoover and Perez, 2001), but these solutions introduce their own theoretical issues.

Kouwenhoven, Mason, Ericksen and Crawford (2005) are attempting to tackle the attribution problem in a Resource Management Act setting by trialing a systems modelling software package called RAP (Rapid Assessment Programme). They claim this tool, when used as part of a strategic thinking exercise with council planners and environmental experts, can be used to develop a robust “scorecard” linking projects and posited outcomes. Results from initial pilot projects are yet to be comprehensively evaluated.

Attribution is most relevantly addressed at an intervention or project level – did we achieve what we set out to with this particular project? At the broader community well-being level, individual projects and interventions are largely subsumed to the point of inconsequence when placed amongst other influencing factors. Indicators should be used only as signposts and guides and not score cards or league tables. Monitoring guides such as those produced by the City of Onkaparinga (2000) provide practice examples. Other examples are cited in MARCO (2005).

Ruffner (2002, p 4) also takes a pragmatic approach and argues that “despite the perceived difficulties, outcome assessment in fact can be done, albeit at times with a somewhat different mindset and approach than from the direct measurement of inputs and outputs”. Ruffner recommends Mayne’s (2001) approach of addressing attribution through contribution analysis and laying out a plausible “performance story” (refer Table 1).

Table 1: Contribution Analysis

Step 1: Develop the results chain	Describe the program theory model/program logic/results chain describing how the program is supposed to work. Identify as well the main external factors at play that might account for the outcomes observed. This program theory should lead to a plausible association between the activities of the program and the outcomes sought. Some links in the results chain will be fairly well understood or accepted. Others will be less well understood or subject to explanations other than that the program was the “cause.” In this way you acknowledge that attribution is indeed a problem.
Step 2: Assess the existing evidence on results	The results chain should provide a good idea of which intended results (outputs, intermediate and end outcomes) could be measured. What evidence (information from performance measures and evaluations) is currently available about the occurrence of these various results? The links in the results chain also need to be assessed. Which are strong (good evidence available, strong logic, or wide acceptance) and which are weak (little evidence available, weak logic, or little agreement among stakeholders)?
Step 3: Assess the alternative explanations	Outcomes by definition are influenced not only by the action of the program but also by external factors — other programs, as well as social and economic factors. In addition to assessing the existing evidence on results, there is a need to explicitly consider the extent of influence these external factors might have. Evidence or logical argument might suggest that some have only a small influence and that others may have a more significant influence on the intended results.
Step 4: Assemble the performance story	With this information, you will be able to set out your performance story of why it is reasonable to assume that the actions of the program have contributed (in some fashion, which you may want to try and characterize) to the observed outcomes. How credible is the story? Do reasonable people agree with the story? Does the pattern of results observed validate the results chain? Where are the main weaknesses in the story? There always will be weaknesses. These point to where additional data or information would be useful.
Step 5: Seek out additional evidence	To improve your performance story you will need additional evidence. This could involve information on both the extent of occurrence of specific results in the results chain and the strength of certain links in the chain. A number of strengthening techniques that you might be able to adopt are outlined in this work.
Step 6: Revise and strengthen the performance story	With the new evidence, you should be able to build a more credible story, one that a reasonable person will be more likely to agree with. It will probably not be foolproof, but will be stronger and more credible.

Source: Mayne (2001), cited in Ruffner (2002)

Concluding remarks

Attributing outcomes to outputs is a process fraught with uncertainty. Care should be taken not to treat indicators as anything more than indicative, or to read too much into correlations (or lack thereof) between outcome and output indicators. With these warnings in place, planners should seek to tell the performance story through a robust interpretation of available evidence. The selection of evidence should be made cautiously, as “We try to measure what we value; We come to value what we measure” (Meadows, 1998, p 2). Ruffner (2002, p 4) argues that despite measurement challenges it is important to avoid negating the purpose of results-based reform, “which is to refocus efforts on what citizens and society ultimately gain from government. Without a focus of at least some form on outcomes, one too easily can lose sight of the bigger picture, which is what the programme is supposed to be about”.

Appendix 1: Some definitions

Concurrent cause – a cause that joins simultaneously with another cause to produce a result called also concurring cause

Proximate cause – a cause that sets in motion a sequence of events uninterrupted by any superseding causes and that results in a usually foreseeable effect which would not otherwise have occurred

Remote cause – a cause that is followed by a superseding cause interrupting the chain of causation; also a cause that in ordinary experience does not lead to a particular effect

Superseding cause – an unforeseeable intervening cause that interrupts the chain of causation and becomes the proximate cause of the effect called also efficient intervening cause intervening cause

(Source: <http://dictionary.reference.com/search?q=cause>)

References

Baehler, K. (2003) "Managing for Outcomes': Accountability and Thrust", Australian Journal of Public Administration 62 (4), December 2003.

City of Onkaparinga (2000) "Monitoring Outcomes – Achieving Goals: A practical guide for using community indicators to monitor the strategic directions of a local government area or region", City of Onkaparinga, South Australia. Web <http://www.onkaparingacity.com/creatingourfuture/PDF/INDICAT.pdf> (accessed 7 May 2006).

Controller and Auditor General (2006) *Central government: Results of the 2004-05 audits*, Office of the Auditor General, Wellington, NZ. Web www.oag.govt.nz/central-govt/2004-05/part7.htm (accessed 7 May 2006).

Cook, A. (2004) "Managing for Outcomes' in the New Zealand Public Management System", New Zealand Treasury Working Paper 04/15, Wellington, NZ. Web <http://www.treasury.govt.nz/workingpapers/2004/04-15.asp> (accessed 7 May 2006).

Craig, D. (2004) "Building Better Contexts for Partnership and Sustainable Local Collaboration: A Review of Core Issues, with Lessons from the 'Waitakere Way'", Social Policy Journal of New Zealand, Issue 23, December 2004. Web www.msd.govt.nz/publications/journal/23-december-2004/23-pages45-64.html (accessed 7 May 2006).

Duirs, A. (pending) "Working Toward Shared Community Outcomes: An Evaluation of the Hamilton Community Outcomes Consultation", unpublished draft thesis, Department of Psychology, University of Waikato, March 2006.

Gray, D. (2005) "Social development: Focusing on outcomes monitoring results developments in New Zealand", paper presented to the Canadian Social Welfare Policy Conference, Fredericton, New Brunswick, Canada, 16 to 18 June 2005. Web www.ccsd.ca/cswp/2005/managingforoutcomes.pdf (accessed 7 May 2006).

Hoover, K. D. and Perez, S. J. (1999) "Data mining reconsidered: encompassing and the general-to-specific approach to specification search", *Econometrics Journal* 2: 167-191.

Jöreskog, K. and Goldberger, A. S. (1975) "Estimation of a model with multiple indicators and multiple causes of a single latent variable", *Journal of the American Statistical Association* 70: 631-639.

Kelly, G., Mulgan, G. and Muers, S. (2002) "Creating Public Value: An analytical framework for public service reform", paper presented to Strategic Thinkers Seminar, The Mall, London, 24 September 2002. Web www.strategy.gov.uk/downloads/files/public_value2.pdf (accessed 7 May 2006).

Kouwenhoven, P., Mason, G., Ericksen, N. and Crawford, J. (2005) "From Plans to Outcomes: Attributing the State of the Environment to Plan Implementation", paper presented to the New Zealand Planning Institute Conference, Auckland, NZ, April 2005.

McKinlay, P. (2004) "Realising the Potential of the Community Outcomes Process", Local Government New Zealand, Wellington, NZ.

Managing for Shared Outcomes Development Group (2004) *Getting Better at Managing for Shared Outcomes: Guidance prepared for the Managing for Outcomes Programme Office for Outcomes Roll-out 2005/06*, State Services Commission, Wellington, NZ.

MARCO 2005 *Monitoring and Reporting Community Outcomes: A Resource Kit for Integrated Monitoring and Reporting*, Choosing Futures Waikato, Hamilton, NZ. Web: www.choosingfutures.co.nz/files/MARCO_Monitoring_Resource_Kit_-_JANUARY%20DRAFT.pdf (accessed 7 May 2006).

Mayne, J. (2001) "Addressing Attribution through Contribution Analysis: Using Performance Measures Sensibly", *Canadian Journal of Program Evaluation* 16(1): 1-24.

Meadows, D. (1998) *Indicators and Information Systems for Sustainable Development*, The Sustainability Institute, Hartland Four Corners, VT.

Pathfinder Project: <http://io.ssc.govt.nz/pathfinder>

Pathfinder Project (2003a) "Guidance on Outcome Focused Management – Learning Paper: Managing for Outcomes - The Local Authority approach and some implications for Central Government", Wellington, NZ. Web <http://io.ssc.govt.nz/pathfinder/documents/pathfinder-tla.pdf> (accessed 7 May 2006).

Pathfinder Project (2003b) "Guidance on Outcomes Focused Management – Building Block 3: Intervention Logic", Wellington, NZ. Web http://io.ssc.govt.nz/pathfinder/documents/pathfinder-BB3-intervention_logic.pdf (accessed 7 May 2006).

Queensland Treasury (2003) *Managing for Outcomes: Mapping Outputs to Outcomes*, Treasury Office, Brisbane, Queensland. Web www.treasury.qld.gov.au/office/knowledge/docs/manage-for-outcomes/mfo-outcomes.pdf (accessed 7 May 2006).

Ruffner, M. (2002) "Governing for results", paper presented to VII Congreso Internacional del CLAD sobre la Reforma del Estado y de la Administración

Pública, Lisboa, Portugal, 8-11 October 2002. Web
<http://unpan1.un.org/intradoc/groups/public/documents/CLAD/clad0043704.pdf> (accessed 7 May 2006).

Ryan, W. (2005) "COPS and MFO: A presentation to the COPS workshop", powerpoint presentation, Wellington, NZ:
[www.dia.govt.nz/COPwebsite.nsf/Files/Bill%20Ryan./\\$file/Bill%20Ryan.ppt](http://www.dia.govt.nz/COPwebsite.nsf/Files/Bill%20Ryan./$file/Bill%20Ryan.ppt) (accessed 7 May 2006).

Treasury Board of Canada (2005) *Management, Resources, and Results Structure Policy*, Treasury Board of Canada, Ottawa, Ontario, Canada. Web
www.tbs-sct.gc.ca/pubs_pol/dcgpubs/mrrsp-psgrr/mrrsp-psgrr01_e.asp#_ftn1 (accessed 7 May 2006).

Webber, D. (2004) "Managing the Public's Money: From Outputs to Outcomes - and Beyond", paper presented to the New Zealand Association of Economists Conference, Wellington, NZ, 30 June to 2 July 2004. Web
http://www.nzae.org.nz/conferences/2004/5_Webber.pdf (accessed 7 May 2006).