The Dialogue

Leading the conversation

People, Projections and Payments:
A Look at Modern Government Service Delivery

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The Dialogue is a series of papers written by actuaries and published by the Actuaries Institute. The papers aim to stimulate discussion on important, emerging issues.

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The role of Government in the welfare of Australia's population is pivotal and far reaching.

1 Executive Summary – Key Points

- **Government has had the primary role for providing services such as justice, income support, public housing, healthcare, education and child protection services for decades. These services represent roughly a fifth of annual GDP (over $300b per year) and contribute heavily to the population's overall wellbeing. But changes such as fiscal pressures, heightened expectations on measurement and improved longitudinal data mean that there is pressure to improve the effectiveness of these services. This means both ensuring the programs are delivering meaningful improvements in people's lives and improving cost-effectiveness. We see this occurring through better targeting, earlier intervention and the use of innovative funding mechanisms.**

- **Case studies show the increasing sophistication of some government services and how this can be used to improve services for users and investing in people early to both improve their pathways and generate longer-term savings for government. Actuaries have had a role in driving data analysis and informing policy.**

- **Progress will continue inexorably, but there are clear opportunities to accelerate improvements. These opportunities include improved data linkage, better outcomes data collection, tackling fragmented services and pushing for transparency when evaluating programs. This all needs to happen in a way that respects people's privacy and builds trust with the community.**

- **These improvements, while delivering better outcomes for recipients, will also cut government expenditure. Combined government spending across welfare, housing, healthcare, justice and child protection can easily amount to $500,000 - $1,000,000 per person over a lifetime for vulnerable groups in the community. Moderate gains that lead to improved pathways would result in annual savings to government budgets that would be measured in the billions. Most importantly, a large portion of the savings come from better outcomes for individuals who move back into active employment and have better options for a fulfilled life.**

2 Background and recent trends

Government plays a significant role in securing the population's welfare. Income support, the justice system, public housing, healthcare, education and child protection are all areas where we have asked government to assume responsibility for improving the care of our most disadvantaged citizens.

Some government spending programs are new – for example, the rollout of the National Disability Insurance Scheme represents an important new support mechanism for disabled Australians. However, most of the systems listed above have endured for decades in a recognisable form. The age pension was introduced not long after Federation. Other key elements of the Australian 'welfare state', such as income support for single parents and the unemployed, plus the disability pension, were rolled out in the early 1940s, and these supports remain today. Similarly, public housing expanded rapidly in the two decades after World War II and the policies driving the system have changed little.

This stability in the provision government services has done much to address the needs of the poor and vulnerable in society. But the world has not stood still; in recent times there have been some very significant changes that have profound implications for government services.

1. **Better data:** Computerised management systems for many government services have led to significant volumes of administrative data. Moreover, we now have extended longitudinal datasets[1] for services that extend back decades, often to the 1990s. We can use this data to see long-term patterns of service use, including people who repeatedly require support. Moreover, we can see how such behaviours differ by segment; issues such as higher levels of long-term unemployment for Aboriginal and Torres Strait Islanders can only be properly understood when the datasets are collected.

2. **An increasing focus on outcomes:** Many people have recognised that the *amount* of services delivered (e.g. how many cancer patients a hospital treats in a year) is not as important as understanding what *outcomes* are achieved (e.g. how many patients go into remission). A focus on outcomes asks whether a service is genuinely effective in helping people. However, outcomes are usually more difficult to define, and measurement often requires more than standard administrative data. More challenging still is the recognition that equality in service provision does not lead to an equality of outcomes; for instance, children from low socio-economic backgrounds require significantly more support to achieve comparable educational outcomes to children from wealthy backgrounds (Lamb et al, 2015). This focus on outcomes has sharpened government thinking.

3. **Better prediction:** We live in an age where prediction is easier and cheaper (Agrawal et al, 2016). With good data, computers can now make accurate predictions of future outcomes that allow for many input characteristics. We can (probabilistically) predict which jobseekers will find employment quickly, which prisoners will re-offend, or who will end up homeless. This means we can anticipate outcomes, good or bad, rather than just observing them. Such predictions raise ethical issues that must be properly addressed, but most people are comfortable with the idea of providing higher levels of support for those at most risk of poor outcomes.

4. **An increasing appetite to evaluate program effectiveness:** Evaluations have long been a mainstay of government policy, with cost-benefit analysis a proven technique. New programs are more likely to subjected to evaluation, but improved data and prediction can also complement traditional measurement. Knowing about likely long-term impacts from observed changes due to a policy can more easily be factored in and more detailed analysis can give more insight into 'what works for who'.

The amount of services delivered is generally not as important as an understanding of how to achieve relevant outcomes.

1 Datasets where we can track people's repeated service usage over time. So instead of studying the volume of those accessing homelessness shelters, say, we can ask whether people are using the services repeatedly over a series of years.

Government
faces ongoing
fiscal pressures
associated
with an ageing
population, but
other factors
contribute to
rising costs.

5.   **The changing role of the not-for-profit sector:** Before the government took responsibility for services like welfare, health and education, it was charities and other not-for-profit organisations that supported more vulnerable citizens. Their role reduced as government spending increased, but we have seen a reversal of this trend in recent years. Some government services have been outsourced to not-for-profits (and sometimes for-profits too). For example, in 1998 the Federal Government introduced the 'Job Network', a competitive environment where governments would pay third-party providers to assist jobseekers into employment, a service previously provided by the public sector. The program aimed to improve competition and innovation, leading to better outcomes for job seekers. Nowadays third-party providers play important roles including for prisons, homelessness services and public housing (or 'social housing'). This has also led to the increasing professionalisation of many of these organisations, as they scale up to handle larger government contracts.

6.   **Fiscal pressures:** It is well-known that government has long-running fiscal challenges associated with the ageing population; the old-age ratio (the number of people over 65 divided by the number aged 15-64) is currently about 23% whereas in 50 years it will be 38% (AIHW, 2015). However, other factors have contributed to increasing costs to government too.

   • **Welfare:** The rapid growth in the Disability Support Pension (DSP) population up until 2011 (when stricter tests were introduced) has increased long-term welfare costs. Numbers on the DSP rose fourfold to 800,000 over the 30 years to 2011 (McVicar and Wilkins, 2013).

   • **Housing:** The opportunity cost of providing public housing (the difference between market rents and the subsidised rents paid by public housing tenants) has grown tremendously due to fast growth in property rents. Providing housing to those most in need adds to this, as they often earn less and require larger effective subsidies. For example, in NSW in 1960 only 15% of public housing tenants were on government benefits (as opposed to earned wages), compared to 94% today (FACS, 2014).

   • **Crime and justice:** While the incidence of crime has broadly decreased over time, prison populations have not. In Australia the prison population has grown from 26,000 to 40,500 over the decade to 2017Q1 (ABS, 2017), well in excess of the 18% increase in the total population during that time. Courts costs have also increased rapidly over time.

   • **Healthcare:** Cost inflation pressures in healthcare are well-known. Substantial increases in spending are due to a combination of growing costs and increasing community health expectations. Healthcare inflation has consistently run at 2.5% above CPI for decades (Miller, 2016).

All these factors mean that governments are faced with the need to increase taxes or find ways to improve the cost effectiveness of service delivery.

3 Implications

What do these trends mean for government services?

First, there is more impetus to appropriately target support. There is general agreement that support should be given to those who most need it, and to those who can least afford to pay for it themselves. The welfare system in Australia has a high degree of income and means testing to restrict assistance to those most in need. Similarly, tax rules regarding the Medicare levy and private health insurance rebates have been designed to push wealthier people from the public to private system. Income targeting is useful for controlling fiscal costs, but ultimately has more to do with the allocation of resources rather than improvement in the way a service is delivered.

Second, there's been a push towards prevention programs and measuring the related return on investment. Evidence has been growing that some types of spending can be tied to improved outcomes years later. For example, there is significant evidence that early childhood education improves school performance, which in turn has been strongly linked to higher employment rates and income in adulthood. For governments, this means more tax and lower social security spending. The idea of early investments that produce positive fiscal impacts later has a natural appeal, since it generates both societal benefits and improves the government's balance sheet.

Government needs to target support more effectively, promote prevention programs, and continue to innovate.

Third, there are opportunities to innovate in how services are delivered. Much recent excitement revolves around 'impact investment' where payment levels are tied to the outcomes achieved. The most sophisticated form of this is the social impact bond, where private investors contribute capital and assume the risk of a program's effectiveness; if it succeeds, the government pays investors a higher return, justifiable as the outcomes have led to fiscal savings elsewhere. NSW has the most advanced social impact investment market, with six transactions in the market, managed by the Office of Social Impact Investment. Bonds have also been launched in Queensland and South Australia, with interest shown by other States and the Commonwealth. While there can be complexity in designing these bonds, they can offer private investment in social sector services, risk-sharing of outcomes, and disciplined measurement of the effectiveness of a program.

4 Examples

So what are practical examples of how these ideas are playing out in specific areas?

Income support system

Australia has one of the most sophisticated outcomes-based payment frameworks in the world for employment outcomes and its related use of data. Jobseekers with work requirements are referred to third-party employment service providers. There are separate services for able-bodied jobseekers and those with disabilities (who may have different work requirements depending on their assessed capacity). A large proportion of revenue for these providers is outcome-based; they receive government payments when they place jobseekers in employment. These outcome payments are structured to improve longer-term outcomes:

- The bulk of outcome payments are paid at 12 weeks and 26 weeks after job placement, and only if the employment is sustained. This encourages providers to appropriately train and place jobseekers.

- Outcome payments are larger for jobseekers with greater barriers to employment. Jobseekers are streamed based on their characteristics and allocated to different funding bands. This ensures providers still have an incentive to help those with the largest barriers to employment.

The streaming described in the second bullet relies on good information on barriers to employment. The program is rich in data; jobseekers are interviewed to ascertain their barriers (such as housing instability, education and duration unemployed). Providers must maintain and submit good records to receive payments. As a result, there is high quality data for the program on which to base streaming rules and other policy decisions.

Running a network of employment service providers has its challenges, too. The heavy use of data creates a significant amount of reporting, which can be viewed as a burden. There is also a need for assurance activity to ensure that services being delivered to jobseekers are at standard. Also, there will always be a tension between the right balance of carrots (e.g. payments to help people find jobs, or wage subsidies) and sticks (e.g. work for the dole, or benefit suspensions for failing mutual obligations) in the design of active labour market programs.

Another trend in income support systems is the adoption of an 'investment approach' – an approach that applies to government services generally but is most prominent in income support. This takes a long-term view of future welfare spending for an individual or cohort and then tries to generate longer-term savings using shorter-term investments. In New Zealand, this approach and related reforms have reduced working-age future benefit costs by 14% over six years (Greenfield et al, 2017). This translates to 0.6m fewer years on benefit, reflecting more people in jobs and earning higher incomes. Some of this saving has also been re-invested to increase benefit rates more than the usual CPI-related increases. This approach has also been adopted in Australia following the McClure review (McClure et al, 2015). The 2017 valuation report[2] shows a future welfare system cost of $4.7 trillion for the current Australian population, with rising costs driven by growing numbers of age pensioners.

Public housing

Rising housing costs in our cities have significantly increased the pressure of housing support, particularly public housing. Public housing[3] is particularly amenable to long-range analysis, since the duration of tenancies in housing tend to be long and ongoing costs high. The New Zealand investment approach to social housing demonstrates some of the types of analysis that are possible (Greenfield et al, 2015):

Rising housing costs have increased the pressure on housing support.

2 https://www.dss.gov.au/sites/default/files/documents/06_2018/j17_valuation_report_final_0.pdf

3 Sometimes called social housing, to recognise the role of non-government providers.

- There is a notional potential saving for households that have more bedrooms than they need. This often occurs when adult children leave the household, or because the property was larger than needed initially. In New Zealand's case, the theoretical saving from 'right-sizing' public housing is larger than the long-term cost of providing additional housing places for everyone currently on the waiting list. The renewal of public housing stock through rebuilds and the buying/selling of vacant properties can improve the match between houses and households.

- There are often regional imbalances. In some places, less disadvantaged people can be housed in vacant properties while more disadvantaged people have longer waits in other regions. Better targeting of new property locations, informed by an understanding of public housing demand, can ameliorate this issue.

- With average public housing durations measured in decades, there is also a recognition that there may be better options for people with a genuine but temporary housing need. New Zealand has invested heavily in emergency and transitional support for such households, which can also reduce long-term fiscal costs.

Justice

Policing, courts and corrections can all benefit from analytics and long-term predictions. For courts, the progression of a case through the court system can be predicted in ways so that courtrooms are used more efficiently. For corrections, prediction models of recidivism are already used in many jurisdictions internationally to help inform parole decisions.

More broadly, criminal offending is highly concentrated amongst a small fraction of the population. One Swedish study found 1% of the population accounted for 63% of violent crimes (Falk et al, 2014). Identification of these repeat offenders, particularly those predicted to be at high risk of future offending, enables better and earlier support, such as mental health or substance abuse assistance. Again, such programs are designed with the goal of improving outcomes (lower reoffending, better employment and housing opportunities for ex-offenders) and reducing future justice sector costs; a win-win for society and government.

5 Priorities for government

Many of the changes described above are almost inevitable; our ability to better design and manage services based on improved data and measurement is appealing to most governments. However, there remain some challenges for government to manage and overcome. Efforts in these areas will allow more and better analysis to be done in coming years.

Linkage and collaboration

A natural direction to improve the delivery and coordination of services is via data linkage. There is a growing body of evidence that poor outcomes across sectors tend to be concentrated on the most disadvantaged in society; for example, those with high income support needs might also have higher criminal offending rates. While not surprising, the ability to establish the degree of this concentration and design policy responses is limited by the ability to link individuals across government administrative datasets. Improved procedures (both technical and governance related) will enable more of this type of research.

The limited ability to link individuals across datasets hampers improved procedures and research.

In New Zealand, the Integrated Dataset Infrastructure (IDI), run by Stats NZ, is a central repository for linked data. A large collection of datasets spanning government is regularly updated and centrally linked, which improves the quality and timeliness of linkage while also reducing duplication of effort. This has tremendously simplified cross-sectoral research while maintaining strong privacy protections.

In Australia, data linkage remains more piecemeal. A key stumbling block is the State-Commonwealth divide, with significant procedural barriers to linking together relevant data. This is a challenge since many social sector areas span Commonwealth and State support; health, housing, education and disability support are prominent examples.

Broadening outcome collection

The information that is measured best is typically the information needed to administer a program. For instance, payments are typically captured and monitored. However, this means that events that are important in understanding people's outcomes are often not collected if they aren't needed for administration purposes. For example, knowing people exit a public house is important administratively, but doesn't automatically tell you if this was a good outcome (like buying their own home) or a poor one (like going to prison). The most common type of gap is what happens to people after they leave a service. Do people who have a hospital procedure make a full recovery? Do people leaving homelessness shelters have stable accommodation? Do children exiting foster care find appropriate education and employment pathways?

Most government departments are aware of the need for better outcome data, in some cases baking this collection into program design. However, in other cases such collection is viewed as an unnecessary expense that uses up limited resources. While cost is always a tension, the value of such collection to policymakers is tremendous.

Rethinking fragmented systems

The current design of some sectors depends on the historical development of programs and would not necessarily be the way you would design them from first principles. For example, in NSW there are at least six types of housing support available:

- Assistance from a non-government specialist homelessness service
- NSW Government temporary accommodation support
- NSW Government private rental subsidy
- NSW Government social housing
- NSW Government affordable housing programs
- Federal Government Rent assistance

All these programs provide very important housing support and typically assist different cohorts of need. However, having a large number of programs creates the challenge of ensuring people do not fall through the cracks, and makes it difficult to judge how well targeted housing support is.

Major reform is sometimes warranted but can be costly and risk people falling through the cracks who were previously supported; another option is better collaboration and undertaking person-centred (as opposed to program-centred) research and analysis.

Accountability and transparency

A continuous challenge for government is finding an appropriate level of transparency in their management of programs. Political risk aversion is natural but means that good analysis is often not published; this is a loss to the broader community of social sector providers and researchers.

This challenge is amplified when governments are properly measuring the effectiveness of policy changes; not every policy experiment will be successful, which means that publishing an evaluation will open the government up to criticism and reduce the likelihood of it trying new things.

I believe we should not be afraid of the truth. We should aim to have mature and informed debates about policy, which in turn relies on governments to trust the public with reports that deal with complex issues. Greater transparency provides accountability to government and allows non-government players to better contribute to the sector.

Privacy and governance

Finally, privacy will always be a key concern when applying increasingly sophisticated analytics to data. It also does not take much to break faith with the broader community; a few high-profile privacy failures could easily set back analytics progress for years. For this reason, we need to be good stewards of data, and be sensitive to the reasonable community expectations. This includes ensuring that:

- Personal data is protected, and deleted from analysis datasets when not needed
- Re-identifiability risks are minimised
- Reporting is done in a way that protects privacy
- Computing facilities are secure and only accessed with a clear governance framework
- Appropriate safeguards are in place to vet those accessing sensitive data.

Happily, much progress is being made. The IDI in New Zealand offers very high privacy protection, appropriate given the large amount of data that is stored. Comparable secure platforms have been developed for Australian contexts too, such as the Australian Bureau of Statistics' Datalabs, the Sax Institute's SURE environment and NSW's Data Analytics Centre.

The processes and governance considerations are important. A clear application process is needed for projects that access individual-level data, but the process needs to be balanced against being overly rigid or time-consuming.

In the current environment so much data is readily collected and can provide opportunities for deep analysis. Governments must commit to developing the right framework to safeguard privacy but must also work to link data sets in a way that most helps those in need.

Data privacy is a key concern for the broader community and faith in data security can be quickly eroded.

6 Conclusion

Government service delivery covers a wide range of programs with different challenges and different levels of maturity in their use of data and prediction. However, there is a clear trend towards sophisticated analysis to enable these services to be delivered better. Data and models will play an increasingly important part in how programs are targeted, measured and assessed for effectiveness. The large amount of money being spent plus the significant potential impact on people's lives, means that even incremental improvements in government services will yield substantial benefits over time.

Governments must improve their ability to target recipients, intervene earlier and use innovative funding mechanisms to support on-going programs. Improving services for users and investing in people earlier will result in better outcomes for those in need of support and generate long-term and possibly large savings for governments.

These goals will only be met with stronger and better links between data sets already collected by State, Territory and Commonwealth authorities, a concentration on outcomes, and transparency when it comes to evaluating programs.

References

Agrawal, A., Gans, J., & Goldfarb, A. (2016). The simple economics of machine intelligence. *Harvard Business Review,* 17.

Australian Institute of Health and Welfare (2015). *Australia's welfare 2015*[4] .
https://www.aihw.gov.au/reports/australias-welfare/australias-welfare-2015/notes

Australian Bureau of Statistics, (2017). *Corrective Services, Australia*, cat. no. 4512.0,
http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4512.0Main+Features1September%20quarter%202017?OpenDocument

Department of Family and Community Services (2014). Social Housing in NSW: A discussion paper. *Department of Families and Community Services, NSW Government.*
http://www.facs.nsw.gov.au/__data/assets/file/0009/303030/Social-Housing-in-NSW_Discussion-Paper.pdf

Falk, Ö., Wallinius, M., Lundström, S., Frisell, T., Anckarsäter, H., & Kerekes, N. (2014). The 1% of the population accountable for 63% of all violent crime convictions. *Social psychiatry and psychiatric epidemiology*, 49(4), 559-571.

Greenfield, A., Miller, H., Wolanski, K. & McGuire, G. (2015). Baseline valuation of the social housing system. *Prepared for the Ministry of Social Development, New Zealand.*
http://www.msd.govt.nz/documents/about-msd-and-our-work/publications-resources/evaluation/social-housing-valuation/2015/2015-social-housing-valuation-report.pdf

Greenfield, A., Miller, H., McGuire, G. & Dixie, L. (2017) Annual report on the Benefit System for Working-age Adults. Available at
https://www.msd.govt.nz/about-msd-and-our-work/publications-resources/evaluation/annual-report-of-the-benefit-system-for-working-age-adults.html

Lamb, S., Jackson, J., Walstab, A., & Huo, S. (2015). Educational opportunity in Australia 2015: Who succeeds and who misses out. *Mitchell Institute.*

McClure, P., Sinclair, S., & Aird, W. (2015). A new system for better employment and social outcomes. *Report of the Reference Group on Welfare Reform to the Minister for Social Services.*

McVicar, D., & Wilkins, R. (2013). Explaining the growth in the number of recipients of the Disability Support Pension in Australia. *Australian Economic Review*, 46(3), 345-356.

Miller, H. (2016). The rise and fall of inflation indices. *General Insurance Seminar*, November 2016.
https://www.actuaries.asn.au/Library/Events/GIS/2016/HughMillerPaper.pdf