The Dialogue

Leading the conversation

Private health and health care financing

– Learning from the world

Josefa Henriquez, Andrew Matthews, Francesco Paolucci and Adam Stolz

Actuaries Institute

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About the authors

Josefa Henriquez BSc Economics

Josefa is an economist currently working at the University of Bologna in Italy on the European Horizon 2020 funded MCDS Therapy economic research group. She was formerly an advisor in the Minister's Cabinet at the Ministry of Health of Chile, where she focused on the development of the health insurance reform act. Josefa's research has concentrated on health economics and she recently contributed to the publication of the Chilean chapter of the book 'Risk Adjustment, Risk Sharing and Premium Regulation in Health Insurance Markets' 2018, Elsevier.

Andrew Matthews FIAA, BCom, MSOD, GAICD

Andrew is an Associate Professor at Monash University, a Director of The Stroke Foundation, currently Chief Actuary of Medibank Private and soon to join Finity Consulting. His main focus is Health Insurance. Andrew is a Fellow of the Actuaries Institute. He also has a Master's in Organizational Development (MSOD) with Pepperdine University in California, USA – a leadership program in the art and science of strategic change and building organizational capability. Andrew's experience spans corporate, consulting and education.

Professor Francesco Paolucci PhD Erasmus

Franceso is Professor in Health Economics in the Newcastle Business School at The University of Newcastle in Australia, and at the School of Economics, Management & Statistics, University of Bologna in Italy. A scholar and advisor, over the last decade he has published extensively in the areas of public policy, economics and management with a particular focus on healthcare nationally and internationally. Some of his published work includes one single authored book, three edited special issues in peer reviewed journals and 55 academic peer-reviewed articles. In 2016 he received a '40under40' Business News award in WA for his entrepreneurial and business leadership. Francesco is a permanent member of the Risk Adjustment Network, which is the leading network in health insurance and financing research and advisory globally, and the country representative for Australia.

Adam Stolz FIAA, BComs (Hons), GAICD

Adam is a senior actuary with broad experience in health insurance, life insurance and retirement savings, in Australia as well as internationally. Adam is currently Deputy Chief Actuary and General Manager Pricing at Medibank, and has previously worked with AIA and AXA in France and the US. Adam has a passion for customer-orientated innovation in the health and insurance sectors.

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Executive summary

The purpose of this paper is to explore private health: how is it financed, whether it meets the needs of Australian consumers, and where there may be areas of potential reform worth further investigation. We use international comparisons to inform the discussion. The paper builds on the recent Green Paper of the Actuaries Institute (released in June 2019).

Key findings are:

- Australia's health care system compares favourably to other developed countries. Nonetheless, there are areas for improvement, such as for specific segments of the population (including Aboriginal and Torres Strait Islander people) and for people requiring services such as mental health. Further, Australia's high out-of-pocket expenses and health cost growth suggests a need to review the health system to ensure sustainability for future generations.

- The Actuaries Institute Green Paper evidenced an ageing population, more people with long term chronic diseases, advancements in healthcare and costs increasing above wages growth.

- The UK, Germany, Netherlands and Chile are comparison points regarding the structure, financing, premium setting and risk equalisation. The intention is not to find a perfect system but rather seek possibilities to adapt to changing needs and improve the Australian system.

- From our assessment of international systems, three considerations stand out for further investigation:

  1. ***Better integrating public and private systems:*** Clarifying the fit of private health insurance with public health insurance (Medicare) and the impacts on provision.
  2. ***Risk adjusted rebates:*** Enabling funding to follow patient needs across the health system rather than only within private health insurance. Prospective risk equalisation across the health system (public and private) is used in other systems to achieve this.
  3. ***Community rating:*** Leave it alone for now. Changing community rating is not a first order priority but may be in future if participation of the young and healthy continues to decline. In the countries reviewed there is often a form of community rating combined with some partial risk rating.

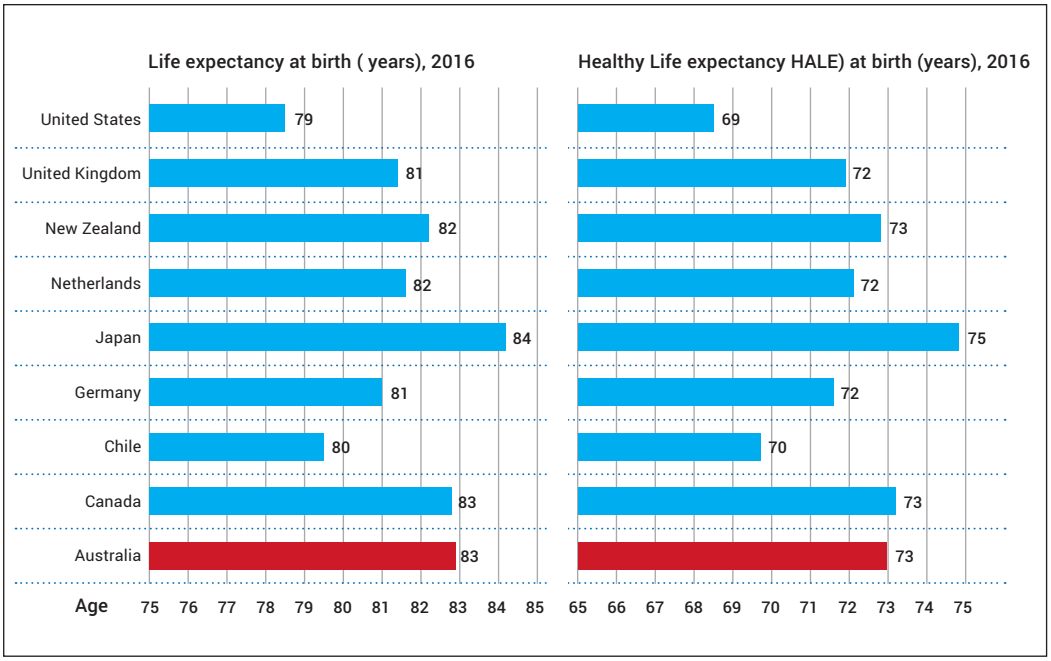
If we don't commit the time and effort to adapt our system, using considerations such as above, we risk ending up with a system that does not reflect Australian values.

1. Australia's health system – Global comparisons

1.1 Health outcomes

Australians are healthy, and our health care system performs well by international standards on many measures. This is reflected in the relatively high life expectancy, and healthy life expectancy[1], which respectively, reach up to 83 and 73 years old, being one of the highest after Japan (Figure 1). Noting the limitation that such outcomes only in part depend on health care services.

Figure 1: Life expectancy



Source: World Health Organization (2016)

However, the experience in Australia is worse for indigenous communities (as shown in Table 1).

Table 1: Life expectancy at birth (years) comparison between Indigenous and non-indigenous

	Indigenous		Non-indigenous		Indigenous life expectancy gap (years)	
	Males	Females	Males	Females	Males	Females
2005-2007	67.5	73.1	78.9	82.6	11.4	9.6
2015-2017	71.6	75.6	80.2	83.4	8.6	7.8

Source: Australian Bureau of Statistics (2013 and 2018a)

The gaps are significant and would be even worse when comparing individual treatment journeys and access to care - the way such people experience the system is vastly different to other Australians. This illustrates while the system performs well there is a need for improvement.

1 Life expectancy: Average number of years that a newborn is expected to live if current mortality rates continue to apply; Healthy life expectancy: Average number of years that a person can expect to live in 'full health' by taking into account years lived in less than full health due to disease and/or injury (World Health Organization).

Our health care system ranks well internationally and represents roughly 10% of the economy (slighter larger than the OECD average).

1.2 Health care system performance

Based on the Commonwealth Fund report (The Commonwealth Fund, 2017), Australia ranks in the Top three health care systems, with the UK and Netherlands (Table 2).

Table 2: Health care system performance ranking

	AUS	CAN	FRA	GER	NET	NZ	NOR	SWE	SWI	UK	US
OVERALL RANKING	2	9	10	8	3	4	4	6	6	1	11
Care Process	2	6	9	8	4	3	10	11	7	1	5
Access	4	10	9	2	1	7	5	6	8	3	11
Administrative Efficiency	1	6	11	6	9	2	4	5	8	3	10
Equity	7	9	10	6	2	8	5	3	4	1	11
Health Care Outcomes	1	9	5	8	6	7	3	2	4	10	11

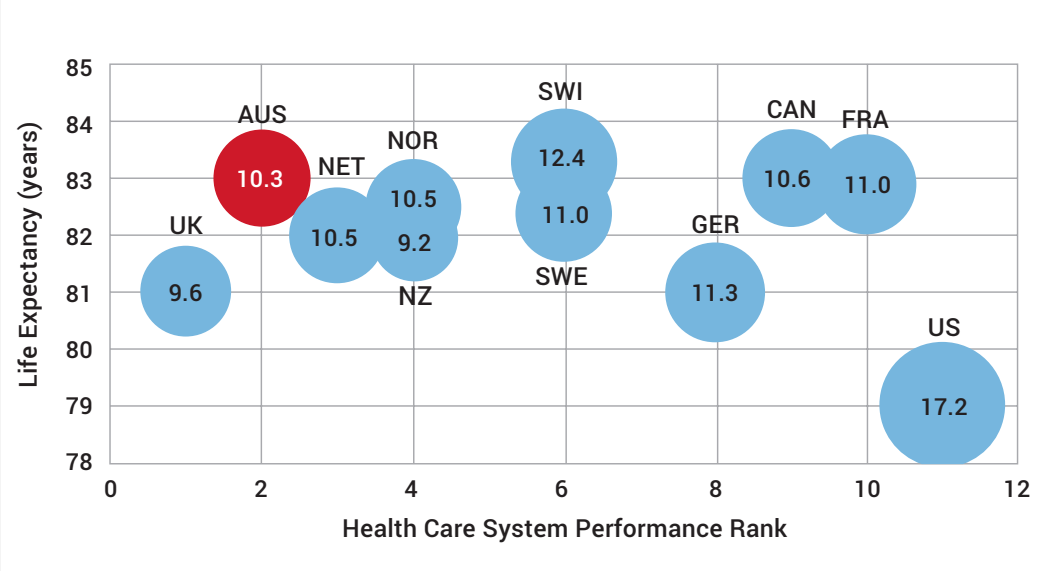
Source: The Commonwealth Fund (2017)
Note: AUS=Australia, CAN = Canada, FRA = France, NET = Netherlands, NZ = New Zealand, NOR= Norway, SWE = Sweden, SWI = Switzerland, UK = United Kingdom, US = United States.

The Netherlands and UK rank strongly on equity and may offer opportunities for enhancements to the Australian system.

1.3 Health care funding

The Australian system is a universal mandatory national scheme (Medicare) with financing and stewardship fragmented between Commonwealth, State and Territory governments and private insurers (voluntary PHI). Individuals also contribute through taxation, and a Medicare Levy, Medicare Levy Surcharge and out-of-pocket expenses. Health care is roughly 10% of the economy (10.3% of 2016-17 GDP[2]). Expenditure in Australia is above the OECD average of around 9%, in line with the UK and lower than countries such as the US, Germany, and the Netherlands.

Figure 2: Health care system comparison – Outcomes vs. costs



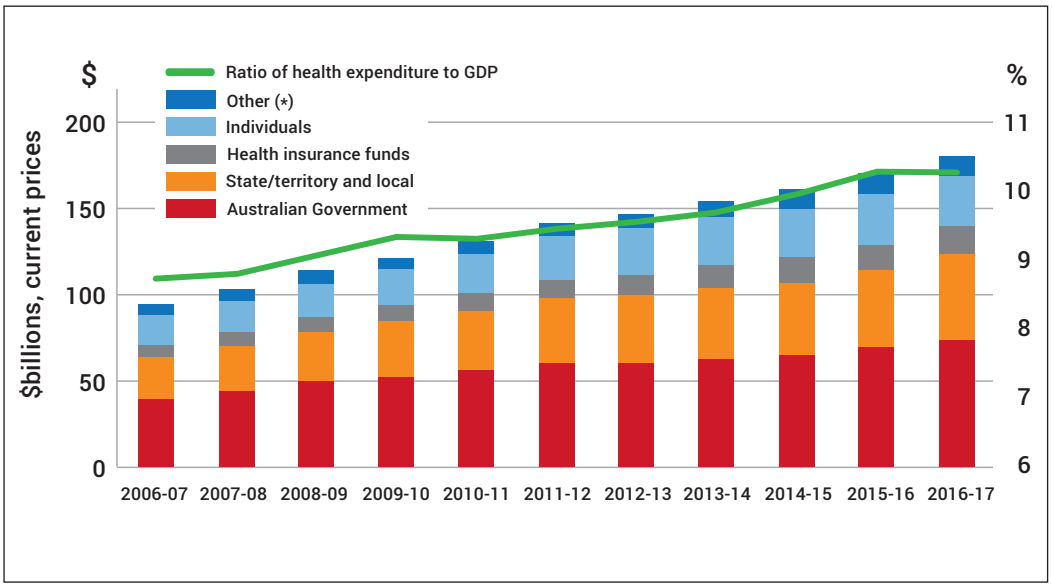
Note: The bigger the bubble the higher proportional GDP spend on health care
Source: World Health Organization (2016), The Commonwealth Fund (2017), OECD (2017a), AIHW (2018)

2 Health care over GDP was the same figure for the period 2015-16. Health care financing estimates in both AIHW and OECD reports exclude all expenditure for residential aged care facilities in welfare (social) services.

Australia currently performs well against other developed countries in terms of the cost to the system (where the size of the bubble indicates the proportion of GDP spent on health care) compared to the outcomes generated. The latter being contextualised by life expectancy and the Health System Performance ranking (Figure 2). A complicating factor in these comparisons is aged care[3] related health costs, as for the Australian system these are excluded from the estimations. This likely underestimates the figures when comparing to other countries. ACFA (2018) reports for 2016-17 period $17.5b in aged care financing by the government, and $4.8b by consumers, which would increase the proportion of GDP spent of health care by 1.26 percentage points. The chart indicates that whilst a range of non-health system factors influence a country's performance on life expectancy it is important to focus not just on total funding but also that funds are spent efficiently.

Health care cost increases have been one of the areas of concern and focus for many health systems around the world. Australia is no exception (see Figure 3). Health care expenditure is on a rising trend (nearly doubling from $95b to $181b in the period 2006-07 to 2016-17; AIHW, 2018). Even after adjusting for inflation and population growth this reflects a 33% increase in per capita costs over the period (AIHW, 2018). The 2015 Intergenerational Report (Commonwealth of Australia, 2015) estimates that the Commonwealth's real health expenditure (per capita) will more than double by 2055.

Figure 3: Australia's health care expenditure by source of funding (LHS) and ratio to GDP (RHS)



Source: Own elaboration based on AIHW (2018)
Note: (*) includes funding by injury compensation insurers and other private funding. All non-government sector capital expenditure is also included here

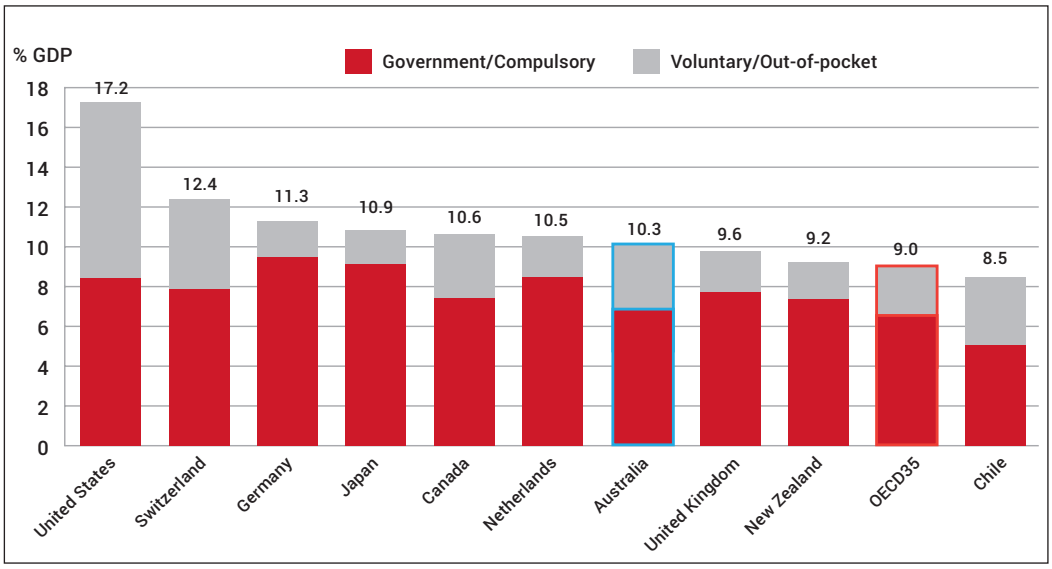
The overall funding shares by different players have remained stable over the past 10 years. In 2015-16 the ratios were: 41% Commonwealth Government, 26% State and Territory governments, 9% private insurers, 17% individual out-of-pocket expenses and 7% other (Figure 3, AIHW, 2018)[4].

There is concern about health care expenditure growth not only in terms of the total amount of funds spent on health care, but also to the funding from various sources. PHI is a voluntary product offered in Australia that removes a servicing burden from the public sector. PHI members can access private facilities for procedures and cover while still contributing to Medicare via taxation. Another important funding component is the proportion spent directly on health services by the population from their own pocket on top of voluntary PHI benefits or in their absence. In an international comparison the share of funding from individuals through out-of-pocket (OOPs) expenses is relatively high in Australia

3 Aged care includes residential care, home care and support, flexible care, workforce and service improvement, assessment and information services.
4 Some differences between OECD data and AIHW arise from differences in definitions which can be found in the respective reports.

(Figure 4). If one looks at just the Government funding in isolation, Australia is similar to countries like New Zealand and Canada. But when also including the compulsory cover products, the share of funding from compulsory funding mechanisms like Government sources and compulsory health insurance may be low compared to other developed countries like Canada, the Netherlands and the UK.

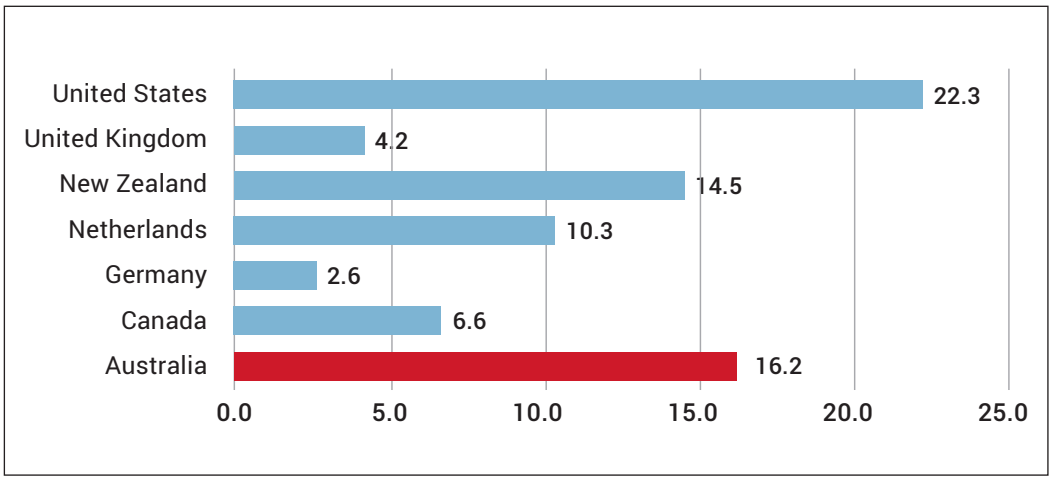
Figure 4: Health care system expenditure as a share of GDP (2016)



Source: OECD (2017a)

A significant level of OOP funding for health care is prone to produce a reactive rather than a preventative health care system. It also undermines care integration and cohesion leaving many with gaps in accessing essential care. The OOP payments often relate to cover gaps/bill shock experienced by those that have PHI. The estimate for Australia of 17% of health care expenditure coming from individual out-of-pocket expenses may well be an underestimate. The high level of out-of-pocket expenses in Australia may be limiting access. This may be contributing factor to a relatively high proportion of Australians reporting they have skipped a medical consultation due to cost (16.2% compared with the OECD average of 10.5%, OECD, 2017a) (Figure 5).

Figure 5: Consultations skipped due to cost (2016 or nearest year)

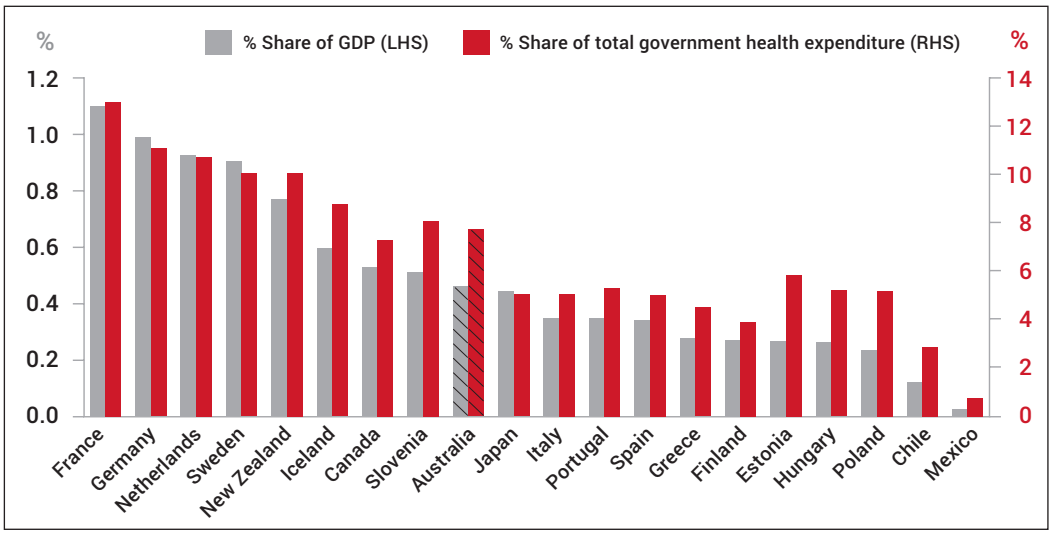


Source: OECD (2017a)

Missed consultations can lead to the aggravation of a condition potentially leading to serious health events in future. This is especially true when considering the long-term impact and management of chronic conditions like diabetes.

There are significant gaps in Australia's level of funding for some services compared with other international health care systems. An important example is mental health which has a big burden in working age populations. Nearly half of all Australians are expected to experience a mental health related illness in their lifetime (Black Dog Institute, n.d.). Further, research indicates that more than half of people with mental illness do not access treatment. While there are several reasons, the cost of treatment and the lack of funding would be contributors. Government expenditure in this area is moderate by international standards (more up to date comparative data is not readily available).

Figure 6: Government expenditure on mental health services — International comparison selected OECD countries, 2011



Source: Productivity Commission (2019a)

1.4 Rising health expenditure drivers

Health care expenditure is projected to continue growing at strong rates in excess of inflation due to several factors, including sustained low fertility and increasing life expectancy. The Australian population is ageing with the Australian Bureau of Statistics (2018b) stating "over the 20 years between 1998 and 2018, the proportion of the population aged 65 years and over increased from 12.2% to 15.7%. This group is projected to increase more rapidly over the next decade, as further cohorts of baby boomers turn 65 years of age". The average cost for hospital admissions is over 4x higher for the population aged over 65 years than under 65 years (AIHW data 2012-13). This trend also impacts aged care spending by government, having increased more than 23% for the period 2012-13 to 2017-18 (Productivity Commission, 2019b).

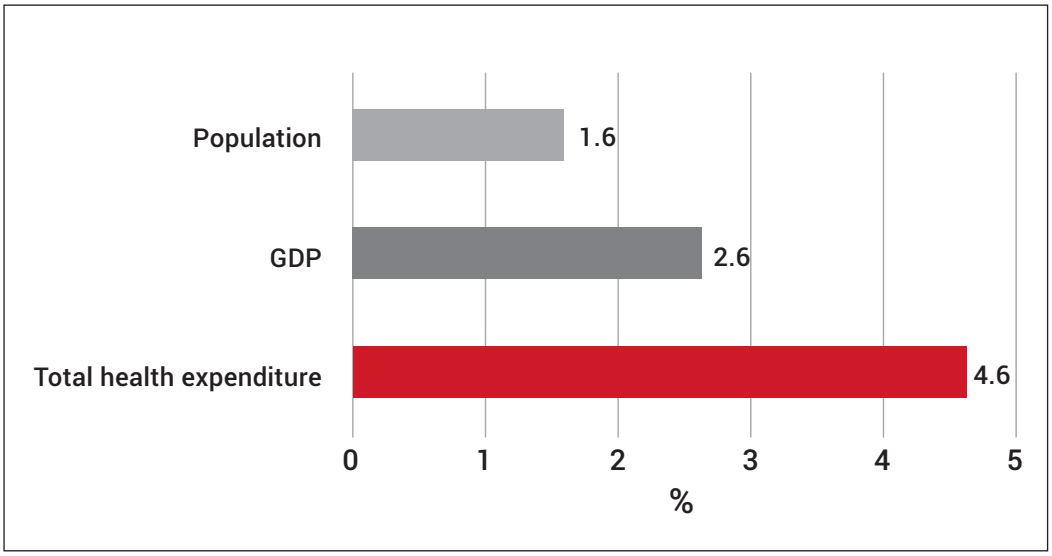
Even if Australia is a country where people live longer than in most developed nations, results for risk factors such as smoking and obesity are mixed. While few Australian adults smoke (12.4%, among the lowest in the OECD), a relatively high proportion are overweight or obese (27.9%, the fifth highest in the OECD and above the average of 19.4% (OECD, 2017b)). Additionally, half of Australians have at least one of eight common chronic conditions[5] which require intensive high cost care (AIHW, 2017).

As a result, over time total health care expenditure has been increasing by 2 percentage points higher than GDP (4.6% compared to 2.6%, Figure 7). The average population growth of 1.6% (2006-2017) is shown as just one contributor to total growth.

5 Arthritis, asthma, back pain and problems, cancer, cardiovascular disease, chronic obstructive pulmonary disease, diabetes and mental health conditions.

Health care expenditure is projected to continue to grow in excess of inflation as community needs grow.

Figure 7: Growth rate of population, real GDP and real health expenditure (2006-07 to 2016-17)



Source: AIHW (2018)
Note: Real growth is growth at constant price terms, i.e. in excess of inflation.

Of interest would be a comparison between PHI premium increases and Medicare per capita costs. Preliminary analysis of AIHW data indicates it is likely PHI premium increases are of a similar order as Medicare 'proxy premium' increases though noting that sectors cover different risks and people. This is an area for potential further development.

2. Australia and international case studies

2.1 Overview

The table below illustrates how Australia compares to other developed countries in terms of life expectancy at birth (as an easily relatable and comparable measure of health outcomes), the cost to the population, and how it is funded.

No one system is perfect. The best format will be the one that is going to be able to adapt to changing needs and improvements.

Summary box 1: Health system snapshot

Country	Life Expectancy	Health Cost as % GDP	Health Cost Real Growth %	Public/ Private	Premium Structure
Australia	83	9.6%	2.7%	Government + Private HI	Taxation Community Rating
UK	81	9.7%	0.9%	Government Single Payer	Taxation
Germany	81	11.3%	1.8%	Mandatory Insurance (Statutory + Private HI)	Employee-Employer Income related Risk Rating
Netherlands	82	10.5%	1.0%	Mandatory Insurance	Employer income related Community Rating
Chile	80	8.5%	5.9%	Mandatory Insurance (Government + Private HI)	Income related Community + Risk Rating

Source: Authors own and World Health Organization (2016), AIHW (2018) & OECD (2017a).

2.2 What can we learn?

In contrast to the Australian health system, each international case study (described in detail in the Appendix) provides a reference point for potential enhancements outlined in the following ways:

- **UK:** a strong National Health Service (NHS) system provides a scenario if private health insurance was minimised and government would take over financing and commissioning of provision of services. Risk equalisation is present to assign resources in an equitable manner. While this single payer system has benefits of efficiency, other problems have emerged that are not observed in Australia's mixed public-private delivery model for health services, especially relatively poor performance on health care outcomes (see Table 2). Like many other markets, including Australia, the UK system is also struggling to adapt to the impact of ageing and elderly population growth.

- **The Netherlands:** offers insights on an integrated system with a mandatory competitive scheme, and a risk-based subsidisation scheme. In Australia, the National Health and Hospital Reform Commission (2009) indicated the long run model of preference to be competitive integrated national insurance with risk adjusted subsidies, in line with the Netherlands.

- **Germany:** sets out an option where individuals can opt out of the mandatory scheme to receive private cover. The private scheme has some risk-rating to improve selection effects. The German statutory system enables strong competition between funds with prospective risk equalisation.

- **Chile:** is a system where there is a strong public-private mix with no duplication. A small risk equalisation scheme is present, based on age and gender. If applied in Australia, individuals could choose either Medicare or PHI, while the Medicare Levy Surcharge could be collected in a common fund between PHI and Medicare to re-distribute resources using risk-based subsidies.

These countries have been taken as benchmarks because they share several common features with Australia, with comparable policy implications and future challenges. These countries can be compared for: the level of health expenditure; the out-of-pocket and services included in the cost-sharing design; and the health status of their population. As noted earlier, the recent Commonwealth Report had the Netherlands, UK and Australia as the three highest rated systems. As authors, we were able to draw on involvement in a recent study that compared over 10 other countries (McGuire & van Kleef, 2018).

No system is put forward as perfect and the key is learning from other systems. Many of the systems that perform well are structurally quite different. This prompts the idea of not being married to a single correct system but rather one that is able to adapt to changing needs and improvements.

2.3 Premium setting and risk equalisation: efficiency vs affordability

PHI in Australia is questioned for affordability and complexity. This has led to a decrease in participation, especially by the young and healthy who benefit the least in community rating[6].

PHI industry reforms commenced in April 2019 are intended to address some of these issues. These reforms allow insurers to offer age-based discounts to 18 to 29-year olds[7], offer lower premiums for an increase in hospital excess levels to $750, and give effect to Gold/Silver/Bronze/Basic product categories and standardised clinical categories (The Department of Health, 2018).

6 Low risk individuals are disincentivised given their expected claims are below the price.

7 In order to effectively sustain cross subsidies in the market, low risk individuals are needed. Several measures to improve this have already been put in place over a number of years (e.g. premium rebate, lifetime health cover loading, youth discounts and lower premiums for benefit exclusions and excess payments).

Based on international case studies, two other areas of reform which could lead to an improved uptake of the young and healthy while maintaining premium affordability are, first, the link between premium setting and risk equalisation and, second, the use of the latter tool to re-distribute subsidies. In essence, this would be a further evolution of how the principle of community rating is given affect in Australia.

In a free market environment, insurers can charge premiums based on the likelihood and amount of claims (expected claims) for each type of policyholder. The expected claims generally increase with certain risk factors like age, gender and health status, as do premiums. Therefore, older consumers with pre-existing conditions (Group A) are more likely to pay higher premiums than younger consumers with no pre-existing conditions and low risk behaviours (Group B). In this context, premiums are risk-rated. Another consequence is that consumers in Group A (higher risk persons) with low income may be unable to afford and access basic health insurance without external intervention. Risk rated premiums are often also accompanied by exclusions of pre-existing conditions. In this sense even when a person in Group A is willing and able to pay the higher risk rated premiums, they still may not be given access to funding for certain benefits owing to these being pre-existing at the time of taking up the policy. This is relatively common in the US private health insurance market. No countries operate a completely free market environment for health insurance.

In their social health insurance systems, Dutch and German insurers can risk rate their premium in case of supplementary private health insurance but not basic and statutory insurance. Private insurers in Chile also risk rate their premiums but not their public insurance where contributions are income related.

Countries like Australia, Germany, the Netherlands and Chile rely on community rating to limit the variation in premiums with the objective of achieving the same price for consumers with different risks (McGuire, et al., 2013) through cross subsidies from low risk to high risk consumers. The pooling of different risks priced equally creates groups of predictable profits and losses, which generate incentives for insurers to risk select (i.e. insurers implementing strategies to not contract with high risk individuals). Community rating of premiums also creates an incentive for policyholders to anti-select (adverse selection) against insurers and only take up cover when they expect to incur a claim.

In order to counteract these incentives, some type of equalisation is implemented. (In Australia this is through *retrospective* claims cost equalisation; in some other countries such as the Netherlands,

Germany and Chile it is *prospective* risk subsidies.) With equalisation (in any format) an external sponsor (the Fund) intervenes by administering (*claims or risk*) adjusted subsidies in order to compensate insurers or consumers for the lower or higher than average value of claims/risks they incur/accept. A summary of the different risk equalisation and subsidy models is outlined in Summary Box 2 below and Table A.1 in the Appendix.

Summary box 2: Features of the risk equalisation/subsidy mechanisms in selected countries

Countries	Type of equalisation	Risk adjusters	Type of model	Premium setting
Australia	Claims equalisation	Age and high cost claims (between private health insurers)	Retrospective	Community rating (PHI)
Netherlands	Risk equalisation and risk subsidies	Age/gender; diagnostic information from use of prescription drugs; hospital treatments inpatient and outpatient diagnosis from previous year; multiple year high cost; medical equipment; physiotherapy; homecare spending and geriatric rehabilitation, interaction of age with morbidity, region; socioeconomic status; source of income, education, household size.	Prospective	Community rating (basic insurance), and risk rated (supplementary and complementary)
Germany	Risk equalisation and risk subsidies	Age and gender, reduced earning capacity interacted with age and gender, 80 hierarchical morbidity groups, reimbursement groups interacted with age	Prospective	Income contribution (statutory), and risk rated (PHI)
Chile	Risk equalisation and risk subsidies	36 groups of age and gender interaction	Concurrent	Income contribution (public), community rating and risk rated (PHI)

Source: Authors own

Community rating with equalisation measures still leaves space for selection as not all risks are reflected in the equalisation setting (no country has a perfect system). Even countries with a highly sophisticated risk equalisation arrangement, such as the Netherlands, still observe a degree of risk selection (van de Ven, van Vliet, & van Kleef, 2016; van Kleef, Eijkenaar, & van Vliet, 2019).

An alternative approach to achieve affordability (instead of the current community rating with income-based government rebates), while sustaining an increasing uptake by the healthy, is to allow partial risk rating (or 'community rating by actuarial category')[8] but with some support from the government (as a rebate directed on need not income) to enable affordable premiums for high cost individuals.

Such an approach promotes equity by subsidising for those factors on which society wants solidarity. This can be achieved via accounting for support in the rebate mechanism itself and by implementing

8 Term coined by Enthoven (1980) which states that insurers will charge individuals in a same risk group the same premium, but these premiums can differ between the groups.

minimum benefits on applicable packages. This enables a more deliberate distinction as to which risks are shared and which are user-paid (out-of-pocket). Another important feature is that the higher risk customers who attract a rebate (to themselves or to the provider of services) can have funding applied across both the public and private systems (currently the individual would only get subsidised care delivered by a public provider). In international systems this helps ensure resources across the whole health care system are available to respond to consumer needs.

International comparisons encourage thought of the central policy issue of the role for PHI with Medicare.

These international comparisons encourage thought of the central policy issue of the role for PHI with Medicare. A possible optimising step is replacing the PHI rebate and Medicare levy surcharge exemptions with a risk-related rebate. This links the rebate to the savings PHI generates for Medicare and removes complications for members of 'going public' or 'going private', as the fund would pay either way. The rebate involves means testing and age brackets (affecting the size of the rebate from 30 to 40 per cent). This can be an anchor of risk-adjusted rebates and help manage a gradual transition.

2.4 A practical example for learning

To illustrate this, we look at a specific issue of need to expand availability of treatment such as for a person needing mental health services.

Currently, the person would be covered under the public health system if the service were available and there was no waiting list. If the services were not available publicly and the person sought private treatment, no risk funding would follow the patient. Instead, the private health insurers would have relatively high claims costs (equalised across all insurers through the risk equalisation scheme) and/or the patient would have high OOPs.

Under the reforms we suggest above, a risk-based rebate is calculated based on factors such as: age, gender, health condition, co-morbidities, etc. The individual contribution can be capped at a community rating level meaning an individual would not suffer a burden of excessively high cost. Where extra services were delivered by the private sector funding would be available. And if the services moved from private to public the funding would also follow the risk. That is, the provider of services would receive some funding for that service.

What we are advocating is not revolutionary change, but experiments based on what is working elsewhere that enable an innovation on a smaller scale and evaluation of experience and value. There is a risk there will otherwise be no change or adaption. Perhaps, Machiavelli summed it up best:

> "It must be remembered that there is nothing more difficult to plan, more doubtful of success, nor more dangerous to manage than the creation of a new system. For the initiator has the enmity of all who would profit by the preservation of the old institutions and merely lukewarm defenders in those who would gain by the new ones."
> – Machiavelli (1513)

Although Australia's health system compares favourably internationally, there is still scope for improvement, greater fairness and funding efficiencies.

Conclusion

Australia's health system compares favourably to international systems. Nonetheless, there are areas for improvement to remain strong and sustainable for all Australians.

Implications for dialogue and debate:

1 **Avoid any review of Australia's health system being limited to only PHI** – Any review, or series of reviews, must be broader with the objective of improving the overall health system, not just the part that is PHI. Remember what's important – a review of private health insurance in isolation will not meet the objective of improving the health of the nation.

2 **Avoid becoming globally uncompetitive** – Include international learnings in any review of Australia's health system. Informed dialogue includes looking at global systems to discover and act on what exists and works elsewhere that may offer potential to adapt in Australia. We are not saying Australia should adopt an overseas system but utilise insights from overseas to adapt to changing needs and find improvements in the Australian context.

3 **Embrace opportunities to enhance the 'health of the nation' –** Few would disagree that there are many places where the Australian health system can be improved, e.g. indigenous health, remote services, mental health, out-of-pockets. However, an impediment may be finding the funding and hence the need to look globally for efficiencies. Another impediment is the suitability of services offered. Just as lessons on funding can be gained from other systems so to might lessons on health outcomes for disadvantaged minorities.

4 **Risk adjusted rebates are a possibility to explore** – If we agree there are opportunities to enhance our system and assuming some funding constraints, we need to find efficiencies to enable investment in new areas. Improving funding mechanisms is possible with new technology and learning from risk adjusted rebates in overseas health care. That is, not just risk equalisation between PHI funds but also risk adjusted rebates that can enhance integration across the system – public and private.

5 **Initiating for collective action** – To enhance outcomes and efficiency while being people centric requires collaboration across the health network – private and public. It is a long bow to say funding drives outcomes, but funding mechanisms are a catalyst to creating the conditions for better health. Talking of broad system change brings diverse opinions. Many successful change initiatives stem from small actions in an area of need. The challenge is to find ways of catalysing our system so that change acquires a dynamic of its own.

To achieve *optimum health outcomes at an efficient cost*, the crucial capability is not a perfect system (there is no perfect system) but one that is able to adapt to changing needs and continue to improve.

Appendix

i. Australia

Australia has a mandatory national insurance system (Medicare) that interacts with voluntary private health insurance (PHI). Uptake of the latter is broad with 37 competing health funds (APRA, 2018). In March 2019 around 11.2 million (44.2%) residents in Australia held private insurance hospital coverage, and 13.6 million (53.5%) had private insurance general treatment coverage. Studies show an increase of private patients in public hospitals, and even if enrolment is high, the PHI market comprises only 10% of total health care expenditure.

PHI provides hospital cover for when you go to hospital, as well as general treatment cover (sometimes known as ancillary or extras) for ancillary treatment (e.g. dental, physiotherapy). PHI has some fundamental principles that have been in place since its creation, notably open enrolment (funds must accept all customers) and community rating (customers to all pay the same premium for a given level of cover). Community rating leads to cross subsidies between healthier/younger and unhealthier/older customers. To support community rating a risk equalisation scheme was implemented (APRA, 2017). Risk equalisation is in reality a scheme to share claims cost including an age-based fund (providing a subsidy to funds with a higher proportion of claims from older policyholders) as well as a high cost claims pool. In order to incentivise take up of PHI, with the goal to mitigating the fiscal pressure on the public scheme, several subsidies and penalties are in place. These include a Premium Rebate, the Medicare Levy Surcharge and the Lifetime Health Cover loading. In April 2019, a range of new PHI reforms were introduced to improve transparency and affordability, including new product classification, youth discounts and higher excess options.

ii. United Kingdom

The UK organises its health care system based on a National Health Service (NHS) model. Since its foundation in 1948, it has as its main characteristics universality, comprehensiveness of its services and no charge at the point of use. It is financed through general taxation, and co-payments only account for around 1.3% of funding (OHE, 2008).

Demographic change, disease patterns, funding and regulation, have put the NHS in an "existential crisis" (Iacobucci, 2017a). When the NHS was established the population of the UK was 49.4 million (OHE, 2008). Now 69 years later, the population is around 66 million, an increase of 33%. Additionally, the pyramid of population has shifted to include a higher proportion of older people. Treatment for elderly older than 84 years (providing hospital and community health services) is around three times more costly than for a person aged 65 to 74 years (Iacobucci, 2017a).

Changing disease patterns and co-morbidities are also key cost drivers. The Department of Health estimates that long term conditions now account for 70% of total health and social care spending in England. Poor diet has increased obesity and type 2 diabetes (Iacobucci, 2017b).

Additionally, a funding squeeze has put the system under pressure. Cuts to public health services of 6% since the move to local government will continue to increase on average by 3.9% a year and will last until 2020-21 (Iacobucci, 2017c). This tight fiscal management has led to improved control of health costs; however, it has created some problems with increased waiting periods and health outcome indicators.

Risk equalisation (established in the 1970s), 'target fair share' or 'weighted capitation', aims to distribute resources between health care organisations 'to support equal opportunity of access to health services by those with equal needs, and to contribute to a reduction in avoidable health inequalities' (NHS England, 2018). The formula is calculated for variables related to general and acute care, maternity, mental health, prescribing and supply needs (Department of Health, 2011).

iii. The Netherlands

The Dutch health care system has a statutory health insurance system based on principles of regulated competition, where there is a mandate to enrol in one of the private competing funds, which are regulated by the government. The financing of the system comes from three sources: earmarked payroll tax (6.9% contributed by the employers), community rated insurance premium (paid by individuals older than 18 years), and general tax revenue. Income related health care allowances (subsidies) for low income individuals are also in place.

The benefit package is standardised and covers a comprehensive set of services. Out-of-pocket expenditure is due to the mandatory deductible and voluntary options.

The financing of the system and the redistribution of resources has as its key element the risk equalisation and risk subsidies scheme which was first implemented in 1993. The Dutch government has improved the scheme by adding health status factors, like indicators of mental illnesses, indicators of disability and functional restrictions, and multi-year Diagnostic Cost Groups (DCGs), until 2018 when they introduced a multiple-year low spending indicator variable. Even though the risk equalisation has undergone several changes, risk selection is significantly present in most health insurers (van de Ven, van Vliet, & van Kleef, 2016).

The premiums are risk rated for supplementary health insurance (dental care for those over 18 years, alternative medicine, physiotherapy, spectacles and lenses, contraceptives, and full-cost coverage of co-payments for medicines) and insurance premiums and products are not regulated. Insurers are allowed to screen applicants based on risk factors and offer both statutory and voluntary benefits. Most of the population (more than 80%) purchase a mixture of statutory and supplementary benefits.

With a fully private, mandatory scheme, which by default eliminates the duplication of the Australian system, this system provides a more sustainable financing model because there is a clear distinction on who has to bear the costs. Common benefits of these arrangements such as competition on quality would be expected to increase the overall health status of the population.

iv. Germany

The German health care system is composed of two distinct mandatory schemes: statutory health insurance (*'gesetzliche Krankenversicherung'* – GKV) and private insurance (*'private Krankenversicherung'* – PKV) (IQWiG, 2018a). Individuals must enrol in one, although only individuals that earn above 59,400 euros yearly as of 2018 can opt for private insurance (as well as self-employed). Around 89% of the population is enrolled in one of the more than 100 statutory insurance funds (GKV Spitzenverband, 2018) that compete in the market, while the remaining 11% are enrolled in one of the 44 private insurance funds (IQWiG, 2018b).

In statutory insurance premium contributions are income dependent and the amount (14.6%) is equally shared among the employer and the employee. If required, additional premiums may be charged by the funds on top. The funds offer a standardised comprehensive catalogue and there is open enrolment. On the other hand, in private insurance premiums are risk rated (on age, health status and the requested health services). As expected, risk selection in the statutory insurance part is more predominant than in private insurance where premiums can vary according to risk factors.

Risk equalisation is estimated through a regression model, using age interacted with gender, reduced earning capacity interacted with age and gender, 80 hierarchical morbidity groups, reimbursement groups interacted with age (Wasem, Buchner, Lux, & Schillo, 2018).

Private insurance in Australia and statutory funds in Germany share some common features: there is choice of insurer by consumers, there is some regulation of the products, and restrictions to premium settings

are in place (i.e. community rating), as well as risk equalisation mechanisms. Germany has made several improvements in its risk equalisation scheme (Buchner, Geopffarth, & Wasem, 2013). Risk equalisation in Australia involves non-standardisation of the benefit package which fosters incentives for risk selection through product differentiation including exclusions. For the consumer the result is product complexity. The introduction of standard categories of gold/silver/bronze/basis is an improvement in this situation.

v. Chile

Mandatory health insurance in Chile is provided mainly by two parallel components: the public option Fonasa (*Fondo Naconal de Salud,* 78% of population) and the private option Isapres (*Instituciones de Salud Previsional*, 14% of population with 6 competing private insurers). Most of the population is covered by one of these schemes (92% of the population in 2017[9]).

Contributions are fixed by law and state that workers (and pensioners) must allocate 7% of their gross salary to one of the components of their preference to obtain health coverage. Nonetheless, the two components operate under different regulatory arrangements in relation to benefit package and coverage, pricing and enrolment, among other factors.

First, in Fonasa there is a standardised benefit package which includes as its baseline GES services, a list of 80 health care conditions explicitly guaranteed, primary care gatekeeping, inpatient care and outpatient, emergency care, some pharmaceuticals, and cost sharing is income based. Second, there are no premiums and contributions (7%) are extensive for the whole family. Additionally, an important part of the budget is received through general taxation (64%). Third, it accepts all enrolees.

In contrast, in Isapres there is extensive product differentiation with around 6,800 plans and the only common feature among the plans is the benefits related to the GES services list. Premiums are structured with a community rated base and a risk rated premium on top according to age and gender. Health status declaration is required, and this can lead to rejection or restricted coverage.

The risk equalisation scheme was introduced in 2005, only for the private insurance, and exclusive to the mandatory GES services to support community rating. The risk adjustment formula is based on an actuarial cell method that uses age and gender (18 classes for men and 18 classes for women).

The Australian and Chilean health care systems share some features: in particular, a strong presence of a public run and financed system, and that to support community rating in the private insurance sector a simple risk equalisation is in place.

9 The number of insured in each scheme was taken from Fonasa website and Superintendence of Health web site for 2017. The percentage distribution is only available for 2017 according to CASEN survey..

vi. Definitions related to risk equalisation

Table A1 describes some basic terminology related to risk equalisation.

Table A.1: Definitions related to risk equalisation (RE)

Term	Definition
Risk adjustment and risk-based subsidies	van de Ven & Ellis (2000, p. 758) define **risk adjustment** as "the use of information to calculate the expected health expenditures of individual consumers over a fixed interval of time (e.g., a month, quarter, or year) and set subsidies to consumers or health plans to improve efficiency and equity". Therefore, risk-based subsidies or compensations, will derive from the calculation of risk adjustment, and result in riskier individuals (i.e. older and sicker) having a higher expected expenditure which translates into higher subsidies, and conversely, lower risk individuals (i.e. younger and healthier) having smaller expected expenditure and subsidies.
Prospective, concurrent and retrospective	(a) **Prospective RE:** or ex-ante payment, uses past information (from year t-1) to predict the expenditure of health services in the year t. This is the case of the Netherlands, Germany, Ireland and Switzerland. (b) **Concurrent RE:** uses information from the prediction period (year t). The regulator must have the complete information on a given year to be able to predict expenditure. This is the case of Chile. (c) **Retrospective RE:** or ex-post payment, usually takes place after insurance events or claims have happened. This is the case in Australia. The use of one over the other is determined by the availability of information, and the regulators objectives towards fit, cost containment and efficiency concerns.

Source: van de Ven & Ellis (2000); Fouda, Fiorentini, & Paolucci (2017); Ellis, Martins, & Rose (2018)

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Institute of Actuaries of Australia
ABN 69 000 423 656
Level 2, 50 Carrington Street,
Sydney NSW Australia 2000
t +61 (0) 2 9239 6100
f +61 (0) 2 9239 6170
actuaries@actuaries.asn.au
www.actuaries.asn.au