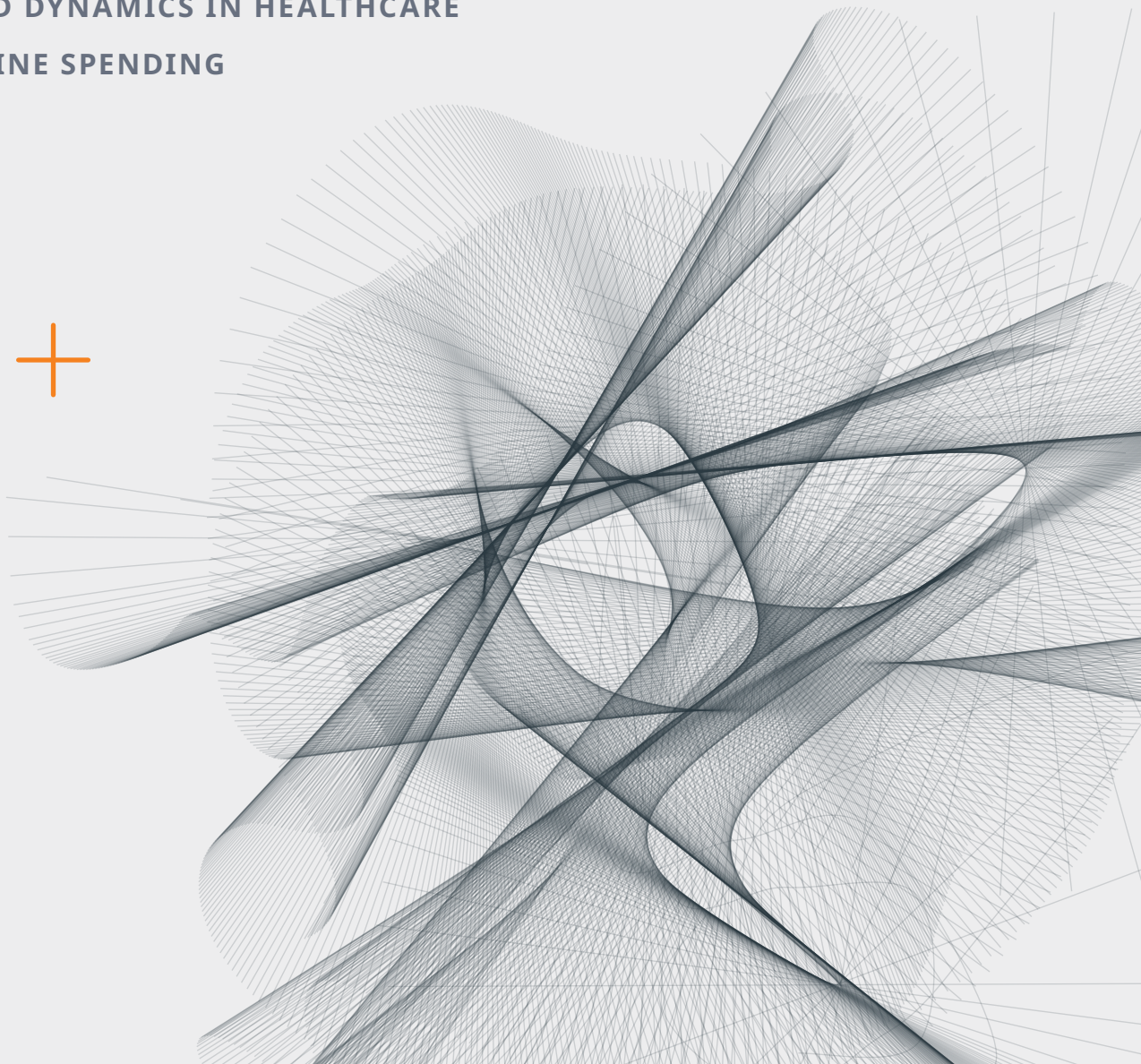




# Understanding Medicine Spending in Australia

TRENDS AND DYNAMICS IN HEALTHCARE  
AND MEDICINE SPENDING



JULY  
**2020**

# Introduction

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The current and future levels of spending on healthcare, and on medicines in particular, are key issues for stakeholders. In Australia, where government data suggest spending is rising, an enhanced understanding of the drivers of those trends can better inform policy.

This report is intended to inform stakeholders about healthcare and medicine spending trends and drivers of change in Australia. The report analyzes pharmaceutical spending trends from 2009–2019 and includes comparisons to spending in other healthcare sectors. In particular, the report examines the Pharmaceutical Benefit Scheme (PBS), pharmaceutical sector spending and market dynamics affecting pharmaceutical spending at country and individual levels. It presents analyses on the impact of rebates, brand volume, and price on spending, as well as a view of per capita revenue and net spending.

The report provides unique views of IQVIA data alongside official government statistics to provide context and clarity to these important issues.

The study was produced by the IQVIA Institute for Human Data Science with support from IQVIA Australia and Merck Sharp & Dohme Corp., a subsidiary of Merck & Co., Inc., Kenilworth, NJ, USA. The contributions to this report by Bernard Gardocki, Alana Simorellis, and many others at IQVIA are gratefully acknowledged.

## **Find Out More**

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## **MURRAY AITKEN**

*Executive Director*

*IQVIA Institute for Human Data Science*

## Overview

Rising healthcare costs and spending, especially in the pharmaceutical sector, continue to be a point of interest around the world. In Australia, cost and spending trends have seen sustained growth since 2010 and are expected to see similar growth rates through 2023.

In Australia, the Pharmaceutical Benefit Scheme (PBS) is a program offering subsidized prescription medicines for most medical conditions to residents as a part of the National Medicines Policy. The overarching goal of achieving optimal population health alongside economic objectives is possible in part due to the PBS, which has negotiated significant rebates, especially as high-profile medicines have launched.

In this report, we assess healthcare cost trends, especially in the PBS pharmaceutical sector, and how these market dynamics affect pharmaceutical spending at country and individual levels.

From fiscal years 2010 to 2018, net PBS spending on pharmaceuticals decreased from 8% to 5% of total healthcare spending. Spending on non-PBS medicines has remained a constant share of healthcare spending at 6%. While overall healthcare spending has grown 5% on a CAGR basis since 2010, net PBS pharmaceutical spending growth has varied but only increased at a compound annual growth rate of 0.5%. The year-to-year variations seen in government PBS spending relate to the launch of viral hepatitis and oncology therapies, which experienced quick and significant growth and were also offset with substantial rebates.

Interestingly, PBS and non-PBS medicine spending trends indicate government expenditures comprise a decreasing share of total medicine spending, which has been declining since 2010 from 52% to 45%. During the same timeframe, individual share of spending on medicines, or out-of-pocket costs, rose from 47% to 55%. This shift is mostly due to non-PBS medicine spending. As a result, Australians are now shouldering more of the cost burden for their medicines.

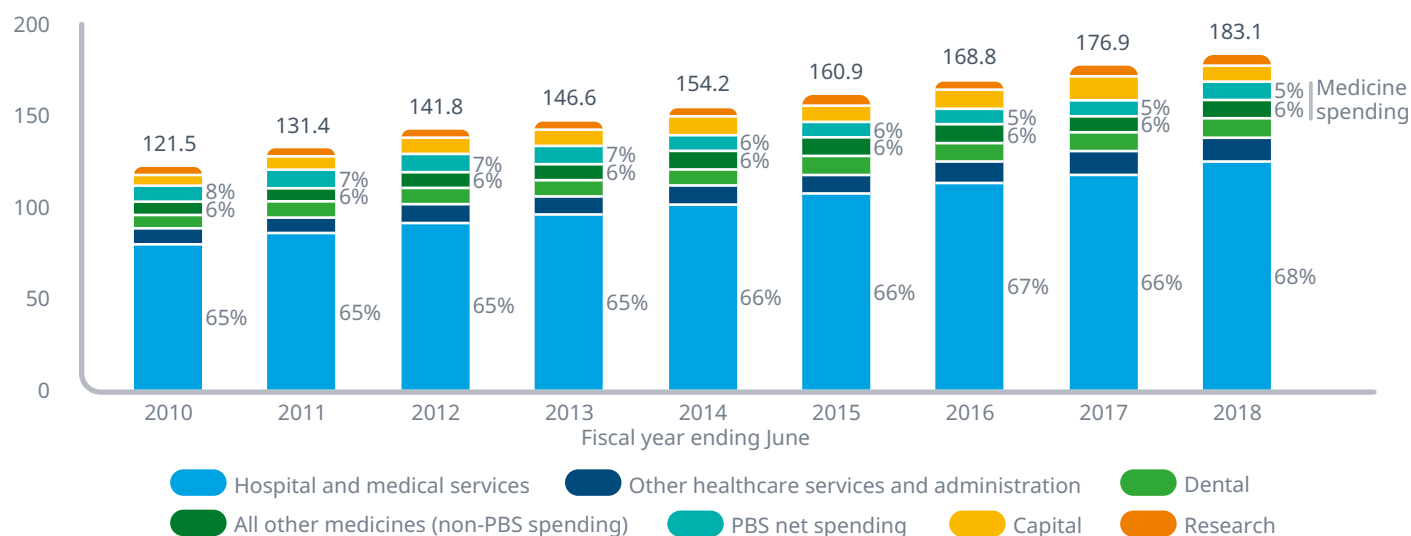
After accounting for rebates, pharmaceutical net revenues remained relatively flat. While pharmaceutical non-discounted revenues before rebates rose 26% over the past 10 years reaching \$12 billion, rebates have increased to \$2.4 billion in 2018. This flat pharmaceutical net revenue is partially due to declines in brand revenue from patent expiries. Brand revenues have declined in share, accounting for 59% of net pharmaceutical revenue in 2010, and declining to 48% in 2019. These declines coincided with impactful brand launches, including the direct-acting antivirals for hepatitis C and innovative cancer treatments, which nonetheless did not fully offset lower brand revenues from expiries.

Several growth segments contribute to lower spending as they are comprised of drugs that are less expensive than their competition, or are segments where prices are declining. By combining these various segments into one 'price event', including generics, brand losses of exclusivity, and brand prices offset by rebates, the overall effect on growth is clearer. In this view, new brands — those launched within the prior two years — are compared to the price event and protected brand volume. The largest positive driver of growth in this view is volume due to the launch of new brands, with CAGRs of 5.2% and 4.1% over five and nine years, respectively.

GDP per Capita (per person adjusted for economic and population growth) in Australia was \$55k in 2019. By comparison, spending on PBS medicines was \$390 in the same year, which was up 6% from a low of \$366 in 2010 but down 6% from a peak of \$413 in 2012. That means that Australians pay just over AUD \$1 per day for access to PBS medicines, nearly unchanged from 2010. Although Hospital and Medical spending data is not available yet for 2019, even if it, conservatively, did not increase over 2018, it represents per capita spending of \$4954, up by \$1886 from \$3068 in 2010, and equivalent to \$13.57 per day in 2018, versus \$5.17 in 2010. Additionally, pharmaceutical spending is projected to decline through 2023, which may unintentionally lead to more hospital spending and exceed current projections. Such costly interventions may be avoided with additional spending on pharmaceuticals.

# The majority of net healthcare spending is in hospital and medical services, while PBS spending has declined from 8% to 5% since 2010

**Exhibit 1: Historical Percentage of Overall Net Healthcare Spending by Sector, Fiscal Years 2010–2018, AU\$Bn**



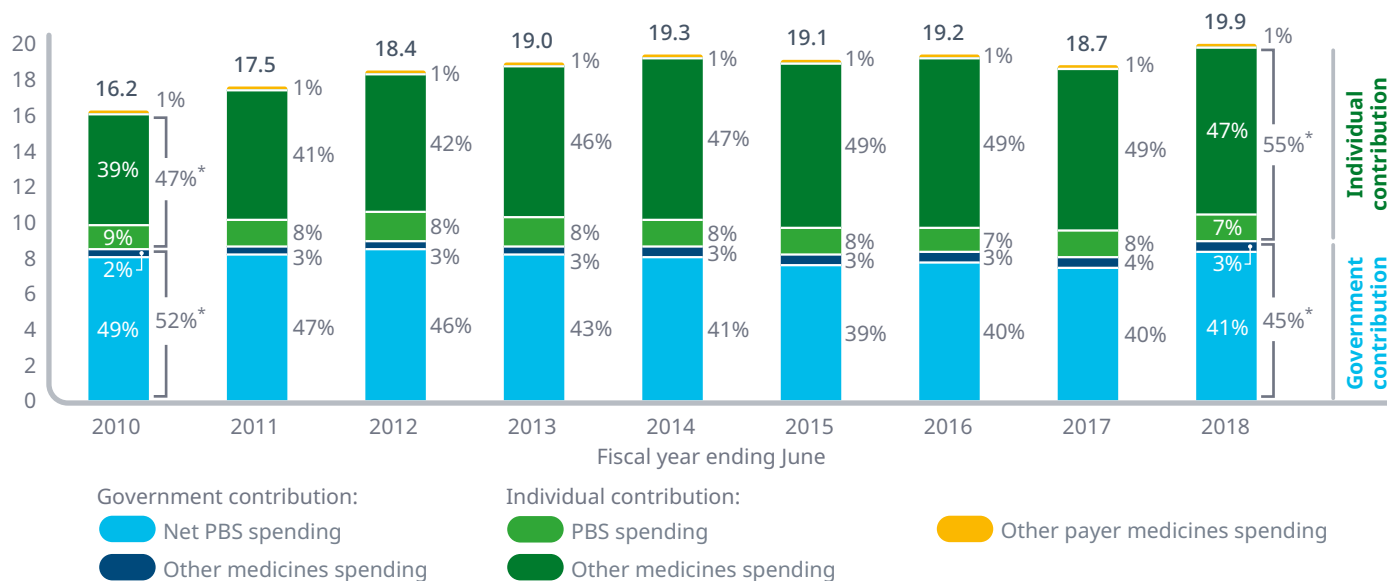
Source: Australian Institute of Health and Welfare, 2009–2019; Australian Government Department of Health, 2009–2019

- Australia’s net healthcare spending has increased since fiscal year 2010 from \$121.5 billion to \$183.1 billion in fiscal year 2018, corresponding to a 4.5% five-year CAGR and a 5.3% CAGR over the timeframe.
- Hospital and medical services represent the largest percentage of net healthcare spending, ranging from 65% to 68% of spending, realizing costs of \$79 billion in fiscal year 2010 and reaching \$124 billion in fiscal year ending 2018.
- PBS net pharmaceutical spending has declined from 8% to 5% of net healthcare spending, with incremental declines over the time period.
- This decline in percentage corresponds to an increase in spending from \$9.4 billion in fiscal year 2010 to \$9.7 billion in fiscal year 2018.
- All other medicines spending has remained a constant share of net healthcare spending at 6%.
- Looking at PBS net spending and all other medicine spending together, these two segments comprised 14% of net total spending in fiscal year 2010 and declined to 11% in fiscal year 2018.
- Like medicine spending, remaining sectors have seen slight attrition over the timeframe, with other healthcare services and administration, all other medicines, and dental services comprising smaller percentages of overall spending, potentially contributing to increases in hospital and medical services.

Exhibit Notes: Fiscal year represents July of the previous year through June of the labeled year. PBS = Pharmaceutical Benefits Scheme. Net healthcare spending includes both federal and state government expenditures, less rebates found in the Department of Health Annual Reports. Sector spending data was collected and collated from yearly public reports published by the Australian Institute of Health and Welfare from 2009–2019. Data prior to fiscal year 2014–2015 is estimated data by the Australian Institute of Health and Welfare.

## While government spending on medicines has remained largely flat, individual contribution to spending has increased

Exhibit 2: Net Government, Individual, and Other Payer Medicines Spending, Fiscal Years 2010–2018, AU\$Bn



Source: Australian Institute of Health and Welfare, 2009–2019; Australian Government Department of Health, 2009–2019

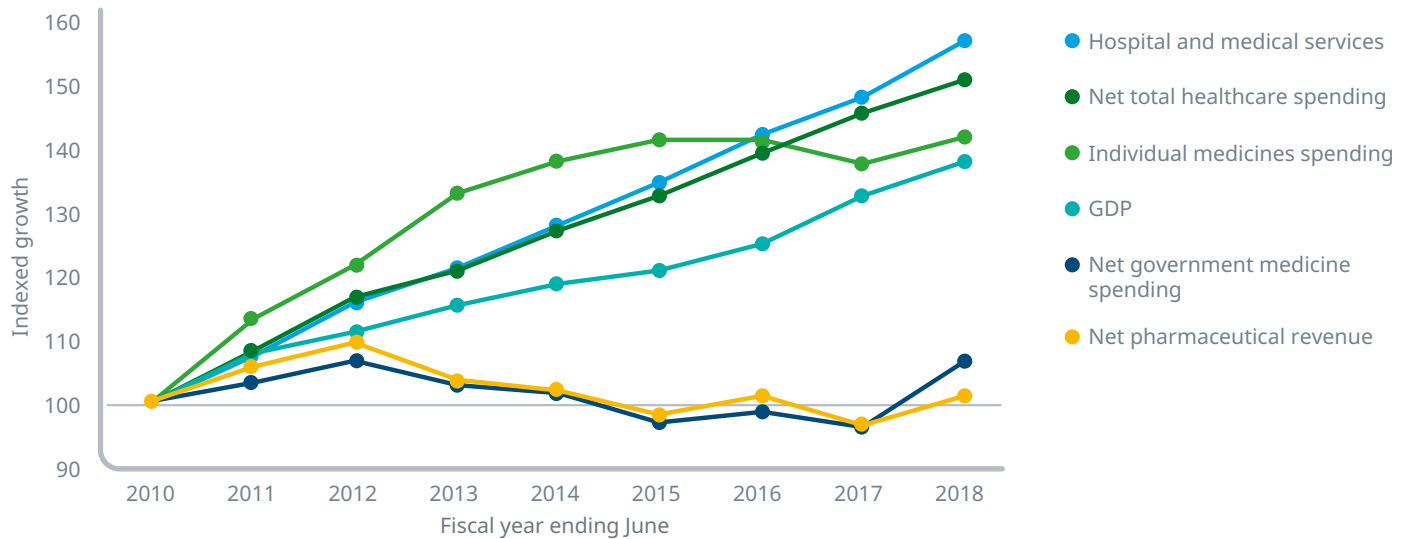
Note: \*Percentages may not sum due to rounding.

- Total spending on medicine has increased 23% since fiscal year 2010, rising from \$16.2 billion to \$19.9 billion in fiscal year 2018.
- Government spending on medicines, including PBS and non-PBS expenditure, comprises a decreasing share of total medicine spending, declining from 52% to 45% during the timeframe (reflecting rounding).
- During the same timeframe, individual share of spending on medicines, including PBS and non-PBS expenditure, has risen from 47% to 55%\*.
- Total government spending on medicines has risen over 6% since fiscal year 2010, with PBS spending increasing 3% since fiscal year 2010.
- Individuals are now shouldering more of the cost burden than the government, mostly due to non-PBS medicine spending.
- The COVID-19 pandemic will likely result in increased government expenditure by the PBS from 2020 onwards. This is because the unemployment rate in Australia has risen as a result of the pandemic, and more people will be eligible for a concession card, which will see their PBS co-pay reduced from \$41 to \$6.60, and their safety net threshold (above which medicines are dispensed at no further cost) reduced from \$1,486.80 to \$316.80. At time of writing, it is not yet clear how many additional people will qualify for a concession card, nor for how long.

Exhibit Notes: \*Percentages may not sum due to rounding. Fiscal year represents July of the previous year through June of the labeled year. PBS = Pharmaceutical Benefits Scheme. Government spending on medicines includes PBS, other medicines, private, and OTC (over the counter medicines) spending minus rebates. Individual spending on medicines includes PBS, other medicines, private, and OTC spending. Other payer medicines spending includes PBS, other medicines, private, and OTC spending. Information collected and collated from yearly public reports published by Australian Institute of Health and Welfare from 2009–2019, and where noted, net PBS spending is gross spending less rebates found in the Department of Health Annual Reports. Data prior to fiscal year 2014–2015 is estimated data by the Australian Institute of Health and Welfare.

# Government medicine spending growth has been outpaced by other contributors to healthcare spending including patient out-of-pocket costs

**Exhibit 3: Indexed Net Healthcare, Sector, and GDP Spending Growth for Fiscal Years 2010–2018**



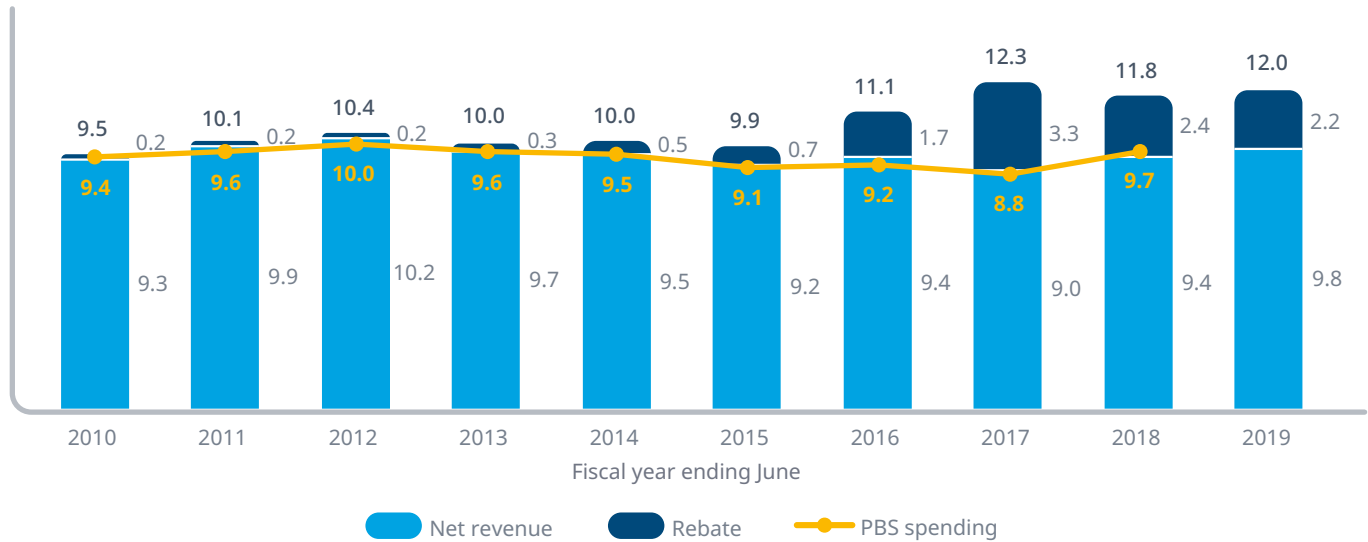
Source: IQVIA MIDAS, Sep 2019; Australian Institute of Health and Welfare, 2009–2019; Australian Government Department of Health, 2009–2019; Economics Intelligence Unit, Jun 2019

- Overall growth in net total healthcare spending has been 50% since fiscal year 2010 on an index basis, with the greatest growth occurring over the past five years.
- Hospital and medical services are the greatest drivers of this growth, seeing 57% growth since fiscal year 2010, and more recently, sustained and rapid growth since fiscal year 2015.
- Out-of-pocket spending, represented by individual medicines spending has risen by 42% since 2010, exceeding GDP growth.
- Net government spending on medicines has declined, seeing negative growth since fiscal year 2012, although there is a slight increase from fiscal year 2017 to fiscal year 2018.
- The decline in government spending, despite positive growth on individual medicine spending, is likely due to the impact of rebating on high-profile launches, such as hepatitis C and innovative cancer treatments.
- Net pharmaceutical revenue, similar to net government medicine spending has declined since fiscal year 2012, with a slight increase in fiscal year 2016.
- Overall GDP growth has seen stable and consistent growth in the timeframe, with a 38% increase since fiscal year 2010.
- While total healthcare spending in 2018 represents growth since 2010 that is 13% higher than GDP during the period, Government spending on pharmaceuticals during this period is lower than GDP growth by 31%.

Exhibit Notes: All charted values are indexed to fiscal year 2010 data, such that the 2010 value is set equal to 100. Fiscal year represents July of the previous year through June of the labeled year. PBS = Pharmaceutical Benefits Scheme. Net government spending on medicines includes PBS, other medicines, private, and OTC spending minus rebates. Individual spending on medicines includes PBS, other medicines, private, and OTC spending. Information collected and collated from yearly public reports published by Australian Institute of Health and Welfare from 2009–2019, and where noted, net PBS spending is gross spending less rebates found in the Department of Health Annual Reports. Data prior to fiscal year 2014–2015 is estimated data by the Australian Institute of Health and Welfare.

## Total pharmaceutical revenue has risen over the past 10 years, but remains flat when accounting for rebates

Exhibit 4: Total Non-Discounted Revenue, Rebates and Reported Net Spending for Fiscal Years 2010–2019, AU\$Bn



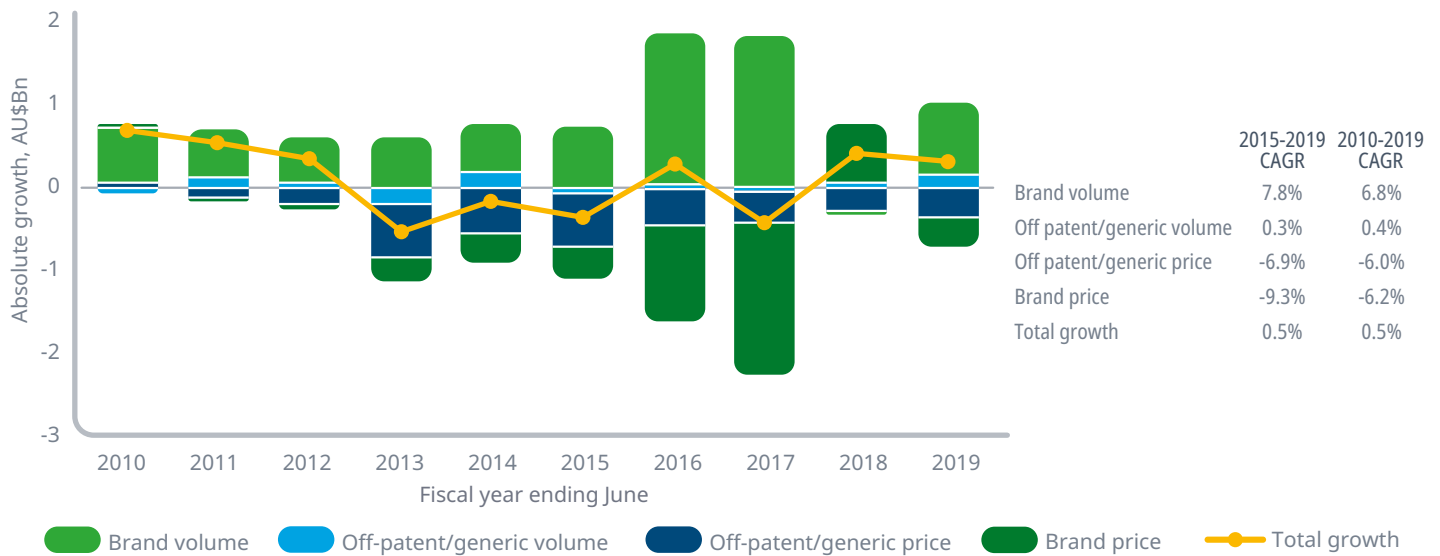
Source: IQVIA MIDAS, Sep 2019; Australian Institute of Health and Welfare, 2009–2019; Australian Government Department of Health, 2009–2019

- Over the last 10 years, total non-discounted revenue from pharmaceuticals has increased 25.9%, reaching just over \$12.0 billion in fiscal year 2019, corresponding with five- and nine-year CAGRs of 3.6% and 2.6%, respectively.
- However, after accounting for the amount of rebates reported, net revenues have remained relatively constant over the ten-year period, rising from \$9.3 billion to \$9.8 billion, a 5% increase since fiscal year 2010. This very slight increase corresponds to 0.5% nine- and five-year CAGRs.
- Consistent with net pharmaceutical revenues, pharmaceutical spending reported by the Australian PBS also suggests flat spending over the timeframe after accounting for rebates.
- The total amount of rebates has grown since fiscal year 2010, with spending increasing approximately three-fold over the past five years.
- Rebating has increased from \$193 million in fiscal year 2010 to \$2.2 billion in fiscal year 2019; a 12-fold increase.
- More substantial increases in rebates begin in fiscal year 2015 and rebates peak by 2017, coinciding with the commercial availability of high-cost, yet potentially curative, treatments for hepatitis C and innovative cancer treatments.
- The close alignment between net pharmaceutical revenues and net PBS spending allows the use of net pharmaceutical data to explore the elements of growth on a granular level.

Exhibit Notes: Fiscal year represents July of the previous year through June of the labeled year. PBS = pharmaceutical benefits scheme. PBS spending includes pharmacy and wholesaler margins. Measures total value of spending on medicines, including generics, branded products, biologics, small-molecules, retail and non-retail channels. Non-discounted revenue is based on IQVIA reported invoice values from wholesaler transactions measured at trade/invoice prices and exclude off-invoice discounts and rebates. Rebates are applied from data within the Department of Health Annual Reports. Includes all medicines in both pharmacy and institutional settings. As of publication, PBS 2019 Fiscal year ending June data had not been released. Net revenue is shown at manufacturer level.

# After adjusting for rebates, net pharmaceutical spending trends have remained at similar levels from fiscal year 2010 to 2019

**Exhibit 5: Brand Volume, Net Price, and LOE Contributions to Growth from Fiscal Years 2010–2019, AU\$Bn**



Source: IQVIA MIDAS, Sep 2019; IQVIA Institute, Sep 2019; Australian Government Department of Health, 2009–2019

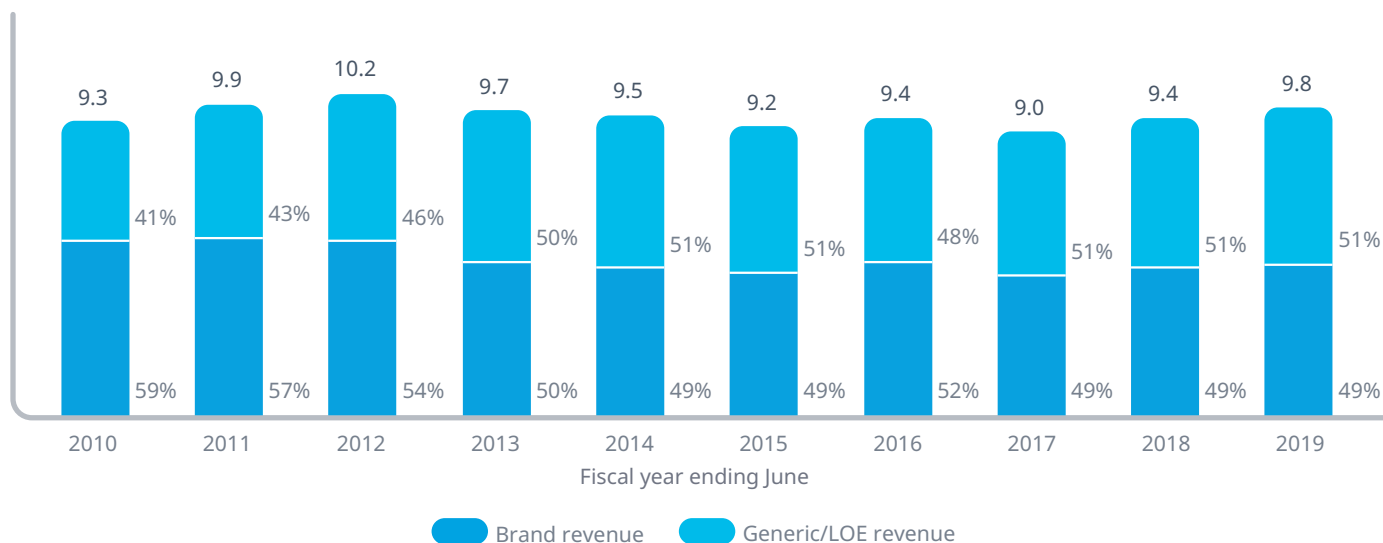
- After adjusting the brand price segment for rebates, positive contributions to growth observed in pharmaceutical invoice spending (see Exhibit 4) remain due to brand volume growth, however brand price then has a greater negative contribution to growth.
- With adjustments, brand volume growth shows slightly higher CAGRs, at 7.8% and 6.8%, while brand price CAGRs are negative, at -9.3% since 2015 and -6.2% since 2011.
- This trend is most obvious in fiscal years ending 2016 and 2017, which is consistent with the increased amount of rebating seen in this timeframe.
- In fiscal year 2017, the offset of brand price is sufficient to overcome the positive contributions of brand volume, yielding an overall negative growth.
- The rebound in net brand price growth in 2018 is a combined result of less negative invoice price trends and lower rebate receipts.
- Off-patent generic prices and volume remain relatively constant, offering minor contributions to overall growth in fiscal year 2016 and beyond, a stark change from fiscal years 2013–2015.

Exhibit Notes: Fiscal year represents July of the previous year through June of the labeled year. The off-patent/generic segment includes Loss of Exclusivity (LOE), which are brands that were once protected and have since lost patent protection, and Generics, which includes both unbranded and branded generics. All segments are mutually exclusive in each time period. Includes all medicines in both pharmacy and institutional settings. Rebates are applied from data within the Department of Health Annual Reports. Charted values may not sum due to rounding.



## Pharmaceutical net revenue has been relatively flat since fiscal year 2010, with the proportion of brand revenue declining

Exhibit 6: Net Pharmaceutical Revenue and Percentage Brand and Generic, Fiscal Years 2010–2019, AU\$Bn



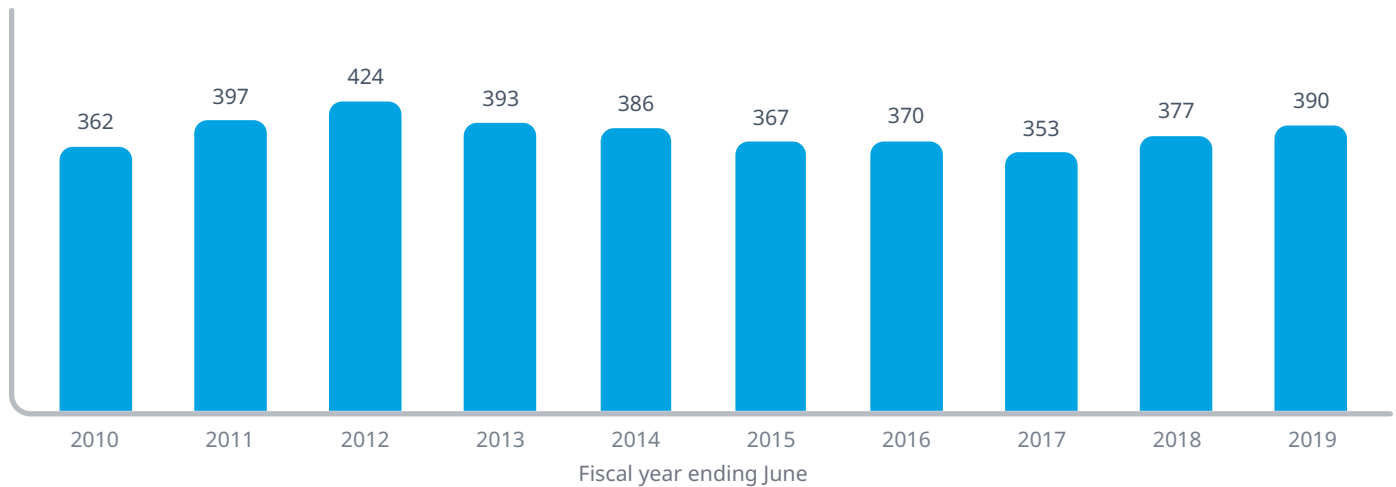
Source: IQVIA MIDAS, Sep 2019; Australian Government Department of Health, 2009–2019

- When adjusted for rebates, pharmaceutical revenue has remained largely flat since fiscal year 2010, with only a 2.9% increase in net revenue through fiscal year 2019.
- However, the proportion of branded revenues has changed significantly within the past 10 years.
- Brand revenues accounted for 59% of net pharmaceutical revenue in fiscal year 2010. In the fiscal year 2019, brand revenues composed only 49% of pharmaceutical revenue.
- This change in the percentage of brand revenue correlates with an overall 13% decline in brand revenues and a 30% increase in generic product revenues.
- These declines in brand share of net pharmaceutical revenue coincide with some of the most impactful brand launches in recent history, including innovative cancer treatments and direct-acting antivirals for hepatitis C, as well as significant numbers of other novel therapy launches.

Exhibit Notes: Fiscal year represents July of the previous year through June of the labeled year. PBS = pharmaceutical benefits scheme. PBS spending includes pharmacy and wholesaler margins. Measures total value of spending on medicines, including generics, branded products, biologics, small-molecules, retail and non-retail channels. To arrive at non-discounted pharmaceutical revenue, invoice spending based on IQVIA reported values from wholesaler transactions were measured at trade/invoice prices and exclude off-invoice discounts and rebates. Rebates are then applied from data within the Department of Health Annual Reports. Includes all medicines in both pharmacy and institutional settings. Pricing is at the manufacturer level.

## Adjusted per capita spending on pharmaceuticals increased by 8% over nine years, but declined since a peak in fiscal year 2012

Exhibit 7: Real Net Per Capita Pharmaceutical Revenue, Fiscal Years 2010–2019, \$2019 AU\$



Source: IQVIA MIDAS, Sep 2019; Australian Government Department of Health, 2009–2019; Economist Intelligence Unit, Jun 2019

- Over the past nine years, real net per capita pharmaceutical revenue has increased by approximately 8% (1% on a nine-year CAGR basis), meaning Australians are now spending only \$28 more per person than nine years ago after adjusting for economic and population growth, equivalent to an average spend per day of \$1.07 in 2019.
- Real net per capita calculations and chaining take into account economic growth and population growth. Over this period, that amounted to approximately 7% economic growth, as well as 13% population growth, in the same nine-year period.
- The current adjusted per capita revenue of \$390 in fiscal year 2019 is a decline since the peak in fiscal year 2012.
- The lowest per capita revenue since fiscal year 2010 was \$353 and occurred in the fiscal year 2017.
- This drop in per capita revenue in 2017 coincides with over \$3 billion received in rebates that year (see Exhibit 4) and is likely due, in part, to rebates associated with an increased uptake in hepatitis C and innovative cancer treatments.

Exhibit Notes: Fiscal year represents July of the previous year through June of the labeled year. PBS = pharmaceutical benefits scheme. PBS spending includes pharmacy and wholesaler margins. Measures total value of spending on medicines, including generics, branded products, biologics, small-molecules, retail and non-retail channels. To arrive at non-discounted pharmaceutical revenue, invoice spending based on IQVIA reported values from wholesaler transactions were measured at trade/invoice prices and exclude off-invoice discounts and rebates. Rebates are then applied from data within the Department of Health Annual Reports. Includes all medicines in both pharmacy and institutional settings. Pricing is at the manufacturer level. Real medicine spending is chained to \$2019 and reported in \$AUD.

# As a result of rebates, growth in net pharmaceutical spending is largely flat

**Exhibit 8: Brand Volume, New Brands, and Net Price Contributions to Growth, Fiscal Years 2010–2019, AU\$Bn**



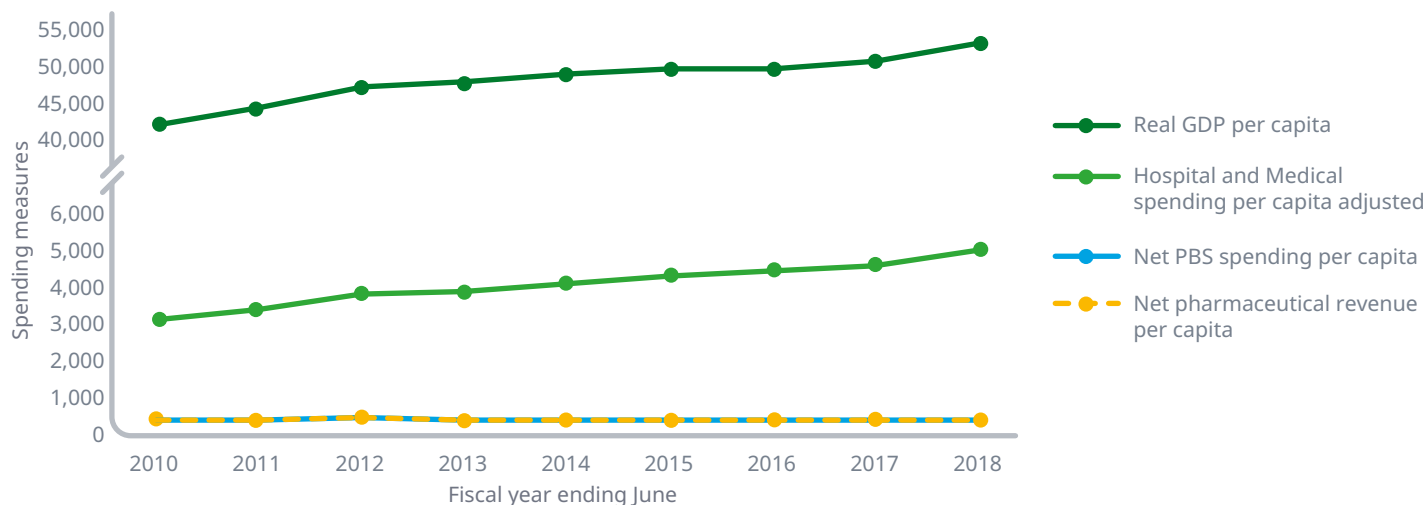
Source: IQVIA MIDAS, Sep 2019; IQVIA Institute, Sep 2019; Australian Government Department of Health, 2009–2019

- An alternative view of growth is presented here separating out New Brands from Protected Brands (defined together in Exhibit 5 as brand volume)
- It shows that pharmaceutical spending growth is largely flat after accounting for rebates, and is driven by protected brand volume and new brands, offset by price events.
- ‘Price event’ in the chart, combines several growth drivers that contribute to changes in the average price of medicines including generics, brand losses of exclusivity, and brand prices (offset by rebates).
- Price events have been the largest negative driver of growth in the period, with a peak of -\$2,274 billion in fiscal year ending 2017. This corresponds to CAGRs of -22.3% over a five year period, and -17.3% over a nine year period.
- After adjusting for rebates and assessing the contributions of various segments in fiscal years ending 2016 and 2017, the largest driver of positive contribution to growth are new brands.
- As demonstrated previously, protected brand volume remains a strong positive contributor to growth especially in these two fiscal years, and to a lesser extent throughout the timeframe.
- The contribution to growth by price events for on/off-patent products remains a strong negative contributor to growth throughout the timeframe and especially so in fiscal years ending 2016 and 2017.
- As a result of the negative contribution of price events in fiscal year ending 2017, total growth declined despite the positive contribution of growth by new brands.

Exhibit Notes: Fiscal year represents July of the previous year through June of the labeled year. New brands are protected branded products on the market less than 24 months during the year reported. Protected brands are products that are no longer “new” and have yet to reach patent expiry. Price event accounts for Protected Brand Price, Loss of Exclusivity (LOE), and Generics price and volume shifts. LOE products are brands that were once protected and have since lost patent protection. Generics include both unbranded and branded generics. All segments are mutually exclusive in each time period. Includes all medicines in both pharmacy and institutional settings. Rebates are applied from data within the Department of Health Annual Reports. Charted values may not sum due to rounding.

## Net pharmaceutical revenues and PBS spending have remained constant on an adjusted per capita basis averaging slightly over \$1 per day

Exhibit 9: Historical Real Net Per Capita PBS Spending, Revenues, and GDP, Fiscal Years 2010–2018, AU\$ 2019\$



Source: IQVIA MIDAS, Sep 2019; Australian Institute of Health and Welfare, 2009–2019; Australian Government Department of Health, 2009–2019; Economist Intelligence Unit, Jun 2019

- Net pharmaceutical revenues and PBS spending have remained constant on an adjusted per capita basis, and average only a little over \$1 per day, compared to steadily increasing spend on hospital and medical, which is currently averaging \$13.57 per day.
- GDP per capita in Australia was \$55k in 2019. By comparison, spending on PBS medicines was \$390 in the same year (not shown), which was up 6% from a low of \$366 in 2010 but down 6% from a peak of \$413 in 2012. That means that Australians pay just over AUD \$1 per day for access to PBS medicines. Although Hospital and Medical spending data is not available yet for 2019, even if it, conservatively, did not increase over 2018, it represents per capita spending of \$4954, up by \$1886 from \$3068 in 2010, and equivalent to \$13.57 per day in 2018 vs \$5.17 in 2010.
- Per capita net pharmaceutical revenues have also increased, though by 4%, from \$362 in fiscal year 2010 to \$377 in fiscal year 2018.
- Both per capita net PBS spending and per capita net pharmaceutical revenues account for 0.7%, respectively, of total per capita GDP in fiscal year 2018, a decline from 0.9% in fiscal year 2010.
- In the most recent annual report released by the Australian Department of Health, medical, hearing, and private health insurance spending segments are projected to grow 2–5% on a CAGR basis through fiscal year 2023.
- However, government reports project a decline in pharmaceutical spending corresponding to a -5% CAGR through fiscal year 2023.
- An unintended consequence of declines in pharmaceutical spending may be unpredicted rise in hospital spending exceeding current projections. However, more costly interventions may be avoided by investing in innovative branded medicines.

Exhibit Notes: Fiscal year represents July of the previous year through June of the labeled year. PBS = Pharmaceutical Benefits Scheme. Information collected and collated from yearly public reports published by Australian Institute of Health and Welfare from 2009–2019, while rebates were obtained from Department of Health Annual Reports. The 2017–2018 annual reports provides the projected growth through 2023.

## NOTES ON SOURCES

This report is based on the IQVIA services detailed below.

**IQVIA MIDAS™** is a unique data platform for assessing worldwide healthcare markets. It integrates IQVIA national audits into a globally consistent view of the pharmaceutical market, tracking virtually every product in hundreds of therapeutic classes and providing estimated product volumes, trends, and market share through retail and non-retail channels. MIDAS data is updated monthly and retains 12 years of history.

## METHODOLOGY

Overall healthcare spending and sector spending data was obtained from annual reports released by the Australian Institute of Health and Welfare, which publishes reports on a yearly basis. To arrive at net healthcare cost and net PBS spending the amount of PBS rebates, referred to as 'PBS drug recoveries' were obtained from the Australian Department of Health Annual Reports, which are also published on a yearly basis. These rebates were removed from gross PBS medicine spending values.

PBS spending data covers prescription drugs and includes pharmacy and wholesaler margins, but excludes over-the-counter (OTC) medicines, vaccines, and private insurance costs. Wholesaler margins included in PBS data are approximately 7.5%, while administration, handling, and dispensing fees vary based on the price of the product. Handling fees range from \$4 to \$1980, determined by the cost of the product. Dispensing fees are assessed based on drug preparation and whether a drug is specialized (s100 HSD category). Optional fees may also be charged, as long as the patient co-pay does not exceed \$40.30.

The government reports for the fiscal years ending in June 2009 through 2019 were collated and compared to IQVIA audited data. This resulted in specific selection of IQVIA data to exclude OTC and vaccines to better align with PBS data. However, wholesaler and pharmacy margins are not included, while private sector data are included in IQVIA data in this report. To calculate net IQVIA pharmaceutical revenues, the PBS drug recoveries were applied to IQVIA audited sales revenues to estimate net manufacturer revenues after rebates. The close correlation between IQVIA data and reported PBS data allowed for high-confidence granular analysis of elements of growth driving trends.

Because rebates are obtained from the Department of Health Annual Reports directly, and therefore do not account for any possible rebates in the private sector, it is possible for non-PBS spending and net manufacturer revenue to be slightly lower than reported here.

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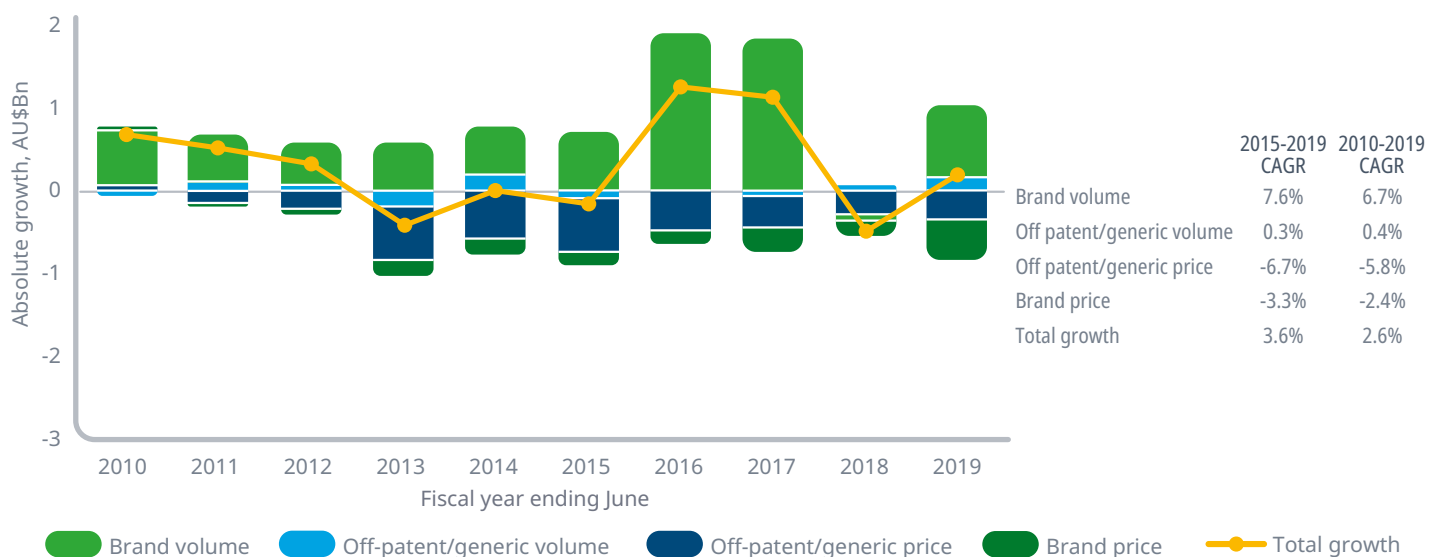
# Appendix

## CONTRIBUTIONS TO GROWTH

Positive growth observed in pharmaceutical non-discounted revenue, before adjusting for rebates, is due almost exclusively to brand volume growth, with significant growth occurring in fiscal years 2016 and 2017. Brand volume growth further overcomes substantial offsets in off-patent generic price – with CAGRs for this segment corresponding to 7.6% since fiscal year 2015 and 6.7% since fiscal year 2011 – to yield positive growth overall. In this analysis, brand volume includes new products, which are particularly notable in the 2016 and 2017 fiscal years when there were hepatitis C and innovative cancer treatment launches.

Growth is offset by brand price due to the impact of rebates, and declines in off-patent generic prices, where contributions of these segments have been relatively unchanged. Brand volume is the only segment to see large fluctuations in the time period assessed. There is very little contribution to growth from the off-patent/generic volume segment, with CAGRs of 0.3% and 0.4% since 2015 and 2011, respectively. There are slight variations in years when larger products reach loss of exclusivity.

**Exhibit 10: Brand Volume, Price, and LOE Contributions to Growth from Fiscal Years 2010–2019, AU\$Bn**



Source: IQVIA MIDAS, Sep 2019; IQVIA Institute, Sep 2019

Exhibit Notes: Fiscal year represents July of the previous year through June of the labeled year. The off-patent/generic segment includes Loss of Exclusivity (LOE), which are brands that were once protected and have since lost patent protection, and Generics, which includes both unbranded and branded generics. All segments are mutually exclusive in each time period. Includes all medicines in both pharmacy and institutional settings. Charted values may not sum due to rounding.

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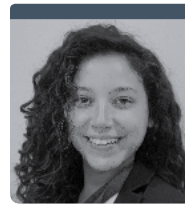
Michael Kleinrock serves as research director for the IQVIA Institute for Human Data Science, setting the research agenda for the Institute, leading the development of reports and projects focused on the current and future role of human data science in healthcare in the United States and globally. Kleinrock leads the research development included in Institute reports published throughout the year. The research is focused on advancing the understanding of healthcare and the complex systems and markets around the world that deliver it. Throughout his tenure at IMS Health, which began in 1999, he has held roles in customer service, marketing, product management, and in 2006 joined the Market Insights team, which is now the IQVIA Institute for Human Data Science. He holds a B.A. degree in History and Political Science from the University of Essex, Colchester, UK, and an M.A. in Journalism and Radio Production from Goldsmiths College, University of London, UK.



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Elyse Muñoz is a Thought Leadership Manager for the IQVIA Institute, managing aspects of IQVIA Institute research projects and conducting research and analysis within global healthcare. Elyse joined IQVIA in 2017 as an associate consultant in the Competitive Intelligence consulting group, where she developed rich clinical and commercial insights to serve clients. She worked in major therapy areas including diabetes, cardiovascular disease and kidney dysfunction, as well as rare diseases such as hemophilia. Elyse holds a Bachelor of Science from Arizona State University in genetics, as well as a Ph.D. in genetics from Pennsylvania State University. Her research focused on the genetic makeup of the parasite that causes malaria to aid in the development of targeted drugs to eradicate the disease.

# About the Institute

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The IQVIA Institute for Human Data Science contributes to the advancement of human health globally through timely research, insightful analysis and scientific expertise applied to granular non-identified patient-level data.

Fulfilling an essential need within healthcare, the Institute delivers objective, relevant insights and research that accelerate understanding and innovation critical to sound decision making and improved human outcomes. With access to IQVIA's institutional knowledge, advanced analytics, technology and unparalleled data the Institute works in tandem with a broad set of healthcare stakeholders to drive a research agenda focused on Human Data Science including government agencies, academic institutions, the life sciences industry and payers.

## Research Agenda

The research agenda for the Institute centers on 5 areas considered vital to contributing to the advancement of human health globally:

- Improving decision-making across health systems through the effective use of advanced analytics and methodologies applied to timely, relevant data.
- Addressing opportunities to improve clinical development productivity focused on innovative treatments that advance healthcare globally.
- Optimizing the performance of health systems by focusing on patient centricity, precision medicine and better understanding disease causes, treatment consequences and measures to improve quality and cost of healthcare delivered to patients.

- Understanding the future role for biopharmaceuticals in human health, market dynamics, and implications for manufacturers, public and private payers, providers, patients, pharmacists and distributors.
- Researching the role of technology in health system products, processes and delivery systems and the business and policy systems that drive innovation.

## Guiding Principles

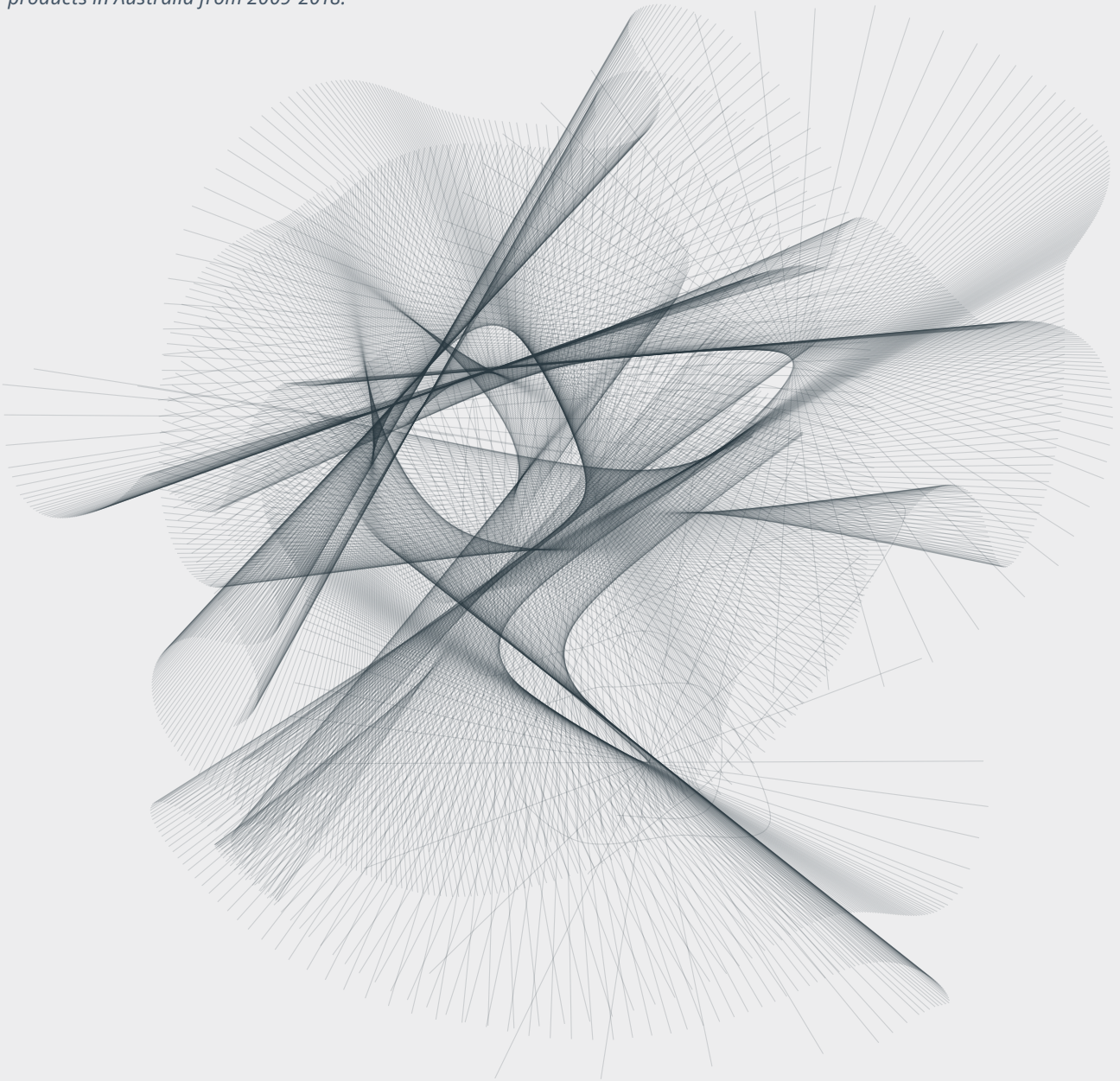
The Institute operates from a set of Guiding Principles:

- Healthcare solutions of the future require fact based scientific evidence, expert analysis of information, technology, ingenuity and a focus on individuals.
- Rigorous analysis must be applied to vast amounts of timely, high quality and relevant data to provide value and move healthcare forward.
- Collaboration across all stakeholders in the public and private sectors is critical to advancing healthcare solutions.
- Insights gained from information and analysis should be made widely available to healthcare stakeholders.
- Protecting individual privacy is essential, so research will be based on the use of non-identified patient information and provider information will be aggregated.
- Information will be used responsibly to advance research, inform discourse, achieve better healthcare and improve the health of all people.



*The IQVIA Institute for Human Data Science is committed to using human data science to provide timely, fact-based perspectives on the dynamics of health systems and human health around the world. The cover artwork is a visual representation of this mission. Using algorithms and data from the report itself, the final image presents a new perspective on the complexity, beauty and mathematics of human data science and the insights within the pages.*

*Artwork on the cover of this Understanding Medicine Spending in Australia report was generated using IQVIA MIDAS™ data assessing pharmaceutical market growth contributions by protected and off-patent products in Australia from 2009-2018.*



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