



Supporting Information

Supplementary methods and results

**This appendix was part of the submitted manuscript and has been peer reviewed.
It is posted as supplied by the authors.**

Appendix to: Atkins ER, Nguyen LH, Chatterton ML, et al. The cost of treating hypertension in Australia, 2012–22: an economic analysis. *Med J Aust* 2024; doi: 10.5694/mja2.52522.

Supplementary methods

Table 1. Consumer price index data used to adjust costs to 2022 Australian dollars

Financial year	Report period	All group consumer price index	Mean consumer price index value
2013-14	Sep-13	2.2%	2.7%
	Dec-13	2.7%	
	Mar-14	2.9%	
	Jun-14	3.0%	
2014-15	Sep-14	2.3%	1.7%
	Dec-14	1.7%	
	Mar-15	1.3%	
	Jun-15	1.5%	
2015-16	Sep-15	1.5%	1.4%
	Dec-15	1.7%	
	Mar-16	1.3%	
	Jun-16	1.0%	
2016-17	Sep-16	1.3%	1.7%
	Dec-16	1.5%	
	Mar-17	2.1%	
	Jun-17	1.9%	
2017-18	Sep-17	1.8%	1.9%
	Dec-17	1.9%	
	Mar-18	1.9%	
	Jun-18	2.1%	
2018-19	Sep-18	1.9%	1.7%
	Dec-18	1.8%	
	Mar-19	1.3%	
	Jun-19	1.6%	
2019-20	Sep-19	1.7%	1.4%
	Dec-19	1.8%	
	Mar-20	2.2%	
	Jun-20	-0.3%	
2020-21	Sep-20	0.7%	1.6%
	Dec-20	0.9%	
	Mar-21	1.1%	
	Jun-21	3.8%	
2021-22	Sep-21	3.0%	4.4%
	Dec-21	3.5%	
	Mar-22	5.1%	
	Jun-22	6.1%	

Table 2. Included and excluded blood pressure lowering medications*

Drug class	Included	Excluded (most use in conditions other than hypertension)
Angiotensin -converting-enzyme inhibitors	Captopril Enalapril Fosinopril Lisinopril Perindopril Quinapril Ramipril Trandolapril	
Angiotensin-II receptor blockers	Candesartan Eprosartan Irbesartan Losartan Olmesartan Telmisartan Valsartan	
Calcium channel blockers	Amlodipine Felodipine Lercanidipine Nifedipine	Most use for atrial fibrillation: Diltiazem Verapamil
Beta blockers	Atenolol Pindolol Metoprolol tartrate	Only listed for heart failure and most use in heart failure: Carvedilol Nebivolol Bisoprolol only listed for severe cardiac arrhythmia Sotalol Most use in heart failure: Metoprolol succinate Most use in migraine: Propranolol Most use in pregnancy: Labetalol
Diuretics	Chlortalidone (no longer on PBS) Hydrochlorothiazide Indapamide	

Drug class	Included	Excluded (most use in conditions other than hypertension)
Alpha blockers and antihypertensive drugs	Diazoxide (no longer on PBS) Methyldopa Moxonidine Hydralazine	Clonidine – multiple off label uses e.g. psych Hair loss Minoxidil prostate Prazosin All other drugs in this class – used for prostate or pulmonary hypertension
Angiotensin -converting-enzyme inhibitor + Calcium channel blockers	Enalapril + lercanidipine Perindopril + amlodipine Ramipril + felodipine Trandolapril + verapamil	
Angiotensin -converting-enzyme inhibitor + diuretics	Enalapril + hydrochlorothiazide Fosinopril + hydrochlorothiazide Perindopril + indapamide Quinapril + hydrochlorothiazide	
Angiotensin-II receptor blocker + calcium channel blockers	Olmesartan + amlodipine Telmisartan + amlodipine Valsartan + amlodipine	
Angiotensin-II receptor blockers + diuretics	Candesartan + hydrochlorothiazide Eprosartan + hydrochlorothiazide Irbesartan + hydrochlorothiazide Olmesartan + hydrochlorothiazide Telmisartan + hydrochlorothiazide Valsartan + hydrochlorothiazide	
Diuretics + diuretics	Amiloride + hydrochlorothiazide Triamterene + hydrochlorothiazide (no longer PBS listed)	
Angiotensin-II receptor blocker + calcium channel blockers + diuretics	Olmesartan + amlodipine + hydrochlorothiazide Valsartan + amlodipine + hydrochlorothiazide	
Angiotensin receptor neprilysin inhibitor		Use in heart failure: valsartan/sacubitril

PBS = Pharmaceutical Benefits Scheme.

* Prepared by the authors using the Pharmaceutical Benefits Schedule, Australian Medicines Handbook, and clinical expertise.

Supplementary results

Table 3. Estimated numbers and costs of general practice consultations for the management of hypertension, and numbers of antihypertensive medication prescriptions dispensed, Australia, 2012–22

	Number of general practice visits for hypertension (millions)*	Prescriptions of antihypertensive medications (million)†
Base case: 3.8% of general practice visits are for hypertension		
2012–13	4.9	48
2013–14	5.1	52
2014–15	5.3	51
2015–16	5.5	51
2016–17	5.7	50
2017–18	5.9	50
2018–19	6.0	51
2019–20	6.2	52
2020–21	6.5	54
2021–22	7.2	56
Low: 1.5% of general practice visits are for hypertension		
2012–13	1.9	—
2013–14	2.0	—
2014–15	2.1	—
2015–16	2.2	—
2016–17	2.2	—
2017–18	2.3	—
2018–19	2.4	—
2019–20	2.4	—
2020–21	2.6	—
2021–22	2.8	—
High: 6.0% of general practice visits are for hypertension		
2012–13	7.7	—
2013–14	8.1	—
2014–15	8.4	—
2015–16	8.7	—
2016–17	8.9	—
2017–18	9.3	—
2018–19	9.5	—
2019–20	9.8	—
2020–21	10.3	—
2021–22	11.4	—

* Based on proportion of all general practice attendances (see table 5).

† Based on PBS item reports.

Table 4. Original and inflated (2022 Australian dollars) Medicare Benefits Schedule (MBS), Pharmaceutical Benefits Scheme (PBS), and patient out-of-pocket expenditure for diagnosing and treating hypertension (includes 2021-22 ambulatory blood pressure monitoring costs)

A. Adjusted for inflation (consumer price index)

	Medications costs (\$ million, 2021-22)			General practice consultation and monitoring costs (\$ million, 2021-22)			All costs (\$ million, 2021-22)		
Year	Total PBS costs	Patient out-of-pocket costs	Total costs	MBS costs	Patient out-of-pocket costs	Total costs	PBS/MBS costs	Patient out-of-pocket costs	Total costs
Base case: 3.8% of general practice visits are for hypertension									
2012–13	609.5	441.6	1051.1	239.7	30.6	270.3	849.2	472.2	1321.4
2013–14	554.2	467.4	1021.6	250.6	30.7	281.3	804.8	498.1	1302.9
2014–15	488.1	463.6	951.7	266.	30.7	296.7	754.1	494.3	1248.4
2015–16	502.6	457.6	960.2	277.4	31.9	309.3	780.0	489.5	1269.5
2016–17	399.3	450.1	849.4	283.8	32.3	316.1	683.2	482.4	1165.6
2017–18	374.6	457.7	832.3	291.2	33.5	324.7	665.8	491.2	1157.0
2018–19	365.2	468.6	833.8	295.1	34.2	329.3	660.3	502.9	1163.2
2019–20	364.1	474.1	838.2	302.3	32.3	334.5	666.4	506.4	1172.8
2020–21	399.5	465.2	864.6	316.8	31.5	348.3	716.3	496.6	1212.9
2021–22	387.3	468.0	855.4	310.3	35.1	345.5	697.7	503.1	1200.8
Total	4444.4	4613.9	9058.3	2833.2	322.8	3156.0	7277.8	4936.7	12 214.5
Low: 1.5% of general practice visits are for hypertension									
2012–13	609.5	441.6	1051.1	94.7	12.0	106.7	704.2	453.6	1157.8
2013–14	554.2	467.4	1021.6	99.0	12.0	111.0	653.2	479.4	1132.6
2014–15	488.1	463.6	951.7	105.1	12.0	117.1	593.2	475.6	1068.8
2015–16	502.6	457.6	960.2	109.6	12.5	122.1	612.2	470.1	1082.3
2016–17	399.3	450.1	849.4	112.1	12.7	124.8	511.4	462.8	974.2
2017–18	374.6	457.7	832.3	115.0	13.1	128.2	489.6	470.8	960.5
2018–19	365.2	468.6	833.8	116.6	13.4	130.0	481.8	482.0	963.8
2019–20	364.1	474.1	838.2	119.4	12.7	132.1	483.5	486.8	970.3
2020–21	399.5	465.2	864.6	125.1	12.3	137.5	524.6	477.5	1002.1
2021–22	387.3	468.0	855.4	121.9	14.0	135.8	509.2	482.0	991.2
Total	4444.4	4613.9	9058.3	1118.5	126.7	1245.3	5562.9	4740.6	10 303.6
High: 6.0% of general practice visits are for hypertension									
2012–13	609.5	441.6	1051.1	378.5	48.3	426.8	988.0	489.9	1477.9

	Medications costs (\$ million, 2021-22)			General practice consultation and monitoring costs (\$ million, 2021-22)			All costs (\$ million, 2021-22)		
Year	Total PBS costs	Patient out-of-pocket costs	Total costs	MBS costs	Patient out-of-pocket costs	Total costs	PBS/MBS costs	Patient out-of-pocket costs	Total costs
2013–14	554.2	467.4	1021.6	395.7	48.5	444.2	949.8	515.9	1465.7
2014–15	488.1	463.6	951.7	420.1	48.4	468.5	908.2	512.0	1420.2
2015–16	502.6	457.6	960.2	438.1	50.3	488.4	940.7	507.9	1448.6
2016–17	399.3	450.1	849.4	448.2	51.0	499.2	847.5	501.1	1348.6
2017–18	374.6	457.7	832.3	459.8	52.9	512.7	834.4	510.6	1345.0
2018–19	365.2	468.6	833.8	465.9	54.1	520.0	831.1	522.7	1353.8
2019–20	364.1	474.1	838.2	477.3	50.9	528.2	841.4	525.1	1366.5
2020–21	399.5	465.2	864.6	500.2	49.7	549.9	899.7	514.9	1414.6
2021–22	387.3	468.0	855.4	490.7	56.2	546.9	878.0	524.2	1402.2
Total	4444.4	4613.9	9058.3	4474.5	510.3	4984.8	8918.8	5124.3	14 043.1

B. Original data

	Medications costs (\$ million, 2021-22)			General practice consultation and monitoring costs (\$ million, 2021-22)			All costs (\$ million, 2021-22)		
Year	Total PBS costs	Patient out-of-pocket costs	Total costs	MBS costs	Patient out-of-pocket costs	Total general practice costs	PBS/MBS costs	Patient out-of-pocket costs	Total costs
Base case: 3.8% of general practice visits are for hypertension									
2012–13	507.9	368.0	876.0	199.8	25.5	225.3	707.7	393.5	1101.2
2013–14	474.3	400.0	874.3	214.5	26.3	240.8	688.8	426.3	1115.1
2014–15	424.9	403.5	828.4	231.6	26.7	258.3	656.5	430.2	1086.7
2015–16	443.5	403.8	847.3	244.8	28.1	272.9	688.3	431.9	1120.2
2016–17	358.3	403.9	762.3	254.7	29.0	283.7	613.1	432.9	1046.0
2017–18	342.6	418.6	761.3	266.4	30.6	297.0	609.0	449.3	1058.3
2018–19	339.6	435.7	775.3	274.4	31.8	306.2	613.9	467.6	1081.5
2019–20	343.1	446.8	789.9	284.8	30.4	315.2	627.9	477.2	1105.1
2020–21	382.5	445.4	828.0	303.4	30.2	333.5	685.9	475.6	1161.5
2021–22	387.3	468.0	855.4	314.4	35.6	350.0	701.8	503.6	1205.4
Total	4004.0	4193.7	8198.2	2588.80	294.20	2882.90	6592.9	4488.1	11 081.00
Low: 1.5% of general practice visits are for hypertension									
2012–13	507.9	368.0	876.0	78.9	10.0	88.9	586.8	378.0	964.9

Year	Medications costs (\$ million, 2021-22)			General practice consultation and monitoring costs (\$ million, 2021-22)			All costs (\$ million, 2021-22)		
	Total PBS costs	Patient out-of-pocket costs	Total costs	MBS costs	Patient out-of-pocket costs	Total general practice costs	PBS/MBS costs	Patient out-of-pocket costs	Total costs
2013–14	474.3	400.0	874.3	84.7	10.3	95.0	559.0	410.3	969.4
2014–15	424.9	403.5	828.4	91.5	10.5	101.9	516.4	414.0	930.3
2015–16	443.5	403.8	847.3	96.7	11.0	107.7	540.2	414.8	955.0
2016–17	358.3	403.9	762.3	100.6	11.4	112.0	458.9	415.3	874.3
2017–18	342.6	418.6	761.3	105.2	12.0	117.2	447.8	430.6	878.5
2018–19	339.6	435.7	775.3	108.4	12.5	120.9	448.0	448.2	896.1
2019–20	343.1	446.8	789.9	112.5	11.9	124.4	455.6	458.7	914.3
2020–21	382.5	445.4	828.0	119.8	11.8	131.7	502.30	457.2	959.6
2021–22	387.3	468.0	855.4	122.8	14.0	136.7	510.1	482.0	992.1
Total	4004.0	4193.7	8198.2	1021.1	115.4	1136.4	5025.1	4309.1	9334.5
High: 6.0% of general practice visits are for hypertension									
2012–13	507.9	368.0	876.0	315.4	40.2	355.7	823.3	408.3	1231.6
2013–14	474.3	400.0	874.3	338.7	41.5	380.1	813.0	441.5	1254.5
2014–15	424.9	403.5	828.4	365.6	42.2	407.8	790.5	445.7	1236.2
2015–16	443.5	403.8	847.3	386.6	44.4	431.0	830.1	448.2	1278.3
2016–17	358.3	403.9	762.3	402.2	45.8	447.9	760.5	449.7	1210.2
2017–18	342.6	418.6	761.3	420.6	48.4	469.0	763.2	467.0	1230.2
2018–19	339.6	435.7	775.3	433.2	50.3	483.5	772.7	486.0	1258.7
2019–20	343.1	446.8	789.9	449.8	48.0	497.8	792.8	494.8	1287.6
2020–21	382.5	445.4	828.0	479.0	47.6	526.6	861.5	493.1	1354.6
2021–22	387.3	468.0	855.4	490.7	56.2	546.9	878.0	524.2	1402.2
Total	4004.0	4193.7	8198.2	4081.8	464.6	4546.3	8085.6	4658.5	12 744.1

Table 5. Reported visits, benefits, and co-payments for Medicare Benefits Schedule item 23 for 2012-22

Financial Year	Total general practice non-referred attendances (millions)	Total benefits paid (Medicare and patients) (millions)	Bulkbilled visits (millions)	Proportion as bulkbilled visits	Total bulk-billed benefits (millions)	Number of non-bulkbilled visits (millions)	Non-bulkbilled benefits paid (millions)	Benefits paid per non-bulkbilled visit	Mean patient contribution
2012–13	128.7	\$5927.7	105.8	82.23%	\$4946.9	22.9	\$980.8	\$42.90	\$29.32
2013–14	134.2	\$6335.7	111.9	83.40%	\$5364.5	22.3	\$971.2	\$43.58	\$31.03
2014–15	139.4	\$6796.6	117.5	84.32%	\$5818.7	21.8	\$977.9	\$44.76	\$32.16
2015–16	145.1	\$7182.8	123.5	85.10%	\$6216.2	21.6	\$966.6	\$44.71	\$34.24
2016–17	148.8	\$7465.7	127.5	85.69%	\$6505.6	21.3	\$960.2	\$45.12	\$35.83
2017–18	154.7	\$7815.9	133.2	86.07%	\$6833.5	21.6	\$982.4	\$45.57	\$37.39
2018–19	158.3	\$8057.8	136.5	86.24%	\$7043.4	21.8	\$1014.5	\$46.58	\$38.46
2019–20	163.2	\$8296.	142.9	87.54%	\$7326.2	20.3	\$969.9	\$47.68	\$39.33
2020–21	171.5	\$8777.2	152.2	88.75%	\$7825.5	19.3	\$951.7	\$49.32	\$41.12
2021–22	189.3	\$9114.6	167.2	88.30%	\$8014.2	22.2	\$1100.4	\$49.66	\$42.25

Table 6. Reported benefits and prescription volumes for antihypertensive drugs, Australia, 2021–22, with estimated component costs

Component	Value (\$ million) or number	Notes
Pharmaceutical Benefits Scheme (PBS)-subsidised		
Total benefits paid on all electronic prescription fees	\$14.9	From PBS
Total number of antihypertensive prescriptions	35.2 million	Estimate based on PBS item reports
Total government and patient expenditure for PBS-subsidised antihypertensive scripts	\$580.2	Estimate based on PBS item reports
Pharmacy service costs	\$425.6	Administration, handling and infrastructure fees, dispensing fees, and electronic prescription fees
<i>Administration, handling, and infrastructure fees</i>	\$150.7	\$4.28 per prescription
<i>Dispensing fees</i>	\$272.5	\$7.74 per prescription
<i>Electronic prescription fees for antihypertensives</i>	\$2.4	Proportion of total PBS expenditure on electronic prescription fees
Medicine costs	\$154.6	
<i>Wholesale markup</i>	\$14.4	Minimum \$0.41/item
<i>Ex-manufacturer price</i>	\$140.2	Balance after deducting for all itemised costs from total government and patient expenditure on PBS-subsidised antihypertensive prescriptions
Under copayment (i.e. wholly patient out-of-pocket)		
Total antihypertensive prescriptions under co-payment level	20.4 million	Estimate based on PBS item reports
Total patient expenditure	\$275.1	Estimate based on PBS item reports
Pharmacy service costs	\$185.5	
<i>Administration, handling, and infrastructure fees</i>	\$87.4	\$4.28 per prescription
<i>Dispensing fees</i>	\$98.1	Balance after deducting for all itemised costs from total patient expenditure
Medicine cost	\$89.7	
<i>Wholesale markup</i>	\$8.4	Ratio of under-co-payment prescriptions compared with PBS-subsidised prescription
<i>Ex-manufacturer price</i>	\$81.3	Ratio of under-co-payment prescriptions compared with PBS-subsidised prescription

PBS = Pharmaceutical Benefits Scheme.

Consolidated Health Economic Evaluation Reporting Standards (CHEERS) 2022 Checklist

Note: the page numbers in this list refer to the submitted manuscript, not the published version or its supporting information file.

Topic	No.	Item	Location where item is reported
Title			
	1	Identify the study as an economic evaluation and specify the interventions being compared.	NA
Abstract			
	2	Provide a structured summary that highlights context, key methods, results, and alternative analyses.	Abstract
Introduction			
Background and objectives	3	Give the context for the study, the study question, and its practical relevance for decision making in policy or practice.	Introduction
Methods			
Health economic analysis plan	4	Indicate whether a health economic analysis plan was developed and where available.	NA
Study population	5	Describe characteristics of the study population (such as age range, demographics, socioeconomic, or clinical characteristics).	Methods
Setting and location	6	Provide relevant contextual information that may influence findings.	Methods
Comparators	7	Describe the interventions or strategies being compared and why chosen.	NA
Perspective	8	State the perspective(s) adopted by the study and why chosen.	Methods
Time horizon	9	State the time horizon for the study and why appropriate.	NA
Discount rate	10	Report the discount rate(s) and reason chosen.	NA
Selection of outcomes	11	Describe what outcomes were used as the measure(s) of benefit(s) and harm(s).	Methods
Measurement of outcomes	12	Describe how outcomes used to capture benefit(s) and harm(s) were measured.	Methods, Pharmaceutical costs, Costs of general practice consultations and ambulatory blood pressure
Valuation of outcomes	13	Describe the population and methods used to measure and value outcomes.	Methods, Pharmaceutical costs, Costs of general practice consultations and ambulatory blood pressure
Measurement and valuation of resources and costs	14	Describe how costs were valued.	Methods, Pharmaceutical costs, Costs of general practice consultations and ambulatory blood pressure
Currency, price date, and conversion	15	Report the dates of the estimated resource quantities and unit costs, plus the currency and year of conversion.	Methods
Rationale and description of model	16	If modelling is used, describe in detail and why used. Report if the model is publicly available and where it can be accessed.	NA
Analytics and assumptions	17	Describe any methods for analysing or statistically transforming data, any extrapolation methods, and approaches for validating any model used.	Methods, Pharmaceutical costs, Costs of general practice consultations and ambulatory blood pressure monitoring
Characterising heterogeneity	18	Describe any methods used for estimating how the results of the study vary for subgroups.	NA
Characterising distributional effects	19	Describe how impacts are distributed across different individuals or adjustments made to reflect priority populations.	NA
Characterising uncertainty	20	Describe methods to characterise any sources of uncertainty in the analysis.	Costs of general practice consultations and ambulatory blood pressure monitoring
Approach to engagement with patients and others affected by the study	21	Describe any approaches to engage patients or service recipients, the general public, communities, or stakeholders (such as clinicians or payers) in the design of the study.	NA

Topic	No.	Item	Location where item is reported
Results			
Study parameters	22	Report all analytic inputs (such as values, ranges, references) including uncertainty or distributional assumptions.	Supporting information, tables 1-6
Summary of main results	23	Report the mean values for the main categories of costs and outcomes of interest and summarise them in the most appropriate overall measure.	Results
Effect of uncertainty	24	Describe how uncertainty about analytic judgments, inputs, or projections affect findings. Report the effect of choice of discount rate and time horizon, if applicable.	Results, Supporting information, tables 3-4
Effect of engagement with patients and others affected by the study	25	Report on any difference patient/service recipient, general public, community, or stakeholder involvement made to the approach or findings of the study	Not reported
Discussion			
Study findings, limitations, generalisability, and current knowledge	26	Report key findings, limitations, ethical or equity considerations not captured, and how these could affect patients, policy, or practice.	Discussion, Limitations
Other relevant information			
Source of funding	27	Describe how the study was funded and any role of the funder in the identification, design, conduct, and reporting of the analysis	Acknowledgements
Conflicts of interest	28	Report authors conflicts of interest according to journal or International Committee of Medical Journal Editors requirements.	Competing interests

From: Husereau D, Drummond M, Augustovski F, et al. Consolidated Health Economic Evaluation Reporting Standards 2022 (CHEERS 2022) Explanation and Elaboration: A Report of the ISPOR CHEERS II Good Practices Task Force. Value Health 2022;25. doi:10.1016/j.jval.2021.10.008