

A statistical analysis on the impact of COVID-19 on hospital activity in Australia

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Outline





- About IHACPA and our role in funding
- COVID-19 in Australia
- Aim
- Method
- Result
- Conclusions
- Next steps



About IHACPA

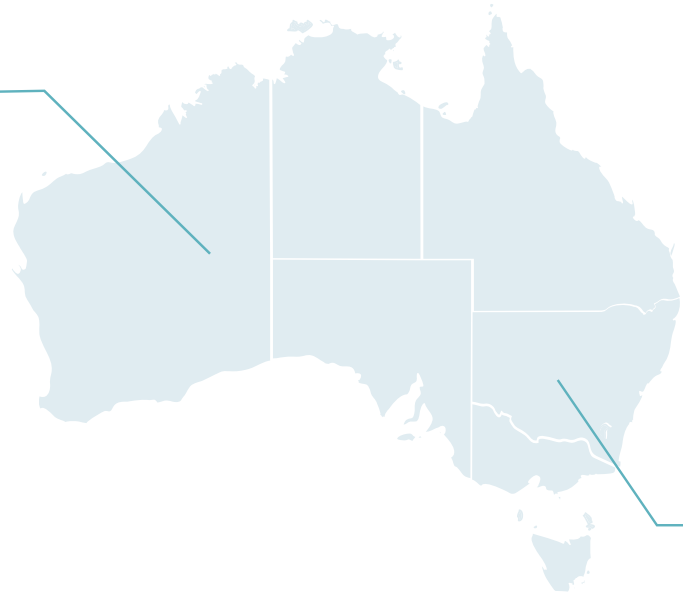
The Independent Health and Aged Care Pricing Authority (IHACPA)

Overview of IHACPA

-  Independent government agency established under the *National Health Reform Act 2011*.
-  Provides independent costing and pricing expertise across public hospitals and aged care.
-  Independent, impartial, evidence-based advice to Australian governments.
-  Developing and implementing robust and transparent funding systems.

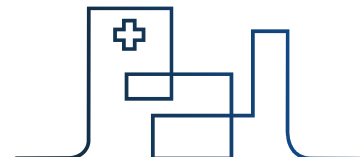
The influence of IHACPA

IHACPA determines the national efficient price annually



$$\Delta \text{Funding} = f(\Delta \text{Price}, \Delta \text{Volume})$$

Commonwealth funding is provided by the National Health Funding Body to the local hospital network



States and territories determine the volume and distribution of services



COVID-19 in Australia

- Zero-COVID suppression strategy until late 2021
- Aggressive responses
 - Strict travel controls
 - Lockdowns
 - Exhaustive contact tracing
- Vaccinations from February 2021
- Most social controls phased out from October 2021



Why we're doing this

- 2022-23 and 2023-24 prices were based on 2019-20 and 2020-21 data, respectively.
- Observed national fall in activity in 2019-20 and in 2020-21 associated with a large increase in average costs:
 - Fixed costs within the hospital system
 - Supported by Government supplements (“Minimum Funding Guarantee”)
- Reported cost per unit was deemed to not represent efficient cost of services in the future
- IHACPA adjusted activity (‘normalised’) for both 2022-23 and 2023-24 pricing
 - To isolate the rise in average costs that is due to the drop in activity.
 - Recognise that there were also legitimate and unavoidable cost rises
- Normalising adds ‘synthetic’ activity to the denominator in calculating the cost per unit

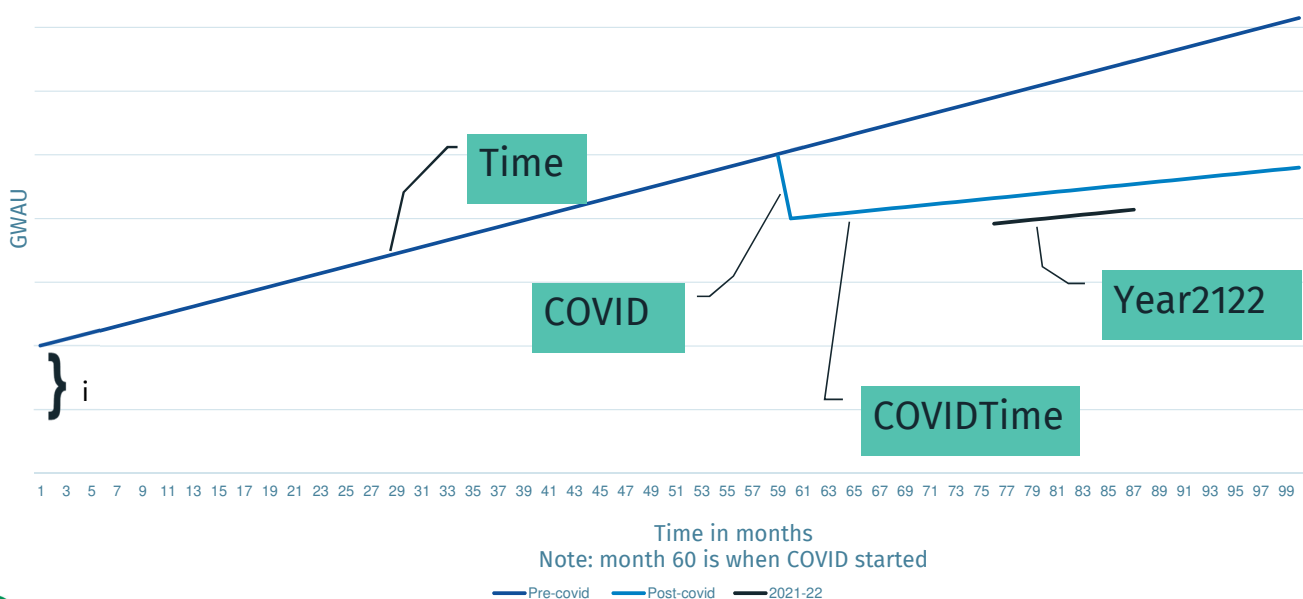


Method for normalising

- Conditions for normalising:
 - Has activity fallen? – has it returned to normal?
 - Have average cost increased due to the fall in activity?
 - Has the MFG supported hospitals?
- Regression analysis used to determine if activity has fallen
 - Refinements to previous analysis
 - Growth panel models look at national percentage changes based on each jurisdiction's data
 - Account for lockdowns
 - Examines if there is 'new' COVID-19 era trend
- Results of regression analysis is used to calculate the 'synthetic' activity



Stylised example of regression model





Models

- Is 2021-22 activity below trend?
 - Using 4 national models and the admitted acute stream data to investigate this question after accounting for COVID-19 and lockdowns.
 - Model 1: What was the impact of COVID-19 on activity?
 - Model 2: What was the impact of COVID-19 on activity after accounting for lockdowns?
 - Model 3: Is activity in 2021-22 on trend with either pre or post COVID-19 era trajectories after accounting for lockdowns?
 - Model 4: What explains the 2021-22 results?
 - Dependent variable is the natural log of the total monthly GWAU.
 - Observation period used is from July 2015 to June 2023 for the eight states and territories.

Model - Summary of independent variables



Variable	Description	1	2	3	4
Time	Continuous variable which takes on the value of 1 to 96 for each month t .	✓	✓	✓	✓
COVID Flag	Indicates the observations falling in the COVID-19 era.	✓	✓	✓	✓
Covid x Time	Continuous variable which indicates the COVID-19 era months (Time interacted with COVID Flag)	✓	✓	✓	✓
Lockdown	Indicates whether the capital/region city of jurisdiction j is in lockdown for 10 days or more in month t .		✓	✓	✓
Lockdown x Year2122	Indicates whether the capital/region city of jurisdiction j is in lockdown for 10 days or more in month t in the year 2021-22 (Lockdown interacted with 2021-22)		✓	✓	✓
Year2122	Indicates the observations in the year 2021-22.			✓	✓
Omicron	Indicates January and February 2022.				✓
Controls	Control variables to account for jurisdiction and seasonal effects	✓	✓	✓	✓



Results

	Model 1		Model 2		Model 3		Model 4	
	% change	P value	% change	P value	% change	P value	% change	P value
Time (month)	0.23%	0	0.23%	0	0.23%	0	0.23%	0
COVID flag	-14.74%	0.002	-4.19%	0.351	-3.94%	0.384	-3.89%	0.388
COVID x Time	0.14%	0.079	0.01%	0.933	0.02%	0.834	0.02%	0.822
Lockdown - capital			-6.29%	0.074	-6.43%	0.038	-6.68%	0.033
Lockdown - regional			-9.47%	0.006	-10.12%	0.001	-9.81%	0.002
Lockdown - capital x 2021-22			6.38%	0.005	7.12%	0.001	5.96%	0.005
Lockdown - regional x 2021-22			6.12%	0.016	9.31%	0	8.86%	0
2021-22 year					-3.40%	0	-1.92%	0.043
Omicron wave							-7.92%	0



Conclusions

- In ABF when activity falls, hospitals become susceptible to a funding shock
- In Australia, we had a funding guarantee
 - This has implications on average cost and, in our system, average price
- Normalisation was IHACPA's response to account for the rise in costs that was due to shock of activity drop.



Next steps

- Cost impacts 2021-22 (done)
- 2022-23 activity and cost analysis
- 2023-24 activity analysis
- Extending analysis to understand other system shocks

Thank you

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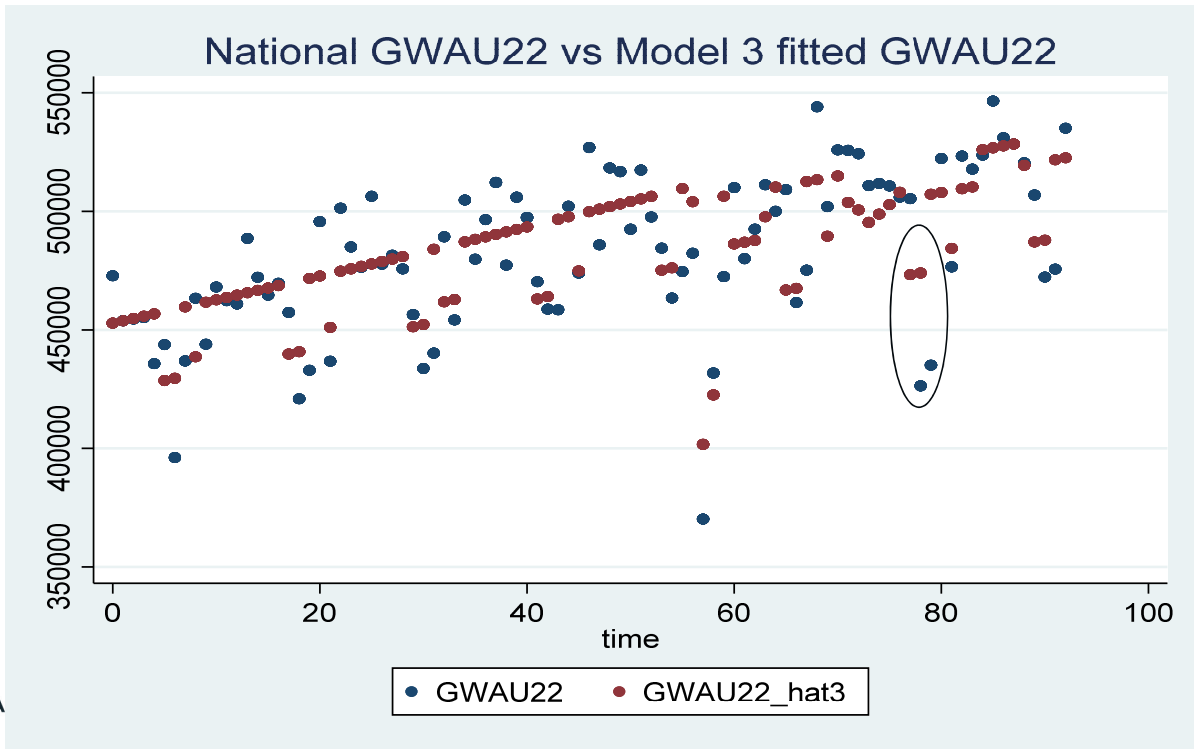


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Model 3: actual v model predicted



Model 4: actual v model predicted

