Royal Australasian College of Surgeons

Regional variation and rising costs of groin hernia repairs in Australia: is there an urgent need for clinical consensus guidelines?

Introduction

There has been a slow but steady rise in Australia over the past 20 years in the proportion of groin hernias repaired using a minimally invasive surgery (MIS) approach. In 2011/12, the absolute number of MIS operations performed for inguinal and femoral hernias overtook the number of open operations.[1] The reasons for this are multifactorial and not necessarily based on strong clinical evidence or economics.

When considering fixed costs such as operating room time and the use of disposables, in 2011/12 laparoscopic inguinal hernia repair in a Victorian metropolitan public hospital was AUS$1268 extra per procedure than open repair.[2] In a private hospital in NSW in 2016, laparoscopic hernia repair performed as an overnight stay was AUD$2000 extra per procedure than an open repair done as a short stay operation.[3]

In the United States, the number of robotic-assisted inguinal hernia repairs rose an average of 2% per year from 2012 to 2018 across 73 Michigan hospitals,[4] and cost an additional AUS $3260 (US$2200) per procedure compared with laparoscopic repair.[5] The rising trends in MIS for groin hernia repair and increased access to robotics in Australia suggest that healthcare costs in relation to this surgical condition are set to increase. However, the potential impact of changing surgeon preferences on Medicare Benefits Schedule (MBS) expenditure for groin hernia repairs is unknown.

In July 2021, Medicare introduced changes to the classification of abdominal wall hernias including a new MBS item number (30748) to replace the two previous numbers for laparoscopic or open repairs (30 609 or 30 614, respectively); raising the MBS fee slightly from $479.05 to $483.35 regardless of technique.[6] This change effectively removed classifications for the surgeon's chosen repair method. The rationale behind this decision is unclear but has the potential to increase hospital and patient out of pocket costs if the repair method involves the use of significant disposable equipment or is followed by complications.

The current report analysed Medicare statistical data for groin hernia repair procedures from July 2000 to June 2021—prior to the introduction of the new MBS item number. These data describe the Medicare reimbursement for hernia repair during this period, although this does not necessarily represent the cost of the operation or what the hospitals or surgeons charge.

Methods

Over the period July 2000 to June 2021, data for MBS benefit *per capita* (i.e., per 100 000 population) were extracted for item numbers 30 609: '*Femoral or inguinal hernia, laparoscopic repair of,*

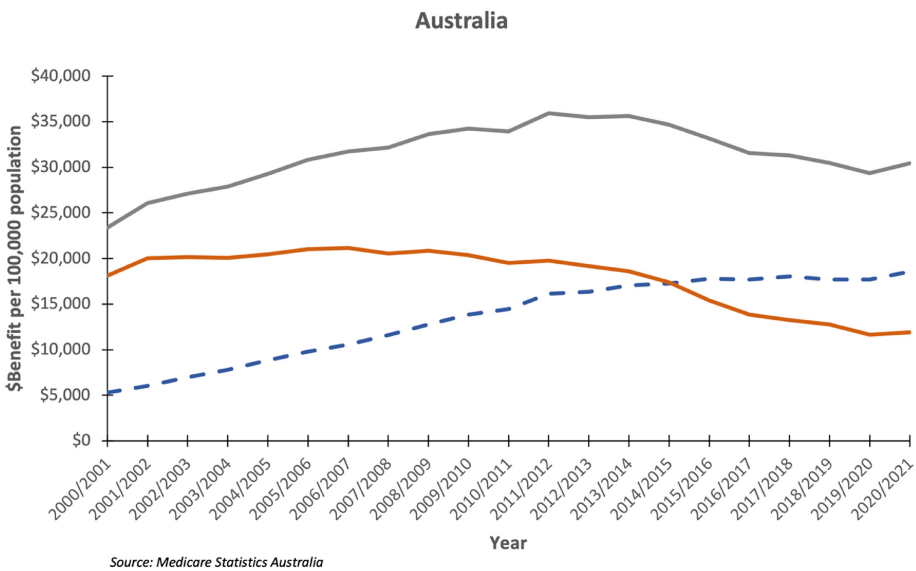

Fig. 1. Medicare expenditure per 100 000 population for groin hernia repairs in Australia, 2000/2001 to 2020/2021. The grey line represents the total *per capita* expenditure for groin hernia repairs regardless of technique. The dotted blue line represents the benefit paid for MBS item 30609 (laparoscopic inguinal or femoral repair). The orange line represents the benefit paid for MBS item 30 614 (open inguinal or femoral hernia repair).

Table 1 Medicare benefits *per capita* (100 000 population) paid for laparoscopic or open groin hernia repair in Australia: July 2000 to June 2021

State or territory	Open ($Benefit)	Laparoscopic ($Benefit)	Difference		Average annual growth for laparoscopic repair (%)	Average annual growth for open repair (%)
			$Benefit	%		
NSW	325 978	328 362	-2384	−0.7	6.2	−2.3
VIC	401 642	193 541	208 101	51.8	8.3	−2.8
QLD	363 564	353 039	10 525	2.9	6.1	−3.1
SA	413 414	259 142	154 272	37.3	4.8	−0.9
WA	448 713	237 282	211 431	47.1	7.1	−0.5
TAS	496 031	344 759	151 272	30.5	4.2	1.8
ACT	438 270	196 618	241 652	55.1	19.3	−2.7
NT	223 338	194 968	28 370	12.7	7.8	−3.2
Australia	375 720	282 293	93 427	24.9	6.5	−2.1

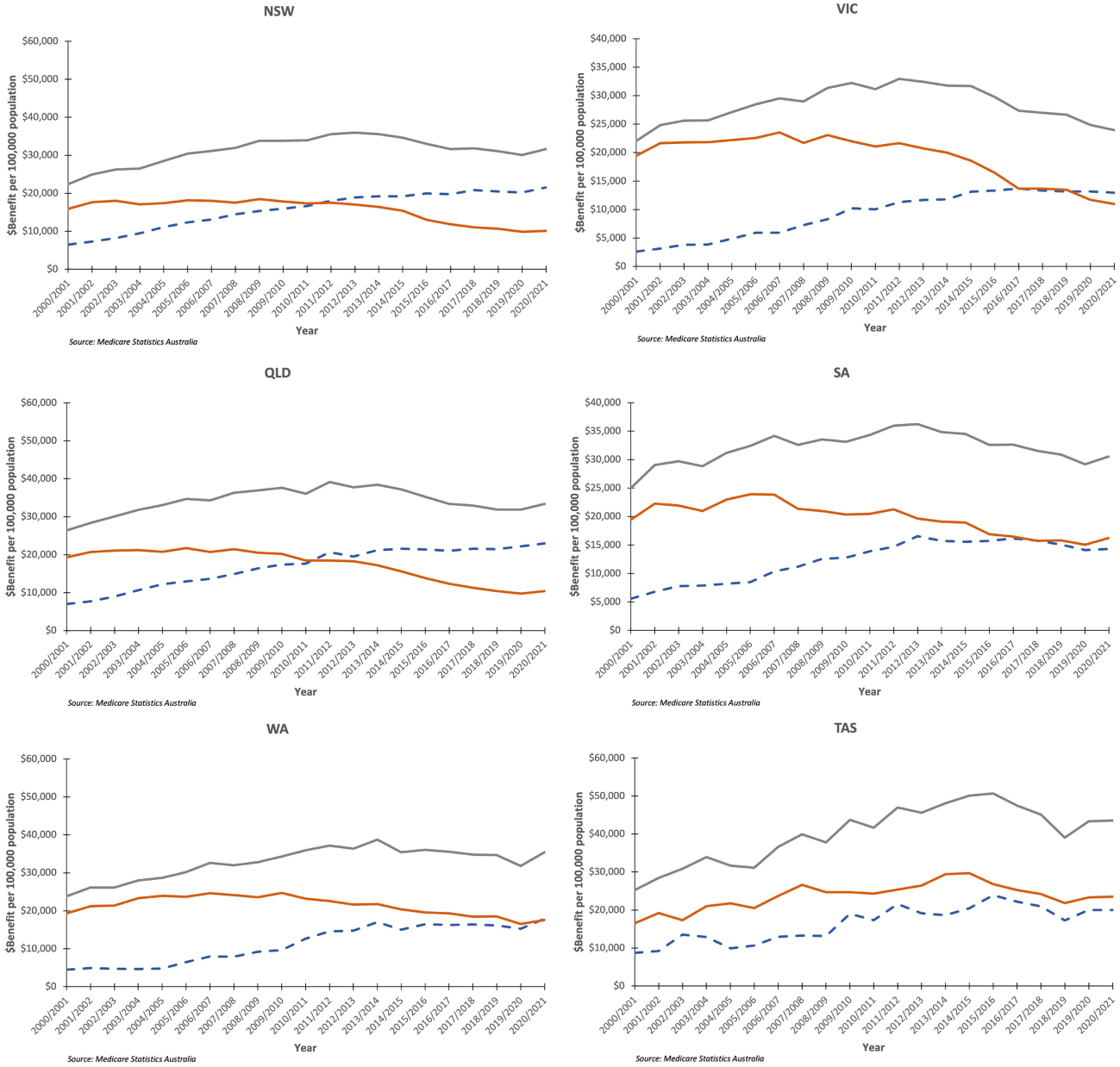

Fig. 2. Medicare expenditure per 100 000 population by state and territory, 2000/2001 to 2020/2021. The grey line represents the total *per capita* expenditure for groin hernia repairs regardless of technique. The dotted blue line represents the benefit paid for MBS item 30 609 (laparoscopic inguinal or femoral repair). The orange line represents the benefit paid for MBS item 30 614 (open inguinal or femoral hernia repair).

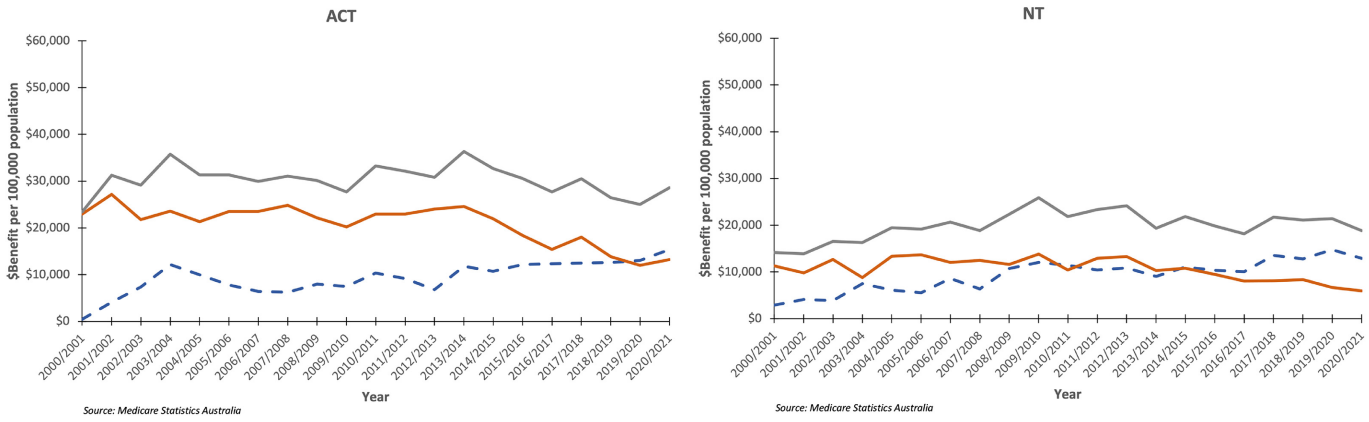

Fig. 2. (Continued)

other than a service associated with a service to which item 30614 applies' and 30 614: '*Femoral or inguinal hernia or infantile hydrocele, repair of, on a person 10 years of age or over, other than a service to which item 30503 or 30615 applies*.'

For each financial year, data were disaggregated by state. Descriptive analysis and the proportions of expenditure were calculated using Microsoft Excel Version 16. The study was considered negligible risk and granted exemption from review by The University of Sydney Human Research Ethics Committee.

Results

During the study period, the national annual benefit increased by 2.7% per year from $4.7 million to $7.9 million. Total expenditure for laparoscopic repair rose from 22.6% in 2000/2001 to 61.0% in 2020/2021, exceeding open repair in 2014/2015 (Fig. 1). The average *per capita* spending for laparoscopic repairs increased by 6.5% per year ($5288 to $18556) and decreased for open repair by 2.1% per year ($18 103 to $11880).

There were marked regional variations in spending across Australia (Table 1). In 2000/2001, the highest and least funded regions varied by 86.3% (QLD versus NT: $26 383 versus $14156). In 2020/2021, this figure increased to 130.8% (TAS versus NT: $43 542 versus $18870). The average annual growth in spending ranged from 0.4% in VIC to 2.8% in TAS.

There was a 10-year regional difference in the crossover in spending for laparoscopic over open repair. QLD was the first (2010/2011), followed by NSW (2011/2012), the NT (2014/2015), VIC (2016/2017), SA (2017/2018) and the ACT (2019/20). In 2020/2021, WA reached parity while TAS still received more funding for open repairs than laparoscopic repairs (Fig. 2).

Discussion

These regional variations in spending on groin hernia reflect, at least in part, significant variations in surgical practice which have been previously documented in Australia.[7] Although more work is required to fully understand these data, the findings likely reflect local enthusiasm for a specific surgical approach. Regional variations in practice have been reported previously (Vu et al Surgeon utilization of minimally invasive tchniques for inguinal hernia repair: a population-based study. Surgical Endoscopy 2019 3392): 486-493) but the marked regional and time trend variations seen in Australia contrast with only modest variations in surgical practice reported in other parts of the world.[8]

The data presented here describe increasing health system costs for groin hernia repair procedures over time and wide regional variations in Medicare spending. This is despite a lack of strong evidence that MIS has clinical benefit over contemporary open groin hernia repair techniques[9] and that there are no locally produced clinical consensus guidelines or pathways for hernia surgery.[10] Furthermore, a recent systematic review of robotic-assisted groin hernia surgery drew attention to the weak evidence for a benefit over either contemporary open or laparoscopic techniques, and cautioned readers to be alert for the 'spin' factor in many studies.[11]

Further research is needed to explain factors driving variations in hernia repair procedures in Australia. However, this is perhaps now made more challenging with the consolidation of MBS item numbers. Surgeons, government funding bodies, private health insurance companies, and hospitals need to work together to improve understanding of these issues.

Acknowledgement

Open access publishing facilitated by The University of Sydney, as part of the Wiley - The University of Sydney agreement via the Council of Australian University Librarians.

Author contributions

Joanna M. Z. Mills: Conceptualization; data curation; formal analysis; methodology; writing – original draft; writing – review and editing. **Georgina M. Luscombe:** Conceptualization; methodology; supervision; writing – review and editing. **Thomas J. Hugh:** Conceptualization; methodology; supervision; writing – review and editing.

References

1. Kevric J, Papa N, Toshniwal S, Perera M. Fifteen-year groin hernia trends in Australia: the era of minimally invasive surgeons. *ANZ J. Surg.* 2018; **88**: E298–302.

2. Smart P, Castles L. Quantifying the cost of laparoscopic inguinal hernia repair. *ANZ J. Surg.* 2012; **82**: 809–12.
3. Batabyal P, Haddad RL, Samra JS, Wickins S, Sweeney E, Hugh TJ. Inguinal hernia repair with Parietex ProGrip mesh causes minimal discomfort and allows early return to normal activities. *Am. J. Surg.* 2016; **211**: 24–30.
4. Sheetz KH, Claflin J, Dimick JB. Trends in the adoption of robotic surgery for common surgical procedures. *JAMA Network Open* 2020; **3**: e1918911.
5. Abdelmoaty WF, Dunst CM, Neighorn C, Swanstrom LL, Hammill CW. Robotic-assisted versus laparoscopic unilateral inguinal hernia repair: a comprehensive cost analysis. *Surg. Endosc.* 2019; **33**: 3436–43.
6. Department of Health, Australian Government. *MBS Online: Medicare Benefits Schedule*. Canberra, ACT: Commonwealth of Australia; 2021. [Cited 28 Jul 2022.] Available from URL: www.mbsonline.gov.au
7. Royal Australasian College of Surgeons. Same-day surgery for femoral, inguinal and umbilical hernia repair in adults. Final report; 2017. https://www.surgeons.org/-/media/Project/RACS/surgeons-org/files/reports-guidelines-publications/surgical-variance-reports/2017-04-21_rpt_racs_mbp_hernia_repair.pdf
8. Latenstein CS, Thunnissen FM, Harker M *et al*. Variation in practice and outcomes after inguinal hernia repair: a nationwide observational study. *BMC Surg.* 2021; **21**: 1–7.
9. Bittner R, Chen D. Editorial comment to the paper "A case for open inguinal hernia repair" written by John Morrison. *Int J Abdom Wall Hernia Surg* 2018; **1**: 74–8.
10. Simons MP, Smietanski M, Bonjer HJ *et al*. International guidelines for groin hernia management. *Hernia* 2018; **22**: 1–65.
11. Hansen DL, Fonnes S, Rosenberg J. Spin is present in the majority of articles evaluating robot-assisted groin hernia repair: a systematic review. *Surg. Endosc.* 2022; **13**: 1–8.

Joanna M. Z. Mills,* BA Hons, MPhil, MBBS
Georgina M. Luscombe,† PhD
Thomas J. Hugh,*‡ MD, FRACS

**Northern Clinical School, Sydney Medical School, The University of Sydney, Sydney, New South Wales, Australia, †Sydney Medical School, The University of Sydney School of Rural Health, Sydney, New South Wales, Australia and ‡Upper Gastrointestinal Surgical Unit, Royal North Shore Hospital, Sydney, New South Wales, Australia*

doi: 10.1111/ans.18016