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Public performance reporting and hospital choice: A questionnaire of patients undergoing cancer surgery in the private healthcare sector

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Abstract

Objectives National mandatory public performance reporting (PPR) for Australian public hospitals, including measures of cancer waiting times, was introduced in 2011. The aims of this study were to assess whether PPR of hospital data is used by patients with breast, bowel or lung cancer when selecting a hospital for elective surgery and how PPR could be improved to meet their information needs.

Design A national cross-sectional postal questionnaire.

Setting Australian private healthcare sector.

Participants Patients with breast, bowel or lung cancer who attended a hospital for elective surgery (n=243) between January and December 2016.

Outcome measures Patients' choice of hospital, use of PPR information and preferred areas of PPR information. Descriptive and content analyses were conducted.

Results The majority of respondents (94%) attended a private hospital. Almost half could choose a hospital. Choice of hospital was not influenced by PPR data (92% unaware) but by their specialist (90%). Respondents considered PPR to be important (70%) but did not want to see the information, preferring their general practitioners (GPs) to tell them about it (40%). Respondents considered costs of surgery (59%), complications (58%) and success rates (57%) to be important areas of information that should be publicly reported. Almost half suggested that quality indicators be reported at the individual clinician level. Content analysis of the open-ended questions identified four themes: 1) decision-making factors; 2) data credibility; 3) unmet information needs; and 4) unintended consequences.

Conclusions Our findings suggest that PPR of hospital data had no substantial impact on patients' choice of hospital. Nonetheless, many respondents expressed interest in using PPR information in the future. To increase PPR awareness and usability, personalised and integrated information on

cost and quality of hospitals is required. Dissemination of PPR information via specialists and GPs could assist patients in interpreting the data and to support decision-making.

Strengths and limitations of the study

- There have been very few studies on the impacts of PPR on consumers’ choice of hospitals in the private healthcare sector since the introduction of national mandatory PPR of public hospital data in Australia.
- This study used a national cross-sectional questionnaire in the private healthcare sector to assess the use of PPR of hospital data by patients with breast, bowel or lung cancer to inform hospital choice.
- Given the growing prevalence of PPR data being disseminated through the internet, this study provided further insights into the level of demands for PPR and preferred areas of PPR information.
- The results are not generalisable to other cancer elective surgeries, younger patients and public hospitals because of the non-population representative characteristics of respondents (older women who used private hospitals).

Introduction

There are growing efforts within healthcare systems internationally to measure and publicly disseminate healthcare providers' performance data for greater transparency, to increase accountability and to improve quality of care [1, 2]. Public performance reporting (PPR) of healthcare providers' data is aimed at improving the quality of care by guiding consumers to select high quality providers over low quality providers. It aims to stimulate quality improvement among providers by identifying areas in which they underperform. These pathways are interconnected by providers' motivation to maintain or increase market share [3].

In many countries, such as the United States (US) and the United Kingdom (UK), PPR of hospital and individual clinician's performance data has been a central feature of government health policy [4]. In Australia, national mandatory PPR of public hospital data was introduced in 2011. All public hospitals are required to provide data to the Australian Institute of Health and Welfare (AIHW) which is then reported via the MyHospitals website [5]. PPR on the MyHospitals website is voluntary for private hospitals. Some private healthcare providers (e.g. Healthscope [6]) and most states/territory government also have their own PPR websites (e.g. the Victorian Health Services Performance [7]).

Prior research indicates that PPR changes healthcare providers' behaviour but has limited impact on consumers' healthcare decision-making [8-10]. Previous research also suggests that consumers want more choice over their healthcare [11]. However, results from questionnaires conducted in the US and the Netherlands showed that most consumers do not use or barely use PPR information when selecting a specialist or a hospital [12-15]. This may be because consumers are not aware of PPR information, they do not have access to it and they do not understand or trust it [8, 15, 16]. Instead, consumers rely on various sources of information to make an informed hospital choice including: advice from their general practitioner (GP); their previous experience; family and friends' experiences; the reputation of the hospital; and the distance of the hospital from their home [13, 14, 17, 18].

Given the recent introduction of PPR in Australia, there have been few studies on the impacts of PPR on Australian consumers' choice of hospitals [19], particularly in the private healthcare sector [20]. To address this gap, the present study aimed to assess whether PPR of hospital data was used by patients with breast, bowel or lung cancer to inform hospital choice; the level of demands for PPR; and how PPR could be improved to meet their information needs. The focus was on patients with access to private healthcare undergoing cancer elective surgery because choice of hospital is likely to be possible and cancer waiting times are publicly reported for all public and some private hospitals [5]. It should be noted that most surgery for cancer is categorised as 'elective' as it falls outside 'emergency' surgery. Elective surgery does not imply non-essential or cosmetic surgery. It is surgery that is considered necessary following a medical assessment of the patient but admission can be delayed for at least 24 hours. Public patients are then place on a hospital waiting list for planned surgery, with recommended maximum wait times classified as urgent (within 30 days), semi-urgent (within 90 days) or non-urgent [5]. In the private sector, patients can usually access elective surgery more quickly than in the public sector, especially for semi-urgent or non-urgent cases. Better understanding of factors that influence hospital choice, including PPR information, can help explain consumers' decision making processes and inform policy-makers whether greater resources should be allocated to PPR.

Methods

Australian healthcare system

Australia has a universal publicly funded health insurance scheme (Medicare) which provides free access to public hospitals [21]. Private healthcare insurance is also available and encouraged by government policy (i.e. high income earners receive a tax penalty for not purchasing, and middle income earners receive a private health cover rebate.) [22]. In 2014-15, there were 10.1 million (57.1%) Australian adults with private healthcare insurance [23]. Private patients can be treated in either public or private hospitals, paid entirely by their private healthcare insurance, co-paid with their private healthcare insurance, or self-funded. Private patients can exercise greater choice of specialist, hospital and timing of procedures than public patients.

Study design

This study is part of a larger research program which aims to improve understanding of how PPR might improve quality of care in public and private hospitals in Australia by examining the perspectives of multiple stakeholders. Previous components of the research program include interviews with healthcare consumer advocates, providers, purchasers (public and private funders of healthcare services) [24], senior hospital clinical administrators [25, 26] and general practitioners (forthcoming). This component of the research program uses a quantitative approach to understand the use of PPR information when selecting a hospital for surgery among patients with breast, bowel or lung cancer. A national cross-sectional study design of the private healthcare sector was conducted using postal questionnaires.

Questionnaire design

We developed a short questionnaire with four sections: 1) cancer type; 2) hospital stay; 3) hospital choice; and 4) about you. The first section included two questions about the type of cancer the participants had, period of diagnosis, and confirmation of undergoing cancer surgical treatments between 1st January and 31st December 2016. The second section included two questions about the type of hospital they attended (i.e. public or private hospital) and their status (public or private patient). The third section included 10 questions about factors influencing their hospital choice, the awareness and use of the available PPR information, preferred areas of PPR information (i.e. quality and performance indicators), level of data presentation, the importance of PPR information and barriers to using PPR information. This section included two additional open-ended questions about any concerns or experiences of PPR they would like to share. The final section included demographic characteristics such as gender, age, marital status, education, employment status, occupation, income and health care insurance status. The questionnaire was piloted with a consumer group from Peter MacCallum Cancer Centre in Victoria [27] to identify ambiguities or difficult questions and to ensure that the questionnaire could be completed in a timely manner. The consumer group included five women aged between 35-45 years. Four women previously had cancer, including three in the last 12 months. The questionnaire was revised in response to the comments received from the consumer group.

Sample

Participants were identified and contacted by the Australian Government Department of Human Services (DHS) through their Medicare Benefits Schedule (MBS) records (including procedure codes). Eligibility criteria included: participants aged 18 years and over; diagnosed with breast, bowel or lung cancer; and attended an Australian hospital for cancer surgical treatments between 1st January and December 2016. MBS is a list of Medicare services subsidised by the Australian government [28]. Therefore, the sample included only those who made a Medicare claim (i.e. private patients in public or private hospital). Patients who did not make a Medicare claim (i.e. public patients in public hospital in which there are no costs to the patients) are not included. Their records are managed by the individual state governments. The selection of the appropriate MBS procedure codes was done by the researchers in consultation with a surgeon who specialises in cancer care.

Data collection

The postal questionnaire was open between April and July 2017. Study invitations were mailed out to a random sample of 1,000 eligible participants by the Australia Government DHS. We required 264 participants to achieve a 90% confidence level with a 5% margin of error. The expected response rates of previous research conducted by the Centre were approximately 20-30%. Researchers were not provided with contact details of the selected sample. Study invitations included a cover letter from the DHS, a plain language explanation of the study, the questionnaire and a reply-paid envelope addressed to the researchers. Each participant received a $10 e-gift card as reimbursement for their time if they included an email address with their return questionnaire.

Data analysis

Descriptive analyses of the closed-ended questions were conducted using the Statistical Package for the Social Sciences (SPSS) version 23. Content analyses of the two open-ended questions were conducted using NVivo version 11.

Ethical considerations

Ethical approval for this study was granted by the Melbourne School of Population and Global Health Human Ethics Advisory Group, The University of Melbourne. The return of the questionnaire was taken as an indication of voluntary consent to participate.

Results

Sample characteristics

In total, 243 participants completed the questionnaire (24.3% response rate). Compared to respondents, non-respondents were more likely to be male and younger. The sample was somewhat representative of the Australian population who had cancer elective surgery. Patients with breast and lung cancer were slightly over-represented whereas patients with bowel cancer were under-represented [29].

The characteristics of the respondents are described in Table 1. Over 60% of respondents were diagnosed with breast cancer, 27% with bowel and 10% with lung cancer, with the majority diagnosed in the last 12 months (70%). Almost all the respondents were women (99%) aged between 55 and 74 years (62%). The majority were born in Australia (77%) and married/in a defacto relationship (79%). Almost 30% had a bachelor/postgraduate degree, a slight under-representation of the Australian women population with a bachelor degree or higher [30]. Half of the respondents were pensioners/retirees and 40% were employed. Of those employed, over 60% worked in a professional or managerial position. Over half had a household income of less than $99,999. Fewer than half (44%) had healthcare benefits (e.g. healthcare card which entitles access to cheaper prescription medicines). Almost all respondents (97%) had private health insurance, which usually covered both hospital treatment and extras such as outpatient physiotherapy (88%).

Hospital stay and choice

Respondents self-reported that 94% attended a private hospital and 6% attended a public hospital for cancer surgery. Among those who attended a public hospital, 87% were private patients and 13% were public patients. The small proportion of public patients in the sample may suggest that some of the care provided involved a private component. Costs of private hospitals were reportedly covered partly by the respondents and their health insurance (49%) or fully covered by their health insurance (47%). Almost half (48%) of the respondents attended their preferred hospital, 28% did not have a choice in hospital, and 25% did not have a hospital preference. Of those who did not have a choice of hospital, 37% would have liked to have had a choice.

Awareness and use of PPR information

Ninety-two percent of respondents reported no awareness of PPR information. Of those who were aware of it, 88% did not use it when selecting a hospital and 56% considered PPR to be of little or no importance to inform their choice of hospital. Reasons cited for not using PPR information included limited choice of hospital, as well as prior experience with certain hospitals, and trust in the advice of their doctor: *"We only have a private and public hospital where I live, so* *choice was limited regardless of the information provided"; "I was too sick to do any research at the time. I took advice from my specialist"*.

Factors influencing hospital choice

Table 2 presents the factors that influenced the choice of hospital. PPR data did not influence choice of hospital. The most common factors that impacted hospital selection were specialists (90%), reputation of the hospital (24%), distance to the hospital from home (24%), patients' previous experience (18%), and GPs advice (17%).

Barriers affecting the use of PPR

Table 3 shows the barriers affecting the use of PPR in selecting a hospital. The most common barriers impeding the use of PPR data included lack of PPR awareness (74%), lack of PPR relevance (11%) and interested in PPR for their condition solely (10%).

Source of PPR information

Despite the lack of PPR awareness and barriers to the use of PPR, overall 71% of respondents considered PPR to be very important or important to inform their choice or family members' future choice of hospital. However, most respondents did not want to access PPR information themselves, preferring their GPs or other healthcare providers to tell them about it (40%). Other preferred sources of PPR information included websites (35%), printed books/directories (10%) and mobile phone applications (3%). A small proportion of respondents did not want any PPR information (9%).

Preferred types of PPR information

Table 4 shows the types of PPR information that respondents most wanted access to. Respondents considered costs of surgery (59%), complications (58%) and success rates (57%) important areas to report on. Respondents reported that they preferred PPR information to be reported at the individual clinician level (48%), followed by hospitals (31%) and specific clinical units within hospitals (18%).

Additional comments and concerns related to PPR

Almost half of the respondents (48%) provided information in response to one or both open-ended questions. Analysis of their responses revealed four themes: 1) decision-making factors; 2) data credibility; 3) unmet information needs; and 4) unintended consequences. Themes two, three and four provided further insights into PPR of hospital data which were not captured in the quantitative findings.

1. Decision-making factors

Consistent with the quantitative findings, choice of hospital was determined by advice from specialists or GPs rather than PPR information. Although respondents perceived PPR to be important for hospital's accountability and transparency, they reported that their choices were restricted to the hospital or hospitals where their specialist performed surgery. Other respondents had relied on their GP's for a specialist recommendation:

> "I did not check on the hospital. My surgeon was recommended as the 'best' by my GP who I trust and she could operate quickly and worked out of a specific hospital - no choice to be made." (Respondent #39)

Some respondents preferred their GPs to be informed about PPR information and relay it to them, or direct them to an appropriate website or other resource to inform their decision. Additional factors influencing patients' selection of hospital included family and friends.

2. Data credibility

Although over 90% of respondents reported not being aware of PPR, they nonetheless raised concerns with the reliability, validity and timeliness of the data. Some were cynical and suspicious of the data, questioning its trustworthiness:

> “The hospitals information accuracy. No hospital is going to let ‘issues’ out otherwise loss of patients means loss of money and so it goes. In an ideal world, we could ‘believe’ the information and make our decisions as consumers with accuracy. I don't believe the information will truly reflect the real world. I have seen government departments fudge stuff.” (Respondent #200)

Some respondents expressed their lack of clarity and concern around who collected the data (i.e. independent body), how it was collated (i.e. qualifications and experiences of the people, data quality processes), and why certain areas of information (i.e. quality and performance indicators) were chosen to be reported.

3. Unmet information needs

Respondents reported the following areas of information (currently not available on the MyHospitals website) to be of interest: patient experiences; hospital cleanliness; food quality; nursing standards (e.g. bedside manners); and hospital facilities (e.g. available entertainments such as movie/tablet rentals). However, several respondents worried that reporting patient experiences may be misleading and damaging to a hospital’s reputation if there were no site moderators:

> “As a patient I am not a medical expert as are other patients. We can comment on the level of care but not the medical treatment. So, my opinion and that of other patients is very subjective. Just like 'TripAdvisor' someone could rubbish a hospital with no medical grounds or expertise.” (Respondent #52)

4. Unintended consequences

Additional PPR concerns raised by respondents included unnecessary stress and increased pressure on hospital staff because of PPR. Some respondents likened PPR of hospital data to the education reporting system which compares how a school is performing on the National Assessment Plan Literacy and Numeracy (NAPLAN) tests with other similar schools. A respondent claimed that increased focus on reporting in the education sector resulted in poorer education and expressed concern that PPR of hospital data could similarly lead to a deterioration in the quality of care provided. Some respondents suggested that the PPR systems need to be design in a way which minimises administrative burden and is supportive of hospital staff:

> "It would have to be carefully designed to be fair to all involved without creating excessive administrative and pressure and hierarchy as sometimes happens in schools reporting - overly burdensome for staff so counter-productive." (Respondent #57)

Discussion

The results of the study, which are reflective of experiences in the private healthcare sector, highlighted that many respondents did not use PPR information to inform their hospital choice, mainly because they were not aware of it. This is consistent with previous studies [12-15]. Instead, as patients, they were guided by their specialists when selecting a hospital. Almost half of the respondents reported that they did have a choice of hospital, which suggests they were involved in the decision-making process with their specialists. Others have reached similar conclusion [31]. Although determining how the specialists and patients selected hospitals was not part of this study, the responses to the open-ended questions revealed that the availability of specialists and where he/she performed the elective surgery generally determined which hospital they attended as patients. Future research is required to explore the decision-making process between specialists and patients, and whether the dissemination of PPR information to patients via specialists (as potential mediators of patient choice) is feasible.

The limited awareness of PPR among respondents may be associated with the lack of mandatory PPR for private hospitals. Half of all Australian private hospitals voluntarily participate on the MyHospitals website but they do not necessarily report on all of the quality indicators that public hospitals do [5]. Some private healthcare providers (e.g. Healthscope) publish their own PPR websites to help patients make informed decisions [6]. However, Healthscope reports aggregated data on quality indicators for all their private hospitals combined, instead of individual hospitals, specialists or conditions – this limits its relevance and usability for healthcare consumers. Almost half of the study respondents proposed that publicly reported hospital-related information (which includes quality and performance indicators) be reported at the level of individual specialists. In the US and the UK, ratings of individual specialists working in hospitals are publicly reported [4]. There is evidence that public reporting of individual specialists' data have led to improvement in the quality of care [32, 33]. However, unintended consequences such as 'cream skimming' and 'gaming' (i.e. avoiding treating high risk patients who are likely to have poor outcomes) have also been reported [34, 35]. In Australia, debates surrounding PPR of individual specialist-level continues [36-38].

Consistent with previous research, we found the following performance indicators to be of relevance to patients: costs of surgery; complications rates; success rates; patient experiences; hospital cleanliness; and food quality [39, 40]. None of these quality indicators are currently reported on the MyHospitals website [5]. Patient experience is one of 17 indicators recommended to be publicly reported but methodological issues has prevented its disclosure. In contrast, several states' performance websites actively report on patient experiences, complications, and standards of cleaning to various level of details [7, 41-43]; the Bureau of Health Information in New South Wales the most thorough and interactive in its web-based reporting [41]. In other countries, such as England, The Netherlands and the US, patient reported experience and outcomes are routinely collected and available for consumers to view. These measures are found to be positively associated with delivery of care [44], clinical outcomes [45], clinical effectiveness and patient safety [46].

None of the performance websites in Australia describe costs of surgery. There are no costs associated with attending an Australian public hospital as a public patient. It may not be surprising then that costs of surgery and associated out-of-pocket costs are not reported. However, knowing out-of-pocket costs was considered important for patients with private healthcare insurance. Costs of elective surgery were fully covered by private healthcare insurance in only 47% of cases, with one respondent commenting that out-of-pocket cost for her breast cancer surgery was $7,500. In Australia, there are limited publicly available sources for patients to access information on out-of-pocket costs for inpatient and outpatient care [47, 48]. The Royal Australasian College of Surgeons in collaboration with Medibank (an Australian private health insurer), publishes surgical variance reports which describe average out-of-pocket charges for surgeons and other medical services (i.e. anaesthetist, assistant surgeon and for diagnostics). Their reports were not targeted at consumers but for specialists, to encourage improvement in private hospital clinical outcomes and patient care. In the US, report cards and reporting websites (e.g. OpsCost [49], Healthcare Bluebook [50], Fair Heath consumers [51]) have been developed to help consumers compare hospital quality and cost of care. Evaluation of report cards with cost information, in an experimental setting, showed that some employees avoided low-cost providers because they perceived low-cost care as substandard and higher prices as proxy for higher quality [52]. The authors suggest that including quality indicators with costs data may improve consumers' decision-making. Given the limited research in this area and the growth in comparative quality and cost websites, further studies are warranted to evaluate its accessibility, usefulness and content for consumers.

Although many respondents considered PPR to be important for transparency and accountability, they were sceptical of the reliability and validity of PPR data. The reason for this is unclear given that most patients were not aware of PPR. Some comments from the open-ended questions demonstrated lack of understanding of how PPR data was collected, and collated and the methodologies used to construct the quality indicators. In support, past research suggests that consumers distrust PPR data because they have difficulties interpreting the information [8, 16, 53].

In the US, consumer-focused best practice guidelines have been developed for presenting, promoting and disseminating PPR data to improve its comprehensibly and perceived trustworthiness [40, 54].

Patients preferred that the dissemination of PPR information to occur via their GPs. In Australia, GPs are gatekeepers to secondary care with patients requiring their referral for non-emergency access. Therefore, GPs are in a good position to help patients interpret PPR data or guide patients to appropriate resources to support decision-making. However, past research shows that GPs rarely used PPR information when referring patients to hospitals because they are unaware of PPR data and they were concerns about its reliability and validity [55, 56]. Addressing these barriers are essential if GPs are to be a viable source of PPR information for their patients.

Limitations

These findings should be interpreted carefully due to several limitations. Given the non-population representative characteristics of respondents (older women who used private hospitals), the results are not generalisable to other cancer elective surgeries, younger patients and public hospitals. Future research is needed to gather data from a larger sample and to expand this study to other elective surgeries and public patients in public hospital (could be recruited via the individual state government which hold their records). Recall bias may have also affected our results, particularly among elderly patients. However, we attempted to minimise recall bias by ensuring that only patients who had cancer elective surgery within the last 12 months were eligible to complete the questionnaire.

Conclusions

PPR of hospital data appears to have no substantial impact on selection of hospitals among a randomly selected cohort of Australian patients with breast, bowel or lung cancer who were treated as private patients. Almost one third of respondents reported no choice of hospital and current PPR information did not appeared to meet their information needs. Nevertheless, a substantial number of respondents expressed interest in PPR information and claimed that they would use it in their future decision-making. Given the growing prevalence of performance data being publicly disseminated through the internet, further efforts are required to develop quality and cost indicators of interest to patients. While this study focused on people treated for cancer, it has relevance for all consumers of healthcare. The dissemination of PPR information to patients via specialists and GPs may enable patients to make clinically and financially informed choices with the assistance of their medical doctors.

Contributors

MK, DD and MB conceptualised and designed the study and obtained its funding. KP, RC and MK contributed to the design of the questionnaire. KP, MK and JM selected the sample (MBS procedure codes). KP collected, analysed and interpreted the data and drafted the manuscript. RC, MB, DD, JM and MK contributed to data interpretation and critically reviewed the manuscript. All authors read and approved the final manuscript.

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Competing interests

The authors declare that they have no competing interests.

Data sharing statement

The dataset analysed during the current study are not publicly available due to participants' confidentiality.

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Table 1 Demographic characteristic of respondents (n=243)

	N (%)
Cancer Type	
Breast	155 (63.8%)
Bowel	65 (26.7%)
Lung	23 (9.5%)
Diagnosis period	
Less than 12 months	176 (72.4%)
Between 1 and 5 years ago	65 (26.7%)
More than 5 years ago	2 (0.8%)
Gender	
Male	49 (20.2%)
Female	191 (98.8%)
Missing	3 (1.2%)
Age groups	
25-34	3 (1.2%)
35-44	13 (5.3%)
45-54	36 (14.8%)
55-64	77 (31.7%)
65-74	73 (30.0%)
75-84	32 (13.2%)
85+	6 (2.5%)
Missing	3 (1.2%)
Country of birth	
Australia	186 (76.5%)
Others	53 (21.8%)
Missing	4 (1.6%)
Marital status	
Single/never married	10 (4.1%)
Married/in a defacto relationship	193 (79.4%)
Widowed/divorced/separated	37 (15.2%)
Missing	3 (1.2%)
Education	
Postgraduate	25 (10.3%)
Bachelor	45 (18.5%)
Diploma/certificate	75 (30.9%)
High school	93 (38.3%)
Missing	5 (2.1%)
Employment	
Full-time	45 (18.5%)
Part-time/casual	34 (14.0%)
Self-employed	18 (7.4%)
Retired/pensioner/unemployed	124 (51.0%)
*Other**	18 (7.4%)

Missing	4 (1.6%)
Occupation (limited to those working)	
Manager	22 (22.7%)
Professional	39 (40.2%)
Technician or trades worker	4 (4.1%)
Community of personal service worker	3 (3.1%)
Clerical or administrative worker	15 (15.5%)
Sales worker	0 (0.0%)
Machinery operator or driver	0 (0.0%)
Labourer	0 (0.0%)
Never worked for a wage	0 (0.0%)
Other	13 (13.4%)
Missing	1 (1.0%)
Household income	
Less than $25,000	22 (9.1%)
$25,000 to $49,999	51 (21.0%)
$50,000 to $99,999	69 (28.4%)
$100,000 or more	51 (21.0%)
Prefer not to stay	36 (14.8%)
Missing	14 (5.8%)
Health care benefits	
Yes	107 (44.0%)
No	134 (55.1%)
Missing	2 (0.8%)
Private health insurance	
Yes	235 (96.7%)
Hospital cover only	28 (11.9%)
Extra's cover only	1 (0.4%)
Hospital and extras cover	206 (87.7%)
No	5 (2.1%)
Missing	3 (1.2%)

*others include those who are currently not working due to their illness and home duties.

Table 2 Factors influencing hospital choice*

	N (%)
Specialist	218 (89.7%)
Distance of the hospital from home	57 (23.5%)
Reputation of the hospital	57 (23.5%)
Own experience	44 (18.1%)
General practitioners	42 (17.3%)
Length of waiting list	37 (15.2%)
Health insurer provider	20 (8.2%)
Family members/friends	22 (9.1%)

Hospital catchment area	17 (7.0%)
Size of the hospital	4 (1.6%)
Hospital/other website	3 (1.2%)
Performance reporting website	0 (0.0%)
Booklet/leaflet or someone else at GP clinic	0 (0.0%)

*total does not reflect 100% as patients could select multiple factors

Table 3 Barriers affecting the use of PPR information*

	N (%)
Not aware	179 (73.7%)
Not relevant	26 (10.7%)
Results about own condition	23 (9.5%)
Accuracy of the information	8 (3.3%)
No internet access	7 (2.9%)
Too difficult to understand	3 (1.2%)
It was out of date	2 (0.8%)
Unsure how to use the information	0 (0.0%)

*total does not reflect 100% as patients could select multiple factors

Table 4 Preferred types of PPR information*

	N (%)
Costs of surgery	144 (59.3%)
Complications rates	141 (58.0%)
Successful recovery	138 (56.8%)
Patient's experience/satisfaction	132 (54.3%)
Medical errors	110 (45.3%)
Waiting times	109 (44.9%)
Readmission rates	91 (37.4%)
Mortality rates	72 (29.6%)
Length of stay	45 (18.5%)

*total does not reflect 100% as patients could select multiple factors

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract p.2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found p.2
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported pp.4-5
Objectives	3	State specific objectives, including any prespecified hypotheses p.5
Methods		
Study design	4	Present key elements of study design early in the paper p.6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection p.7
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants p.7
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable p.6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group p.6
Bias	9	Describe any efforts to address potential sources of bias NA
Study size	10	Explain how the study size was arrived at p.7
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding p.8
		(*b*) Describe any methods used to examine subgroups and interactions NA
		(*c*) Explain how missing data were addressed NA
		(*d*) If applicable, describe analytical methods taking account of sampling strategy NA
		(*e*) Describe any sensitivity analyses NA
Results		
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed p.8
		(b) Give reasons for non-participation at each stage p.8
		(c) Consider use of a flow diagram NA
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders p.8
		(b) Indicate number of participants with missing data for each variable of interest\ p.21 (Table 1)
Outcome data	15*	Report numbers of outcome events or summary measures pp.9-10 (in text). and pp.21-23 (Tables 1, 2,3 and 4)
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were

		adjusted for and why they were included NA
		(*b*) Report category boundaries when continuous variables were categorized NA
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period NA
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses NA
Discussion		
Key results	18	Summarise key results with reference to study objectives pp.13-15
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias p.16
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence pp.13-16
Generalisability	21	Discuss the generalisability (external validity) of the study results p.16
Other information		
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based p.17

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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Public performance reporting and hospital choice: A cross-sectional study of patients undergoing cancer surgery in the Australian private healthcare sector

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Public performance reporting and hospital choice: A cross-sectional study of patients undergoing cancer surgery in the Australian private healthcare sector

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Abstract

Objectives National mandatory public performance reporting (PPR) for Australian public hospitals, including measures of cancer waiting times, was introduced in 2011. PPR is voluntary for private hospitals. The aims of this study were to assess whether PPR of hospital data is used by patients with breast, bowel or lung cancer when selecting a hospital for elective surgery and how PPR could be improved to meet their information needs.

Design A national cross-sectional postal questionnaire.

Setting Australian private healthcare sector.

Participants Private patients with breast, bowel or lung cancer who attended a public or private hospital for elective surgery (n=243) in 2016.

Outcome measures Patients' choice of hospital, use of PPR information and preferred areas of PPR information. Descriptive and conventional qualitative content analyses were conducted.

Results Most respondents (94%) attended a private hospital. Almost half could choose a hospital. Choice of hospital was not influenced by PPR data (92% unaware) but by their specialist (90%). Respondents considered PPR to be important (70%) but did not want to see the information, preferring their general practitioners (GPs) to tell them about it (40%). Respondents considered costs of surgery (59%), complications (58%) and success rates (57%) to be important areas of information that should be publicly reported. Almost half suggested that quality indicators be reported at the individual clinician level. Analysis of the open-ended questions identified four themes: 1) decision-making factors; 2) data credibility; 3) unmet information needs; and 4) unintended consequences.

Conclusions PPR of hospital data had no substantial impact on patients' choice of hospital. Nonetheless, many respondents expressed interest in using it in the future. To increase PPR awareness and usability, personalised and integrated information on cost and quality of hospitals is

required. Dissemination of PPR information via specialists and GPs could assist patients in interpreting the data and support decision-making.

Strengths and limitations of the study

- There have been very few studies on the impacts of PPR on consumers' choice of hospitals in the private healthcare sector since the introduction of national mandatory PPR of public hospital data in Australia.
- This study used a national cross-sectional questionnaire in the private healthcare sector to assess the use of PPR of hospital data by patients with breast, bowel or lung cancer to inform hospital choice.
- Given the growing prevalence of PPR data being disseminated through the internet, this study provided further insights into the level of demands for PPR and preferred areas of PPR information.
- The results are not generalisable to other cancer elective surgeries, younger patients and public hospitals because of the non-population representative characteristics of respondents (older women who used private hospitals).

Introduction

There are growing efforts within healthcare systems internationally to measure and publicly disseminate healthcare providers' (i.e. hospitals and clinicians) performance data for greater transparency, to increase accountability and to improve quality of care [1, 2]. Public performance reporting (PPR) of healthcare providers' data is aimed at improving the quality of care by guiding consumers to select high quality providers over low quality providers. It aims to stimulate quality improvement among providers by identifying areas in which they underperform. These pathways are interconnected by providers' motivation to maintain or increase market share [3].

In many countries, such as the United States (US) and the United Kingdom (UK), PPR of hospital and individual clinician's performance data has been a central feature of government health policy [4]. In Australia, national mandatory PPR of public hospital data was introduced in 2011. All public hospitals are required to provide data to the Australian Institute of Health and Welfare (AIHW) which is then reported via the MyHospitals website [5]. Quality indicators reported on the MyHospitals website are underpinned by the Performance and Accountability Framework. The framework identifies 48 indicators, of which 17 are hospital indicators and 31 are primary healthcare indicators. Hospital indicators publicly reported include hand hygiene, staphylococcus aureus infections, time patients spent in emergency department, cancer surgery waiting times and financial performance of public hospitals. Indicators yet to be publicly reported, due to their associated methodological issues, include measures of mortality, unplanned readmission rates, patient experiences and access to services by type of service compared to need.

PPR on the MyHospitals website is voluntary for private hospitals. In 2015-16, there were 630 private hospitals in Australia [6] and 36% voluntarily participate on the MyHospitals website but they do not necessarily report on all the quality indicators that public hospitals do [5]. Large private healthcare providers (e.g. Healthscope with 46 hospitals [7] and Ramsay Health Care with 73 hospitals [8]) publish their own PPR websites to help patients make informed decisions. Most states/territory government also have their own PPR websites (e.g. the Victorian Health Services Performance [9] and New South Wales Bureau of Health Information [10]). Quality indicators varies across MyHospitals, private healthcare providers and states/territory government websites. Examples of additional quality indicators reported on the private healthcare providers and states/territory government websites but not on the MyHospitals website include patient experiences, Apgar scores for babies (assessment of a baby's wellbeing after birth), patient falls, pressure injuries and rehabilitation outcomes.

Prior research indicates that PPR changes healthcare providers' behaviour but has limited impact on consumers' healthcare decision-making [11-13]. Previous research also suggests that consumers want more choice over their healthcare [14]. However, results from questionnaires conducted in the US and the Netherlands showed that most consumers do not use or barely use PPR information when selecting a specialist or a hospital [15-18]. This may be because consumers are not aware of PPR information, they do not have access to it and they do not understand or trust it [11, 18, 19]. Instead, consumers rely on various sources of information to make an informed hospital choice including: advice from their general practitioner (GP); their previous experience; family and friends' experiences; the reputation of the hospital; and the distance of the hospital from their home [16, 17, 20, 21].

Given the recent introduction of PPR in Australia, there have been few studies on the impacts of PPR on Australian consumers' choice of hospitals [22], particularly in the private healthcare sector [23]. The focus was on patients with access to private healthcare undergoing cancer elective surgery because choice of hospital is likely to be possible and cancer waiting times are publicly reported for all public and some private hospitals [5]. It should be noted that most surgery for cancer is categorised as 'elective' as it falls outside 'emergency' surgery. Elective surgery does not imply non-essential or cosmetic surgery. It is surgery that is considered necessary following a medical assessment of the patient but admission can be delayed for at least 24 hours. Public patients are then place on a hospital waiting list for planned surgery, with recommended maximum wait times classified as urgent (within 30 days), semi-urgent (within 90 days) or non-urgent [5]. In the private sector, patients can usually access elective surgery more quickly than in the public sector, especially for semi-urgent or non-urgent cases. Better understanding of factors that influence hospital choice, including PPR information, can help explain consumers' decision making processes and inform policy-makers whether greater resources should be allocated to PPR. Therefore, the present study aimed to assess whether PPR of hospital data was used by patients with breast, bowel or lung cancer to inform hospital choice; factors that influence their hospital choice; the level of demands for PPR; barriers to using PPR; and how PPR could be improved to meet their information needs.

Methods

Australian healthcare system

Australia has a universal publicly funded health insurance scheme (Medicare) which provides free access to public hospitals [24]. Private healthcare insurance is also available and encouraged by government policy (i.e. high income earners receive a tax penalty for not purchasing, and middle income earners receive a private health cover rebate) [25]. In 2014-15, there were 10.1 million (57.1%) Australian adults with private healthcare insurance [26]. Private patients can choose to be treated in either public or private hospitals. To access public or private hospital for non-emergency care, patients must be referred by their GPs. Issues of payments for private hospitals are generally discussed during the consultations [27]. Medicare covers 75% of the Medicare Benefits Schedule (MBS) fee for private patients. The remaining 25% is paid entirely by their private healthcare insurance, co-paid with their private healthcare insurance, or self-funded if the patient does not have private healthcare insurance. Private patients can exercise greater choice of specialist, hospital and timing of procedures than public patients.

Study design

This study is part of a larger research program which aims to improve understanding of how PPR might improve quality of care in public and private hospitals in Australia by examining the perspectives of multiple stakeholders. Previous components of the research program include interviews with healthcare consumer advocates, providers, purchasers (public and private funders of healthcare services) [28], senior hospital clinical administrators [29, 30] and general practitioners (forthcoming). This component of the research program uses a quantitative approach to understand the use of PPR information when selecting a hospital for surgery among patients with breast, bowel or lung cancer. A national cross-sectional study design of the private healthcare sector was conducted using postal questionnaires.

Questionnaire design

We developed a short questionnaire with four sections: 1) cancer type; 2) hospital stay; 3) hospital choice; and 4) about you (Appendix A). The first section included two questions about the type of cancer the participants had, period of diagnosis, and confirmation of undergoing cancer surgical treatments between 1st January and 31st December 2016. The second section included two questions about the type of hospital they attended (i.e. public or private hospital) and their status (public or private patient). The third section included 10 questions about factors influencing their hospital choice, the awareness and use of the available PPR information, preferred areas of PPR information (i.e. quality and performance indicators), level of data presentation, the importance of PPR information and barriers to using PPR information. This section included two additional open-ended questions about any concerns or experiences of PPR they would like to share. The final section included demographic characteristics such as gender, age, marital status, education, employment status, occupation, income and health care insurance status. The questionnaire was piloted with a consumer group from Peter MacCallum Cancer Centre in Victoria [31] to identify ambiguities or difficult questions and to ensure that the questionnaire could be completed in a timely manner. The consumer group included five women aged between 35-45 years. Four women previously had cancer, including three in the last 12 months. The questionnaire was revised in response to the comments received from the consumer group.

Sample

Participants were identified and contacted by the Australian Government Department of Human Services (DHS) through their MBS records (including procedure codes). Eligibility criteria included: participants aged 18 years and over; diagnosed with breast, bowel or lung cancer; and attended an Australian hospital for cancer surgical treatments between 1st January and 31st December 2016. MBS is a list of Medicare services subsidised by the Australian government [32]. Therefore, the sample included only those who made a Medicare claim (i.e. private patients in public or private hospital). Patients who did not make a Medicare claim (i.e. public patients in public hospital in which there are no costs to the patients) are not included. Their records are managed by the individual state governments. The selection of the appropriate MBS procedure codes (Appendix B) was done by the researchers in consultation with a surgeon who specialises in cancer care. In total, 29,793 eligible participants were identified (52% with breast cancer, 32% with bowel cancer and 16% with lung cancer). A stratified sampling by cancer type was performed for 1,000 eligible participants. Samples within each stratum were selected with simple random sampling.

Data collection

The postal questionnaire was open between April and July 2017. Study invitations were mailed out to a random sample of 1,000 eligible participants by the Australia Government DHS. A sample size calculation for cross-sectional study was conducted [33]. The confidence level was set at 90% with a 5% margin of error. The estimate proportion of the population who used PPR when selecting a hospital was set at 0.4. The required sample size is 261 participants. The expected response rates of previous research conducted by the Centre were approximately 20-30%.

Researchers were not provided with contact details of the selected sample. Study invitations included a cover letter from the DHS, a plain language explanation of the study, the questionnaire and a reply-paid envelope addressed to the researchers. Each participant received a $10 e-gift card as reimbursement for their time if they included an email address with their return questionnaire.

Data analysis

Descriptive analyses of the closed-ended questions were conducted using the Statistical Package for the Social Sciences (SPSS) version 23. A conventional qualitative content analyses of the two open-ended questions were conducted using NVivo version 11. A conventional qualitative content analysis aims to interpret meaning from the content of text data without using preconceived categories [34]. Codes were derived directly from the text data and then grouped into categories that represent similar meanings.

Ethical considerations

Ethical approval for this study was granted by the Melbourne School of Population and Global Health Human Ethics Advisory Group, The University of Melbourne. The return of the questionnaire was taken as an indication of voluntary consent to participate.

Results

Sample characteristics

In total, 243 participants completed the questionnaire (24.3% response rate). Compared to respondents, non-respondents were more likely to be male and younger. The sample was somewhat representative of the Australian population who had cancer elective surgery. Patients with breast (64% vs. 58%) and lung cancer (9% vs. 7%) were slightly over-represented whereas patients with bowel cancer were under-represented (27% vs 35%) [35].

The characteristics of the respondents are described in Table 1. Over 60% of respondents were diagnosed with breast cancer, 27% with bowel and 10% with lung cancer, with the majority diagnosed in the last 12 months (70%). Almost all the respondents were women (79%) aged between 55 and 74 years (62%). The majority were born in Australia (77%) and spoke English (95%). The majority were married/in a defacto relationship (79%). Almost 30% had a bachelor/postgraduate degree, a slight under-representation of the Australian women population with a bachelor degree or higher [36]. Half of the respondents were pensioners/retirees and 40% were employed. Of those employed, over 60% worked in a professional or managerial position. Over half had a household income of less than $99,999. The median annual gross household income in Australia for the 2015-16 period was $84,032 [37]. Fewer than half (44%) had healthcare benefits (e.g. healthcare card which entitles access to cheaper prescription medicines). Almost all respondents (97%) had private health insurance, which usually covered both hospital treatment and extras such as outpatient physiotherapy (88%).

Hospital stay and choice

Respondents self-reported that 94% attended a private hospital and 6% attended a public hospital for cancer surgery. Among those who attended a public hospital, 87% were private patients and 13% were public patients. The small proportion of public patients in the sample may suggest that some of the care provided involved a private component (e.g. certain diagnostic imaging and pathology services are not fully covered by Medicare [38]). Alternatively, this could have been a clerical error in the MBS records. Costs of private hospitals were reportedly covered partly by the respondents and their health insurance (49%) or fully covered by their health insurance (47%). Three percent of respondents self-funded their treatments. Almost half (48%) of the respondents attended their preferred hospital, 28% did not have a choice in hospital, and 25% did not have a hospital preference. Of those who did not have a choice of hospital, 37% would have liked to have had a choice.

Awareness and use of PPR information

Ninety-two percent of respondents reported no awareness of PPR information. Of those who were aware of it, 88% did not use it when selecting a hospital and 56% considered PPR to be of little or no importance to inform their choice of hospital. Reasons cited for not using PPR information included limited choice of hospital, as well as prior experience with certain hospitals, and trust in the advice of their doctor: *"We only have a private and public hospital where I live, so choice was limited regardless of the information provided"; "I was too sick to do any research at the time. I took advice from my specialist"*.

Factors influencing hospital choice

Table 2 presents the factors that influenced the choice of hospital. PPR data did not influence choice of hospital. The most common factors that impacted hospital selection were specialists (90%), reputation of the hospital (24%), distance to the hospital from home (24%), patients' previous experience (18%), and GPs advice (17%).

Barriers affecting the use of PPR

Table 3 shows the barriers affecting the use of PPR in selecting a hospital. The most common barriers impeding the use of PPR data included lack of PPR awareness (74%), lack of PPR relevance (11%) and interested in PPR for their condition solely (10%).

Source of PPR information

Despite the lack of PPR awareness and barriers to the use of PPR, overall 71% of respondents considered PPR to be very important or important to inform their choice or family members' future choice of hospital. However, most respondents did not want to access PPR information themselves, preferring their GPs or other healthcare providers to tell them about it (40%). Other preferred sources of PPR information included websites (35%), printed books/directories (10%) and mobile phone applications (3%). A small proportion of respondents did not want any PPR information (9%).

Preferred types of PPR information

Table 4 shows the types of PPR information that respondents most wanted access to. Respondents considered costs of surgery (59%), complications (58%) and success rates (57%) important areas to report on. Respondents reported that they preferred PPR information to be reported at the individual clinician level (48%), followed by hospitals (31%) and specific clinical units within hospitals (18%).

Additional comments and concerns related to PPR

Almost half of the respondents (48%) provided information in response to one or both open-ended questions. Analysis of their responses revealed four themes: 1) decision-making factors; 2) data credibility; 3) unmet information needs; and 4) unintended consequences. Themes two, three and four provided further insights into PPR of hospital data which were not captured in the quantitative findings.

1. Decision-making factors

Consistent with the quantitative findings, choice of hospital was determined by advice from specialists or GPs rather than PPR information. Although respondents perceived PPR to be important for hospital's accountability and transparency, they reported that their choices were restricted to the hospital or hospitals where their specialist performed surgery. Other respondents had relied on their GP's for a specialist recommendation:

> "I did not check on the hospital. My surgeon was recommended as the 'best' by my GP who I trust and she could operate quickly and worked out of a specific hospital - no choice to be made." (Respondent #39)

Some respondents preferred their GPs to be informed about PPR information and relay it to them, or direct them to an appropriate website or other resource to inform their decision. Additional factors influencing patients' selection of hospital included family and friends.

2. *Data credibility*

Although over 90% of respondents reported not being aware of PPR, they nonetheless raised concerns with the reliability, validity and timeliness of the data. Some were cynical and suspicious of the data, questioning its trustworthiness:

> "The hospitals information accuracy. No hospital is going to let 'issues' out otherwise loss of patients means loss of money and so it goes. In an ideal world, we could 'believe' the information and make our decisions as consumers with accuracy. I don't believe the information will truly reflect the real world. I have seen government departments fudge stuff." (Respondent #200)

Some respondents expressed their lack of clarity and concern around who collected the data (i.e. independent body), how it was collated (i.e. qualifications and experiences of the people, data quality processes), and why certain areas of information (i.e. quality and performance indicators) were chosen to be reported.

3. *Unmet information needs*

Respondents reported the following areas of information (currently not available on the MyHospitals website) to be of interest: patient experiences; hospital cleanliness; food quality; nursing standards (e.g. bedside manners); and hospital facilities (e.g. available entertainments such as movie/tablet rentals). However, several respondents worried that reporting patient experiences may be misleading and damaging to a hospital's reputation if there were no site moderators:

> "As a patient I am not a medical expert as are other patients. We can comment on the level of care but not the medical treatment. So, my opinion and that of other patients is very subjective. Just like 'TripAdvisor' someone could rubbish a hospital with no medical grounds or expertise." (Respondent #52)

4. Unintended consequences

Additional PPR concerns raised by respondents included unnecessary stress and increased pressure on hospital staff because of PPR. Some respondents likened PPR of hospital data to the education reporting system which compares how a school is performing on the National Assessment Plan Literacy and Numeracy (NAPLAN) tests with other similar schools. A respondent claimed that increased focus on reporting in the education sector resulted in poorer education and expressed concern that PPR of hospital data could similarly lead to a deterioration in the quality of care provided. Some respondents suggested that the PPR systems need to be design in a way which minimises administrative burden and is supportive of hospital staff:

> "It would have to be carefully designed to be fair to all involved without creating excessive administrative and pressure and hierarchy as sometimes happens in schools reporting - overly burdensome for staff so counter-productive." (Respondent #57)

Discussion

The results of the study, which are reflective of experiences in the private healthcare sector, highlighted that many respondents did not use PPR information to inform their hospital choice, mainly because they were not aware of it. This is consistent with previous studies [15-18]. Instead, as patients, they were guided by their specialists when selecting a hospital. Almost half of the respondents reported that they did have a choice of hospital, which suggests they were involved in the decision-making process with their specialists. Others have reached similar conclusion [39]. Although determining how the specialists and patients selected hospitals was not part of this study, the responses to the open-ended questions revealed that the availability of specialists and where he/she performed the elective surgery generally determined which hospital they attended as patients. Future research is required to explore the decision-making process between specialists and patients, and whether the dissemination of PPR information to patients via specialists (as potential mediators of patient choice) is feasible.

The limited awareness of PPR among respondents may be associated with the lack of mandatory PPR for private hospitals. Over a third of Australian private hospitals voluntarily participate on the MyHospitals website [5]. Some private healthcare providers (e.g. Healthscope and Ramsay Health Care) publish their own PPR websites [7, 8]. However, Ramsay Health Care reports aggregated data on quality indicators for all their private hospitals combined, instead of individual hospitals, specialists or conditions – this limits its relevance and usability for healthcare consumers. Recently, Healthscope has launched the MyHealthscope website which allow healthcare consumers to view and compare the performance of each their hospital against the industry rate. Again, the results are not stratified by conditions or reported at the individual specialist-level.

Almost half of the study respondents proposed that publicly reported hospital-related information (which includes quality and performance indicators) be reported at the level of individual specialists. In the US and the UK, ratings of individual specialists working in hospitals are publicly reported [4]. There is evidence that public reporting of individual specialists' data have led to improvement in the quality of care [40, 41]. However, unintended consequences such as 'cream skimming' and 'gaming' (i.e. avoiding treating high risk patients who are likely to have poor outcomes) have also been reported [42, 43]. In Australia, debates surrounding PPR of individual specialist-level continues [44-46].

Consistent with previous research, we found the following performance indicators to be of relevance to patients: costs of surgery; complications rates; success rates; patient experiences; hospital cleanliness; and food quality [47, 48]. None of these quality indicators are currently reported on the MyHospitals website [5]. Patient experience is one of 17 indicators recommended to be publicly reported on the MyHospitals website. However, methodological issues (i.e. lack of national comparable information) has prevented its disclosure. In contrast, several states' performance websites actively report on patient experiences, complications, and standards of cleaning to various level of details [9, 10, 49, 50]; the Bureau of Health Information in New South Wales the most thorough and interactive in its web-based reporting [10]. Although some of the quality indicators collected by the states are similar, there are no consistency on the tools use to collect the data. For example, the inpatient experiences surveys conducted in Victoria (92 questions) [51], New South Wales (99 questions) [52] and South Australia (71 questions) [53] are drawn from various sources including the NHS inpatient survey, the Picker Institute Questionnaire and the Patient Experience Information Development Working group, state's key performance indicators and national set of core common patient experience questions. This limits comparison at the national level but allows hospital comparison within states. In other countries, such as England, The Netherlands and the US, patient reported experience and outcomes are routinely collected and available for consumers to view. These measures are found to be positively associated with delivery of care [54], clinical outcomes [55], clinical effectiveness and patient safety [56].

None of the performance websites in Australia describe costs of surgery. There are no costs associated with attending an Australian public hospital as a public patient. It may not be surprising then that costs of surgery and associated out-of-pocket costs are not reported. However, knowing out-of-pocket costs was considered important for patients with private healthcare insurance. Costs of elective surgery were fully covered by private healthcare insurance in only 47% of cases, with one respondent commenting that out-of-pocket cost for her breast cancer surgery was $7,500. In Australia, there are limited publicly available sources for patients to access information on out-of-pocket costs for inpatient and outpatient care [57, 58]. The Royal Australasian College of Surgeons in collaboration with Medibank (an Australian private health insurer), publishes surgical variance reports which describe average out-of-pocket charges for surgeons and other medical services (i.e.

anaesthetist, assistant surgeon and for diagnostics). Their reports were not targeted at consumers but for specialists, to encourage improvement in private hospital clinical outcomes and patient care. In the US, report cards and reporting websites (e.g. OpsCost [59], Healthcare Bluebook [60], Fair Heath consumers [61]) have been developed to help consumers compare hospital quality and cost of care. Evaluation of report cards with cost information, in an experimental setting, showed that some employees avoided low-cost providers because they perceived low-cost care as substandard and higher prices as proxy for higher quality [62]. The authors suggest that including quality indicators with costs data may improve consumers' decision-making. Given the limited research in this area and the growth in comparative quality and cost websites, further studies are warranted to evaluate its accessibility, usefulness and content for consumers.

Although many respondents considered PPR to be important for transparency and accountability, they were sceptical of the reliability and validity of PPR data. The reason for this is unclear given that most patients were not aware of PPR. Some comments from the open-ended questions demonstrated lack of understanding of how PPR data was collected, and collated and the methodologies used to construct the quality indicators. In support, past research suggests that consumers distrust PPR data because they have difficulties interpreting the information [11, 19, 63]. In the US, consumer-focused best practice guidelines have been developed for presenting, promoting and disseminating PPR data to improve its comprehensibly and perceived trustworthiness [48, 64].

Patients preferred that the dissemination of PPR information to occur via their GPs. In Australia, GPs are gatekeepers to secondary care with patients requiring their referral for non-emergency access. Therefore, GPs are in a good position to help patients interpret PPR data or guide patients to appropriate resources to support decision-making. However, past research shows that GPs rarely used PPR information when referring patients to hospitals because they are unaware of

PPR data and they were concerns about its reliability and validity [65, 66]. Addressing these barriers are essential if GPs are to be a viable source of PPR information for their patients.

Limitations

These findings should be interpreted carefully due to several limitations. Given the non-population representative characteristics of respondents (older women who used private hospitals), the results are not generalisable to other cancer elective surgeries, younger patients and public hospitals. Future research is needed to gather data from a larger sample and to expand this study to other elective surgeries and public patients in public hospital (could be recruited via the individual state/territory government which hold their records). Recall bias may have also affected our results, particularly among elderly patients [67, 68]. However, we attempted to minimise recall bias by ensuring that only patients who had cancer elective surgery within the last 12 months were eligible to complete the questionnaire.

Conclusions

PPR of hospital data appears to have no substantial impact on selection of hospitals among a randomly selected cohort of Australian patients with breast, bowel or lung cancer who were treated as private patients. Almost one third of respondents reported no choice of hospital and current PPR information did not appeared to meet their information needs. Nevertheless, a substantial number of respondents expressed interest in PPR information and claimed that they would use it in their future decision-making. Given the growing prevalence of performance data being publicly disseminated through the internet, further efforts are required to develop quality and cost indicators of interest to patients. While this study focused on people treated for cancer, it has relevance for all consumers of healthcare. The dissemination of PPR information to patients via specialists and GPs may enable patients to make clinically and financially informed choices with the assistance of their medical doctors.

Contributors

MK, DD and MB conceptualised and designed the study and obtained its funding. KP, RC and MK contributed to the design of the questionnaire. KP, MK and JM selected the sample (MBS procedure codes). KP collected, analysed and interpreted the data and drafted the manuscript. RC, MB, DD, JM and MK contributed to data interpretation and critically reviewed the manuscript. All authors read and approved the final manuscript.

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Competing interests

The authors declare that they have no competing interests.

Data sharing statement

The dataset analysed during the current study are not publicly available due to participants' confidentiality.

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Table 1 Demographic characteristic of respondents (n=243)

	N (%)
Cancer Type	
Breast	155 (63.8%)
Bowel	65 (26.7%)
Lung	23 (9.5%)
Diagnosis period	
Less than 12 months	176 (72.4%)
Between 1 and 5 years ago	65 (26.7%)
More than 5 years ago	2 (0.8%)
Gender	
Male	49 (20.2%)
Female	191 (78.6%)
Missing	3 (1.2%)
Age groups	
25-34	3 (1.2%)
35-44	13 (5.3%)
45-54	36 (14.8%)
55-64	77 (31.7%)
65-74	73 (30.0%)
75-84	32 (13.2%)
85+	6 (2.5%)
Missing	3 (1.2%)
Country of birth	
Australia	186 (76.5%)
Others[a]	53 (21.8%)
Missing	4 (1.6%)
Language spoken at home	
English	230 (94.7%)
Others[b]	8 (3.3%)
Missing	5 (2.1%)
Marital status	
Single/never married	10 (4.1%)
Married/in a defacto relationship	193 (79.4%)
Widowed/divorced/separated	37 (15.2%)
Missing	3 (1.2%)
Education	
Postgraduate	25 (10.3%)
Bachelor	45 (18.5%)
Diploma/certificate	75 (30.9%)
High school	93 (38.3%)
Missing	5 (2.1%)
Employment	
Full-time	45 (18.5%)

Part-time/casual	34 (14.0%)
Self-employed	18 (7.4%)
Retired/pensioner/unemployed	124 (51.0%)
Other[c]	18 (7.4%)
Missing	4 (1.6%)
Occupation (limited to those working)	
Manager	22 (22.7%)
Professional	39 (40.2%)
Technician or trades worker	4 (4.1%)
Community of personal service worker	3 (3.1%)
Clerical or administrative worker	15 (15.5%)
Sales worker	0 (0.0%)
Machinery operator or driver	0 (0.0%)
Labourer	0 (0.0%)
Never worked for a wage	0 (0.0%)
Other	13 (13.4%)
Missing	1 (1.0%)
Household income	
Less than $25,000	22 (9.1%)
$25,000 to $49,999	51 (21.0%)
$50,000 to $99,999	69 (28.4%)
$100,000 or more	51 (21.0%)
Prefer not to stay	36 (14.8%)
Missing	14 (5.8%)
Health care benefits	
Yes	107 (44.0%)
No	134 (55.1%)
Missing	2 (0.8%)
Private health insurance	
Yes	235 (96.7%)
Hospital cover only	28 (11.9%)
Extra's cover only	1 (0.4%)
Hospital and extras cover	206 (87.7%)
No	5 (2.1%)
Missing	3 (1.2%)

[a] others include Argentina, Bosnia and Herzegovina, Canada, China, Croatia, Denmark, England, France, Germany, Hungary, India, Iran, Ireland, Italy, Malta, New Zealand, Philippines, Romania, Scotland, Taiwan, The Netherlands, Uruguay, USA, Vietnam and Wales.

[b] others include Danish, Farsi, French, Italian, Mandarin, Serbian and sign language.

[c] others include those who are currently not working due to their illness and home duties.

Table 2 Factors influencing hospital choice*

	N (%)
Specialist	218 (89.7%)
Distance of the hospital from home	57 (23.5%)
Reputation of the hospital	57 (23.5%)
Own experience	44 (18.1%)
General practitioners	42 (17.3%)
Length of waiting list	37 (15.2%)
Health insurer provider	20 (8.2%)
Family members/friends	22 (9.1%)
Hospital catchment area	17 (7.0%)
Size of the hospital	4 (1.6%)
Hospital/other website	3 (1.2%)
Performance reporting website	0 (0.0%)
Booklet/leaflet or someone else at GP clinic	0 (0.0%)

*total does not reflect 100% as patients could select multiple factors

Table 3 Barriers affecting the use of PPR information*

	N (%)
Not aware	179 (73.7%)
Not relevant	26 (10.7%)
Results about own condition	23 (9.5%)
Accuracy of the information	8 (3.3%)
No internet access	7 (2.9%)
Too difficult to understand	3 (1.2%)
It was out of date	2 (0.8%)
Unsure how to use the information	0 (0.0%)

*total does not reflect 100% as patients could select multiple factors

Table 4 Preferred types of PPR information*

	N (%)
Costs of surgery	144 (59.3%)
Complications rates	141 (58.0%)
Successful recovery	138 (56.8%)
Patient’s experience/satisfaction	132 (54.3%)
Medical errors	110 (45.3%)
Waiting times	109 (44.9%)
Readmission rates	91 (37.4%)
Mortality rates	72 (29.6%)
Length of stay	45 (18.5%)

*total does not reflect 100% as patients could select multiple factors

How to complete this questionnaire

In this survey we talk about information you might have seen in newspapers, reports or websites that has to do with 'public performance reporting information' about hospitals in Australia. This is information about the quality of hospitals in Australia and is available to Australian residents. For example, information about waiting times in hospitals, the number of people that got infections when they went to hospital, and the length of waiting lists for elective surgery. Images from the 'MyHospitals' website which provide public performance reporting information about hospitals are shown below:

Learn about your local hospital

Search and compare performance information for more than 1,000 Australian public and private hospitals.

Latest reports

Released 28 April 2016

Groundbreaking report reveals changes in hospital efficiency.

Released 10 December 2015

Data release: Hand hygiene, results for Audit Period 1 & 2 2015 now available.

Latest data

Costs of acute admitted patients data 2013–14, and average length of stay in hospital data 2013–14

Compare hospitals

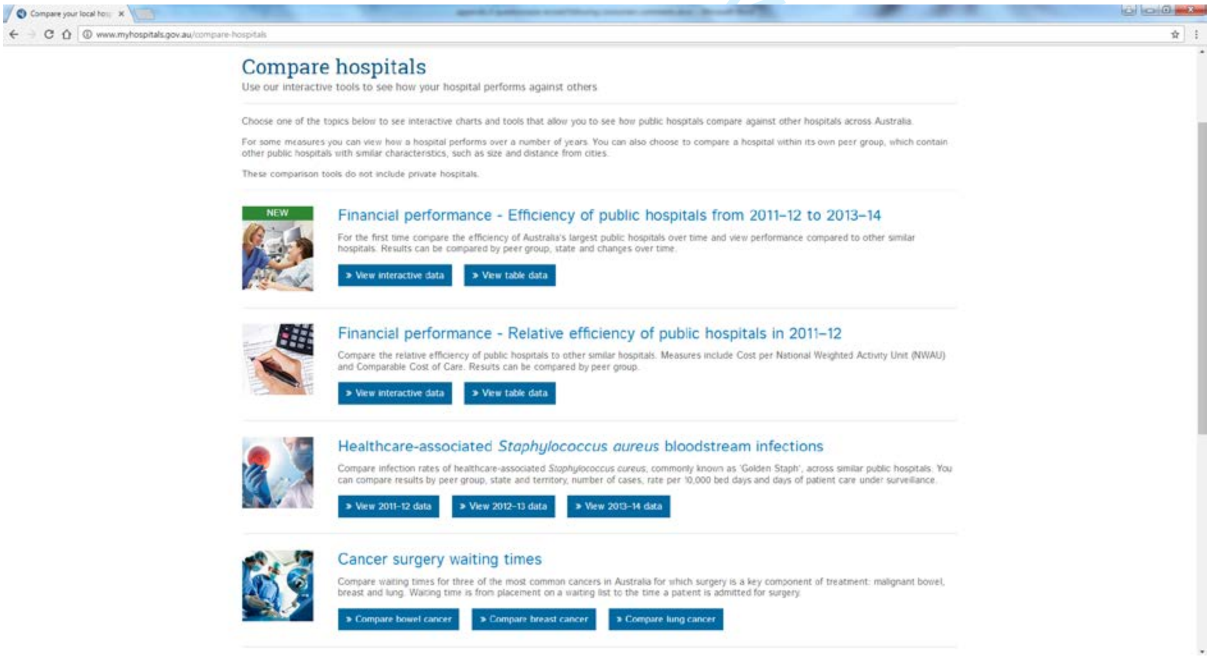
Use our interactive tools to compare your local hospital to other hospitals for select measures.

Map search

Use our interactive maps to search for Australian hospitals and explore hospital performance information.

Our indicators

See the list of indicators we use to measure hospital performance across Australia.



Compare hospitals

Use our interactive tools to see how your hospital performs against others

Choose one of the topics below to see interactive charts and tools that allow you to see how public hospitals compare against other hospitals across Australia.

For some measures you can view how a hospital performs over a number of years. You can also choose to compare a hospital within its own peer group, which contain other public hospitals with similar characteristics, such as size and distance from cities.

These comparison tools do not include private hospitals.

Financial performance - Efficiency of public hospitals from 2011–12 to 2013–14

For the first time compare the efficiency of Australia's largest public hospitals over time and view performance compared to other similar hospitals. Results can be compared by peer group, state and changes over time.

Financial performance - Relative efficiency of public hospitals in 2011–12

Compare the relative efficiency of public hospitals to other similar hospitals. Measures include Cost per National Weighted Activity Unit (NWAU) and Comparable Cost of Care. Results can be compared by peer group.

Healthcare-associated *Staphylococcus aureus* bloodstream infections

Compare infection rates of healthcare-associated *Staphylococcus aureus*, commonly known as 'Golden Staph', across similar public hospitals. You can compare results by peer group, state and territory, number of cases, rate per 10,000 bed days and days of patient care under surveillance.

Cancer surgery waiting times

Compare waiting times for three of the most common cancers in Australia for which surgery is a key component of treatment: malignant bowel, breast and lung. Waiting time is from placement on a waiting list to the time a patient is admitted for surgery.

Source: http://www.myhospitals.gov.au/ (Permission received from the Australian Institute of Health and Welfare to publish the images under the CC BY-NC-ND 3.0 license.)

Please answer every question you can. If you are unsure about how to answer a question make your response the closest answer you can, or write a response in the 'other' box.

Please read the instructions about each question carefully. Some questions require you to give only one response, others allow you to mark more than 1 option.

Sometimes you will find the box you have marked has an instruction to go to another question. By following the instructions carefully you will be able to move past questions that do not apply to you.

- ***Please put a cross in the box next to the answer you choose like this:*** ☒
- ***If you make a mistake or wish to change a response, scribble out the mistake and put a cross in the correct box like this:*** ☒
- ***Print clearly when written responses are required***
- ***Return completed questionnaire in the reply paid envelope***

➢ *The questionnaire starts here at Q1.*

Q1. If you have been diagnosed with any of the following conditions, please indicate approximately how long ago the diagnosis was made. If you had several diagnoses, please indicate approximately how long ago the most recent diagnosis was made.

Mark only one period of time for the condition picked. Please give your best estimate.

I was diagnosed with or had…	Less than 12 months ago	Between 1 and 5 years ago	More than 5 years ago	I never had this
Breast cancer	☐	☐	☐	☐
Bowel cancer	☐	☐	☐	☐
Lung cancer	☐	☐	☐	☐

Q2. Have you had surgery in a hospital in Australia for the cancer listed at Q1 in the last 12 months (i.e. between 1st January and 31st December 2016)?

☐ Yes

☐ No

➢ *If you **do not** have any of the conditions listed at Q1 and you **did not** undergo cancer surgery in a hospital in Australia between 1st January and 31st December 2016 as stated in Q2, you are not eligible to complete this questionnaire. There is no need for you to return this questionnaire. Thank you for your interest.*

➢ *If you **do** have any of the conditions listed at Q1 and you **had cancer surgery** in a hospital in Australia between 1st January and 31st December 2016 as stated in Q2, please **continue** and complete the questionnaire. The questions relate specifically to when you were seeking surgical treatment for the cancer you indicated at Q1.*

Hospital stay

Q3. Which hospital did you attend for the cancer surgery you indicated at Q1? *(Choose ONE answer)*

☐ A public hospital

☐ A private hospital

Q4. Were you treated in the hospital for the cancer surgery as...*(Choose ONE answer)*

☐ a public patient *(no cost to you)*

☐ a private patient *(costs covered entirely by your health insurance)*

☐ a private patient *(costs partly covered by your health insurance, and partly by you)*

☐ a private patient *(costs covered entirely by you)*

Hospital choice

Q5. Which of the following information types or factors helped you to make a decision about which hospital to be treated at for the cancer listed at Q1? *(Mark all that you used)*

☐ General practitioner (GP)
☐ Specialist/consultant
☐ Health insurer provider
☐ Booklet/leaflet
☐ Hospital website
☐ Other internet site (i.e. community forum)
☐ Performance reporting website (i.e. MyHospitals)
☐ Family members/friends
☐ Own experience
☐ Someone else at GP clinic
☐ Hospital catchment area
☐ Distance of the hospital from home
☐ Reputation of the hospital
☐ Size of the hospital (i.e. number of beds)
☐ Length of waiting list (i.e. surgery)
☐ None of the above
☐ Other *(please list)*

Q6. Were you able to personally choose the hospital that you went to? (*Choose ONE answer*)

☐ I did not have a preference

☐ Yes

☐ No ⟶ **If no, did you want to choose it?** ☐ Yes ☐ No

Q7. At the time that you went to hospital, were you aware of 'public performance reporting information' about hospitals? For example, information on the *MyHospitals* website, which you can use to compare hospitals? (*Choose ONE answer*)

☐ No → **(Go to Q9)**

☐ Yes → **Did you use 'public performance reporting information' to help you choose a hospital?** ☐ Yes ☐ No

If yes, how was the information helpful? *(Please describe)*

If no, why was the information not helpful? *(Please describe)*

Q8. How important was 'public performance reporting information' about hospitals in helping you choose the hospital that you went to? (*Choose ONE answer*)

Unimportant	Of little importance	Somewhat important	Important	Very important
☐	☐	☐	☐	☐

Q9. Have any of the following stopped you from using 'public performance reporting information' about hospitals when choosing a hospital? (*Mark as many answers as apply*)

☐ I was concerned about the accuracy of the information

☐ It was too difficult to understand

☐ It was not relevant to me

☐ I did not know about it

☐ I was unsure how to use the information

☐ I had no internet access

☐ I only wanted to know results about my condition

☐ It was out of date

☐ Other *(Please describe)*

Q10. How would you like to get information about how hospitals in Australia are performing? (*Choose ONE answer*)

☐ A printed book or directory

☐ Mobile phone apps

☐ I do not want this information

☐ I do not want to see the information but I want my GP or other healthcare provider to see it and tell me about it

☐ Websites

☐ Other *(Please describe)*

Q11. Of the different types of 'public performance reporting information' about hospitals listed below, which would you most like to use? (*Mark as many answers as apply*)

☐ How long people stayed in hospital

☐ The number of people with health problems or complications (e.g. infections) after their surgery

☐ The number of people that were readmitted to hospital because they had continued problems

☐ How much the surgery will cost me

☐ The experience or satisfaction of other people

☐ The number of people with minimal or no health problems after the surgery (i.e. successful surgery)

☐ How long people waited for their surgery

☐ The number of people that died during their surgery or after their care

☐ The number of surgical or nursing mistakes that harm other people

☐ Other *(Please describe)*

Q12. At what level do you think 'public performance reporting information' about hospitals should be reported (e.g. in the *MyHospitals* website)? At the level of…(*Choose ONE answer*)

☐ Individual doctors *(where you CAN see the performance of individual doctors)*

☐ Specific clinical units within hospitals *(where individual doctors are NOT identified)*

☐ Hospitals as a whole *(where specific doctors and/or the unit where they work are NOT identified)*

Q13. Please <u>rank</u> each of the following areas of information in order of importance to you with <u>*1 being the most important*</u> and <u>*9 being the least important*</u>? (*Put the numbers 1 to 9 beside each type of information*)

☐ How long people waited for their surgery

☐ The number of people that were readmitted to hospital because they had continued problems

☐ The number of people with health problems or complications (e.g. infections) after their surgery

☐ The number of people with minimal or no health problems after the surgery (i.e. successful surgery)

☐ How much the surgery will cost me

☐ How long people stayed in hospital

☐ The number of surgical or nursing mistakes that harm other people

☐ The experience or satisfaction of other people

☐ The number of people that died during their surgery or after their care

Q14. If the information you said was important to you at Q11 was publicly available, then how important do you think 'public performance reporting information' about hospitals would be to you in the future if you or a family member needed to choose a hospital for elective treatment? (*Choose ONE answer*)

Unimportant	Of little importance	Somewhat important	Important	Very important
☐	☐	☐	☐	☐

Q15. Do you have any concerns about using 'public performance reporting information' about hospitals when making a decision about which hospital to choose? *(Please describe)*

Q16. Do you have any other comments or experiences you would like to share that are related to 'public performance reporting information' about hospitals? *(Please describe)*

About you

For each question, please give one response

Gender

☐ Female ☐ Male ☐ Transgender/intersex/other

Your age in years ☐ **Country of birth** ☐

What language do you mainly speak at home? ☐

Your postcode ☐ **Your state** ☐

Marital status

☐ Single/Never married ☐ Married/In a de facto relationship ☐ Widowed ☐ Divorced/Separated

Do you live…

☐ with your spouse, partner or family members
☐ alone
☐ in a share house (with non-relatives)
☐ others *(please specify)*

Highest level (or equivalent) of education you completed

☐ Year 8 or below
☐ High school year 9 or 10
☐ High school year 11 or 12
☐ Certificate (e.g. TAFE training)
☐ Diploma/Advance diploma
☐ Bachelor degree
☐ Postgraduate degree (e.g. Masters, PhD)

Employment status

☐ Working full time
☐ Working part time or casual
☐ Self-employed
☐ Unemployed
☐ Student
☐ Retired or pensioner
☐ Other *(Please specify)*

Main area of occupation *(If retired, please indicate your previous occupation group)*

☐ Manager
☐ Professional
☐ Technician or trades worker
☐ Community or personal service worker
☐ Clerical or administrative worker
☐ Sales worker
☐ Machinery operator or driver (e.g. bus)
☐ Labourer
☐ Never worked for a wage
☐ Other *(Please specify)*

Current approximate annual household income (before tax)

☐ Less than $25,000
☐ $25,000 to $49,999
☐ $50,000 to $74,999
☐ $75,000 to $99,999
☐ $100,000 to $149,999
☐ $150,000 or more
☐ I prefer not to say

Please indicate if you have a health care or other health benefits card

☐ Yes (e.g. Health Care Card, Veterans Affairs, Seniors)
☐ No

Please indicate if you have private health insurance

☐ Yes → **What type of private health insurance do you have?**
  ☐ Hospital cover ONLY
  ☐ Extra's cover ONLY
  ☐ Hospital AND Extras cover
☐ No

Your email address

Your e-gift card will be sent to your chosen email address. If you do not have an email address, list your home address. Please print clearly. This section with your email or postal address will not be kept with the information you have provided, therefore your questionnaire will remain anonymous.

Thank you for your participation in this questionnaire. Please place the questionnaire in the reply paid envelope and post it. You do not have to use a stamp. If you have misplaced the reply paid envelope, please use a plain envelope (no stamp is necessary) and address to:

Dr Khic-Houy Prang Reply Paid 78439
Centre for Health Policy, The University of Melbourne
Level 4, 207 Bouverie Street, Carlton VIC 3010, Australia

Appendix B

Medicare Benefits Schedule procedure codes

Breast cancer	30299, 30300, 30302, 30303, 31506, 31509, 31512, 31515, 31519, 31524, 31530, 31533, 31536, 31548, 45527
Bowel cancer	32006, 32023, 32024, 32025, 32026, 32028, 32039, 35404, 35406, 32000, 32003, 32004, 32005
Lung cancer	30696, 38438, 38440, 38441, 38812, 41898

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract p.1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found p.2
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported pp.4-5
Objectives	3	State specific objectives, including any prespecified hypotheses p.6
Methods		
Study design	4	Present key elements of study design early in the paper p.7
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection p.8
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants p.8
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable p.7
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group p.7
Bias	9	Describe any efforts to address potential sources of bias NA
Study size	10	Explain how the study size was arrived at p.8
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why NA
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding p.9
		(*b*) Describe any methods used to examine subgroups and interactions NA
		(*c*) Explain how missing data were addressed NA
		(*d*) If applicable, describe analytical methods taking account of sampling strategy NA
		(*e*) Describe any sensitivity analyses NA
Results		
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed p.9
		(b) Give reasons for non-participation at each stage p.9
		(c) Consider use of a flow diagram NA
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders p.9
		(b) Indicate number of participants with missing data for each variable of interest\ Table 1
Outcome data	15*	Report numbers of outcome events or summary measures pp.10-11 (in text). and Tables 1, 2,3 and 4
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were

		adjusted for and why they were included NA
		(*b*) Report category boundaries when continuous variables were categorized NA
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period NA
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses NA
Discussion		
Key results	18	Summarise key results with reference to study objectives pp.14-15
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias p.18
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence pp.15-17
Generalisability	21	Discuss the generalisability (external validity) of the study results p.18
Other information		
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based p.19

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

Public performance reporting and hospital choice: A cross-sectional study of patients undergoing cancer surgery in the Australian private healthcare sector

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Public performance reporting and hospital choice: A cross-sectional study of patients undergoing cancer surgery in the Australian private healthcare sector

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Abstract

Objectives National mandatory public performance reporting (PPR) for Australian public hospitals, including measures of cancer waiting times, was introduced in 2011. PPR is voluntary for private hospitals. The aims of this study were to assess whether PPR of hospital data is used by patients with breast, bowel or lung cancer when selecting a hospital for elective surgery and how PPR could be improved to meet their information needs.

Design A national cross-sectional postal questionnaire.

Setting Australian private healthcare sector.

Participants Private patients with breast, bowel or lung cancer who attended a public or private hospital for elective surgery (n=243) in 2016.

Outcome measures Patients' choice of hospital, use of PPR information and preferred areas of PPR information. Descriptive and conventional qualitative content analyses were conducted.

Results Most respondents (94%) attended a private hospital. Almost half could choose a hospital. Choice of hospital was not influenced by PPR data (92% unaware) but by their specialist (90%). Respondents considered PPR to be important (70%) but they did not want to see the information, preferring their general practitioners (GPs) to tell them about it (40%). Respondents considered surgery costs (59%), complications (58%), and recovery success rates (57%) to be important areas of information that should be publicly reported. Almost half suggested that quality indicators should be reported at the individual clinician level. Analysis of the open-ended questions identified four themes: 1) decision-making factors; 2) data credibility; 3) unmet information needs; and 4) unintended consequences.

Conclusions PPR of hospital data had no substantial impact on patients' choice of hospital. Nonetheless, many respondents expressed interest in using it in the future. To increase PPR awareness and usability, personalised and integrated information on cost and quality of hospitals is

required. Dissemination of PPR information via specialists and GPs could assist patients to interpret the data and support decision-making.

Strengths and limitations of the study

- This study used a national cross-sectional questionnaire in the private healthcare sector to assess the use of PPR of hospital data to inform hospital choice, among patients with breast, bowel or lung cancer.
- The results are not generalisable to other cancer elective surgeries, younger patients or public hospital settings, because of the non-population representative characteristics of respondents.
- Given the nature of the study, there is a risk of recall bias, in particularly among elderly respondents.

Introduction

There are growing efforts within healthcare systems internationally to measure and publicly disseminate healthcare providers' (i.e. hospitals and clinicians) performance data for greater transparency, to increase accountability, and to improve quality of care [1, 2]. Public performance reporting (PPR) of healthcare providers' data is aimed at improving the quality of care by guiding consumers to select high quality providers over low quality providers. It aims to stimulate quality improvement among providers by identifying areas in which they underperform. These pathways are interconnected by providers' motivation to maintain or increase their market share [3].

In many countries, such as the United States (US) and the United Kingdom (UK), PPR of hospital and individual clinician's performance data has been a central feature of government health policy [4]. In Australia, national mandatory PPR of public hospital data was introduced in 2011. All public hospitals are required to provide data to the Australian Institute of Health and Welfare (AIHW) which is then reported via the MyHospitals website [5]. Quality indicators reported on the MyHospitals website are underpinned by the Performance and Accountability Framework. The framework identifies 48 indicators, of which 17 are hospital indicators and 31 are primary healthcare indicators. Hospital indicators publicly reported include: hand hygiene; staphylococcus aureus infections; time patients spent in emergency department; cancer surgery waiting times; and financial performance of public hospitals. Indicators yet to be publicly reported, due to their associated methodological issues, include: measures of mortality; unplanned readmission rates; patient experiences; and access to services by type of service compared to need.

PPR on the MyHospitals website is voluntary for private hospitals. In 2015-16, there were 630 private hospitals in Australia [6] and 36% voluntarily contributed to the MyHospitals website, but they did not necessarily report on all of the quality indicators (as public hospitals are required to do) [5]. Large private healthcare providers (e.g. Healthscope with 46 hospitals [7] and Ramsay Health Care with 73 hospitals [8]) publish their own PPR websites to help patients make informed decisions.

In addition, most states/territory governments also have their own PPR websites (e.g. the Victorian Health Services Performance [9], and New South Wales Bureau of Health Information [10]). Quality indicators vary across MyHospitals, private healthcare providers, and states/territory governments websites. Examples of additional quality indicators reported on the private healthcare providers and states/territory governments websites, but not on the MyHospitals website, include: patient experiences; Apgar scores for babies (assessment of a baby's wellbeing after birth); patient falls; pressure injuries; and rehabilitation outcomes.

Prior research indicates that PPR changes healthcare providers' behaviour but has limited impact on consumers' healthcare decision-making [11-13]. Previous research also suggests that consumers want more choice over their healthcare [14]. However, results from surveys conducted in the US and the Netherlands showed that most consumers did not use, or barely used, PPR information when selecting a specialist or hospital [15-18]. This may be because many consumers are not aware of PPR information or do not have access to it, or they do not understand or trust it [11, 18, 19]. Instead, consumers rely on various sources of information to inform their choice of hospital, including: advice from their general practitioner (GP); their previous experience; family and friends' experiences; the reputation of the hospital; and the distance of the hospital from their home [16, 17, 20, 21].

Given the recent introduction of PPR in Australia, there have been few studies on the impacts of PPR on Australian consumers' choice of hospitals [22], particularly in the private healthcare sector [23]. The focus was on patients with access to private healthcare undergoing elective surgery for cancer – because for these patients, choice of hospital is likely to be possible, and cancer waiting times are publicly reported for all public and some private hospitals [5]. It should be noted that most surgery for cancer is categorised as 'elective' because it falls outside of the category of 'emergency' surgery. Elective surgery does not then only encompass non-essential or cosmetic surgery. In Australia, surgery for cancer is categorised as elective because patient hospital admission can be delayed for at least 24 hours. Public patients are then placed on a hospital waiting-list for planned surgery, with recommended maximum wait times classified as: urgent (within 30 days); semi-urgent (within 90 days); or non-urgent [5]. In the private sector, patients can usually access elective surgery more quickly than in the public sector, especially for semi-urgent or non-urgent cases. Better understanding of factors that influence hospital choice, including PPR information, can help explain consumers' decision-making processes, and inform policy-makers on whether greater resources should be allocated to PPR. Therefore, the present study aimed to assess (among patients with breast, bowel or lung cancer): whether PPR of hospital data was used to inform their choice of hospital; factors that influence their choice of hospital; their level of demand for PPR; barriers to their use of PPR; and how PPR could be improved to meet their information needs.

Methods

Australian healthcare system

Australia has a universal, publicly funded, health insurance scheme (Medicare) that provides free access to public hospitals [24]. Private healthcare insurance is also available and encouraged by government policy (i.e. high income earners receive a tax penalty for not purchasing, and middle income earners receive a private health cover rebate) [25]. In 2014-15, there were 10.1 million (57%) Australian adults with private healthcare insurance [26]. Private patients can choose to be treated in either public or private hospitals. To access public or private hospital for non-emergency care, patients must be referred by their GP. Issues around payment of private hospital bills are generally discussed during the consultations [27]. Medicare covers 75% of the Medicare Benefits Schedule (MBS) fee for private patients. The remaining 25% is either paid entirely by private healthcare insurers, co-paid by patients with their private healthcare insurer, or self-funded if the patient does not have private healthcare insurance. Compared to public patients, private patients can exercise greater choice in specialist, hospital, and timing of procedures.

Study design

This study was part of a larger research program which aimed to improve understanding of how PPR might improve quality of care in public and private hospitals in Australia, by examining the perspectives of multiple stakeholders. Previous components of the research program included interviews with healthcare consumer advocates, providers, purchasers (public and private funders of healthcare services) [28], senior hospital clinical administrators [29, 30], and general practitioners [31]. This component of the research program used a quantitative approach to understand the use of PPR information when selecting a hospital for surgery among patients with breast, bowel or lung cancer. A national cross-sectional study design of the private healthcare sector was conducted using postal questionnaires.

Questionnaire design

We developed a short questionnaire with four sections: 1) cancer type; 2) hospital stay; 3) hospital choice; and 4) about you (see supplementary file 1). The first section included questions about the type of cancer participants had, period of diagnosis, and confirmation of cancer surgical treatments between 1st January and 31st December 2016. Section two included questions about the type of hospital attended (i.e. public or private hospital) and patient status (i.e. public or private). The third section included questions on factors influencing hospital choice, awareness and use of the available PPR information, preferred areas of PPR information (i.e. quality and performance indicators), level of data presentation, the importance of PPR information, and barriers to using PPR information. Two open-ended questions were included to capture other issues, concerns or experiences of PPR that respondents might want to share. The final section captured demographic characteristics such as gender, age, marital status, education, employment status, occupation, income, and health care insurance status.

Patient and public involvement

The questionnaire was piloted with a consumer group from Peter MacCallum Cancer Centre in Victoria [32] to identify ambiguities or difficult questions, and to ensure that it could be completed in a timely manner. The consumer group included five women aged between 35-45 years; four previously had cancer – including three in the last 12 months. The questionnaire was revised in response to their comments. The consumer group was not involved in the recruitment and conduct of the study. Upon completion of the study, a summary of the results will be provided to the consumer group.

Sample

Participants were identified and contacted by the Australian Government Department of Human Services (DHS) through their MBS records (including procedure codes). Eligibility criteria included: participants aged 18 years and over; diagnosed with breast, bowel or lung cancer; and attended an Australian hospital for cancer surgical treatments between 1st January and 31st December 2016. MBS is a list of Medicare services subsidised by the Australian government [33]. Therefore, the sample included only those who made a Medicare claim (i.e. private patients in public or private hospitals). Patients who did not make a Medicare claim (i.e. public patients in public hospital in which there are no costs to the patients) were not included because their records are managed by individual state governments. The selection of the appropriate MBS procedure codes (see supplementary file 2) was done by the researchers in consultation with a surgeon who specialised in cancer care. In total, 29,793 eligible participants were identified (52% with breast cancer, 32% with bowel cancer and 16% with lung cancer). Stratified sampling by cancer type was performed for 1,000 eligible participants. Samples within each stratum were selected with simple random sampling.

Data collection

The postal questionnaire was open between April and July 2017. Study invitations were mailed out to a random sample of 1,000 eligible participants by the Australia Government DHS. A sample size calculation for this cross-sectional study was conducted [34]. The confidence level was set at 90% with a 5% margin of error. The estimate proportion of the population who used PPR when selecting a hospital was set at 0.4. The required sample size was 261 participants. The expected response rate, based on previous research conducted by the Centre for Health Policy, was approximately 20-30%. Researchers were not provided with contact details of the selected sample. Study invitations included a cover letter from the DHS, a plain language explanation of the study, the questionnaire and a reply-paid envelope addressed to the researchers. Each participant received a $10 e-gift card as reimbursement for their time if they included an email address with their return questionnaire.

Data analysis

Descriptive analyses of the closed-ended questions were conducted using the Statistical Package for the Social Sciences (SPSS) version 23. A conventional qualitative content analysis of the two open-ended questions was conducted using QSR NVivo 11. Conventional qualitative content analysis aims to interpret meaning inductively from the content of text data without using preconceived categories [35]. Codes were derived directly from the text data and then grouped into categories that represented similar meaning.

Ethical considerations

Ethical approval for the study was granted by the Melbourne School of Population and Global Health Human Ethics Advisory Group, The University of Melbourne. The return of the questionnaire was taken as an indication of voluntary consent to participate.

Results

Sample characteristics

In total, 243 participants completed the questionnaire (24% response rate). Compared to respondents, non-respondents were more likely to be male and younger. The sample was somewhat representative of the Australian population who has had cancer elective surgery. Patients with breast (64% vs. 58%) and lung cancer (9% vs. 7%) were slightly over-represented whereas patients with bowel cancer were under-represented (27% vs 35%) [36].

The characteristics of the respondents are described in Table 1. Almost 64% of respondents were diagnosed with breast cancer, 27% with bowel, and 10% with lung cancer, with the majority diagnosed in the last 12 months (70%). Almost all respondents were women (79%) aged between 55 and 74 years (62%). The majority were born in Australia (77%) and spoke English at home (95%), and were married/in a defacto relationship (79%). Almost 30% had a bachelor/postgraduate degree (a slight under-representation of Australian women with a bachelor degree or higher [37]). Half of the respondents were pensioners/retirees and 40% were employed. Of those employed, over 60% worked in a professional or managerial position. Over half had a household income less than AUD$100,000 (the median annual gross household income in Australia for the 2015-16 period was $84,032 [38]). Fewer than half (44%) held a healthcare benefits card (e.g. healthcare card which entitles access to cheaper prescription medicines). Almost all respondents (97%) had private health insurance that included hospital treatment, and most (88%) had insurance that also covered ‘extras’ such as outpatient physiotherapy.

Hospital stay and choice

Respondents self-reported that 94% attended a private hospital and 6% attended a public hospital for cancer surgery. Among those who attended a public hospital, 87% were private patients and 13% were public patients. The small proportion of public patients in the sample may suggest that some of the care provided involved a private component (e.g. certain diagnostic imaging and pathology services are not fully covered by Medicare [39]). Alternatively, this could have been a clerical error in the MBS records. Costs of private hospitals were reportedly co-paid by the respondents and their health insurer (49%), or fully covered by their health insurer (47%). Three percent of respondents self-funded their treatments. Almost half (48%) of respondents attended their preferred hospital, 28% did not have a choice in hospital, and 25% did not have a hospital preference. Of those who did not have a choice of hospital, 37% indicated that they would have liked to have had a choice.

Awareness and use of PPR information

Ninety-two percent of respondents reported no awareness of PPR information. Of those who were aware of it, 88% did not use it when selecting a hospital and 56% considered PPR to be of little or no importance to inform their choice of hospital. Reasons cited for not using PPR information included limited choice of hospital, as well as prior experience with certain hospitals, and trust in the advice of their doctor: *"We only have a private and public hospital where I live, so choice was limited regardless of the information provided" (Respondent #111); "I was too sick to do any research at the time. I took advice from my specialist" (Respondent #113)*.

Factors influencing hospital choice

Table 2 presents the factors that influenced the choice of hospital. PPR data did not influence choice of hospital for any respondent. The most common factors that impacted hospital selection were: specialists (90%); reputation of the hospital (24%); distance to the hospital from home (24%); patients' previous experience (18%); and GPs advice (17%).

Barriers affecting the use of PPR

Table 3 shows the barriers affecting the use of PPR in selecting a hospital. The most common barriers impeding the use of PPR data included: lack of PPR awareness (74%); lack of PPR relevance (11%); and interested in PPR for their condition solely (10%).

Source of PPR information

Despite the lack of PPR awareness and barriers to the use of PPR, overall, 71% of respondents considered PPR to be ‘very important’ or ‘important’ to inform their choice or family members’ future choice of hospital. However, most did not want to access PPR information themselves, preferring their GPs or other healthcare providers to tell them about it (40%). Other preferred sources of PPR information included: websites (35%); printed books/directories (10%); and mobile phone applications (3%). A proportion of respondents did not want any PPR information (9%).

Preferred types of PPR information

Table 4 lists the types of PPR information that respondents most wanted access to. Over half of all respondents considered costs of surgery (59%), complication rates (58%), recovery success rates (57%), and information on patient’s experience and satisfaction (54%) to be important areas to report on. Respondents indicated that they preferred PPR information to be reported at the individual clinician-level (48%), followed by hospital-level (31%), and specific clinical unit-level within hospitals (18%).

Additional comments and concerns related to PPR

Almost half of respondents (48%) provided information in one or both open-ended questions. Analysis of their responses revealed four themes: 1) decision-making factors; 2) data credibility; 3) unmet information needs; and 4) unintended consequences. Themes two, three and four provided further insights into PPR of hospital data which were not captured in the quantitative findings.

1. Decision-making factors

Consistent with the quantitative findings, choice of hospital was determined by advice from specialists or GPs rather than PPR information. Although respondents perceived PPR to be important for hospital accountability and transparency, they reported that their choices were restricted to the hospital or hospitals where their specialist performed surgery. Other respondents had relied on their GP for a specialist recommendation:

> "I did not check on the hospital. My surgeon was recommended as the 'best' by my GP who I trust and she could operate quickly and worked out of a specific hospital – no choice to be made." (Respondent #39)

Some respondents preferred their GPs to be informed about PPR information and relay it to them, or direct them to an appropriate website or other resource to inform their decision. Additional factors influencing patients' selection of hospital included family and friends.

2. Data credibility

Although over 90% of respondents reported not being aware of PPR, they nonetheless raised concerns with the reliability, validity and timeliness of the data. Some were cynical and suspicious of the data, questioning its trustworthiness:

> "The hospital's information accuracy. No hospital is going to let 'issues' out, otherwise loss of patients means loss of money and so it goes. In an ideal world, we could 'believe' the information and make our decisions as consumers with accuracy. I don't believe the information will truly reflect the real world. I have seen government departments fudge stuff." (Respondent #200)

Some respondents expressed concern around the lack of clarity around who collected the data (i.e. independent body), how it was collated (i.e. qualifications and experiences of the people, data quality processes), and why certain areas of information (i.e. quality and performance indicators) were chosen to be reported.

3. Unmet information needs

Respondents reported the following areas of information (currently not available on the MyHospitals website) to be of interest: patient experiences; hospital cleanliness; food quality; nursing standards (e.g. bedside manners); and hospital facilities (e.g. available entertainments such as movie/tablet rentals). However, several respondents worried that reporting patient experiences may be misleading and damaging to a hospital's reputation if there were no site moderators:

> "As a patient I am not a medical expert as are other patients (not medical experts). We can comment on the level of care but not the medical treatment. So, my opinion and that of other patients is very subjective. Just like 'TripAdvisor' someone could rubbish a hospital with no medical grounds or expertise." (Respondent #52)

4. *Unintended consequences*

Additional PPR concerns raised by respondents included unnecessary stress and increased pressure on hospital staff because of PPR. Some respondents likened PPR of hospital data to the education reporting system which compares how a school is performing on the National Assessment Plan Literacy and Numeracy (NAPLAN) tests with other similar schools. A respondent claimed that increased focus on reporting in the education sector resulted in poorer education and expressed concern that PPR of hospital data could similarly lead to a deterioration in the quality of care provided. Some respondents suggested that PPR systems need to be design in a way which minimises administrative burden and is supportive of hospital staff:

> "It would have to be carefully designed to be fair to all involved without creating excessive administrative and pressure and hierarchy, as sometimes happens in schools reporting – overly burdensome for staff, so counter-productive." (Respondent #57)

Discussion

The results of the study, which are reflective of experiences in the private healthcare sector, highlighted that many respondents did not use PPR information to inform their hospital choice, mainly because they were not aware of it. This is consistent with previous studies [15-18]. Instead, as patients, they were guided by their specialists when selecting a hospital. Almost half of respondents reported that they did have a choice of hospital, which suggests they were involved in the decision-making process with their specialists. Others have reached similar conclusion [40]. Although determining how the specialists and patients selected hospitals was not part of this study, the responses to the open-ended questions revealed that the availability of specialists, and where he/she performed the elective surgery, generally determined which hospital was attended. Future research is required to explore the decision-making process between specialists and patients, and whether the dissemination of PPR information to patients via specialists (as potential mediators of patient choice) is feasible.

The limited awareness of PPR among respondents may be associated with the lack of mandatory PPR for private hospitals. Over a third of Australian private hospitals voluntarily participate on the MyHospitals website [5]. Some private healthcare providers (e.g. Healthscope and Ramsay Health Care) publish their own PPR websites [7, 8]. However, Ramsay Health Care reports aggregated data on quality indicators for all of their private hospitals combined, instead of individual hospitals, clinicians or conditions – this limits its relevance and usability for healthcare consumers. Recently, Healthscope launched the MyHealthscope website which allows healthcare consumers to view and compare the performance of each of their hospitals against the industry rate. Again, the results are not stratified by conditions nor reported at the individual clinician-level.

Almost half of the study respondents proposed that publicly reported hospital-related information (which includes quality and performance indicators) be reported at the level of individual clinicians. In the US and the UK, ratings of individual clinicians working in hospitals are publicly reported [4]. There is evidence that public reporting of such data has led to improvement in the quality of care [41, 42]. However, unintended consequences such as 'cream-skimming' and 'gaming' (i.e. avoiding treating high risk patients who are likely to have poor outcomes) have also been reported [43, 44]. In Australia, debates surrounding PPR of individual specialist-level continues [45-47].

Consistent with previous research, we found the following performance indicators to be of relevance to patients: costs of surgery; complications rates; success rates; patient experiences; hospital cleanliness; and food quality [48, 49]. None of these quality indicators are currently reported on the MyHospitals website [5]. Patient experience is one of the 17 indicators recommended to be publicly reported on the MyHospitals website; methodological issues (i.e. lack of national comparable information), however, have prevented this. In contrast, several state-based performance websites do report on patient experience, complications, and standards of cleaning – to various level of details [9, 10, 50, 51]. The Bureau of Health Information in New South Wales is the most thorough and interactive in its web-based reporting [10]. Although some of the quality indicators collected by the state governments are similar, there is no consistency in the tools used to collect the data. For example, the inpatient experiences surveys conducted in Victoria (92 questions) [52], New South Wales (99 questions) [53], and South Australia (71 questions) [54], are drawn from various sources including the NHS inpatient survey, the Picker Institute Questionnaire, the Patient Experience Information Development Working group, each state's key performance indicators, and a national set of core common patient experience questions. This limits comparison at the national level, but allows hospital comparison within states. In other countries, such as England, the Netherlands and the US, patient reported experience and outcomes are routinely collected and available for consumers to view. These measures are found to be positively associated with delivery of care [55], clinical outcomes [56], clinical effectiveness and patient safety [57].

None of the performance websites in Australia describe costs of surgery. There are no costs associated with attending an Australian public hospital as a public patient. It may not be surprising then that costs of surgery, and associated out-of-pocket costs, are not reported. However, knowing out-of-pocket costs was considered important for patients with private healthcare insurance. Costs of elective surgery were fully covered by private healthcare insurance in only 47% of cases, with one respondent commenting that the out-of-pocket cost for her breast cancer surgery was AUD$7,500. In Australia, there are limited publicly available sources for patients to access information on out-of-pocket costs for inpatient and outpatient care [58, 59]. The Royal Australasian College of Surgeons, in collaboration with Medibank (an Australian private health insurer), publishes surgical variance reports which describe average out-of-pocket charges for surgeons and other medical services (i.e. anaesthetist, assistant surgeon and for diagnostics). Their reports are not targeted at consumers but for specialists, to encourage improvement in private hospital clinical outcomes and patient care. In the US, report cards and reporting websites (e.g. OpsCost [60], Healthcare Bluebook [61], Fair Heath consumers [62]) have been developed to help consumers compare hospital quality and cost of care. Evaluation of report cards with cost information, in an experimental setting, showed that some employees avoided low-cost providers because they perceived low-cost care as substandard, and higher prices as a proxy for better quality [63]. The authors suggested that quality indicators including costs data may improve consumers' decision-making. Given the limited research in this area, and the growth in comparative quality and cost websites, further studies are warranted to evaluate its accessibility, usefulness and content for consumers.

Although many respondents considered PPR to be important for transparency and accountability, they were sceptical of the reliability and validity of PPR data. The reason for this was unclear given that most patients were not aware of PPR. Some comments from the open-ended questions demonstrated lack of understanding of how PPR data is collected and collated, and the methodologies used to construct the quality indicators. In support, past research suggests that consumers distrust PPR data because they have difficulties interpreting the information [11, 19, 64]. In the US, consumer-focused best practice guidelines have been developed for presenting, promoting and disseminating PPR data to improve its comprehensibly and perceived trustworthiness [49, 65].

Patients preferred that the dissemination of PPR information occur via their GPs. In Australia, GPs are gatekeepers to secondary care with patients requiring GPs' referrals for non-emergency access. Therefore, GPs are in a good position to help patients interpret PPR data or guide patients to appropriate resources to support decision-making. However, past research shows that GPs rarely used PPR information when referring patients to hospitals because they were unaware of PPR data and they had concerns about its reliability and validity [31, 66, 67]. Addressing these barriers are essential if GPs are to be a viable source of PPR information for their patients.

Limitations

These findings should be interpreted carefully due to several limitations. Given the non-population representative characteristics of respondents (older women who used private hospitals), the results are not generalisable to other cancer elective surgeries, younger patients and public hospitals. Future research is needed to gather data from a larger sample, and to expand this study to other elective surgeries and public patients in public hospital (who could be recruited via the individual state/territory government which hold their records). Recall bias may have also affected our results, particularly among elderly patients [68, 69]. However, we attempted to minimise recall bias by ensuring that only patients who had cancer elective surgery within the last 12 months were eligible to complete the questionnaire.

Conclusions

PPR of hospital data appears to have no substantial impact on selection of hospitals among a randomly selected cohort of Australian patients with breast, bowel or lung cancer who were treated as private patients. Almost one third of respondents reported that they had no choice of hospital, and current PPR information did not appeared to meet their information needs. Nevertheless, a substantial number of respondents expressed interest in PPR information and claimed that they would like to use it for their future decision-making. Given the growing prevalence of performance data being publicly disseminated through the internet, further efforts are required to develop and include quality and cost indicators that are of interest to patients. While this study focused on people treated for cancer, it has relevance for all consumers of healthcare. Future dissemination of PPR information to patients via specialists and GPs may enable patients to make clinically and financially informed choices with the assistance of their medical doctors.

Contributors

MK, DD and MB conceptualised and designed the study and obtained its funding. KP, RC and MK contributed to the design of the questionnaire. KP, MK and JM selected the sample (MBS procedure codes). KP collected, analysed and interpreted the data and drafted the manuscript. RC, MB, DD, JM and MK contributed to data interpretation and critically reviewed the manuscript. All authors read and approved the final manuscript.

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Competing interests

The authors declare that they have no competing interests.

Data sharing statement

The dataset analysed during the current study are not publicly available due to participants' confidentiality.

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Table 1 Demographic characteristic of respondents (n=243)

	N (%)
Cancer Type	
Breast	155 (63.8%)
Bowel	65 (26.7%)
Lung	23 (9.5%)
Diagnosis period	
Less than 12 months	176 (72.4%)
Between 1 and 5 years ago	65 (26.7%)
More than 5 years ago	2 (0.8%)
Gender	
Male	49 (20.2%)
Female	191 (78.6%)
Missing	3 (1.2%)
Age groups	
25-34	3 (1.2%)
35-44	13 (5.3%)
45-54	36 (14.8%)
55-64	77 (31.7%)
65-74	73 (30.0%)
75-84	32 (13.2%)
85+	6 (2.5%)
Missing	3 (1.2%)
Country of birth	
Australia	186 (76.5%)
Others[a]	53 (21.8%)
Missing	4 (1.6%)
Language spoken at home	
English	230 (94.7%)

Others[b]	8 (3.3%)
Missing	5 (2.1%)
Marital status	
Single/never married	10 (4.1%)
Married/in a defacto relationship	193 (79.4%)
Widowed/divorced/separated	37 (15.2%)
Missing	3 (1.2%)
Education	
Postgraduate	25 (10.3%)
Bachelor	45 (18.5%)
Diploma/certificate	75 (30.9%)
High school	93 (38.3%)
Missing	5 (2.1%)
Employment	
Full-time	45 (18.5%)
Part-time/casual	34 (14.0%)
Self-employed	18 (7.4%)
Retired/pensioner/unemployed	124 (51.0%)
Other[c]	18 (7.4%)
Missing	4 (1.6%)
Occupation (limited to those working)	
Manager	22 (22.7%)
Professional	39 (40.2%)
Technician or trades worker	4 (4.1%)
Community of personal service worker	3 (3.1%)
Clerical or administrative worker	15 (15.5%)
Sales worker	0 (0.0%)
Machinery operator or driver	0 (0.0%)
Labourer	0 (0.0%)
Never worked for a wage	0 (0.0%)
Other	13 (13.4%)
Missing	1 (1.0%)
Household income	
Less than $25,000	22 (9.1%)
$25,000 to $49,999	51 (21.0%)
$50,000 to $99,999	69 (28.4%)
$100,000 or more	51 (21.0%)
Prefer not to stay	36 (14.8%)
Missing	14 (5.8%)
Health care benefits	
Yes	107 (44.0%)
No	134 (55.1%)
Missing	2 (0.8%)
Private health insurance	
Yes	235 (96.7%)

Hospital cover only	28 (11.9%)
Extra's cover only	1 (0.4%)
Hospital and extras cover	206 (87.7%)
No	5 (2.1%)
Missing	3 (1.2%)

[a] others include Argentina, Bosnia and Herzegovina, Canada, China, Croatia, Denmark, England, France, Germany, Hungary, India, Iran, Ireland, Italy, Malta, New Zealand, Philippines, Romania, Scotland, Taiwan, The Netherlands, Uruguay, USA, Vietnam and Wales.

[b] others include Danish, Farsi, French, Italian, Mandarin, Serbian and sign language.

[c] others include those who are currently not working due to their illness and home duties.

Table 2 Factors influencing hospital choice*

	N (%)
Specialist	218 (89.7%)
Distance of the hospital from home	57 (23.5%)
Reputation of the hospital	57 (23.5%)
Own experience	44 (18.1%)
General practitioners	42 (17.3%)
Length of waiting list	37 (15.2%)
Health insurer provider	20 (8.2%)
Family members/friends	22 (9.1%)
Hospital catchment area	17 (7.0%)
Size of the hospital	4 (1.6%)
Hospital/other website	3 (1.2%)
Performance reporting website	0 (0.0%)
Booklet/leaflet or someone else at GP clinic	0 (0.0%)

*total does not reflect 100% as patients could select multiple factors

Table 3 Barriers affecting the use of PPR information*

	N (%)
Not aware	179 (73.7%)
Not relevant	26 (10.7%)
Results about own condition	23 (9.5%)
Accuracy of the information	8 (3.3%)
No internet access	7 (2.9%)
Too difficult to understand	3 (1.2%)
It was out of date	2 (0.8%)
Unsure how to use the information	0 (0.0%)

*total does not reflect 100% as patients could select multiple factors

Table 4 Preferred types of PPR information*

	N (%)
Costs of surgery	144 (59.3%)
Complications rates	141 (58.0%)
Successful recovery	138 (56.8%)
Patient's experience/satisfaction	132 (54.3%)
Medical errors	110 (45.3%)
Waiting times	109 (44.9%)
Readmission rates	91 (37.4%)
Mortality rates	72 (29.6%)
Length of stay	45 (18.5%)

*total does not reflect 100% as patients could select multiple factors

How to complete this questionnaire

In this survey we talk about information you might have seen in newspapers, reports or websites that has to do with 'public performance reporting information' about hospitals in Australia. This is information about the quality of hospitals in Australia and is available to Australian residents. For example, information about waiting times in hospitals, the number of people that got infections when they went to hospital, and the length of waiting lists for elective surgery. Images from the 'MyHospitals' website which provide public performance reporting information about hospitals are shown below:

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Search and compare performance information for more than 1,000 Australian public and private hospitals.

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Costs of acute admitted patients data 2013–14, and average length of stay in hospital data 2013–14

Compare hospitals

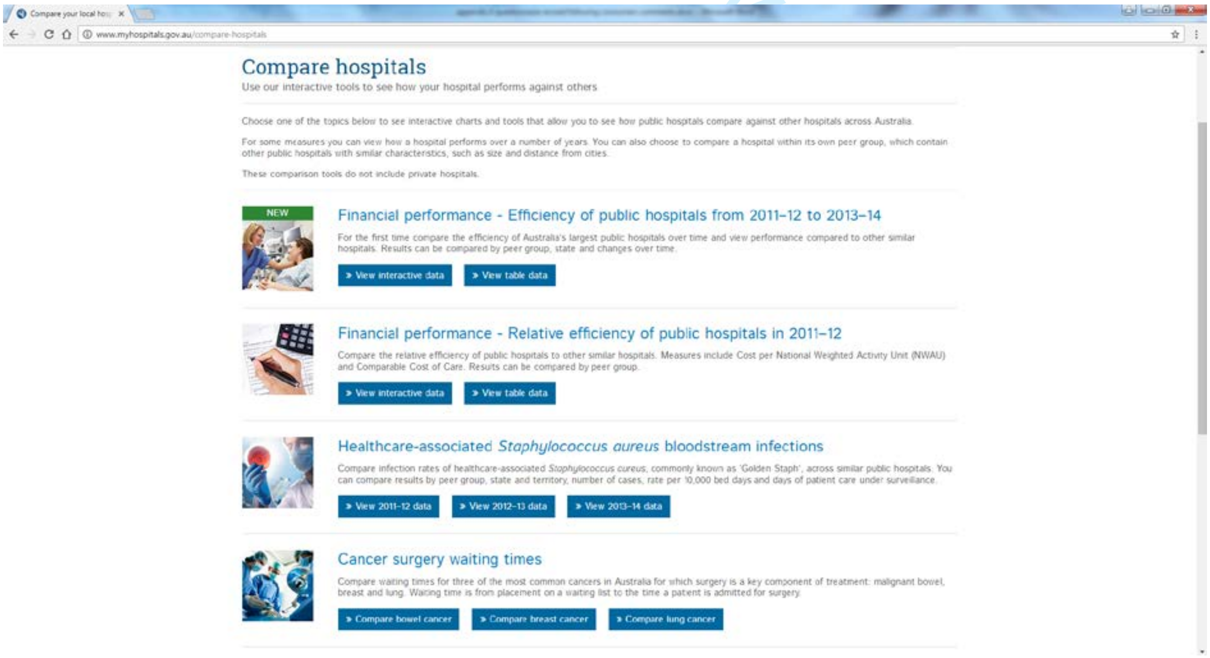
Use our interactive tools to compare your local hospital to other hospitals for select measures.

Map search

Use our interactive maps to search for Australian hospitals and explore hospital performance information.

Our indicators

See the list of indicators we use to measure hospital performance across Australia.



Compare hospitals

Use our interactive tools to see how your hospital performs against others

Choose one of the topics below to see interactive charts and tools that allow you to see how public hospitals compare against other hospitals across Australia.

For some measures you can view how a hospital performs over a number of years. You can also choose to compare a hospital within its own peer group, which contain other public hospitals with similar characteristics, such as size and distance from cities.

These comparison tools do not include private hospitals.

Financial performance - Efficiency of public hospitals from 2011–12 to 2013–14

For the first time compare the efficiency of Australia's largest public hospitals over time and view performance compared to other similar hospitals. Results can be compared by peer group, state and changes over time.

Financial performance - Relative efficiency of public hospitals in 2011–12

Compare the relative efficiency of public hospitals to other similar hospitals. Measures include Cost per National Weighted Activity Unit (NWAU) and Comparable Cost of Care. Results can be compared by peer group.

Healthcare-associated *Staphylococcus aureus* bloodstream infections

Compare infection rates of healthcare-associated *Staphylococcus aureus*, commonly known as 'Golden Staph', across similar public hospitals. You can compare results by peer group, state and territory, number of cases, rate per 10,000 bed days and days of patient care under surveillance.

Cancer surgery waiting times

Compare waiting times for three of the most common cancers in Australia for which surgery is a key component of treatment: malignant bowel, breast and lung. Waiting time is from placement on a waiting list to the time a patient is admitted for surgery.

Source: http://www.myhospitals.gov.au/ (Permission received from the Australian Institute of Health and Welfare to publish the images under the CC BY-NC-ND 3.0 license.)

Please answer every question you can. If you are unsure about how to answer a question make your response the closest answer you can, or write a response in the 'other' box.

Please read the instructions about each question carefully. Some questions require you to give only one response, others allow you to mark more than 1 option.

Sometimes you will find the box you have marked has an instruction to go to another question. By following the instructions carefully you will be able to move past questions that do not apply to you.

- ***Please put a cross in the box next to the answer you choose like this:*** ☒
- ***If you make a mistake or wish to change a response, scribble out the mistake and put a cross in the correct box like this:*** ▨ ☒
- ***Print clearly when written responses are required***
- ***Return completed questionnaire in the reply paid envelope***

➢ *The questionnaire starts here at Q1.*

Q1. If you have been diagnosed with any of the following conditions, please indicate approximately how long ago the diagnosis was made. If you had several diagnoses, please indicate approximately how long ago the most recent diagnosis was made.

Mark only one period of time for the condition picked. Please give your best estimate.

I was diagnosed with or had…	Less than 12 months ago	Between 1 and 5 years ago	More than 5 years ago	I never had this
Breast cancer	☐	☐	☐	☐
Bowel cancer	☐	☐	☐	☐
Lung cancer	☐	☐	☐	☐

Q2. Have you had surgery in a hospital in Australia for the cancer listed at Q1 in the last 12 months (i.e. between 1st January and 31st December 2016)?

☐ Yes

☐ No

➢ *If you **do not** have any of the conditions listed at Q1 and you **did not** undergo cancer surgery in a hospital in Australia between 1st January and 31st December 2016 as stated in Q2, you are not eligible to complete this questionnaire. There is no need for you to return this questionnaire. Thank you for your interest.*

➢ *If you **do** have any of the conditions listed at Q1 and you **had cancer surgery** in a hospital in Australia between 1st January and 31st December 2016 as stated in Q2, please **continue** and complete the questionnaire. The questions relate specifically to when you were seeking surgical treatment for the cancer you indicated at Q1.*

Hospital stay

Q3. Which hospital did you attend for the cancer surgery you indicated at Q1? *(Choose ONE answer)*

☐ A public hospital

☐ A private hospital

Q4. Were you treated in the hospital for the cancer surgery as...*(Choose ONE answer)*

☐ a public patient *(no cost to you)*

☐ a private patient *(costs covered entirely by your health insurance)*

☐ a private patient *(costs partly covered by your health insurance, and partly by you)*

☐ a private patient *(costs covered entirely by you)*

Hospital choice

Q5. Which of the following information types or factors helped you to make a decision about which hospital to be treated at for the cancer listed at Q1? *(Mark all that you used)*

☐ General practitioner (GP)

☐ Specialist/consultant

☐ Health insurer provider

☐ Booklet/leaflet

☐ Hospital website

☐ Other internet site (i.e. community forum)

☐ Performance reporting website (i.e. MyHospitals)

☐ Family members/friends

☐ Own experience

☐ Someone else at GP clinic

☐ Hospital catchment area

☐ Distance of the hospital from home

☐ Reputation of the hospital

☐ Size of the hospital (i.e. number of beds)

☐ Length of waiting list (i.e. surgery)

☐ None of the above

☐ Other *(please list)*

Q6. Were you able to personally choose the hospital that you went to? (*Choose ONE answer*)

☐ I did not have a preference

☐ Yes

☐ No → **If no, did you want to choose it?** ☐ Yes ☐ No

Q7. At the time that you went to hospital, were you aware of 'public performance reporting information' about hospitals? For example, information on the *MyHospitals* website, which you can use to compare hospitals? (*Choose ONE answer*)

☐ No → **(Go to Q9)**

☐ Yes → **Did you use 'public performance reporting information' to help you choose a hospital?** ☐ Yes ☐ No

If yes, how was the information helpful? *(Please describe)*

If no, why was the information not helpful? *(Please describe)*

Q8. How important was 'public performance reporting information' about hospitals in helping you choose the hospital that you went to? (*Choose ONE answer*)

Unimportant	Of little importance	Somewhat important	Important	Very important
☐	☐	☐	☐	☐

Q9. Have any of the following stopped you from using 'public performance reporting information' about hospitals when choosing a hospital? (*Mark as many answers as apply*)

☐ I was concerned about the accuracy of the information

☐ It was too difficult to understand

☐ It was not relevant to me

☐ I did not know about it

☐ I was unsure how to use the information

☐ I had no internet access

☐ I only wanted to know results about my condition

☐ It was out of date

☐ Other *(Please describe)*

Q10. How would you like to get information about how hospitals in Australia are performing? (*Choose ONE answer*)

☐ A printed book or directory

☐ Mobile phone apps

☐ I do not want this information

☐ I do not want to see the information but I want my GP or other healthcare provider to see it and tell me about it

☐ Websites

☐ Other *(Please describe)*

Q11. Of the different types of 'public performance reporting information' about hospitals listed below, which would you most like to use? (*Mark as many answers as apply*)

☐ How long people stayed in hospital

☐ The number of people with health problems or complications (e.g. infections) after their surgery

☐ The number of people that were readmitted to hospital because they had continued problems

☐ How much the surgery will cost me

☐ The experience or satisfaction of other people

☐ The number of people with minimal or no health problems after the surgery (i.e. successful surgery)

☐ How long people waited for their surgery

☐ The number of people that died during their surgery or after their care

☐ The number of surgical or nursing mistakes that harm other people

☐ Other *(Please describe)*

Q12. At what level do you think 'public performance reporting information' about hospitals should be reported (e.g. in the *MyHospitals* website)? At the level of…(*Choose ONE answer*)

☐ Individual doctors *(where you CAN see the performance of individual doctors)*

☐ Specific clinical units within hospitals *(where individual doctors are NOT identified)*

☐ Hospitals as a whole *(where specific doctors and/or the unit where they work are NOT identified)*

Q13. Please <u>rank</u> each of the following areas of information in order of importance to you with <u>*1 being the most important*</u> and <u>*9 being the least important*</u>? (*Put the numbers 1 to 9 beside each type of information*)

☐ How long people waited for their surgery

☐ The number of people that were readmitted to hospital because they had continued problems

☐ The number of people with health problems or complications (e.g. infections) after their surgery

☐ The number of people with minimal or no health problems after the surgery (i.e. successful surgery)

☐ How much the surgery will cost me

☐ How long people stayed in hospital

☐ The number of surgical or nursing mistakes that harm other people

☐ The experience or satisfaction of other people

☐ The number of people that died during their surgery or after their care

Q14. If the information you said was important to you at Q11 was publicly available, then how important do you think 'public performance reporting information' about hospitals would be to you in the future if you or a family member needed to choose a hospital for elective treatment? (*Choose ONE answer*)

Unimportant	Of little importance	Somewhat important	Important	Very important
☐	☐	☐	☐	☐

Q15. Do you have any concerns about using 'public performance reporting information' about hospitals when making a decision about which hospital to choose? *(Please describe)*

Q16. Do you have any other comments or experiences you would like to share that are related to 'public performance reporting information' about hospitals? *(Please describe)*

About you

For each question, please give one response

Gender

☐ Female ☐ Male ☐ Transgender/intersex/other

Your age in years ☐ **Country of birth** ☐

What language do you mainly speak at home? ☐

Your postcode ☐ **Your state** ☐

Marital status

☐ Single/Never married ☐ Married/In a de facto relationship ☐ Widowed ☐ Divorced/Separated

Do you live…

☐ with your spouse, partner or family members
☐ in a share house (with non-relatives)
☐ alone
☐ others *(please specify)*

Highest level (or equivalent) of education you completed

☐ Year 8 or below
☐ High school year 9 or 10
☐ High school year 11 or 12
☐ Certificate (e.g. TAFE training)
☐ Diploma/Advance diploma
☐ Bachelor degree
☐ Postgraduate degree (e.g. Masters, PhD)

Employment status

☐ Working full time
☐ Working part time or casual
☐ Self-employed
☐ Unemployed
☐ Student
☐ Retired or pensioner
☐ Other *(Please specify)*

Main area of occupation *(If retired, please indicate your previous occupation group)*

☐ Manager
☐ Professional
☐ Technician or trades worker
☐ Community or personal service worker
☐ Clerical or administrative worker
☐ Sales worker

☐ Machinery operator or driver (e.g. bus)
☐ Labourer
☐ Never worked for a wage
☐ Other *(Please specify)*

Current approximate annual household income (before tax)

☐ Less than $25,000
☐ $25,000 to $49,999
☐ $50,000 to $74,999
☐ $75,000 to $99,999

☐ $100,000 to $149,999
☐ $150,000 or more
☐ I prefer not to say

Please indicate if you have a health care or other health benefits card

☐ Yes (e.g. Health Care Card, Veterans Affairs, Seniors)
☐ No

Please indicate if you have private health insurance

☐ Yes → **What type of private health insurance do you have?**
  ☐ Hospital cover ONLY
  ☐ Extra’s cover ONLY
  ☐ Hospital AND Extras cover
☐ No

Your email address

Your e-gift card will be sent to your chosen email address. If you do not have an email address, list your home address. Please print clearly. This section with your email or postal address will not be kept with the information you have provided, therefore your questionnaire will remain anonymous.

Thank you for your participation in this questionnaire. Please place the questionnaire in the reply paid envelope and post it. You do not have to use a stamp. If you have misplaced the reply paid envelope, please use a plain envelope (no stamp is necessary) and address to:

Dr Khic-Houy Prang Reply Paid 78439
Centre for Health Policy, The University of Melbourne
Level 4, 207 Bouverie Street, Carlton VIC 3010, Australia

Appendix B

Medicare Benefits Schedule procedure codes

Breast cancer	30299, 30300, 30302, 30303, 31506, 31509, 31512, 31515, 31519, 31524, 31530, 31533, 31536, 31548, 45527
Bowel cancer	32006, 32023, 32024, 32025, 32026, 32028, 32039, 35404, 35406, 32000, 32003, 32004, 32005
Lung cancer	30696, 38438, 38440, 38441, 38812, 41898

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract p.1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found p.2
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported pp.4-5
Objectives	3	State specific objectives, including any prespecified hypotheses p.6
Methods		
Study design	4	Present key elements of study design early in the paper p.7
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection p.8
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants p.8
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable p.7
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group p.7
Bias	9	Describe any efforts to address potential sources of bias NA
Study size	10	Explain how the study size was arrived at p.8
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why NA
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding p.9
		(*b*) Describe any methods used to examine subgroups and interactions NA
		(*c*) Explain how missing data were addressed NA
		(*d*) If applicable, describe analytical methods taking account of sampling strategy NA
		(*e*) Describe any sensitivity analyses NA
Results		
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed p.9
		(b) Give reasons for non-participation at each stage p.9
		(c) Consider use of a flow diagram NA
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders p.9
		(b) Indicate number of participants with missing data for each variable of interest\ Table 1
Outcome data	15*	Report numbers of outcome events or summary measures pp.10-11 (in text). and Tables 1, 2,3 and 4
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were

		adjusted for and why they were included NA
		(*b*) Report category boundaries when continuous variables were categorized NA
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period NA
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses NA
Discussion		
Key results	18	Summarise key results with reference to study objectives pp.14-15
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias p.18
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence pp.15-17
Generalisability	21	Discuss the generalisability (external validity) of the study results p.18
Other information		
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based p.19

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.