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The impact of public performance reporting on health plan selection and switching: A systematic review and meta-analysis

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ABSTRACT

The dissemination of public performance reporting (PPR) cards aims to increase utilisation of information on quality of care by consumers when making health plan choices. However, evaluations of PPR cards show that they have little impact on consumer choices. The aim of this study is to undertake a systematic review and meta-analysis of the impact of PPR cards in promoting health plan selection and switching between health plans by consumers. We searched five online databases and eight previous reviews for studies reporting findings on PPR and health plans. We extracted data and conducted quality assessment, systematic critical synthesis and meta-analyses on the included studies. We identified eight relevant health plan articles related to selection (n = 2), switching (n = 4), selection/switching (n = 2). Meta-analyses showed that PPR was associated with an improvement in health plan selection and a very small deterioration in switching health plans though these changes were not statistically significant. Differences were observed between employer-sponsored health insurance and Medicare/Medicaid insurance. Given the small number of studies included in the review, further research examining the impact of PPR on health plan selection and switching in a range of insurance markets is required.

1. Introduction

The public reporting of hospital performance data (hereafter referred to as 'PPR') that occurs in Australia and other high income countries [1–3] is used to improve healthcare transparency and accountability, and as a mechanism to drive quality improvement and inform consumer decision-making [1,4–6]. PPR may improve quality of care either by triggering organisational change to improve quality or by enabling consumer, practitioners or funders to select away from poorly performing services [7].

Several systematic reviews have already been undertaken to identify existing peer-refereed research relating to the impacts of PPR [5,6,8–13]. These reviews focused on different aspects of PPR and therefore yielded different results (see Appendix A). For example, some reviews focus on the mechanisms by which PPR exerts influence [12,14] while others focus on impacts [6]. There are numerous studies about the impact of consumer selection on health plans, hospital and clinician. The evidence concerning the influence on PPR on consumer behaviours is much stronger for selection of clinicians and health plans than for selection of hospitals [14], where the effect on consumer behaviour tends to be weak and transient, if observed at all [6,14]. One reason for this difference in effects may be, as Totten et al. [12] observed, that the characteristics of public reports and their context, have been rarely studied or even described. It is also not clear how constraints on consumer choice due to plans, geography, waiting time or clinician choice affect the magnitude of PPR effects. Greater PPR effects in studies of health plans may also reflect greater homogeneity among consumers in plan switching studies because the people involved in the studies have the same employer [15–17] or are eligible for the same schemes [18]. However this could be offset by the act that larger more diverse employers are the most likely to offer health plan choice [19].

In the current literature, studies looking at the impact of PPR at health plan level should therefore demonstrate the clearest link between PPR and the choices consumers are being asked to make. Evidence of the impact of PPR on consumer selection at health plan level may provide incentives for health plans to select away from lower quality providers [20]; thus, potentially increasing consumer's power across different levels of choice. On a pragmatic level, there are sufficient comparable studies of health plans to make meta-analysis possible. Furthermore, previous reviews have tended to conflate studies of health plan selection and health plans switching [5,14]. While the parameters associated

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with these choices may be similar, it may be that different information or incentives are required to encourage a switch. Providing this greater conceptual clarity is a strong justification for a further systematic review and meta-analysis on health plans, given that the magnitude and type of impacts of PPR are not settled despite previous study.

This study was conducted as part of a wider systematic review and meta-analysis (where possible) of the impacts of PPR (e.g. process/structure measures, expert/peer assessed measures, healthcare outcomes and consumer experiences) on outcomes (e.g. selection, quality improvement, clinical outcomes, organisation change or unintended consequences) among healthcare purchasers (public and private), providers (organisations and individual clinicians) or consumers. In this paper, we described the impacts of PPR on consumer selection and switching of health plans that better meet their needs. Understanding whether consumer preferences for a particular health plan is influence by quality of care information can provide further insights into the mechanisms underpinning consumer choice processes and information needs. The availability of quality of care information and consumer sensitivity to such information may also stimulate health insurers to improve the quality of health plans on offer.

2. Methods

2.1. Search strategy

We identified articles through a literature search of five databases from their dates of inception to 16th April 2015: Medline; Embase; Psycinfo; the Cumulative Index to Nursing and Allied Health Literature (CINAHL); and Evidence-Based Medicine Reviews (EBMR). Our search strategy was based on the one used by Ketelaar et al. [11] which included randomised and quasi-randomised trials, interrupted time series and controlled before-after studies. We extended our search to include observational study designs if they conformed to the Meta-analysis of Observational Studies in Epidemiology guidelines [21]. Search terms were amended with the assistance of a biomedical librarian (see Appendix B for Medline search strategy).

We also screened articles from previous systematic reviews on PPR [4–6,10,11,13,14,22]. When screening articles from previous systematic reviews on PPR, we identified several studies which were not captured in our initial search strategy. Although these studies were observational studies, they did not use standard epidemiological descriptors to describe their study designs (e.g. health economics literature). We extended our search strategy to include the following study design terms: experimental studies; non-randomised studies; observational cohort; time trend; and comparative studies. A second search of the databases above was then conducted on 14th November 2016. Results of database searches were downloaded into Endnote X7. The reference lists of articles were screened during the full-text articles assessment stage to identify additional relevant articles which may have been missed during the electronic databases search.

2.2. Inclusion and exclusion criteria

We included articles in the systematic review if: 1) they examined the effect of PPR on outcomes among purchasers, providers or consumers; and 2) the study design was observational or experimental. We excluded articles if: 1) performance reporting was not publicly disclosed; 2) they reported hypothetical choices; 2) the study design was qualitative; 3) it was published in languages other than English; 4) it was published prior to the year 2000; 5) where pay-for-performance effects were not disaggregated from PPR; and 6) they involved long-term care, and specifically nursing homes.

2.3. Study selection

Two authors independently screened titles and abstracts for relevance. Full text articles were then screened for relevance by two authors independently using a screening guide which was adapted from a previous meta-analysis [23] (see Appendix C). Discrepancies between authors were discussed at a consensus meeting and if discrepancies were not resolved, a third author made the final decision. Studies were separated into groups based on: a) the type of provider/service whose performance was being publicly reported; and b) the impact of PPR (an improvement in performance or a selection/change in health service usage either by provider or consumer). We extracted the following information from the articles: authors, year of publication, country, study design, study population, sample size, type of PPR data, outcome measures, statistical analysis, and findings.

2.4. Quality assessment

We assessed the methodological quality of observational studies with the Newcastle-Ottawa Scale (NOS) [24] and RCT studies with the Cochrane Collaboration's tool for assessing risk of bias [25]. The NOS uses a star system to evaluate the quality of the studies based on three domains: the selection of the study groups; the comparability of the groups; and the ascertainment of either the exposure/outcome of interest. A maximum of 9 stars can be awarded. We graded the quality of each observational study as very low ($\leq$3 stars), low (4–5 stars), moderate (6–7 stars) or high ($\geq$8 stars). The Cochrane Collaboration's tool for assessing risk of bias uses six domains to evaluate the quality of RCT studies: selection bias; performance bias; detection bias; attrition bias; selective reporting; and other sources of bias. Each domain is assessed as low, high or unclear risk of bias. Similarly, the quality of each of the RCT study was graded as low (low risk of bias for all key domains), high (high risk of bias for one or more key domains) or unclear (low or unclear risk of bias for all key domains) risk of bias.

This threshold approach for assessing the quality of studies included in systematic reviews, we believe is superior to the quality-weighting approach [26]. While there are obvious attractions to using the quality-weighting approach to assess the impact of variation in methodological quality of articles in producing heterogeneity in the findings, there are also difficulties with its use. Firstly, there are biases in allocating quality weights, so the approach may not reduce bias overall. Secondly, in moving to what is a meta-regression rather than a meta-analysis approach, it would need to incorporate the full range of independent, moderating variables, not just the methodological quality variable. It would be challenging to capture the full range of these variables across the larger number of the studies being canvassed. Then, interpret the results if, as is likely, incomplete data had to be used.

2.5. Statistical analysis

One author extracted effect size estimates from the studies where possible and a second author reviewed it. We used the Comprehensive Meta-Analysis software version 3 [27] to calculate and pool random-effects size estimate. Studies which did not report appropriate/sufficient data (e.g. stratification of results without reporting overall results, coefficients without standard errors, or lower/upper confidence limits) were not included in the meta-analysis but were retained in the systematic review. Our analyses focused on the effect of PPR on health plan selection and health plans switching. The meta-analysis results are presented in terms

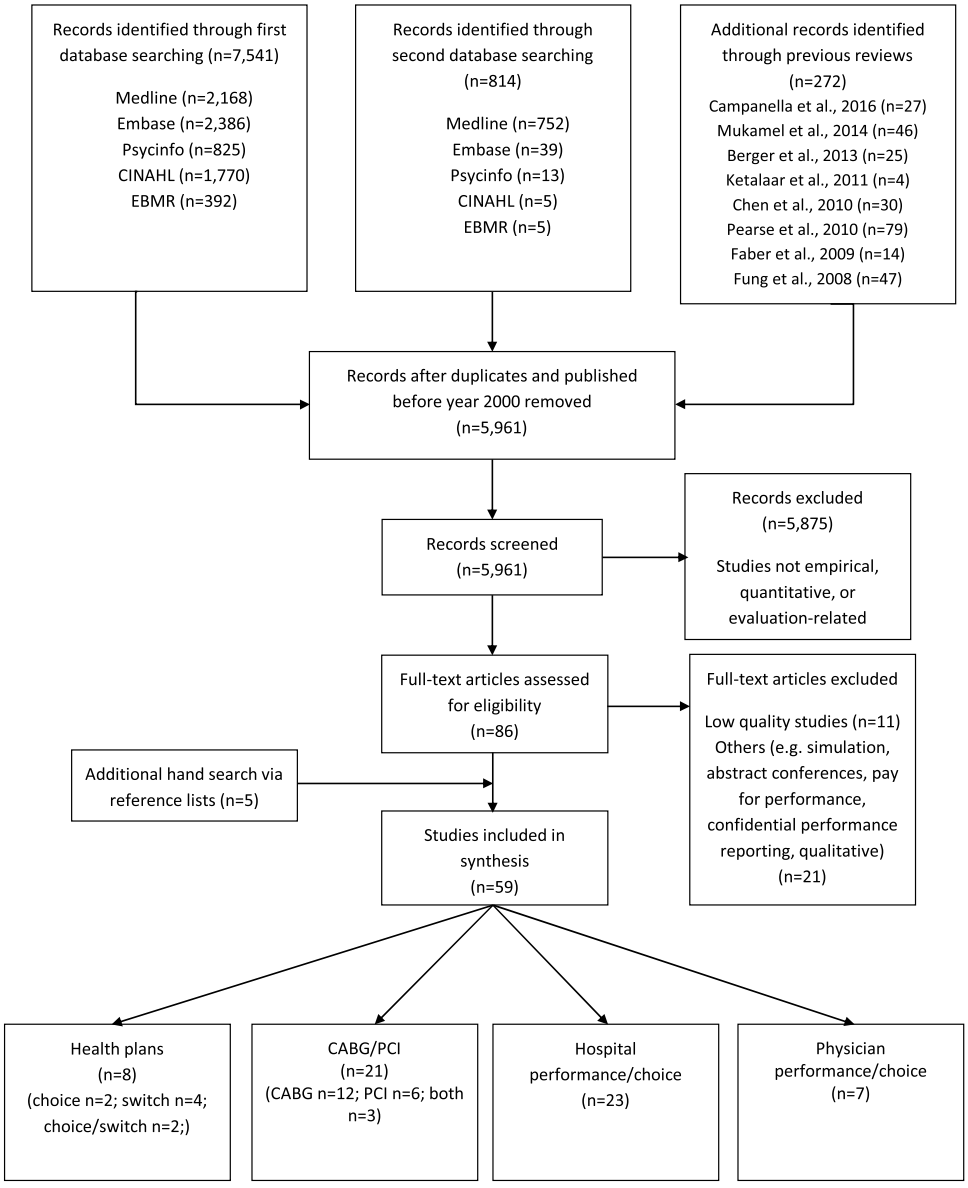


Fig. 1. Flow diagram for retrieval of articles.

of odds ratio (effect size) with 95% confidence intervals, relevant I^2-statistics and Egger's test. A random effect was selected to account for the heterogeneity of the measures across the studies. Heterogeneity was calculated with the I^2-statistics, with values of 25%, 50% and 75% corresponding to low, moderate and high levels of heterogeneity, respectively [25]. Publication bias was assessed with the Egger's test, with the null hypothesis denoting no publication bias ($p \geq 0.05$) and the alternative hypothesis indicating publication bias ($p \leq 0.05$) [28].

3. Results

3.1. Study selection and quality assessment

We identified 5961 articles from five databases and eight previous reviews (Fig. 1). Following titles and abstracts screening, we excluded 5875 articles (non-empirical studies, non-quantitative or non-evaluation-related studies), leaving 86 articles for full-text screening. Following full-text screening, we excluded 32 articles including 11 articles that were assessed to be of low quality. We included 59 articles in our synthesis, including five additional hand searched articles via reference lists. Articles were categorised into four groups: 1) health plans; 2) coronary artery bypass graft (CABG) and percutaneous coronary intervention (PCI); 3) hospital performance and; 4) physician performance. In this paper, results of health plans articles (selection and switching) are presented. Results of CABG/PCI, hospital and physician performance will be reported elsewhere.

3.2. Study characteristics

Characteristics of the included health plans studies (n = 8) are described in Table 1. Two studies assessed health plans selection, four studies assessed health plans switching, and two studies evaluated both health plans choice and switching. One study was rated as high quality and seven studies as moderate quality. All studies were conducted in the US and published between 2001 and 2008 in academic journals. Study designs included RCT (n = 3), cross-sectional (n = 3), retrospective cohort study (n = 1), and before and after (n = 1). The total sample size across all studies consisted of

Table 1
Data extraction for included studies (n = 8).

Authors	Year of publication	Country	Study design	Study population	Sample size	Type of PPR	Outcomes	Statistical analysis	Findings
McCormack et al. [31]	2001	USA	randomised controlled trial	Medicare beneficiaries in Kansas City metropolitan	2107	Medicare & You 1999 handbook, CAHPS report, Medicare & You bulletin	consumer health plans switching	logistic regression	No effect
Beaulieu [15]	2002	USA	cross-sectional study	Harvard University employees	11,500	report cards	consumer health plans choice and health plans switching	logistic regression and conditional logit models	Effect for both
Farley et al. [30]	2002a	USA (Iowa)	randomised controlled trial	Iowa Medicaid beneficiaries	13,077	Medicaid enrolment materials, CAHPS Report	consumer health plans switching	multinomial logistic regression	No effect
Farley et al. [18]	2002b	USA (New Jersey)	randomised controlled trial	New Jersey Medicaid beneficiaries	5217	Medicaid enrolment materials, CAHPS Report	consumer health plans choice and health plans switching	logistic regression	No effect for both
Scanlon et al. [29]	2002	USA	cross-sectional study	General Motors Corporation employees	96,000	report cards	consumer health plans switching	econometric methods	Effect
Wedig and Tai-Seale [16]	2002	USA	cross-sectional study	Federal employees	9162	report cards	consumer health plans choice	nested multinomial logit	Effect
Jin and Sorensen [17]	2005	USA	retrospective cohort study	Federal government annuitants	509,139	US News & World Report, HEDIS/CAHPS report, FEHBP guidebook	consumer health plans choice	econometric methods	Effect
Dafny and Dranove [32]	2008	USA	before and after study	Medicare health maintenance organisation	40 million	Medicare & You 2000 and 2001 handbooks	consumer health plans switching	discrete choice demand model	Effect

HEDIS health plan employer data and information set; CAHPS consumer assessment of health plan study; FEHBP Federal Employees Health Benefits Program; PPR public performance reporting.

40,646,202 participants. The sample size per study ranged from 2107 to 40 million. The most common source of PPR information was the Consumer Assessment of Healthcare Providers and Systems (CAHPS) report. The characteristics of the quality measures provided in the health plans and the outcome measures used in the analysis of each study are described in Table 2.

3.3. Effects of PPR on health plans selection

Four of the eight studies examined the effect of PPR on health plan selection [15–18]. Three studies involved selection of employment-based health insurance plans. Two studies involved selection of plans among Medicaid and Medicare beneficiaries respectively following the release of PPR information. Beaulieu [15] reported that the dissemination of plan ratings (i.e. patient satisfaction and quality of care data) had a significant effect on selection of plans among Harvard University employees. Specifically, Beaulieu found that the selection of a particular plan increased by 10% for every unit in the plan's quality rating. Similarly, Wedig and Tai-Seale [16] and Jin and Sorensen [17] found that among federal employees, an increase of one standard deviation in the quality score (i.e. overall quality of care [16] and National Committee for Quality Assurance score [17]) of a plan was associated with 30.9% and 2.6% points increase respectively, in the likelihood of a particular plan being selected. In contrast, Farley et al. [18] reported no significant effect of report cards (based on CAHPS dimensions) on plans selection among Medicaid beneficiaries in New Jersey. However, they did find a subgroup effect among those who received and read the report cards chose plans with higher quality ratings.

Result of the random effect meta-analysis for PPR and health plan selections are presented in Fig. 2. Result of the meta-analysis indicated that PPR was positively associated with the selection of plan, however the result was not statistically significant (OR = 1.14; 95% CI = 0.96–1.35; p = 0.13). Substantial heterogeneity was observed between effect sizes (I^2 = 99.05). Egger's test was also not statistically significant suggesting the absence of publication bias (p = 0.55).

3.4. Effects of PPR on health plans switching

Six of the eight studies examined the effect of PPR on health plans switching among Medicaid and Medicare beneficiaries (n = 4) and Harvard University and General Motors (GM) employees (n = 2) [15,18,29–32]. Both Beaulieu [15] and Scanlon et al. [29] reported that Harvard University and GM employees in low quality plans were more likely to switch to higher quality plans. Although, the effect found by Beaulieu was relatively small. Scanlon et al. found that GM employees would pay US$23 to avoid a plan with one extra below average rating.

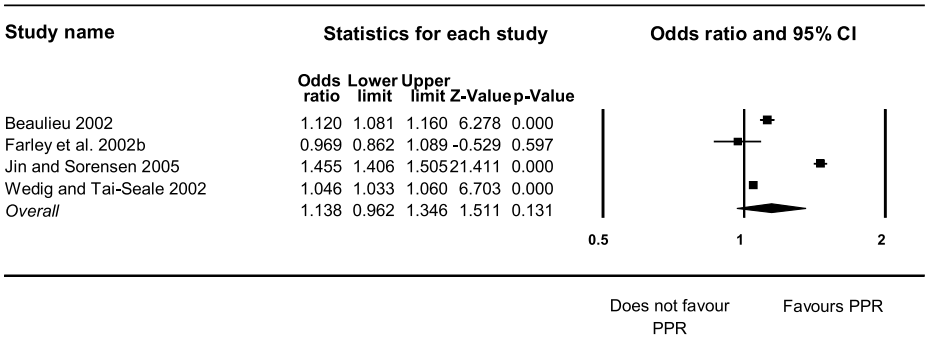
Dafny and Dranove [32] reported that Medicare beneficiaries were switching to higher quality plans because of the report cards. The effect was attributed to customer satisfaction ratings rather than objective measures of quality. Conversely, RCT studies conducted by Farley et al. in New Jersey [18] and Iowa [30], and McCormack et al. in Kansas city [31] found no effect of PPR on plans switching among Medicaid and Medicare beneficiaries. Although Farley et al. found no overall effect on plan switching between those who received report cards and those that did not in Iowa; they found that Medicaid beneficiaries were more likely to switch from a low to a high-quality plan, independently of the report cards. McCormack et al. attributed the lack of PPR effect on plans switching to the PPR materials provided to Medicare beneficiaries which included a message advising them that changing plans was not required.

Fig. 3 presents the result of the random effect meta-analysis for PPR and health plans switching with the exclusion of Scanlon et al.

Table 2
Characteristics of quality and outcomes measures for included study.

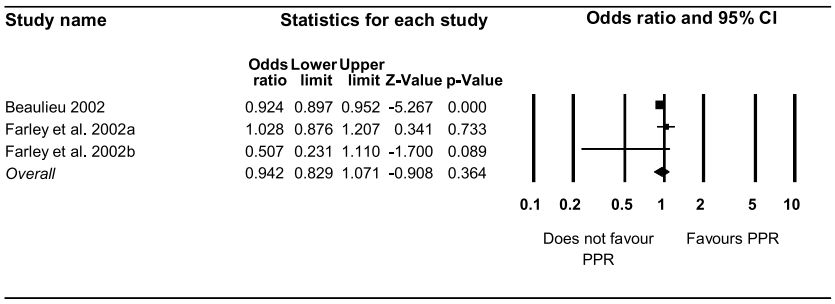
Authors	Health plans choice	Type of PPR	Quality measures provided in health plans	Quality measures used in analysis	Outcomes measures
McCormack et al. [31]	Medicare HMOs	Medicare & You 1999 handbook, CAHPS report, Medicare & You bulletin	• Medicare & You 1999: 52-page about Medicare HMOs (including HEDIS) • CAHPS report: 22-page on quality of care information at the plan level for five Medicare HMOs • Medicare & You bulletin: 8-page abbreviated version of the Medicare & You 1999 handbook	Used the PPR information materials	consumer health plans switching (no description of the type of plans switching)
Beaulieu [15]	Choice of 6-8 plans: 1 PPO plan, 4 local HMO plans, 1 in-house HMO, 3 POS	Report cards (developed from satisfaction survey of sample of each plan's enrolees)	• Patient satisfaction: overall quality of care and services, attention given to enrolees comments, ease of making an appointment, outcomes of medical care, and intent to recommend (star rating range 2 to 4) • Quality of care based on HEDIS: cholesterol screening, follow-up after major affective disorder, diabetic retinal exam, childhood immunisation, mammography rate, cervical cancer screening, prenatal care (star rating range 1 to 5)	The sum of the reported quality of care measures	• consumer health plans choice • consumer health plans switching (low to high quality plans)
Farley et al. [30]	One of the four HMOs under contract with the Medicaid program and sometimes a primary care case management plan (MediPASS)	Medicaid enrolment materials, CAHPS report	• Medicaid enrolment materials: plan enrolment form, benefits and offerings of specific health plans, instructions about the enrolment process and available information sources • CAHPS report: three charts with rating of the health plan, health care, and personal doctor and charts with respondents' reports regarding five aspects of service by the providers or health plan (getting needed care, getting care without long waits, how well doctors communicate, courtesy/respect/ helpfulness, health plan customer service)	Used the CAHPS information	consumer health plans switching (stayed in current plan, switched to MediPASS or low/high-rated HMO)
Farley et al. [18]	One or more HMOs and sometimes a primary care case management plan	Medicaid enrolment materials, CAHPS report	• Medicaid enrolment materials: 7-page brochure that compared the Medicaid HMOs with respect to the consumer ratings and experiences reported in the CAHPS survey • CAHPS report: HMOs performance on 7 dimensions (e.g. doctors and nurses who communicate well, how easy to get referrals to a specialist)	Standardised CAHPS rating of selected HMO and a summary measure of the importance of the CAHPS dimensions	• consumer health plans choice (chose a plan instead of being auto assigned) • health plans switching (chose a plan that perform better according to the CAHPS survey)
Scanlon et al. [29]	Choice of 8 plans: 5 HMOs, 1 PPO, basic medical plan, enhanced medical plan	Report cards (developed from satisfaction survey of General Motors employees, and combination of HEDIS and plan site visits)	• Six domains: preventive care, medical and surgical care, women's health, access to care; patient satisfaction; operational performance (rated as below expected performance, average performance, superior performance)	Aggregation of ratings variables with summary measures for the number of domains with superior ratings and the number with below ratings	consumer health plans switching (from low to high quality plans)
Wedig and Tai-Seale [16]	FEHBP plans (five or fewer unique plan selections)	Report cards (developed from satisfaction survey of federal employees who were enrolled in health plans)	• Aspect of care: overall satisfaction, access to medical care, overall quality of care, doctors available through the plan, coverage and information provided by the plan, customer service and simplicity of paperwork	Percentage of surveyed individuals who rate the overall quality of care as good, very good or excellent	consumer health plans choice
Jin and Sorensen [17]	FEHBP plans (100 of plans offered but federal annuitants typically select from 5 to 10 HMO plans and available FFS plans)	US News & World Report (HEDIS/ CAHPS), FEHBP guidebook (developed from consumer satisfaction survey)	• Quality of care based on US News & World reporting: National Committee for Quality assurance score • Patient satisfaction based on FEHBP guidebook: the percentage of enrolees who report being 'very satisfied' or 'extremely satisfied' overall, and the percentage of enrolees who report being satisfied with a plan's coverage of services	Single composite rating	consumer health plans choice
Dafny and Dranove [32]	Medicare HMOs	Medicare & You 2000 and 2001 handbooks	• Quality of care based on HEDIS: mammography (percentage of women 50-69 receiving a mammogram within past 2 years) • Quality of care based on CAHPS: communicate (percentage of enrolees reporting the doctors in their plan 'always communicate well'), best care (percentage enrolees rating their own care a 10 out of 10)	High quality is defined as scoring one standard deviation above the National mean on a composite of six audited measures of health plan quality	consumer health plans switching (from low to high quality plans)

CAHPS consumer assessment of health plan study; FEHBP Federal Employees Health Benefits Program; FFS fee for service; HEDIS health plan employer data and information set; HMO home maintenance organisation; PPO preferred provider organisation; POS point of service; PPR public performance reporting.



An odds ratio >1 reflects an increase in health plan selection and an odds ratio <1 reflects a decrease in health plan selection.

Fig. 2. Forest plot of the association between public performance reporting and health plan selection.



An odds ratio >1 reflects an increase in health plans switching and an odds ratio <1 reflects a decrease in health plans switching.

Fig. 3. Forest plot of the association between public performance reporting and health plans switching.

[29], McCormack et al. [31] and Dafny and Dranove's [32] studies. Scanlon et al. and McCormack et al.'s studies were excluded from the meta-analysis as we were unable to extract data for overall quality rating from Scanlon et al. and results from McCormack et al. were likely to be biased due to the message that was included in the PPR materials. Dafny and Dranove's study was also excluded from the meta-analysis because their unit of observation was plan-country-year which differ from the other studies. Result of the meta-analysis showed that the presence of PPR was associated with marginally less plans switching but the result was not statistically significant (OR = 0.94; 95% CI = 0.83–1.07; p = 0.36). Moderate heterogeneity was noted between effect sizes (I^2 = 49.17). Egger's test was not statistically significant suggesting the absence of publication bias (p = 0.89).

4. Discussion

The results suggest a positive association between PPR and health plan selection in three of the four studies included in our meta-analysis. However, this effect was non-significant overall. The studies where PPR effects were found focussed on employer-sponsored health insurance while the non-significant study focussed on choices between health plans for Medicaid users. PPR was associated with marginally lower levels of health plans switching in one of the three studies in our meta-analysis. This effect was again non-significant overall. The studies where PPR effects were detected involved switching between employer-sponsored health insurance plans while the studies where no effects were observed involved Medicare and Medicaid users. This pattern may be due to differences between the studies involved or it may reflect differences between the public and employer-sponsored insurance markets.

4.1. Constraints on selection

In public insurance markets, such as Medicare and Medicaid, older people and low-income people have no or limited choice of health plans depending where they live. For example, in some counties in California, Medicaid beneficiaries are limited to one county-run plan or a set of county run/commercial plans [33]. They also have fewer providers to choose from because of low participation rates by physicians in the Medicaid program [34]. Medicare beneficiaries can select between government-run fee-for-service or *Medicare and Choice* which includes two or more private plans [35]. In contrast, employer-sponsored health insurance is provided by private organisations to their employees as part of the employees' compensation package [36]. Employers may provide one or a set of plans that employees can choose from. Employer-sponsored health insurance offers a consumerist approach to health insurance. However, employees are still constrained by the type of plans selected by the employers. The literature has shown that large organisations tend to offer plans with good performance measures [37], whereas small and medium sized organisations prioritise costs over the quality of the plans [38]. The studies included in our review were limited to large organisations such as Harvard University and GM. It is unclear whether the same effects would be observed in small and medium sized organisations. Further research is war-

ranted given that over 60% of the non-elderly population in the US are covered with employer-sponsored health insurance [36].

4.2. Consumer characteristics - selection

The differential effects of PPR on health plan choice between the public and employer sponsored insurance markets may be attributed to differences in consumer characteristics between the markets. Public health insurance markets include older and low-income people. Past research has shown that some Medicare and Medicaid beneficiaries have difficulties in understanding plans information [39,40] and were unable to select a cost-effective plan that met their medication needs [41]. Moreover, as the number of plan choices offered to individuals increases, the difficulty in making a decision is likely to increase and the ability to select an appropriate plan decreases [42]. Wuppermann et al. [43] found that German retirees make better choices when the number of available plans is smaller. In contrast, employer-sponsored health insurance consists of working adults. Our review includes employees from Harvard University and Federal Agencies who may have been more responsiveness to plan information provided by their employers. Past research showed that educated people have more experience in processing relevant information about plans [44,45].

4.3. Quality of information provided - selection

Furthermore, selection of health plans is likely to be influenced by the type and volume of quality information provided. Large organisations spend substantial resources to construct and disseminate report cards to their employees. For example, GM's report card compared eight plans across six domains: preventive care; medical and surgical care; women's health; access to care; patient satisfaction; and operational performance. On the other hand, Medicare provided a 52-page *Medicare and You* handbook and a 22-page CAHPS survey report. Medicaid provided a shorter version of the CAHPS survey report with five additional quality indicators. The large volume of information provided by Medicare and Medicaid could have overwhelmed and discouraged beneficiaries from reading and using it. Consumer-focused best practice guidelines for presenting, promoting and disseminating PPR information suggest that more intensive information is not always associated with greater knowledge and can be counterproductive [46]. Given the differences between consumer groups, future research exploring how to effectively disseminate PPR information to various groups is required.

4.4. Consumer characteristics - switching

Employees were more likely to switch health plans than Medicare and Medicaid beneficiaries. Employees provided with PPR information could discriminate between plans and switched from low quality to high quality plans. This is consistent with past research which showed that switching plans occurred among younger and healthier people than older and ill people [45,47]. Medicare and Medicaid beneficiaries did not switch plans when provided with PPR information. The lack of plan switching among Medicare beneficiaries in McCormack et al.'s study [31] is attributed to the PPR materials which included a message encouraging beneficiaries not to change plans if they were satisfied with their current plan. Medicaid beneficiaries may also have been satisfied with their current plan and the plan information could have reinforced their existing perceptions about the quality of the plan. In support, Rooijen et al. [47] found that satisfaction with service or coverage of the plan, years of enrolment in the plan, and lack of interest to search for other plans were reasons that prevented switching among a Dutch sample. Other probable causes for not switching include transaction costs (i.e. direct financial costs of enrolment and the time or effort it takes to find relevant information on alternative plans) and uncertainty about the quality of the service of the new plan.

4.5. Price - selection and switching

Additional factors such as price may play an important role over PPR information when selecting or switching health plans. Past studies have demonstrated that selection and switching of plans are largely based on premiums [47,48]. Four studies included in our review examined the effect of price on plan choice and selection [15–17,29]. All studies found an effect of price on plan choice among various subgroups (e.g. newly hired employees are more price sensitive than those already enrolled, younger families are more price sensitive than older families, and younger individuals are more price sensitive than younger families). Understanding the optimal trade-off between price and quality is required. Previous experiences, reputation of providers and advice on plans from doctors, family, friends and colleagues could influence plan choice and subsequent switching [49]. Further research is warranted to understand the mechanism underlying consumer plan switching behaviour and what factors mediate these choices.

4.6. Strengths and limitations

To our knowledge, this is the first review to quantitatively synthesise the impact of PPR on health plan selection and switching. Despite the comprehensive overview, the inclusion of moderate and high quality studies and the conduct of meta-analyses, there are several limitations. While the search was extensive and included a wide range of relevant electronic databases, it did not include studies in languages other than English, grey literature, qualitative studies, hypothetical choice studies and studies published prior to the year 2000. The exclusion of studies before 2000 is unlikely to affect the results because PPR has changed drastically since the 1990s with the dissemination of online PPR [50]. Studies which did not explicitly describe their research design may have also been missed from our search strategy. However, a second search was conducted and we widened our inclusion criteria accordingly. Several previous reviews were hand searched to ensure we captured as many studies as possible. All the studies included in our review were conducted in the US where health plans are prominent. The results are unlikely to be generalisable to other countries in which plans are not available but could provide lessons for countries contemplating the implementation of managed care competition. Although we were able to pool data to produce evidence of PPR and plan selection and switching, results of the meta-analyses should be interpreted with caution due to the high level of heterogeneity. High heterogeneity is likely due to the small number of studies and the inclusion of various study designs in the meta-analyses [51]. Therefore, we also conducted separate meta-analyses for RCT (two of three health plans switching studies; OR 0.80; 95% CI 0.42–1.56; $p = 0.52$) and observational studies (three of four health plans selection studies; OR 1.19; 95% CI 0.98–1.45; $p = 0.07$). Results were similar across meta-analyses with various study designs. We did not detect any publication bias with the Egger's test but we recognised that the Egger's test is susceptible to low statistical power when there are few studies [52].

Lastly, the beneficial impact of publicly report of the performance on health services and health practitioners, self-evidently, depends on the quality of the performance data that is publicly reported, being of high quality. Five of the eight studies of health plan selection or switch, considered, use one or both of two widely used and well-developed instruments [17,18,30–32]. These are the Healthcare Effectiveness Data and Information Set (HEDIS) and the Consumer Assessment of Healthcare Providers & Systems (CAHPS).

Both have been shown to have good validity and reliability [53–55]. The remaining three of the eight studies use other tools specifically developed for undertaking the performance ratings used in these studies [15,16,29]. They have not been assessed for validity or reliability. Consequently, one can have confidence in the performance ratings made using HEDIS and/or CAHPS in the five studies but less confidence in the tools specifically developed for the trials undertaken in the other three remaining studies.

5. Conclusions

To our knowledge, this is the first systematic review and meta-analysis to synthesise and quantify the impact of PPR on health plan selection and switching by consumers. PPR was positively associated with health plan selection but less positively so with health plans switching, given the results were not statistically significant and substantial heterogeneity were observed. The meta-analysis also highlighted the need for greater research examining the impact of PPR on health plan selection in a range of insurance markets. The methods suggested that studies concerning switching insurance schemes need to have greater conceptual clarity. The issue of whether consumers switch plans appears to both rely on PPR and information about switching. It may also be methodologically simpler to focus not on whether switching is higher or lower but if it is in the direction suggested by PPR. There is also a need to account for additional factors such as the consumer group, employer type, healthcare system and health plans characteristics that can affect consumer decision-making. Assessing the comparative priorities of these factors will be helpful to ascertain the level of PPR importance for selection and switching of plans.

Conflict of interests

The authors declare that they have no competing interests.

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Authors' contributions

MK and DD conceptualised and designed the study and obtained its funding. KP and HS conducted the second search. All authors screened titles, abstracts and full text for relevance. All authors conducted quality assessment of articles. KP and DD collected and analysed the data. MK and KP drafted the manuscript. All authors contributed to data interpretation and critically reviewed the manuscript. All authors read and approved the final manuscript.

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Declarations of interest: None

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.healthpol.2018.10.003.

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