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RESEARCH ARTICLE

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Effectiveness of hospital transfer payments under a prospective payment system: An analysis of a policy change in New Zealand

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Abstract

Prospective payment systems reimburse hospitals based on diagnosis-specific flat fees, which are generally based on average costs. While this encourages cost-consciousness on the part of hospitals, it introduces undesirable incentives for patient transfers. Hospitals might feel encouraged to transfer patients if the expected treatment costs exceed the diagnosis-related flat fee. A transfer fee would discourage such behavior and, therefore, could be welfare enhancing. In 2003, New Zealand introduced a fee to cover situations of patient transfers between hospitals. We investigate the effects of this fee by analyzing 4,020,796 healthcare events from 2000 to 2007 and find a significant reduction in overall transfers after the policy change. Looking at transfer types, we observe a relative reduction in transfers to non-specialist hospitals but a relative increase in transfers to specialist facilities. It suggests that the policy change created a focusing effect that encourages public health care providers to transfer patients only when necessary to specialized providers and retain those patients they can treat. We also find no evidence that the transfer fee harmed the quality of care, measured by mortality, readmission and length of stay. The broader policy recommendation of this research is the introduction or reassessment of transfer payments to improve funding efficiency.

KEYWORDS
funding efficiency, healthcare provider funding, hospital transfer fees, inter-hospital transfer incentives, prospective payment system

1 | INTRODUCTION

Inter-hospital transfers generally consume more resources as they require more complex treatment and patients stay in hospital for longer. For this reason, many receiving hospitals are less inclined to accept transfers, and sending hospitals are more inclined to transfer these more complex or costly cases. This creates a mismatch problem where those who need care from a specialist facility may be rejected for transfer, or those with locally treatable diagnoses are transferred unnecessarily.

The identified mismatch problem highlights one of the undesirable incentives of prospective payment systems. Funding is based on the average costs of treating a specific diagnosis and not on actual costs. A hospital, therefore, has an incentive to transfer patients whose expected total costs exceed the flat-fee payment and treat patients whose expected costs are below average. While such gaming behavior is optimal from a hospital perspective, it harms social welfare due to inefficiencies and adverse health outcomes.

One way to resolve this issue is to allow a patient's insurance status to dictate the transfer choice, as in the US, where private insurance governs much of the healthcare system (Green et al., 2005). Given that a single agent pays the costs and receives the benefits of the transfer, incentives are correctly aligned. However, in a publicly funded system, the hospital that makes the transfer decision does not cover all costs. In this case, a lump-sum payment like a transfer fee that the sending hospital must pay to the receiving hospital would closer align incentives (see Ellis & Ruhm, 1988).

In 2003, New Zealand switched from a fee-for-service to a prospective payment system and introduced a patient transfer fee. Using data from before and after the policy change, this study investigates whether introducing the transfer fee has changed transfer behavior and the impact it has had on transfer health outcomes. The purpose of the transfer fee is to discourage hospitals from transferring patients for financial gain and offset the potential losses of hospitals receiving a disproportionate share of transfers. An effective transfer fee would therefore be welfare enhancing.

The New Zealand health funding system lends itself to investigating the effectiveness of patient transfer fees for several reasons. First, the policy changes in 2003 allowed us to compare transfers prior to 2003 when the recipient hospital had to cover the treatment cost, with transfers after a transfer fee was imposed. Second, the New Zealand health system requires people to present at the hospital of the district of domicile. This means patients cannot freely choose a specific hospital which eliminates reputation effects. Third, in New Zealand, the transfer of patients is entirely up to the physician's judgment relative to the care needed, with no scope for the ability to pay affecting the level or location of treatment. Finally, the public funding of the New Zealand health care system removes any bias caused by insurance provision and wealth. Overall, this ensures a more equitable distribution of transfers.

The analysis of 4,020,796 New Zealand healthcare events from 2000 to 2007 suggests that the transfer fee has better aligned transfer incentives evident by reducing unnecessary transfers and concentrating transfer decisions only to those patients in need of specialist treatment. Rather than the cost of treatment following the patient to the destination hospital, the transfer fee allows the cost to be referred back to the hospital of origin. This is similar to a private insurer who takes responsibility for transfer costs regardless of the treatment hospital. Our results furthermore suggest that the introduction of a transfer fee did not harm health outcomes.

2 | RELATION TO RELEVANT LITERATURE

To the best of our knowledge, no published studies provide an empirical analysis of inter-hospital transfer fees under a prospective payment system. There is, however, an important paper by Ellis and Ruhm (1988) that provides a theoretical analysis of transfer incentives under alternative reimbursement mechanisms. Relevant to our study is their finding that as decision-makers are likely to be imperfect agents (not equally valuing patient benefits with sending and receiving hospital profits), all currently used funding mechanisms (fee-for-service, prospective, and mixed systems) are inefficient. To mitigate inefficiencies, sending hospitals need to be discouraged from transferring high-cost patients and receiving hospitals need to be compensated for accepting such patients.

Several studies have analyzed the characteristics of transfers and find that they are associated with higher costs compared to regular admissions (Bernard et al., 1996; Jencks & Bobula, 1988; Pietz et al., 2007), have an increased length of stay, poorer overall health outcomes and higher mortality rates (Bernard et al., 1996; Hernandez-Boussard et al., 2017; Sokol-Hessner et al., 2016), and higher severity measures (Rosenberg et al., 2003). These findings suggest that incentives for unnecessary patient transfers exist.

It is worth noting that higher complexity cases are more likely to be transferred to specialized care facilities (tertiary hospitals), which therefore, not only attract the most complicated but also the highest number of cases (Shin et al., 2017). That more complex cases are sent to tertiary hospitals is consistent with patient transfer policies and contributes to efficiency. The focus of our study is to investigate if less complex cases are also transferred for financial benefits, although they could be treated in-house.

3 | INSTITUTIONAL BACKGROUND

Between 1983 and 1993, New Zealand gradually switched from a fee-for-service to a prospective payment system managed by a central Health Funding Authority. This changed in 2000 with the establishment of individual District Health Boards (DHBs), which now receive funding from the Ministry of Health. Given the more autonomous status of the DHBs, new performance measures were introduced to increase efficiency. Important for the context of our study is the introduction of a patient transfer fee on July 1, 2003. In 2008, another round of reforms started with establishing a National Health Board within the Ministry of Health to streamline processes and accountability of DHBs. For our study, we therefore chose an event window between 2000 (when the DHBs were established) and 2008 (when another major reform was implemented), which means we cover 3 years before and 5 years after the transfer fee was introduced.

The New Zealand health care system is currently divided into 20 DHBs. These vary in size (populations between 30,000 and 500,000) and service capacity, with six DHBs having a high-level tertiary hospital. Health funding is provided mainly through general tax and is distributed by the Ministry of Health using a Population-Based Funding Formula. This is a form of prospective payment system that allocates funds to districts based on characteristics of their population (relative size, age, gender, ethnicity, and socioeconomic status). Adjustments are also made for overseas visitors, rural communities and those with a level of unmet needs.

The treatment of non-residents, referred to as inter-district flows, are not funded by the Ministry of Health but is reimbursed separately by the involved DHBs. Inter-district flows arise in two situations. The first is an *intentional* patient transfer based on the need for specialist or extensive treatment, of which a hospital is not capable. The second occurs when a patient has a medical emergency away from home and is treated in a hospital in a different district. Our study investigates incentives for unnecessary transfers, and thus we only analyze events where patients were intentionally transferred to another hospital.

The transfer fee is based on a list of national prices and the actual volume of the flows. The national prices are based on the average cost of treating the corresponding diagnosis across all DHBs. If, however, the receiving hospital is a tertiary hospital, then a more complex formula is used to provide additional compensation for the above-average costs associated with treating the more complex cases transferred to them. To determine the value of the transfer fee, the average cost by diagnosis-related group (DRG) across all tertiary services is calculated and then compared with the average cost across all secondary services. The DRG in tertiary services whose cost is not different from the average cost of the secondary services is discarded from the calculation. Finally, the fee is calculated as the difference between the average cost for a DRG in tertiary services and the average secondary cost, multiplied by the case-weighted volume of the DRG each tertiary provider treats.

Two things are worth noting. First, the sending hospital receives no compensation for transfers from the ministry and pays the fee out of its funding allocation. Funding is based on population size, so indirectly, treatment costs of a transferred patient are part of the base compensation. Second, the outlined fee adds a premium to a transfer and thus disincentivises hospitals from transferring patients for financial gains. We, therefore, expect a reduction in transfers of lower complexity cases that could be treated in-house. There is, however, the concern that a too high transfer fee might encourage a hospital to treat a patient that should be transferred to a more specialized facility. A reduction of transfers of more complex cases to tertiary hospitals or a worsening of health outcomes could be a sign of this.

4 | DATA, DESCRIPTIVE STATISTICS, AND METHODOLOGY

The data used for this analysis are from the Ministry of Health and managed by Statistics New Zealand in their Integrated Data Infrastructure. Subsets of two different datasets were used: Publicly Funded Hospital Discharges and Mortality Registrations. After removing outliers (patients under the age of 18 and patients with a length of stay of over 90 days), we have 4,020,796 observations for 1,472,026 publicly funded inpatients and 48 facilities between June 30, 2000 and July 1, 2008. There were 57,933 transfers (1.4% of the analyzed events) of which 30,704 (53%) were from tertiary to tertiary hospitals; 12,745 (22%) form non-tertiary to tertiary hospitals; 12,166 (21%) from non-tertiary to tertiary hospital and only 2318 (4%) from tertiary to non-tertiary hospitals. Twenty six lakhs ninety three thousand nine hundred and thirty three events (67%) happened after the transfer fee introduction. All data are de-identified and recoded using a unique identifier that matches across the datasets.

For each health event, we have information about the start and end date, diagnosis and severity, length of stay, admission and readmission details, hospital location (both domicile and service), transfer information, cost weight, death date if the patient died and basic patient demographic information. We created a categorical variable that indicates if the patient was not transferred, transferred to a tertiary hospital or transferred to a non-tertiary hospital, based on the location of the hospital of domicile and service. To separate the period before and after implementing a transfer fee, a post-event dummy variable is set to 1 if the event occurred after the policy change. Length of stay measures the length of the health event in days. *30-day mortality* is defined using the patient *death date* variable in the Mortality Register and the patient *event end date* in the

Publicly Funded Hospital Discharges data, subtracting one from the other and choosing only cases where the difference is less than 30 days. We use a similar process to define the *30-day readmission* variable. Here, we use event start date and event end date from the Publicly Funded Hospital Discharges data to define a dummy where any readmission greater than 0 and less than 30 equals 1 and otherwise 0. A readmission is related to the initial admission and not to an admission with a new diagnosis.

The severity of a diagnosis is measured by the Complication and Comorbidity Level (CCL). It is a single value that reflects the chance of other diagnoses held by the patient affecting the current diagnosis. This takes a value of 0 if there is no, 1 if there is minor, 2 moderate, 3 severe and 4 catastrophic evidence of a complication. When other diagnoses affect current treatment, this may complicate the treatment process or prohibit standard treatment procedures instead of requiring expertise or specialist resources. CCLs are unique to the diagnosis given; for example, a complication that may affect resource consumption for a heart attack may not complicate treatment for a broken arm.

Our demographic control variables are gender (male and female), age in years, and ethnicity (New Zealand European, Māori, Pacific, Asian, and others). A more detailed description of all variables is in Appendix A, while Table 1 provides the descriptive statistics of the variables used in the empirical analysis (see Appendix C for a breakdown into pre and post-policy change).

Looking at transfer frequencies, the percentage of transfers have decreased after the fee introduction. However, when analyzing only transfers, we see that the percentage of transfers to tertiary hospitals have increased while the percentage of transfers to non-tertiary hospitals have decreased (see Table 2).

The following table (Table 3) quantifies the transfer percentages by CCL for the pre and post fee subsamples. Most transfers to tertiary hospitals are of the highest complexity rating, which is to be expected. Most transfers to non-tertiary hospitals have the second-highest complexity rating as low complexity cases are treated in-house, while the most complex cases are transferred to tertiary hospitals. It is this category that provides the largest incentives for hospitals to transfer patients unnecessarily.

TABLE 1 Descriptive statistics of variables used in the empirical analysis

Variable name	Variable name in equations	Variable type/measurement	Mean	Std. Dev.
Dependent variables				
Transfer	Transfer	Binary, transfer = 1	0.014	0.118
Transfer		*Categorical variable*:		
	TR_NO	No transfer	0.986	0.118
	TR_T	Transfer to tertiary	0.130	0.113
	TR_NT	Transfer to non-tertiary	0.012	0.034
Length of stay	LOS	Days	4.140	7.060
30-day mortality	MORT	Dummy, 1 = yes	0.040	0.201
30-day readmission	READ	Dummy, 1 = yes	0.145	0.353
Complication and Comorbidity Level (CCL)	CCL	Categorical		
CCL 0 (no evidence)	CCL0	Dummy, 1 = yes	0.209	0.421
CCL 1 (minor evidence)	CCL1	Dummy, 1 = yes	0.496	0.512
CCL 2 (moderate)	CCL2	Dummy, 1 = yes	0.184	0.395
CCL 3 (severe)	CCL3	Dummy, 1 = yes	0.086	0.251
CCL 4 (catastrophic)	CCL4	Dummy, 1 = yes	0.016	0.126
Control variables				
Post transfer fee introduction	POST	Dummy, 1 = yes	0.670	0.469
Gender (female)	X	Dummy, 1 = female	0.595	0.491
New Zealand European	X	Dummy, 1 = yes	0.588	0.491
Māori	X	Dummy, 1 = yes	0.166	0.353
Pacific	X	Dummy, 1 = yes	0.063	0.251
Asian	X	Dummy, 1 = yes	0.049	0.212
Other	X	Dummy, 1 = yes	0.138	0.354
Age at discharge	X	Years	53.260	21.688

Note: $N = 4,020,796$.

TABLE 2 Descriptive statistics of transfer percentages

Year	Transfer/total events	Transfer tert/total transfers	Transfer non-tert/ total transfers
2000	1.5%	86.3%	13.7%
2001	1.5%	85.6%	14.4%
2002	1.7%	84.1%	15.9%
2003	1.4%	90.7%	9.3%
2004	1.3%	95.1%	4.9%
2005	1.3%	95.2%	4.8%
2006	1.3%	95.6%	4.4%
2007	1.3%	95.4%	4.6%

TABLE 3 Percentages of Complication and Comorbidity Level (CCL) transfers pre and post-transfer fee introduction

		No transfer		Transfer tertiary		Transfer non-tertiary	
		Pre	*Post*	*Pre*	*Post*	*Pre*	*Post*
CCL	**0**	98.8%	98.5%	1.1%	1.4%	0.1%	0.1%
	1	99.1%	98.9%	0.8%	1.1%	0.1%	0.0%
	2	98.7%	98.6%	1.0%	1.3%	0.3%	0.1%
	3	96.7%	97.2%	2.5%	2.5%	0.8%	0.3%
	4	94.4%	94.2%	5.5%	5.7%	0.1%	0.0%

Looking at the difference between pre and post fee percentages shows, it is also the category where the transfer fee had the most significant impact.

To more formally identify a potential change in transfer behavior after the introduction of the transfer fee, we use the following binary logistic model where transfer is either zero if a patient was not transferred and one if a patent was transferred, with zero being our base category and X a list of our demographic control variables:

$$\ln\left(\frac{transfer}{no\,transfer}\right) = \beta_0 + \beta_1 POST + \sum_{i=1}^{4} \beta_{i+1} CCL_i + \sum_{i=1}^{4} \beta_{i+5} CCL_i \times POST + \beta_{10} X_{it} + \varepsilon_{it} \quad (1)$$

To test if any change in transfer behavior is more prominent in transfers to tertiary or non-tertiary hospitals, we categorize our transfer variable into "no transfer" (TR_NO), "transfer to tertiary hospital" (TR_T) and "transfer to non-tertiary hospital" (TR_NT) with "no transfer" being the base category in our multinomial logistic regression:

$$\ln\left(TR\_T_{it}/TR\_NO_{it}\right) = \beta_{11} + \beta_{12} POST + \sum_{i=1}^{4} \beta_{i+12} CCL_i + \sum_{i=1}^{4} \beta_{i+16} CCL_i \times POST + \beta_{21} X_{it} + \varepsilon_{it} \quad (2)$$

$$\ln\left(TR\_NT_{it}/TR\_NO_{it}\right) = \beta_{22} + \beta_{23} POST + \sum_{i=1}^{4} \beta_{i+23} CCL_i + \sum_{i=1}^{4} \beta_{i+27} CCL_i \times POST + \beta_{32} X_{it} + \varepsilon_{it} \quad (3)$$

The lowest complexity category is the base group of the CCL variable (CCL 0) and the $CCL_{ij} \times POST_t$ interaction terms allow us to differentiate the effect of transfer by the level of medical difficulty before and after the policy change. Relative to the most straightforward cases, more complex cases should increase the likelihood of transfer.

Next, we analyze the impact on the three health outcome measures 30-day Mortality ($MORT_{it}$), 30-day Readmission ($READ_{it}$) and Length of Stay (LOS_{it}) where $OUTCOME_{it}$ is the placeholder for the three outcome measures.

$$OUTCOME_{it} = \beta_0 + \beta_1 YEAR_t + \sum_{i=1}^{7} \beta_{i+1} TRANSFER_i \times YEAR_t + \beta_9 TRANSFER_i \times 2000 + \beta_{10} CCL + \beta_{11} X_{it} + \varepsilon_{it} \quad (4)$$

We use a logit model for mortality and readmission and OLS for length of stay.

5 | FINDINGS

5.1 | Analysis results

Table 4 outlines our main findings. Column (1) shows a negative POST coefficient with an odds ratio smaller than one, suggesting a decrease in transfers after the policy change. The hypothesized relationship between high complexity cases and transfer is confirmed. While the most likely outcome for any CCL category is not to be transferred, the odds ratios are increasing in the level of complexity. Only the CCL2 and 3 interaction terms are significant and both have positive coefficients suggesting that after the fee introduction, medium complexity cases are more likely to be transferred than cases with no complications. The CCL4 interaction term is insignificant.

Columns (2) and (3) in Table 4 show changes in transfers to tertiary and non-tertiary hospitals in relation to our "no transfer" base category, respectively. The key finding is that, although overall transfers have decreased, we see a relative increase in transfers to tertiary hospitals (significantly positive POST coefficient) and a decrease in transfers to non-tertiary hospitals (significantly negative POST coefficient). Our interaction term shows an increase in the likelihood of transfers to tertiary hospitals for CCL3 and 4, while the same can be said for CCL2 and 3 for transfers to non-tertiary hospitals. The suggestion that the transfer fee might discourage CCL3 transfers to a non-tertiary hospital is not supported by our data.

Overall, the results confirm a suspected focusing effect: after introducing the transfer fee, transfers to tertiary hospitals, which treat more complex cases, have increased while transfers to non-tertiary hospitals have decreased.

Looking at health outcomes (Table 5), we see an increase in mortality over the years which is not surprising given the steady increase of health events over the sample period. Readmissions are constant while patients spend less time in the hospital. As expected, there is a positive link between increasing complexity levels and our health outcomes; patients with more complications stay longer in the hospital and are more likely to be readmitted or pass away.

Almost all the mortality and readmission transfer interaction terms are significant and negative, suggesting that the introduction of the transfer fee did not result in more readmissions or death. All length of stay transfer interaction terms are positive and significant but decrease over time. Again, there is no evidence that the policy change had a negative impact.

Overall, our investigation into health outcomes does not support potential concerns that, as a result of the transfer fee, patient wellbeing suffered. Table 5 provides all coefficients, odds ratios and significance values.

5.2 | Robustness checks

To confirm our findings, we conduct several subsample tests. First, we split the data into pre and post-event but could not find any significant differences in means of our independent variables that could have driven our results (see Appendix B). Next, we excluded one by one the three most common illnesses related to transfers from our dataset to check if specific diagnoses

TABLE 4 Effects of a policy change in transfer funding

	(1) Transfer binomial		(2) Transfer tertiary multinomial		(3) Transfer non tertiary multinomial	
Variable	***B***	**Exp(*B*)**	***B***	**Exp(*B*)**	***B***	**Exp(*B*)**
POST	−0.219***	0.803	0.267***	0.991	−0.452***	0.636
CCL						
CCL1	−1.708***	0.181	−0.232***	0.793	−0.488***	0.614
CCL2	−1.896***	0.150	0.080***	1.083	0.163*	1.177
CCL3	−1.533***	0.216	0.777***	2.176	1.034***	2.811
CCL4	−0.530***	0.589	1.596***	4.933	−0.784***	0.457
CCL × POST						
CCL1 × POST	0.192	1.211	0.037	1.038	0.362	1.437
CCL2 × POST	0.132*	1.141	−0.005	0.995	0.399***	1.491
CCL3 × POST	0.092***	1.096	0.256***	1.292	0.615***	1.849
CCL4 × POST	−0.197	0.821	0.230***	1.259	0.432	1.541

*Significant at the 10-percent level. **Significant at the 5-percent level.***Significant at the 1-percent level.

TABLE 5 Effects of a policy change on health outcomes

	(1) Mortality binomial		(2) Readmission binomial		(3) Length of stay linear	
Variable	***B***	**Exp(*B*)**	***B***	**Exp(*B*)**	***B***	***t***
2001	−0.038***	0.963	0.628***	1.875	−0.0002***	−2.579
2002	0.013	1.013	0.567***	1.763	−0.002***	−4.082
2003	0.042***	1.043	0.511***	1.668	−0.009***	−13.702
2004	0.058***	1.060	0.528***	1.696	−0.013***	−20.557
2005	0.118***	1.125	0.517***	1.676	−0.019***	−29.164
2006	0.129***	1.138	0.523***	1.686	−0.023***	−36.067
2007	0.128***	1.136	0.515***	1.674	−0.022***	−34.568
CCL	0.554***	1.740	0.137***	1.146	2.349***	636.903
2000 × Transfer	−0.126**	0.882	−2.332***	0.097	0.020***	44.000
2001 × Transfer	0.015	1.016	−2.212***	0.109	0.022***	47.511
2002 × Transfer	−0.181***	0.834	−2.111***	0.121	0.023***	51.392
2003 × Transfer	−0.228***	0.796	−2.549***	0.078	0.023***	49.950
2004 × Transfer	−0.353***	0.702	−2.708***	0.067	0.019***	42.248
2005 × Transfer	−0.253***	0.777	−2.678***	0.069	0.014***	30.804
2006 × Transfer	−0.213***	0.808	−2.707***	0.067	0.016***	36.134
2007 × Transfer	−0.301***	0.740	−2.764***	0.063	0.019***	41.042

*Significant at the 10-percent level. **Significant at the 5-percent level. ***Significant at the 1-percent level.

influenced our results (DRG 297, 13.25% of transfers; DRG 246, 6.12% of transfers and DRG 274, 4.62% of transfers). All findings remain the same.

Finally, we split our data into patients who live in a district with a tertiary hospital and those who do not and re-run our binomial and multinomial logistic regressions (Equations 1–3) to see if the area of domicile has an impact on transfer behavior. Patients in the non-tertiary subsample (1,815,763 events) and tertiary subsample (2,238,241 events) have very similar demographic characteristics to the full sample with very similar percentages of pre and post fee events (67% of post events in the non-tertiary subsample, 68% in the tertiary sample and 67% in the full sample). As in the full sample, we find a significant reduction in transfers after the policy change in both subsamples. Surprisingly, however, there is a more significant reduction in the tertiary subsample, suggesting that the policy change has had a more significant impact on the transfer behavior of tertiary hospitals. Fifty-seven percentage of all transfers originate in a tertiary hospital which could explain the more significant impact. Also, in both subsamples, we find the same focusing effect as in the full sample with a reduction of transfers to non-tertiary hospitals and an increase to tertiary hospitals. Again, the effect is more pronounced in the tertiary subsample. The results of the regressions are in Appendix C.

6 | CONCLUSION AND POLICY IMPLICATIONS

In many countries, prospective payment systems have replaced fee-for-service systems to encourage cost-consciousness of hospitals. However, one undesirable side-effect is that a system that compensates hospitals on average costs provides incentives to transfer patients that have expected above-average treatment costs. This study concludes that an appropriate transfer fee reduces such an incentive and encourages hospitals to only transfer patients that need specialist care.

Two important (and related) issues in the context of transfer fees are potential negative side-effects on health outcomes and efficiency improvements. If the fee is too high, hospitals might feel encouraged to treat patients that should be transferred to a specialist, leading to sub-optimal treatment. Although our study finds no evidence of this, we cannot exclude that a transfer fee negatively impacts patient wellbeing. Health outcomes might have improved over the analysis period due to better treatment procedures covering any negative impact.

The question of efficiency gains is equally difficult to answer. The focusing effect of the fee redistributes funds from non-specialist facilities favored by a prospective payment system to specialists that treat more above-average cost cases. The fee also reduces the overall costs within the healthcare system as unnecessary transfers are retained at the non-specialist facility and do not receive arguably more expensive specialist services. This suggests that the fee is efficiency-enhancing from a funding system perspective. However, to identify the overall welfare contribution of the transfer fee, a more comprehensive analysis is required taking patient wellbeing and the cost and benefits of both sending and receiving hospitals into account.

The effectiveness of the analyzed transfer fee is encouraging as it highlights that efficiency gains can be achieved with a specific policy change. We encourage all public health care funders to consider introducing such a fee or re-evaluating their existing transfer payments.

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CONFLICT OF INTEREST

No.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the New Zealand Ministry of Health.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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