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Comparative effectiveness research in practice: the Drug Effectiveness Review Project experience

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Aim: Assess the effect of the Drug Effectiveness Review Project's comparative effectiveness research findings on prescribing behavior independently and in conjunction with a Medicaid preferred drug list. **Method:** We queried prescription drug claims and enrollment information from the 2001–2008 Medicaid Analytic eXtract and Medicaid Statistical Information System for 17 states using a Wilcoxon signed rank test design to evaluate the effects of the Drug Effectiveness Review Project's report release and preferred drug list implementation on ACE inhibitor prescribing behavior at a state level. The primary outcome of interest was the percentage of ACE inhibitor prescriptions that are defined as 'differentiated' based on the content of the Drug Effectiveness Research Program report. **Results:** The use of differentiated ACE inhibitors increased significantly in states that participated in the Drug Effectiveness Research Program and subsequently implemented a preferred drug list ($p < 0.05$, one-tailed). However, there was no significant change in utilization in nonparticipating states or in states that participated but did not subsequently implement a preferred drug list. **Conclusion:** Although the publication of comparative effectiveness research findings may not directly influence practice, a preferred drug list can align utilization with clinical evidence. The states that participate in the Drug Effectiveness Review Project and use preferred drug lists have greater utilization of higher quality drugs, making the combination an effective strategy to translate comparative effectiveness research into practice.

KEYWORDS: comparative effectiveness research ▪ evidence-based medicine ▪ implementation research ▪ Medicaid

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Comparative effectiveness research (CER) has significant potential to improve healthcare quality and provide practical guidance to patients and physicians making healthcare decisions [1]. The Recovery Act invested US$1.1 billion in CER, and the Affordable Care Act established a public–private institute for patient-centered outcomes research with funding that could exceed US$500 million/year [101]. In order to improve the quality of patient care and affect health costs, findings from the research supported by these investments must be incorporated into clinical practice [2]. Translation of clinical evidence into practice, however, is often slow [3].

The Drug Effectiveness Review Project (DERP) is a program that has been conducting secondary CER since its inception in 2002. Currently, nine states participate in DERP. Partners propose drug classes for review and pose the evidence questions that the review should address. DERP then performs systematic literature reviews on the comparative safety and efficacy of drugs within a single pharmacological or therapeutic class. DERP reports provide a synthesis of clinical evidence regarding the comparative safety and efficacy of drugs. Completed reviews are posted

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on the DERP website for public access after a public comment period. The methodology that DERP employs in its reviews has been discussed elsewhere [4,102].

The impact of a DERP report's release and a state's participation in DERP on physician prescribing behavior has not been studied quantitatively. Some have asserted that using DERP findings to influence public policy would serve to accomplish what a generation of medical education would take [4,5]. To the best of our knowledge, this is the first quantitative investigation into the effects of DERP findings on clinical practice.

The methodology used by states to implement DERP findings varies and includes both reimbursement and physician education strategies. A strategy centered on reimbursement, the preferred drug list (PDL) is the most common public policy vehicle for implementing the DERP findings. A PDL controls Medicaid fee-for-service (FFS) drug reimbursement [103]. While there is diversity in each state's approach to developing a PDL and variety in the drugs

Table 1. State Medicaid program characteristics (data as of June 2008).

	Medicaid beneficiaries					
US state	***Total number of beneficiaries***	***Beneficiaries >18 years old (nondisabled)***	***FFS beneficiaries***	***Average annual per capita spending (US$)***	***Beneficiaries using ACE inhibitors†***	***Study-eligible beneficiaries using ACE inhibitors‡***
DERP participants with PDLs						
AR	635,065	184,537	107,834	3676	3702	177
ID	171,795	39,019	31,920	4799	1458	105
KS	283,383	74,073	121,770	5578	3250	727
MI	1,523,390	416,364	230,794	4199	4052	2378
MN	583,564	202,159	212,126	7129	14,037	3342
MS	830,262	247,302	3902	4387	13,654	10,383
MT	82,832	23,417	27,451	5617	857	148
NY	4,208,629	1,985,215	1,636,315	7927	79,559	22,061
OR	408,932	134,690	39,503	4272	1864	1312
WA	990,321	316,939	132,307	4388	27,117	2288
WI	863,145	372,466	459,797	4440	20,105	3247
WY	62,660	13,976	62,660	5056	422	364
Nonparticipants with PDLs						
IN	839,101	300,813	234,193	4907	8898	1406
OH	1,749,120	563,568	1,051,046	5768	16,403	11,226
SC	690,391	257,316	551,001	4165	5517	2434
VT	133,466	59,755	47,113	5096	4837	64
VA	704,739	195,225	259,203	4840	7562	1047
WV	296,831	73,565	159,369	5682	7048	5624
DERP participants without PDLs						
NC	1,299,624	390,925	456,168	4943	14,604	2673
Nonparticipants without PDLs						
NE	210,235	56,712	40,260	5915	1777	737

†The monthly average of beneficiaries with a claim for ACE inhibitors in the 12 months of fiscal year 2007.
‡The monthly average of study-eligible beneficiaries with a claim in the 12 months of fiscal year 2007. A beneficiary is 'study eligible' if he/she has 6 months of continuous FFS enrollment.
DERP: Drug Effectiveness Review Project; FFS: Fee-for-service; PDL: Preferred drug list.

Table 2. ACE inhibitor-preferred drug list characteristics.

US state	Date of relevant PDL implementation†‡	Inclusion of DERP-differentiated ACE inhibitors on PDL†			
		Number of preferred ACE inhibitors	*Ramipril*	*Captopril*	*Enalapril*
DERP participants					
AK	November 2005	3	Yes	Yes	Yes
ID	May 2005	4	Yes	Yes	Yes
MI	June 2005	4	No	Yes	Yes
MN	October 2005	8	Yes	Yes	Yes
MT	July 2005	4	No	Yes	Yes
NY	June 2006	7	Yes	Yes	Yes
OR	January 2006	5	No	Yes	Yes
WI	September 2005	6	No	Yes	Yes
WY	December 2005	3	No	Yes	Yes
Non-DERP participants					
IN	September 2002	6	No	Yes	Yes
OH	October 2004	4	No	Yes	Yes
SC	May 2004	4	No	Yes	Yes
VT	November 2006	6	No	Yes	Yes
VA	January 2004	3	No	Yes	Yes
WV	November 2004	8	Yes	Yes	Yes

†Refers to the first list following DERP report publication (or if no changes were made following the publication, the list in place at time of publication).
‡Effective date of a change in a PDL.
DERP: Drug Effectiveness Review Project; PDL: Preferred drug list.

included in each state's list, states generally consider cost, safety and efficacy when formulating their PDLs [6,103]. Most PDLs, however, share a common principle: 'preferred' drugs within a drug class on the PDL are more favorably or more easily reimbursed than other drugs in the same class, thereby encouraging the use of preferred drugs.

Medicaid PDLs have previously been shown to influence physician prescribing behavior both for Medicaid and non-Medicaid patients [7]. Given the broad potential impact of PDLs on physician prescribing, it is critical that they are aligned with best medical evidence. Research indicates, however, that this is not necessarily the case [8].

Most states that participate in DERP use the DERP reports to inform their Medicaid PDL drug coverage [6,104]. Arkansas, for example, has a statutory requirement to make its PDL evidence based, and thus consults DERP reports prior to PDL development. North Carolina, on the other hand, forewent PDLs entirely in favor of using the DERP reports for provider education [9]. Prior analysis from North Carolina found education programs to be effective in reducing costs by shifting from branded to generic medications, but no prior analysis has explored the effects of switches from one drug within a class to another [105]. Idaho combines approaches, employing DERP reports to inform its PDL as well as its materials for academic detailing efforts to primary care providers [106]. No previous analysis has characterized the effect of the DERP reports, or the DERP reports used in combination with PDLs, on prescribing behavior.

Here we investigate the impact of DERP report release and of a state's participation in DERP on physician prescribing behavior. Specifically, we seek to answer two questions: first, does the publication of CER (in this case, a DERP report) alone increase the utilization of differentiated therapies in DERP-participating states? Second, does the combination of CER together with a policy vehicle (in this case, a

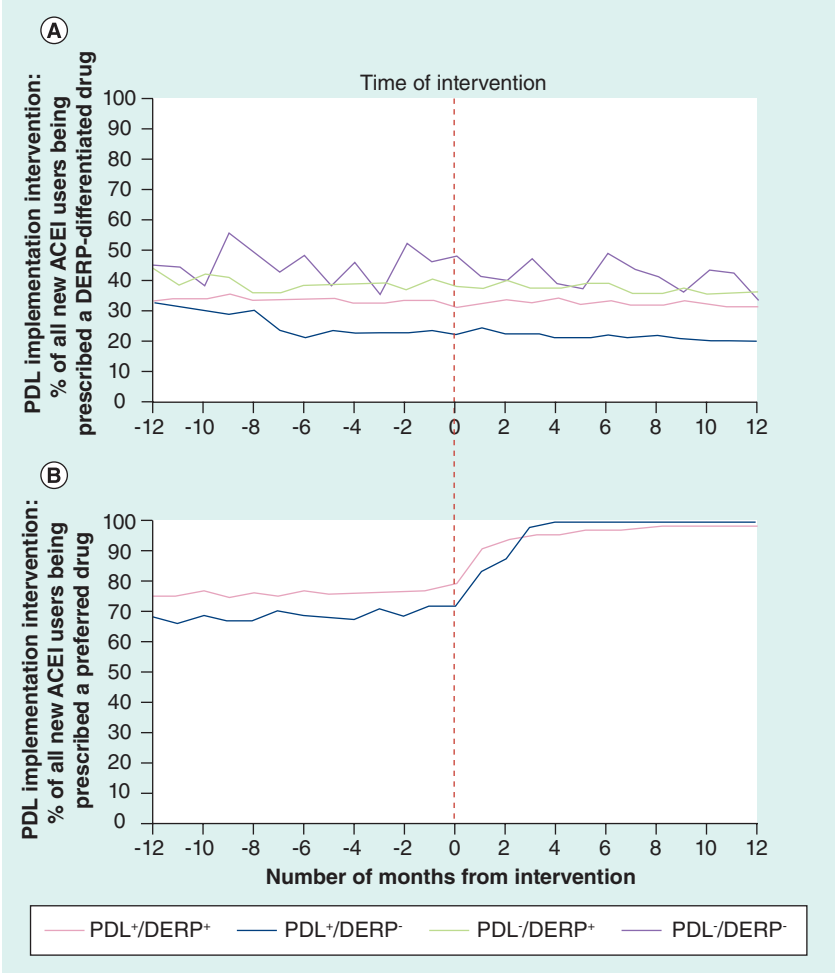

Figure 1. Effect of Drug Effectiveness Review Project release and preferred drug list implementation on new ACE inhibitor prescriptions. DERP report release **(A)** is not associated with any significant effect on the share of new prescriptions written for DERP-differentiated ACEIs in any cohort. PDLs implementation **(B)** is associated with a dramatic increase in the share of new ACE inhibitor prescriptions that are 'preferred' based on that state's PDL.
ACEI: ACE inhibitor; DERP: Drug Effectiveness Review Project; PDL: Preferred drug list.

PDL) increase the utilization of differentiated therapies?

Methods

Data sources

We examined Medicaid administrative claims data from 2001 to 2008 through the Center for Medicare and Medicaid Services' (CMS's) Medicaid Analytic eXtract and the Medicaid Statistical Information System. The prescription drug claims downloaded from CMS repositories were processed in September 2009. Together, these sources contain data on all adjudicated claims for medical services for enrolled Medicaid beneficiaries.

Drug class selection & cohort definition

At the time of analysis, DERP had reviewed 27 unique drug classes. We required that the DERP report was published on or before 1 January 2006 so that we could measure a response within our data set. We sought a drug class that had a relatively well-established evidence base and no new entrants. In addition, we required that the DERP reports contain at least one finding of superiority of one therapeutic over another and that the drug class have sufficient utilization in the Medicaid population. Based on these criteria, we selected ACE inhibitors as the drug class to investigate.

The study period was from 1 June 2001 to 1 June 2008. We defined four cohorts based on two state-level characteristics: participation in DERP and use of an ACE inhibitor-relevant PDL during the study period. The four resulting cohorts were:

- DERP participants with a PDL
- DERP participants without a PDL
- Non-DERP participants with a PDL
- Non-DERP participants without a PDL

The first cohort included all states participating in DERP with an ACE inhibitor PDL during the study period. The second cohort included DERP participants that did not have an ACE inhibitor PDL implemented during the study period. The third cohort included non-DERP participants that implemented ACE inhibitor PDLs; these states were matched with the first cohort based on Medicaid FFS enrollment, average Medicaid expense per beneficiary and Medicaid beneficiary age. The fourth cohort included the only non-DERP state that we confirmed did not have an active PDL during the study period. For analyses involving PDL implementation dates, we excluded states for which we were unable to obtain historic PDLs.

Beneficiary inclusion & exclusion criteria

The population is all Medicaid beneficiaries continuously enrolled in FFS Medicaid for at least 6 months prior to the month of analysis. The sample includes all beneficiaries who made a claim for an ACE inhibitor during the month of analysis, but excludes all beneficiaries eligible for both Medicare and Medicaid and all those aged 65 years or older.

To constitute as a qualifying prescription for the month of analysis, a claim must have at least

a 2-week supply and a utilization period that overlaps with at least 7 days in a given month. Additionally, if a beneficiary has more than one qualifying prescription for the same drug in a month, only the first claim is considered in the analysis.

Statistical analysis

We evaluated the effects of DERP report release and PDL implementation on ACE inhibitor scripts as well as on beneficiaries utilizing ACE inhibitors using the Wilcoxon signed rank test with the null hypothesis that there are no significant differences between the pre- and post-treatment observations. The nonparametric Wilcoxon signed rank test was chosen over the parametric t-test for paired samples as it does not require a normality assumption.

Our response variable for analyses addressing the effect of DERP report release on ACE inhibitor prescribing and utilization was the share of ACE inhibitor users that were using 'DERP-differentiated' ACE inhibitors. The DERP report on ACE inhibitors did not recommend a specific subset of ACE inhibitors, as is often the case for DERP reports. It did, however, indicate in its summary that "across indications, the evidence for mortality reductions is strongest for captopril, enalapril and ramipril" [107]. We defined this subset of ACE inhibitors as DERP differentiated and all others as 'nondifferentiated'. Similarly, for analyses measuring the effect of PDLs, the response variable was the share of ACE inhibitor scripts in each state that were on the PDL in that state. Such ACE inhibitors were considered 'preferred' and all others were considered 'nonpreferred'. The state was the unit of analysis.

We defined June 2005 as the event month for DERP report release, as it was the publication date of the final DERP report on ACE inhibitors. Each state in the PDL group implemented its ACE inhibitor PDL at a different time. Thus, we defined the month when each state implemented its PDL as time zero for the purposes of the PDL analysis.

We analyzed new ACE inhibitor prescriptions and utilization among beneficiaries already taking ACE inhibitors at the time of intervention (DERP report release and PDL implementation). We defined new users as those beneficiaries who had not used an ACE inhibitor in the prior month. In assessing changes in utilization among beneficiaries already taking ACE inhibitors, we computed the number of beneficiaries changing from one ACE inhibitor to another and the number of beneficiaries dropping ACE inhibitors. We then aggregated the number of changes for the 3 months prior to and following both DERP report release and PDL implementation.

Table 3. Shifts in ACE inhibitor-using beneficiaries using a Drug Effectiveness Review Project-differentiated agent.

Cohort	3 months prior to DERP report release		3 months following DERP report release		Difference	
	n	%	*n*	%	*n*	%
$DERP^+/PDL^+$	19,604	31.4	18,242	30.5	-1362	-0.9
$DERP^-/PDL^+$	7576	23.3	7425	22.7	-151	-0.6
$DERP^+/PDL^-$	909	38.5	897	37.6	-12	-0.8
$DERP^-/PDL^-$	291	45.4	300	45.9	9	0.5

DERP report release was not associated with significant changes in any cohort in use of DERP-differentiated agents among patients already taking ACE inhibitors.
DERP: Drug Effectiveness Review Project; PDL: Preferred drug list.

Results

State, DERP report & PDL characteristics

A total of 14 states participated in DERP at some point during our study period, and ten met the criteria for inclusion in our analysis. Of these, only North Carolina did not have a PDL

Table 4. Shifts in ACE inhibitor utilization following preferred drug list implementation.

Cohort	Number of ACE inhibitor-using beneficiaries using a DERP-differentiated agent (%)		
	3 months prior to PDL implementation†	*3 months following PDL implementation*	*Difference*
$DERP^+/PDL^+$	29,934 (76.1)	30,435 (88.5)	501 (12.3)
$DERP^-/PDL^+$	24,282 (70.9)	30,626 (93.2)	6344 (22.3)

PDL implementation was associated with a change from nonpreferred to preferred agents in both cohorts with PDLs. Moreover, it was associated with an increase in use of DERP-differentiated agents on $DERP^+/PDL^+$ states, but not $DERP^-/PDL^+$ states.
†Considers version of the PDL following DERP report release.
DERP: Drug Effectiveness Review Project; PDL: Preferred drug list.

Table 5. Shifts in ACE inhibitor utilization following preferred drug list implementation.

Type of switch	Number of beneficiaries switching (%)			
	3 months prior to PDL implementation†		*3 months following PDL implementation*	
	DERP⁺/PDL⁺	***DERP⁻/PDL⁺***	***DERP⁺/PDL⁺***	***DERP⁻/PDL⁺***
Total switches	15,202	13,772	16,612	18,956
Nondifferentiated to differentiated	108 (0.7)	52 (0.4)	2023 (12.2)	4462 (23.5)
Differentiated to nondifferentiated	88 (0.6)	41 (0.3)	9 (0.1%)	8 (0.0)
New differentiated	6908 (45.4)	6119 (44.4)	7088 (42.7)	6229 (35.5)
New nondifferentiated	1937 (12.7)	2407 (17.5)	336 (2.0)	6724 (1.5)
Dropping class	5695 (37.5)	4695 (34.1)	6448 (38.8)	278 (32.9)
Other‡	466 (3.1)	458 (3.3)	708 (4.3)	1255 (6.6)

PDL implementation was associated with a change from nonpreferred to preferred agents in both cohorts with PDLs. Moreover, it was associated with an increase in the use of DERP-differentiated agents on DERP⁺/PDL⁺ states, but not DERP⁻/PDL⁺ states.

†Considers version of the PDL following DERP report release.

‡Includes patients taking multiple drugs in class, preferred to preferred and nonpreferred to nonpreferred.

DERP: Drug Effectiveness Review Project; PDL: Preferred drug list.

implemented. We matched characteristics of the Medicaid programs in non-DERP states with PDLs to those of the DERP states with PDLs. We were only able to identify one non-DERP state – Nebraska – without a PDL during our study period (Table 1).

Four of the nine (44%) DERP states included all three of the 'DERP-differentiated' drugs in their PDLs versus only one of the six (16.7%) remaining PDL states that did not participate in DERP (Table 2). Generics of captopril and enalapril were available for the duration of the study period, but ramipril did not become generic until 10 June 2008 [108].

■ Effect of DERP report release on ACE inhibitor utilization

The release of the DERP report did not appear to change the number of new prescriptions for differentiated ACE inhibitors (Figure 1). The Wilcoxon signed rank test also failed to show that DERP report release had a significant effect on new users ($p < 0.1897$). Furthermore, we did not observe an increase in the share of DERP-differentiated ACE inhibitors among patients already taking an ACE inhibitor following the release of the DERP report (Tables 3–5). The Wilcoxon signed rank test failed to show that the release of the DERP report is associated with an increase in the share of DERP-differentiated ACE inhibitor users.

■ Effect of PDL implementation on ACE inhibitor utilization

In contrast to the response seen following the publication of the DERP report, PDL implementation produced almost immediate shifts in new prescription patterns in the short term, with near total adherence to PDLs in the longer term. PDL implementation is associated with an immediate increase in the use of preferred drugs for new ACE inhibitor users (Figure 1). The Wilcoxon signed rank test confirmed that this effect was significant ($p < 0.01$). PDLs also induced significant shifts in the share of ACE inhibitor users on preferred drugs based on the Wilcoxon signed rank test ($p < 0.001$; Tables 3–5).

We also noted a small increase in beneficiaries who stopped taking ACE inhibitors entirely in the 3 months following PDL implementation in half of the states with PDLs. We did not, however, observe a significant concomitant increase in utilization of any other antihypertensive agents among such beneficiaries (data not shown).

Despite the changes in prescribing behavior produced by PDLs, we still observed that 10% of ACE inhibitor utilization was for nonpreferred drugs across all PDL states 3 months following PDL implementation and 2% of ACE inhibitor utilization 12 months following PDL implementation.

Changes in use of DERP-differentiated ACE inhibitors in DERP states using PDLs

In states with all three DERP-differentiated drugs on their PDLs, new users filling prescriptions for preferred ACE inhibitors jumped from 75% of total new users during the 3 months before PDL implementation to 95% of total new users during the 3 months following PDL implementation. This shift was particularly prominent in Arkansas, where new users filling prescriptions for DERP-differentiated ACE inhibitors was 38% before and 97% after PDL implementation (Figure 2). In the DERP$^+$/PDL$^+$ cohort, we found that implementation of an ACE inhibitor PDL within 1 year of DERP report release is associated with an increase in beneficiaries using DERP-differentiated drugs ($p < 0.05$, one-tailed). This effect was not observed in the DERP$^-$/PDL$^+$ cohort.

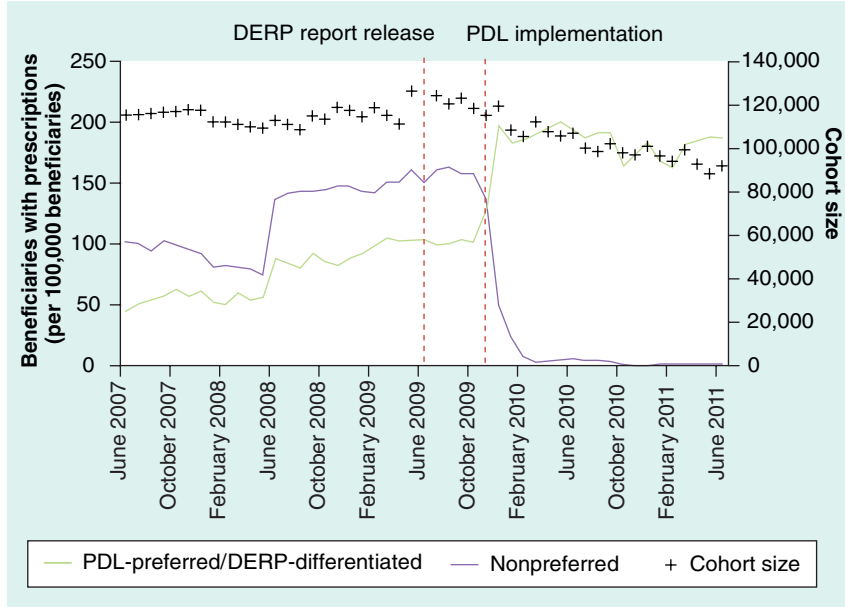

Figure 2. Arkansas case example. In Arkansas (USA), where the PDL during the study period included only the three DERP-differentiated ACE inhibitors, response in DERP-differentiated prescribing associated with PDL implementation was dramatic, whereas no change in prescribing was observed around the time of DERP report release.

DERP: Drug Effectiveness Review Project; PDL: Preferred drug list.

Discussion

DERP reports alone do not increase utilization of differentiated ACE inhibitors

We did not find any evidence that DERP reports alone affect utilization in participating states without PDLs or in any nonparticipating states, despite the public availability of the reports. In contrast to the DERP participating states with PDLs, our analysis revealed no significant changes in ACE inhibitor utilization in North Carolina, which relied exclusively on provider education tools to implement DERP findings. While such tools are credited for physicians switching from branded to generic versions of the same drug, our analyses suggest that they are not associated with shifts in prescribing one ACE inhibitor to prescribing another. The North Carolina legislature has since approved the creation of a PDL for its Medicaid program [109].

Utilization of DERP reports in conjunction with a PDL increased use of differentiated ACE inhibitors

We have demonstrated that a state's participation in DERP together with the use of a PDL is associated with an increase in utilization of drugs with best-in-class efficacy profiles in state Medicaid programs. The three DERP-differentiated drugs appeared on the PDLs of all three DERP states – Arkansas, Idaho and New York – that developed their ACE inhibitor PDLs after the release of the DERP report. The drugs included both branded (ramipril) and generic (captopril and enalapril) ACE inhibitors. Across those three states, the average absolute increase in utilization of the DERP-differentiated drugs was 25% between the 3 months prior to and following PDL implementation.

The DERP report did not have a significant effect on ACE inhibitor utilization in states that did not participate in the program, regardless of the presence of a PDL. Whereas the DERP participants consistently included drugs recommended by DERP among the preferred ACE inhibitors, the preferred drugs in nonparticipating states varied widely (only one out of six included all three differentiated drugs). Despite critiques, many believe the DERP reports represent one of the most comprehensive evidence reviews of a given drug class [5,10,11,102]. Therefore, it is surprising that the publicly released DERP report did not appear to influence utilization or PDL development in nonparticipating states.

While our analyses were limited to the Medicaid population, it has been suggested that PDLs may affect physicians' prescribing habits for all patients, suggesting that increased utilization of differentiated drugs in DERP$^+$/PDL$^+$ states may be state wide [7]. Furthermore, while the DERP is a North American program, the concept of linking CER to formulary or other policy mechanisms to facilitate implementation is applicable to health systems internationally.

PDLs did not limit access

A common criticism of CER is that negative results could inappropriately restrict access to certain therapies. Our results show that states' use of PDLs in conjunction with DERP reports improves access to differentiated therapies without precluding access to other therapies for those who require them. Across all PDL states, use of non-PDL ACE inhibitors represented 10% of utilization 3 months following PDL implementation and 2% of utilization 12 months following PDL implementation. We did note a small increase in patients dropping their ACE inhibitor following PDL implementation without a commensurate increase in utilization of substitute therapeutics. This effect could be due in part to patients refusing to pay for a relatively higher priced, non-PDL drug at the pharmacy, despite continued prescriptions from their physicians [12].

Limitations

This study has several limitations. First, as a natural experiment, it is imperfectly controlled and is not risk adjusted. Confounders of ACE inhibitor prescribing, such as physician education and reimbursement changes, may have affected results. The Wilcoxon signed rank test suggests that the increase in differentiated drug use was due to the PDL, but cannot rule out other factors, such as physician education. North Carolina, as a DERP participant that employed physician education but no PDL, however, did not show significant shifts in prescribing. Second, we have only focused on a single drug class. Preliminary analysis shows similar effects on utilization of both calcium channel blockers and inhaled corticosteroids, but detailed study is needed. Third, the current analysis does not assess potential effects of DERP and PDLs on health outcomes. This relationship warrants further investigation. Finally, we have categorically applied the label DERP-differentiated to the three ACE inhibitors with the best evidence of overall mortality reduction. The DERP report, however, does not make categorical claims as to which agents are superior, but rather highlights how specific drugs are differentiated from others in the same class.

Implications

Concerns persist that the existing tools for CER implementation may not influence clinical practice as hoped [13,14]. The DERP experience suggests that existing policy tools can promote adoption of CER by aligning economic incentives and evidence. Although slow adoption of evidence may be beneficial in certain situations, there is a strong case for accelerated adoption in situations similar to those of ACE inhibitors in which a comparative review is conducted on a well-established drug class. PDLs offer a policy mechanism to alter the 'perceived benefit' of prescribing differentiated drugs, improving the speed and breadth of their adoption [15]. Most states already use PDLs as a mechanism to control Medicaid drug costs. The incorporation of CER findings, such as those in DERP reviews, into pharmacy and therapeutics committee deliberations could result in utilization patterns that more quickly reflect best evidence.

The Federal Government's investments in CER are intended to generate a sufficient body of comparative evidence in response to specific questions to inform policy and shift practice [16]. Federal legislation prevents CMS's use of CER as sole factor in coverage or reimbursement decisions at the Federal level [101]. States and private payers, however, remain free to use CER to shape reimbursement.

Incorporating comparative effectiveness evidence into practice remains a challenge. Further efforts need to show how policy and payment systems can facilitate the successful adoption of CER and, subsequently, improvement in patient outcomes.

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Executive summary

Validated strategies for translating comparative effectiveness research into practice are lacking

- Significant investment has been made in comparative effectiveness research, but translation of results into practice is slow.
- The individual and combined effects of public release of comparative research and preferred drug lists in Medicaid programs are not well quantified.
- An analysis of prescribing patterns of ACE inhibitors using Medicaid claims can quantify provider response to a comparative effectiveness report from the Drug Effectiveness Review Project (DERP) and preferred drug lists (PDLs).

DERP reports alone do not increase utilization of differentiated ACE inhibitors

- The prescribing patterns of ACE inhibitors did not change in the 12 months following public release of a report on ACE inhibitors.
- Utilization of DERP reports in conjunction with a PDL increase use of differentiated ACE inhibitors.
- PDL have an immediate effect on prescriber behavior, shifting utilization from nonpreferred to preferred agents.
- When DERP reports are used to inform PDL development, differentiated drugs are more likely to appear on the PDL.
- Furthermore, prescribing of differentiated drugs is greater in states where DERP reports are used to inform PDL development.
- PDLs appear to be an effective strategy for rapid translation of well-established comparative effectiveness research into practice.

PDLs did not limit access

- Although PDLs dramatically shifted utilization from nonpreferred to preferred agents, a modest baseline of nonpreferred agents was still maintained among Medicaid beneficiaries.
- Implementation of comparative research with a PDL did not appear to prevent access to nonpreferred agents.

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