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TECHNICAL
R E P O R T

The Costs and Benefits
of Moving to the ICD-10
Code Sets

MARTIN LIBICKI,
IRENE BRAHMAKULAM

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1700 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138
1200 South Hayes Street, Arlington, VA 22202-5050
201 North Craig Street, Suite 202, Pittsburgh, PA 15213-1516
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Executive Summary

ICD-9 is the ninth revision of the International Classification of Diseases, a set of codes for recording the causes of mortality and morbidity. In the late 1970s, the United States developed a clinical modification of this code set (ICD-9-CM) and recently mandated its use for all diagnoses (Volumes 1 and 2 of ICD-9-CM). A third volume of ICD-9-CM was developed for procedures.

In 1993, ICD-10 was issued and it, too, was clinically modified to produce ICD-10-CM. A new standard, ICD-10-PCS (ICD-10, Procedure Classification System), was developed at the same time to succeed ICD-9-CM, Volume 3. Neither code set has yet been mandated for use. To help it advise whether such codes should be mandated, the National Committee on Vital and Health Statistics asked RAND the following questions:

- What are the costs and benefits of switching from ICD-9's diagnostic codes to those of ICD-10-CM?
- What are the costs and benefits of switching from ICD-9's procedure codes to those of ICD-10-PCS?
- If it is advisable to switch to both ICD-10-CM and ICD-10-PCS, should the switching be done sequentially or simultaneously?

Most observers believe that ICD-10-CM and ICD-10-PCS are technically superior to their ICD-9-CM counterparts. If nothing else, they represent the state of knowledge of the 1990s rather than of the 1970s. They have also been deemed more logically organized, and they are unquestionably more detailed—by a factor of two in diagnoses (and twenty for injuries) and by a factor of fifty in procedures.

Estimation of Costs

Change, even change to a superior code, is not free. Costs can be classified into three categories:

- costs of training
- productivity losses
- system changes.

We estimated the cost of training by identifying relevant groups—hospital coders, other coders, physicians, and code users. We then estimated how many of them would need

to be trained and how long it would take to train people in each category. We made additional estimates for the initial and long-term loss of productivity among coders and physicians. We estimated the cost of systems reprogramming by sampling payers, providers, and software vendors; dividing their answers by membership (in the case of payers) or revenue (in the case of providers and software vendors); and extrapolating to the entire population. Table S.1 represents our estimate of the one-time and cumulative annual costs of switching to ICD-10-CM and ICD-10-PCS. Note that annual costs are not discounted over time.

The third column in Table S.1 represents the additional costs required to change first to ICD-10-CM and then to ICD-10-PCS; these additional costs come largely from the need to complete testing and systems integration twice rather than once. We see no offsetting benefits from switching sequentially.

Thus, our best guess is that the cost of conversion will run \$425 million to \$1,150 million in one-time costs plus somewhere between \$5 million and \$40 million a year in lost productivity.

Table S.1
Summary of Estimated One-Time Costs and Cumulative Annual Costs^a

	Personnel	Cost Estimate (\$ million)	Additional Cost of Sequential Change (\$ million)
Training	Full-time coders	100–150	0–20
	Part-time coders	50–150	
	Code users	25–50	0–10
	Physicians	25–100	
Productivity losses	Coders	0–150 ^a	
	Physicians	50–250 ^a	
System changes	Providers	50–200	5–50
	Software vendors	50–125	5–20
	Payers	100–250	5–50
	CMS ^b	25–125	5–20

^a Cumulative total of ten years of annual costs (undiscounted).

^b CMS = Centers for Medicare and Medicaid Services.

Estimation of Benefits

To develop benefit estimates, we developed a set of parameters based on plausible—but by no means inevitable—scenarios, to account for five major classes of benefits:

- More-accurate payments for new procedures
- Fewer miscoded, rejected, and improper reimbursement claims
- Better understanding of the value of new procedures
- Improved disease management
- Better understanding of health care outcomes (considered, but not estimated).

These benefits were calculated over a ten-year period (the historic time between successive versions of ICD).

Such benefits largely come from the additional detail that ICD-10-CM and ICD-10-PCS offer. However, to realize those benefits, providers must use the full codes, use them correctly, and use them in a fashion that is neutral to the reimbursement system. ICD-9-CM is by no means always completely, correctly, or neutrally exploited.

More-accurate payments for new procedures could be a benefit for the following reasons: New procedures cannot get a code in ICD-9-CM (which is running out of room); they are more expensive than the procedures they would replace; and they are therefore not fully reimbursed and not always performed for Medicare/Medicaid patients (and for those covered by payers using similar payment standards)—even though they are cost-effective. For this scenario, we estimated the benefits total at \$100–1,200 million.

The case for fewer erroneous, rejected, and exaggerated claims is based on the tendency for ICD-10-CM, and particularly ICD-10-PCS, to be less ambiguous and more logically organized and detailed than their predecessors. However, erroneous, rejected, and questionable claims are likely to rise in the initial confusion; it may take five years to see positive cumulative benefits. For this scenario, we estimated the benefits at \$200–2,500 million for fewer rejected claims and \$100–1,000 million for fewer exaggerated claims.

ICD-10-PCS could help in understanding the value of new procedures that will no longer be lumped in with old procedures, as they often were in ICD-9-CM. The assumption is that analyzing hospital discharge records would permit providers and payers to determine how effective such procedures are and for which populations. This would shift when and where they are performed (e.g., ineffective procedures would be done less often; effective ones would be extended to new patients) with net benefits as a result. For this scenario, we estimated the benefits total at \$100–1,500 million.

By permitting more-detailed billing records, ICD-10-CM would help payers and providers more easily identify patients in need of disease management and more effectively tailor disease management programs. Our disease management scenario focused on diabetes, both for its prevalence and for the sixfold expansion in the number of diabetes codes available in ICD-10-CM. Roughly 60 percent of the benefits came from putting more of the right people in such programs, and the rest came from refining disease management for those already in a program. Assuming that diabetes accounts for two-thirds of the total disease management benefits (there was far less expansion of codes for heart disease, for instance), we put the benefits total at \$200–1,500 million.

We considered other potential benefits—such as the help that better codes give to research on health care, improvements in the ability to rate providers, and an enhanced ability to detect emerging diseases—but could assign no reasonably plausible benefit to them.

Table S.2 on the next page summarizes our benefit calculations.

Conclusions

It is likely that switching to both ICD-10-CM and ICD-10-PCS has the potential to generate more benefits than costs. But the estimates for costs—and, in particular, the parameters for benefits—are subject to considerable variation.

Table S.2
Summary of Estimated Benefits over a Ten-Year Period^a

Category	Benefit (\$ million)	Largely Due to
More-accurate payment for new procedures	100–1,200	ICD-10-PCS
Fewer rejected claims	200–2,500	both
Fewer fraudulent claims	100–1,000	both
Better understanding of new procedures	100–1,500	ICD-10-PCS
Improved disease management	200–1,500	ICD-10-CM ¹

^a Benefits are not discounted over time.