

CARDIOVASCULAR MEDICINE AND SOCIETY

Public Reporting of Percutaneous Coronary Intervention Outcomes

Institutional Costs and Physician Burden



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Public reporting programs for percutaneous coronary intervention (PCI) outcomes have been implemented in several states as part of a movement to improve transparency among patients, physicians, and institutions. Massachusetts has publicly reported hospital-specific PCI mortality rates since 2003. Under this program, hospitals submit data to a central data coordinating center responsible for storage and analysis of statewide PCI outcomes data and the American College of Cardiology's (ACC) National Cardiovascular Data Registry (NCDR). Data for both are collected using the NCDR CathPCI collection instrument, although this information is further supplemented with additional covariates to adequately capture risk in the state public reporting program. The Massachusetts public reporting initiative rigorously audits and adjudicates data to ensure fair and accurate comparisons of hospital performance, and actively seeks feedback from the interventional cardiology community to continuously improve the program.

Through public disclosure of PCI mortality rates, reporting initiatives like the one in Massachusetts aim to incentivize physicians and institutions to improve care and to provide patients with

information to make informed decisions about where to seek care. The evidence to date, however, suggests that public reporting has not clearly led to improvements in quality of care or patient outcomes (1,2).

Consequently, some physicians and policymakers have expressed concern that reporting may impose a significant financial and administrative burden on physicians and hospitals without improving care (3). Understanding the costs, administrative effort, and time required of physicians and institutions to meet PCI reporting requirements is critically important because public reporting programs are proliferating across the United States. National cardiovascular societies, such as the ACC, as well as news and media organizations, are rapidly expanding public reporting initiatives. In addition, the state of Massachusetts is debating whether to continue its existing program. To date, there have been little data on the financial and administrative burden associated with public reporting—information that warrants attention and consideration as reporting programs are implemented nationally.

Therefore, in this study, we surveyed cardiac catheterization laboratories in Massachusetts to answer 3 questions: First, what costs do institutions

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incur to meet public reporting requirements? Second, how many hours do physicians spend on efforts related to public reporting? And third, what is the perception of administrative workload associated with meeting reporting requirements?

METHODS

A standardized survey instrument was developed in consultation with experts in PCI public reporting and administered electronically to all cardiac catheterization laboratory directors in Massachusetts. If a response was not received, laboratories were contacted via telephone to identify another individual best able to provide information regarding costs and burden of reporting. The final survey instrument included questions in the following domains: Institutional costs of public reporting; full-time equivalent staff required to meet public reporting requirements; time spent by interventional physicians on efforts related to reporting; and the perception of administrative work associated with public reporting. The survey also included an option to provide additional comments. Questions used free text, yes/no, and categorical responses.

Nonfederal cardiac catheterization laboratories in Massachusetts that perform PCI and participate in state-mandated reporting were identified using state public databases, and laboratory directors (or alternate contacts) were identified by contacting each site. Facility characteristics of respondents were characterized using the American Hospital Association annual survey of U.S. hospitals (2014). Facility characteristics were compared between respondents and nonrespondents using the Fisher exact test. Statistical tests were 2-sided at a significance level of 0.05.

RESULTS

The study survey was sent to all 24 cardiac catheterization laboratories that participate in the Massachusetts state public reporting program. Overall, the response rate was 63% ($n = 15$). Respondents were more likely to be from cardiac catheterization laboratories at large hospitals (>400 beds; 53.3% vs. 0%) and teaching institutions (53.3% vs. 22.2%). In addition, respondents more often had cardiothoracic surgery available onsite (73.4% vs. 44.5%) and higher mean annual PCI volumes (491 vs. 314).

The median estimated range of annual institutional costs to meet state public reporting requirements was \$100,000 to \$200,000, although estimates ranged from \$0 to \$50,000 to $> \$300,000$ (Figure 1A). The median number of full-time equivalent staff employed to handle public reporting

requirements was 1.0, and ranged from 0.5 to 2.75 (Figure 1B).

The median total time spent by interventional cardiologists to meet public reporting requirements (i.e., documentation, review of reports, and data entry) was 5 to 10 h per week, and ranged from 0 to 5 h to >20 h per week across institutions (Figure 1C). On a scale of 1 (least) to 10 (most) for administrative burden associated with meeting PCI public reporting requirements, the median perceived burden was 7 (range 2 to 9) (Figure 1D). Most respondents felt that the potential benefits of PCI public reporting to quality of care and health care transparency did not outweigh the administrative and/or financial burden (64.3%).

DISCUSSION

Overall, we found that efforts to meet public reporting requirements for PCI outcomes in Massachusetts resulted in substantial financial costs to participating sites. The total estimated cost of reporting among the 14 cardiac catheterization laboratories that provided this information was approximately \$2 million per year. Public reporting requirements also led to additional administrative burden on interventional physicians, and more than one-half of respondents conveyed that the potential benefits of reporting did not outweigh the burden imposed on institutions.

In recent years, the value of public reporting programs for PCI have been debated, given little evidence that they have achieved their objectives. Survey data, for instance, suggest that patients undergoing PCI are unaware of and rarely use publicly reported information (4). Perhaps more importantly, reporting has not been associated with improvements in outcomes. After the implementation of state public reporting in Massachusetts, for example, 30-day acute myocardial infarction (AMI) mortality rates among Medicare patients did not improve (1). A subsequent study found higher in-hospital AMI mortality rates in Massachusetts (and New York), relative to nonreporting states, concentrated among patients who did not receive PCI (2). Though reporting has encouraged institutions to collect and monitor data for quality improvement, the public disclosure of outcome data has also pushed physicians to avoid high-risk, but indicated, PCIs. Lower rates of PCI in reporting states, for instance, have been most pronounced among patients who may stand to gain the most from intervention, such as those with AMI complicated by cardiogenic shock (5,6). In a recent survey of interventional cardiologists in

ABBREVIATIONS AND ACRONYMS

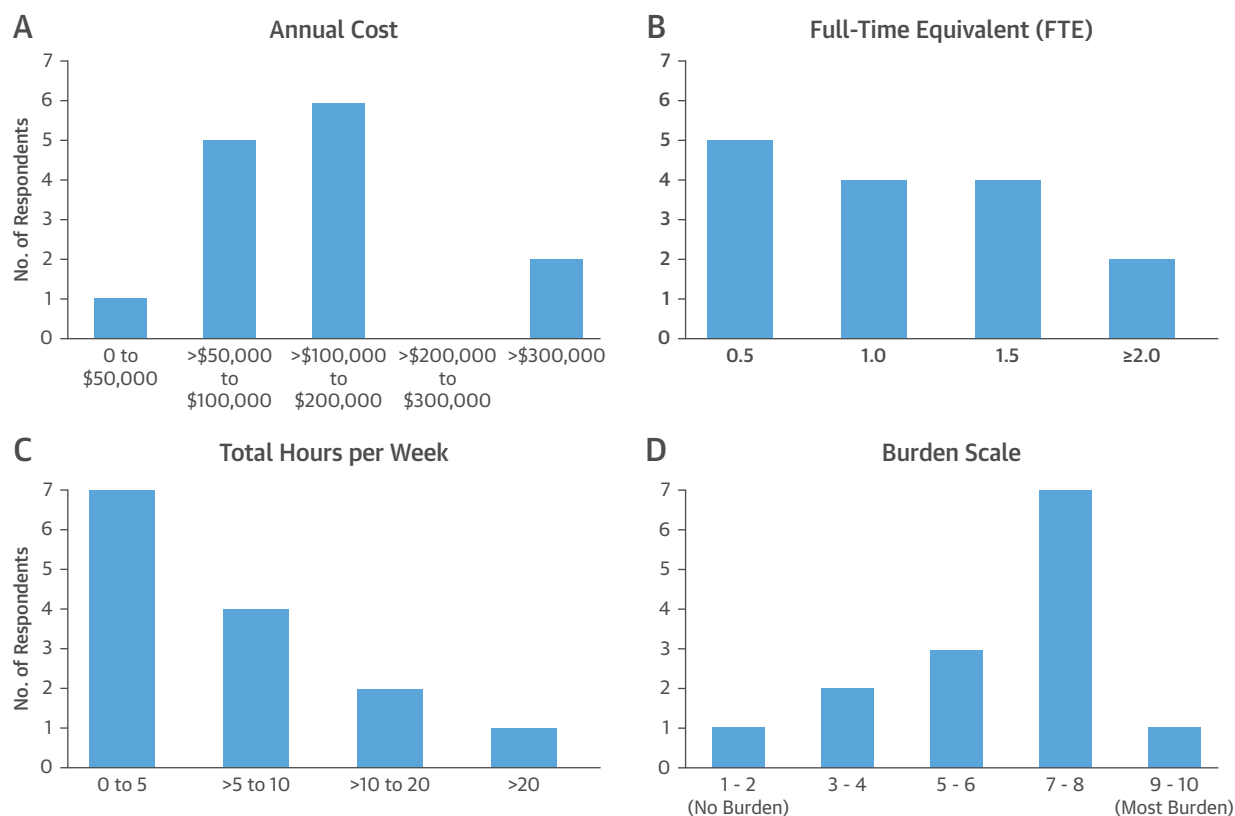
ACC = American College of Cardiology

AMI = acute myocardial infarction

NCDR = National Cardiovascular Data Registry

PCI = percutaneous coronary intervention

FIGURE 1 Financial and Administrative Burden Associated With Public Reporting of Percutaneous Coronary Intervention Outcomes



(A) Annual estimated costs to cardiac catheterization laboratories for public reporting in Massachusetts. **(B)** Total staff members employed (in full-time equivalents) to specifically handle state percutaneous coronary intervention public reporting requirements. **(C)** Approximate range of total hours spent per week by interventional cardiologists on efforts related to meeting public reporting requirements. **(D)** Administrative burden associated with meeting public reporting requirements for percutaneous coronary intervention, on a scale of 1 (no burden) to 10 (most burden).

Massachusetts and New York, a majority (75%) admitted to, at times, not performing high-risk, but indicated, PCIs due to concern that doing so might negatively impact their publicly reported outcomes (7). As a result, some have argued that reporting simply impedes access to care for critically ill patients and potentially results in harm (8). Our study raises concern that this policy, which has not clearly improved patient outcomes, has also imposed financial and administrative burden on physicians and institutions.

To ensure high-quality public reporting, a centralized data coordination center for public reports of PCI and cardiac surgery data was contracted by the Massachusetts Department of Public Health, with a total budget of \$3.4 million over 5 years. Some of the costs incurred by institutions in Massachusetts were, in part, used to fund data analysis. We were unable to capture expenditures

by the Department of Public Health for efforts related to public reporting, unreimbursed costs for time volunteered by interventional cardiologists to ensure high-quality case adjudication, nor the costs for mandatory external quality review if an institution was identified as an outlier. Notably, other states with public reporting programs incur significant costs to run these programs. In New York state, total appropriations for cardiac data and quality and outcomes initiatives was approximately \$2.4 million over 4 years (2015 to 2018) (9), and in Texas, the 2018 budget for the Texas Health Care Information Center Program, which publicly reports data for an array of conditions and procedures, was >\$2 million.

Beyond cost, we also found that interventional physicians dedicated additional time on a weekly basis to meet public reporting requirements. Other activities that helped maintain the high quality of

reporting in Massachusetts, such as case review and adjudication by interventional cardiologists, likely also increased burden. More broadly, in the United States, physicians and staff spend approximately 15 h per week and \$15.4 billion per year to deal with quality measures (10), despite the fact that many measures are not valid measures of performance. Given concern that mortality associated with PCI may not accurately reflect quality of care, it is not surprising that most surveyed cardiac catheterization laboratories in our study felt the potential benefits of reporting did not outweigh the administrative and/or financial burden.

Though overlap exists between efforts required to submit data to fulfill state-mandated public reporting in Massachusetts and those required to participate in the ACC NCDR (e.g., data in Massachusetts are collected using the NCDR CathPCI data instrument and submitted to both organizations), there are unique aspects of the Massachusetts program that likely contribute to additional cost and burden. First, the Massachusetts program implemented a vigorous auditing process to ensure there was no evidence of “gaming” or “up-coding” that might impede accurate comparisons of institutional performance. For instance, institutions were, at times, required to submit medical records and coronary angiograms as part of the adjudication process. Second, interventional cardiologists in Massachusetts volunteered time to participate in adjudication meetings, and additional variables were collected and adjudicated to improve risk-adjustment models based on physician input and feedback. As a result, Massachusetts public reporting program was dynamic and adaptive. Though these efforts resulted in additional cost and burden beyond that of participating in the ACC public reporting initiative, they also helped ensure that the Massachusetts state public reporting program was fair and of high quality.

Notably, optional comments by survey respondents provided important insights regarding the perception of public reporting in Massachusetts. Respondents consistently conveyed support for collecting and reviewing data on care quality and outcomes and stated that reporting has helped organize and formalize this process. However, some indicated excessive burden associated with doing so. Many felt that public reporting has, in fact, promoted improved quality within their cardiac catheterization laboratories, but also conveyed

concern that these gains have been mitigated by the fact that reporting, in its current form, incentivizes risk-averse behavior. Collectively, these comments reflect a strong belief in the importance of quality measurement and improvement among interventional cardiologists, but also suggest that efforts to improve reporting should focus on reducing burden (e.g., through auto-abstraction of electronic medical record data) and diminishing risk aversion, which could potentially be achieved through nonpublic and/or disease-based reporting (3).

This study has several limitations. First, characteristics of sites that responded to the survey differed from those that did not, though our response rate was high. Second, cardiac catheterization laboratory directors' responses may not have been representative of the view of other interventional cardiologists working at these sites. Third, though our survey focused on the Massachusetts public reporting program, we were unable to delineate the extent to which these efforts (and cost and burden) may also reflect participation in the ACC NCDR public reporting initiative. Understanding the costs and administrative burden associated with the ACC's national public reporting efforts remains an important area for further research. And fourth, our survey was limited to the state of Massachusetts, though to our knowledge, this is the first study that has characterized the costs and administrative burden associated with public reporting.

In summary, public reporting of PCI mortality imposed financial and administrative burden on interventional cardiologists and institutions in Massachusetts. Given that reporting has not been shown to improve care or outcomes, and may instead incentivize physician risk aversion, these data raise concern about the value of current efforts to publicly report PCI outcomes. As public reporting continues to expand nationally under the ACC, it will be important to ensure these efforts are efficient and do not result in excessive cost and administrative burden to physicians and institutions.

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