Our core mission as a community of congenital heart surgeons is to ensure the safety and quality of care delivered to our patients and their families. As content experts, we are best equipped to understand and evaluate issues that threaten our core mission and develop strategies to respond to these threats.

The era of public reporting in health care, and pediatric cardiovascular surgery in particular, has become a fixture of modern program management through the development and dissemination of Society of Thoracic Surgeon (STS) risk-adjusted performance scores (observed/expected mortality rates and the recently eliminated star-rating system). The impact of the STS reporting has been greatly amplified by incorporation of STS risk-adjusted performance as a central component of rankings of congenital heart surgery programs published by private enterprises. Although public reporting is an important and useful tool to assist the specialty in its core mission, there are potential ramifications of public reporting that may be perceived as threats. The purpose of this article is to examine these perils and propose potential solutions with the intention of provoking spirited discourse among our colleagues, which will lead to better solutions.

When the STS Congenital Heart Surgery Database (CHSD) was first reported approximately 3 decades ago, most surgeons and programs failed to fully appreciate the impact of public reporting and how it would evolve to influence our practice. The STS CHSD was originally intended as an internal quality improvement platform and was not designed or intended to be used as a public comparator between programs. Public ranking of institutions based on CHSD data represents a distortion of its original intent and a misuse of its design, structure, and analytic approach. The STS CHSD data have been integrated into scoring systems published by private enterprises that are specifically marketed as ranking systems and represent further distortion of the original intent of the STS CHSD. Considering the discontinuity between the design and intent of the STS CHSD and the use of its publicly reported data, there is a desperate need for expert and objective interpretation of these data outputs to provide accurate meaning and context for the public. This is a de facto attribute of the mechanisms proposed herein.

In the current era, there is enormous competition between programs and pressure to improve their publicized rankings, sometimes to an extent that careers can be made or broken based on publicly reported institutional data. Technical expertise in the high-risk, high-reward specialty of pediatric cardiovascular surgery has vastly improved from the days of our predecessors, and some of this improvement has undoubtedly been fueled by beneficial attributes of public reporting. In principle, publishing STS risk-adjusted scores or rankings computed by private enterprises are a natural extension of our commitment to the well-being and continuous improvement in

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Received for publication Feb 22, 2023; revisions received March 10, 2023; accepted for publication March 16, 2023.

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J Thorac Cardiovasc Surg 2023; ■:1-5
0022-5223/36.00
Copyright © 2023 by The American Association for Thoracic Surgery
https://doi.org/10.1016/j.jtcvs.2023.03.022

The Journal of Thoracic and Cardiovascular Surgery • Volume ■, Number ■ 1
the quality of care of our patients. Full transparency and acceptance of our responsibility for every aspect of the delivery of care are necessary components of our core mission as surgeons and patient advocates. Public reporting provides transparency to the public and is an important tool for surgical programs to evaluate the safety and quality of their performance in comparison with others, reflect on opportunities to improve, and develop plans to provide improved care. These immutable concepts will (appropriately) maintain public reporting as a prominent reality for the foreseeable future. Public reporting is congruent with our core mission to ensure the safety and quality of care offered to patients and families and, in that way, serves the broader public interest.

Unfortunately, our enthusiasm for public reporting is offset by a recognition that risk adjustment is imperfect. Because congenital heart disease is composed of an extremely wide array of diagnoses, procedures, and associated risk factors, it is impossible (with current technology and available data) to perform perfectly accurate risk adjustment for every individual patient. We are beholden to a schema that has excellent predictive value for large populations of patients but cannot adjust risk properly for every individual patient with risk factors that are not sufficiently quantified in the risk adjustment model. If public reporting was a low-profile enterprise, we could simply accept these limitations, interpret the data at face value, and continue our efforts to improve. But this is not the case.

The use of publicly reported data has, instead, become a high-profile enterprise that has resulted in widespread program-level subservience and, in many cases, near addiction to published rankings. When an institution’s ranking goes up, celebrations that are eerily similar to a college football team winning the conference title occur despite the conveniently ignored lack of statistical difference between rankings. Upon the occasion of an institution’s ranking going down, a discouraged surgeon from an excellent top-rankings program said “it was like a five-alarm fire around here” with a newly formed hospital team in “battle station mode” demanding “change” despite the lack of statistical differences in metrics between adjacent ranking institutions and an unclear relationship between published rankings and outcomes. This pressure to achieve more favorable rankings has created unintended consequences that may incentivize behaviors to manage numbers rather than patients with a collateral adverse effect manifested by a reluctance to provide care to our most complex patients. Simply stated, surgeons and programs may become risk averse in an effort to protect or improve their ranking.

The objective of this publication is to examine the unintended consequences of the current public reporting and rankings structures, propose solutions, and initiate a dialogue within our specialty. The purpose of this discussion is not to evaluate whether we should have public reporting (we should be transparent). Nor is the purpose of this discussion to dissect the imperfections of the current STS CHSD risk model or the private enterprises that rank programs (they are imperfect, but the best we have at present). Accepting the concept that public reporting will not go away, we must ask what we can do as a specialty to protect our patients from a process that was initially designed to help but has now created unintended consequences that may be detrimental to patient care.

To begin a dialogue, 3 major unintended consequences of public reporting are identified and described below with 3 proposed solutions that are closely linked. It is fully expected that the list of unintended consequences is incomplete and the proposed solutions are inadequate in their current state. Nevertheless, the current list of unintended consequences and proposed solutions can serve as a foundation upon which to begin a conversation for specialty-wide efforts to redirect the power of public reporting to better serve our patients.

ASSISTANCE FOR UNDERPERFORMING PROGRAMS WITH A CLINICAL SUPPORT PANEL

With public reporting on the STS website and its amplification through use of its data in rankings schemes published by private enterprises, a subset of programs are publicly branded as underperforming. The agencies that provide these data to the public, however, have remained detached from the ramifications of these public issuances, and programs identified as underperforming are left to their own devices to address deficiencies and improve their performance. Such improvement, however, is not always forthcoming. It is convenient to brand the technical skill of the surgeon(s) as the core problem leading to underperformance of a program, but the factors leading to poor outcomes typically go beyond surgeon performance. Complex organizations can have deficits in availability of resources, quality of processes, or appropriateness of priorities.

Resources

Limitations contributing to performance issues may include insufficient availability of intensive care unit beds, operating room availability, extracorporeal membrane oxygenation coverage, and clinical staffing models with appropriate levels of nursing, anesthesia, critical care, perfusion, and cardiology personnel.

Processes

Problems may involve clinical decision making, management of clinical care rounds, or mechanisms to monitor and improve quality, and finally, institute or program.

Priorities

Priorities may be skewed away from patient-centeredness (especially if resources are constrained) and negatively impact clinical operations.
Of note, surgeons may or may not have the leverage within an institution to improve access to resources, management of processes, and maintenance of appropriate priorities. Rather than simply leave surgeons to fend for themselves, our specialty needs a trusted and responsible organization to oversee such activities and to provide guidance, assistance, and support to underperforming programs in their efforts to improve. This solution could take the form of a multidisciplinary committee of experts convened under the oversight of an appropriate professional society to serve as a Clinical Support Panel. At the request of the underperforming program, the outside multidisciplinary review team would perform an in-depth analysis of all aspects of the program, prescribe a remediation plan for the surgeon and program, and provide objective support in any discussion of resource availability with the hospital administration. This process of education for the hospital might provide much needed support for the surgeons if resource limitations are an issue.

Furthermore, any concerns that the risk-adjustment process that resulted in a label of underperformance was unfair due to specific patient/program circumstances could be adjudicated by the expert panel with arm’s length objectivity and the gravitas of the sponsoring professional society. The review might also help to educate the hospital on the shared responsibility between the surgeons, the administration, and the rest of the healthcare providers in provision of care, methods to optimize team-based patient-centered decision making, and a surveillance plan to monitor quality.

The credibility of the Clinical Support Panel would be predicated on a dispassionate and critical review of all aspects of a program, including surgeon performance. This will require objective, incisive, and difficult conversations at times. Ultimately, review of progress and remediation should lead to issuance of a credentialing sign off from the Clinical Support Panel indicating that the program has achieved a level of performance that is deemed acceptable to the sponsoring professional society. Given the small size of our surgical community and the inherent close personal and professional relationships, this critical feedback will be hard (but rewarding) work for experts in our specialty and a new dimension of responsibility for the sponsoring professional society.

**MANAGEMENT OF RISK-ADJUSTMENT ORPHANS WITH MORTALITY WAIVERS**

A major unintended consequence of public reporting is the unavoidable reluctance to offer intervention to a patient with risk factors that are not recognized or insufficiently quantified in the current STS risk adjustment model. Rare comorbidities or clusters of common comorbidities are easily identifiable to an experienced clinician. Some extreme examples include a conjoined twin requiring a Norwood procedure, an infant with lower-extremity amputations and total systemic venous thrombosis requiring a minor cardiac procedure, or an atrial septal defect closure in a patient requiring liver transplantation. There is a myriad of examples of subtle risk profiles that are clinically apparent, but poorly accounted for with population-based risk adjustment models. For the sake of nomenclature, let’s define these patients as risk-adjustment orphans (RAOs). The conventional wisdom is that a large program can absorb the excess of incurred risk associated with a RAO patient. In practice, however, large volume institutions quickly expend their ability to absorb excess risk because multiple smaller programs are likely to request transfer to a large institution when an RAO patient is identified. Very quickly, a clinical decision to accept an incoming transfer of a RAO patient (or offer surgical care to an inpatient RAO) can devolve into a “numbers game,” with reluctance to offer an intervention rather than a decision that is completely focused on what is best for the patient. It is implausible to maintain that risk aversion practices intended to limit exposure of a program to an adverse outcome has not crept into clinical decision-making within our specialty, and the resulting restriction of access to surgical care is a major unintended consequence of the rankings enterprise.

As a specialty, we need a mechanism to manage the incurred “reporting risk” for RAO patients so that we can focus our attention on provision of appropriate clinical care. Under the oversight of an appropriate professional society, a Mortality Waiver Committee could be charged with the responsibility to review applications for waivers on a case-by-case basis through a process that keeps the Committee blinded to the identity of the patient and the institution submitting the request. When appropriate, the Committee would submit recommendation to the STS Database for a waiver of mortality. Under this paradigm, the application would need to be filed before performing the surgical procedure. Because it will be infeasible to review the application and return a decision before surgical intervention, the program will need to manage the patient by doing what is best for the patient at the time with no guarantee that a waiver will be granted (e.g., we will still need to always do what is right for the patient and the existence of the waiver application must not result in treatment delays). After the procedure is completed, however, the waiver may be granted by the Mortality Waiver Committee. If the patient did not survive and the waiver was granted, the hospital will still report to the STS that the case was performed and, therefore, the patient’s risk factors will be included in the calculation of the expected mortality for the program. The death, however, will be reported as a “waived mortality” and will not be reported in the observed mortality statistic. Consequently, the observed/expected mortality ratio will not be adversely affected; in fact, there will be a small incentive to provide care to this high-risk patient because the risk will be reflected...
in the expected risk denominator while the mortality will not be reflected in the numerator of the observed/expected ratio for the program. Therefore, the proposed management plan for RAO patients would provide a small incentive (and, more important, remove a large disincentive) to provide care for high-risk patients whose risk is not fully scored in currently available population-based risk adjustment models.

The sponsoring professional society would be expected to provide oversight, monitor the proceedings of the Mortality Waiver Committee, and maintain transparency by disseminating reports describing the rationale for waiving mortality reporting for each patient with anonymization of patient identifiers and institution. It is possible that future risk adjustment models might be informed through mining and analysis of the groups of patients in whom mortality risk was deemed appropriate for waiving by the expert committee, a rich research opportunity.

INCENTIVIZING HIGH-RISK PROGRAMS WITH DESIGNATION AS AN INNOVATIVE TREATMENT PROGRAM

Another major unintended consequence of public reporting is the current strong disincentive to develop a program to tackle clinical problems associated with a high-risk patent population. For example, at Texas Children’s Hospital, a large program was established to manage pulmonary vein stenosis with a rapidly growing referral base. A comprehensive multidisciplinary team was developed providing interventional services in the operating room and the catheterization lab. Patients typically undergo multiple catheter-based and reparative surgical procedures that are the state of the art for this difficult disease. However, these patients were not believed to be accurately risk adjusted in the current public reporting framework, and the Heart Center faced a dilemma: Should the program be further expanded to leverage the technical expertise and well-developed multidisciplinary team, which will undoubtedly benefit patients, knowing that there will be an inevitable negative impact on publicly reported surgical outcomes due to insufficient risk adjustment? The program was supported, but the adverse effects of public reporting in establishing a high-risk program are illustrated. Although unintended, public reporting is creating a strong disincentive to develop the programs that are needed to advance the field.

As a specialty, we can manage this disincentive by transforming the current public reporting system in a manner that recognizes (and incentivizes) innovative therapeutic programs. Again, an appropriate professional society could help to provide the necessary oversight to properly evaluate and designate a program as an Innovative Treatment Program (ITP). With arm’s length oversight, the ITP Oversight Committee could evaluate and credential programs for special consideration in terms of public reporting. In a manner analogous to the adjustment for management of single patient RAOs (outlined above), the current disincentive to develop an ITP could be transformed into an incentive through provision of waivers for mortality. The ITP Oversight Committee could also monitor clinical outcomes and academic productivity to ensure that patient outcomes are appropriate. Furthermore, the existence of such designated high-risk clinical programs would encourage appropriate referral of patients to such programs, potentially improving outcomes for a difficult patient population, but also accelerating clinical understanding and progress through research and analysis. To this end, a requirement of the designation of an ITP would be mandatory reporting of all clinical outcomes on a regular basis with ITP Oversight Committee review of all data to ensure complete transparency of outcomes and to provide efficient and timely translation of clinical experience into knowledge shared across our specialty with timely publication and discourse in academic venues.

IMPLEMENTATION

As stated, professional societal oversight and sponsorship will be required to provide the expertise and infrastructure needed to manage the proposed Clinical Support Panel, the Mortality Waiver Committee, and the ITP Oversight Committee. The sponsoring professional society will need to petition the STS to accommodate the new reporting structure and work collaboratively to achieve the aims articulated here. Eventually, we should bring the private enterprises that currently rank programs into the dialogue to explore other creative means to incentivize behaviors designed to enhance patient care.

The Congenital Heart Surgeons Society (CHSS) is now widely acknowledged to be a highly trusted voice of congenital heart surgeons and their patients. The only surgical society in the United States focused solely on congenital heart surgery, with a long track record of dedication to those affected by congenital heart disease, a rich tradition of focused outcomes research, and a recent strategic commitment to quality improvement initiatives across the field, the CHSS is well suited to provide the oversight, transparency, and gravitas needed to ensure the success of these endeavors. Wisely and strongly managed, the unintended consequences of public reporting can be transformed into incentives that will improve care for individual patients and high-risk populations.

Study Limitations

This article describes personal perceptions of the unintended consequences of public reporting on patient care. It is likely and, in fact, expected that other surgeons will have different perceptions of the scope of this problem. Furthermore, the proposed remedies to improve the current state are likely to provoke disagreement, proposal of new ideas, and hopefully an open dialogue toward better solutions.
CONCLUSIONS
The objective of this article is to provoke productive discourse focused on the management of the unintended consequences of public reporting that pose threats to our profession and compromise the care of our patients. As a specialty, we have an opportunity to redirect the power of public reporting to further incentivize provision of the best possible clinical care. As the leading advocate of congenital heart surgeons, the CHSS is ideally positioned to sponsor this discourse.

Conflict of Interest Statement
The authors reported no conflicts of interest.

The Journal policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

Key Words: threat, opportunities, congenital heart surgery, risk adjustment, leadership