PSNet
PATIENT SAFETY NETWORK

Equity in Patient Safety

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Introduction

Safety and equity are among the central components that determine quality of care, according to nonprofit advisory agencies like the Joint Commission and the Institute of Medicine (IOM). Although the IOM's definition of quality describes safety and equity as two of their six domains of healthcare quality, safety and equity are intrinsically connected. Patient safety focuses on preventing avoidable harm. Inequitable care is unfair or unjust care received by specific individuals or groups. It is well-documented that certain groups of people disproportionately experience avoidable harm within the healthcare system, directly linking inequitable care to patient safety.[1] Resolving this inequity can be approached from a safety lens. If we understand that patient safety is the result of systems-level approaches that promote safety, then healthcare organizations can also achieve equity through systems designed to undo inequalities in care that, like medical error, occur due to multiple, complex causes.

In an influential commentary, Karthik Sivashanker, MD, MPH, and Tejal K. Gandhi, MD, MPH, described how systems-level and data-driven patient safety can drive greater equity. For example, healthcare organizations can stratify voluntary adverse event report data by race, ethnic group, patient gender, disability status, or other social determinants of health to identify inequities.[2] These stratified patient safety data are presented in the National Healthcare Quality and Disparities Report Chartbook on Patient Safety, which aggregates patient safety measures and analyzes that data to identify disparities. Overall, across all dimensions of patient safety the chartbook analyzed, data show that households with income less than the federal poverty guideline received worse care than households with higher incomes in 33% of patient safety measures; that Black patients received worse care than White patients in 36% of patient safety measures; and that Native Hawaiians and Pacific islanders received worse care than White patients in 25% of patient safety measures, among other racial, ethnic, or social disparities.

Leapfrog Hospital Safety Grades, which grade hospitals on patient safety data, have released findings on patient safety and health equity. These findings show that hospitals with high Leapfrog grades, reflecting high performance on patient safety measures, are likely to provide safer care to any given patient regardless of racial or social background than are hospitals with lower Leapfrog grades. However, on some

indicators (e.g., postoperative sepsis infections, perioperative hemorrhage), these highly graded hospitals had the greatest disparities in adverse events stratified by race. Thus, inequities in patient safety continue to be a problem even among the highest performing hospitals.

The Joint Commission noted findings that show disparities in healthcare quality and safety among historically marginalized groups are sometimes viewed socially, as problems beyond the scope of healthcare systems. Against such views, they have announced a new patient safety goal to improve equity, explicitly positing that equity is a safety and quality priority.

Achieving equity in patient safety is complex, and it continues to be an area of research. Over the past year, articles published on PSNet focused on root causes such as clinician biases, and technological tools such as artificial intelligence (AI) which may exacerbate or mitigate racial disparities in health. Research also described current efforts to improve equity in patient safety, and equity initiatives in clinical settings such as obstetrics. Taken as a whole, this work shows that ultimately, equity in health is inherently a patient safety problem, since these disproportionate harms are preventable, and that safer, more equitable healthcare is achievable.

Clinician Biases

Clinician biases may impact the safety of care received by historically minoritized groups. African American public health students in Georgia collected data on their own healthcare visits to assess bias. Their findings suggest implicit racial attitudes may impact clinicians' communication and receptiveness to hearing patient concerns, and that these encounters increase reluctance and distrust on the part of patients. The students suggested additional cultural competency training. Disparities in patient safety may be affected by implicit biases, or negative attitudes toward groups based on race or ethnicity that unconsciously affect behavior. For example, implicit bias about racial differences in pain tolerance has led to systematic undertreatment of pain in Black Americans compared with Whites.[3] Although unconscious, implicit bias may still be overcome in clinical contexts through debiasing strategies. One such strategy is discussed in the context of clinical medical education: an unconscious bias could be propagated by a trainee unconsciously absorbing a senior mentor's biases. This kind of training, known as the "hidden curriculum," can be overcome by the senior staff member explicitly addressing bias, thereby making the hidden curriculum explicit.

The senior staff and trainee dynamic is one of a few complex dynamics that can influence clinical decision making, especially in team-based settings. Researchers have developed a data analysis tool to assess group dynamics for vulnerabilities to bias. In testing their tool, researchers found that for groups with higher team function scores, the probability of women being recommended for advanced heart failure therapies increased. But for teams with lower team function, such as lower scores on dimensions including sharing opinions, experimentation, challenging groupthink, and giving and receiving feedback, health inequities persisted.

Beyond clinician biases, the clinical decision making process may perpetuate inequities in patient safety through racial or ethnic biases associated with healthcare algorithms. In healthcare, algorithms use patient variables to estimate risk for various outcomes, such as the worsening of chronic disease. In a qualitative study on race- and ethnicity-based algorithms in healthcare, respondents found risk of potential bias in

algorithms, even in algorithms that do not explicitly include race. For example, the formula to estimate kidney function includes an adjustment that overestimates the kidney function of Black patients compared to patients of other races with the same laboratory values. This formula is based on outdated and incorrect beliefs that Black people have higher muscle mass than White people. This study suggests possible solutions to bias embedded in formulas and algorithms, such as creating a “fairness” metric and testing algorithm outcomes. Algorithm development must also be more transparent for review by additional stakeholders. As race-based inaccuracies are reported in algorithms and some diagnostic tools such as pulse oximeters, it becomes increasingly important for clinicians to question and assess findings from their tools or algorithms, and for researchers to design future observational studies to assess the impact of racial differences in algorithms and diagnostic tools.

Technology and Equity

Tools such as algorithms or pulse oximeters may inadvertently influence clinical outcomes based on race, but other health technology tools may have the potential to embed health inequities. AI as a tool recently applied in healthcare could further entrench inequities, especially if unregulated. In particular, researchers attempting to develop an AI program to predict pediatric sepsis tried to avoid implicit racial bias in their algorithms. In late-phase testing, they found that their AI predicted slower onset of sepsis in Hispanic children. This finding is likely due to care delays in securing an interpreter. Care delays without recognition of cause would result in an AI tool that underestimates the severity of sepsis in Hispanic children. In this case, the AI developers are reworking their program to eliminate this disparity. Despite initial moves toward greater regulatory oversight on AI in healthcare, proposed rules from the Food and Drug Administration and the Office of the National Coordinator for Health Information Technology are not yet in force.

Even if AI developers working in healthcare correct algorithms that may perpetuate structural racism, AI as a technology newly being deployed in our society may itself create inequities. Writing in the journal *Science*, commentators noted that certain patients, such as those who receive care from early-adopter clinicians or those more inclined to trust novel health technologies, are likely to experience benefits from AI. These disparities may further feed into, and become entrenched in, AI assessments of its own efficacy. Clinicians may be more skeptical of AI tools even if they are deployed in ways similar to existing technologies. For example, clinical decision tools driven by AI, which are based on statistical associations, may seem less trustworthy to clinicians than older clinical decision support tools based on expert knowledge and guidelines. Such preferences will vary depending on the clinician. These commentators have suggested that the future utility of AI is complex, but at minimum, as regulation develops, AI should be trained to assess itself against biases. Implementation research is necessary to continue to identify problems in, and solutions to, applying AI in healthcare.

Like AI, telehealth technology can advance health equity and safety, or it could further entrench inequities. Inequitable access to the technology that enables safe telehealth could lead to deficits in safe telehealth or missed or delayed care for patients with access issues. Noting the rapid expansion of telehealth during the COVID-19 pandemic, but also the lack of forward planning after the pandemic, commentators summarized practices that may position telehealth as a tool to increase access to the kind of care that would improve patient safety. They noted that if healthcare systems leverage telehealth as a tool to improve availability of

care, then they will need to assess internet and device access for populations using telehealth. In addition, audio-only telehealth should be carefully planned for; typically, audio-only forms of telehealth are limited by a lack of imaging and are unable to provide the same extent of patient safety as video-enabled telehealth. Audio-only telehealth may be appropriate as a safety net in very vulnerable populations but is not a replacement for interactive video telehealth. Regulation and planning are needed to continue to define the best uses of telehealth and enable access to it.

Efforts to Improve Patient Safety and Equity

Patient safety and equity can be improved through efforts across a few fronts, such as in data gathering, education to address the root cause of health inequities, and through concrete initiatives at the health system level. Advances in patient safety have come from adverse-event reporting data and quality measures. A key initiative to improve equity in patient safety starts at data gathering, as a key commentary notes. The process of safety event reporting may be affected by bias and inequality, as in cases when demographic data are not collected or analyzed, but also in other disparities. For example, healthcare workers report safety events more often for white patients than for historically minoritized patients. A study on laboratory and pharmacy data found that safety reporting did not identify issues in populations that have been made vulnerable by health care and other systems as accurately as in white patients.[4]

These weaknesses in collecting safety data for racial minorities may be exacerbated by mistrust from patients who have a history of being marginalized in healthcare or exploited by biomedical research, which may impact their willingness to consent to share data or participate in studies.[5] In addition, the commentary also noted that historical race- and gender-based bias against healthcare staff could impact healthcare provider perspectives on safety culture and patient safety reporting. For example, healthcare staff who identify as racial minorities are less likely to make patient safety reports, possibly because of these differences in perceptions of safety culture. Racial bias further complicates reporting in that more patient safety events are reported for female and historically minoritized healthcare staff than for male or white staff members.[4] Focusing on these issues in patient safety data could lead to better data gathering practices. Collecting patient demographic data and stratifying patient safety so that structural inequities against historically marginalized groups could be proactively identified would be an important first step in beginning to close inequities in patient safety.

Addressing root causes of health inequities has been a focus of an innovative project in health education at the University of California San Francisco. Still in its early implementation, the REPAIR (REParations and Anti-Institutional Racism) project includes faculty, students, staff, and medical residents in an effort to create dialogue and cross-disciplinary research on structural racism. Among the early outcomes from this project is greater partnership in scholarship and clinical training between social sciences and the medical humanities, and university funding for graduate students to pursue work on the REPAIR project, including teaching curricular content on structural racism. For example, the REPAIR project initiates conversations on topics such as medical reparations. Medical reparations are based on the idea that the past unequal treatment and exploitation of Black people may require redistributive approaches to reconciliation, such as recruitment of Black researchers and funding for research designed to serve Black communities. Notably, in the 1960s, Black medical student activists worked to better integrate the University of California San

Francisco medical school, offered free clinics to underserved communities, and addressed workers' rights and an international antiapartheid movement by the 1980s. Cross-cutting equity efforts have a history in health education.

Equity in patient safety can be improved through better collection of safety data, as well as education. More practical actions to address inequities in patient safety are listed in the Joint Commission's announcement on establishing equity as a patient safety goal. For example, the Joint Commission lists as an element of performance that healthcare organizations assess patients' health-related social needs, such as transportation needs or difficulty in affording medications, and then provide information on support services. Additionally, these organizations are expected to employ data collection practices that enable analysis of racial disparities. The Joint Commission also recommends that the organization engage stakeholders in its equity plan and hold itself accountable to that plan. These concrete, actionable steps may help mitigate inequities in patient safety.

Equity in Obstetrics

Innovative approaches to improve equity in patient safety are emerging and may advance clinical areas in which both equity and patient safety are concerns.[6] Health disparities have been extensively documented in several clinical areas, such as cardiovascular health. In obstetric and gynecological care, equity and patient safety has been a particular concern. For example, maternal death remains more common in non-Hispanic Black women than in white women. Black and Native American women are two to three times more likely to die from pregnancy-related causes. Health outcomes, such as maternal mortality, depend on many factors. Compared with outcomes, care is either provided or not and thus may present a picture of disparity less complicated by other factors. Even at this level, racial disparities exist. For instance, Black, Hispanic, and publicly insured women are less likely than white women to receive minimally invasive hysterectomies when eligible for them. The Joint Commission noted similar disparities in obstetric and gynecological health. During the COVID-19 pandemic, the rate of death for Black and Hispanic postpartum patients rose significantly, while mortality rates for white patients rose less.

Several analyses have found that race, more than financial status, determines the disparity in outcomes observed in obstetrics. Using administrative claims data as well as income data from Internal Revenue Service records, researchers found that although maternal mortality varies with income, with poorer patients having higher death rates than wealthier patients, these disparities are small compared to racial disparities. In fact, Black families at the highest income distribution had worse infant and maternal health than white families in the bottom income distribution. Another study using the National Inpatient Sample from the Healthcare Cost and Utilization Project of the Agency for Healthcare Research and Quality (AHRQ) compared severe maternal morbidity among Black patients based on two indicators of structural racism: incarceration and a measure of racialized economic segregation. They found incarceration inequality was not related to severe maternal morbidity, but racialized economic segregation, or spatial concentrations of racial and economic privilege or disadvantage, was related to maternal morbidity.

Research summarized earlier in this essay suggests that healthcare algorithms and implicit bias may contribute to care inequities. These factors were shown to impact racial bias in a clinician's likelihood to recommend cesarean section during labor, an invasive procedure associated with more morbidity than

vaginal birth, and which occurs more often for Black patients than white patients. Using clinical scenarios, researchers found only one group of clinicians more likely to recommend cesarean delivery for Black patients in the scenario: young practitioners without much experience. That bias may result from over-reliance on a risk factor calculator that used race as a predictive factor. Thus, bias encoded into an algorithm combined with a lack of clinical experience and context could result in unequal care and greater morbidity, such as increased thromboembolism, cardiac arrest, and hysterectomy, based on race.[7]

With such stark racial disparities in maternal care, education designed to mitigate implicit bias and tools to overcome health inequities based on patient safety data is being developed and implemented. Applying education strategies across training in obstetrics, from curricular design that teaches antiracism and social justice theories to reviewing epidemiology and medical evidence for underlying assumptions, could be implemented to help reduce the racial disparities observed in maternal health. In another initiative to reduce disparities in maternal health, patient safety event data was screened using a health equity checklist to identify patient safety events that were associated with social determinants of health or implicit bias. The checklist also enabled identification of areas in the healthcare delivery infrastructure in which the need for culture improvement or restorative work was needed. And applying data analysis with AI to improve maternal health, MedStar Health is developing and implementing a surveillance system that will screen for negative tone and potentially stigmatizing language in the electronic health record alongside other risk factors for adverse birth outcomes.[8]

Conclusion

Equity is a patient safety concern, as preventable harm disproportionately affects some patients based on social, demographic, and economic factors. Efforts to improve equity and patient safety are long-term and ongoing. For example, AHRQ has announced an initiative to fund innovative research meant to build new evidence on implementation and effectiveness of interventions that address disparities and improve equity.[9] To further advance health equity, AHRQ has critically examined its own agency activities for contributions to structural racism and inequality and has sponsored a special issue of *Health Services Research* on healthcare equity. These efforts model how organizations may address the systemic factors that continue to perpetuate inequities. As more healthcare systems work to mitigate inequities in patient safety, the need remains for more research that directly investigates the intersection of equity and patient safety.

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