Rural hospitals face the same challenges as urban hospitals, and then some. Staffing, contracting, payment, malpractice, patient mix, and 30-day readmissions all impact the day-to-day operations of a hospital. Rural hospitals have additional challenges: higher uninsured rates, higher poverty, distance from tertiary care specialties, loss of economies of scale in purchasing and reserves, and staffing shortages with less capacity to rapidly deploy additional staff. The COVID-19 pandemic brought hospital and rural community challenges into sharp focus.

Jiang et al\(^1\) provide an important analysis of the significant association of COVID-19 with the in-hospital mortality of non–COVID-19 acute illnesses, showing a general increase in mortality during the COVID-19 pandemic even among non–COVID-19 illnesses. Urban hospitals had increased mortality during the COVID-19 pandemic for 2 conditions (acute myocardial infarction [AMI] and gastrointestinal [GI] hemorrhage), whereas rural hospitals had increased mortality during COVID-19 for 1 condition (hip fracture). Both rural and urban hospitals had increased mortality for pneumonia and sepsis, with rural hospitals having slightly higher sepsis mortality. Neither rural nor urban hospitals had increased mortality from stroke.

In both rural and urban hospitals, there were relative increases in mortality from non–COVID-19 illnesses during the pandemic. The authors hypothesize that when faced with the overwhelming number and severity of COVID-19 cases, hospitals were unable to provide the same timely and level of care for patients without COVID-19. The sheer volume of serious illnesses was associated with increased mortality compared with before COVID-19. They rightly hypothesized that the increased mortality may have been due to the combined effects of resource strain, as more attention to COVID-19 was required, particularly access to intensive care and mechanical ventilation; delayed care due to hospital crowding; and delayed care due to patient concerns over presenting to a hospital full of COVID-19 infection at hospitals.

While they rightly attribute the COVID-19 pandemic as a likely cause for increased inpatient mortality, their analysis of rural hospitals is incomplete. The authors excluded transfer-out patients from their analysis. Interhospital transfer out of an urban hospital is a rare event, occasionally occurring due to insurance coverage or the need for specialized care for a rare condition. Transfer out of a rural hospital is a common treatment decision.\(^2\) Without careful attention to how interhospital transfer is handled in health care services research, bias against rural hospitals may be introduced into the analysis and interpretation of results.\(^3\)

If a patient presents to a rural hospital, the emergency department triage results in discharge, admission, or immediate transfer. Immediate transfer to another hospital is often not included in hospital discharge data (eg, the Healthcare Cost and Utilization Project and State Inpatient Databases). Patients admitted to a rural hospital may be discharged from that hospital, or they may be transferred to another hospital, often an urban hospital for more specialized care. Patients transferred from a rural hospital are not the same as patients admitted and cared for at a rural hospital.\(^4\) An analysis of the Cooperative Cardiovascular Study\(^5\) found that 28% of patients with an AMI were transferred. Transferred patients were, on average, 3.5 years younger than nontransferred patients and had significantly fewer comorbid conditions, lower predicted mortality, and lower 30-day mortality. No difference in mortality between urban and rural hospitals was found.
Transfer as Treatment

In many rural hospitals, transfer to an urban medical center is a triage and treatment decision. Just like any other treatment, the decision whether to transfer is based on the physician, patient, condition, risks, benefits, and shared decision-making.

Because transferred patients are not the same as patients who remain in a rural hospital, excluding transferred patients introduces significant bias against rural hospitals. Because transferred patients are younger, healthier, and have fewer comorbid conditions than those not transferred, the pool of patients with the best predicted outcomes is removed from a rural hospital, and patients who are older, sicker, and more complex remain. When this concept was first introduced nearly 2 decades ago, there was general skepticism. Health services researchers intuitively thought that rural hospitals transferred patients who were older and sicker. Why would a hospital keep the sickest and transfer the healthiest? But the data show that transferred patients are younger and healthier. When I practiced in a rural critical access hospital for over a decade, I often had older patients choose to stay at that hospital. Even after a robust conversation about potential benefits, some older patients chose to stay in a rural hospital rather than be transferred. Rural physicians make clinical treatment decisions with the patient, determining who is most likely to benefit from an interhospital transfer. Older patients with more comorbid conditions may not derive the same marginal benefit from an urban tertiary care hospital as a younger patient, and hospitalization in an urban hospital may include age-related risks associated with additional testing, invasive treatments, and iatrogenic injury. Older patients may choose to stay in a rural hospital to be near family and friends. Rural hospital transfer has not been adequately studied, so we do not know all the reasons why some patients are transferred and others are not; nor do we know the marginal benefit of transfer among a heterogeneous population of patients.

The authors focus attention on the greater increase in mortality from sepsis in rural (odds ratio, 1.35; 95% CI, 1.30-1.40) compared with urban (odds ratio, 1.27; 95% CI, 1.25-1.29) hospitals. Rural hospitals may have had more constrained resources and a much smaller workforce without the capacity to expand as quickly as urban hospitals and may have been unable to transfer patients to urban centers for advanced care. Decisions about who and when to transfer patients from rural hospitals may have been influenced by physician and patient concerns about exposure to COVID-19 at an urban hospital, with patients choosing to stay in a rural hospital rather than be transferred. Urban hospitals may have been unable to accept patients in transfer due to overcrowding from patients with COVID-19. Similar reasons for transfer decisions may have been seen among the patients with hip fracture. Given the closure or limited use of many urban hospital operating rooms and the perceived elective nature of hip surgery, rural hospitals without surgical services may have found that an urban referral hospital was unable to accept patients with hip fracture. Acute myocardial infarction and GI hemorrhage likely did not have the same relative elective considerations, and patients with AMI or GI hemorrhage were likely transferred from a rural hospital to an urban setting for definitive and intensive care. Further analysis of rural transferred patients and disease-specific transfer rates before and during the COVID-19 pandemic may shed more light on the impact of COVID-19 on rural hospitals.

Rural hospitals face common and unique challenges as they deliver care to anyone who needs care. In rural communities, economies of scale are not possible; rural hospitals face both chronic and acute resource constraint. Chronic constraint is due to smaller workforce, lower patient volumes, and smaller breadth of services (eg, less surgery or smaller or no intensive care units). Acute constraint is due to lack of buffer capacity for all of their services.

Interhospital transfer is a clinical treatment decision, not a random event. Transfer to an urban hospital is a big deal for patients, their families, and rural hospitals, requiring clinical and patient shared decision-making. Interhospital transfer is a unique rural treatment and deserves full consideration in health care services research.
REFERENCES


