

EDITORIAL

Building a Better System Through Deliberate Regionalization

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Over the past 2 decades, regionalization programs for patients with ST-segment–elevation myocardial infarction (STEMI) have been a remarkable success story in clinical medicine. These programs have addressed earlier gaps in care for patients with STEMI who need timely primary percutaneous coronary intervention, but were unable to access such care. For example, an earlier examination of STEMI regionalization in the American Heart Association Mission: Lifeline Accelerator-2 Project increased access to percutaneous coronary intervention with improved quality of care and improved outcomes.¹

See Article by Montoy et al.

Yet, it is important to remember that these efforts at STEMI regionalization represent extensive, long-term efforts by the cardiology and emergency medicine communities.² An ongoing and open question has been whether such efforts in STEMI may have unintentional but positive spillover effects for patients with non–ST-segment–elevation myocardial infarction (NSTEMI), a related condition that also often requires percutaneous coronary intervention. The implications for patients with NSTEMI would be important and suggest that regionalized systems of care could potentially benefit a range of cardiac care requiring specialist intervention (eg, cardiogenic shock).³

In this issue of the *Journal of the American Heart Association (JAHA)*,⁴ Montoy et al explore this

hypothesis. Using sophisticated econometric methods, the investigators rigorously analyzed exhaustive data over a 10-year period as STEMI regionalization programs were rolled out statewide in California. At first glance, improvements in angiography rates and mortality were found in patients with NSTEMI over time; however, after accounting for contemporary population-level trends, regionalization was not found to be the driver of these changes. Thus, the apparent answer is that we are not going to be so lucky with spillover effects but will likely need approaches that build on deliberate regionalization.

The concept and rationale for regionalization is firmly grounded in existing programs for STEMI, trauma, acute ischemic stroke, and out-of-hospital cardiac arrest.⁵ But how we think about their spread may require us to take a step back. Rather than building these programs one at a time, another approach may be to reimagine regionalization as a building block to broader access to care for time-sensitive conditions. This could help us design and scale systems in a purposeful manner so we can at least minimize the challenges that crosscut many conditions. As a simple example, the presence of siloed transfer systems is a problem for multiple conditions. How can we build and develop a universal regionalization system that is interchangeable across emergency departments for diverse disease processes? One can imagine that many components of a regionalized system for STEMI can be repurposed. However, the lesson of the article by Montoy et al is that such a formidable goal requires deliberate effort to realize.

Key Words: Editorials ■ non–ST-segment–elevation acute coronary syndrome ■ regional variation
■ ST-segment–elevation myocardial infarction

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Recognizing the challenge of dedicating resources compared with making them flexible, the field of operations management provides insight to help understand the challenges that scaling specialized services may entail. The development and implementation of a comprehensive regionalized system would require substantial investments to accommodate more disease processes. On the one hand, there must be sufficient availability of specialized resources in the form of equipment and staff to care for patients with unexpected medical emergencies. On the other hand, these expensive resources must be flexible enough to accommodate nonemergent cases to defray the cost of universal availability and readiness. Moreover, a comprehensive regionalized system must be flexible enough to address emergencies that are cardiac, traumatic, or neurologic in nature. This may be reflected in what many think of as the modern-day academic medical center: everything for anyone, at any time. But the access to and viability of such care is fragile and constantly threatened, as recently exposed by the coronavirus disease 2019 pandemic. There is a delicate balance required between flexible and dedicated resources. With too much flexibility, the cost to maintain such systems climbs exponentially and may not improve performance.^{6–8}

The trade-off between the resources needed and the need for customization further impacts how such specialized services are managed and the accompanying challenges that arise. These impact the long-term survival of such services.^{9,10} Health care already requires high-intensity use of resources and provides highly customized services. To subsequently take one already hyperspecialized service provided through STEMI regionalization and think that it may have benefits for even closely related NSTEMI assumes that regionalization does not require customization. Scaling regionalization requires a deliberate focus and necessary but sufficient customization. Applied to NSTEMI, there may be additional personnel needs as scheduled procedures may be interrupted more frequently at the intervention sites as demand increases even if the equipment may not differ. Outside of the intervention suites, the implementation and awareness of guidelines along with a change in perception and provider understanding would similarly be necessary.

Such a vision will require addressing other important considerations. First, is the county level, as used by Montoy et al, the right unit of analysis? Hospitals will do what is economically advantageous and may develop their own networks outside of local government boundaries. Thus, the county may not be the right level for regionalization as economic incentives are powerful, especially with the decline of the county-level measure, seen particularly in California, where this work was done.¹¹ Even if valid, the county-level approach may not generalize to other communities in other areas. Are

there other measures of regionalization that capture the networks of hospitals valid and more applicable?

Finally, we need to consider opportunity costs with these programs. Is sequential regionalization for condition after condition how we should invest limited resources? If so, how do we decide what conditions may be worth it? A condition like NSTEMI has resource overlap with STEMI, but may not warrant the resource expenditures needed to justify the cost. Alternatively, a condition like out-of-hospital cardiac arrest may require more customization but have more benefits for patients.

In summary, this study by Montoy et al did not find an association of STEMI regionalization with improved outcomes in patients with NSTEMI. However, the study holds important clues for how we could scale regionalized programs for cardiovascular and noncardiovascular conditions more broadly. On the basis of the evidence to date, we are unlikely to unlock these efforts without a direct, concerted effort focused on deliberate regionalization.

ARTICLE INFORMATION

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Disclosures

None.

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