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Commentary: Database research—an exercise in futility?

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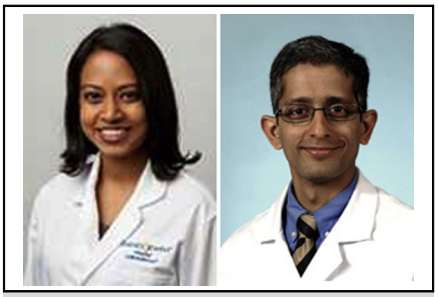

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CENTRAL MESSAGE

Database research can be of value to thoracic surgeons when rigorous statistical methods are used and careful selection of data sources is performed.

The use of administrative and clinical databases in cardiothoracic surgery has experienced exponential growth over the past 2 decades.[1] These publications represent the growing presence of health services research (HSR) in cardiothoracic surgery. Big data have the ability to inform clinical practice and guidelines. However, the actual impact of HSR on thoracic surgical practice is difficult to quantify.

Shemanski and colleagues[2] used qualitative methods to better understand the utility of HSR to thoracic surgeons. Their study has limitations, including a small sample size and a majority academic surgery presence. However, their study represents one of the few to examine thoracic surgeons' perceptions of HSR. The majority found HSR to be problematic because of less rigorous methodology compared with randomized controlled trials (RCTs), selection bias, and lack of granularity of data sources. Although studies could spark interest for future hypothesis generation, interviewees found little utility beyond that.

However, the value of database studies should not be completely discounted. Although database research will not meet the same methodological rigor as RCTs, they still serve an important purpose. RCTs are expensive and time-intensive, and can be difficult to complete because of challenges in patient recruitment.[3] Additionally, databases can allow us to examine the adoption of new technologies and therapies, from minimally invasive surgical approaches to immunologic therapies for cancer.[4] Finally, big data can be useful in identifying health disparities in access to care and delivery of guideline-recommended care.

Nonetheless, the critiques of HSR identified by Shemanski and colleagues[2] are valid, and their study identified major areas for improvement. First, the standard of peer review for HSR publications must be more stringent. All too often, studies are published that do not include adequate risk adjustment.[5] Existing techniques including propensity score matching and multivariable regression analyses can be used in big data studies but are often poorly understood and inappropriately used. Additionally, researchers do not always perform a critical appraisal of the databases selected for particular research questions.[6] This can be particularly true of administrative databases, which do not contain granular data on lung cancer type, staging, or patient functional status. Researchers must carefully consider the strengths and limitations of the databases available.

It is important for big data practices to evolve to enhance the relevance and quality of HSR studies. Development of new statistical methods including machine learning will help strengthen the quality of risk prediction models derived from big data. Additionally, enhancing the types of data that large clinical databases capture will better allow researchers to study important clinical questions. For example, significant future developments to the Society of Thoracic Surgeons National Database will be the incorporation of patient-reported outcomes by inclusion of Patient Reported Outcomes Measurement Information System data.[7] This will provide outcomes data that are meaningful to multiple stakeholders.

Although database research includes inherent limitations compared with RCTs, their utility cannot be undermined. By incorporating more stringent review of HSR publications and encouraging the evolution of statistical

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methods and comprehensiveness of databases, HSR can serve a meaningful role in cardiothoracic surgery.

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Commentary: What do you think of health services research and practice guidelines?

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CENTRAL MESSAGE

A mixed-methods examination of surgeon perceptions of health services research and guidelines will allow us to better leverage our scientific knowledge and clinical acumen to improve patient outcomes.

Shemanski and associates[1] wondered how surgeons use evidence from health services research and practice guidelines to inform clinical decision-making. Through interviews and using qualitative research methods,[2] the authors identified 5 themes and potential variation in surgeon perspectives across age and practice type. These findings led the authors to question whether surgeons routinely use health services research and practice guidelines to inform clinical decisions. The authors plan to test this hypothesis using a survey. Their overall goal is to better disseminate scientific evidence and practice guidelines to inform clinical decision-making.

A strength of their investigation is the diversity of perspectives provided by the study population. The fact that some participants equated administrative database analyses with health services research suggests a poor understanding of a well-established field of scientific inquiry.[3,4] Others showed a good understanding that science incrementally builds knowledge to improve clinical decisions. Some participants said surgeons sometimes use research findings to bolster preferences and biases. Finally, participants identified common and legitimate concerns about trials (eg, feasibility, generalizability) and observational studies (eg, bias). The authors' planned survey may reveal findings that support their presumption of an opportunity to better disseminate scientific results. In addition, the survey may reveal other opportunities, such as increasing scientific literacy, improving the quality of thoracic surgical health services research, overcoming surgeon-level barriers to trial participation (eg, perceived lack of equipoise), and partnering with cognitive psychologists to further investigate how thoracic surgeons integrate scientific evidence into clinical decision-making.

Mixed perceptions about practice guidelines align with findings from another study. In addition to concerns over the timeliness of updates, generalizability of trial results to routine clinical

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