PROJECT INFORMATION

August 2018

Integrating Analytical Methods to Improve Comparative Effectiveness Research

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Organization

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What was the research about?

Comparative effectiveness research compares two or more treatments to see which one works better for certain patients. For example, research can see if medicines or stents work better for people with heart problems. Such research may include:

- *Observational studies.* A research team studies what happens when patients and their clinicians choose the treatments. Traits, such as age or health, may affect patients' treatment choices. These traits may also affect patients' responses to treatments. It may be hard for the team to tell if a patient's traits, the treatment, or a mix of the two affected how well the treatment worked.
- *Clinical trials.* The team assigns patients to a treatment by chance. Traits may affect a patient's ability to join a clinical trial.

In this study, the team tested ways to improve understanding of which treatment works better. First, the team compared different methods that account for things, such as patients' traits, that could affect results of observational studies. In the second part of the study, the team worked on ways to use all available data with a method called meta-analysis. This method combines data from both study types.

What were the results?

The research team first looked at combined observational data for all patients who could and patients who couldn't take part in clinical trials. Patients who could take part in clinical trials had, on average, better survival than patients who couldn't

take part in this type of study. The team found similar results about how treatments worked even when the team used different methods to account for things that could have affected the results.

The team found that meta-analysis results were more precise when the team combined data from groups of patients with data from other individual patients. Having more data improved precision.

What did the research team do?

The research team looked at medical data for patients with heart disease. These patients received medicine, stents, or open-heart surgery. Data came from 23,247 patients in the Duke Databank for Cardiovascular Disease. Data for 75,225 other patients came from published clinical trial and observational studies.

The team compared different statistical methods to account for things that could affect treatment results. The team also looked at data from people who could and who couldn't take part in a published clinical trial for heart disease treatments. Some patients, for example, may have been too sick to take part. Finally, the team used new meta-analysis methods to combine data from multiple studies.

What were the limits of the study?

The research team used patient data from only one disease database that had some missing patient data. The methods the team used may not fully account for this problem.

Future research could look at how well these methods work in studies of other common health problems.

How can people use the results?

Researchers may want to use this study's results for improving research methods for observational and meta-analysis studies.

To learn more about this project, visit www.pcori.org/Wong130.