PROJECT INFORMATION

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Creating and Testing Methods to Estimate Treatment Effect in Observational Studies with Three or More Treatments

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Organization

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What was the project about?

Comparative effectiveness research compares two or more treatments to see which one works best for which patients. But patient traits, such as age or income, may affect patients' treatment choices. These traits may also affect patients' responses to treatments. As a result, researchers may have trouble telling whether a patient's traits, the treatment, or a mix of the two affected how well a treatment worked.

Statistical methods called matching methods can help address this problem when researchers use patient data to compare the effects of treatments. Matching methods help researchers find data from patients who had similar traits such as age or race and received different treatments. Because the patients are similar except for the treatment they receive, the differences in patients' health can more likely be credited to the treatment. Existing methods work well for comparing up to two treatments. But they may not work with three or more treatments.

In this study, the research team created two new matching methods to compare the effects of three or more treatments. The team then analyzed the new methods under different conditions to see how well each worked.

What did the research team do?

The research team used a computer program to create test data that looked like real patient data. The test data had information on patient traits and treatments. The team then developed two matching methods.

The research team first compared the new methods with existing methods. They looked at which methods worked better to match similar patients more accurately. Then the team tested each new method under different conditions, such as comparing different numbers of treatments.

What were the results?

The new methods matched patients more accurately than the existing methods.

The two new matching methods worked well under different conditions. For example, one method matched patients well when comparing three treatments, but the other method performed better when comparing more than five treatments.

What were the limits of the project?

This study compared different matching methods on test data created using a computer program. Results may differ when using real patient data. Also, the methods may not be valid in all situations. For example, the methods may not be valid if patients have differences that can affect their health but are not reflected in the data.

How can people use the results?

Researchers can consider using these statistical methods in studies that compare the effects of three or more treatments.

To learn more about this project, visit www.pcori.org/Gutman317.