

100 Ways of Using Data to Make Lives Better

A series from The Farr Institute of Health Informatics Research showcasing the UK's most significant examples of using data in research

Using Data to Estimate the Effectiveness of Post-Surgery Chemotherapy in Breast Cancer Patients

A new research project aims to find out how much clinical trials can say about the benefit of chemotherapy in the treatment of breast cancer by looking at the data of patients in Scotland



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Public Health
Case Study 37

The Challenge

Over 4,600 women are diagnosed with breast cancer and around 1,000 people in Scotland die from the disease every year.

Over 500 patients with early breast cancer are treated with chemotherapy each year in Scotland, but it remains unknown whether the benefit from chemotherapy observed in clinical trials is the same in patients out-with the eligibility criteria of those trials. For example, half of new diagnoses of invasive breast cancer are in women over the age of 65, but the average age of women in trials is closer to 50.

Reliable alternative methods for estimating the effects (benefits and harms) of chemotherapy in these populations are urgently required to guide the selection of patients for chemotherapy.

The Research

In social sciences, a design called regression discontinuity (RD) has been widely used and has been heralded as a simple to implement and transparent method for providing “real world” effects of treatments, but it is underused in healthcare.

Now a research team from the University of Edinburgh, The Farr Institute and the Innovative Healthcare Delivery Programme (IHDP) seek to apply the RD model to breast cancer patients.

The project will be divided into three phases. The first phase will consist of preparing the data for analysis. Then, the scoring tools will be assessed and the feasibility of applying a RD design will be determined. Finally, estimates of treatment effects from the RD design will be compared to treatment effects extracted from the literature (based on clinical trials).

The very high quality and pre-existing linkage of Scottish healthcare and cancer registration datasets makes Scotland an ideal place to evaluate a new method to find out the following:

1. What benefit is gained from chemotherapy after surgical removal of early breast cancer in patients with characteristics such as advanced age or co-morbidities (one patient suffering from multiple illnesses) that have not been studied in clinical trials?
2. How valid are existing decision tools commonly used to help Scottish patients and clinicians decide whether chemotherapy is worthwhile?
3. How valid and feasible is RD, and can we use existing healthcare records to estimate the effectiveness of chemotherapy in situations where randomised trials are not possible?

The Impact

The results of this project will have direct clinical impact on Scots with breast cancer, who currently face treatment decisions made in the face of uncertain evidence. This project will also provide data to show if a larger UK-wide study of similar design is possible, and will have immediate international impact on the ongoing fierce debate about using chemotherapy in this situation.

For more information about breast cancer and treatment options visit breastcanceruk.org.uk

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