

Session 3: Analytics in Healthcare: From Theory to Practice 1:00 p.m. - 2:30 p.m.

Topic: Exploring Regional Variation and Survival in Colon Cancer Pathway Concordance

Speaker: Luciano Ieraci and Maria Eberg, Ontario Health (Cancer Care Ontario). With Katharina Forster, Bo Green, Erin Kennedy, Ontario Health (Cancer Care Ontario), Claire Holloway, Ontario Health (Cancer Care Ontario) and Department of Surgery, University of Toronto.

Time: 1:30pm-2:00pm

Abstract: Clinical pathways have been defined as structured multidisciplinary plans outlining care for patients with specific health conditions, such as cancer. Pathways are increasingly used in clinical practice and can improve some aspects of care. Measuring concordance of actual care with cancer pathway recommendations (i.e. reference pathways) could identify opportunities to improve care further. However, population-level pathway concordance measures for the entire cancer care trajectory are lacking. Investigations of pathway concordance with specific patient outcomes is also absent in published literature. In the current analyses, we have developed both a characterization of pathway concordance and found its association with overall patient survival.

Measuring the difference between reference and observed pathways was facilitated by using pre-existing methods on string similarity. Each pathway can be represented as a sequence of events and comparisons made between reference pathway sequences and observed sequences according to the events actually received by patients. Levenshtein distance is one such comparison algorithm. We developed a measure based on the Levenshtein algorithm to quantify concordance with a simplified colon cancer pathway map. To develop and validate it, we used a cohort of stage II and III colon cancer patients diagnosed from 2012-2016 in Ontario, Canada. We investigated association between concordance and patient survival at the population level, and compared the measure's discrimination between survivors and decedents. Concordance scores were significantly associated with patient survival and discriminated between more patient pathways. We also examined the variation in concordance scores across health regions and characterized the differences by comparing the prevalence of specific patient subgroups across regions.

Overall, our Levenshtein-based measure incorporated differences between actual care and simplified pathways, was strongly associated with patient survival, and demonstrated good patient discrimination. The developed measure is a potentially valuable tool for health system performance monitoring and quality improvement.