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PEAC Events: identification of Predictable, Expensive, Avoidable, and Cardinal events within a learning health system.

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Objectives

The objectives of this project are to identify patients that can be recruited into specific interventions and the optimisation of the delivery of such interventions, in order to improve access to health services, equity of service delivery, and patient outcomes.

Approach

The entire linked Western Australian Data Collections from 2002-2015 (including population-wide hospital admissions, emergency department presentations, cancer registry records, mental health care, maternity records, and mortality records) were examined. To identify patients at risk, a definition of a 'PEAC' event was developed. This acronym reflects the following criteria for such events. First, the event should 'predictable', i.e. either able to be easily predicted, or able to predict subsequent poor patient outcomes (for example, death). Second, the event should be 'expensive', i.e. be associated with significantly increased levels of individual healthcare utilisation and/or mortality. Third, the impact of the event should be 'avoidable', i.e. an evidence-based intervention should exist that may delay or completely avoid the event, or reduce its sequelae. Fourth, the event should be 'cardinal', which in this context indicates that the event should be clearly and unambiguously defined and recognisable, and specific enough to assign an effective intervention. Once PEAC events were identified, geospatial and predictive modelling of future events were then used to inform clinical service delivery, alongside appropriate return-on-investment analysis to support intervention. Finally, the entire process was embedded within a learning health system, linking research, policy, and practice, to drive ongoing improvement.

Results

Exemplar PEAC events will be described, including hospital admission events associated with chronic disease, mental health, and dental/oral health. The predictability of such events in individuals using statistical models fitted to the available administrative datasets will be presented, along with the sequelae of such events in terms of healthcare use and mortality. The optimisation of delivering interventions targeting PEAC events will be described, along with the process of translating findings into policy and practice within the context of a learning health system.

Conclusion

The identification of PEAC events allows for targeted delivery of healthcare interventions in a manner that not only optimises access, equity, and outcomes, but also permits ongoing improvement of the health system.

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