



NETIMIS

CASE STUDY

Modelling Improvements to
the Paediatric Ambulatory
Care Pathway at Bradford
Royal Infirmary

Overview

This case study has been conducted as part of a final year project for the University of Leeds, in collaboration with both X-Lab Ltd and Bradford Royal Infirmary (BRI). It involved working with the Ambulatory Care Department at BRI to simulate the effects of wide adoption of a recently piloted pathway implementation. The purpose of the simulations was to estimate the potential reduction in hospital admissions, as well as a cost analysis of the wider adoption and the use of the new pathway. Connected Health Yorkshire were a stakeholder in the study, and if the new pathway could be proven to deliver efficiency improvements, it could be adopted by other hospitals involved with the connected health cities project. Bradford City Clinical Commissioning Group (CCG), identified Asthma as a target for improvements as a component of its Bradford Breathing Better Programme launched in January 2017. The CCG report that between 10-40% of patients are non-compliant with their medication regimes, and this non-compliance can contribute to preventable hospital admissions – suggesting that hospital admissions could be reduced through better discharge advice and patient education.

About

In efforts towards achieving the goals of the CCG, the BRI Ambulatory Care department have introduced a pilot pathway for 'wheezing children' (children displaying symptoms of asthma or other respiratory conditions) to improve the linkage between primary, secondary and community care in the region. Due to the pathway having been recently implemented, there is relatively low uptake, and a requirement to understand the cost implications of having the pathway in wide use as well as how many patients could benefit from use of the pathway. The modelling can then be used to demonstrate the benefits of utilising the new pathway to GP services and BRI staff to increase the volume of referrals on to the new pathway.

Challenges

Bradford Teaching Hospitals Foundation Trust (BTHFT) serves a high child population and around 30% of hospital admissions are children. Recent increases of patients using emergency care as the initial care provider are causing strains on the secondary care services. In the case of childhood asthma, it is estimated admissions could have been prevented in 75% of cases, and that only 20% of patients currently receive the level

of care they require. It is thought that with better emphasis on educating patients and their families on how to manage the condition, more admissions could be prevented through effective self-management.

Solution

The pilot 'wheezy child' pathway entails a home visit by a community nurse for one to three consecutive days. The nurse reports back to a consultant in the hospital at intervals during the day to report the patient's condition and this provides an opportunity for intervention. Children could be referred on to the new pathway from either their Primary Care service (GP) or from the Children's Emergency facilities at the BRI. The visits have an emphasis on the education of patients and their families to improve self-care in the community and maintain the opportunity to admit the patient to secondary care should it be in their best interest.

NETIMIS was used to first model the 'past state' process, before the pilot pathway had been introduced. A combination of interviews with domain experts and anonymised data extracts from the Bradford Royal Infirmary's Electronic Patient Record (EPR) system were used to inform and calibrate the model to be reflective of the real care pathway.

Then, a 'future state' model was created using NETIMIS, this time incorporating

the new 'wheezy child' pathway. Further domain expert interviews and a dataset of all referrals on to the new pathway were used to inform the configuration of the future state model before the models were run side-by-side and the results compared.

How NETIMIS Helped

The outputted reports from the NETIMIS simulations enabled an understanding of the potential reduction in admissions associated with wider use of the new pathway. There was shown to be an overall reduction in hospital admissions, as well as a reduction in the total cost of care after 500 patients had interacted with the system.

The visual models provided a communication aid that could be used by the BRI when demonstrating the new care pathway's benefits to GPs, which was revealed as the next step in the pathway implementation.

Conclusion

NETIMIS was able to facilitate the accurate simulation of both the past and future state of the pathway. Through analysing the NETIMIS reports, it was determined that fully implementing the 'future state' pathway could, if widely adopted, reduce the overall cost of care, and reduce hospital attendances and admissions among the children of Bradford.