



# NETIMIS

## CASE STUDY

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

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# Overview

This case study has been conducted as part of an undergraduate project for the University of Leeds in collaboration with X-Lab and Bradford Royal Infirmary (BRI). It involved working with the Ambulatory Care Department at BRI to simulate the effects of the wide adoption of a recently piloted pathway simulation. The purpose of this was to estimate the potential reduction in hospital admissions, a cost analysis of its wider adoption and the value of alternative pathways.

Bradford City Clinical Commissioning Group (CCG), identified Asthma as a target for improvement in its Bradford Breathing Better Programme that was launched in January 2017. The CCG reported that between 10-40% of patients are non-compliant with their medication regimes and this non-compliance contributes to preventable hospital admissions. This suggests that hospital admissions could be reduced through better discharge advice and patient education.

## About

In an effort 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). This aims to improve the linkage between primary,

secondary and community care in the region. Due to the pathway having been recently implemented, there is a relatively low uptake. The 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 has, therefore, not been met. 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; 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 that 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 effectively self-manage the condition, more admissions could be prevented.

## 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 which provides an opportunity for an intervention. Children could be referred on to the new pathway from either their primary care service (usually their 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 first used to model the 'past state' process before the pilot pathway had been introduced. A combination of interviews with domain experts and anonymised data extracts from BRI's Electronic Patient Record (EPR) system were used to inform and calibrate the model to be reflective of the real care pathway.

A 'future state' model was created using NETIMIS which, this time, incorporated the new 'wheezy child' pathway. Further domain expert interviews and a dataset of all referrals onto the new pathway were used to inform the configuration of the future state model.

## How NETIMIS helped

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

The visual models provided a communication aid that could be used by 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.