Was Not Brought, Sheffield Children's NHS Foundation Trust

Summary

Sheffield Children's have used funding from the National Paediatric Accelerator Programme to license an artificial intelligence (AI) tool that predicts a child's risk of not being brought to their outpatient appointment. The algorithm uses sixty variables, including patient demographics, deprivation score and previous appointment attendance. Use of this tool has allowed the service improvement and outpatient teams to target support to families most at risk of not being able to attend. For example, by providing access to transport for those who require it.

"Across a three-week period, we were able to evidence 65 additional attendances through this model."

Context

The elective recovery challenge

The Sheffield Children's NHS Foundation Trust Was Not Brought intervention was established to address the COVID backlog in paediatric care as efficiently and effectively as possible. The Trust is part of two accelerator programmes that aim to reduce waiting lists, one of which is the National Paediatric Accelerator Recovery Programme. This Programme brings together the Children's Hospital Alliance, ten NHS Trusts committed to delivering care for children in innovative ways, while targeting health inequalities, reducing variation, and providing long-lasting change across systems.

The health inequalities challenge

Prior to the pandemic, Sheffield Children's had a was not brought rate (did not attend rate) of more than 11%. Further analysis identified predictable patterns across different postcodes and communities, with a significant difference in the was not brought (WNB) rate between children living in the least deprived deciles compared with children living in the most deprived deciles. This difference was even more striking in the Roma community, where the rate was closer to one in three.

The aim of *Was Not Brought*

Sheffield Children's use of the AI algorithm aims to support families to attend outpatient appointments by removing barriers to attendance, with a focus on transport.

Intervention

Summary of *Was Not Brought*

Was Not Brought uses an AI tool developed by Alder Hey Children's Hospital to predict the likelihood of a child attending their appointment. The AI algorithm uses sixty variables to predict this risk, many of which relate to health inequalities. When applied to Sheffield's population, the algorithm highlighted that children living in more deprived communities and in homes where English is not their first language were most at risk of not being brought to their appointment. A previously completed root cause analysis exploring reasons for non-attendance identified five main causes. One of these was the difficulty in getting transport to appointments. To specifically target this, the Was Not Brought team (the team) offered pre-paid parking permits, bus passes and taxi journeys, to families of children at higher risk of not attending their appointment.

Enablers of delivering *Was Not Brought*

Using data

Relevant data in the Patient Administration System such as ethnicity, past non-attendance and indices of multiple deprivation score for each child on the waiting list is input into the algorithm on a weekly basis. Children are then stratified by their risk score of not attending, informing the intervention provided. Parents of children who have a 50-70% risk are sent an SMS message two weeks prior to the appointment asking them to contact the outpatient department if they are struggling to attend, with a follow up offer of support with transport if required. Parents of children with a risk score of more than 70% are contacted by telephone to ask what support they might need to attend. In addition, families living in more deprived communities are known to move address and change contact number more frequently, so the team has been working to ensure contact information is regularly checked and updated, enhancing data quality.

Involving patients

Conversations with children and their families were central to the work done by the team to understand the root causes of children not being brought to appointments.

Involving staff

Sheffield Children's Hospital has an ongoing programme of work to modernise the outpatient services, supported by a clinical lead. As part of this programme, there has been a sustained focus on improving WNB rates and reducing health inequalities. As a result, senior management and staff across the Trust were receptive to and supportive of piloting the Was Not Brought intervention. The service improvement team promoted the pilot in staff communications and delivered presentations to inform staff of process changes.

System involvement

The ICB is supportive of Was Not Brought as part of their wider focus on decreasing inequalities, particularly for Sheffield's more deprived communities, including the Roma community. The funding to purchase the bus passes, parking permits and taxi journeys was provided from the COVID recovery fund at Sheffield City Council. The service improvement team engaged with local bus companies to provide the bus passes. Mindful of digital exclusion, the team worked with the companies to deliver a low-tech transportation offer, consisting of the team sending scratch-off bus tickets in the post.

Findings and reflection

The changes observed

The main outcome of interest for this intervention is the WNB rate. Potential cost savings are also reviewed using a proxy tariff of £120. This accounts for specialist and secondary care services, as well as the difference in cost of a first versus follow-up appointments. Over the course of the three-week pilot, we evidenced that 65 additional appointment attendances were supported by the intervention. This prevented £7,800 worth of clinical time being lost.

The lessons learnt

- Conversations with parents can reveal the actual barrier to attendance. Travel is not always the main barrier to attendance, but having a conversation allows underlying barriers to be explored and better understood, and if possible, addressed. Some alternative solutions involved rescheduling appointments to a more suitable time and issuing Learning Disability and Autism passports.
- The contact process required fine tuning. Parent or guardians were found to be more likely to answer the phone if contacted between 12pm and 8pm.
- As part of the National Paediatric Accelerator, the team collaborated with Birmingham Children's Hospital to pilot the intervention and share learning.

The *Was Not Brought* team recommend

- Considering how quickly the data that is entered input into an AI algorithm goes out of date. While the team upload the outpatient appointment data every week, they found that appointment changes and clinician availability was better accounted for if the data is uploaded more frequently.
- Recruiting staff from the communities you work with to contact families. This can increase understanding of barriers to attendance, as well as reduce the need for interpreters.

Allowing plenty of time to establish the Data Sharing Agreements with other organisations.

Useful references/resources

- *National Paediatric Accelerator using Alder Hey's AI tool to identify risk of missed appointments*