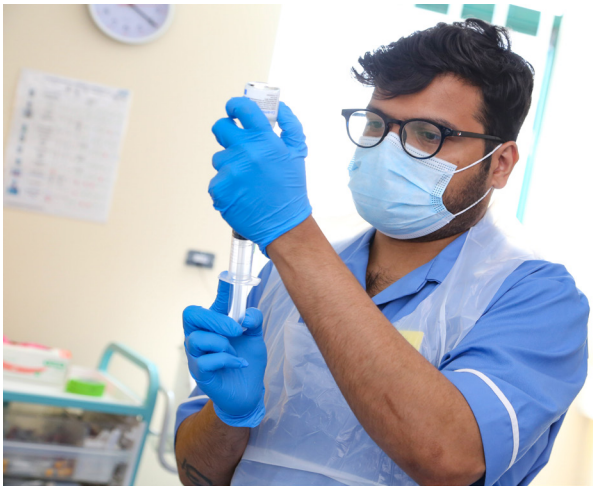
Workforce Analytics

New data science solution enables NHS organisations to predict which employees are at risk of leaving

As the NHS faces up to an ongoing recruitment crisis and high levels of staff turnover remain a major challenge for trusts up and down the country, an innovative new partnership between NHS Shared Business Services (NHS SBS) and Medway NHS Foundation Trust is using workforce data analytics to improve staff retention by predicting – with 95% accuracy – which individual employees are at increased risk of leaving.



The challenge

At the height of the Covid-19 pandemic, the NHS in England – according to figures from The Health Foundation* – faced a workforce shortfall of over 115,000 full-time equivalent (FTE) staff, with projections this will double by 2025/26 and exceed 475,000 by 2033/34.

With such stark figures highlighting the scale of the NHS staffing crisis, the critical and pressing need for NHS trusts to do more to retain their existing employees is clear.

High levels of attrition amongst nursing staff, in particular, can have a significant impact on both patient care and hospital finances. A large acute NHS trust with over 3,000 nurses, for example, will typically have a turnover rate of between 10-12%. This means needing to recruit more than 300 new nurses on an annual basis. With the total financial impact of replacing a fully-trained nurse estimated to be anything up to £12k, this equates to a minimum spend of £3.6m every year.

Even a modest reduction in nursing turnover, therefore, has the potential to save millions of pounds for an individual NHS trust, whilst ensuring a happier and more productive workforce.

In common with NHS organisations around the country, Medway NHS Foundation Trust has looked to address its nurse retention challenge. With over 1,300 registered nurses and an annual turnover rate of 14%, its workforce team was keen to explore innovative ways to use data to improve nurse retention – with the aim of developing a successful model that could also be rolled out to help NHS colleagues across the country.

James Kendall, Head of Workforce Intelligence at Medway NHS Foundation Trust, explained:

"Like the vast majority of NHS trusts we have needed to increase our nursing numbers in recent years to be able to meet rising demand for our clinical services. And we have done so successfully, with the number of NMC registered staff steadily growing from around 1,110 FTE nurses in 2015, to over 1,300 today – with a nursing vacancy rate that has reduced from 34% to 9% in the last five years.

"Attracting staff to the Trust in the first place is obviously essential, but what we are increasingly focused on is how we then keep them.

"In most cases an employee's decision to leave is made up long before they resign from their role. With this in mind, we worked with NHS SBS to pilot a solution that analyses workforce data to predict employees who are at high risk of leaving and the reasons why.

"Whilst the potential benefits to our own organisation were significant, we also knew that any success we had could be replicated elsewhere and have a far-reaching impact for the wider NHS."

*The Health Foundation, 'Going into COVID-19, the health and social care workforce faced concerning shortages', May 2020

The solution

Medway NHS Foundation Trust worked alongside data scientists and workforce experts from NHS SBS to analyse historic data from staff and leavers over a five year period. The aim was to prove that statistical modelling could be used to accurately predict an employee departure.

The subsequent Workforce Analytics solution was developed to analyse employee information – predominately from the NHS Electronic Staff Record (ESR) – and produce a forecast of expected leavers.

The model identifies and assigns a weighted numerical risk score to a range of primary and secondary factors, which when combined can determine the probability of an individual leaving.

To increase the accuracy of the predictive analytics, a large number of factors are analysed. These include an employee's salary, the length of time they have been in their current role, the distance they travel to work, the area they work (e.g. hospital ward), and personal circumstances such as recorded stress or special leave taken.

As part of the solution, analytical reports are provided to the Trust identifying those at increased risk of leaving and including actionable insights to address the risks.

In addition, the intelligence provides the organisation with the ability to identify and focus interventions on those individuals who are in posts that are very difficult to fill.

The reports also enable the Trust to identify any specific teams or departments of increased concern, for instance, a hospital ward with the highest average flight risk score.

James added:

"Having such valuable insight enables us to actively address an employee's reasons for wanting to leave before it's too late. This means better retention rates, improved staff morale, significant recruitment cost savings and greater overall organisation stability."

The result

The Workforce Analytics solution is bespoke to an NHS trust – recognising that factors will be weighted differently depending on an individual organisation.

At Medway NHS Foundation Trust the model was refined until it was capable – when tested against real data – of predicting leavers with an impressive 95% accuracy over a given period.

The result is a solution that enables an NHS organisation to calculate the likelihood of their current employees leaving, for example, a nurse with a 75% flight risk based on statistical analysis.

At Medway, the three most common primary factors linked to an individual's risk of leaving were salary, the length of time an employee had worked at the Trust, and their age.

The most frequently identified secondary factors at the Trust were the time an employee had spent in their current role, whether the post was full-time or part-time, and their sickness record.

When applied to the Trust's current workforce, this intelligence helps to inform appropriate interventions, such as the need for greater line manager engagement through appraisals and 1:1s, any potential opportunities for new or changed roles, flexible working arrangements, and providing financial wellbeing support.

James said:

"What the NHS SBS Workforce Analytics solution has given us is an unprecedented level of intelligence, packaged in a way that enables us to make meaningful interventions for the good of the Trust and our employees.

"We expect this to be completely game-changing when it comes to implementing our People Strategy successfully – saving the Trust considerable time and money when it comes to recruitment costs, but also helping us to make the right decisions to support employee wellbeing.

"Having this new service at our disposal will help lead to a happier and more productive workforce, which is focused on providing the highest quality patient care."