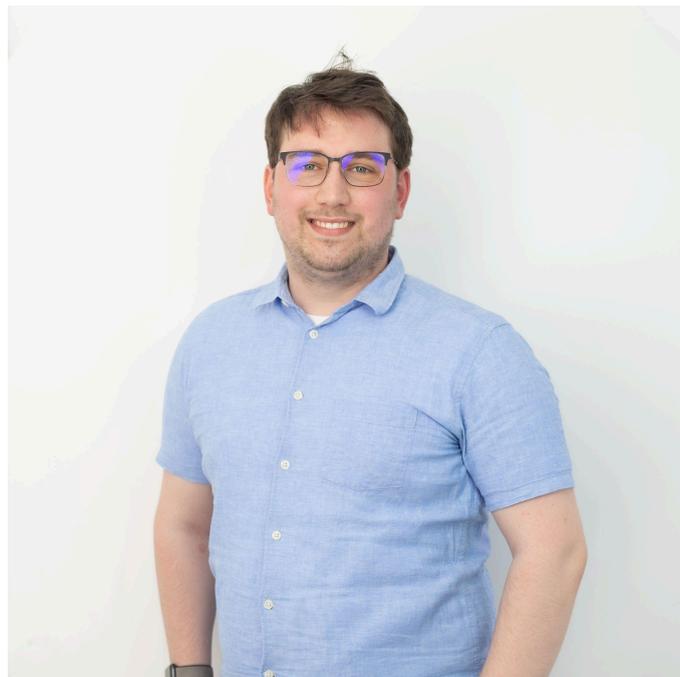




# Advancing Complex Autism Care Through Data-Driven Research

*A Research & Innovation White Paper*



**Written By Oliver Bilich**  
R&D Lead  
Fairmont Residential

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Fairmont Residential Ltd

## The Importance of Research in Specialised Adult Autism Care

The iterative process of reviewing and improving upon our care approaches has always been a fundamental part of Fairmont Residential's operation. With the introduction of digital care records at the start of 2024 however, our care data is more accessible than ever before, allowing us to perform regular, and even automated, analyses on vast amounts of data points. Our dataset currently comprises of 900 thousand recorded interactions containing over three million data points. This enables us to deepen our insights into routines and behaviours, allowing us a better understanding of the people we care for.

## The Impact of our Research

Combining the vast care experience of our staff with our digitally recorded data, we are able to uncover previously unseen trends and patterns through the bulk analysis and processing of our digital data, leveraging a wide range of tools, such as statistical models or machine learning based approaches.

This data-driven decision-making process allows us to improve care outcomes through changes backed by uncovered insights, through measurable metrics. An example of this is performing risk-assessed staff optimisation. By identifying when additional support has the greatest impact and need, we are able to reduce costs and give our service users the greatest possible level of autonomy, while still always guaranteeing a safe environment and an excellent standard of care.

Through structured, data-driven risk assessments, we identified two service users with aligned routines and consistently low historical risk during overlapping periods. This evidence enabled us to implement a shared staffing model, replacing individual additional staff members with a floating staff resource available as required.

This approach safely optimised staffing levels, reduced restrictiveness, and delivered meaningful cost savings without compromising quality or outcomes. For commissioners, this clearly demonstrates how evidence-based service design can protect frontline care while ensuring long-term financial sustainability — a critical requirement for the future of care delivery.

Similarly, medication adjustments for a service user experiencing frequent seizures were guided by objective data analysis. We reviewed measurable indicators including seizure frequency and duration, sleep quality, overall presentation, and qualitative wellbeing measures. This enabled us to achieve a better balance between effective clinical management and overall quality of life, while reducing adverse side effects such as reduced energy, lower engagement, and fatigue.

Because both initiatives were grounded in clear, sound, research-based evidence, all stakeholders were able to confidently review and formally sign off on the changes.

## Future Pathways of Fairmont's Research

Fairmont currently employs a range of analytical tools to interpret our digital care data and extract meaningful insights. These include statistical models, machine learning techniques, and AI language models, enabling us to make effective use of our detailed text records and the contextual information they contain. Using the power of machine learning and AI, we are developing predictive models that are able to assist staff with anticipating time periods of increased risk behaviour, based on real-time digitally recorded data.

While Fairmont's research always aims to improve the care outcomes for our service users by providing better insights into behaviour and routines, we appreciate that our ever-growing dataset of high-quality records can equally provide helpful and valuable insights to the benefit of the wider autistic community, especially adults with ASD. We are collaborating with Professor Geoff Bird and UCL and providing parts of our care data in order to support this important research.

These developments provide the foundation for adopting technological advances both within and beyond the care sector. In the short term, many technologies already used in other industries are readily available and have the potential to enhance our care outcomes. Smart sensors and other IoT devices can provide frequent, rich, and precise data, improving the accuracy of insights. At the same time, they can reduce the administrative burden associated with more basic recording tasks, allowing staff to focus more on complex high-value observations that leverage their professional expertise and experience, further strengthening our person-centred care.



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