

IMPACT REPORT:

Key findings on
population health
from an AI
prediction and
health coaching
model

Foreword

It's estimated that preventable admissions occupy up to 20% of the 23 million annual A&E visits across the country. This enormous burden strains limited resources and restricts access for many patients in need. Overcrowding also remains an issue, with hospitals becoming dangerously full, coupled with the challenges faced by the failure to discharge patients who are medically fit to leave. All of this leads to a severe and unrelenting logjam in A&E departments.

Against this challenging backdrop, new care models such as health coaching are increasingly being explored as measures to help alleviate pressure on hospitals. And while there are many good examples of positive impact, existing coaching programmes have rarely undergone a robust evaluation to measure their survival impact and life quality gains. That is, until now, and our [newly-published paper](#) in the Emergency Medicine Journal.

As recent studies have established a positive association between extended A&Es waits and deaths, we were interested to learn whether 'AI-Guided Clinical Coaching' - a model using AI to predict and case-find high risk patients - could demonstrate a reduction in mortality for those patients enrolled on the programme. We also wanted to provide insights into how mortality impact varied by age, gender, and deprivation status. This is the first UK study of its kind using AI and machine learning prediction techniques, coupled with health coaching.

We found that the intervention was associated with reduced mortality **by almost 50 per cent in elderly males aged 75 and over**. This represents 128 lives saved for every 1,000 treated, or one life saved for every eight patients treated over the course of two years. These findings are nothing short of remarkable, and warrant further investigation to identify the factors driving this reduced mortality.

In this document, we look at how this national trial came about and learn about some of HN's other work in this area. Most importantly, we hear from a patient who has experienced the programme, to better understand the real-world, human impact of AI-guided coaching. It's clear from the findings of this study that AI-powered intervention holds immense potential. Using a digitally enabled triage process like this, we can begin to identify and help patients in new and innovative ways, and deliver truly personalised care to all patients in the process.



Dr Joachim Werr
Founder and Executive Chair
HN



What is anticipatory care?

The concept of anticipatory care, along with personalised care, became a fundamental ambition of the NHS Long-Term Plan published in 2019. This model of care aims to prevent and delay chronic disease by taking a proactive approach. It identifies people who are living with long term conditions and helps them to manage their condition to reduce the risk of their health worsening, and to prevent them from needing to attend hospital.



What is health coaching?

Health coaching care models help individuals, who have one or more long term health conditions. It enables them to develop an understanding of what they can do to improve their own condition and supports that person with developing confidence to manage this themselves. This might be achieved through health literacy or by enabling them to create appropriate coping mechanisms. It eventually supports them to develop a willingness to effectively and proactively manage their own health rather than relying on their local A&E or GP surgery.

About the RCT

- HN's trial was approved by the Health Research Authority and adopted by the NIHR as a commercial multicentre randomised controlled trial. The Nuffield Trust provided project oversight and the predictive analytics service was delivered by HN.
- Patients identified by the AI were randomised either to NHS standard treatment or HN's nurse-led care and coaching intervention that lasted 6-9 months, with weekly tele-coaching appointments.
- The national study was conducted across eight NHS hospital trusts. The analysis was performed on 1,688 participants with a full population of 1,767 patients, using a specialised AI algorithm on their routine health data, identifying patients at high risk of disease progression and emergency care.
- Researchers then provided these patients with either standard NHS care or remote, telephone-based preventative clinical coaching, led by nurses.
- Mortality data were extracted from the national SPINE dataset for all trial participants and each participant was followed for at least 24 months after their enrolment into the trial.

Key findings of this study

- Health coaching could have a significant impact in reducing mortality in elderly males likely to consume unplanned care.
- Males (aged 75 and over) who received HN's service in the study were 46% less likely to die within 24 months of being recruited onto the service.
- There was almost a 20% reduction in mortality in all groups, however this statistic must be treated with caution as it was not found to be statistically significant. More research needs to be done to validate this.
- In this group, for 8 males treated, one extra life was saved over the course of the two year trial. This could be compared to pharmaceutical treatment with statins, which have become synonymous with “heart-attack-and-stroke-preventing,” avoiding one heart attack for every 60 patients treated for five years and one stroke for every 268 patients treated for five years

What does this mean?

- Data-driven prediction models designed using hospital data can help identify the amenable patient population, and prevent them from entering clinical crisis
- This approach combined with health coaching could also influence patients' survival rates.

How this helps ICBs

- Reduces health inequalities as patients who would usually present late can be identified and proactively contacted
- Guides clinical decision making for targeted prevention, triaging and clinical prioritisation
- Frees up capacity to support elective recovery.

Summary

Our study has shown that HN's model may prevent early mortality in certain groups. Predicting unplanned hospitalisation using routinely collected secondary care data, and supporting at-risk patients earlier with remote, anticipatory care could help save lives and address gender-related health inequalities.

The findings of this study highlight the health inequalities which are driven by patient gender. More needs to be done to help patients with health inequalities get access to the care they need. HN's solutions help form part of the solution, as it is proactive in both identifying patients in need and reaching out to them to offer additional support.

AI screening followed by coaching **reduced deaths amongst elderly male patients, showing **46% fewer deaths for those aged 75 and over.****



Compared to pharmaceutical prevention methods such as statins, which avoid 1 heart attack per 60 treated patients over 5 years and 1 stroke per 268 treated patients over 5 years, the impact for these older males was much more pronounced.

The study does not explicitly explain why older males responded well to the intervention. However, one potential factor is that elderly males tend to underreport health issues to doctors. An outreach model that proactively identifies high-risk older males through AI screening and offers preventative care may effectively overcome this disclosure reluctance. By reaching out to elderly males with interventions irrespective of self-reported complaints, their health risks can be managed earlier than otherwise possible.

For males aged 75 and over, the intervention demonstrated a substantial positive impact, with **one additional life saved for every 8 elderly males receiving the intervention**



Patient story

Peter Elcock, 58, struggled daily with the burden of multiple chronic health conditions. As a diabetes patient, he constantly had to monitor his blood sugar levels and medications. On top of that, Peter also faced ongoing battles with depression and anxiety, creating mental health obstacles.

Other ailments like nerve damage in his feet added to the list of issues he managed. For Peter, every day felt challenging. His declining health meant Peter's quality of life suffered greatly, robbing him of joy and independence. He needed solutions—not just to treat his illnesses, but to truly improve his wellbeing. Peter was stuck in a cycle of just coping, unsure how to get his life back.



When Peter's doctor referred him to a new preventative health coaching programme, he was sceptical how regular telephone calls with a health professional could make a difference. But what Peter didn't realise was that advanced AI algorithms had anonymously detected his profile within routine health data, identifying him as high-risk for deterioration and hospitalisation. By flagging patients like Peter proactively, he could receive treatment in a timely and personalised manner, giving him the best possible chance of recovery.

Peter agreed to the coaching programme and soon felt the positive impact of having his own dedicated clinical coach. During Peter's coaching, the AI platform continued running in the background, monitoring his risk trends to strategically adapt the care plan. The coach accessed real-time insights that only this AI tool could provide, revealing the nuanced health signals within Peter's data profile.

Armed with this intelligence, Peter's clinical coach was able to take immediate action, recommending Peter adjust his medications and get additional tests his doctors had overlooked. Peter was amazed at the level of personalisation - "It was like this programme could predict my needs before even I knew them!

Within weeks, Peter's health was turning around. He credits this transformation to the power of the AI prediction technology paired with the compassion of human coaching.

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"The AI spotted risks my doctors had missed. By taking action early, my coach helped me avert a crisis. Within weeks, my health was improving in ways I never thought possible. I began eating right, thinking straight and feeling much better, thanks to the guidance of my coach. It was a tremendous difference for both my mental and physical health."

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Peter believes every patient deserves this kind of predictive, preventative care: "This programme should be expanded - it would relieve stretched hospitals and save so many from preventable hospital waits and admissions. I have no doubt that without this intervention I would be one of those people waiting to receive urgent emergency care in hospital."

AI screening represents the future of sustainable healthcare systems. HN Predict makes preventative care possible in a more targeted manner than ever before. By spotlighting risks early, we can reshape care journeys entirely through strategic human interventions - keeping people well rather than just treating illness.

Our policy recommendations

1

Invest in research on AI prediction and risk stratification tools

This trial demonstrated how AI screening tools can accurately flag high-risk patients for targeted outreach, reducing mortality. But more research is critically needed to validate predictive algorithms across diverse populations and care pathways. Policymakers should look to fund large-scale studies on risk stratification AI to build evidence for national implementation.

2

Develop incentives and reimbursements for preventative AI models

The current system predominantly reimburses treatment activities, not preventative outreach. AI can today support predictive health analytics, patient triage and prevention, and 'HN Predict' is already in use with great effect across the UK and Ireland. HN's model – built by clinicians and undergone robust national trials to improve the allocation of preventative care resources, reducing costs and delivering better patient outcomes – is an important example.

To catalyse adoption of solutions like the trial's AI screening and nursing interventions, policymakers must develop incentives and value-based reimbursements for proven preventative approaches

3

Support infrastructure for data-driven population health

Effectively implementing preventative population health powered by AI requires sophisticated data infrastructure. Policymakers should work with colleagues in health to invest in:

- Integrated data systems spanning care settings
- Robust data security and privacy measures
- Responsible governance that facilitates access to data while upholding security and ethical standards.

This will lay the groundwork for scalable AI prevention strategies that improve outcomes.

Endorsed by patients

In 2021 Yorkshire & Humber Academic Health Science Network (now Health Innovation Yorkshire & Humber) published a report evaluating patient feedback on HN's AI-powered health approach to supporting patients.

Feedback from patients and the public in the report showed strong support for HN's AICC approach. Those who participated in the AICC service were particularly positive about the way clinical coaches had approached them to understand their health and wellbeing, and both physical and mental health needs. The results also showed that clinical coaches helped the enrolled patients overcome many barriers including lack of understanding of health conditions, low confidence, motivation and building a positive attitude towards their own health and disease.



About HN

Download the full paper [here](#).

HN uses AI to predict people at risk of adverse health events, enabling healthcare providers to deliver evidence-based prevention. HN's approach is unique. We blend our advanced data scientific and AI capabilities with digital services, which are delivered by healthcare professionals. This enables organisations to accurately identify patients at risk of adverse and preventable events such as uncontrolled disease progression, hospitalisation and prolonged hospital stay.

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