# Putting patients first: Using AI and clinically-led health coaching to manage unplanned demand in the NHS

## 1 Executive Summary

- A&E attendances have increased by 24.2% over the last five years[1], with none of the major NHS hospital trusts meeting the four-hour 95% standard in December 2019[2]
- 24% of emergency admissions were deemed avoidable by NHS England in 2016-17 at a cost of £3.3 billion[3]
- Clinical studies have shown that 1% of the population consumes 53% of non-elective care*, with much of this population being elderly and their admittance leading to longer non-elective stays in hospital[4]
- With the right support these patients can be empowered to manage their conditions and avoid non-elective care
- AI technology can identify this at-risk group and support them with a clinically-led health coaching programme
- Clinical studies have shown that proactive clinically-led health coaching reduces non-elective admissions by 25-35% and elective activity by 20%. It also showed a reduction of length of hospital stay by up to 1.5 days on average per non-elective spell and strong self-reported improvements on Patient Activation Metric surveys
- The use of an AI-led risk profiling model coupled with clinically-led health coaching could lead to a net cost saving of £3 million per year for a CCG with a population of 340,000
- The challenges to adoption in the NHS are well known: a lack of interoperability of systems, difficulties in scaling across the country and upfront funding to support service transformation
- There is an opportunity for the new £250m NHSX AI Lab to help scale solutions that manage demand in the NHS such as predictive algorithms that identify high service users who can be effectively supported through clinically-led health coaching
- NHS England and NHS Improvement should ensure that health systems where non-elective demand growth is excessive, submit robust plans for improvement which include the use of proven solutions
- The Government and NHS England should ensure the Better Care Fund and Personal Health Budgets include clinically-led health coaching and new incentives should be created in NHS operational guidance to support uptake
- Any changes to the A&E four-hour target should include commitments from the NHS to introduce systems that improve demand management and reduce non-elective care pressures

***** *A Non-Elective Admission is one that has not been arranged in advance.*[5]

[1] NHS Key Statistics England, House of Commons Library (October 2019)
[2] NHS England/NHS Improvement monthly SitRep (December 2019)
[3] Reducing Emergency Admissions. National Audit Office (2018)
[4] Reducing Emergency Admissions. National Audit Office (2018)
[5] NHS definition

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## 2 The challenge: increasing non-elective care use

NHS A&E services are facing unprecedented pressures. Over the last five years there has been an increase of 24.2% in A&E attendances[6], with access targets increasingly being missed with none of the NHS' major hospital trusts hitting the four-hour 95% standard in November 2019[7]. The National Audit Office in 2018 concluded:

*"The NHS still has too many avoidable admissions and too much unexplained variation …and…. The challenge is far from being under control"*[8]

NHS England estimated that 24% of emergency admissions were avoidable in 2016-17[9]. With an estimated £13.7 billion spent on emergency admissions in the same year[10], there was an opportunity cost saving of £3.3 billion.

The public want to see improved waiting times for A&E, with 30% naming it as one of their top three NHS priorities in a recent survey by JL Partners, commissioned by Policy Exchange[11].

Clinical studies have shown that 1% of the population consumes 53% of unplanned care. This group of patients often find it difficult to navigate the NHS and care pathways available to them, presenting at A&E for non-emergency or preventable events. Often this is a result of not managing a chronic condition effectively or multiple conditions complicating care pathways. Much of this population are elderly which increases the likelihood of longer admissions and higher bed occupancy. As the latest National Audit Office report found, older people made up more than half of the growth in emergency admissions between 2013-14 and 2016-17[12].

## 3 The opportunity: identifying non-elective care users with AI, and the impact of clinically-led health coaching

Recent research published by Healthwatch has shown that a lack of understanding of services available and poor accessibility of those services were key determinants of A&E attendance[13]. With the right support, at the right time, patients can be empowered to manage their health through community and primary care, avoiding unnecessary non-elective care and bed usage.

AI predictive algorithms are now able to identify patients with high probability of needing non-elective care, and critically, tailor this to local health populations to enable the most effective early intervention.

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[6] NHS Key Statistics England, House of Commons Library (October 2019)
[7] NHS England/NHS Improvement monthly SitRep (November 2019)
[8] Reducing Emergency Admissions. National Audit Office (2018)
[9] Reducing Emergency Admissions. National Audit Office (2018)
[10] Reducing Emergency Admissions. National Audit Office (2018)
[11] The People's NHS, Policy Exchange (December 2019) https://policyexchange.org.uk/wp-content/uploads/2019/12/The-Peoples-NHS.pdf
[12] Reducing Emergency Admissions. National Audit Office (2018)
[13] People's views on A&E waiting times, Healthwatch (March 2019) https://www.healthwatch.co.uk/sites/healthwatch.co.uk/files/20190311%20Submission%20to%20NHSE%20Clinical%20Standards%20Review%20-%20AE%20-%20final.%20docx_0.pdf

Clinical evidence shows that if this high-risk population receives early intervention through clinically-led health coaching it can dramatically reduce unplanned care episodes. Clinically-led health coaching provides patients with the knowledge, confidence and network of support to manage their conditions more effectively, preventing unplanned care episodes and improving patient activation and health literacy levels, leading to a better quality of life.

This type of health coaching is modelled to suit a person's needs and lifestyle. Technology can also be used to make interventions convenient such as telephone or video appointments. Health coaches rapidly assess patients and establish links to community-based services to support their conditions and symptoms, preventing the need for non-elective care.

### 3.1 Clinically-led health coaching can deliver on key Government and NHS priorities

A proactive clinically-led health coaching model targeting this at-risk population aligns with several policy priorities.

*Conservative Manifesto*

- Focusing on helping those with multiple conditions to have simplified and more joined up access to the NHS
- Improve A&E performance
- Using frontline tech to improve patient experience
- Helping people to live healthier lives[14]

*NHS Long Term Plan*

- Delivering more joined-up and coordinated care, particularly in the community, where treatment costs are considerably lower
- Reducing pressure on emergency hospital services
- Tackling health inequalities by targeting intervention at those at the highest health risk
- Empowering people to take control of their own health and providing more personalised care[15]

Proactive clinically-led health coaching can also support the delivery of the:

- Lord Carter Review – by improving patient flow and management in acute settings
- Prevention Green paper – through providing targeted, tailored and personalised support to patients
- Prevent, Reduce and Delay – intervening to support self-management has the potential to slow the progression of non-clinical care needs as envisioned in the Care Act (2014)

[14] Conservative Manifesto 2019 https://vote.conservatives.com/our-plan
[15] NHS England, NHS Long Term Plan, January 2019

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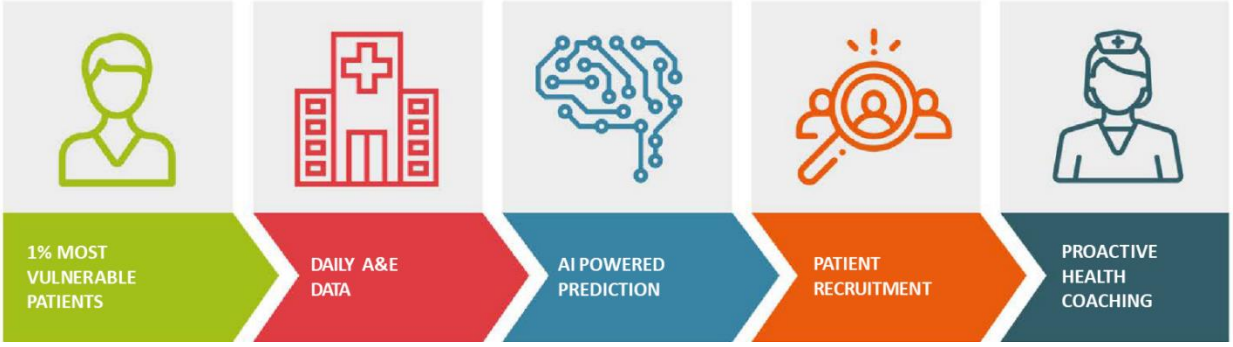
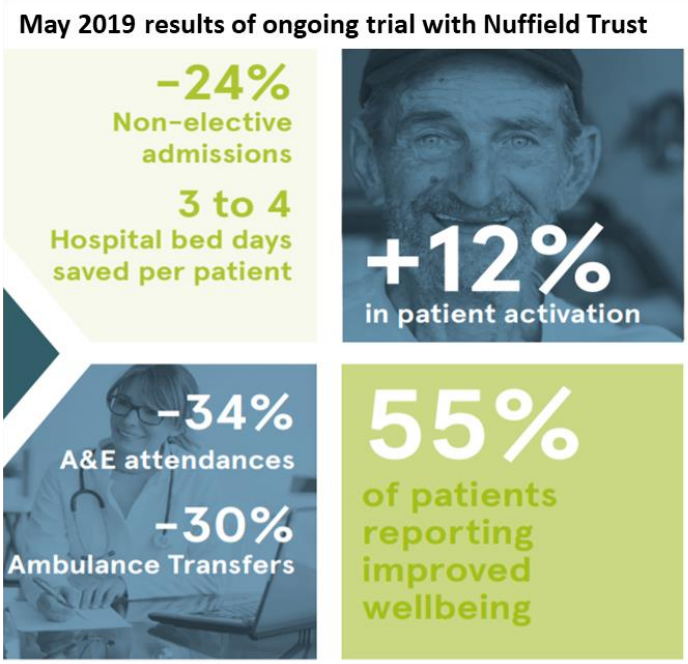
## 4 The evidence: Health Navigator's Proactive clinically-led Health Coaching

Health Navigator combines the analytical power of AI with nurse-led patient coaching, to significantly reduce urgent and emergency care and improve patient quality of life. Globally we have supported over 32,500 patients through our own Proactive clinically-led Health Coaching model. Through our AI algorithm we work with health systems to identify the 1% of the population most at risk of unplanned care episodes and then provide a nurse-led Proactive Health Coaching programme.

### 4.1 Randomised Control Trial (RCT) with the Nuffield Trust

In addition to our previous 12,000 patient study in Sweden, the majority of our UK services are part of a large randomised controlled research trial together with the Nuffield Trust. This has been running since 2015 and has recruited 1,700 patients across nine CCGs.



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## What could this mean for a CCG of 340,000 population?

| High Intensity Users | | | A&E attendances | | Ambulance transfers | | NEL admissions | | Financial considerations | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1% of CCG pop | Patients invited | Patients recruited | Total annual | Estimated reduction (-34%) | Total annual | Estimated reduction (-30%) | Total annual | Estimated reduction (-24%) | Cost of intervention | Gross savings | Net Savings | Projected ROI |
| 3,400 | 1,540 | 1,000 | 14,030 | **4,770** | 8,555 | **2,560** | 6,315 | **1,520** | £ 800,000 | **£ 3.8m** | **£ 3.0m** | **375%** |

### *What does this mean for patients?*

*Barbara, a 43-year old female, presented at A&E multiple times in the last 12 months with shortness of breath and chest pain. Due to the severity of the symptoms, this was queried as a blockage in her lung artery each time. No symptoms were found, and she was sent home on antibiotics for chest infection.*

*She was assigned to a Health Navigator coach, who referred her to appropriate asthma services in her area. Due to Barbara's lack of confidence with healthcare, she had been reluctant to schedule anything like this herself. The weekly calls with the health coach over a period of 6 months provided her with the motivation and education to better self-care.*

*Barbara has never since returned to A&E, and now schedules her own GP and respiratory doctor appointments. Barbara has also joined a slimming club; which she reports she would never have had the confidence to do before health coaching.*

*Additionally, Barbara had a recent minor health issue for which she telephoned her health coach directly for advice. This prevented her from making an unnecessary A&E attendance or GP appointment.*

*Another patient said this about the Health Navigator programme:*

*"If you are brave enough to take control with the navigator that helps you through it then you can truly make a difference to the immediate crises that turn up. You can go from being someone who's asthmatic to someone who has asthma and can cope with it, going from something like six [emergency] admissions in three or four months to none since."*

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## 5 The solution: scaling the programme in England

There needs to be a paradigm established whereby systems are actively investing in proven non-elective demand reduction.

Through Health Navigator's work with the NHS since 2015 we have found that the challenges around implementation are often process and technology oriented. These include:

1. **Variability in clinical systems and data collection** which means we have to customise our model to fit each hospital
2. **Increasing delays in coding/inputting data** which can negatively impact on the model's ability to find the optimal cases.
3. **Lack of integration of care pathways with our model** which can reduce the effectiveness of the care provided to patients
4. **A lack of direct financial incentives** for CCGs to lower A&E attendance and resulting bed days caused by 'blended payment' approaches. This has negatively impacted the cultural motivation of focusing on non-elective demand reduction

To tackle the challenges in emergency care, the Government should seek to tackle these barriers by committing to a set of clear actions.

The creation of the new £250m NHSX AI Lab creates an opportunity, through new funding routes, to scale proven solutions that can alleviate pressures on the system. More widely NHSX should continue to work to deliver interoperability of systems across the NHS to support the scalability and deployment of solutions from outside the NHS within NHS settings. Consideration should be given to mandating these in the future via appropriate policy and contractual levers. To support prioritisation of demand management within non-elective care, areas which have the highest levels of non-elective care activity growth should be required to publish an annual demand reduction strategy with a focus on predictive health population analytics and preventative interventions. All CCGs should also have a demand reduction strategy in place for winter with funding provided to test and deliver new approaches.

For the next NHS Standard Contract, the Department of Health and Social Care and NHS England should consider opportunities to use financial incentives to improve clinical coding to support the effective deployment and return on investment of new technologies, potentially through the Commissioning for Quality and Innovation (CQUIN) scheme. As blended tariffs are introduced there should be no reduction in the quality of clinical coding for individual patients (these data are critical for tracking service utilisation and effectiveness).

The Department of Health and Social Care and Public Health England should ensure that clinically-led health coaching is included as a key enabler for the predictive prevention pilots referenced in the Prevention Green Paper.

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Patients should be given access to clinically-led health coaching through the wider roll-out of Personal Health Budgets to help them manage their condition more proactively. Opportunities should also be explored through the multi-billion-pound Better Care Fund programme to deliver clinically-led health coaching programmes and integrate care for patients.

Potential changes to the four-hour A&E target measure should come with new commitments from the NHS to adopt new technologies and systems that deliver preventative measures to manage demand in urgent and emergency care.

### 5.1 Summary of policy recommendations

- There is an opportunity for the new £250m NHSX AI Lab to help scale solutions that manage demand in the NHS such as predictive algorithms to identify high users that can be better supported through clinically-led health coaching
- Challenged systems should be required to be actively manage non-elective demand growth, with review of interventions and investments planned, for efficacy and scale
- NHSX to ensure that their interoperability of systems work within the NHS includes urgent and emergency care settings to enable them to integrate with external health technology platforms
- The Department of Health and Social Care and NHS England to agree a quality payment (CQUIN) for improving the quality and timeliness of clinical coding
- Public Health England to include clinically-led health coaching as one of its enablers for delivering ‘predictive prevention’ pilots within the Prevention Green Paper
- NHS England to include clinically-led health coaching within Personal Health Budgets for relevant patients
- Explore opportunities to use Better Care Fund resources to deliver clinically-led health coaching programmes and integrate care for patients

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## 6 About Health Navigator

Health Navigator Limited specialise in the provision of innovative health care services. We focus on improved outcomes for high-risk patient groups. The organisation was founded by physicians and researchers from the Karolinska Institute in Sweden in 2010 and established operations in the UK in 2015. To date, Health Navigator have helped improve lives for more than 30,000 patients and have worked alongside them towards better health.

Our team of professionals are from a range of healthcare, economic and engineering backgrounds. We are highly experienced in research, big data, predictive analytics, digital solutions as well as designing and implementing new patient interventions. All our patient facing services are delivered by trained healthcare professionals.

We work with a number of CCGs across the UK including:

- NHS Vale of York CCG
- NHS Mid Essex CCG
- NHS Ashford CCG
- NHS Canterbury and Coastal CCG
- NHS Wolverhampton CCG
- NHS Cannock Chase CCG
- NHS South East Staffordshire and Seisdon Peninsula CCG
- NHS Devon CCG

We work with a number of Trusts across the UK including:

- York Teaching Hospital NHS Foundation Trust
- Mid Essex Hospital Services NHS Trust
- East Kent Hospitals University NHS Foundation Trust
- East Kent Hospitals University NHS Foundation Trust
- Royal Wolverhampton NHS Trust
- University Hospital North Midlands NHS Trust
- Burton Hospitals NHS Foundation Trust
- Torbay and South Devon NHS Foundation Trust