

Assuring fairness and safety in the deployment of AI-guided systems designed to prevent unplanned care and surface unmet needs in the NHS

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Intro to HN: 'Empowered Patients, Sustainable Healthcare'

What we do:

- ✦ Data-driven **case-finding**
- ✦ Remote monitoring
- ✦ **Clinical coaching**
- ✦ Virtual ward solutions

Our focus:

- ✦ Support patients to become activated and to **self-manage** and enhancing their health literacy
- ✦ Enhance the efficient allocation of primary and secondary care resources

Our Credentials:

- ✦ UK's largest **RCT** on clinical case management
- ✦ Supporting over 3000 patients in 2020
- ✦ 40 employees contacts with 5 ICSs
- ✦ **NIA Innovation Accelerator fellows 2020 & 2021**

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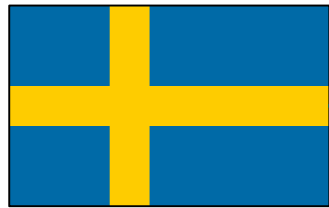
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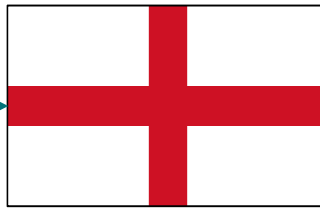


UK's largest randomised trial on data-driven prediction and prevention of unplanned hospitalisations



12,000

Largest EU study
on reducing
unplanned care



1,800

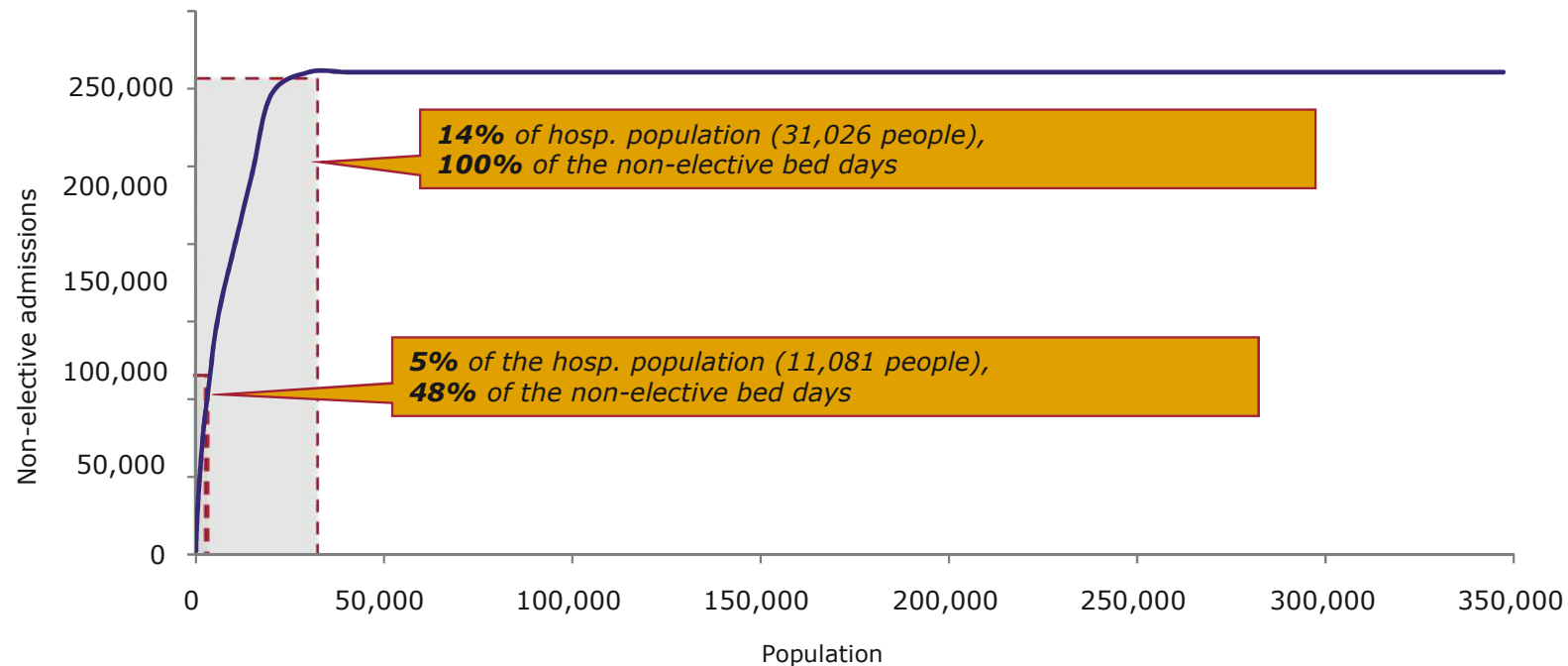
Largest UK study
on reducing
unplanned care

The logo for HN PREDICT, featuring a stylized star icon and the text "HN PREDICT" in white on a purple background.The logo for HN VIRTUAL WARD, featuring a stylized star icon and the text "HN VIRTUAL WARD" in white on a blue background.The logo for HN POPULATION HEALTH ANALYTICS, featuring a stylized star icon and the text "HN POPULATION HEALTH ANALYTICS" in white on a dark green background.



What are the aspects that characterise the high-cost high-need patients?

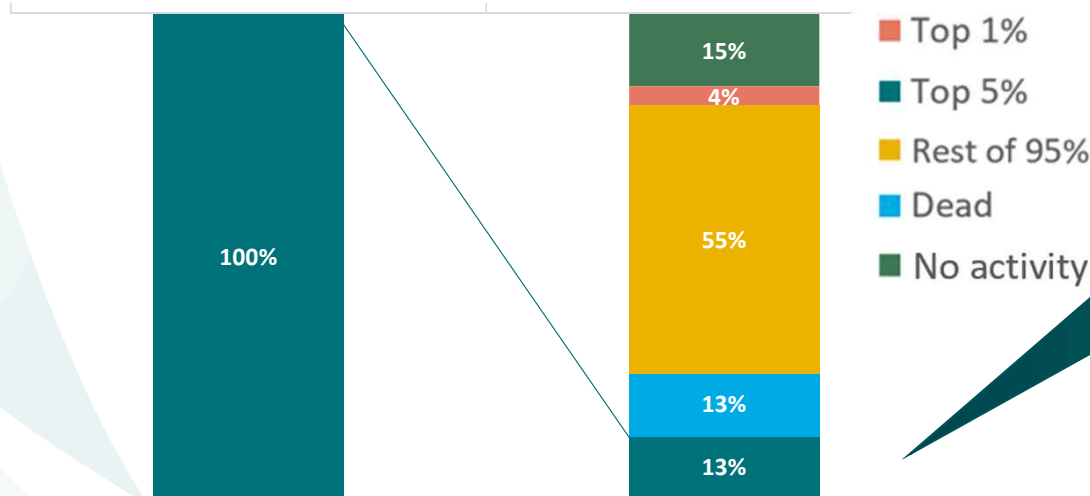
High-cost, high-need patients (5% of the hosp. population) account for 48% of all non-elective bed days per year



This cohort of patients tend to be **older**, have **multiple** chronic conditions and live in **highly deprived** areas

Highest consumers of unplanned bed days are extremely transient over time!

**Top 5% (~11,081 patients)
consumers of unplanned bed days**
Year 1 Year 2



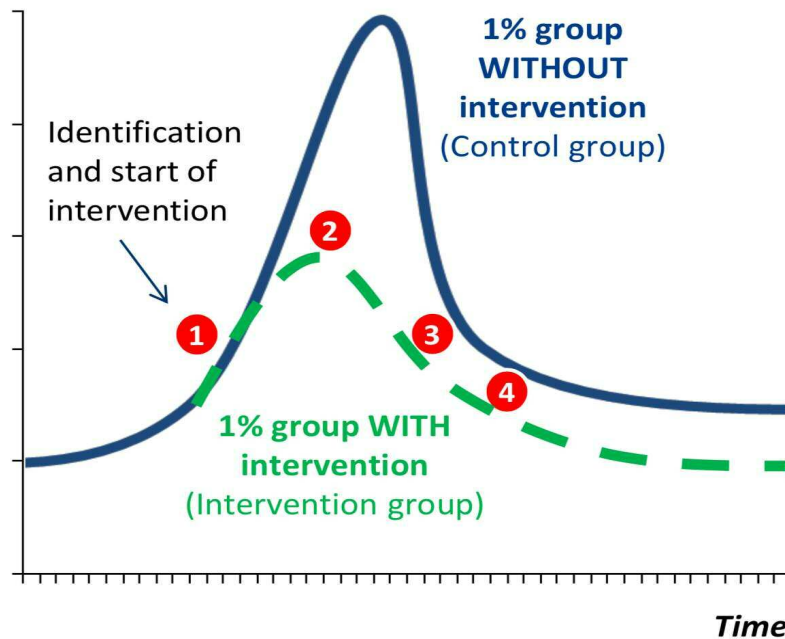
**Only 1 out of 8 (13%)
high consumers are
still high consumers
the year after. Most
other previously high
consuming patients
have no or low urgent
care demand**

Implications for Proactive Care Models to Reduce urgent care Demand

- Identify the right patients in the right “window of opportunity” e.g. Predictive Analytics in near real-time and intervene directly
- Evaluate against control group as “before and after” will give false positive results – most patients naturally reduce their urgent care demand over a 12 month time period

Finding the right patients at the right time – focussing on time, all activity and centring the offer on the front-line service

Healthcare cost
per patient



1. AI powered patient identification

To ensure the right intervention, to the right patients at the right time.



2. Clinical Coaching

Telephone-based and nurse-led, empowering the patient and improving care coordination.



3. Evaluation and continuous follow-up

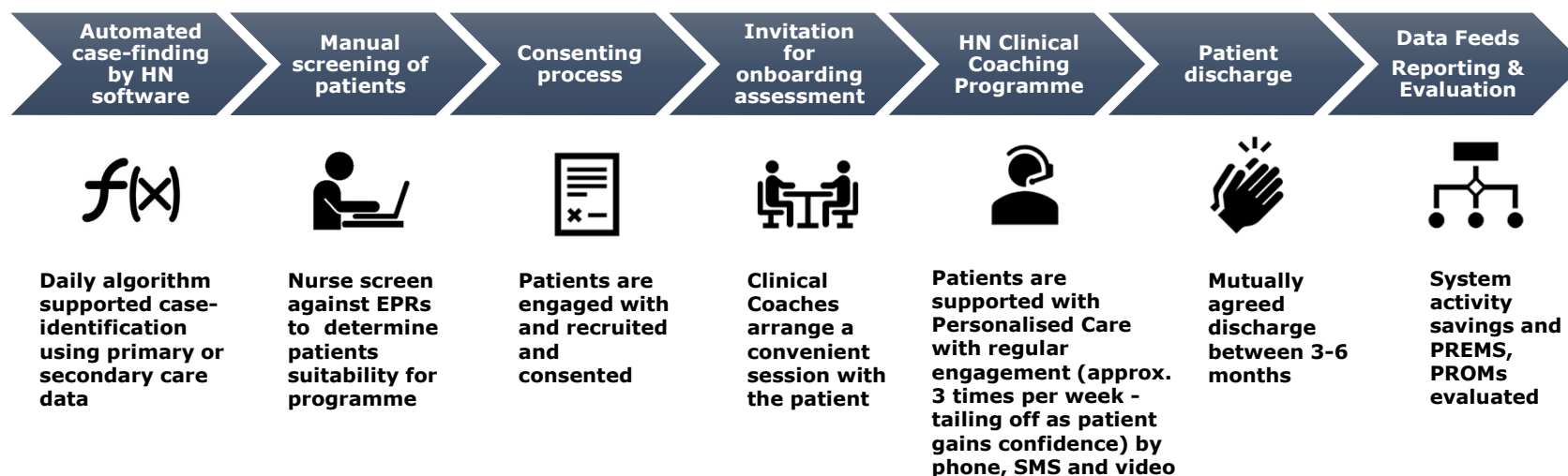
Continuous monitoring to prove impact and ensure resource-efficiency.



4. Discharge

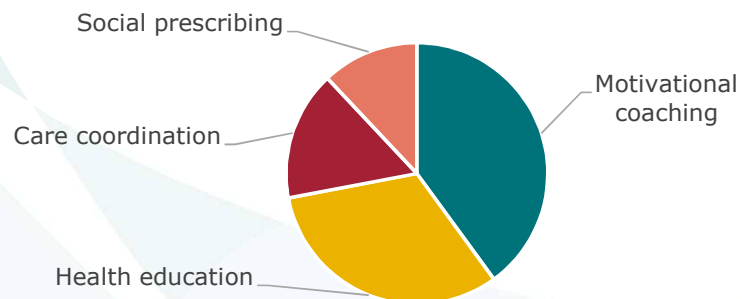
When the patient is no longer in need of our support, it is agreed with the patient that we end the programme.

Process Model for AI-Guided Clinical Coaching (AICC)



[Learn more about Clinical Coaching here](#)

The HN Clinical Coaching Intervention covers:



Hear from patients about their positive experiences

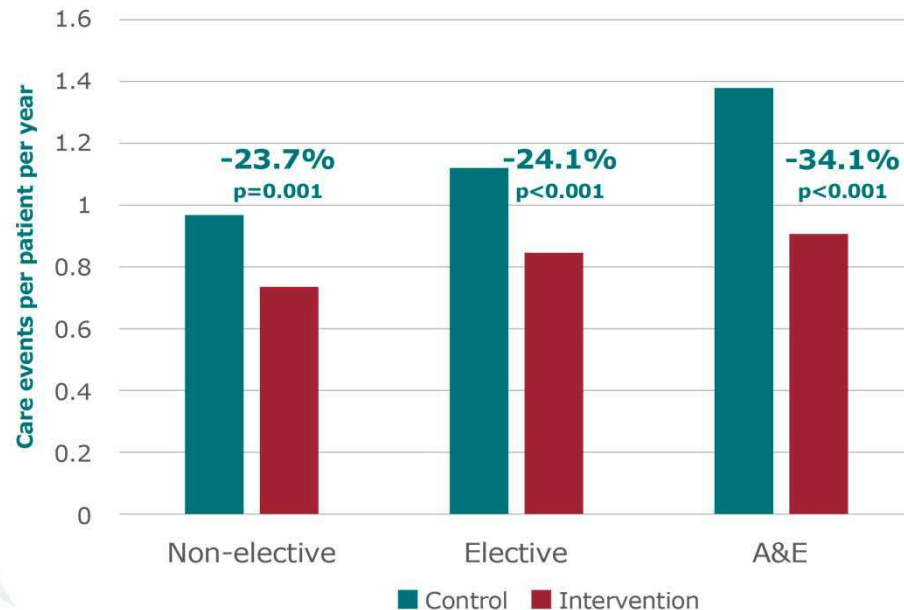


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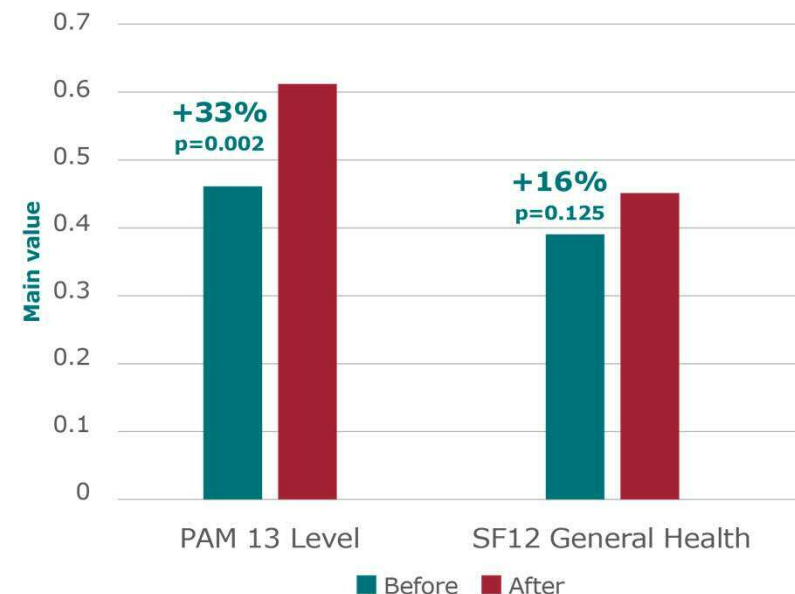


AICC evaluation demonstrating results through a Randomised Control Trial

Reducing avoidable care consumption



Improving patient reported outcomes



Typical patient supported by HN Clinical Coaching

Typical demographics:

Age 74, male or female

Living alone

Low self-reported quality of life

Low engagement in self-care



Most common diagnoses:

COPD

Congestive heart failure

Atrial Fibrillation

Falls and frailty

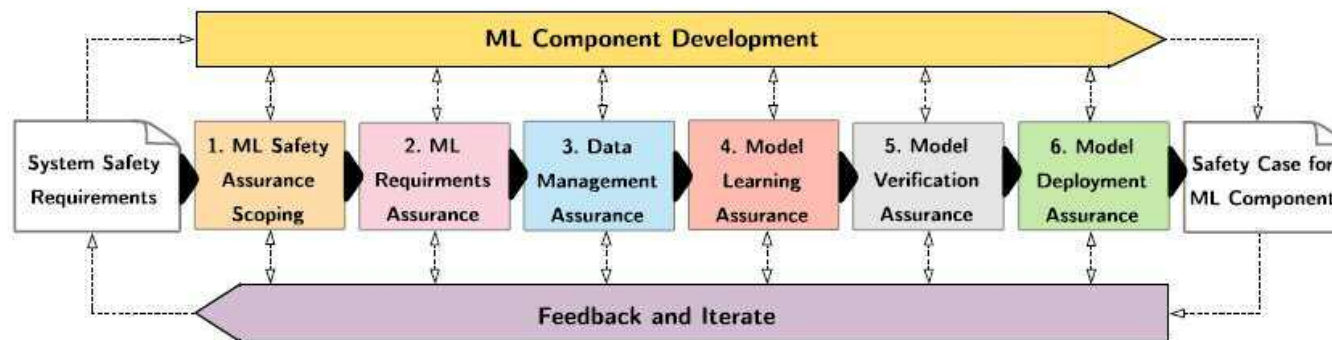
Anxiety and/or depression



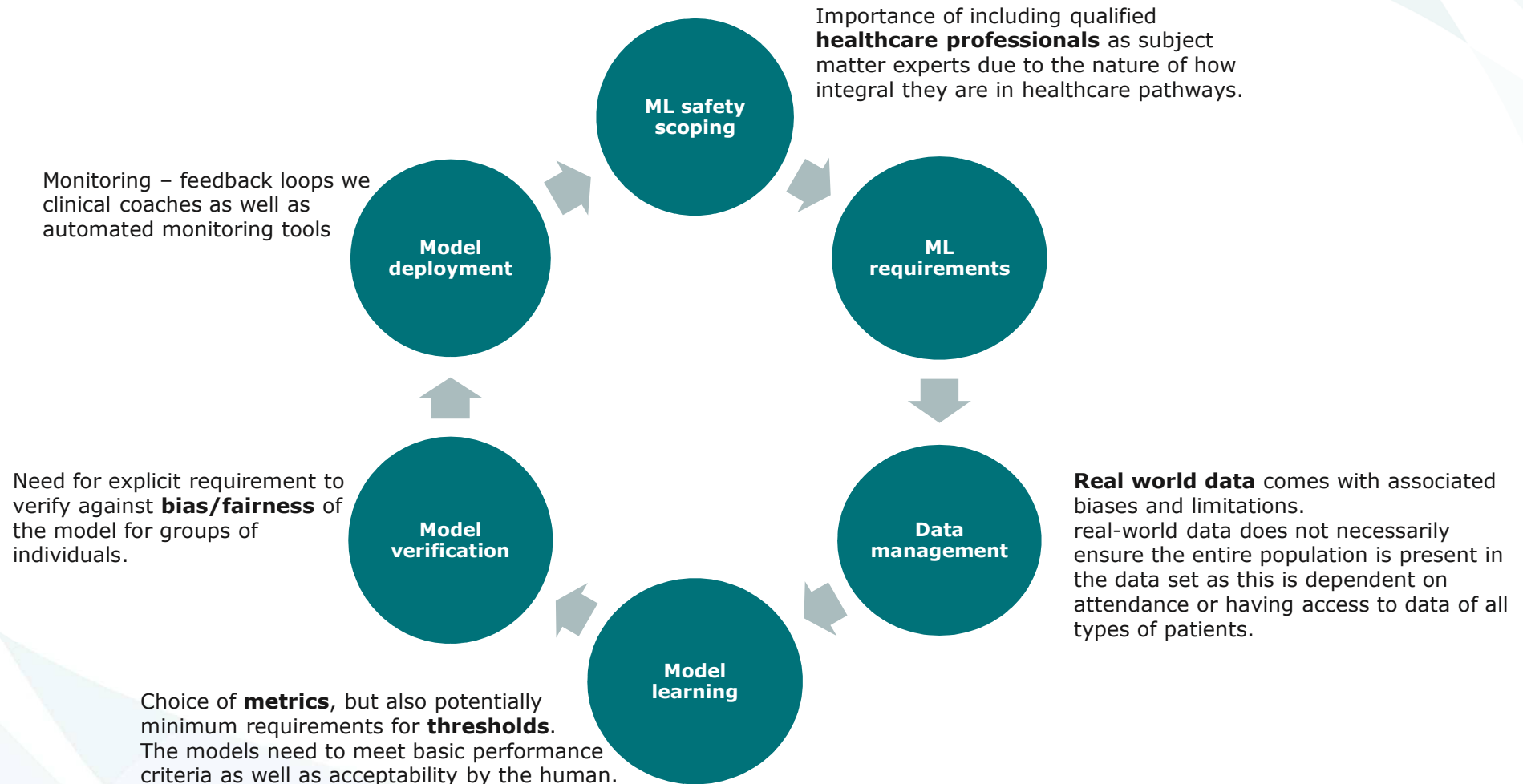
How we assure AI fairness and safety at HN

Partnership with NHS-D and SAFR

- Work commenced around March 2021, with HN participating in the inaugural meeting
- The AMLAS review was conducted in a collaborative way:
 - Each stage was reviewed via a framework of questions created by Shakir (NHS Digital) and the rest of team
 - HN's Data team internal workshops
 - Online workshops organized with Shakir and Sean to review and discuss key insights



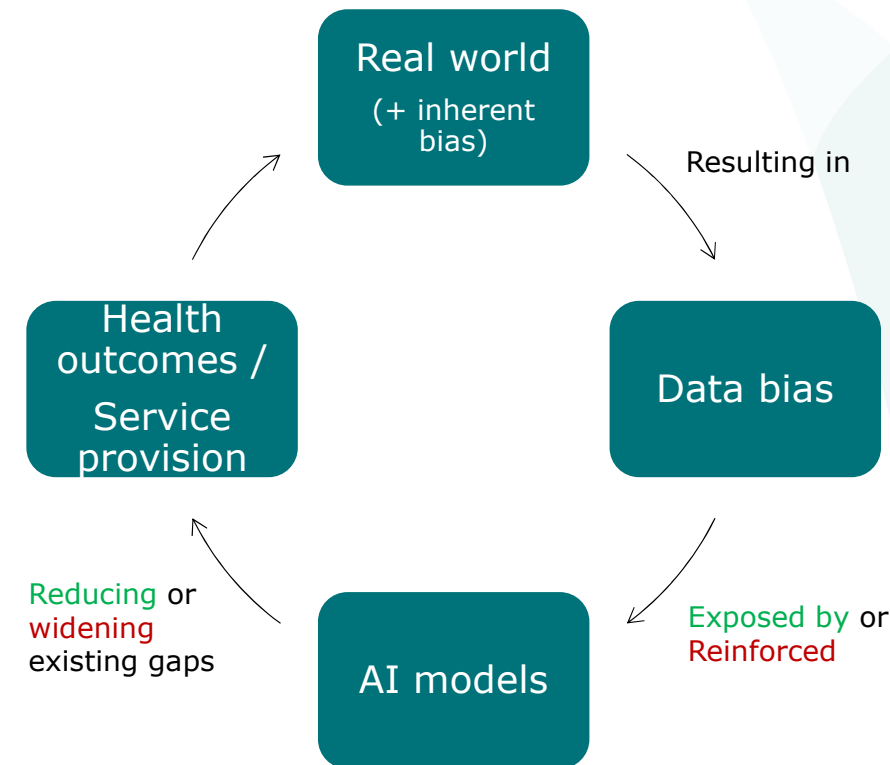
AMLAS review – key take aways



The AMLAS could be complemented with a fairness framework

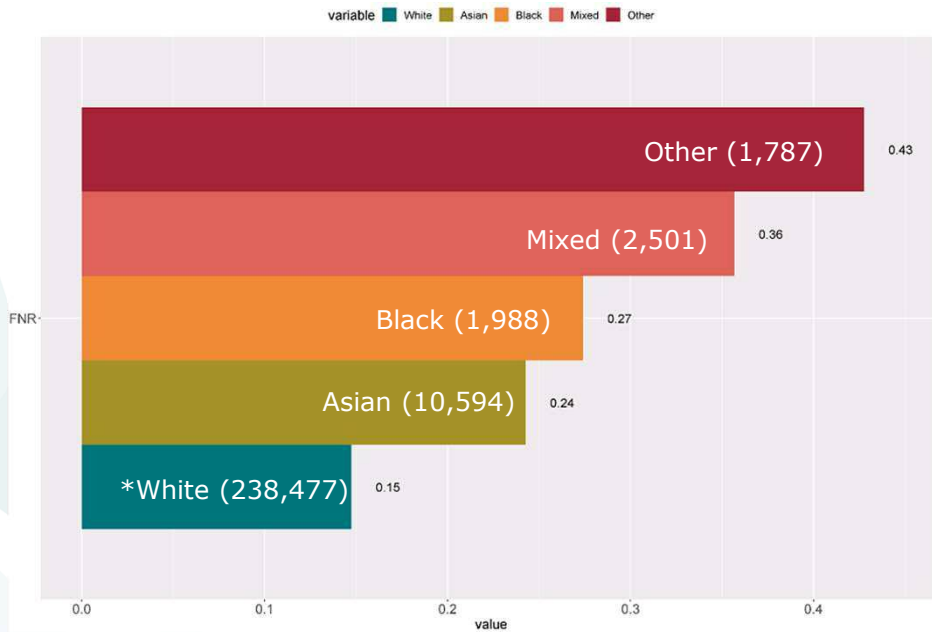
At HN, we pay particular attention in:

- Including **key features** on the local population, such as deprivation and ethnicity split in our models
- Our approach pays attention to **patients' characteristics, medical histories and care utilisation profiles** across secondary care and where the data allows, primary care.
- Ensuring that the models do not discriminate against any **protected characteristic**.
- Consulting with **patient groups** on how their data is used by AI, what AI products will they like to benefit from and how they define topics such as AI Fairness and Ethics.
- Having a **diverse team** working together in all stages of AI development.

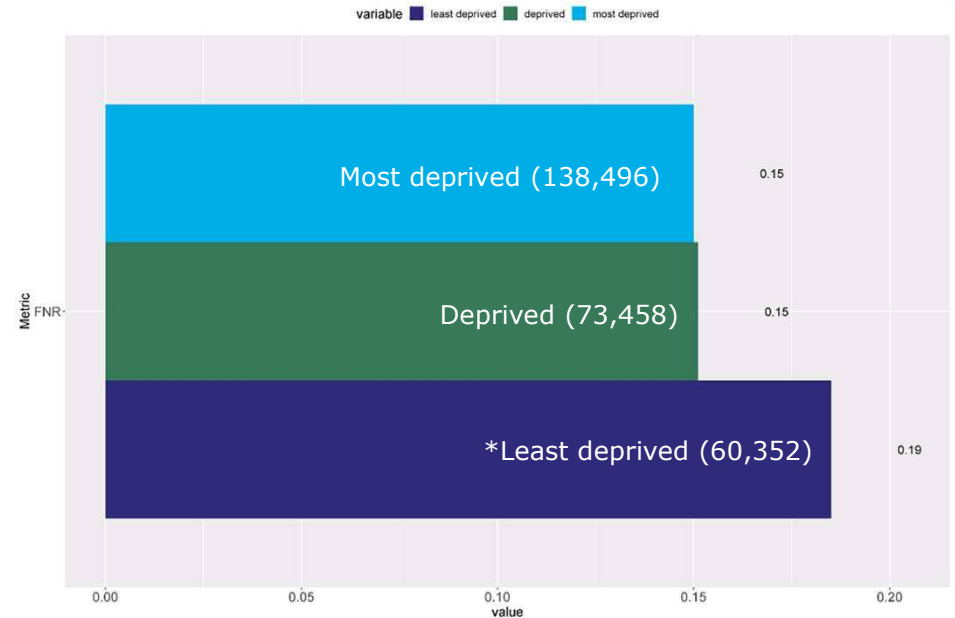


Fairness monitoring – ensuring our models do not discriminate

Target variable: 3+ unplanned bed days



Target variable: 3+ unplanned bed days



*All comparisons are done against the **privileged group**

HN's approach to using AI to support health and care systems, is focused on **surfacing and supporting unmet needs**, so to not reproduce and amplify historical patterns of health inequality and discrimination.

By using AI models, we can surface patients who might be at risk of spiraling care demands and adverse health outcomes, which has often been caused by chronic inequalities and gaps in service provision and access.

Thank you!

For further information, please contact Sara Reis

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