Imagining a child-first NHS: connecting children and families to healthcare through innovation and technology

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Kacey Prudom (18), Liverpool:
"If I could say one thing to the Prime Minister, I would say if he wants to improve things for us, then why not listen to the direct source to find out exactly what the issues are."

FOREWORD:

The future of Britain can shine bright.

But only if we invest in it.

That begins with our children. Every one of us has a responsibility to make sure they have the best start in life. Whether as policymakers, practitioners or parents, it's incumbent upon us all to support their health and happiness. A better future for them is a better future for us all.

The National Health Service is key to this.

Left to its own devices, the NHS will be fossilised as a national sickness service, spending vast amounts of taxpayer money on end-of-life care for an ageing population that is becoming increasingly unhealthy. Government can arrest and reverse this by reimagining the delivery of healthcare, powered by technology, and as this excellent report successfully argues, rebalancing the investment in young people and adults. As it points out, children and young people account for 24% of the population, but just 11% of NHS expenditure and 5% of research funding.

Ignorance becomes negligence if this fact is ignored any longer.

There is hope. The NHS 10 Year Plan is sufficiently long-term with welcome ambition. Its ultimate objective to shift from 'cure' to 'prevention' signals the right destination. We know *where* the NHS needs to go in the next decade and this report contributes important ideas as to the 'how.' A 'My Children' feature in a revamped NHS app is a no-brainer. Supporting families in disadvantaged communities to access new technology, including those in Alder Hey's front yard and my home city of Liverpool, is smart thinking. Boosting investment into researching young people's health is a welcome provocation in these fiscally constrained times.

Hope also arrives in the form of Alder Hey itself. I have never been prouder to sit on a trustee board. It is a hospital that unapologetically puts children at its heart, designing services for them and constantly pushing itself when it comes to innovation. Many of these, including Little Hearts at Home, should be scaled across the country without delay.

If this government wants insight and ideas from those on the frontline of healthcare, delivering a better future for our future then they should look no further than Alder Hey.

Ryan Wain
Trustee, Alder Hey Children's Charity
Executive Director, Politics, Tony Blair Institute

Professor Iain Hennessey: *"Hospital is not part of a normal childhood. Any technology that either stops a child becoming unwell or treats them in their normal environment has to be desirable."*

INTRODUCTION:

This document details analysis of the challenges in healthcare for children and young people in the UK, and provides key recommendations to the Government.

Experts and clinicians identify that prevention and early intervention are crucial to improve the health of children now – and of the adult population in the future. In addition, Alder Hey Innovation is a world leader in digital solutions which support preventative healthcare in the community.

This paper therefore aims to share key recommendations for the Government on how to integrate tech and innovation to the prevention agenda to improve children's health and reduce inequality.

It covers how to use innovation and technology to connect children to healthcare before they need to visit hospital.

And it asks the question: children are digital natives and natural innovators – can the power of innovation and imagination inspire a new way of connecting communities, parents and families to healthcare?

THE CONTEXT:

Alder Hey Children's Charity's 'Put Children First' campaign works to ensure that political leaders put children first within all decision-making - to empower them to live healthier lives, reduce the impact of inequality on health, and support children and young people to fulfil their potential.

Our doctors, nurses and scientists show up every day to improve and protect children's lives. Hundreds of thousands of children and young people (almost half a million) visit us every year. But our work is getting harder.

1. NHS budgets are being stretched to breaking point
2. Rising child poverty and inequality is fuelling ill health, particularly in disadvantaged communities
3. Children and young people's health has not been a political priority for decades

The 10 Year Plan for the NHS includes several policy commitments that will improve the health of children and young people. Some proposals within the 10 Year Plan that speak directly to children, include better support in the community, a focus on children's mental health, vaccines, obesity and oral health.

The Put Children First campaign particularly welcomes the plan's commitment to building a preventative healthcare system.

In this paper we provide recommendations for how innovation, technology and digital transformation can be at the heart of a new preventative care model which prioritises children.

Children and young people don't want a solely digital healthcare system. In addition, there are real issues when it comes to digital inclusivity, and so we must ensure that all solutions are accessible and open to all.

However, children are also natural innovators and digital natives. There are a number of innovative ways in which digital solutions and new innovation can help to prevent illness and improve the health of children and young people.

OUR CREDENTIALS:

Alder Hey Innovation is the largest, dedicated, purpose built, hospital led innovation hub in the UK. Much of the work of the innovation hub is funded and supported by Alder Hey Children's Charity including:

- **Little Hearts at Home -** a clinically validated remote monitoring and collaboration platform from Alder Hey that supports babies with severe congenital heart conditions after discharge by linking families, community nurses and specialist cardiac teams through real-time home data.

- **Lyrebird Health -** an AI medical scribe that securely records consultations and generates structured clinical notes and patient/GP letters in seconds, integrated into clinical systems and now in use at Alder Hey Children's NHS Foundation Trust.

Alder Hey Innovation's strategy is driven by two core objectives: reducing healthcare inequalities and enhancing how care is delivered. The Innovation Centre focuses on five transformative areas where emerging technologies can make the biggest impact on children's health and wellbeing.

1. **Pre-emptive Artificial Intelligence (AI) & Data**
   Harnessing AI and digital biomarkers to detect conditions earlier, prevent deterioration, and support faster, safer clinical decisions. Our goal is to create predictive, pre-emptive models of care that lead to better outcomes for every child.

2. **Digital Platforms**
   Building a "hospital without walls" — a hybrid model that merges physical and virtual care. Through the Internet of Medical Things (IoMT), we connect therapeutic devices, self-care tools, and personal health data to deliver seamless, individualised experiences.

3. **User Experience**
   Designing with young people in mind, we prioritise digital experiences that are intuitive, engaging, and age appropriate. A positive experience drives better compliance, emotional wellbeing, and long-term health outcomes.

4. **HealthTech and Digital Therapeutics**
   From wearable monitors to portable diagnostic tools, we're empowering children and families to manage health conditions more independently. Data-driven, personalised care is helping shift the balance from reactive to proactive healthcare.

5. **Immersive Technologies**
   We're applying immersive tools like augmented reality and 3D visualisation to revolutionise everything from surgical planning to therapy. These technologies not

only improve precision and training but also support cognitive and emotional health in creative new ways.

THE CHALLENGE WE'RE FACING:

Jai Radcliffe (16), Liverpool:

"The biggest thing I want to change for children is a 100% chance of life.... I believe we can have as much impact as adults can."

The UK was once a world leader in children and young people's health. Our outcomes now lag behind those of comparable countries.

- Childhood obesity is rising sharply – by the time they finish primary school, over one in five children are obese.[i]

- Emergency mental health referrals among children and young people have increased by more than 50% within just three years.[ii]

- Poor dental health is increasingly prevalent, with tooth decay now the most common reason for hospital admissions among children aged five to nine in England.[iii]

- Doctors at Alder Hey have reported increases in the number of children presenting with conditions which should have been eradicated – from measles to rotten teeth – as well as conditions usually only seen in adults such as lung disease and chronic obstructive pulmonary disease.[iv]

How did this happen?

The stark reality is that doctors, nurses and staff at Alder Hey and other children's hospitals are being prevented from providing their patients with the care they deserve - by a health system built around adults' needs.

The NHS is complex, especially for children and their families. Their feedback is that they struggle to navigate the system - to know how and where to access the right care at the right time. This highlights the need for more integrated, accessible, and user-friendly solutions.

Children and young people account for 24% of the population but just 11% of NHS expenditure[v] and 5% of research funding.[vi]

In addition, children's hospitals currently receive funding to reflect the total number of children they care for each year.

This approach doesn't enable - and indeed could serve as a deterrent - to innovative programmes aimed at preventing illness or providing care within communities.

Early interventions - including those designed to promote nutrition, mental wellbeing, and developmental delay detection – help avert costly hospital admissions.[vii]

Alongside all of these challenges, there is a rising demand for NHS services across the board – so clinicians need tools to empower and assist them in their work, freeing them up to provide patient facing care that meets the needs of children and young people.

However, with all of the above there is a clear opportunity to create the healthiest ever generation of children.

Put simply, supporting children and young people to lead healthy lives is the single best way to prevent future ill health.

A health policy programme built around that insight would include a guiding focus on improving children and young people's health outcomes.

More to the point, policymakers must recognise the argument that a health policy programme built around adults' health needs risks overlooking the *'key window'* in which preventative healthcare can have the most impact.[viii]

Failing to invest now risks escalating future demand and spending across the system, potentially leading to a 'lost generation' of children whose health and development will be fundamentally compromised.

In order to deliver on the long-promised pivot to prevention, then, the Government must commit itself to building a genuinely child-first NHS – one reflecting the recommendations set out in this policy paper.

OUR RECOMMENDATIONS:

Adam McNally (16), Liverpool:
"The biggest thing I want to change for children and young people is to let more of their voices be heard and listened to."

1. **Invest £400 million annually in innovation in service of a child-first NHS**

At present, less than 1% of digital health investment is directed toward children's health-focused technology. The Government should set a bold target to increase this figure to no less than 10% by the end of the 10-year plan period – to be invested in apps, digital platforms, wearable technologies, or telemedicine tailored to young people[ix].

The expansion of digital health innovations – such as remote monitoring for asthma, mental health self-management tools, oral hygiene prompts, and school-based screening – could dramatically increase early detection, risk stratification, and family engagement, especially in underserved communities.

Research found that families require digital tools tailored to children's developmental and wellbeing needs, not generic adult systems. Digital innovation should, furthermore, not be siloed, but should rather be a core feature of system-wide strategy.

Ring-fencing a proportion of digital health spending to meet children and young people's distinct needs would lead to digital strategies becoming embedded within ICS planning – accelerating the rollout of new technologies across early years hubs, health visiting, school nursing and mental health teams.

This in turn would support the development of preventative systems based on real-time data, prompts, and outcome tracking; improve immunisation rates; and promote equitable access to care.

2. **Put children at the heart of the new NHS app – to help children and families access the right care at the right time**

The ‘My Children’[x] feature should be a core focus of the new NHS app, not merely an afterthought.

Ineffective technology and information sharing in the health service costs the NHS and causes multiple issues for children and young people.

These include inefficiencies in hospital, longer stays and waits for discharge, distressing and stressful experiences within the system including multiple, costly visits for appointments and poor information sharing when children move to adult services.

Effective information sharing between services is crucial for children’s health and social care as well as prevention and safeguarding.

Whether it is building a clearer picture of child health needs, supporting professionals to share information more easily within and between services, or empowering children, young people and parents to take control of their health, improving data and investing in digital innovations have the power to transform child health outcomes.

It is unnecessarily difficult for professionals such as paediatricians to share information with other services and, ultimately, children are the ones who lose out with the most vulnerable hit hardest. We repeatedly hear children tell us they do not want to tell their story twice, whether that is to a social worker or health professional.

The Government should fund services and work with experts to identify innovations which can be scaled - in order for services to update information sharing systems with the latest technology to ensure seamless information sharing.

3. The NHS should be digital first – not digital ‘only’

We know that access to digital services as well as the skill needed to engage with them may be limited in certain circumstances – and can be linked to socio-economic issues.

Our work in one of the most deprived parts of the country means that we are hyper aware of the need for inclusivity and access when developing digital healthcare tools.

To ensure inclusivity we recommend additional funding for parents and families to be able to access devices, and training so they are confident in using them.

Invest in and protect existing resources in the community to ensure access to broadband, WiFi and computers where needed – and ensure that the new Neighbourhood Hubs offer access to these facilities.

Adopt and scale Alder Hey’s Parent Champions scheme - parents with lived experience who support families in the community, particularly those in deprived areas. These Parent Champions, often mothers, provide practical advice and support and connect families with resources like Citizens Advice and Healthy Start vouchers.

A proportionate amount of the new Digital Inclusion Innovation Fund, launched by the Department for Science, Innovation and Technology (DSIT), should be ringfenced for programmes which support children, young people and families.

IN CONCLUSION:

Sophia Morton (12), Liverpool:
"Young people are the future, listen to us and experts to help [prioritise] children's health."

Political leaders, decision makers, policy makers, we all know that the UK is experiencing a children's health emergency.

Alder Hey's mission is to give children the best possible start in life**.** After all, children are the future scientists, innovators, artists, medics and entrepreneurs of this country.

Our doctors, nurses, and scientists show up every day to improve and protect children's lives. Hundreds of thousands of children and young people (almost half a million) visit us every year. We hear their stories, and we've built our hospital and services around them.

But our work is getting harder:

- NHS budgets are being stretched to breaking point.
- Rising child poverty and inequality is fuelling ill health, particularly in disadvantaged communities.
- Children and young people's health has not been a political priority for decades.

To change this, we need to put children first and implement a radical redesign of the health system with children and young people at its heart.

To make this even simpler: **to make a future Britain healthy, invest in our children today.**

CASE STUDIES:

Little Hearts at Home:
Little Hearts at Home (LHAH) is a clinically validated remote monitoring and collaboration platform from Alder Hey that supports babies with severe congenital heart conditions after discharge by linking families, community nurses and specialist cardiac teams through real-time home data. Parents and clinicians record and review vital signs, feeding and symptoms in a secure app; automated alerts and two-way communication enable early recognition of deterioration and timely adjustments to care, helping to prevent emergency episodes and supporting earlier, safer discharge. By shifting routine monitoring from hospital to home and coordinating action across services, LHAH helps prevent ill health and delivers care closer to where families live, in line with the NHS ambition for at-home care.

CYP As One:
CYP As One is a co-created, web-based single point of access for children and young people's mental health in Liverpool and Sefton (now rolled out across Cheshire and Merseyside), replacing multiple paper forms with one digital referral and a hub of resources for families, schools and professionals. By simplifying referrals, triaging and signposting to the right local service first time, it reduces delays, enables earlier intervention and helps prevent deterioration and crisis; by coordinating support across community, NHS and voluntary providers, it delivers timely help closer to home rather than defaulting to hospital-based care.

Was Not Brought:
The Was Not Brought (WNB) AI tool is an Alder Hey-developed predictive model used across the Children's Hospital Alliance to identify children at high risk of missing outpatient appointments by analysing factors such as past attendance, demographics and deprivation; services then use the risk score to trigger practical, tailored support (e.g., phone outreach, free transport, school-based clinics, flexible scheduling) that removes barriers to care. This targeted approach reduces missed appointments, enables earlier intervention and reallocation of freed slots, and helps prevent deterioration by getting children seen sooner; reported impacts include a 60% reduction in WNB across targeted groups, and (across participating trusts) a 25% fall in DNAs equating to 27,500 additional attendances and c.£3m savings, alongside more advance cancellations that support efficient rebooking.

Lyrebird Health:
Lyrebird Health is an AI medical scribe that securely records consultations and generates structured clinical notes and patient/GP letters in seconds, integrated into clinical systems and now in use at Alder Hey Children's NHS Foundation Trust. By reducing documentation time and producing clear, jargon-light letters and instant referrals from the consultation, clinicians can communicate care plans sooner, focus more on families during visits, and create capacity for proactive follow-up and virtual/community contacts - supporting earlier intervention that helps prevent deterioration and keeps care closer to home.

AUTHORS AND CONTRIBUTORS:

The policy paper can be attributed to the Put Children First campaign by Alder Hey Children's Charity.

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- The Put Children First Campaign Youth Panel: Adam McNally, Jai Radcliffe, Kacey Prudom, Rosie Smith, Sophia Morton

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[ii] The Guardian, 7 Feb 2024, Children's emergency mental health referrals in England soar by 53%.
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[v] Lord Darzi for the Department for Health and Social Care (2024), Independent Investigation of the National Health Service in England.
[vi]Mohn Centre for Children's Health and Wellbeing, Barriers to Engaging Young People in Research.
[vii] King's Fund, 20 Nov 2024, If prevention is better than cure then we need to prioritise children's health.
[viii] Royal College of Paediatrics and Child Health, 14 April 2025, NHS 10 year plan: Focusing on preventing sickness, not just treating it.
[ix] Based on current government spending plans, we believe that this would equate to at least £400 million annually during the current Spending Review period. The government has said that it will spend £10 billion on digital health transformation between 2026-2027 and 2028-2029. It will also invest between £13.6 and £14.6 billion in capital funding during each of these years, and government guidelines suggest that 0.4% of this investment will be directed towards digital infrastructure. Finally, we believe it is reasonable to assume that at least some of the funding allocated to day-to-day NHS spending will be directed towards digital health technology and programmes.
[x] My Children will help parents collect their children's health information in one convenient place - a 21st century alternative to the 'red book'. It will provide advice and support throughout childhood, on weaning, maintaining healthy habits, or where to find support for concerns about mental health. Over time, we will add more information and create more functionality to support parents to record feeding times, monitor sleep, or use AI analytics to understand the best way to care for their child if, for example, they have developed a new rash. Fit for the future: 10 Year Health Plan for England.