

Working with patients and clinicians to develop a toolkit for the evaluation of neighbourhood multi-disciplinary care for children and young people: A protocol paper

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Abstract

Background

Child poverty in the United Kingdom is rising and with that comes increased demands on the health, social, and education systems trying to improve children and young peoples' health and wellbeing. In response, the National Health Service is proposing that services are reshaped to create integrated Neighbourhood Multi-disciplinary teams (NMDTs) of health and social care professionals working locally to provide care to individuals with complex needs. However, the evidence base for this complex service level intervention is weak and commissioners and professionals are in urgent need of a set of metrics and tools that enable their consistent evaluation. These must be accessible, easy to use, and provide outcomes relevant to both service users and providers to ensure the development of NMDTs for children and young people that are safe, high quality, valued by users and cost-effective.

Methods

The study consists of two work packages. The first will use a scoping review to identify key metrics and routinely collected datasets, and/or data collection tools that will form the basis of an evaluation toolkit for NMDTs. The second work package will use these to inform a co-design exercise with parents, and service providers to arrive at a consensually agreed prototype evaluation toolkit.

Discussion

This work will develop a practical evaluation toolkit that can be used to collect and understand evidence of safe and effective integrated care across multiple domains informed by the key indicators described by NHS and including an indication of their economic merits. The toolkit will support the wider implementation and in-depth evaluation of NMDTs for children and young people and their roll-out at a national level in a way that is practicable in busy health care environments. The work will take 12 months, with the final toolkit being made freely available online alongside the necessary supporting and explanatory materials for use by researchers and clinical teams, and service leads.

Trial registration:

Clinical trial number: not applicable

Background

Children, young people (CYP) and their families living in high income countries face mounting challenges to their health and well-being, as the prevalence of chronic conditions, obesity, and mental ill health continues to increase [1]. These issues are exacerbated in underserved populations (i.e., minoritized and

economically-deprived communities [2, 3]), by a range of socio-economic and cultural pressures that inhibit access and utilization of primary or preventative health care services [4, 5].

In the United Kingdom (UK) recent evidence suggests that it is not only in underserved populations where these challenges are becoming more pronounced but across all socio-economic strata [6]. This has led to increasing demand for health care services, including increased attendances at emergency departments and long waits for community services [7] [8], frequently due to conditions and circumstances that can be more effectively addressed in community settings (including pharmacies) [9, 10]. With ongoing constraints of capacity and resource affecting the National Health Service (NHS), fundamental changes in how health and social support are delivered to these children have been suggested that provide better integrated and more localized care and support that also address the wider determinants of health [11–13].

The most recent NHS Long Term Plan recognises this need for a multi-faceted neighbourhood led approach to better meet the needs of CYP in underserved populations [14–17]. Specifically it recommends creation of Neighbourhood Multi-Disciplinary Teams (NMDTs) [18] to deliver timely healthcare for CYP using primary-care led teams integrated with wider services including education, social support (including social care), and the Voluntary, Community, and Social Enterprise (VCSE) sector [18]. The overall aim is to reduce referrals to secondary care, and better link with community services, and other health and social care and support providers, increasing the opportunities for early intervention and preventive health [18]. However, the specific design of each NMDT is to be locally determined to reflect the local population providing a combination of core services using clinical and community-based providers. These core components, and the potential range of providers that might be involved are summarised in Table 1.

Table 1
Summary of NMDTs components and staff

Elements of NMDT	Definition	Examples
Core components	Key areas to enhance the current primary care offer	<ul style="list-style-type: none"> • Case identification • MDT case discussion and triage • Direct care • Professional knowledge sharing • CYP/family/carer engagement • Health promotion
Clinical Workforce requirements	The core clinical roles expected to be part of every NMDT	<ul style="list-style-type: none"> • General Practitioners • Paediatrician • Mental health professional(s) • Children's community nurse • Nurse specialist, (for example, asthma) • Practice nurse
Extended community-related requirements	wider local services, particularly with education, social support including social care and Voluntary, Community, Social, Enterprise, partners	<p>Allied health professionals,</p> <ul style="list-style-type: none"> • Dietitian, • Occupational therapist, • Physiotherapist, • Speech and language therapist • Autism and learning disability keyworkers <p>Education-based</p> <ul style="list-style-type: none"> • School nurse • Specialists supporting special education needs, • Neurodevelopmental conditions (inc. Autism and Attention Deficit Hyperactivity Disorder, • Mental health support teams in schools <p>Community-based roles</p> <ul style="list-style-type: none"> • Health visitor

Elements of NMDT	Definition	Examples
		<ul style="list-style-type: none"> • Pharmacist • Public health, prevention and support • Voluntary, community and social enterprise partners • Wellbeing practitioner • Youth worker <p>Social support and care</p> <ul style="list-style-type: none"> • Early Help keyworker • family hub keyworker • health and justice link worker • social prescribing link worker • social worker

The broader potential of these integrated NMDTs to provide accessible health and targeted family support to mitigate the social determinants of ill-health is widely recognized [12, 13, 19–23]. However, evidence supporting their optimal configuration and associated benefits has remained largely inconsistent, particularly for CYP in England and Wales, [24–28].

Despite the lack of suitably robust evidence and reliable data required for such a complex service-level intervention [29, 30] regional Integrated Care Boards (ICBs) have been advised to begin the roll-out of NMDTs beginning in 2025 [15, 16]. In recognition of the need to accrue more reliable evidence, NHS has called for service leads to “consider how they will evaluate the impact of these integrated services” in a “systematic, consistent and scalable way to build the case for future expansion” [18]. However, health and social care and support organisations have limited resources and opportunity to identify the full range of applicable indicators, tools and datasets necessary for such an evaluation [31]. The protocol presented here describes how these needs will be addressed by co-designing a freely available, ready to use, evidence-based toolkit for evaluating NMDTs for CYPs. By facilitating the capture of evidence that is consistent and comparable the toolkit will support local service leads and regional and national commissioners in better understanding how NMDTs can be configured to deliver cost-effective and inclusive care and social support.

Methods

Aims

The overall purpose of NMDTs for CYP is to improve the outcomes and experience for children and young people, as well as their families and carers. Led by primary care teams that include paediatric and mental health expertise, and a range of community providers, they will deliver care closer to home and so provide more timely access to a range of specialist advice.

To understand how successfully these nascent NMDTs are working from both a patient and service perspective, this work aims to develop a practical and relevant evaluation toolkit. This will co-designed, to collect and understand evidence of delivering safe and effective integrated care by NMDTs serving CYP across multiple domains of health care and social support (including social care). To achieve this overall aim the work will meet two objectives:

1. Identify the full range of potential metrics, indicators, and datasets needed to provide relevant and robust evidence of the success or otherwise of NMDTs
2. Use the principles of co-design to refine the acceptability and applicability of these proposed indicators, datasets, and data collection tools with families, and service providers to arrive at a prototype evaluation toolkit.

Clinical trial number: not applicable

The framework underpinning the toolkit

To begin the process of measuring the impact of NMDTs, the NHS has outlined a number of indicators that guide any evaluation [18]. These relate to primary and secondary care access and utilisation, the treatment and management of chronic conditions, school attendance, and patient satisfaction [18]. These indicators can be summarised within four domains; *Health service utilisation*, *Management of chronic conditions*, *Education*, and *Patient/staff engagement and satisfaction*. These will form the basis of the evaluation toolkit alongside indicators and datasets within three additional domains: *Social support utilisation*, reflecting the impact of any social support delivered by the NMDT indicators might include number of children as cases in social services, targeted family help (Early Help), and Voluntary, Community, Social Enterprise (VCSE) community service engagement; *Preventive care*, reflective of the NHS's shift from treatment to prevention, indicators might be linked to public health data and include healthy diet/exercise, oral health, vaccination, smoking exposure, Vitamin D supplementation [24, 32], and *Health economic evidence* to understand the relevant multisector costs and consequences arising from NMDT and potential for cost-effectiveness. These domains, and potential indicators are summarised in Table 2. It is important to note that NMDTs are not necessarily expected to respond to all domains as specific service offers will be shaped by the needs and influences of local context and capacity. Therefore the toolkit's metrics will mirror that variability and will have an adaptive nature, depending on which domains are primary objectives, and which are secondary or 'aspirational' for a given NMDT.

Table 2
Planned domains of NMDT evaluation toolkit

Domain	NHS prescribed indicators
1. Health service utilisation (primary, secondary, community care)	<p>Reduction in outpatient referrals for certain specialties, such as general paediatrics</p> <p>Reduction in waiting times for certain outpatient appointments, such as general paediatrics</p> <p>Reduction in number of Accident & Emergency attendances and re-attendances</p> <p>Reduction in number of acute mental health presentations in crisis</p> <p>Reduction in non-elective admissions</p> <p>Reduction in subsequent General Practice appointments for children and young people who have been discussed in the NMDT</p>
2. Social service utilisation	<i>None specified</i>
3. Management of chronic conditions	Condition-specific outcomes
4. Education	<p>Increased rates of school readiness</p> <p>Increased rates of school attendance</p>
5. Preventative care	<i>None specified</i>
6. Patient/Staff satisfaction engagement	Increased patient satisfaction via Friends and Family test
7. Health economic evidence	<i>None specified</i>

Patient and Public Involvement

The protocol was developed in discussion with our community representative group that was convened to support the study team's delivery and evaluation of an NMDT for CYP that delivered integrated health and social support in Central and South Birmingham [33–36]. This formal engagement exercise with our patient and public partners helped us understand their needs and expectations of service evaluation and the need to introduce co-design to ensure any toolkit was acceptable to all involved.

Our Patient and Public Involvement (PPI) team included CYP from the local youth centre [37], and parents from local community groups such as Approachable Parenting [38]. This established network will form the basis of a Patient and Public Involvement and Engagement (PPIE) Panel which will include CYP and be led by Dr Bird (who has experience of leading PPIE in both his diagnostic and health services research) and meet every four months over the 12-month study period.

Project plan

The work will comprise two inter-linked work packages reflective of the objectives outlined above to create a pragmatic and adaptive toolkit capable of evaluating a range of integrated and locally responsive services.

Work Package 1: Identification of key outcomes, datasets, and data collection tools to enable evaluation of integrated health and social care offers for CYP

Overview

The first work package (WP1) consists of two elements: WP1a, a scoping review which will be used to identify the full range of indicators relevant to the evaluation of NMDTs. In WP1b we will explore the data needed to measure these indicators, at a local neighbourhood level where possible, including that routinely captured by health, education, and social support and care organisations, local authorities and research databases. If the data needed is not routinely collected we will determine options for the most effective means of prospectively collecting additional data [39]. In combination WP1 will allow us to compile a full list of potential indicators and the datasets and data collection tools necessary to measure them.

Detailed methods

WP1a: Scoping review

A scoping review was chosen for its utility in exploring developing evidence [40] and they have previously been used in the context of localised and integrated care including the elements required of the service [41], the facilitators and barriers to their delivery [42], priorities for future development [43], and understanding patient experience [44].

The intention is to complement the NHS's list of key indicators by exploring evidence of existing evaluation work of integrated NMDTs in the UK and abroad [26, 33, 45, 46]. We know from the authors' recent systematic review of NMDTs for CYP that evaluation metrics and methodology for combined services are poorly developed [26]. This scoping review will therefore also explore indicators of success and how they might be measured in isolation for constituent elements of the service.

The review will be informed by an *a priori* protocol, be registered on Open Science Framework [47] and use best practice in scoping review methodology [40]. It will be transparent and reproducible, including independent reviews of included and excluded papers by the study team to reduce bias and errors, who will extract and present data in a structured way [40].

WP1b: Identifying datasets in UK settings to inform key indicators

The second element of WP1 will identify the data necessary to measure the indicators and outcomes identified in WP1a, including the resources necessary in access or collecting the data. We define these datasets within two broad categories based on whether they are routinely collected or will require prospective collection.

Routinely collected data consists of generic, individual data routinely collected as part of delivering a service in health or social care, or local authority organisations or otherwise as part of pre-existing research databases including their quality and completeness. We will search known sources and repositories of data held by the NHS, clinical organisations or on research databases. These will include the Health Data Research gateway, [48], NHS Digital data Catalogue [49], UK Health Data Research Alliance [50].

If the requisite data is not routinely collected, readily available or of sufficient quality, we will explore how it might be collected prospectively, including the use of pre-existing, validated or adapted data collection tools. Below we illustrate the approach by describing some of the potential routinely collected datasets or data collection tools within each domain of the toolkit these are summarised in Table 2.

We will also explore the opportunities and challenges of data linkage to maximise the value of appropriate datasets collected either routinely or prospectively [51]. Used appropriately this data linkage can create cohorts that consider a wide range of risk factors and outcomes (including social determinants) and are especially powerful for capturing information on populations that are hard to reach [52].

Table 2
Summary of potential sets and prospective data collection tools

Domain	Routinely collected data	Examples	Prospective data	Examples
1. Health service utilisation	Data on demographics, administration (service contact appointment details), and medical data relating to symptoms, diagnoses, and treatments	<p>Primary care - EMIS, SystmOne [53]</p> <p>Secondary care - NHS Spine, the Personal Demographics Service (PDS), Electronic Patient Records and the Summary Care Record, hospital episode statistics [54].</p> <p>Community care datasets [55]</p> <p>Research data base - Clinical Practice Research Datalink [56] DExtER) [57].</p>	Individualised data collection on service interaction with primary, secondary, and community care	Purposely developed dashboards embedded within existing clinical management systems [34, 58]
2. Social support and care utilisation	Data from social services	<p>Children's Social Care National Framework [59]</p> <p>Children's Social Care Dashboard [60]</p> <p>Children's Safeguarding Performance Information Framework [61]</p> <p>Families Programme Outcomes Framework [62]</p> <p>Families First Partnership programme [63]</p>	The impact of social support on acceleration to social care	<p>Current View Tool (CVT) for mental health [64]</p> <p>General outcome measures (CORC) [65]</p> <p>Signs of Safety [66]</p>
3. Management of chronic conditions (inc. mental health)	Use routinely collected data on target conditions	Data on asthma, eczema, constipation, as well as mental health issues and neurodevelopmental disorders held on electronic health records [67]	The need to collect data prospectively on key tracer conditions	PROMs [70] e.g. asthma [71]; or constipation [72]

Domain	Routinely collected data	Examples	Prospective data	Examples
		<p>The SDCS collection system [68].</p> <p>Health Data Research UK [69]</p>		
4. Education	Data held by local authorities and Department for Education on school attendance.	<p>Department of Education's "Pupil attendance in schools" [73], Monitor school attendance dashboard [74], National pupil database [75]</p> <p>Contextualise data on attendance with other relevant data sets for example data on free school meals</p>	Individual attendance, exclusions, achievement data	ASPIRE attendance monitoring tool [72]
5. Preventive care	Routinely collected data relating to preventive care	<p>Child Health Information Service which issues invite letters for immunisations and health visitor appointments; [76]:</p> <p>uptake of the "Healthy Start" initiative[77]</p> <p>Impact of the oral health check and delivery of toothbrushing kits on dental caries [78];</p> <p>smoking cessation advice [79]</p> <p>Public Health Outcomes Framework [80]</p> <p>Early intervention and prevention for mental health [81]</p> <p>National Child Measurement Programme (NCMP): information for schools 2025 [82]</p>	A link between individual preventive care and long-term and short-term outcomes	<p>A software-based surveillance framework [85]</p> <p>Preventive health care checklists [86]</p>

Domain	Routinely collected data	Examples	Prospective data	Examples
		Family Hub data [83] Healthy Babies: guidance for local authorities [84]		
6. Staff and patient satisfaction and engagement	Routinely collected data to assess patient satisfaction	“Friends and families” test [87]. Patient consent, engagement and withdrawal from targeted family help [63]	Understanding patient and family experience and how it changes over time Child voice data	PREM community delivered mental health [88], PREM integrated care [89]
	Routinely collected data on staff retention	NHS Staff survey [90]	Understanding staff satisfaction	Organisation issues NHS people pulse survey [91]
7 Health economic evidence	Identification and valuation of the resource utilisation and outcomes from relevant domains where applicable to comprehensively model the economic merits of NMDTs and understand which sectors incur or save costs.	Cost-effectiveness registry for literature health related quality of life utility weights [92] NHS cost collection Unit costs of Health and Social Care [93]	Data on the cost of delivering NMDTs	Standardized data collection templates & logs [94] Time-Driven (Activity-Based) Costing tools [95] Micro-costing tools [94, 96]

1. Health service utilisation

Routinely collected data

Routinely collected data from a variety of sources in primary [53, 97] and secondary care [54] will be assessed to understand their potential to explore patterns of attendance and cause, including data on demographics, locality, administration (service contact appointment details), and medical data relating to symptoms, diagnoses, and treatments.

In primary care this could include routine service data [97] which will likely be drawn from the clinical management systems of primary care organisations (such as the EMIS system) [53] and in secondary care settings will use data managed through systems like the NHS Spine, the Personal Demographics Service (PDS), Electronic Patient Records and the Summary Care Record, as well as hospital episode

statistics (HES) [54]. We will also explore the Community Services Dataset which re-uses clinical and operational data including the relevance of its data items, definitions and associated value sets extracted or derived from local information systems [55].

Pre-existing research databases will also be explored such as the Clinical Practice Research Datalink (CPRD) containing anonymised patient data from GP practices across the UK that links primary care data to a range of other health related data [56], another potentially useful primary care database is the health improvement network (THIN) [98]. Another useful research tool might be the “Data extraction for epidemiological research” (DExtER), tool which extracts data from databases such as THIN and CPRD or held on Egton Medical Information Systems (EMIS) converts and reformats it performs basic epidemiological analysis specific to the research question and study design [57].

Prospectively collected data

Prospective data might be collected by using purposely developed dashboards that can be embedded within existing clinical management systems used in primary care [58, 99]. For example, the study team has experience of using a purposely developed dashboard that collected data specifically relating to an NMDT service which sits within the EMIS clinical management system and collates data on demographics, disposition (referred, discharged), care plan provided, preventative health delivered, referral to Early Help services [34].

2. Social support and care utilisation

Routinely collected data

It is important to understand if and how effectively the NMDT provides social support such as records of referrals to other social support services,, Family Help, VCSE signposting, or otherwise escalated to children’s social care links with other community institutions [100]. This includes an understanding of the type, content, and quality of the data held by local social support organisations, this might include data returns by Targeted Family Help Teams, Social Care – CP and Child in Need data, VCS data, Early Help Assessment data, Housing especially child Temp Accommodation data.

Prospectively collected data

There are a number of tools that might be used to prospectively collect data on the impact or referral into community services or improved outcomes such as improved mental health [64], General outcome measures in the Child Outcomes Research Consortium (CORC) [65], or Signs of Safety [66]. We will also explore the potential to map the impact of such interventions from measures such as “outcome wheels”, where families score impact pre- and post-intervention [101, 102].

3. Chronic conditions and mental health and well-being

Routinely collected data

Explore the quality of data from primary, secondary, and community care held on service utilisation through common chronic conditions in CYP such as asthma, eczema, constipation, as well as mental health issues and neurodevelopmental disorders. For example, frequency of unscheduled attendance for exacerbations, the use of care plans, the number of referrals made to secondary care services [67].

Prospectively collected data

We will explore the tools and opportunities for collecting prospective data on key tracer conditions including any relevant Patient Reported Outcome Measures (PROMs) [70], e.g. asthma [71]; mental health and neurodiversity, e.g. Quality of Life in Autism questionnaire for CYP [103]. This may include identifying data and outcomes on early intervention for mental health and impact on the number of attendances by CYP in crisis.

4. Education

Routinely collected data

Indicators recommended by the NHS include school readiness and attendance. Data held by local authorities on school attendance, including Department of Education's "Pupil attendance in schools" statistics which provides information on the levels of overall, authorised, and unauthorised absence in state-funded primary schools, secondary schools and special schools [73]. It also includes daily, weekly, and year-to-date information on attendance, absence, and reasons for absence [73]. The Department of Education also hold information on the "Supporting Families" framework and provided by the education sector [62].

5. Preventive care

Routinely collected data

Evidence supporting the potential of personalised prevention to improve population health outcomes is growing [104], however at the time of writing there are no NHS recommended indicators relating to preventative care or its systematic link to personalised or genomic data. These indicators might include increases in vaccination uptake such as flu [105] which may be detected using the government's Child Health Information Service which records letters issued for immunisations and health visitor appointments [76], uptake of the "Healthy Start" initiative; oral health checks and delivery of toothbrushing kits on dental caries [78]; Impact of smoking cessation advice (for parents carers and home-sharers) [79]; Core outcomes related to healthy eating and exercise advice [106, 107]. Beyond the scope of this work is the leverage of genomic profiles and big data [108].

We will look for datasets that provide information on identifying the target group; the number of recipients; the content or intention of the preventive encounter; and any follow-up activities [109]. Work in the United States has reported the success of using routinely collected primary care data [110]. In addition to these we will also explore the Public Health Outcomes Framework [80].

Prospectively collected data

Work on prospectively collecting data on preventive health is in the early stages, though one promising methodology includes the use of software-based surveillance tools [85] and or the use of preventive health care checklists [86].

6. Staff and patient satisfaction and engagement

Routinely collected data

The NHS stipulated indicators describe the use of the “friends and families” test to assess patient satisfaction though there are other measures of satisfaction that might be used [87].

Prospectively collected data

There are a number of patient reported experience measures that might be used or adopted [111]. However, potential Patient Reported Experience Measures (PREMs) might include those on the community delivery of mental health [88] or for integrated care [89]. The study team have undertaken a qualitative exploration of the experiences of staff delivering an NMDT that will further inform this element of the study [35, 36]. We will explore the potential use of NHS staff survey data or of individual services issuing the people pulse survey in relation to the NMDT [90, 91].

7. Health economic evidence

Routinely collected data

Early examples of economical modelling of NMDTs for CYP in the UK have identified the need for data that better reflects health and community family support and social care utilisation [33, 112]. This previous work will be expanded by undertaking a mapping exercise to identify how well the other domains on resource utilisation and participant outcomes can be used to comprehensively assess the relevant costs and consequences of NMDTs for CYP in the UK. Where feasible a comparative analysis will be used to assess the relevant multisector costs and consequences arising from an NMDT versus no NMDT, alongside the overall costs of delivering NMDT.

Domains such as education lack routinely collected costing data to value the economic impact and may instead need to resort to prospectively collected data and modelling to extrapolate intermediate outcomes such as school attendance on downstream longer-term consequences [113–115].

Prospective data collecting tools

As no national unit costs of delivering NMDTs for CYP are available from routinely collected data, there are a number of pre-existing tools and methodologies that have the potential to prospectively collect the requisite data including Activity-Based Costing which maps resource consumption (staff time, supplies) to specific activities (patient visits, screenings) [95], Time-driven activity-Based Costing (TDABC), a more precise variant that measures time spent on activities using time-and-motion studies [95], or direct observation, which captures precise resource use, common in studies of new or complex interventions

[116, 117]. Finally, micro-costing tools might be deployed, these cover a range of cost estimation methodologies to collect detailed resource utilization and unit cost data [96].

Work Package 2: Using principles of co-design to create a prototype toolkit

Overview

We will use the findings from WP1 to inform a co-design exercise used to produce a prototype toolkit that describes the indicators, data collection tools and datasets capable of the consistent evaluation of NMDTs for CYP that is consensually agreed and practicable [118]. The co-design process will be conducted over a series of iterative workshops moderated by members of the study team with experience in co-design and production [119, 120]. Recruitment to the workshops will start 01/06/2026.

Detailed Methodology

Settings/recruitment

Recruitment to the co-design workshops

Recruitment of a representative sample of CYP's families supported by NIHR's "INnovations in CLinical trial design and delivery for the UnDEr-served project roadmap" [121]. Our PPI group will regularly review recruitment across different social strata and if necessary, we will develop an action plan with them in response to any issues that arise regards securing a representative sample. Specifically we are keen to recruit from underserved populations traditionally less-likely to be involved in research (defined here as those who are economically deprived, geographically isolated, or from racial and ethnic minorities engaged less effectively by formal healthcare interventions or experiencing poorer outcomes and higher levels of service utilisation than other sections of the population [122–125]). Where needed and in collaboration with the panel we will also recruit via social media, a process which has shown promise in recruiting underserved populations [126]. We can explicitly capture the child's voice alongside parent/carers' voices using best practice in delivering inclusive and participative child friendly workshops [127].

We will use our established connections with the local Integrated Care Board and Birmingham Health Partners to raise awareness of the work and purposively recruit staff from clinical, educational and community-based organisations with a range of experiences of leading or delivering similar integrated health and social care offers for CYPs in Birmingham and across the UK.

Conducting the co-design workshops

A total of six co-design groups will be conducted created separately of CYP's families (x2) and of staff (x2). Then a final set of workshops combining families and staff (x2). This iterative process of co-design

will combine the inputs from families and staff participants and our PPIE panel to consensually arrive at a prototype toolkit that is practicable, relevant and interpretable for its target audience [128].

Each workshop will be conducted with 6–8 participants and moderated by the study team with experience in co-design and co-production. Although the natural preference would be to conduct the focus groups in person, the latest evidence suggests there is no consensus as to whether face-to-face or online focus groups hold specific advantages in terms of the data produced [129]. Therefore, we are equally content to use online focus groups where it is more practicable and where resources might otherwise be constrained [129].

Data collection/analysis

We will follow best practice in conducting direct, structured observations [130], and the co-design workshops will be recorded (subject to informed consent being provided), and workshops will be audio recorded, transcribed verbatim by a professional transcription service, anonymised and kept in compliance with the General Data Protection Regulation (GDPR) 2018 and Data Protection Act 2018. The qualitative data gathered as part of the co-design element will be held on secure university servers in accordance with the ethical approval gained.

We expect these workshops to reflect on the relevance of the various indicators to service providers and users, the appropriateness of the identified datasets and data collection tools and the resource necessary for obtaining and analysing the data. The expectation is that this co-design process will enable us to arrive at a prototype evaluation toolkit that is practical whilst providing data on impact and cost effectiveness that is meaningful and relevant.

Discussion

In the absence of suitable resource and time to allow for the establishment of randomised controlled trials for large-scale service innovation, the NHS have encouraged use of the “test and learn” approach to enable continuous evaluation and improvement in real-time [15]. This toolkit will facilitate this approach by providing the practical means for service providers to evaluate their NMDT services [132].

The study team acknowledge that there are limiting factors in using routinely collected data health records, these include missing data, misclassification bias due to inaccurate clinical coding and residual confounding [133]. Therefore, as part of the guidance that accompanies the toolkit we will consider ways in which this missingness and completeness might be mitigated and documented and recommendations made as to how future evaluations might report on the reach of the inferences and limitations of their evaluation.

The team also recognise the potential barriers associated with co-design between communities and health and social care organisations [134]. These include the potential dominance of “professionals” and

lack of relative empowerment and training of "non-professional" partners [134]. Therefore, to support equitable participation and the success of the co-design exercise, training in co-design will be offered to all participants in advance of the workshops. This will help address the potential dominance by any one element of the group, create expectations that all will be granted a voice and reinforce the value placed on the unique contribution of each individual [135].

Ethics/Regulatory approvals

We will remain cognisant of the legal frameworks of data security and confidentiality in considering if and how patient level data might be used by the toolkit including the Data Protection Act 2018 (incorporating General Data Protection Regulation and the Common Law Duty of Confidentiality). In fulfilling our ethical and legal obligations we will explore the governance of each dataset recommended for use in the toolkit and between which organisations data sharing agreements might be put in place. This in line with the NHS's recommendations for how data is collected and shared across settings [18]. When applicable, data will be stored and processed within the Birmingham Environment for Academic Research, a secure research platform providing restricted access to secure data storage and high-computing resources [131].

We have been granted a favourable opinion from the University of Birmingham's Science Technology Engineering and Mathematics Committee (ERN_5648-Feb2026) to perform the work. All research involving human participants and approved by University of Birmingham is conducted in line with the ethical principles of the Declaration of Helsinki. In all cases informed consent will be provided before participation in the co-design workshops. Substantial amendments that require review by the committee will not be implemented until that review is completed.

Dissemination plan

We will publish the prototype toolkit online as part of the Neighbourhood Health Research Lab website hosted by University of Birmingham. The toolkit will be made freely available to all and be accompanied with guidance on its implementation, including the use of data collection tools and data analysis.

Our findings will be published in the peer-reviewed literature with at least one publication expected for each work package. These will describe the outputs of the review, perspectives of staff and patients on the impact of NMDTs and the rationale underpinning the final selections contained in the toolkit. Our findings will be presented at two national conferences.

We will disseminate our toolkit to NMDTs through our links with NHS's "Developing integrated care team". We will use a range of slide decks for local and national service leads, commissioners, and policymakers. To disseminate our findings to community groups we will use non-expert means such as workshops and video blogs with the content informed by our PPIE panel. The work began in at the start of 2026 and will run for 12 months. The

Abbreviations

CORC	Child Outcomes Research Consortium
CPRD	Clinical Practice Research Datalink
CYP	Children and young people
DExtER	Data extraction for epidemiological research
EMIS	Egton Medical Information Systems
HES	Hospital Episode Statistics
ICB	Integrated Care Board
NHS	National Health Service
NMDT	Neighbourhood Multi-disciplinary Teams
PDS	Personal Demographics Service
PREM	Patient Reported Experience Measures
PROM	Patient Reported Outcome Measures
PPI	Patient and Public Involvement
PPIE	Patient and Public Involvement and Engagement
THIN	the health improvement network
TDABC	Time-driven activity-Based Costing
UK	United Kingdom
VCSE	Voluntary, Community Social Enterprise (
WP	Work Package

Declarations

Ethics approvals

We have been granted a favourable opinion from the University of Birmingham's Science Technology Engineering and Mathematics Committee (ERN_5648-Feb2026)

Consent for publication

N/A

Availability of data and materials

The datasets that will be used during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests

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Authors' contributions

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