"Moving beyond bean counting"

Discovery phase
AIMS Insight report

Author: Alison Morton
Acting Executive Director
Institute of Health Visiting

Publication Date: January 2021

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1. INTRODUCTION

The Institute of Health Visiting (iHV) and Southern Health NHS Foundation Trust were awarded funding by the Health Foundation to work together to consider how to improve analytical capability in health visiting. The timing of this study brought an unexpected impetus to this work, commencing during the lockdown restrictions of the COVID-19 pandemic in 2020 which accelerated digital transformation across the healthcare system as practitioners sought new ways of delivering services safely, including better use of data.

The way we live our lives is changing with ever-increasing digital opportunities. All health practitioners, including health visitors, are at various stages in a journey of service transformation to maximise the flexibility made possible by mobile devices and easy access to data and information to support their practice. We are interested in learning how we can engage health visitors digitally to help them in their work with families with children; in particular, their work with the most vulnerable families who are often at risk of having their needs overlooked or falling in the gaps between services in the healthcare system. As a 'discovery' phase project, we have taken a user needs led approach to address a 'gap' in knowledge and understand more about the current national analytical capability in health visiting.

Responding to user needs is critical in determining any digital support provided for health visitors. If there is not a clear user need identified, resources could be wasted by providing services that do not get used by the intended audience.

The project aims to improve analytical capability by:

i. Enabling a better understanding of the challenges and opportunities within the field of health visiting analytics and learning more about the ways that health visitors would like to use data.

ii. Exploring whether we can make better use of data and analytics to support health visitors' work with vulnerable, "invisible children" and those with additional needs.

iii. Sharing our learning and insights from this project to develop analytical tools and easy-to-use dashboards that will help drive quality improvements to deliver more effective care to the children.

To build our understanding of the needs of health visitors, in the first phase of this project we completed a national survey of health visitors and convened two national co-design workshops with groups of practitioners and key national experts in fields relevant to health visiting data and analytics. This helped us to understand their experiences, identify key challenges, and explore any opportunities or enablers of analytical capability in health visiting practice. This report provides an overview of the insights gathered from this national scoping phase which formed the first step in the project.

2. AIM AND BACKGROUND

Health visitors lead delivery of the Healthy Child Programme (HCP), which is a universal prevention, health promotion and early intervention programme available to all families. Ensuring every child has the "best start in life" and reducing inequalities requires a whole system integrated approach, as prevention and intervention cut across a range of stakeholders working with children and their families. Public Health England (PHE) has set out the Government's priority to effectively address the causes of poor outcomes for children[1] and the importance of taking a systematic and holistic approach to reach at-need populations[2] which includes using data to prioritise and plan actions to effectively reduce inequalities.

The importance of workforce capabilities to manipulate, analyse and interpret data within a modern healthcare system is widely recognised[3], and better use of technology and data has also been identified in the NHS Long Term Plan[4] as a prerequisite for supporting and enabling the key developments needed to reshape the health and care system. Key to this is the reshaping of the workforce, "by improving information flows and access to systems, so that skills and capabilities are enhanced, leading to a step-change in staff productivity" (OfCom, 2017)[5]. Yet within health visiting, there is often limited or no access to the right level of skilled analysts and data scientists to improve analytical capability and support decisions to improve practice. Health visitors, like most frontline clinicians, also require continuous professional development to keep pace with the rapid advancements in technology to support their learning, and increase their confidence and competence in applying data and analytics to their everyday practice.

Currently, the use of data in health visiting is predominantly focused on demonstrating compliance to external bodies and key performance indicators (KPIs) which lack depth, measuring only a small proportion of the health visitor's role and workload, with limited information on service quality. These simple reductive approaches for demonstrating impact in health visiting have been widely criticised for providing partial and misleading conclusions[6]. There is also limited use of data within health visiting to capture the level of need within a large group of vulnerable children who have not accessed support services and have been labelled as "invisible children" by the Children's Commissioner[7]; in 2019 the office of the Children's Commissioner estimated that 2.3 million children were living with risk because of a vulnerable family background – of these, more than a third were 'invisible' (in the sense of not being known to services) and therefore not getting any support.

Currently, there is good data on health visitor service delivery presented in the PHE metrics of uptake of the mandated reviews[8], although there is a considerable time lag between data submission and the publication of these national health visiting metrics. Local areas also have KPIs to identify, through electronic flagging, activity related to children subject to a Child Protection or Child in Need Plan. However, a survey by Southern Health NHS Foundation Trust identified that 59% of health visiting activity which incorporates support for families with additional needs, but below the threshold for statutory support, did not fit in either of these categories and was therefore "invisible" to commissioners or service planners; we believe that this represents the challenges that most provider organisations nationally are facing – although this assumption requires further exploration and testing.

Furthermore, there is growing concern that the prioritisation of process outcome measures may lead to unintended consequences, as health visitors change their practice to focus on achieving performance targets in order to "tick the box". However, this focus on process outcomes has been criticised as it risks "missing the point", overlooking quality components of care and providing limited opportunities for quality improvement.

The iHV surveys its members every year and in 2019[9] asked questions about the data that health visitors collect to demonstrate service effectiveness for key public health priorities. The findings indicate a mixed picture nationally, with limited data being collected and many health visitors report that the process is time-consuming and reduces face-to-face clinical time.

The health visiting service, like all other parts of the health service, needs to maximise the opportunities afforded by data and analytics. But currently, this is not supported with a culture of shared learning which results in health visiting being isolated, with few opportunities for sharing learning and meeting collectively. As a result, we run the risk of "reinventing the wheel" or reintroducing strategies that have been found not to work elsewhere. Therefore, it is important that a shared learning culture is fostered which enables health visitors and analysts to learn from each other to support excellence in practice. Quality improvement methodology – the use of methods and tools to continuously improve quality of care and outcomes for patients – should be at the heart of local plans for redesigning healthcare[10].

The iHV Vision for Health Visiting, published in October 2019[11], calls for a shift in focus from the current position, moving on from "bean counting" towards "measuring what matters". To achieve this, there is a need to gain a greater understanding of the challenges and opportunities faced by managers and clinicians, as well as the needs of commissioners within the field of health visiting data and analytics. Evaluation and analytical capability should drive quality improvement as part of a learning culture.

In conclusion, there has been no national work on user needs and analytical capability in health visiting, resulting in limited knowledge in this area and assumptions that need to be tested. Exploring this gap will enable a more accurate picture of analytical capability in health visiting, with greater understanding of the factors that support its implementation in practice.

3. APPROACH AND METHODOLOGY

Our approach draws on co-production and rapid cycle improvement methodology, and is separated into three interlocking phases:

Phase 1: National Scoping discovery phase

To increase understanding of "where we are" as well as "where we need to be", with the aim of collating capability deficiencies and strengths, "user needs" are required to describe the functionality/solution that will be valuable to either a user (health visitor or health visitor manager) or commissioner of Health Visitor services[i]. Currently, there is limited knowledge of user needs and this stage will test and refine our assumptions to inform Phase 2 of the project.

Phase 2: Local Application of discovery phase and alpha testing

This phase will build on the learning in phase 1 and enable us to research, prototype, test and learn about our users' needs. Continuous learning will enable us to build a service that meets user needs.

Phase 3: Dissemination

This phase will support wider system learning through the dissemination of our findings, sharing experiences of leading change in practice. This will include our successes, as well as challenges, to improve care as part of a learning culture. It is hoped that sharing the learning from phase 1 and 2 will provide some context and background to some of the challenges being faced by the health visiting profession, as well as solutions that have been developed in this project to drive quality improvement. No such resources for health visiting currently exist.

4. HEALTH VISITOR SURVEY

This project involved a survey design with a purposive sample of respondents, to represent the geographical regions of the United Kingdom (UK), aimed at exploring issues related to the use of data and analytics in health visiting. The iHV has significant reach through its survey function and this was determined as a robust method to gather insights from practitioners with current health visiting practice experience.

The questions were formulated and then agreed by the expert steering group before being transferred to an electronic survey using Survey Monkey. This was then disseminated for completion through the iHV network, emailing members and associates and released to social media, to ensure that the widest reach of health visitors working with families was achieved.

The survey allowed us to filter the respondents from Southern Health Foundation Trust (SHFT). This was important to enable us to consider any variation in response from the National picture and to inform our work within SHFT in phase two of the project.

N.B. See Appendix 1 for a copy of the survey questions.

4.1 Background of respondents

The survey was completed during the COVID-19 pandemic which affected the response rate, as frontline practitioners prioritised their contribution to the emergency response and were also faced with numerous competing surveys at the same time. The respondents were drawn from England, Wales and Scotland. Despite efforts to represent all 4 UK nations, the study did not achieve any representation from Northern Ireland.

A **total of 145** professionals completed the survey; their responses represented a range of views on data and analytics. As the survey comprised a relatively small sample and a "snap shot" in time, the goal of data saturation was considered unachievable. Therefore, a considered approach to sampling was undertaken, keeping the survey open for an extended period of time with the aim of reaching a level of "data sufficiency" that would provide insight into the project's aims and questions, with multiple views and a range of participant actions[12].

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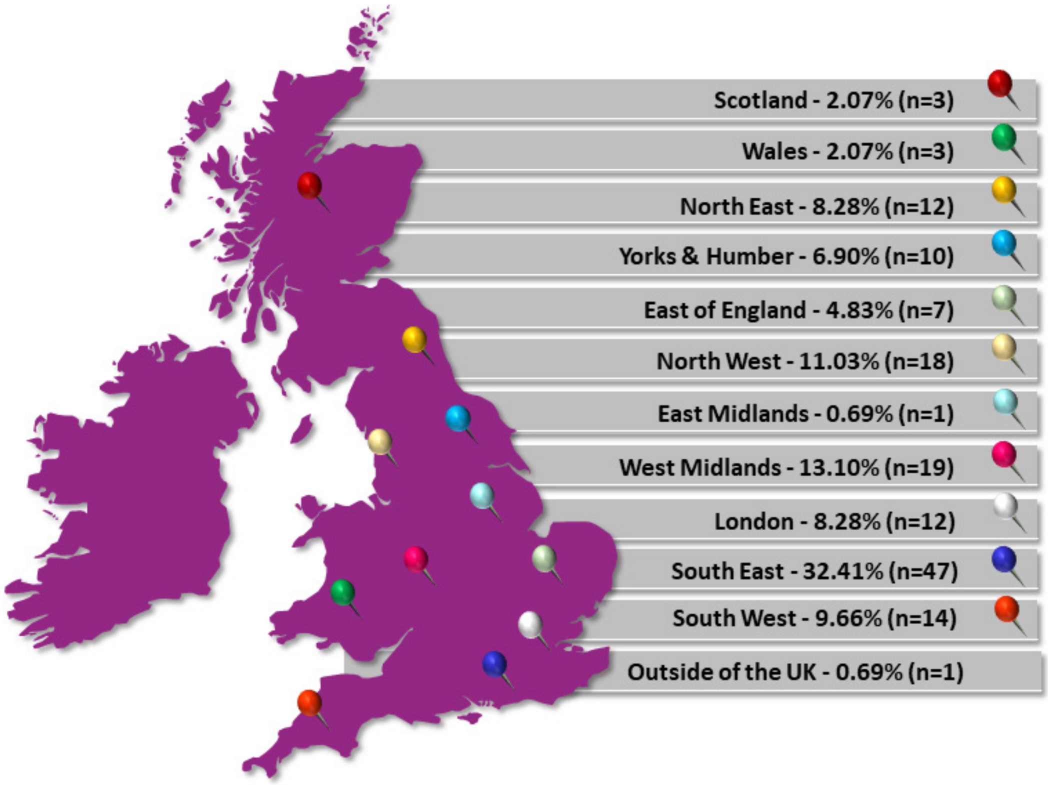
[i] User stories/ user needs are defined as an expression of a target audience's goals, values, though processes and sometimes aspirations commonly developed from face-to-face research with end users.

Table 1: Break down of respondents by professional group

Respondent Role	National Sample	SHFT sample	Non-SHFT sample
Health Visitors Specialist Community Public Health Nurses (SCPHNs)	65.5% (n=95)	71.9% (n=23)	63.7% (n=72)
Health visiting management	27% (n=39)	21.9% (n=7)	28.3% (n=32)
Health visiting education	1.4% (n=2)	0%	1.8% (n=2)
Specialist clinical role	4.1% (n=6)	6.2% (n=2)	3.5% (n=4)
Commissioning	0%	0%	0%
Research	0%	0%	0%
Other	2% (n=3)	0%	2.7% (n=3)
Total	**n=145**	**22% (n=32)**	**78% (n=113)**

Note: For this report, the term health visitors will be used to describe all professionals who responded to the survey as this was the majority.

Figure 1: Geographical spread of survey respondents

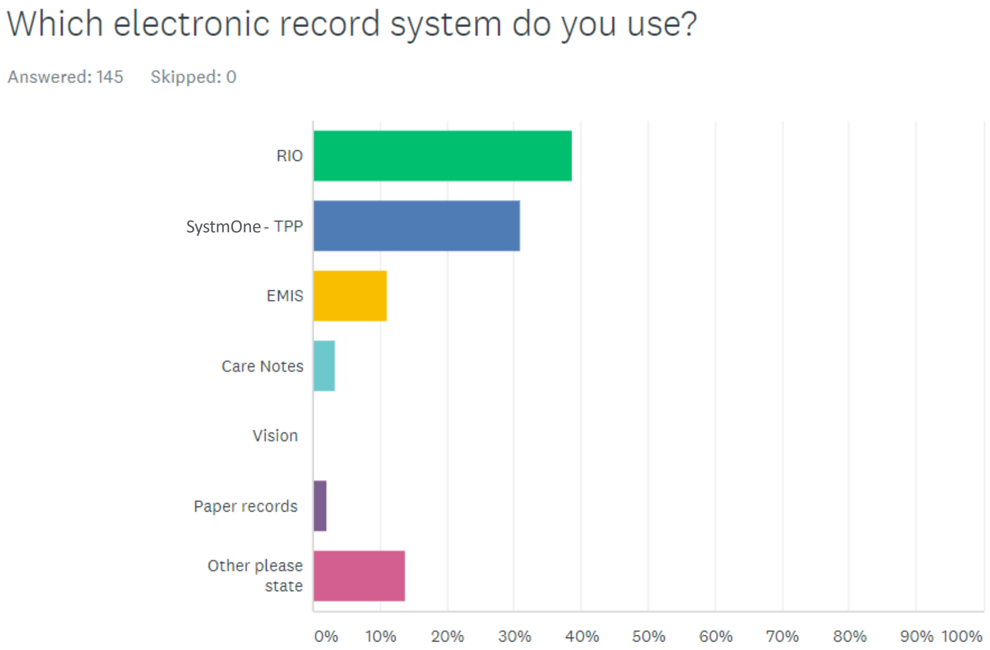


4.2 Electronic record systems

There is no single standard electronic patient record (EPR) system for health visiting in the UK and health visitors reported a range of different systems.

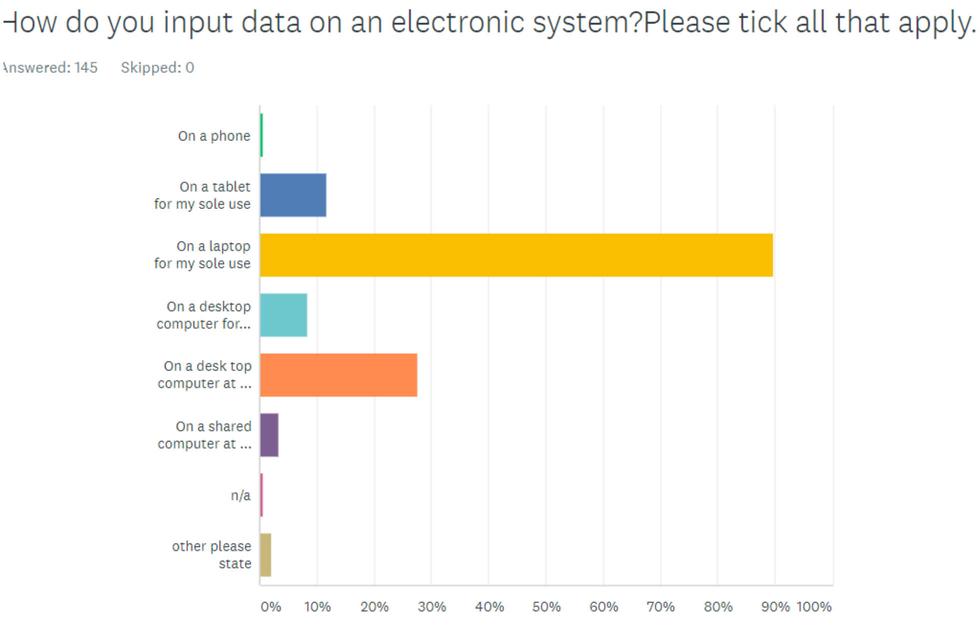
RIO was the most commonly used system, used by almost 39% of respondents, followed by SystmOne (31%); although we recognise that the data may not be fully representative of the UK as 22% of the respondents in this survey worked in the project pilot site of Southern Health which uses RIO.

Table 2 – Survey Question 3



Almost 90% of respondents reported that they entered data onto the EPR on a laptop for their sole use.

Table 3 – Survey Question 5



The findings from these questions indicate that almost all health visitors were using an electronic patient record system (EPR), with the majority having access to a laptop for their sole use. This is important as it demonstrates a level of IT infrastructure on which to build analytical capability.

4.3 Data capture – vulnerability factors

This section describes the range of vulnerability factors collected by health visitors. The survey questions were themed on the national definitions of vulnerability[13] to capture the breadth of vulnerability factors. Vulnerable children are defined as "Any children at greater risk of experiencing physical or emotional harm and/or experiencing poor outcomes because of one or more factors in their lives". PHE, NHS England and partners have developed a framework for vulnerability during the COVID-19 pandemic to support 'child and young person-centred recovery' for 3 broad groups of vulnerability, which are:

- Clinical vulnerability includes a group of children who may be more vulnerable because they have underlying health conditions or risk factors and those who do not have access to treatment or preventative public health measures such as immunisations.
- Children and families who are at increased risk and have a statutory entitlement for care and support (Children in need; children who are subject to a Child Protection plan; Children in Care; children with Special Education Needs and Disabilities (SEND) with an Education, Health and Care plan and those with a social worker)
- Children who may be at higher risk due to being negatively impacted through wider determinants of health and/or family stressors, social circumstances and may not be known to services. Infants and children's physical, emotional and mental wellbeing are significantly shaped by the social determinants of health which include a wide range of risk factors associated with poorer health and other outcomes.

The survey responses on the level of data on vulnerability factors routinely collected by health visitors are shown in the following Tables 4, 5 and 6.

Table 4 – Clinical vulnerability - Survey Question 6

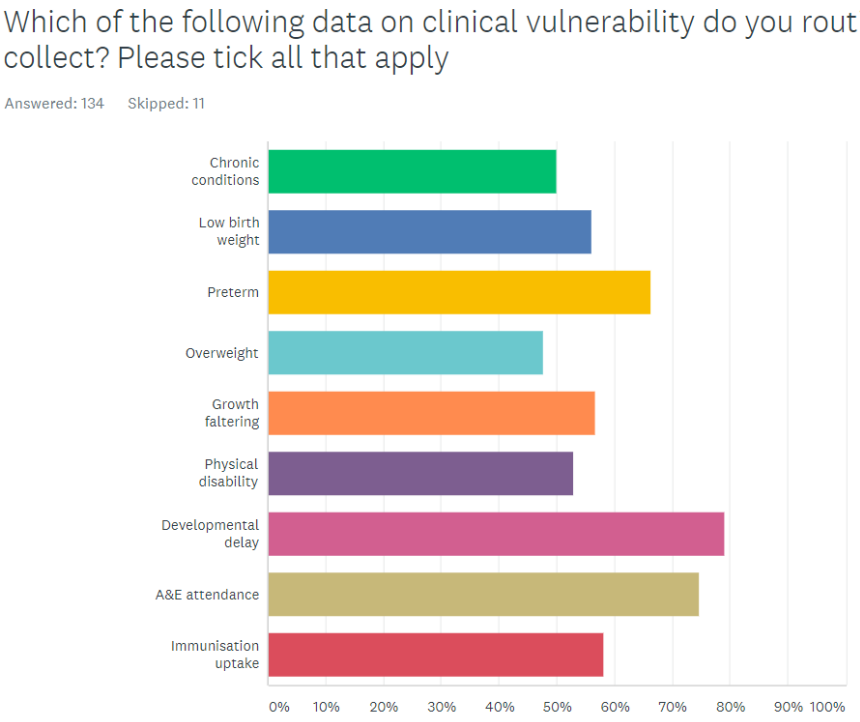


Table 5 – Statutory entitlement - Survey Question 7

Which data on those at higher risk, or who have a need for statutory entitlement for care and support, do you routinely collect? Please tick all that apply.

We have tabled the responses with those with the highest responses first:

Statutory need	Yes responses
Subject to a Child Protection/ Child in Need Plan	98% (n=142)
Child in Care (LAC)	95.2% (n=138)
Child with Special Educational Needs or Disabilities/ Education and Health Care Plan	67.6% (n=98)
Young Carers	26.2% (n=38)

Table 6 – Vulnerability due to the wider determinants of health - Survey Question 8

Which of the following data on risk factors for wider health outcomes do you routinely collect? Please tick all that apply.

We have tabled the responses with those with highest responses first:

Risk factors	Yes responses
Domestic Violence and Abuse	85.5% (n=124)
Parent(s) smoking	84.8% (n=123)
Family Categorised as "Early Help" or receiving "Team around the Family/Child (not statutory support)	71% (n=103)
Parental substance misuse / alcohol dependency	68.3% (n=99)
Parent(s) with mental health conditions	67.6% (n=98)
Teenage parents	49.7% (n=72)
Parent(s) with a learning disability	49.6% (n=72)
Parent(s) with physical disabilities	39.3% (n=57)
Homeless family or other issues related to housing	39.3% (n=57)
Parent(s) with a chronic condition	38% (n=55)
Asylum seekers / refugees/ migrants	37.9% (n=55)
Single parent household	33.1% (n=48)
Unemployed / workless household	32.4% (n=47)
Parental Adverse Childhood Experiences (ACEs)	32.4% (n=47)
Care leavers	25.5% (n=37)
Gypsy / traveller community	24.1% (n=35)
Poverty in receipt of food bank	16.6% (n=24)
People previously in prison	13.1% (n=19)
Military family	11.7% (n=17)
Sex workers	9% (n=13)

The survey findings demonstrate the range of data on risk and vulnerability factors currently collected by health visitors and also the considerable gaps in information in some areas. The Government has set out their commitment to improving outcomes for vulnerable children; health visitors support this ambition by playing an important role in the identification of children's risk and protective factors. Once risk and vulnerability factors are identified, it is important that they are accessible to practitioners to enable them to consider the full breadth of these factors, alongside protective factors, to inform their clinical decision-making to consider strategies to mitigate vulnerability. Further exploration of the key drivers of data recording is needed to gain a greater understanding of the reasons why certain data are recorded, or omitted, and this will form part of the focus of the practitioner workshops within the discovery phase of this project.

4.4 Interoperability: Information sharing and communication

It has been widely recognised that there is a clear need for more effective information sharing between organisations working within the healthcare system to optimise outcomes and quality of care. This is reliant on the ability of IT systems to be interoperable with one another, to enable more integrated ways of working and inform clinical decision-making. Our survey sought to understand the extent of interoperability within health visiting. Respondents were asked whether they were able to view information from other agencies/organisations (interoperability) within their own health visiting records to support their decisions on risks/vulnerability. The findings are presented in Table 7:

Table 7 – Survey Question 9

Are you able to see information from other agencies/organisations (interoperability) within your own health visiting records to support your decisions on risks/vulnerability?

Agency/ organisation	Yes, I can view this information electronically	No, I cannot view this information electronically
A&E / critical care attendance	45% (n=63)	55% (n=77)
Child Social Care	9.5% (n=13)	90.5% (n=124)
Child Health Information Systems (CHIS)	63.8% (n=88)	36.2% (n=50)
Police / Domestic Violence and Abuse Notifications	34.1% (n=47)	65.9% (n=91)
NHS Adult Mental Health Service	36% (n=49)	64% (n=87)
NHS Child Mental Health Service	23.7% (n=32)	76.3% (n=103)
Therapy Services (SLC/OT/Physio etc.)	60.3% (n=85)	39.7% (n=56)
Maternity Services	20.6% (n=28)	79.4% (n=108)
Housing Homeless notifications	2.2% (n=3)	97.8% (n=131)
Dental Care	2.3% (n=3)	97.7% (n=130)
GP records	52.5% (n=75)	47.5% (n=68)
Voluntary sector providers care	0.8% (n=1)	99.2% (n=132)
Summary Care Record	40.9% (n=56)	59.1% (n=81)
Child Protection System (CPIS)	15.7% (n=21)	84.3% (n=113)

The survey findings highlight the limited extent of interoperability and data sharing in health visiting.

3 in 5 health visitors were able to view Child Health Information System and children's therapies data, however only 1 in 5 health visitors reported access to maternity and child protection data.

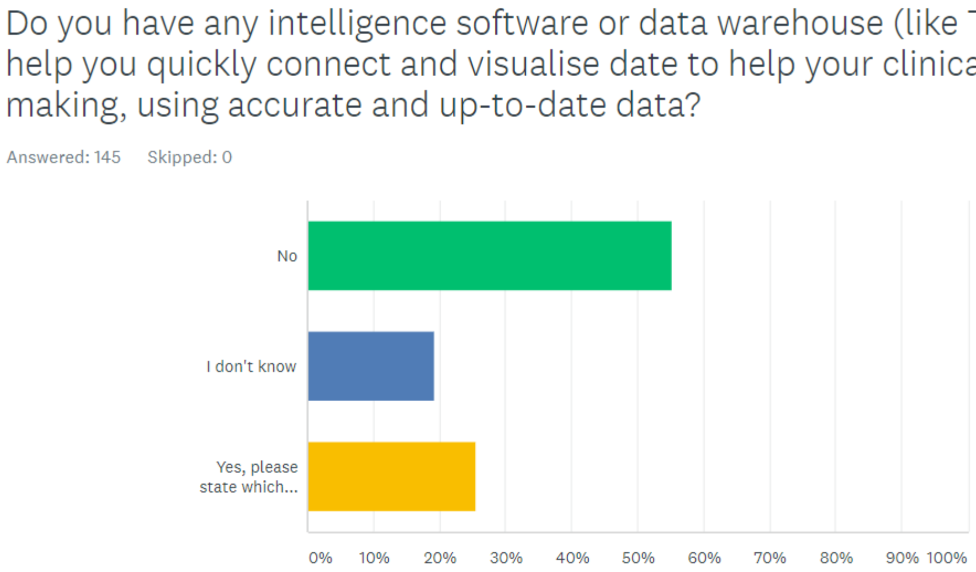
Just less than a half of health visitors had access to A&E/ critical care data, with a similar response to GP records.

4.5 Analytical capability

The Health Foundation highlights that "*A skilled workforce that is able to manipulate, analyse and interpret data is essential for a modern healthcare system… Analysis can help shape care for individual patients as well as informing decisions about services or across organisations and health systems*"[14].

Our survey sought to determine the extent of analytical capability in health visiting services. Only 25% of survey respondents had access to any intelligence software or data warehouse to help them quickly connect and visualise data to support clinical decision-making, using accurate and up-to-date data. Of these, 92% of respondents used Tableau.

Table 8 – Survey question 10


Do you have any intelligence software or data warehouse (like Tableau) to help you quickly connect and visualise date to help your clinical decision making, using accurate and up-to-date data?

Answered: 145 Skipped: 0

4.6 Respondents' views on the use of analytics to support health visitors' clinical decision making

The survey sought to elicit health visitors' views on the use of analytics to support health visitors' clinical decision-making around risk/vulnerability using a series of example user stories. Respondents were asked to rate each statement on how closely they aligned to their current situation/view.

Table 9 – Survey question 11

What are your views on the use of analytics to support health visitors' clinical decision-making around risk/vulnerability? Please rate each statement on how closely it aligns to your current situation/view.

	Strongly agree	Agree	Disagree	Strongly disagree
I find it very helpful, it enhances my practice	30%	37%	19%	4%
I find it unhelpful, it does not enhance my practice	3%	14%	53%	31%
We have access to analytics to inform my clinical practice when working with risk / vulnerability where I work	9%	23%	42%	25%
I would like to see the development of use of analytics to support my practice and maximise the use of data and analytical capability in health visiting in the future	50%	45%	5%	0%
I do not think data and analytics have a place in health visiting	3%	6%	48%	46%

The majority of health visitors were in favour of increasing the use of data and analytics to inform their clinical decision-making. 79% of respondents agreed or strongly agreed that data analytics would be helpful and enhance their practice. Only 8% of health visitors stated that they did not think that data and analytics had a place in health visiting. Both the positive and negative views require further exploration in the practitioner workshops as part of the co-production element of this project.

4.7 Scoping user needs

To support the project's aim to develop and refine health visitor user needs to inform the enhancement of analytical capability in health visiting, we asked respondents to rate a selection of "draft user stories". Respondents were asked, "In your view, what is needed to improve the way we use data and analytics in health visiting?" and to rate how important a series of options were and whether they would enhance their practice.

Table 10 – Survey question 11: User needs

As a health visitor, I want to...	Strongly agree	Agree	Disagree	Strongly disagree
To view information on known vulnerability before I complete an assessment of need at Universal Contacts	72.% (n=103)	27.3% (n=39)	0.7% (n=1)	0% (n=0)
To view information on known vulnerability before I compete an assessment of need when a family transfers in from a different area	78.5% (n=113)	20.8% (n=30)	0.7% (n=1)	0% (n=0)
To receive timely data /information from other agencies highlighting when families' needs/ vulnerability has changed to support a responsive service (i.e. movement between levels of support U,UP,UPP)	81.2% (n=117)	18.8% (n=27)	0% (n=0)	0% (n=0)
Information on risk/ vulnerability factors to be presented to me in a visual way to help me prioritise/ triage the work on my caseload	67.6% (n=96)	28.9% (n=41)	3.5% (n=5)	0% (n=0)
A mechanism to alert me when a child/ family with high levels of vulnerability has been/ may have been missed	81% (n=115)	18.3% (n=26)	0.7% (n=1)	0% (n=0)
To know which families on my caseload are currently receiving a universal plus/ UPP care plan (e.g. listening visits, support from a nursery nurse for a specific need, open referral to another agency etc...)	77.6% (n=111)	22.4% (n=32)	0% (n=0)	0% (n=0)
To track whether interventions are making a difference – i.e. outcome measures, client goals etc...	64.14% (n=93)	33.1% (n=48)	2.07% (n=3)	0.7% (n=1)

4.8 Current IT and analytical capability

Respondents were asked to rate whether they currently had the following capabilities to support the draft user needs listed above within their current operating system:

Table 11: Analytical capability

Do you have the following capabilities?	Yes	No
To view information on known vulnerability before I complete an assessment of need at Universal Contacts	53.9% (n=77)	46.1% (n=66)
To view information on known vulnerability before I compete an assessment of need when a family transfers in from a different area	25.9% (n=37)	74.1% (n=106)
To receive timely data /information from other agencies highlighting when families' needs/ vulnerability has changed to support a responsive service (i.e. movement between levels of support U,UP,UPP)	25.2% (n=36)	74.8% (n=107)
Information on risk/ vulnerability factors to be presented to me in a visual way to help me prioritise/ triage the work on my caseload	24.8% (n=35)	75.2% (n=106)

Do you have the following capabilities?	Yes	No
A mechanism to alert me when a child/ family with high levels of vulnerability has been/ may have been missed	21.8% (n=31)	78.2% (n=111)
To know which families on my caseload are currently receiving a universal plus/ UPP care plan (e.g. listening visits, support from a nursery nurse for a specific need, open referral to another agency etc...)	76.4% (n=110)	23.6% (n=34)
To track whether interventions are making a difference – i.e. outcome measures, client goals etc...	31.9% (n=44)	68.1% (n=94)

The findings from our survey highlight the extent of the limited analytical capability in current health visiting practice and reinforcing this project's aim to gain a greater understanding of the key drivers of this.

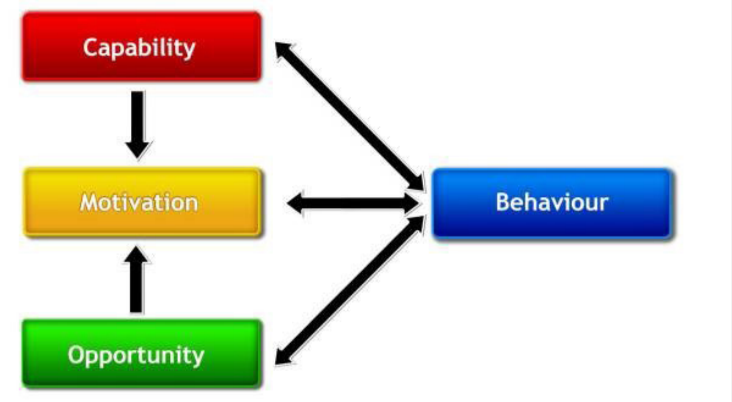
4.9 Qualitative survey findings - Improving analytical capability in health visiting

Data were collected on ways to improve analytical capability using free text boxes to elicit key themes as the responses were largely unknown, and their use enables respondents to express their own views and explanations. Qualitative data analysis comprised initial familiarisation with the data and primary thematic analysis. The themes from the thematic analysis were then mapped on to the key factors of the COM-B model[15]. This two-staged approach aimed to maximise the richness in the data, whilst ensuring that the analysis benefited from the explanatory model of implementation that the COM-B structure provided.

The COM-B model of behaviour is widely used to identify what needs to change in order for a behaviour change intervention to be effective. It identifies three factors that need to be present for any behaviour to occur: capability, opportunity and motivation. These factors interact over time so that behaviour can be seen as part of a dynamic system with positive and negative feedback loops. Motivation is a core part of the model and the PRIME Theory[16] of motivation provides a framework for understanding how reflective thought processes (Planning and Evaluation processes) and emotional and habitual processes (Motive and Impulse/inhibition processes) interact at every moment leading to behaviour (Responses) at that moment.

This section will present the survey findings using the three COM-B constructs to identify the factors that support and hinder the implementation of analytical capability in health visiting. Whilst some themes resonated across more than one COM-B construct, findings are reported within the construct that was most central to each theme. The constructs and significant sub-components are presented in detail with excerpts from original survey comments to support the findings.

Figure 2: The COM-B system: a framework for understanding behaviour



Credit image source Implementation Science, doi: 10.1186/1748-5908-6-42

Table 12 – COM-B core factors and sub-components affecting implementation of improved data analytics in health visiting

COM-B CORE FACTORS	SUB COMPONENTS
Capability: is defined as the individual's psychological and physical capacity to engage in the activity concerned. It includes having the necessary knowledge and skills.	Health visitor workforce skills: Understanding of capability of data analytics. Health visitor workforce skills: Individual practitioner skills.
Motivation: is defined as the aggregate of mental processes that energise and direct behaviour, not just goals and conscious decision-making. It includes habitual/ instinctive processes, emotional responding, as well as analytical decision-making.	Sense-making: • Legitimation – including user benefits • Differentiation • "Time" Clinical management: • Caseload management/ prioritisation of caseload • Reviewing "transfers-in"/ new families known risk and resilience factors prior to the health visitor contact • Information sharing between agencies • Care-planning • Clinical decision-making – particularly when working with children and families with vulnerability/ risk factors; accessible information • Responsive to changing needs • Demonstrating impact – appraisal and quality improvement • Identifying "missed children"
Opportunity: is defined as the attributes of an environmental system and all the factors that lie outside the individual that make the behaviour possible or prompt it.	IT and analytical capability/ infrastructure Interoperability and communication: • Access to data from other agencies • Information governance considerations - concerns about breaching General Data Protection Regulations (GDPR) • Ethical considerations Performance and appraisal Data quality – inaccurate or incomplete data Workforce/ staffing

4.10 Capability

This core factor is defined as the individual's psychological and physical capacity to engage in the activity concerned. It includes having the necessary knowledge and skills. The findings from our survey are presented as workforce skills divided into the following sub-components:

4.10.1 Workforce skills - Understanding of capability of data analytics

Survey respondents described a lack of understanding of the capability of data analytics:

"[barrier]: lack of understanding of the process"

"[barrier]: not enough time to… learn the systems where we could have access."

"[barrier]: I have no experience" "awareness of what is out there"

"[solution]: For everyone to have an understanding of the basics e.g. why it is important and then build on this. We now have sight of our dashboard and can see how many of our KPIs we are achieving or falling short on, in some ways it can be demoralising but it can also be positive to see all the hard work reflected in green. Then we need to build upon this knowledge and enable staff to search for information"

"[solution]: "better understanding of the benefits"

They also reported a perceived lack of understanding amongst commissioners on analytical capability which was found to be a barrier. Respondents suggested solutions that included:

"[solution]: influence used to help commissioners understand how technology and data analysis may improve children's lives"

"[solution]: better understanding – employing statisticians [analysts]… Specific role for health analytics in 0-19 teams, with budget"

4.10.2 Health visitor workforce skills – Individual practitioner skills

This sub-component describes respondents reported lack of skills and perceived lack of capacity to learn new skills amidst a plethora of other practice changes and service transformations:

"[barrier]: I have very little knowledge about how to access data if it has been collected"

"[barrier]: I think we have experienced many changes. Recently I think it has been overwhelming - with the further introduction of systems… it can feel your capacity to learn new things is at maximum"

"[barrier]: lack of training of staff, little support"

Respondents also reported lack of knowledge and skills to effectively use the IT systems of other agencies where interoperability arrangements were in place:

> ***"[barrier]: we are not trained by them and do not have the support when things change and it is not always easy to get the information"***

They also described feeling anxious about the impact of their perceived low level of knowledge and skills in this area:

> ***"[barrier]: Fear from staff not inputting the right data"***

> ***"[barrier]: Health visitors lack of knowledge and fear of IT/data"***

Respondents suggested that the perceived complexity of IT systems and analytics were stumbling blocks and that the importance of having systems that were easy to use was an important aspect in overcoming these obstacles.

> ***"[solution]: Training… easy to use systems that are not overly complex"***

> ***"[solution]: better IT training which would allow staff to use what they have more effectively"***

4.11 Motivation

The core factor of motivation is defined as the aggregate of mental processes that energise and direct behaviour, not just goals and conscious decision-making. It includes habitual processes, emotional responding, as well as analytical decision-making.

4.11.1 Sense-making - legitimation – including user benefits, differentiation, "time"

The findings from our quantitative data reported earlier indicate that most health visitors feel that improved analytical capability in health visiting has the potential to make a positive contribution to their practice. However, they also described experiencing many barriers to its effective use in their current practice. Gaining a greater understanding of these drivers will be important to ensure that the use of data and analytics is fit for purpose and improves health visiting practice:

i. **Legitimation:** Health visitors described the importance of data and analytics being fit for purpose and enhancing their practice:

> ***"[analytics] needs to be meaningful"***

> ***"Of course inputting data and analysing it is important, and necessary for quality control and measuring outcomes. I actually quite like data crunching"***

> ***"Some don't like data… Need to [listen to] positive as well as negative feedback"***

> ***"[barrier]: Seems more managerial and used to say where we have not met targets or missed something on our notes rather than anything else"***

> ***"[barrier]: Lack of acceptance that data and analytics are needed in health visiting"***

Respondents offered solutions to improve legitimation:

"Have system that is fit for purpose"

"For health visitors to see the value I think any data analytics needs to focus on impact of our interventions"

"Make it easier for clinicians to use and see a purpose for the data they are asked to input"

Some respondents described a lack of congruence with their current needs and practice with limited or no perceived benefit:

"I am employed to deliver a service to clients, which means I need to spend time with them, assessing and offering planned and agreed interventions… If health visiting is reduced to data collection and analysis, I don't want to do the job"

"[barrier]: Overload of areas of data collection, can feel like endless tick boxing"

Respondents also reported that legitimation was dependent on being assured that increased use of data and analytics would "do no harm":

"[barrier]: Computer-led not clinically-led data collection; data collection for reporting purposes is the only driver. There is also the 'moral' question of whether labelling people is helpful to them. The current system of adding alerts and never removing them because of lack of time or lack of understanding of human rights is appalling. Lots of children and families are stigmatised and would be horrified if they knew what alerts, through laziness or poor systems, are on their records"

ii. **Differentiation:** This sub-component describes the health visitors' understanding of how analytical capability differs from their existing practice. Most health visitors recognised that it offered a new approach to practice, however some needed further convincing of how it would enhance their practice.

"Analytics is not useful on a day-to-day basis. Tableau may tell me a child has a care plan. I already know that. The health record tells me this too, and reminds me of the detail of the plan, what the goals are and what interventions are being used. The health record is the first place I would go to check this type of data"

"My experience is that the child's health record should hold the information I require. Tableau is useful for reviewing case load priorities, caseloads and measuring outcomes. However the relevant information I need before reviewing any client is in their health record and is qualitative rather than quantitative. I need to know what is in a care plan, rather than whether they have a care plan - I know that already"

iii. **Time:** Time was considered to be an important resource for both the health visitor and the organisation that could be described as being "spent" on activities that were considered to be legitimate, or not. Effective use of data and analytics was dependent on the health visitor having sufficient time to input and review data held on a client, or group of clients, prior to an appointment/client-related activity and perceiving this as worthwhile. Some respondents felt that time spent on data collection and analytics was a waste of time.

"[barrier]: Time. Checking lots of different places for information is time consuming"

"[barrier]: Time to input different information- i.e. if information is stored in different places/forms for different things"

"Lack of time would be the main barrier"

"[solution]: A review of systems with thought to the information we collect. Streamlining the system to ensure inputting is as quick and efficient as it can be so we are not spending excessive time at a computer rather than with families"

"[solution]: Easier quicker way to input data"

Uptake and use of data and analytics in health visiting was also influenced by the concept of time as a process. Health visitors described the importance of having time to learn the skills needed to maximise their analytical capability

4.11.2 Clinical management

Respondents recognised that data and analytics served multiple purposes within health visiting, both for the organisation/commissioners and for themselves as frontline practitioners. When the sole purpose of data and analytics were perceived to be for the benefit of the organisation or commissioners, respondents reported limited perceived value which had a negative impact on their engagement in the process:

"[barrier]: [lack of] flexibility and responsiveness to current need, currently meeting needs of commissioners of service that may or may not always meet our requirements"

"[barrier]: The wrong questions asked by data analytics"

"[barrier]: Submitted data only gets viewed by management not seen at ground level"

"The mechanisms developed locally focus on KPI - this means time and effort has been diverted from developing systems to help us understand/ support families and the impact of our work"

The survey findings indicate that improved engagement in data and analytics would be achieved if their use and application were tailored to the needs of frontline practitioners.

"[solution]: Give priority to reviewing all the data we are collecting and making sure feedback is given to us, KPIs are useful to some extent but needs to be given context eg why when we are increasingly busy with reduced staffing (for example)"

"I think someone should be leading the way who understands the health visitor role. I think if staff recognised the importance of it and it was a 2-way process where results were routinely shared you would be more likely to input accurately to capture the role more effectively… using an accessible to all data system, graphs and charts"

Respondents also recognised the importance of co-production:

> *"We need to be involved with the process. What data should or shouldn't be collected how often and for what purpose"*

The quantitative survey responses to question 11 provide some indication of user needs and these were confirmed in the free text findings. Respondents provided suggestions of areas of practice where they perceived analytics could add value, including:

i. **Caseload management/prioritisation of caseload**

> *"[solution]: identifiable UP/UPP caseloads, with attached risk and vulnerability information"*

> *"[solution]: Using risk factors to determine levels of intervention"*

> *"[solution]: [local system] enables us to search for our caseload based on our name, this is in addition to coding families as U, UP or UPP as well as within KPIs. It is possible for managers to see how many families we hold as individuals and this is calculated depending on contracted hours to ensure equity. It also means that in certain circumstances, e.g. if a member of staff leaves or is on long term leave, it is possible to search and reallocate to reduce the risk of the families not being seen".*

ii. **Reviewing "transfer-ins"/new families known risk and resilience factors prior to the health visitor contact**

> *"[solution]: Embedded collection [of previously collected data] from record keeping that is appropriate to each visit"*

iii. **Information sharing between agencies**

> *"[solution]: More working together with ways to pull the information from each area into an accessible form"*

iv. **Care-planning**

> *"[solution]: Productive and responsive… one family one plan approach"*

> *"[solution]: We use it to run reports on the families with alerts to make sure they are getting the care plans and care they need"*

v. **Clinical decision-making – particularly when working with children and families with vulnerability/risk factors; accessible information to support timely clinical decision-making**

"[solution]: individualised updates on vulnerable clients, i.e. when last seen by an agency working with the family"

"[solution]: Bringing up bloodspot results during a visit and confirming things there and then, makes a huge difference in terms of ongoing trust and belief; to be able to quickly seize on an answer and give it in a speedy manner"

vi. **Responsive to changing needs**

"[solution]: We review reports from A&E, DART notifications and MARAC to support us to identify vulnerable children and use professional judgement on the requirement for enhancing care"

vii. **Demonstrating impact – appraisal and quality improvement**

"[FNP service within 0-19] collect data over a long period with each client, as well as short data questionnaires we use with each client. Mastery, for example will be scored at enrolment and then again at graduation 2 years later - which gives a good sense of how that client may have grown in her self-efficacy as a parent. We use the ASQ data as well as the data around contraception, second pregnancies etc to enable us to see trends, which can enable not only our service, but wider services eg - upon noticing that we had a larger number of our 24 month ASQ results in communication low scores, we were able to work with the SALT service to identify that part of their service had been decommissioned in the previous year, and that this may have been a contributory factor"

viii. **Identifying "missed children"**

"[solution]: We have a dashboard which shows KPIs, missed children and levels of dependency of caseloads"

"[solution]: [data analytics] ensures that we are able to have a failsafe for all our core contacts"

4.12 Opportunity

The core factor of opportunity is defined as an attribute of an environmental system (i.e. factors that lie outside the individual), that make the behaviour possible or prompt it. This includes physical opportunities like financial or material resources, and social opportunities that involve other people and organisations.

4.12.1 IT and analytical capability/infrastructure

Respondents described the importance of having access to a range of factors within this sub-component:

i. **Good internet connection**

"[solution]: Connectivity… good internet connection"

ii. IT support resource/team to develop and implement "fit for purpose" health visitor IT systems

"Investment in good IT systems and software Recruitment of staff that are able to advise on the above (these are probably not health visitors)"

iii. Adequate IT hardware – laptops, tablets, smartphones to input and access data in a timely way

"[solution]: We need tablets and good wifi. Phones with good wifi that can download apps"

"laptop is fine but I think we need portable equipment like tablets or use of a 3/5G dongle so records can be written whilst visiting families"

iv. Effective/efficient IT system – fit for purpose

"[barrier]: Inadequate systems, difficult to navigate… Our computer system is clunky and not very user friendly"

"[barrier]: when health visiting moved to local authority our records were bolted onto the social care records. The data collected doesn't always meet our needs and is weighted towards social care. For instance no immunisations information, no APGAR scores etc"

"[barrier]: Systems have been designed by people who do not understand Health Visiting"

"[solution]: simple operating system"

"[solution]: Have a system which is quick and efficient to use"

"[solution]: we could do with a system that is designed for us and easily transmits data to and from GP services, social care and maternity etc."

v. Software to support analytical capability

"[barrier]: Little support with SystmOne (as not employed by NHS anymore). We do tend to ask about [risk factors] and they will be recorded but I think would be difficult to extract from the records"

"[solution]: Reports should be made available across the system and used to analyse population health further particularly around inequalities. Information could be available on an individual, family and community level"

"[barrier]: Analytical tools are not available… IT systems do not support this"

"[solution]: A better system that allows visual presentation and more accessible informatics instead of trawling through a journal and looking at different questionnaires"

vi. One shared national IT system across the NHS and social care

"[barrier]: Too many separate systems, for example we routinely use: RIO, the HIE therein, EPR for hospital records, EMIS for GP records, the 'Portal' for national surveillance screening results - it's dizzying!"

"[barrier]: Lack of shared system across UK"

"[solution]: more integrated working, one IT system for the whole of the NHS"

vii. Streamlined data collection – to make best use of time (described in Motivation section above)

"[solution]: Reduction in data collection…. We need to be involved with the process. What data should or shouldn't be collected how often and for what purpose"

"[solution]: A review of systems with thought to the information we collect. Streamlining the system to ensure inputting is as quick and efficient as it can be so we are not spending excessive time at a computer rather than with families"

4.12.2 Interoperability and communication

Survey respondents were unanimous that good communication between agencies with data sharing and interoperability between IT systems were crucial to effective health visitor service delivery. They highlighted a number of barriers and related solutions to improve better integrated working.

i. Access to data from other agencies

"[barrier]: Information is being collected about families by a variety of services we link with but only available once concerns are raised"

"[barrier]: Systems don't integrate… No systems in place in relation to social care so totally reliant on communication with individual Social Workers"

"[barrier]: IT systems are complex, they do not link together - we need a central depository were we feed data into"

"[barrier]: Multiple electronic systems that do not link up, we currently have no automatic access to the NHS spines, imms and NBBS are on a different system, child health is separate, GP is separate, community services is separate, midwives system is separate… resulting in multiple emails to share info which is time consuming and inefficient with risk of errors and missing things. Vulnerable families can move around under the radar being missed multiple times!"

"[barrier]: No shared access. Therefore, finding out level of need too late"

"[barrier]: Each service uses a different system which does not share information. Outside agencies do not share info to support the health visitor make appropriate decisions before they see the family themselves"

ii. **Information governance considerations** - respondents spoke about their anxieties around data sharing and concerns about breaching General Data Protection Regulations (GDPR)

"My barrier to the above data is that my employer threatens me with Data breach if I look at other records held for my family. Therefore I have to ask for information or go in blind"

"GDPR, and Information Governance restrictions between services - assumptions from practitioners that it is more work which will take away from the face-to-face relationship of the home visit"

Respondents also raised the need for greater clarity around data sharing, what could/couldn't be recorded, lines of accountability and how interoperability and data sharing differs from the referral process.

"[barrier]: If we have access to everything, do we then become an investigatory service?"

"[solution]: Increased knowledge of partners responsibilities in information sharing"

"[solution]: ensure systems talk to each other. Cross cutting agreements on data sharing and privacy with some national guidance are needed"

iii. **Ethical considerations**

"[barrier]: Information governance is a minefield and a client could argue that we do not need to know everything about them"

"There is also the 'moral' question of whether labelling people is helpful to them. The current system of adding alerts and never removing them because of lack of time or lack of understanding of human rights is appalling. Lots of children and families are stigmatised and would be horrified if they knew what alerts, through laziness or poor systems, are on their records"

4.12.3 Performance and appraisal

This sub-component describes how respondents determine how effective or useful data and analytics are in health visiting and how they evaluate their "worth". Respondents reported a tension between the perceived use of data and analytics as a performance management tool and their use to inform and enhance clinical practice.

"[barrier]: data collection for reporting purposes is the only driver"

"[barrier]: You collect masses of [data] for contracting purposes but it isn't available/ accessible for practitioners to use meaningfully and to aid practice"

Respondents also described their frustration that the data did not provide an accurate appraisal of the quality or outcomes of their work:

"[barrier]: the priorities of the CCG and the Trust are to count numbers not quality"

"[solution]: Procurement of one national system for health visitor service with strategic reporting for commissioners and PHE. It is a national imperative for this to happen, linked to reducing adverse childhood experiences for children, linked to the reducing the financial long-term costs of failure e.g. going into care"

"[barrier]: Sometimes it feels as though the numbers just do not reflect the work"

"[solution]: I worked within FNP and used data meaningfully to understand engagement of client and predict possible outcomes… FNP has brilliant data that is real time and generates easy to understand reports"

"[solution]: measuring impact of health visitor interventions"

"[solution]: In previous services we used data to review breastfeeding rates and inform interventions"

4.12.4 Data Quality – inaccurate or incomplete data

The quality of data input and data accuracy are well known limitations of analytical capability. Respondents reported their concerns about clinical decision-making being based on inaccurate or incomplete data.

"[barrier]: Fear from staff not inputting the relevant data"

"[barrier]: the recording is open to interpretation which means key information around vulnerability gets missed"

"[solution]: Make sure they are accurate…. consistent, standardised inputting"

"[barrier]: They are not always accurate… Systems not matching up and giving different data"

"[barrier]: Poor IT equipment meaning that staff do not input information in a timely manner"

"[solution]: A single robust system and Business Intelligence. To be able to trust the data"

"[barrier]: Unless the correct forms are being used it does not inform anything… limited information, mistrust of data"

4.12.5 Workforce/staffing

Respondents highlighted the importance of sufficient workforce capacity to enable effective health visiting practice and the implementation of improved analytical capability. Many respondents reported the impact that workload pressures had on their ability to implement change and have dedicated time for quality improvement initiatives.

"[barrier]: Workload pressures… Time consuming and need to be kept updated. Depends on size of caseload and sufficient staff to complete this work"

"[solution]: More staff as amount of information we have to look at has increased"

"[solution]: More health visitors… investment… Having a reasonable caseload"

4.13 Summary of Health Visitor Survey

The survey highlighted a number of capability, motivation and opportunity factors that affect the implementation of improved analytical capability in health visiting aligned to the COM-B model. Further exploration of these factors in the national workshops is needed to gain a greater understanding of their implications on health visiting practice, and possible solutions for quality improvement.

5. CO-DESIGN NATIONAL WORKSHOPS

5.1 Method

Alongside the national scoping survey, the first phase of our 'discovery' project included two national co-design workshops to gain a greater understanding of user needs and learn more about the current national analytical capability in health visiting. The workshops were designed to build on the emerging themes from the national survey to enable deeper exploration of the identified challenges and opportunities through root cause analysis[17] and refinement of the user needs. In particular, we sought to explore the use of data and analytics to support health visitors' work with vulnerable "invisible children" and those with additional needs, to inform phase 2 of the project.

The workshops were held virtually using the Zoom meetings platform, rather than face-to-face as planned, due to the COVID-19 national restrictions that were in place at the time of the workshops.

5.2 Sampling

We recruited participants to the workshops using purposive sampling which does not seek to generalise to the whole population, but instead to select a group of individuals who are likely to demonstrate or add insight to the area of our project through their prior knowledge and expertise in frontline health visiting practice and/or the use of data and analytics to inform clinical decision-making. As the workshops comprised a relatively small sample and a "snap shot" in time, the goal of data saturation was considered unachievable. Therefore, a considered approach to sampling was undertaken with the aim of reaching a level of "data sufficiency" that would provide insight into the project's aims and questions, with multiple views and a range of participant actions[18].

The purposive sample aimed to represent a geographical spread of practitioners from across England to reflect potential different patterns of service delivery, access to technology, analytical capability in health visiting and practitioner engagement and views on the topic.

5.2.1 Participants in national workshop 1 – practitioner workshop

Participants in workshop 1 were drawn from practitioners in health visiting practice. All practitioners who participated in our national survey were asked to indicate whether they consented to us contacting them to join the national workshop and/or be kept up to date with the project's progress and outputs. Of the 145 participants, 22 indicated that they would like to be involved; they were e-mailed and invited to the workshop, with a reminder sent to achieve geographical spread. The final sample of 15 practitioners who attended workshop 1 represented a variety of health visiting clinical backgrounds, with geographical representation from across England, see Table 13 and Figure 3.

Table 13 – Details of workshop 1 participants - practitioner workshop

Job role	Number who attended
Senior Manager/Professional Nursing Lead/ Clinical Lead	5
Team Lead	3
Healthy Child Programme Area Manager	1
Health Visitor	1
Specialist Health Visitor (Safeguarding)	1
Clinical Systems Specialist	1
Digital Clinical Safety Facilitator	1
PhD student	1

Figure 3: Geographical representation of workshop 1 participants

5.2.2 Participants in national workshop 2 – expert workshop

A similar process of purposive sampling was applied to our 2nd workshop which comprised national experts working in policy, research or education with the early years, health visiting practice, data collection, information governance and analytics in community healthcare. See Table 14 for details of workshop 2 participants.

Participants were selected to provide national insight to the area of our project. We specifically targeted experts from across the health and social care system, rather than focusing solely on health visiting, to support transferable learning as the use of data and analytics in health visiting is currently not well established. We also targeted experts with experience of using data and analytics to support vulnerable children and their families; this included supporting children living with domestic violence and abuse as this represents a significant risk factor for children and is a useful example to focus the scope of our enquiry and test assumptions.

Workshop 2 was also held virtually, which presented an unexpected benefit as Dr Lynn Kemp, a recognised international leader in the field of early childhood interventions in primary and community health, translational research and implementation science from Western Sydney University, was able to join and share her considerable expertise in this subject.

Table 14 – Details of workshop 2 participants - expert workshop

Name	Job role	Organisation
Lesley Barrington	Head of Information Assurance	Southern Health NHS Foundation Trust
Nicky Brown	Regional Lead Nurse for Safeguarding and CYP Healthcare, Wellbeing and Workforce, London	Public Health England Office for London
Sarah Culkin	Head of Analytics	NHSX
Dr Sandi Dheensa	Principle Investigator, Domestic Violence/ Abuse and Health Research Group	Bristol Medical School, University of Bristol
Kenny Gibson	National Head of Safeguarding	NHS England & NHS Improvement
Thomas Griffiths	Head of Evaluation and Data Sharing Lead	Troubled Families Programme, Ministry of Housing, Communities and Local Government
Distinguished Professor Lynn Kemp	Director, Translational Research and Social Innovation (TReSI) Member of the Ingham Institute	School of Nursing and Midwifery Western Sydney University
Kath Lancaster	Independent Nurse Consultant	The Lancaster Model
Becky Leader	Practice Lead on Data Transformation	Troubled Families Programme, Ministry of Housing, Communities and Local Government
Toby Lowton	NHSX - Economist	NHSX
Coleen Milligan	National Programme Manager	Public Health England
Sue Peckover	Retired	(Sheffield Hallam University)
Kate Thurland	Interim Head of Lifecourse Intelligence	Public Health England
Louise Wilson	Network Delivery Manager, Northern England Maternity Network PGR and Associate Researcher	Northern England Clinical Networks (NHSE/I) Newcastle University

5.3 Workshop schedule

The workshop schedule was guided by the themes elicited from the national survey using the COM-B framework to provide a deeper level of understanding of the key barriers and enablers of data use and analytical capability in health visiting.

The aims of the workshop were to:

- Provide an overview of the project
- Consider what is data?
- Share feedback from survey
- Explore current practice, barriers/enablers of data use and analytical capability in health visiting – with solutions for improvement
- Share next steps with details of ongoing project peer review process

To capture the participants' views, a range of groupwork methods were used and these were adapted to the virtual setting. The workshop session was broadly split into two sections:

The first section focused on "setting the context" with a series of short presentations from the project team to ensure all participants were provided with information on the purpose of the project, key definitions, an overview of data use in health visiting and the initial findings from the national survey. Participants were then asked to consider a short schedule of open questions in smaller breakout groups. Open questions were used predominantly as the responses were largely unknown (due to the discovery nature of the project) and their use enables participants to express their views, reasons and explanations. The breakout room questions at this stage focused on identifying any obvious gaps in the national survey findings.

The second section of the workshop focused on more small group sessions, with feedback to the main group discussions, to enable participants to provide further insight and scrutiny of the key barriers to data use and analytical capability. These groups were facilitated by a member of the project team. Participants were asked to use the "Five whys" approach to root cause analysis to build on the findings from our national survey.

Root cause analysis using five whys:

The Five Whys?

"What is it? By repeatedly asking the question 'why?' (use five as a rule of thumb), you can peel away the layers of a problem to get to the root cause. Five whys can help you determine the relationship between different root causes of a problem. It is a simple tool and can be completed without statistical analysis.

When to use it? You can use this tool either in isolation or to complement a root cause analysis. Because it quickly helps identify the source of an issue or problem, you can focus resources in the correct areas and ensure you are tackling the true cause of the problem, not just its symptoms"

NHS Improvement (2018)[19]

Participants were then asked to provide their views and experiences of key enablers and solutions. The workshop schedule of questions were broadly similar for both workshops, with questions slightly tailored to the specific group of participants as detailed below:

Workshop 1:

1. Health visitors say they don't have enough time - why?
2. Health visitors don't engage with data - why?
3. Health visitors say data doesn't help them in their day-to-day role - why?
4. Health visitors are concerned about the ethical implications of data recording - why?
5. Health visitors are concerned about the ethical implications of data analysis - why?

Workshop 2:

1. Health visitors say they don't have enough time - why?
2. Health visitors don't engage with data - why?
3. Health visitors can't access all the information they need from other organisations - why?
4. Health visitors are concerned about the ethical implications of data recording and analysis - why?
5. Health visitors working in different areas all record different vulnerability factors - why?

Workshop sessions were recorded using Zoom meeting recording function with consent and notes made on all key points. Written notes were also made during and on completion of the break-out sessions which could not be recorded.

5.4 Workshop findings

This section covers the key findings from our national workshops which provide additional insight into the analytical capability deficiencies in health visiting, through exploration of the root causes and further refinement of the "user needs" to describe the functionality/ solution that will be valuable to either a user (health visitor or health visitor manager) or commissioner of health visitor services . There was considerable overlap in the key themes identified as root causes for the different workshop questions. To avoid repetition, these have been amalgamated and are presented using the COM-B core factors with direct quotes from workshop participants to support the findings.

5.4.1 Root cause analysis: Health visitors say they don't have enough time, they don't engage with data and say data doesn't help them in their day-to-day role - why?

Workshop participants described how workforce capacity issues in health visiting often resulted in data and analytics not being prioritised. This was due to the following root causes:

i. **Health visiting is not seen as a priority for investment** - There is limited data on the impact of the health visiting service on child and family outcomes, or cost-effectiveness. This has resulted in cuts to the health visiting workforce with associated increasing caseload sizes, with higher levels of vulnerability which place additional demands on health visitors' time.

ii. **Health visiting IT systems are not designed for the needs of the end-user as health visitors are not included in the design process, *"It is 'bolted on' to a system designed for GPs using a medical model- there are hardly any SNOMED codes that reflect health visiting activity"***

- Time-consuming data entry and retrieval processes: "***too many tick boxes to fill in***"
- Effort was often duplicated with the same information recorded in multiple ways, "***We are already recording the information in free text- it's duplication***"
- Data is not addressing their needs - feedback needs to be easily interpreted – good visualisations, with accurate data.

iii. **Data is wrong, inaccurate or out of date, as a result, health visitors do not trust it to support their clinical decision-making.**

- Data is only as good as the information that practitioners put in "***rubbish in… rubbish out***"
- Because data is not perceived to be useful, as it is inaccurate, health visitors don't prioritise data recording – "***it feels like a waste of time… If the data is wrong, they might make the wrong decisions, which could cause harm***"
- Artificial intelligence has not been developed to accurately score and prioritise risk/ vulnerability in health visiting.

iv. **Health visitors need support to improve data and analytics in their practice**. Health visitors have insufficient knowledge and skills in the use of data and analytics. This was due to a lack of training on their importance as a core part of their role. However, many don't have support for data and analytics in health visiting – there is limited training, no "helpdesk" or "on call" technical assistance or prompts to improve data quality and avoid errors.

5.4.2 Root cause analysis: Health visitors can't access all the information they need from other organisations and are concerned about the ethical implications of data recording and analysis - why?

Participants reported variation in their access to information from other agencies and the extent to which they utilised this information, due to:

i. **Variation in operating systems/electronic patient records due to locally devolved decisions on IT systems and intraoperability:**

- Commissioned services are constrained by what service they are paid to deliver. Health visitors need access to appropriate IT equipment with analytical capability that is fit for purpose to address the requirements of health visiting practice.
- No single IT system across the healthcare system and it is unlikely that this will be resolved. Organisations will source systems that best serve their needs.

ii. **Lack of information sharing across the healthcare system:**

- IT systems "do not talk to each other" – different systems, no intraoperability or local arrangements for information sharing
- Information is requested for "a specific need" and therefore may be missed, or not processed correctly.

iii. **Lack of consistent national data collection**

- Lack of consistency in data collection between different Health visitor provider organisations and across different sectors of the healthcare system
- Varying thresholds and definitions of vulnerability does not enable comparisons between areas
- Lack of understanding across the system of other users' needs
- Data is used for different purposes and these need to be made explicit as they serve different user needs (e.g. commissioner, manager, clinician).

iv. **Data quality concerns – health visitors do not trust data to support clinical decision-making or that it represents population's needs:**

- Information not trusted as accurate, or relevant to health visitors - quality of information is reliant on the quality of information inputted at source
- Difficulty eliciting accurate information in a "single snapshot" health visitor contact – quality of information is dependent on a trusted "health visitor-client relationship" developed over time. Health visitors were also concerned that prioritising data collection might appear intrusive and skew the focus of the health visitor contact
- Method of data collection and enquiry can cloud what is said – training and evaluation of approaches and their impact on data quality is crucial. If health visitors don't trust the process, the data becomes de-legitimised. Important to acknowledge and address the perception that it undermines their clinical judgement. Data use needs to be seen to enhance clinical decision-making, not replace it
- Missing/incomplete data – health visitors are concerned that missing data does not mean "no need/vulnerability". Concerns that a simplistic algorithm may provide false reassurance
- Patient records are often built around a medical model making it difficult to capture and record the right information relevant to health visiting practice.

v. **Information governance and safeguarding requirements are seen as a barrier to information sharing:**

- Data is not recorded or shared as it appears unsafe and may lead to a confidentiality breach with Human Resources consequences.
- Concerns about recording data on a shared system "Who can access the data as well as the health visitors?"

- Transparency for parents. It is their data. Parents not well informed about data collection. Some may assume that we have "one NHS" and all clinicians have access to all their data, others do not realise the level of data that is being recorded.
- Recording information about a child – rights of the child – what you record now may impact on the child in the future.
- Fear - Segmentation. Clinicians are very aware of their obligations in terms of record keeping as a legal document – clinicians tend to record defensively
- Need to "win hearts and minds" to increase practitioner motivation to engage in data and analytics in health visiting.

5.4.3 User needs

This section describes the further refinement of the "user needs" completed by workshop participants to describe the functionality/solution that would be valuable to improve the use of data and analytical capability in health visiting services . [Note: both Capability and Opportunity factors influence practitioner motivation].

COM-B core factors: Capability
User need 1: **Workforce skills: To equip the workforce with the knowledge and skills to maximise the use of data and analytics in health visiting and improve data quality.** All health visitors should receive training in the use of data and analytics, including information governance and ethical considerations, as an integral part of their practice and core Specialist Community Public Health Nurse (SCPHN) training. To support implementation, access to continuous professional development, supervision, support from dedicated analysts for health visiting and technical assistance when needed, should be provided. To increase motivation, this should include information on the benefits of data and analytics for frontline health visitors and the families that they work with - "winning hearts and minds" will be central to successful implementation.
User need 2: **National and local leadership** of digital transformation and analytics in health visiting is needed to drive innovation, share best practice and support local quality improvement, including access to analysts and "Digital Champions" in health visiting.
User need 3: **Modelling** by providing examples for health visitors to aspire to or imitate. Examples of 'good practice' health visitor case studies on use of data and analytics need to be shared to drive practitioner motivation and enable trailblazer sites to: lead by example; demonstrate the impact of effective data and analytics to drive quality improvement; and share learning across the healthcare system.

COM-B core factors: Opportunity

User need 4:

Health visitor input in the design/development process of IT systems and analytics is needed to ensure systems are fit for purpose, providing efficient data entry and quick access to timely, easy to interpret, data.

"Health visitors need "ownership" in the data quality improvement process, rather than being "done unto" – if they can't see that it has a use for their own purpose, they won't see the value and engage with it"

User need 5:

Health visitors need access to appropriate IT equipment with analytical capability that is fit for purpose to address the requirements of health visiting practice.

User need 6:

Data should be presented in visualisations that produce the information from a variety of sources that health visitors use to support their own clinical judgement (e.g. A&E attendance, missed appointments, previous history of risk factors, any recent safeguarding concerns etc...).

Artificial Intelligence (AI) tools for risk stratification, without clinical input, should not be introduced until there is a sound evidence-based clinical decision-making tool for health visiting on which to base the AI algorithm.

The need for visualisations to inform clinical decision-making build upon the user stories set out in the national survey findings:

To view information on known vulnerability before I complete an assessment of need at Universal Contacts
To view information on known vulnerability before I complete an assessment of need when a family transfers in from a different area
To receive timely data /information from other agencies highlighting when families' needs/ vulnerability has changed to support a responsive service (i.e. movement between levels of support U,UP,UPP)
Information on risk/ vulnerability factors to be presented to me in a visual way to help me prioritise/ triage the work on my caseload
A mechanism to alert me when a child/ family with high levels of vulnerability has been/ may have been missed
To know which families on my caseload are currently receiving a universal plus/ UPP care plan (e.g. listening visits, support from a nursery nurse for a specific need, open referral to another agency etc…)
To track whether interventions are making a difference – i.e. outcome measures, client goals etc…

User need 7:

National Guidance on data collection, record keeping and use of analytics in health visiting is needed with information on:

- the different types of data needed for different purposes and the importance of data quality
- benefits for practice to support health visitors' confidence to record data
- the practical application of: GDPR, Caldicott principles, considerations needed to ensure the "best interests of the child" and family are maintained (including father and linking family members), guidance from the NMC
- information to give out to parents and families about records kept on them and how this might be used for their care.

User need 8:

Interoperability/data sharing to ensure:

- a "single record" of information on the child
- nationally agreed guidance on record keeping for health visitors, including a template on the information/data that should be recorded
- that data moves with the child when they move
- it is accessed by health and social care providers involved in their care
- information on relevant parental "risk factors" that may impact child outcomes
- it can be accessed by the parent/those with parental responsibility
- it provides information to inform local and national analytics and population data collection.

User need 9:

Standardised national coding convention for health visiting that:

- is fit for purpose – incorporates activity and the breadth of scope of health visiting practice, incorporating all high impact areas
- enables evidence of impact of health visiting on child and family outcomes (rather than just "bean counting")
- describes consistent thresholds for vulnerability to enable comparison between areas – for all 3 types of vulnerability defined by PHE (clinical, statutory and determinants of health) with risk profiling/ RAG rating.

User need 10:

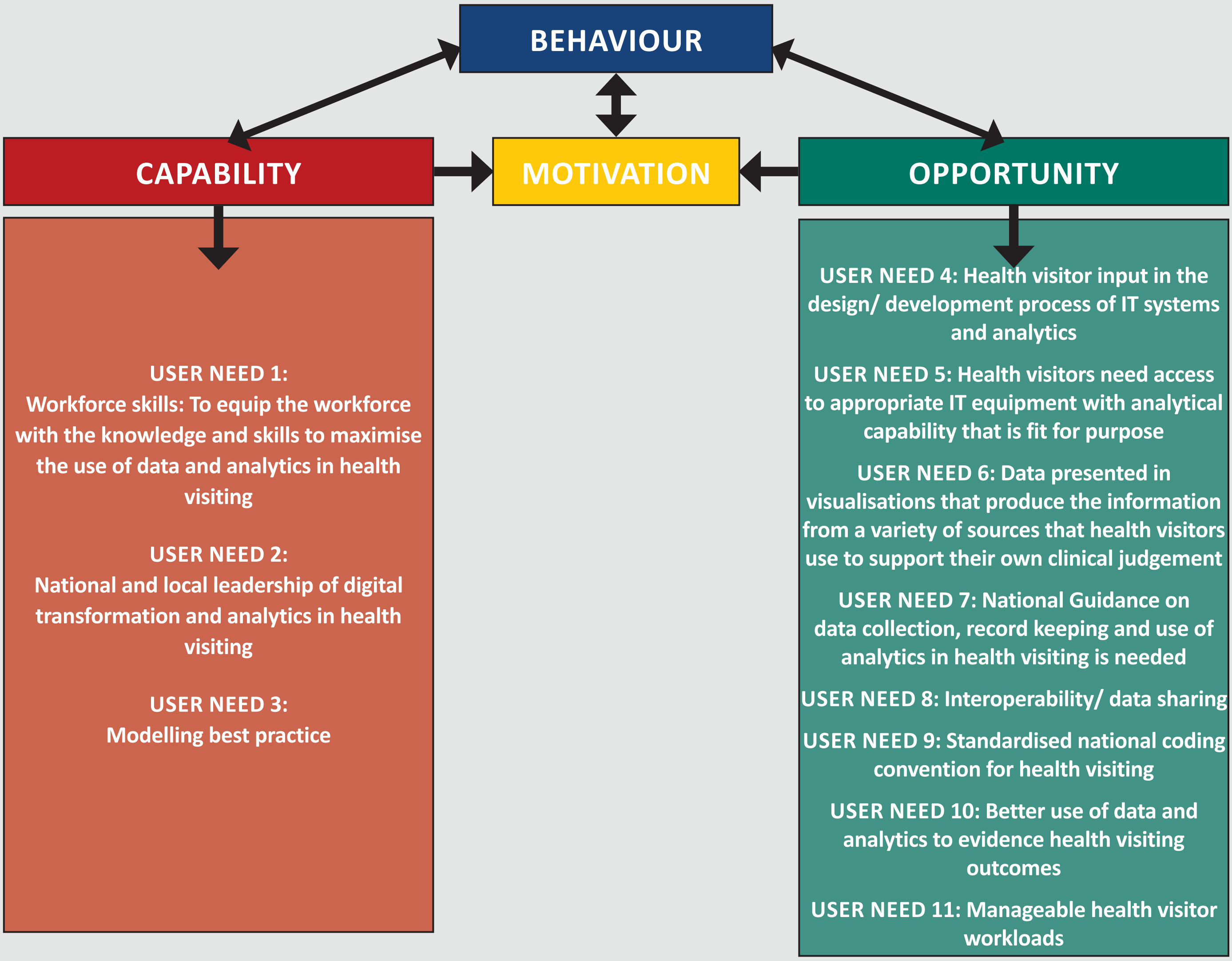
Better use of data and analytics to evidence health visiting outcomes is needed to drive investment back into the service. Health visitors recognised that:

"We can't evidence that it makes a difference – we need better data and analytics to do this."

User need 11:

Health visitors need manageable workloads to ensure that they have sufficient time to engage in quality improvement using data and analytics in their practice – this will require a national and local workforce plan for health visiting to address the current national shortage of health visitors.

Figure 4: Improving use of data and analytical capability on health visiting: User needs



USER NEED 1:
Workforce skills: To equip the workforce with the knowledge and skills to maximise the use of data and analytics in health visiting

USER NEED 2:
National and local leadership of digital transformation and analytics in health visiting

USER NEED 3:
Modelling best practice

USER NEED 4: Health visitor input in the design/ development process of IT systems and analytics

USER NEED 5: Health visitors need access to appropriate IT equipment with analytical capability that is fit for purpose

USER NEED 6: Data presented in visualisations that produce the information from a variety of sources that health visitors use to support their own clinical judgement

USER NEED 7: National Guidance on data collection, record keeping and use of analytics in health visiting is needed

USER NEED 8: Interoperability/ data sharing

USER NEED 9: Standardised national coding convention for health visiting

USER NEED 10: Better use of data and analytics to evidence health visiting outcomes

USER NEED 11: Manageable health visitor workloads

6. SUMMARY AND NEXT STEPS

The findings from phase 1 of this project presented in this report will be used to inform their local application in phase 2. The team in Southern Health NHS Foundation Trust will prioritise the user needs that most closely align with their local priorities and can be addressed within the timescale of the project. This will enable the project team to research, prototype, test and refine users' needs through a process of continuous learning.

The findings from phase 1 and 2 will then be disseminated nationally to support wider system learning through sharing experiences of leading change in practice. This will include our successes, as well as challenges, to improve care as part of a learning culture. We recognise that a whole system approach is needed to drive system change and implementation in practice; to support this, we will share our findings with national leaders in NHSX, PHE and the local authority to highlight any systemic barriers and maximise the enablers identified in this discovery project. It is hoped that sharing the learning from phases 1 and 2 will provide some context and background to various challenges being faced by the health visiting profession, as well as solutions that have been developed in this project to drive quality improvement.

ACKNOWLEDGEMENTS

We would like to thank the health visitors who took the time, often outside work, to complete our survey. Without your feedback it would be impossible to get a true picture of the use of data and analytics in health visiting from the point of view of those on the front line. We would also like to thank the health visitors and experts from across the health and social care system who generously shared their time and expertise to support this project through their engagement in our two national workshops, and subsequent correspondence via email, to clarify issues and provide further detail to support this work.

APPENDIX 1

National Health Visitor Survey Questions

1. **What is your main role:**
   - Health Visiting practice with families (including practice teachers)
   - Health visiting management
   - Health visiting education
   - A specialist clinical role
   - Research
   - Commissioning
   - Other – please state
2. **Area of the UK**

   Employed by Southern Health Foundation Trust YES/NO

   If not employed by Southern Health NHS Foundation Trust please tick your region

   a. North East
   b. Yorks and Humber
   c. East of England
   d. North West
   e. East Midlands
   f. West Midlands
   g. London
   h. South West
   i. South East
   j. Scotland
   k. Wales
   l. Northern Ireland
   m. Outside the UK, please state UK
3. **Which electronic record system do you use?**
   - RIO
   - SystemOne TPP
   - EMIS
   - Care notes
   - Vision
   - Other – please state
   - We use paper records

4. How do you input data on an electronic system?

- On a phone
- on a tablet for my sole use
- on a laptop for my sole use
- on a desktop computer for my sole use
- on a shared computer at my work base
- on a shared computer at a central point (not my work base)
- n/a

5. Which vulnerability data do you routinely collect?

1. Clinical vulnerability	**Tick all that apply**
Chronic conditions	
Low birth weight	
Overweight	
Preterm status	
Physical disability	
Developmental delay	
A&E attendance	
Immunisations uptake	
2. Higher risk and have statutory entitlement for care and support	**Tick all that apply**
Subject to a Child Protection/ Child in Need Plan	
Child with Special Educational Needs or Disabilities/ Education and Health Care Plan	
LAC -Child in Care	
Young carers	
3. Higher risk due to wider determinants of health / other factors leading to poor outcomes	**Tick all that apply**
Domestic Violence and Abuse	
Parental substance misuse/ alcohol dependent parents	
Parent (s) with a learning disability	
Parent (s) with a chronic condition	
Parent(s) with mental health conditions	
Parent (s) with physical disabilities	
Single parent household	
Parents smoking	
Poverty receipt of food bank	
Unemployed / workless household	
Family categorised as "Early Help" or receiving "Team around the Family/ Child" due to vulnerability (not statutory support)	
Teenage parents	

Asylum seekers, refugee, migrants	
Gypsy/ traveller community	
Sex workers	
People who leave prison	
Care leavers	
Homeless family or other issues related to poor housing	
Military family	
Parental adverse childhood experiences	

6. **Are you able to see information from other agencies / organisations (interoperability) within your own health visiting records, to support your decision on risks / vulnerability?**

For each data source please tick yes I can see the information or no I cannot

Data information source	Yes I can view this information as part of our electronic record	No I cannot view this information
A&E/ critical care attendance		
Children's social care		
Child Health Information Systems (CHIS)		
Police/ Domestic Violence and Abuse notifications		
NHS adult mental health providers		
NHS child mental health services		
Therapy services – SLC/ OT/Physio/Comm Paed		
Acute care hospital		
Maternity service providers		
Housing homelessness notifications		
Dental care		
Voluntary sector providers of care		
GP's records		
Summary care record		
Child Protection Information System (CPIS)		

Free text box - Is there any other data that you can see if so please list

7. **Do you have any data intelligence software or data warehouse (like Tableau) to help you quickly connect and visualise your data and help with your clinical decision making using accurate and up-to-date data?**

- Yes – please state which software
- No

8. **What are your views on the use of analytics to support health visitors' clinical decision-making around risk/ vulnerability?**

Please rate each statement on how closely it fits your current situation/ views

	Strongly agree	Agree	Disagree	Strongly disagree
I find it very helpful it enhances my practice				
I find it unhelpful it does not enhance my practice				
We have access to analytics to inform my clinical practice when working with risk/ vulnerability where I work				
I would like to see development of use of analytics to support my practice and maximise the use of data and analytical capability in health visiting in the future				
I do not think data and analytics have a place in health visiting				

Free text box – please tell us more about why you ticked the option above and your general views and experiences of using data and analytics in health visiting.

9. **In your view, what is needed to improve the way that we use data and analytics in health visiting? Please indicate how important each of these options are/ would be to enhance your practice by rating the following statements**

As a health visitor, I want….	Strongly agree	Agree	Disagree	Strongly disagree
To view information on known vulnerability factors before I complete an assessment of need at universal contacts				
To view information on known vulnerability factors before I complete an assessment of need when a family transfers-in from a different area				
To receive timely data /information from other agencies highlighting when families' needs/ vulnerability has changed to support a responsive service (i.e. movement between levels of support U,UP,UPP)				
Information on risk/ vulnerability factors to be presented to me in a visual way to help me prioritise/ triage the work on my caseload				
Information on risk/ vulnerability factors to be presented to me in a visual way to help me prioritise/ triage the work on my caseload				
A mechanism to alert me when a child/ family with high levels of vulnerability has been/ may have been missed.				

To know which families on my caseload are currently receiving a universal plus/ UPP care plan (e.g. listening visits, support from a nursery nurse for a specific need, open referral to another agency etc…)				
To track whether interventions are making a difference – i.e. outcome measures, client goals etc…				

Free text box - do you have any other suggestions of how data and analytics could support your practice?

10. Where you work do you currently work do you have the following capabilities …

	Yes	No
To view information on known vulnerability factors before I complete an assessment of need at universal contacts		
To view information on known vulnerability factors before I complete an assessment of need when a family transfers-in from a different area		
To receive timely data / information from other agencies highlighting when families' needs/ vulnerability has changed to support a responsive service (i.e. movement between levels of support U,UP,UPP)		
To have information on risk/ vulnerability factors presented to me in a visual way to help me prioritise/ triage the work on my caseload		
A mechanism to alert me when a child/ family with high levels of vulnerability has been/ may have been missed.		
To know which families on my caseload are currently receiving a universal plus/ UPP care plan (e.g. listening visits, support from a nursery nurse for a specific need, open referral to another agency etc…)		
To track whether interventions are making a difference – i.e. outcome measures, client goals etc…		

11. In your view, what are the main barriers to the use of data and analytics in health visiting?

Free text

12. What do you think needs to be done to help you use data and analytics in health visiting/ what are the solutions?

Free text

13. Do you have any examples of how you have used data / analytics to support your practice in identifying vulnerable children, enhancing care?

Free text

14. Would you be interested in supporting this development – we are looking for members to join our expert reference group? Please provide your name role and contact email

Free text

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Institute of Health Visiting
A Registered Charity Number 1149745
c/o Royal Society for Public Health, John Snow House, 59 Mansell Street, London E1 8AN
Telephone: +44 (0) 207 265 7352 | Email: info@ihv.org.uk
www.ihv.org.uk