Women’s Digital Care Record ‘Accelerators’
Project Analysis Report
March 2020
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1. Executive Summary

In 2018 NHS Digital were commissioned by NHS England to provide a convenient means for pregnant women to access their electronic record. This was done by initiating pilots across 20 Trusts in England, working with women, maternity services and supportive system suppliers.

The Project supported the recommendation made in the National Better Maternity Review, Better Births to provide women with access to their record. It also provided the opportunity to undertake a first ‘at scale’ research study to understand the value provided by access to these records and wider Personal Health Records (PHRs).

The Project targets were added into the Long-Term Plan, with a commitment to offer 100,000 women access to their record by the end of March 2020. This target was achieved in August 2019 and the project has continued to increase this access, research and associated benefits.

In October 2019 an independent Academic Health Science Network research study, led by the South West was undertaken that supported the findings of this report. The NHS Long Term Plan committed to rolling out “Maternity Digital Care Records” for all women by 2023/24.

The Women’s Digital Care Record (WDCR) provides a range of tangible benefits for both pregnant women, and clinical professionals working in maternity services. Within healthcare there is an overwhelming desire to meet the needs of users, to improve patient services and patient outcomes. The WDCR, as a digital solution to replace paper based maternity notes, has the potential to deliver change and demonstrably improve the healthcare experience of users, and improve efficiencies in healthcare.

Benefits of WDCRs

Women

Women feel positive about WDCRs. Most women use digital tools in their everyday life (websites, mobile apps) and they are comfortable in searching information online. WDCRs provide women with easy access to maternity notes and other important information to help them manage their health and care during pregnancy. The most valued features are access to their maternity records, appointment information, results, scans, contact details including numbers, local and national leaflets and pregnancy timeline information. The automated ‘dataflow’ of some of these features into WDCRs require other health care functions input,
such as blood test results, scans, consultants’ appointments. However, the WDCR is not yet fully interoperable. Women also value the opportunity to input into their WDCR and pregnancy diary and add notes and pictures. Furthermore, they also found it useful to be able to communicate with their midwives by sharing their birth plan and capturing questions to ask at appointments.

**Midwives and Clinicians**

Midwives can clearly see the benefits of digital maternity notes. The WDCR saves both paper and time in dual recording. The information is easily shareable with the team and other health care professionals. Processes are more secure as midwives are not required to carry sensitive information on paper with them. Digital systems also leave a clear audit trail. If the data flows well between different systems, midwives find it easy to use and feel that they don’t miss out on important information. They feel they can document and share information more effectively and see the journey of the service user. Midwives also feel that that they can prepare and get to know the women better if they can view the information from different sources easily before appointments.

**Quantifying the benefits (£)**

Quantifiable benefits have focused on three key areas: (i) Reducing stationery, leaflets, managing paper records, (ii) improving efficiency in clinical time (iii) improving efficiency in admin time. Where a hospital trust has been able to identify a quantitative benefit opportunity this data has been recorded in their benefits plan. We have been able to identify the baseline costs/values and target benefit values for these benefits across the three main benefit areas. Several qualitative benefits are also identified associated with care experience and indirect contribution to wider safety and public health initiatives that result in improved outcomes for women.

**Implementation Insights**

**The role of the IT Digital Midwife**

Investment in the ‘Digital Midwife’ role, super users and visible digital leadership is imperative to providing ongoing training and support to staff. Some Trusts have developed their own
training materials and e-learning resources to supplement the supplier training and have provided support to other Trusts which has proved effective. The role of the IT/Digital Midwife is also important to provide ongoing training/support and digital change as system updates are released. Having community midwives as clinical champions helped to convince the community midwives to see the benefits of the digital maternity records and embrace the change.

**Infrastructure (equipment, connectivity, IT support)**

The lack of infrastructure in terms of access to fit for purpose equipment, connectivity issues and IT support for community midwives was a key theme across the majority of pilot Trusts. A number of Trusts have invested in 4G iPads to address community-based connectivity issues. This has supported paper light working for these Trusts which has led to a number of benefits. Where paper is still heavily in use, this leads to dual processes and affects adoption and utilisation.

**Business Process & Cultural Change**

Most Trusts reported some resistance to the change. A robust communications plan is important to ensure all staff and stakeholders affected are aware of the change and understand the benefits to themselves and to women which will encourage higher rates of engagement.

A lack of confidence in the digital tools led to reluctance to move away from the paper records. Investing in timely training will improve staff’s understanding and confidence in using digital records to improve engagement.

**Training**

Training should be timely and ongoing training/support is required. Staff resources sometimes made it difficult for staff to be released for training. A key recommendation is that clinical staff should be involved in the train the trainer and that managers should have a good understanding of the system to be able to provide support.
Summary

This learning project has clearly demonstrated tangible benefits for both women and clinical professionals in the Maternity Pathway. A combination of factors have been critical in the success of implementing and embedding WDCRs. In contrast, an absence of these same factors can also impede the ability to adopt these digital tools:

- **Interoperability** across the pathway is key to the success of digitising maternity services and growing the clinical content of these records

- **Infrastructure** is important for confidence and usage of digital. This means quality training, usable equipment, appropriate software, connectivity and IT support

- **Digital Leadership** is essential. If the journey is not supported by midwifery teams and digital leaders in maternity, women are less likely to use their PHRs
2. Project Purpose

The project’s aim was to rapidly bolster the existing provision of digital personal health records in use across England within Maternity. It included localities where the current provision was such that a limited amount of funding could enable a significant proportion of women to access a digital maternity health record.

**Project Objectives**

- To deliver WDCR and support the project’s pilot Trusts to ‘go live’ with the product
- To provide the opportunity for users to access WDCR (‘get it in the hands of women’) and increase WDCR uptake
- To support business change activities (implementation and embedding) for each pilot site
- To capture and measure the benefits pertaining to anticipated outcomes from WDCR utilisation
- To gather feedback from users (clinical professionals and women) to enable further evaluation of contextual insights and utilisation

**Project ‘Anticipated’ Outcomes and Business Drivers:**

| **The Woman** | Access to their personal maternity record online, giving them greater visibility, control and understanding of their health and related information. Access to trusted information about pregnancy with increased ownership and improved outcomes around safety and maternity experience. It will reduce the barrier between the Health Care Professional and the woman relating to clinical or professional jargon. It also has the potential to include critical reminders around screening, immunisations and appointments during pregnancy. |
The Health Care Professional

Reducing the administrative burden on Health Care Professionals and reducing the risk of missing important clinical information for mothers. Reducing burden of repeated questions from mothers. Interact via more pro-active, convenient and efficient channels. Safer, better care and better value.

Provider and NHS Efficiency

Reducing the cost to organisations of capturing and sharing information whilst improving data quality. Supporting necessary interactions and interventions. Supporting new models of care to generate efficiencies and service improvement.

Project Scope

In 2018 NHS Digital initiated ‘accelerator’ pilots across 20 Trusts in England, working with women, maternity services and supportive system suppliers to provide a convenient means for pregnant women to access their electronic record.

Project Delivery Targets

To offer **100,000 women with access** to their WDCR by **March 2020**. This later became a Long-Term Plan commitment.

3. Women’s Digital Care Record (WDCR) - Background

The Better Births, the report of the National Maternity Review, was published in 2016 and identified that maternity services in England needed, in the next 5 years, to ‘become safer, more personalised, kinder, professional and more family friendly; where every woman has access to information to enable her to make decisions about her care’.

The review made 4 key recommendations, each of which make direct statements that relate to the priority for a PHR, these are:

- Investment should be made in electronic, interoperable maternity records to reduce the administrative burden of information recording and sharing
• All women to have access to comprehensive digital sources of information via digital tools or personal health record

• The digital tool or personal health record must interface with professionally held electronic maternity records so that the woman can access her own records and receive personalised information

• The technological solutions must be accessible to women, families and professionals, particularly outside of the hospital setting

In March 2017, ‘Implementing Better Births: A Resource Pack for Local Maternity Systems’ was published, outlining ‘the ask’ of Local Maternity Systems (LMS) and a request that local transformation plans were produced by October 31st 2017. A section entitled ‘Digitally enabled transformation’ within the resource pack suggested that LMS undertake a series of actions, including the ‘identification of measures to improve user experience through access, enhanced usability and personalisation’.

Workstream 7 of the Maternity Transformation Programme, ‘Harnessing Digital Technology’, led by NHS Digital, established a national programme of work to enable local digital transformation. NHS Digital and NHS England were commissioned to progress with the implementation of electronic records for women, as a demonstrator for wider citizen enablement. The Digital Maternity Programme in NHS Digital were asked to coordinate the delivery of ‘accelerator’ pilots for maternity roll out of WDCR in England.
Strategic Fit / Policy

Strategically, the broader programme aligns to the Maternity Transformation Programme (MTP) and to the Five-Year Forward View (FYFV) objectives, The Secretary of States’ Techvision and latterly the Long-Term Plan ambitions. These are articulated within the Programme Business Case (PBC) and are set out below:

In 2019 the formation of NHSx also led to ensuring a strategic fit with Policy Objectives relating to ‘Empowering the Person’ as follows:

- Reducing the burden on clinicians and staff, so they can focus on patients
- Giving people the tools to access information and services directly
- Ensuring clinical information can be safely accessed, wherever it is needed
- Aiding the improvement of patient safety across the NHS
- Improving NHS productivity with digital technology
Map of 20 x Accelerator Pilot Trusts

- **North Cumbria**
  - North Cumbria University Hospitals NHS Trust
- **Lancashire & South Cumbria**
  - Blackpool Teaching Hospital NHS FT
- **Derbyshire**
  - Chesterfield Royal Hospital NHS Foundation Trust
- **The Black Country**
  - Royal Wolverhampton
  - Sandwell & West Birmingham
  - Walsall Healthcare NHST
- **Birmingham & Solihull**
  - Birmingham Women's & Children's NHS FT
- **South West London**
  - Epsom & St Helier
- **Northumberland, Tyne and Wear and North Durham**
  - Gateshead Health NHS Trust
  - Queen Elizabeth Hospital
- **West Yorkshire**
  - Calderdale & Huddersfield NHS Foundation Trust
  - Calderdale Royal Hospital
  - Leeds Teaching Hospitals NHS Trust
  - St James
  - Doncaster Royal Infirmary
- **Cambridgeshire & Peterborough**
  - North West Anglia NHS FT
  - Peterborough City Hospital
- **Norfolk & Waveney**
  - Norfolk and Norwich University Hospitals Trust
- **South East London**
  - Kings College Hospital
  - Guys & St Thomas
- **Kent & Medway**
  - Maidstone & Tunbridge Wells NHS Trust
  - Tunbridge Wells Hospital
  - East Kent Hospitals University NHS Foundation Trust
  - William Harvey
- **Cornwall & The Isles of Scilly**
  - Royal Cornwall Hospital NHS Trust
- **Staffordshire**
  - University Hospital of North Midlands, Stoke
Maternity System Suppliers

There are three maternity system suppliers which are delivering WDCR Products on behalf of the Accelerator Pilots. These are as follows:

<table>
<thead>
<tr>
<th>Name</th>
<th>Product Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clevermed (Badgernet)</td>
<td>‘Maternity Notes’</td>
</tr>
<tr>
<td>K2 Medical Systems (Athena)</td>
<td>‘My Pregnancy’ notes</td>
</tr>
<tr>
<td>Wellbeing Software (Euroking)</td>
<td>‘PHR’ by Wellbeing Software</td>
</tr>
</tbody>
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4. Project Approach

The project provided an opportunity to research and understand the value provided by WDCR as a demonstrator for wider roll out of Personal Health Records (PHRs) through learning gained from the Accelerator Pilots.

NHS Digital’s WDCR project team, including the Implementation and Business Change Function, has led the relationship management and engagement interface with the Trusts.

- Implementation and Business Change – to drive up uptake & utilisation
- Alignment with Local Health Care Record Exemplars, PHR’s and other initiatives
- Refine and develop PHR/WDCR Strategy

Implementation and Business Change (IBC) Function

The objective of the IBC Function within NHS Digital is to improve patient outcomes and improve efficiency through implementing, driving up the usage of, and ensuring effective business change is delivered for products that NHS Digital produce for the health and care environments.

The IBC Service is made up of 4 Regional Teams (RTs) which reflect the geographies of the NHS England regional teams and a Central Support Team (CST). The RTs own the relationships with the local NHS and Social Care stakeholders and consist of implementation and business change experts with a mix of knowledge across NHS Digital products, care settings and the local geography they cover.
The WDCR project team and IBC function has presided over the following activities to support the pilot Trusts:

- Supported the implementation of the WDCR products to ensure pilot Trusts ‘go live’ (via ongoing engagement with key project and clinical leads at each site)
- Supported the ‘post go-live’ embedding and business change activities associated with WDCR implementation
- Stakeholder engagement. Supplier based ‘Learning from Local’ groups have been set up to provide a platform for collaboration and knowledge sharing. Pilot Trusts have had the opportunity to share updates on implementation planning and progress, lessons learned/best practice and highlight risks and issues
- Supported the development, baselining and tracking of benefits realisation plans, in order to determine the emerging benefit themes, and the core benefits which can be measured
- Supported the development and implementation of user research, to capture feedback from users (clinical professionals and women) which will inform contextual insights for further analysis
- Coordinated the development of marketing materials for pilot Trusts to use to promote the Women’s Digital Care Record
- The development of standardised reporting streams and the collection of WDCR utilisation data from ‘live’ pilot Trusts. The creation of a monthly project dashboard to illustrate progress and comparative data (including utilisation and number of women offered WDCR)
5. Personal Health Records - Direction of Travel

Women’s Digital Care Records relate to a complex and intensive pathway of care. WDCRs are Personal Health Records but specific to this pathway. In future they are likely to form a part of a PHR that relates to a lifetime of care for every citizen.

People will increasingly consume, and contribute to, their own longitudinal personal health record using digital health and care tools. This record, combined with their clinical record, will form a 360-degree view of their health data – not just what their health and care team know about them – but what they know about themselves. This can inform their care team and their informal care network such as family and carers if they choose to share it.

One of the key themes of the Long-Term Plan has been the move to increased prevention, with “People managing their physical and mental wellbeing” and the aim to be “Supporting people to age well”. Key to this strategy is giving people access to their record or relevant parts of it in apps or websites “linked increasingly to home-based and wearable monitoring equipment” to allow people to stay out of care settings. Apps and mobile technology are increasingly seen as helping people to play a role in their own care and that of others.

These tools will not just include condition specific tools, but will utilise existing consumer focused apps, tools and wearables to provide new ways of self-care and prevention. They will also be able to create richer information which if the individual chooses to allow, can be shared with their care teams to provide better care and potentially even new ways of delivering care. One of the key tools being cited as an enabler for this future are Personal Health Records.

Currently Personal Health Records (PHRs) could still be defined as an emerging technology. We have seen key developments in this area over the last couple of years but barring a few notable exceptions these have often been localised projects solving one specific need. It is key to note that PHRs form part of a journey of maturity, there are increasing numbers of citizen-focussed tools coming to market aimed at increasing personalised care. Not all of these tools will need full access to the clinical record with both read and write capability to meet their user’s needs.

**Figure 1.** Shows the differing levels of maturity of digital citizen focus tools. It also suggests the differing levels of empowerment provided by the spectrum of citizen-focused tools.
Going forward we expect all systems, including PHRs, to support the national requirement that IT systems in healthcare must ‘talk’ to each other. This is reinforced by the NHS Digital data and technology standards framework which has the support of the Secretary of State for Health and Social Care. This push towards interoperability will allow citizen entered data to be shared with care systems, creating a richer view of the patient for clinicians whilst also empowering people to better manage their own care. A standard and Information Standards Notice (ISN) for Maternity was published in 2019.

Local Health and Care Record exemplars (LHCREs) are developing an initial longitudinal care record and normalising the data within to support joined up care. They are also demonstrating functionality which can create value from this longitudinal record, such as care plans, to realise the transformation of care.

The future of PHRs is one where they are informed by and meet users’ key needs. By users we mean all those that make use of a PHR system – within health and care services as well patients and the wider public. These user needs will be supported by user centred design. All NHS digital, data and technology services should be designed to meet user needs in line with the principles of the Digital Service Standard and Technology Code of Practice. Also, an NHS Digital Service Manual has been released in public beta, covering services for patients and the public, these will provide commissioners and developers with the tools to deliver quality products.

There are other programmes of work to support the increasing empowerment of people. The NHS App is providing a simple and secure way for people to access a range of NHS services on their smartphone or tablet. Whilst currently this does not meet the minimum requirements to be classed as a personal health record, plans are being made for future releases which will add PHR functionality.
NHS Login has been developed to provide a single, easy to use system for verifying the identity of people who request access to these digital health records and services. Other national systems such as the National Record Locator Service (NRLS) and National Event Management Service to name but a few have an ability to support the interoperable landscape needed to realise the visions of the Long-Term Plan and general direction of travel.

There are several patient-facing applications being developed, which are aligned with particular care pathways or based on organisational structures. These structures will increasingly focus on more regional interoperable solutions linked to initiatives such as LHCREs enabling access to the longitudinal record for the person and reducing siloed data.

**What Exactly Is a Woman’s Digital Care Record?**

At a very basic level, a record should provide access to clinical data, so that the woman has access to her clinical record. However, a useful record is part of a broader suite of functionality. The importance of this richer set of features is what provides the incentive for women to access their record.

The rich feature set that makes women want to return to their record includes:

- Self-managed care and education
- Preventative advice
- Actionable information
- Transactional services and pathway management

Each of the supplier-based products offer different types of functionality and indeed this variance has enabled understanding of how the different products are used and are usable.

The typical features or functionality one may expect to find in such a product include:

- Self-refer to a hospital and complete a pre-booking form
- View maternity leaflets and other information
- Access blood results and scan reports/pictures
• View ‘what to expect when you’re expecting’ by week
• View important contact information for the maternity unit
• Record any preferences throughout pregnancy
• Record any questions to ask your midwife
• View dates and times of appointments
• Record birth plan preferences
• Access pregnancy notes
• Baby Movements Diary
• View pregnancy summary
• Provide feedback on care/experience

**Data Portability in Personal Health Records**

The ability to share data into Personal Health Records and to enable data portability has only become viable through the publication of the Maternity Record Standard. At the outset of the project, much focus was placed upon the differences between supplier based PHR products and those PHRs that can be sourced and procured independent of the system in use.

A common misconception had been that supplier based ‘provision’ was of limited value because it was tied to the supplier’s main maternity system. However, these have often been the only financially and technically viable offerings in maternity care. Significant change is required for non-supplier PHRs to provide an offering which can meet service user needs, integrate with clinical systems and secure the support of health professionals, whilst at the same time being affordable and sustainable.

The following sets out the differences between tethered and untethered solutions, however it should be noted that the most critical aspect of learning is that the merits of tethered vs untethered are in fact less critical an issue than that of data portability. The ability for information to flow in and out of maternity systems into a PHR of choice is critical for the future of a diverse PHR offering within maternity care. Many of the general ‘PHRs’ available are only able to provide clinical information without the rich context and personalisation that more specific Maternity PHRs provide in this care pathway. The 2018 GDPR sets out a requirement for data portability.
### What are ‘Tethered’ PHRs?

Tethered PHRs are provided to individuals by a health or care provider, like a local hospital. They are tightly connected to the system the provider uses to manage the care pathway.

### What are ‘Untethered’ PHRs

Untethered PHRs are the opposite of tethered PHRs and are standalone systems, provided by a health and care provider, or by an outside company.

Although the ‘Accelerator’ project focused upon enabling and increasing uptake and use of supplier-based products, there was no viable alternative without making significant investment in capital development of either NHS or commercial products.

The supplier based products may be classed on the surface as a ‘tethered’ offering, however these products now have the capability to stand alone from the systems they link into, thus supporting other trusts who may wish to access the ‘PHR’ capability alone.

The importance of data sharing is the key criteria for delivering a safe and effective full ‘PHR’ or WDCR. The inclusion of data gathered along the woman’s care pathway is facilitated by standards and open Application Programming Interfaces (APIs) or data access, supporting the flow of data into and out of Maternity Information Systems.

Portability of data and clinical information is therefore the overriding key criteria rather than whether a supplier has an association with the PHR being provided. This is especially the case whilst the commercial PHR market matures, with a need to provide high quality pathway specific information over and above the ability to only view a clinical record.

The value of PHRs specific to the maternity pathway has been to offer contextually relevant and personalised information based upon each individual service user, aligned to their own clinical and personal needs. A sustainable model for the introduction and use of PHRs in maternity is needed. Without funding, any expectation of the use of standalone products not associated with Maternity Information Suppliers (MIS) would need to be limited. This is because:

- Where included as part of the MIS package, no additional cost is created for Providers or women, so is a natural choice
• Standalone products would require a funding model, either to be purchased by Trusts or purchased/sustained by the woman, which may create inequalities of access

• Options to fund through advertising or charitable endeavours are limited in their sustainability and acceptability

• Generic products realise lower benefits and provide only basic clinical information, missing out on the opportunities associated with prevention, self-management and feature sets associated with the Maternity pathway

There is an expectation that adopters of the Maternity Record Information Standards Notice will share data by default for clinical care purposes. As a result, there is the potential for a range of PHR procurement options and ability for new quality and innovative entrants into the market. In time there is an expectation that more generic PHRs may begin to provide modular components that could include a pregnancy path pathway or maternity module layered on top of an existing longitudinal record PHR.

Local Health Care Record Exemplars (LHCRE) and Personal Health Records (PHR)

In addition to WDCR, other areas of the country are developing PHRs that can be used for wider care. Southampton, Hampshire, Isle of Wight and Portsmouth (SHIP) LMS, are working on the development of a single maternity PHR to cover all maternity units in Hampshire which would allow mothers (and partners) to see and provide information from/into their PHR. SHIP forms a part of the Wessex LHCRE, geographies tasked with joining up Local Health Care Records using regional type technology architecture to support data sharing.

The ‘My Maternity Record’ solution is being developed from the existing ‘My Medical Record’, a more generic Patient PHR. It is an online platform for women and their Healthcare Professionals to gather, store, use and share pregnancy related health information. It could replace the current handheld paper notes with an online digital antenatal record or link to an online antenatal record that is part of a wider core maternity system.

The online maternity record could be used as a source of information, guidance and advice for women to manage their pregnancy.

The online record would be used from the point of referral to maternity services through to discharge from maternity services and would be able to feed relevant information on to NHS agencies providing postnatal care and support such as GPs and Health Visitors.
The online record could receive and send data from multiple sources and make it available to the women and their medical professions in a single place.

This is due to go live with a small cohort of users in private beta in 2020.

Wessex is one of only two LHCRE Trusts tasked with incorporating Maternity as a pathway of care into their architectural design. Any learning from this will then be extended and shared into other LHCRE Trusts. Currently, no other investment has been made in the development of Maternity specific PHRs by LHCREs. It is anticipated that every LHCRE will facilitate or support the exposure of data relevant to the maternity pathway that could be used in a range of generic Patient and/or Maternity Care Records.

6. User Research & Analysis

This section will discuss:

- The methods applied for undertaking User Research during the project
- The experiences from women as service users

Women’s Digital Care Record - User Research

User Research Methods

User research is part of user-centred design aiming to understand different ways of working and to improve services to meet user needs.

‘User needs’ are defined as the needs that a user has of a service or a system. Services and systems which are designed around users and their needs are more likely to be used, create a good user experience and help more people get the right outcome from them. User research helps to understand what users need from a service or system to achieve their goals and to assess users’ experiences of the service or system to make sure it meets their needs. (See more at https://www.gov.uk/service-manual).

The Aims of the WDCR Project User Research

The main aims of the WDCR project’s user research were:
• To gain a deeper understanding of users and their needs and to understand their current challenges, pain points and identify opportunities.
• To explore whether current digital tools (namely WCDRs) are meeting users’ needs

The Scope included:

• Pregnant women’s experiences with WDCR in managing their pregnancy health and care information
• Midwives’ experiences with WDCRs

**Method**

The user research was planned in collaboration with the NHS Digital Maternity Programme, IBC and PHR Teams. User research activities involved Digital Midwives from the pilot Trusts and other clinicians involved in the maternity pathway, some Maternity Voice Partnership members and the Learning from Local Groups. The research was conducted on 12 different Trusts with a mixture of the following:

• Digitally mature vs paper only
• Regional/geographic variation
• Size of service
• Badgernet, Euroking, K2, paper only

The user research methods included desk research of existing data sets, planning workshops with different stakeholders, user recruitment, in-depth face-to-face or phone interviews with users, contextual inquiries in situ and a focus group.

The nature of user research so far has been mainly qualitative. Qualitative research is a scientific method of observation to gather non-numerical data. This type of research refers to “the meanings, concepts, definitions, characteristics, metaphors, symbols, and description of things" and not to their "counts or measures". Qualitative research is useful when trying to understand why and how a certain phenomenon may occur rather than how often. Qualitative methods such as interviews, ethnographic field studies, and (to some degree) usability tests are often more exploratory and seek to get a more in-depth understanding of the individual users’ or user group’s experiences, motivations, and everyday lives. The results of qualitative research are usually not expressed numerically, but rather as themes or categories that have occurred during the research. The next step in the WDCR user research is to do quantitative
research, mainly surveys for pregnant women and midwives based on qualitative findings. Analysis of qualitative research data was done by content analysis by categorisation of the answers into thematic groups.

61 In-depth Interviews

- Pregnant women using digital maternity notes (19) (Consisting of women aged between 18-45 on their first, second, third, or more, pregnancy)
- Pregnant women using paper maternity notes (6) (A mixture of first- and second-time pregnant women, age range 25-40 years old)
- Midwives (19) (mainly community midwives)
- Digital Midwives (8)
- Matrons (2)
- Maternity support workers (2)
- Team leads for community midwives (4)
- IT training manager (1)

Contextual Inquiries

Contextual inquiry (CI) involves observing what people do as they go about their day in their real work context - not what they say they do. It is useful for creating software that supports users' actual and not supposed activities. Contextual inquiry sessions should occur in the environment in which participants normally perform those tasks. A contextual inquiry is not a complaint session or a group session. Contextual Inquiry is a powerful research tool because it allows you to observe a user in the real work context and ask clarifying questions at the same time.

Contextual Inquiries completed:

- Community Midwives preparing for the day in the morning at their office (Gateshead)
- Community Midwife completing a booking appointment with a pregnant woman at home (Gateshead)
- Community Midwife completing a booking appointment with a pregnant woman at a Hospital clinic (Calderdale)
- Community and Labour Ward Midwives’ IT training (North Cumbria)
- Community Midwife completing a first booking appointment at a community clinic (Chesterfield)
- Community Midwife completing an antenatal checkup at a Community Clinic (Chesterfield)
- Maternity Support Worker undertaking tasks (Chesterfield)
- Observation of the checking desk at the Birth Centre (Chesterfield)
- Observed the movement of notes at a Diabetes Antenatal Clinic (Chesterfield)

Focus Group

A Focus Group was held with 8 Spanish speaking pregnant women to understand their experiences of digital tools to manage their health and care information during pregnancy and how language effects the user experience of digital maternity notes.

Women’s Experiences of WDCRs

The findings from the user research revealed a collection of user needs/requirements associated with the Women’s Digital Care Record products, described below.
WDCR – Qualities of WDCR That Make a Good Experience for Women

- Full connection to all NHS clinical data
- One interactive and easy to use digital touchpoint for all the information that women need to manage their health and care during pregnancy
- Management of all scheduled appointments and events during pregnancy
- Access to all up-to-date information
- Ability to communicate with their Midwife and to interact with WDCRs
- Women preferred app to a browser
- NHS approved content
- Ease of use
- Accessible for all

Full Connection to All NHS Clinical Data

Women value the WDCR as it connects their NHS clinical data. Women like to have access to their digital notes and want to review them – even if it is just to be “nosy”. They feel that they are more in control and more aware of their health history.

Comments included:

- “I now feel educated… I didn’t know how disempowered I felt until I got full set of results”
- “I want to know everything about my medical records”
- “It’s nice to see what is recorded about me. I would discuss any errors or mistakes with the midwife”
- “I can take ownership”
- “It made me think about my medical history and health”

Expectations for WCDRs being fully connected to all NHS clinical data and being complete and always up to date are high. Most women expect the NHS to have all their data and trust it is shared between clinicians. They expect to see “accurate and complete” notes. However, this is not currently happening with WCDRs the clinical maternity data is not yet fully interoperable (blood test results, scan pictures, consultants’ notes/appointments, out of area information are often unavailable).
Comments included:

- “I presumed triage team would have access to the notes via the maternity system”
- “I thought most hospital notes would be able to access my notes anyway”

Challenges Identified by Women

Information is missing, especially from other care settings.

Comments included:

- “I was disappointed…the blood test results were not there”
- “My triage notes weren’t available, and I would have expected them to be there as part of my digital maternity notes”
- “The App doesn’t have a growth chart”
- “I can’t see my consultant notes or appointments”
- “Sometimes the appointment letters have differed from the app”

If information is missing e.g. from previous pregnancies and traumatic experiences, retelling a story can cause anxiety and stress for women. For example, women who have high risk pregnancies and are seen by a number of clinicians in different departments (who are using different systems and may not have access to complete information) have to repeat their stories if the clinicians don’t have previous information or don’t have time to read it. When clinicians can share all information effectively, women have less to retell.

Comments included:

- “I think it’s poor if you cannot see it in other places. You spend so much time having to repeat your medical history over and over again. I have now written it in on an A4 page to share”
- “It was upsetting to tell it all again and again… It made me anxious [woman who had lost 2 babies]”
- “I got fed up having to repeat myself and I then stuck a note on the front of my green notes which said: Please read my previous history before you speak to me”
- “Don’t have to repeat myself when all in one place”
There are delays in information sharing – women expect information to be instantly online.

Comments included:

- “It took few days to surface information after appointments… You expected it to be instant”
- “I went to see my notes online after appointment, but there wasn’t any information yet”

Private Scans are not connected to WDCR’s, yet many women have private scans before their first booking appointment.

Comments included:

- “The NHS is only part of the pregnancy. I have had 2 NHS scans and 4 private scans”

One interactive and easy to use digital touchpoint

Women want all the information they need to manage their health and care during pregnancy all in one place.

Comments included:

- “I would love to have it all in one place”
- “All available in one place to read on the go when I want to”
- “I need to know what local contact numbers are available”
- “I now use pregnancy+, Baby Centre etc. I would love to have it all in one place”
- “I use it once a week just to have a scroll. Nothing really stands out… it’s just great that everything is on there”

Valued features in WDCRs

Any solution that is offered to women should be designed iteratively, following user-centred design principles (meeting user needs, being easy to use) and should be accessible for all. The following features/functionality is what women value in their WDCRs:
Management of all scheduled appointments and events during pregnancy

Comments included:

- “[It would be good to see] what appointments or events are required”
- “I would like to add consultants’ appointments in too”
- “[It would be good to see] what is expected week by week”

One interactive place for all the information that women need to manage their health and care during pregnancy

- Medical history, blood and other test results, scans, baby's heartbeat, midwife's comments
- Contact numbers for maternity, delivery and antenatal clinic
- National and local leaflets
- Information about of what happens in pregnancy and how the baby develops (especially in weekly timeline)

Comments included:

- “Access to contacts is a big positive”
- “I have checked all the leaflets now – I didn’t receive any paper leaflets, so I went to the app to check”
- “I can own my information, personal diary and upload pictures”

Ability to communicate with midwives and to input into their WDCRs

Women need to be able to communicate easily with their midwife during their pregnancies. In the interview's women reported having access to WDCRs had improved their communication with their midwives. Some women are using WDCRs as a platform to communicate with their midwife or to share and contribute information.
Comments included:

- “Digital is an easy way to contact my midwife”
- “It’s great, I can add the birth plan which feeds to the midwife”
- “I want to be able to share all this information with the midwife as they’re the carer of the baby”
- “I will write down some questions and take some pictures to show to my midwife”

However, not all apps are offering write-in functionality and some women have been unable to find the sections where they can write in. The functionality could be more forward thinking.

Comments included:

- “I want to log my baby’s movements...they can say this is normal or no you need to come in”
- “I want to input how I feel on a day-to-day basis and then share with my midwife”

- Pre-portal to fill in all details before the first booking appointment
- Picture uploads
- Writing and sharing birth plan
- Writing notes into a diary (e.g. recording mood)

Women preferred using an app as opposed to the browser as it was easier to access, they were familiar with downloading apps.

Comments included:

- “It’s still a bit of a grey area. I don’t know if I can remember how to access the browser now”
- “The App is easy”

NHS Approved Content

Women feel that the NHS is a trustworthy and reassuring source of information.
Comments included:

- “I use NHS trusted information”
- “I use Google for not too serious questions and then check NHS.uk”
- “You can’t trust everything online. You have to filter a lot of it out”

**Easy to Use**

The ease of use of a product, may differ depending on product and version. A woman’s experience with WDCRs is influenced by its ease of use. Many women reported usability issues such as logging in, navigation issues and understanding the language used in WDCRs.

Comments included:

- “It’s not easy to use so I’ve not relied on it. I’m not bothered”

**Usability:**

- “It’s hard to find the appointments”
- “My profile was logging details, not details of my pregnancy. I needed to look at ante-natal summary to see pregnancy details”

**Slow navigation:**

- “It could be a lot more user friendly. There is a lot scrolling down. It would be helpful to have a hub or tabs to break it down”
- “I don’t find it user friendly… It’s really slow”
- “I have to scroll a lot to find information in the app. I would change how the info is presented by grouping them by dates or types of info”

**Log in:**

- “It logs you in and out all the time and buffers when it does login”
- “I would have used it after each appointment, but it’s not been available”
Accessible for All

Women with access needs are more likely to struggle viewing and using digital tools (in their current state). The WDCR may exclude women who have learning needs or are not native English speakers or do not have appropriate technology.

Comments included:

- “It’s all very good with the app including notes from my appointments. but being in English it does not help me”
- “Everything is language based – what about disabilities?”
- “I think paper notes are better for accessibility”

Women are still using paper and multiple apps as the WCDR is not meeting all their needs. Many women are being given paper alongside their WDCR, so their journey fluctuates between online and offline, especially if they are seen in multiple places who use a mix of paper and digital or key features or information is missing from the WDCR.

If needs are not met digitally, then users will resort to using paper, which is often seen as more comprehensive and the full benefits of digital will not be realised. They will also use other apps or information sources online if they are unable to find in the WCDR.

Comments included

- “You just use what you’ve got to use”
- “I wouldn’t recommend this [PHR] as a centre of information as I still need to bring my paper notes”
- “I found it confusing as my consultant still needed to see my paper notes”
- “I want to see correlated information… what should baby measure now”
- “My scan appointments and consultant appointments are not showing”
- “The digital notes need to be complete for me to use them”
- “Is the app meant to replace paper notes or it is just a nice feature?”
- “I don’t want to repeat myself if all information isn’t available in WDCRs”
- “I am still expected to take paper notes to appointments”
Those who are classed as “high risk” and see many care professionals across settings, could benefit the most are more likely to have incomplete clinical information in their WDCRs.

Comments included:

- “You just use what you’ve got to use”
- “I always have paper notes to hand and both consultant and midwife write in so the information can flow between midwife and obstetrician” – Pregnant woman with Lupus
- “Information may get missed if the digital record is not complete”
- “I am high risk pregnancy, some consultant appointments are not showing on the App. I may miss them. Are they recorded anywhere?”

The usage of WDCRs varies based on several factors, such as how much content is available, usability of the product, woman’s digital confidence and their onboarding experience.

Women typically reported using their app after an interaction with a health professional.

Comments included:

- “I can review the recorded information and bring up any errors with my midwife”

If they are offered paper alongside their WCDR, digital usage is generally poor.

Comments included:

“[WDCR] has appointments, but I have these on paper anyway”
### An Overview of the Benefits for Women

<table>
<thead>
<tr>
<th>Benefits that women see in WDCRs</th>
<th>User Feedback /Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is easier to carry</td>
<td>“A4 paper folders are too big to carry around”</td>
</tr>
<tr>
<td>It is accessible 24/7</td>
<td>“Access wherever you are, via phone. You have records to hand if you are taken ill or visit a different hospital”</td>
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<tr>
<td></td>
<td>“It is useful that I can make notes anytime as I always have my phone with me”</td>
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<tr>
<td>Multiple people can access it</td>
<td>“My partner can have access to them too”</td>
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<tr>
<td>It is better for the environment</td>
<td>“I don’t like to waste paper”</td>
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<tr>
<td>It is easy to contact the midwife</td>
<td>“It is an easy way to contact the midwife through the app”</td>
</tr>
<tr>
<td>They can verify their own information</td>
<td>“I can see what has been written in my notes and bring up any errors with the midwife”</td>
</tr>
<tr>
<td>It provides an easy access to information</td>
<td>“It’s good to have digital notes: you don’t forget your appointments and I can see scans and don’t have to wait”. “All the available information in one place to read on the go when I want to”</td>
</tr>
<tr>
<td>They can be more in control and aware of their health</td>
<td>“I can prepare questions better for my appointments”</td>
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<td></td>
<td>“I can take ownership”</td>
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<td></td>
<td>“I think self-care is the way forward. If people self-care it takes lots of burden off the NHS”</td>
</tr>
<tr>
<td>There is still access to notes post-pregnancy</td>
<td>“It would be helpful to refer back if the baby has complications e.g. prolonged jaundice”</td>
</tr>
<tr>
<td>It can save time (don’t need to repeat history)</td>
<td>“I showed my Newcastle notes within my app, so I didn’t have to repeat myself. They treated them as if they were my green notes”</td>
</tr>
<tr>
<td>You cannot lose the notes</td>
<td>“You never lose the information”</td>
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</tbody>
</table>
Summary - Women’s Experience

In general, women feel positive about WDCRs. Most women use digital tools in their everyday life and they are used to searching information online. WDCRs give women easier access to maternity notes and other important information to help them manage their health and care during pregnancy. For women, the most valued features in digital maternity notes are access to their maternity records, appointment information, results, scans, contact details and numbers, local and national leaflets and pregnancy timeline information. The automated dataflow of some of these features into WDCRs requiring other health care functions’ input (blood test results, scans, consultants’ appointments) are not yet fully integrated. Women also value being able to input into their WDCR and pregnancy diary and the ability to add notes and pictures. They also found it useful to be able to communicate with their midwives e.g. sharing their birth plan and recording questions to ask at their next appointment.

If women must use both paper and digital, they find it confusing as all the relevant information is not in one place. Most maternity services still offer women paper in addition to WDCRs. There are some usability issues with the current WDCR products, but it would need more research to discover them in detail. It is important that suppliers include user-centred design principles into their product development to assure a good user experience and usability for their users.

Additional challenges of using WDCRs for women can be caused by being out of area and when they move from a digital to a non-digital practice, or vice versa. There are also areas with high numbers of women who are not English speakers, which could create an additional barrier for them to find or understand the information related to their health and care information. However, it important to note, the non-English speakers we have engaged with as part of the user research have provided positive feedback and have acknowledged the potential benefits of the WCDR.

WDCR products will need to compete with a mature apps market that meets some user needs already. Opportunities lie with NHS credibility, access to NHS records and clinical information and ability for women to add their own data.
7. Learning for the NHS: Clinical Insight and Implementation

In this section we discuss:

- Learning from implementing WDCR – the successes, challenges and experience of implementation
- The experience from clinicians, particularly midwives, as users of the product

What should a successful WDCR Implementation look like?

To understand the salient issues associated with delivery of WDCR’s, the analysis has centred on feedback from midwives’ (*the midwives’ experience*), lessons learned from the pilot Trusts, and also the findings from the independent research project ("Barriers to delivery & enablers for adoption of WDCR’s"), led by the South West Academic Health Science Network (SWAHSN)/University of Plymouth and NHS Digital.

Midwives' Experiences

Most midwives see the opportunities and benefits that digital systems and tools can bring. They know that digital systems and tools can help reduce cost, save time and improve reporting. They allow for up to date, more secure, instantly sharable, and readable patient information.

- “[it has] massively reduced the amount of paperwork and admin of dual recording”
- “Increased secure and full audit trail”
- “Previous pregnancy and any social information history available”
- “Recorded once on the maternity system and then shared appropriately”
- “Midwives can download records and have them available offline”
- “[it] automatically syncs when back online”
- “Information available at the point of contact at the point of care”
- “All safeguarding information available on the maternity system (accessible)”
- “Accessible to all relevant clinicians”
• “Can send women messages e.g. Blood results normal”
• “Legibility of notes”
• “Referrals online e.g. Health Visitors, safeguarding”
• “Quicker to download information”
• “More streamlined i.e. Cuts out printing”

However, there are some key areas that are affecting midwives’ experiences and also the interaction between pregnant women and midwives. These include equipment, connectivity and IT support, training, data duplication and sharing information with other systems (issues with interoperability and data flow).

Comments included:

• “It should save time and make the job easier, but the old equipment and connectivity issues cause major frustrations”
• “System crashes or we can’t log in and we have to use pen and paper – information is not shared, especially on home visits”
• “We have rubbish laptops… the battery life is very poor”
• “I tape up my laptop battery. We have no smart phones”
• “If I can’t log in at home visit, I have to use paper – I can’t wait 20 mins to just log in”
  “It can take 20 mins to log in. I come to work 30 mins before my shift to log in in all the systems. Too many systems”
• “We have old equipment and no IT support”
• “Tablets would be better than laptops”
• “I should download women’s records on the tablet before the visits as there isn’t always Internet available – 4G iPads will really help”

Training

Providing continuous and in-depth training and support is key to increasing staff skills, confidence and getting them to use the systems effectively and efficiently as part of their daily working practices. Midwives are often given iPads or laptops without being taught how to operate them. Age can present barriers for midwives, some were not taught to type at school and find technology a challenge.
Comments included:

- “Training was given too early before going live”
- “Who do I contact for help?”
- “I am not sure how it all works. I need to be sure I report and document all relevant things”
- “There is no ongoing training”
- “I had no instructions on using the laptop”
- “I didn’t learn to type at school or to use computers”
- “Getting all midwives and clinicians on board with the digital record”
- “Would be helpful for all midwives to be able to demonstrate the WDCR for women”

Data duplication (Interoperability and data flow)

The ability to fully document information digitally reduces the need for duplication.

Comments included:

- “If I can’t access the system on a home visit, I have to write on paper my notes and then write them in the system after my community visits. I do this on my own time. It can take 2 hours”
- “The full benefits of digital won’t be realised till it is end to end”
- “There are different systems – some still use paper”

Midwives are still duplicating data. There are several reasons for this:

- Running a dual process during implementation
- Having to re-key information across systems within the hospital as they are not integrated for example, Blood results and scans
- Duplicating in external systems (or duplicating on paper and sending across) so other clinicians outside the trust can access the notes such as GPs and Health Visitors
- Duplicating on paper as the system isn’t end-to-end within the maternity service
- Having to duplicate in handheld notes if a woman doesn’t consent to a PHR or is giving birth in a paper-based hospital
Sharing Information (Interoperability and Data Flow)

There is a lack of interoperability between maternity systems and other trust systems which results in important information often being missing or lacking.

Comments included:

- “How can I assure the real time information if systems don’t talk to each other? What if I have an emergency appointment in London?”
- “The midwife is reliant on the woman providing sensitive information which they can be reluctant to do. Midwives often have to use their ‘6th sense’ to identify issues and accessing can be long and manual process (e.g. receiving notes via post from local safeguarding teams, waiting for GP to open find out if previous drug abuse etc)”
- ‘Still a standalone system, not integrated to other systems in the Trust.’
- ‘No ability to link into GP systems…. ICE (Blood results) integration is coming soon!’

Interacting with Women

Midwives need to be confident onboarding and demonstrating digital notes to women and conveying the benefits.

Comments included:

- “It was a bit awkward [using the laptop] I can now concentrate on the woman and not the technology” – (Midwife working in high digital maturity setting)
- “You can see patients become frustrated when the IT fails”
- “Some midwives find the laptop intrusive when talking to women and will record on paper and type notes up later”
- “I don’t feel confident answering questions for women as I’ve not seen the system. I often tell them to ask at their next scan”
- “It would be helpful for all midwives to be able to demonstrate the app for women.”

Digital Tools allow women and midwives to prepare before an appointment. This is especially important if there are any safeguarding issues high risk pregnancy.
Comments included:

- “Women like to know what we know about them beforehand – it’s more personal. I review notes prior to appointments”
- “We didn’t previously have access to information, so we didn’t necessarily know if it was safe to visit (pre-digital)”
- “It is useful to know about any health or social issues prior to the appointment – women don’t disclose everything”
- “We now know if the children have been removed from them, or if there has been any domestic violence”
- “The first booking appointment takes the most time, 1-1.5 hours. If it’s pre-booked it can take 20 minutes”

Benefits and Disbenefits for Midwives

<table>
<thead>
<tr>
<th>Benefits</th>
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<tbody>
<tr>
<td>Improved access to information (more information held in one place, harder to lose/misplace notes, can access remotely)</td>
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<tr>
<td>Improvements in data quality</td>
</tr>
<tr>
<td>Automation of certain tasks saving time (e.g. reporting)</td>
</tr>
<tr>
<td>Promoting best practice via prompts (e.g. pulse)</td>
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<tr>
<td>Easier to edit/legibility</td>
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<tr>
<td>More secure (data is password protected)</td>
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<tr>
<td>Multiple HCPs can access records at the same time</td>
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<tr>
<td>Reduced printing costs</td>
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<tr>
<td>Access to the same data (continuity of care)</td>
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<table>
<thead>
<tr>
<th>Disbenefits</th>
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<tbody>
<tr>
<td>Some midwives have left their role due to digitalisation</td>
</tr>
<tr>
<td>Increased appointment times during the initial phase of implementation due to dual processes and a lack of familiarity. This should be a short term disbenefit</td>
</tr>
<tr>
<td>Digitalisation demands instant and up to date notes. If the information is not recorded in a timely manner information will be out of date</td>
</tr>
<tr>
<td>A perception of losing information after it’s been saved</td>
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</table>
Technology and or connectivity issues may cause information may be lost

Summary - Midwives Experience

In general, midwives can see the benefits of digital maternity notes. They can see that it saves both paper and time in dual recording. The information is easily shareable with other Health Care Professionals and the wider multidisciplinary team. Further to this, the process is more secure as they don’t have to carry sensitive information on paper with them. Digital systems also leave a clear audit trail. If the data flows well between different systems, midwives find it easy to use and feel that they don’t miss important information. They feel they can document more effectively and see a more structured patient journey. Midwives also feel that that they are able to prepare and get to know the women if they can see all the information from different sources before appointments.

To be successful in integrating WDCRs into midwives’ working practices, the systems need to be easy to use and data flow between systems needs to be as seamless as possible. It can be challenging if midwives need to log into a number of systems or use paper as part of the process. It is important that suppliers include user-centred design into their product development to assure a good user experience.

Midwives also need up to date equipment (hardware and software), IT support including digital Midwives support, reliable connectivity and the ability to work offline. Midwives need continuous training and support to be able to effectively use and integrate digital into their everyday workflow. Midwives are the best advocates to promote the digital maternity notes to women and the benefits they bring.

The Role of the Digital Midwife

The ‘Digital Midwife’ is a new emerging role in maternity services. Digital midwives are instrumental to the successful delivery of digital projects within maternity.

They act as a clinical champion for implementing digital transformation within their trusts, provide support and guidance for midwives and women, and identify opportunities for future change. Many are focused on delivering digital ‘end to end’ processes and achieving integration between systems within the trust. More work needs to be done to establish the Digital Midwife role within the field of midwifery.
Digital midwives can feel isolated at times, so they require good support networks, both locally and nationally, to share good practice and to learn from each other. Sometimes they face resistance from staff who are hesitant to change their ways of working or are reluctant to promote the digital notes. They champion the adoption of digital technology and provide the digital leadership to inspire the workforce.
IT Digital Midwife: Pilot Site Case Study - Gateshead: Corinne Blackburn featured in the NHS Long Term Plan

“This innovative technology increases choice and personalisation and empowers women by enabling them to take greater ownership of their maternity care.

As well as access to information such as their appointment details and their test results, there is also lots of useful advice and support and the option to add personalised birth plans, diaries and upload photos.

Going digital has also brought lots of advantages for staff such as reducing the need for duplication and carrying bulky maternity notes. The initial booking appointment time has also been reduced by up to 10 minutes thanks to the pre-portal booking functionality, which frees up valuable time.

Over the course of a year, the Trust could potentially save over 400 hours in staff time, which will free up more time for patient care.

It also improves communication and helps us to find out more about our mothers-to-be, creating a valuable resource for clinicians who have all the information they need to make the best decisions.

The last few years have been a huge learning curve, but I’ve really enjoyed the challenge and it is very much part of my career now.

It is exciting to see one of the world’s oldest professions constantly developing and innovating to ensure women in Gateshead have the highest standards of care.”

Conclusion – Midwives & Women’s Experience

It should be acknowledged that digital maternity is much wider than hospital maternity care. In order to achieve success in the digitalisation of maternity services, interoperability (both internally and externally) must be achieved. Where the service is not fully digital, staff are required to record data on both paper and digital systems which increases workload and discourages women from using the PHR, as the paper version is currently meeting their information needs. For both digital confidence and usage to improve, the infrastructure must reflect the ambitions of the service provider through the provision of adequate equipment and
technology. As demonstrated throughout this report, the development of any future solutions for WDCR or any national standards must be user-centered, iterative, and interactive.

Key Insights Summary

- Digital Maternity is much wider than hospital maternity care
- Interoperability (internal and external) is key to the success of digitising maternity
- Infrastructure for digital is important for confidence and usage of digital. This means training, equipment, connectivity, IT support and Digital Midwives are key to success
- If the woman’s journey is not fully digital (where possible), duplication increases, and women are less likely to use their PHRs
- Development of future solutions for WDCRs or any national standards must be user-centered, iterative and interactive
Recommendations for Implementation

Throughout the pilot project, lessons learned have been captured through IBC engagement with the individual pilot Trusts and through the supplier based ‘Learning from Local’ groups. These were set up to provide a platform for collaboration and knowledge sharing.

The following themes were identified as key issues or enablers to successful implementation:

- Training
- Planning
- The role of the IT Digital Midwife
- Infrastructure (equipment, connectivity, IT support)
- Business Process & Cultural Change

The table in Appendix 1 captures the key issues experienced by the pilot Trusts. These findings are validated by an independent academic research project led by the South West Academic Health Science Network and NHS Digital.

South West Academic Health Science Network (SWAHSN)

NHS Digital worked in collaboration with SWAHSN and the University of Plymouth to deliver a discreet 4-month research and evaluation project, focusing on unearthing further PHR’s insights and analysis.

The purpose of the research was to improve understanding of the barriers and enablers for use of WDCR across selected Trusts, situated in different geographical locations.
Summary of Findings from Independent Evaluation

**Barriers**

- **Training** – There were multiple issues surrounding training staff in WDCR. In some cases, training was delivered too early before implementation, or did not fit with staff’s schedules. Only 35% of staff felt that the training they received was sufficient.

- **Infrastructure** – Not all the Trusts had enough devices for midwives to access the WDCR, and a lack of stable internet connection was an issue across all Trusts.

- **Support & Resource** – There was a general lack of support, with updates to the WDCR from the supplier not always being timely or possible, and not always enough staff or funding to support the implementation.

- **Interoperability** – Digital record software did not communicate with other WDCR or other systems used in the Trusts, leading to duplication and a lack of information, especially with GPs.

- **Paper Use** – Paper is still in use at all Trusts, with leaflets, consent forms, and other documents still paper-based. Going paperless is difficult, as 29% of women want paper alongside WDCR, and 21% want paper alone. **Usability and Functionality** – Were likely to be factors effecting ultimate use of WDCR.

**Enablers**

- **Understanding Benefits** – 85% of maternity staff understood the benefits to their role, and 86% understood the benefits to women.

- **Buy In** – Higher rates of understanding WDCR were associated with higher rates of engagement.

- **Digital Midwives and Super Users** – Staff with a good knowledge of both the clinical and IT aspects of WDCR implementation were seen as very helpful when on hand to support other staff.

- **Supporting Women’s Use** – Staff heavily encourage women to use their digital records, demonstrating how to use them and providing support through booklets and helplines.
• **Safety** – WDCR were seen as less likely to be lost than paper records and as more confidential, with 88% of women feeling that they are secure.

See Appendix 2 for further information

### 8. Data Analysis and Utilisation

A focus on the experience and value delivered to both health professionals and women through improved outcomes can also be demonstrated through supporting data analytics and metrics associated with use and uptake of the record.

As the number of Trusts involved in the pilot has increased, so has the number of women being offered access to the WDCR. The number of unique users has also increased, standing at 129,000 and 78,500 respectively (December 2019).

The chart below offers projected numbers for the 2019-20 year which are anticipated to exceed the long-term plan target by approximately 40,000 women by March 2020. These users have generated over 2.2 million accesses since January 2018.
Deployment & Utilisation: Women offered access vs active users

- LTP T1 achieved December 2018
- LTP T2 achieved August 2019

Forecast Trajectory 'offered'
Forecast Trajectory 'active users' (Unique logins)
Evaluating the extent to which women access their WDCR is a key measure of the usability of the product. There are different ways of defining utilisation, the method used for the purpose of this report, has been agreed with the suppliers.

A single WDCR use is counted when a woman logs into the portal. It does not count further logins after the initial log in. Some of these logins may be the woman simply logging in to the portal and not using any of the functionality.

Further to this, utilisation is calculated by taking the proportion of women who access their record either before their first booking appointment, or in the month following their booking appointment, as a percentage of all those who have been given access. Access can be given either before or during the appointment and is largely governed by local practice.

The chart below includes data from two of the suppliers and shows that national utilisation has continued to rise since the WDCR pilot began.

Dips in the chart below can be associated with Trusts going live with the pilot. Although not always the case, Trusts often experience low utilisation early after adoption before seeing an improved rate.
**Contextual Insights into Utilisation**

This comparative chart below gives an indication of utilisation for December 2019. The national average utilisation rate for all Trusts is 66%. The utilisation rate represents the number of women who have had a booking appointment in December 2019 and have logged on either before their booking appointment or after their booking appointment within the month or before the 20th of the following month.

![December 2019 - Percentage Utilisation](image)

Whilst the overall national average utilisation is 66%, the chart shows that there is wide variation of utilisation rates across the individual Trusts.

For example, the lowest utilisation rate is 35% whilst the highest is 99%.

At the site with the lowest utilisation rate, several reasons have been highlighted including, training (lack of time to complete all training), dual running of paper and electronic notes, old equipment and connectivity issues were also highlighted. To address some of these issues the Trust is planning to reduce the paper notes and implement the growth chart electronically to enable paper light processes which should increase utilisation. The Trust also recognises the need for further staff training and have developed a new business size information card for women to carry in their purse to promote the WDCR.

Another site identified an issue with low utilisation despite using an interactive mature PHR. When the Trust went live with WDCR in April 2016, the decision was made that the women...
could also have paper notes if they wished. It was felt important to give the woman the choice. The midwives were not convinced of the benefits of giving women access to the WDCR as they still provided paper notes and there was no perceived benefit to the midwife. There were limited communications both internally and externally as to what the WDCR was and the associated benefits. There were also language issues with the women. Some midwives were not asking women if they wanted access to their digital notes as they assumed that the woman wouldn’t be able to access and read the record. Technical issues also posed a barrier as network availability was limited and the midwives had to tether their phones to access the system. This was time consuming and had a negative impact on WDCR uptake. Other HCPs and consultants were not engaged with the WDCR and were not aware of the benefits.

In order to mitigate some of these issues and improve uptake, the following activities were undertaken by the Digital Midwife (with IBC support):

- Designed a poster in-house that was displayed in each booking clinic and GP practice. This was later followed by a national poster and banners supplied and funded by NHS Digital to promote the WDCR.
- Relaunch of the WDCR was carried out targeting midwives and GPs at both locations. IBC supported and were available to assist with questions which was positively received.
- Communications were sent to GP’s to provide them with details of WDCR for Maternity records.
- The process of midwives asking the woman about WDCR was reviewed. A request was made for a change in the booking system, where the midwife was prompted to ask about access.
- The Digital Midwife attended the Divisional Leads and team meetings, providing a demo of WDCR and answering any questions.
- The prospect of interpreting the information leaflets into other languages was considered.
- Through system reports, the midwives who were not offering access were identified and potential issues such as technical, training and support were addressed.

Some Trusts have consistently high utilisation rates. Feedback from Trusts suggest that if women are registered prior to or during the booking appointment this increased uptake.

At one site with a high utilisation rate, once women self-refer and their referral is sent to the appropriate community team, the woman is registered on the maternity system and for WDCR.
The referral is then acknowledged within 24 hours and the woman is sent information about the WDCR with their registration details. This allows them to log on prior to their booking appointment and complete demographic information and past medical history which saves time at the booking appointment. This approach has been implemented by the community midwife teams and has had a positive impact on utilisation.

At another Trust, the Digital Midwife developed the business card below which includes a QR code allowing women to download the Badgernet App as a means of promoting the WDCR. The Trust also actively contact women who haven’t engaged with the App to understand the reasons why and offer support as required.

![Business Card Image](image1)

![QR Code Image](image2)

Despite the steady rise in the national utilisation rate there is noticeable variance across the different suppliers. The level of functionality appears to be one factor that has affected utilisation. The chart below suggests that the increasing national utilisation rate can be almost entirely attributed to one supplier which currently offers more interactive personalised
functionality, for example women recording their preferences about their pregnancy and birth plan. Other suppliers are working to develop their products with similar capability.

**Women Offered Access**

Utilisation can only be achieved if women are being actively offered access to the WDCR. Both suppliers provide data which shows to what extent this is happening at the original booking appointment.

The chart below shows that during the early stages of the pilot the percentage of women being offered access was around 65%. Since then, this has risen on a consistent basis up to around the last 6 months which has seen the offer rate plateau at around the 90% mark.
Whilst the majority of women are being offered the product on a routine basis at their initial booking appointment, there remains a small proportion of women who decline access, the reasons for which are not captured. However, it remains important to analyse this data, if as many women as possible are to benefit from using the WDCR.

The chart below shows despite some increase in the proportion of women declining access around the October 2018 to May 2019 period, the overall decline rate is largely unchanged. Figures for the most recent data (December 2019) show the decline rate varies from 0% up to 19.6%.
Further analysis into one Trust with notable numbers of women declining suggests 62% women who had declined were women ‘out of area’. These women are likely to be receiving their antenatal care from surrounding Trusts but were choosing to deliver at the pilot site. These women could be given access to the digital tools for information or guidance, but their maternity records are held by the Trusts providing their community care and therefore still require handheld notes.

The issue of ‘out of area’ women was reported by all Trusts. The lack of interoperability and data sharing across different maternity services has meant that ‘out of area’ women still need paper notes and dual processes are still required. Feedback from a number of Trusts suggests that a small number of midwives are still not proactively offering all women access to their digital record and that this accounts for the number of women declining. For example, there is an assumption that non-English speaking women may not interact with the WDCR, however this could be the assumption of the midwife rather than the choice of the woman.
Feedback and Learning: Challenging Some Key Assumptions

- There was an assumption that non-English speaking women wouldn’t want access to their digital record, but this was incorrect. Many non-English speaking women are registered and actively using WDCR.
- There was a further assumption that not every woman had a smart phone. This was also incorrect as very few women don’t have a smart phone.

Demographics – Ethnicity

Whilst this information is a useful metric in terms of volumes, it does not give any context into the ways in which individual users interact with their record or highlight if there any differences between women of varying demographics.

Analysis of ethnicity data, currently provided by one supplier, suggests that once access to the WDCR has been given, access and logon volumes tends not to differ greatly across women from different ethnic backgrounds.

The chart below shows the average number of logons to the WDCR per month by ethnicity for five pilot Trusts between January 2018 and December 2019.
Despite some spikes (such as those seen in one site amongst black women, and another site, amongst Chinese women) there are no noticeable trends to suggest that usage is consistently higher or lower amongst any ethnic group.

Social Deprivation & Utilisation Rates

Further research may want to focus on user uptake and any potential links to deprivation and education. Below are the utilisation rates (September 2019) for four pilot Trusts and contextual information from the Index of Multiple Deprivation (IMD) and specifically Local Authority ranking of Social Deprivation across England (317 in total). Deprivation measures include income, employment, education, health, crime and living environment.

<table>
<thead>
<tr>
<th>Site</th>
<th>Utilisation Rates (September)</th>
<th>Local Authority ranking of Social Deprivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site 1</td>
<td>(90%)</td>
<td>This Trust is located in an Authority which is ranked as one of the least deprived areas. Ranked 299 out of 317 Local Authorities based upon deprivation measures and supplementary indices.</td>
</tr>
<tr>
<td>Site 2</td>
<td>(69%)</td>
<td>This Trust is located in an Authority which is ranked as one of the most deprived areas. Ranked 6 out of 317 Local Authorities based upon deprivation measures and supplementary indices.</td>
</tr>
<tr>
<td>Site 3</td>
<td>(50%)</td>
<td>This Trust is located in an Authority which is ranked as one of the most deprived areas. Ranked 41 out of 317 Local Authorities based upon deprivation measures and supplementary indices.</td>
</tr>
<tr>
<td>Site 4</td>
<td>(36%)</td>
<td>This Trust is located in an Authority which is ranked as one of the most deprived areas. Ranked 76 out of 317 Local Authorities based upon deprivation measures and supplementary indices.</td>
</tr>
</tbody>
</table>

Initial Insights

It is important to re-iterate that these 4 comparisons do not prove any correlation and further detailed analysis is recommended before any conclusions could be drawn. It is acknowledged that hospital birthing populations come from a range of IMD populations and more focused
individual user detail research is recommended to unearth insights to explain the variations of utilisation (Please refer to the User Research analysis section of the report).
Gestation Periods and Utilisation

Further investigation of the utilisation data has been undertaken to analyse uptake across different ‘gestation periods’ (i.e. The foetal development period from the time of conception until birth) between January 19 and Aug 19. Data has been taken from all Trusts currently involved in the pilot and is presented by individual supplier.

Gestation Periods – criteria to measure/track utilisation rates.

<table>
<thead>
<tr>
<th>Gestation Periods</th>
<th>Key Interactions with Clinicians</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>8 to 11 weeks</strong> (8 weeks to 11 weeks plus 6 days)</td>
<td>Initial Booking Appointment with Midwife. (Some tests, such as screening for sickle cell and thalassaemia, should be done before a woman is 10 weeks pregnant).</td>
</tr>
<tr>
<td><strong>12 to 15 weeks</strong> (12 weeks to 15 weeks plus 6 days)</td>
<td>Ultrasound scan to estimate when baby is due, check the physical development and screen for possible conditions, including Down's syndrome.</td>
</tr>
<tr>
<td><strong>16 to 19 weeks</strong> (16 weeks to 19 weeks plus 6 days)</td>
<td>Midwife or doctor will provide information about the ultrasound scan offered at 18 to 20 weeks.</td>
</tr>
<tr>
<td><strong>20 to 23 weeks</strong> (20 weeks to 23 weeks plus 6 days)</td>
<td>20-week ultrasound scan to check the physical development of the baby.</td>
</tr>
<tr>
<td><strong>24 to 27 weeks</strong> (24 weeks to 27 weeks plus 6 days)</td>
<td>An appointment at 25 weeks (if this is first baby).</td>
</tr>
<tr>
<td><strong>28 to 31 weeks</strong> (28 weeks to 31 weeks plus 6 days)</td>
<td>An appointment at 31 weeks (if first baby). Midwife or Doctor should review, discuss and record the results of any screening tests from the last appointment.</td>
</tr>
<tr>
<td><strong>32 to 35 weeks</strong> (32 weeks to 35 weeks plus 6 days)</td>
<td>Midwife or doctor should provide information about preparing for labour and birth, including how to recognise active labour, ways of coping with pain in labour, and a birth plan.</td>
</tr>
<tr>
<td><strong>36 to 39 weeks</strong> (36 weeks to 36 weeks plus 6 days)</td>
<td>Midwife or doctor should provide information such as breastfeeding, caring for your newborn baby, vitamin K and screening tests for your newborn baby. Also discuss the options and choices about what happens if pregnancy lasts longer than 41 weeks.</td>
</tr>
<tr>
<td><strong>40 weeks +</strong> (40 weeks plus)</td>
<td>An appointment at 40 weeks (if this is first baby). Midwife or doctor should provide information about what happens if pregnancy lasts longer than 41 weeks.</td>
</tr>
</tbody>
</table>
(Online Notes access by Gestation: 01/01/2019 to 31/08/2019)
Both suppliers show a similar pattern relating to what stage during pregnancy women are most likely to access their WDCR. Logons are considerably higher at the earlier stages of pregnancy around the 8 to 12-week period before dipping and climbing again at the 28 to 35-week period.

These observations can be linked to the times when women are more likely to interact with healthcare services in relation to their pregnancy. The 8-12-week period is normally when the initial booking appointment occurs, with the initial dating scan taking place in the following weeks.

Data supplied by Supplier 1 also indicates that women continue to access their records following the delivery episode (Supplier 2 are not currently supplying this data). Over 13,000 women who had accessed their WDCR were still doing so over 3 months after they had given birth.

One supplier provided the below table which shows ‘Hit Rates’ for a number of the most popular features on their app during October 2019. In sending the data, the supplier noted that some of this activity is likely to be related to which components the Trusts are using.
rather than a women’s choice, so this should be taken into consideration when assessing the data.

From this we can see 9 out of every 10 women (89%) visited the ‘My Personal Care Plan – week entry’ feature. Over three-quarters (76%) of women also accessed the ‘Mother Medical Report’ section which can contain many different types of individual types of medical reports.

Features visited less frequently include the ‘Pre-Booking’ section where the user completes a pre-booking questionnaire (3%), though it is noted not all Trusts have enabled this feature. The ‘Timeline Event’ section, which displays when a user clicks to view a timeline event from either the My Personal Care Plan or the Baby timeline, is only visited by 7% of users.

**WDCR ‘Hit Rates’ (October 2019)**

<table>
<thead>
<tr>
<th>View Title</th>
<th>Description</th>
<th>% of all users</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Mother timeline) My Personal Care Plan - week entry</td>
<td>Displayed when a user opens a timeline week entry</td>
<td>89%</td>
</tr>
<tr>
<td>Mother medical report</td>
<td>Individual medical report (there are many different report types)</td>
<td>76%</td>
</tr>
<tr>
<td>Leaflets</td>
<td>List of all leaflets</td>
<td>54%</td>
</tr>
<tr>
<td>Appointments</td>
<td>List of appointments</td>
<td>54%</td>
</tr>
<tr>
<td>Birth preferences</td>
<td>Where user can enter preferences for birth i.e. I would like a water birth</td>
<td>40%</td>
</tr>
<tr>
<td>(Mother timeline) My Personal Care Plan - weekly diary</td>
<td>The personal diary entry for a timeline week entry</td>
<td>35%</td>
</tr>
<tr>
<td>Baby timeline - day entry</td>
<td>Displayed when a user clicks to view a timeline day entry</td>
<td>8%</td>
</tr>
<tr>
<td>Timeline event</td>
<td>Displayed when a user clicks to view a timeline event from either the My Personal Care Plan or the Baby timeline</td>
<td>7%</td>
</tr>
<tr>
<td>Pre-booking</td>
<td>The pre-booking questionnaire (not all units have enabled this feature)</td>
<td>3%</td>
</tr>
</tbody>
</table>
9. Benefits Analysis *(Quantifiable Benefits: £)*

The benefits analysis involved engaging with each of the Trusts to ensure that benefits were evidence based and ensuring that they reflect the operational perspective.

This included:

- Capturing benefits from the front line of change
- Gaining insight and knowledge of where improvements are likely to be noted
- Articulating the benefits that can be measured based on available data and insight

The Trusts were asked to complete a Benefits Realisation Plan (BRP) supported by IBC colleagues and the Programme Benefits Lead. The BRP serves to identify, baseline, monitor, and manage the collective set of benefits. By managing the realisation of benefits, we are able to articulate the value of the digital transformation enabled by the WDCR.

A key component of the BRP was to ensure the completion of benefit baselines and tracking benefits realisation progress as new processes and ways of working are implemented.

A peer review of the benefits measures and valuations was conducted to ensure consistency and accuracy.

**Benefit Themes**

From the benefits articulated we have identified a range of themes as represented in the following diagram.
Quantifying the Benefits

We have been able to quantify benefits with a focus on three key areas.

Women's Digital Care Record 3 Main Themes

- Reduced Stationery, Leaflets, managing paper record
  Provide women digital access to key information and remove the need for the paper based handheld record where women opt for use of the app.

- Efficiency in Clinical Time
  Enable women to input their demographic details into their personal record prior to their first appointment, saving staff time to capture this. Reduce the amount of data duplication when recording appointments.

- Efficiency in Admin Time
  Enable a reduction in the amount of time taken by administrative staff to request and return paper health records.
A range of metrics were identified by the programme to support the Trusts in identifying quantitative values to support their benefit plans. As a starting point we utilised a common set of measures to surface potential quantitative benefits.

<table>
<thead>
<tr>
<th>Reduction in Financial Costs Associated with Supporting Paper Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurements associated with reducing paper based maternity notes/pack:</td>
</tr>
<tr>
<td>• % reduction in printing materials - % reduction in printing costs associated with local information leaflets</td>
</tr>
<tr>
<td>• % reduction in No of booklets - % reduction in the number of antenatal paper record printed</td>
</tr>
<tr>
<td>• % reduction in No of Leaflets - % reduction on other leaflet costs e.g. purchase and carriage of national leaflets</td>
</tr>
<tr>
<td>• % reduction in ‘storage costs’ - % reduction in archiving antenatal paper record or the scanning of paper records</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clinical Efficiency Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurements to track:</td>
</tr>
<tr>
<td>• % in the reduction of duplication (dual entry of information) via the introduction of WDCR</td>
</tr>
<tr>
<td>• % reduction in supporting initial and ongoing appointment bookings</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Administrative Efficiency Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurements to track:</td>
</tr>
<tr>
<td>• % reduction in time spent in record preparation and administration</td>
</tr>
</tbody>
</table>
Benefits Identification

A benefit is likely to be realised over time following a period of local business change and adoption of new working practices. All Trusts have demonstrated savings from reduced stationery costs, and several Trusts have been able to quantify the administrative and clinical efficiencies of removing paper records.

We are working with all Trusts to gain a detailed understanding of their anticipated benefits as they adopt the WDCR. Where a site has been able to identify a quantitative benefit opportunity this data has been recorded in their benefits plan. We have been able to identify the baseline costs/values and target benefit values for these benefits across the three main benefit areas. However, the way in which benefits are calculated mean that only direct savings can be reflected. The actual value of avoided costs due to reduction in harm and contributions to safety ambitions will significantly enhance savings made to the NHS. This includes contributions as a result of behaviour change or safety contributing towards:

- reduced mortality, stillbirth and harm
- reductions in smoking and obesity and consequential impacts on maternity care
- increased rates of breastfeeding

The following target benefit value opportunities are real examples reported from Trusts derived from implementing WDCR. More work is required to further explore the value of implementing WDCR on improving women’s experience and the impact on maternity outcomes.

Implementing WDCR will reduce the need for paper notes as women will have access to this through an app or portal. Therefore, this will reduce the spend on the paper files that are completed during pregnancy. The files that will be reduced include the green, yellow and purple notes (for mother and baby) and the plastic wallets they are contained in.

Costs associated with removing paper were calculated to be £27,000 per year from one medium size Trust (4800 births per year).

Another benefit opportunity exists to reduce the amount of duplication required to record the information for each woman due to the reduction in paper notes, therefore reducing clinical staff time taken to record the data.

Costs associated with clinical time efficiencies were calculated to be £152,568 per year from one small Trust (2700 births per year).
Furthermore, implementing WDCR will reduce the need for administrative staff to prepare a copy of the medical record on women’s demand.

Costs associated with admin time efficiencies were calculated to be £50,000 per year from one large Trust (6700 births per year).

A number of Trusts have implemented a pre-booking process to allow women to input their demographic details and past medical history prior to their booking appointment, saving staff time to capture this information.

Costs associated with saving clinical time on capturing administrative information were calculated to be £33,000 per year from one small Trust (2800 births per year).

**Variation in Financial Benefits Targets**

It is recognised that there is variation across the Trusts in terms of quantitative benefit values. We are currently working with Trusts to understand in more detail the reasons for variation.

Some pilot Trusts are regarded as being ‘digitally mature’ and have significantly reduced or removed paper from their business processes. These Trusts have already realised benefits associated with paper-based cost savings. For example, reduction of costs associated with printing leaflets, postage costs for all self-referrals, appointment letters, and buying maternity booklets. Conversely, there are Trusts which are still ‘paper heavy’ and are experiencing issues of dual processing and duplication. There would a clear benefit opportunity to remove paper, improve clinical and administration efficiencies leading to a reduction in costs.

Furthermore, it is important to note the implementation status of each pilot site. Some Trusts have only just gone ‘live’ and therefore, will need time to fully realise their forecasted benefits values (£). Whereas, other Trusts have already implemented a PHR product, and to some extent embedded ‘business change’. In these instances, some of the benefits associated with the introduction of digital maternity records have already been realised.

It is key to highlight the Digital Maturity Assessment scoring of each site to provide further context. The Maternity DMA (2018) provided the opportunity to measure how well maternity services in England are making use of digital technology. The outputs of the Self-Assessment were to assist individual organisations to identify key strengths and gaps in their provision of digital services. The analysis contained in the report provided an overview nationally of the progress maternity services are making in obtaining the benefits associated with adopting digital technology. **The National Average DMA score is 51.** In reference to the pilot’s Trusts,
the lowest scoring site had a DMA score of 47, whilst the highest scoring site had a DMA score of 77.

**Benefit Variation: Summary**

- There is variation across the Trusts due to differing levels of digital maturity
- Some Trusts are paper light already, so efficiencies enabled by the WDCR are less than others because they have already been realised
- Some Trusts are embarking on a broader digital maternity transformation which will unlock broader benefits enabled by the WDCR
- Current levels of adoption and automation maybe sub-optimal as business change takes time to embed and transition to business as usual

**Quality Benefits**

All Trusts are anticipating a range of quality benefits and in particular an improvement in the experiences of both women and midwives enabled by the WDCR.

One of the key themes emerging is the Trust’s ability to measure quality of care, owing to the poor response to Friends and Family (FFT) surveys. With increasing completion rates, attention can be applied to improve areas of concern and increase the women’s positive experience of the care she receives.

Integrating the FFT into the WDCR has the potential to increase completion rates and support quality improvements.

Another emerging theme is the potential for the NHS to support a reduction in their carbon footprint by a reduction in use of the paper record. At one Trust the project team calculated that the implementation of the maternity system will save 15.2 tonnes on CO2 emissions from the environment every year from the 1.4 million sheets per year of paper reduction.

Several Trusts are due to conduct some focused case studies to elaborate on quality benefits and user experience and this insight will be included in future reports.
Enabling Capability

The benefits identified support a range of improvements aligned to ‘Better Births’, with improving safety seen as a key outcome and described by one midwife as the ‘golden thread’ that ties this initiative into the broader Maternity Transformation Programme. Importantly the WDCR benefits contribute to the key objectives for NHS X as set out recently, namely;

- Reducing the burden on clinicians and staff, so that they can focus on patients
- Giving people the tools to access information and services directly
- Ensuring clinical information can be safely accessed, wherever it is needed
- Aiding the improvement of patient safety across the NHS
- Improving NHS productivity with digital technology
- Allowing feedback on quality of clinical service e.g. friends & family test

Benefits: Next Steps

- Complete review of benefits realisation plans for those Trusts still to go-live and revisit existing plans to understand in more detail the variance.
- Ensure tracking data received for all pilot Trusts and update benefits realised data.
- Develop benefits map linked to Better Birth and NHS X objectives.
- Final benefits realisation review and disseminate learning.
10. **WDCR Project – Key Recommendations**

The Women’s Digital Care Record (WDCR) provides a range of tangible benefits for both pregnant women and clinical professionals working in the maternity services. Within healthcare there is an overwhelming desire to meet the needs of users, to improve patient services and patient outcomes. The WDCR, as a digital solution to replace paper based maternity notes, has the potential to deliver change and demonstrably improve the healthcare experience of users and improve efficiencies in healthcare.

The user feedback gathered from both users and midwives is positive, and clearly shows the support for digital products which support personalised self-care and knowledge management. There is enthusiasm from both women and clinical professional for products which provide easy accessibility, portability, and the removal of paper based maternity notes from the maternity pathway.

The project has only touched the surface in terms of understanding user requirements and determining what is considered the ‘gold standard’ of a WDCR. Through further interrogation and investigation of WDCR product functionality (via usability testing and analysis), there is the opportunity to collect, establish and validate a list of core requirements. These requirements can and ‘should’ form the basis to develop a WDCR ‘standard’ which reflects the needs of users.

As reflected in the report, there are a number of barriers which could impact and inhibit the uptake and utilisation of the WDCR.

A business change model should include three keys areas:

- Investment and ‘buy in’ from the Health Providers (appropriate funding and key stakeholder support)
- A collaborative approach between all key stakeholders
- A product which is fit for purpose and which satisfies the needs of the users and offers benefits realisation opportunities
Key Recommendations:

- Development of a Maternity Information Systems framework, supporting Trusts in selecting high quality interoperable clinical systems with the capability to support information provision to women
- Development and/or application of clinical and non-clinical standards within a Woman’s Digital Care Record
- Creation of a supporting Specification for Women’s Care Records based upon feature sets and capabilities identified as part of the ‘Accelerator’ project
Appendix 1

Implementation Enablers and Barriers – Feedback from Trusts

<table>
<thead>
<tr>
<th>Themes/Groupings</th>
<th>Key Learnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training and Engagement (Midwives/Clinicians)</td>
<td><strong>Enablers</strong></td>
</tr>
<tr>
<td></td>
<td>• Having a project midwife/team to test and implement the patient portal</td>
</tr>
<tr>
<td></td>
<td>• Community midwives fully trained and informed about the patient portal. They are the key people leading from the front in the promotion and uptake of the portal</td>
</tr>
<tr>
<td></td>
<td>• Hosting monthly drop in to provide extra training and forum for support</td>
</tr>
<tr>
<td></td>
<td>• Producing a monthly tips newsletter for midwives, including fixes and tips</td>
</tr>
<tr>
<td></td>
<td>• Providing a checklist for trouble shooting if women have problems registering for the PHR i.e. ensure correct e-mail/contact details</td>
</tr>
<tr>
<td></td>
<td>• Having an IT Digital Midwife to maintain the App/portal and leaflets and support the midwives and women</td>
</tr>
<tr>
<td></td>
<td>• Attending monthly meetings with our LMS, to help each other and share resources</td>
</tr>
<tr>
<td></td>
<td>• Having a community midwife as a clinical champion helped to convince the community midwives to see the benefits of the digital maternity records and accept the change</td>
</tr>
<tr>
<td></td>
<td>• Ask midwives to volunteer to be super users to offer ongoing support and training (clinical involvement)</td>
</tr>
<tr>
<td></td>
<td>• Clinical managers/Team Leaders need a good understanding of the system so that they can provide support</td>
</tr>
<tr>
<td></td>
<td>• Ensure staff have adequate training so that they confidently demonstrate the PHR functionality to women</td>
</tr>
</tbody>
</table>
- Ensure all staff who document information within a woman’s record are aware of the change and have received appropriate training

**Key barriers**

- Training for community midwives is more challenging to organise as teams are normally geographically dispersed
- Availability of staff resource to ensure support is available
- Resourcing makes it difficult for staff to be released for training
- The system is updated every 2 months, so training requirements are ongoing. A way to communicate system changes/new ways of working is needed.
- The ‘Train the Trainer’ training provided by the supplier was considered insufficient. There is a need to ensure more midwives are involved in the Train the Trainer Training to understand the clinical application of the training. The staff who then disseminated training had minimal training themselves on the system prior to training others
- Found many women did not log on in the first 30 days of having been given access, so when they did try, their log-on was out of date. Midwives need to be able to trouble shoot and learn how to re-set passwords
- Training should be timely and ongoing training/support required
- Reliant on community midwives to promote the WDCR with women. Midwives would benefit from having an iPad/tablet for demonstration purposes so that they can promote the functionality with women
- Lack of confidence/skills in IT systems, which results in dis-engagement
- Basic IT Skills training required for community midwives. Some staff were given iPad/laptops without the appropriate IT training
- Community midwives work alone and do not have direct access to IT support
### Data Quality
Outline the expectations of what is required from clinicians to ensure the woman receives the full benefits when accessing her maternity notes. For example, when clinicians don't publish information to the portal that should be available such as bloods results and assessments.

- Reluctance/fear of change. Clinicians preference of the paper handheld record and fear of what the woman can and can't see on the portal
- The paper handheld record is still often viewed as being owned by the clinician and not the woman. Therefore, a reluctance to change documentation so that the woman can understand her notes without medical jargon or abbreviations

### Training and Engagement (Users)

<table>
<thead>
<tr>
<th><strong>Enablers</strong></th>
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<tr>
<td>- If midwives sit with the women and help them to log on, this helps avoid problems and increase utilisation</td>
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<td>- Promoting the PHR at booking appointments has been proven to increase uptake and utilisation</td>
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<td>- Some services have developed a process where women are registered for the WDCR prior to their booking appointment and can discuss any issues with their midwives at the time of the appointment. This has led to very high utilisation rates.</td>
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<td>- Challenge assumptions. Women who cannot speak English may find the digital tools easier as they can use Google Translate, to copy and paste from the App/portal.</td>
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<td>- Ensure there is clear information for women explaining how to access the App/portal including who to contact if there are any problems registering or logging on</td>
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<td>- Some services have developed small business card size information cards which women can carry in their purses to refer to</td>
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<tr>
<td>- Women's access to their records drives up data quality standards</td>
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<tr>
<td>- User groups with women – community based to raise awareness of what it means</td>
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- Support from local Maternity Voices Partnership (MVP)
- Review utilisation data to gain insights into numbers of women registering for the portal and address reasons why women are not offered access or decline access
- Availability of Wi-Fi in public areas should allow all women to be able to access their record
- Continued advertising/promoting PHRs to women

**Key Barriers**

- Availability of information/promotional resources in different languages
- Had a higher than expected cohort of women who do not have strong computer skills
- If women are offered access to both paper and digital notes this has negatively affected uptake and utilisation
- The PHR functionality is currently read only. The new functionality will be much more user friendly and interactive. Believe that the new functionality will improve utilisation
- Although majority of women appear to have access to smart phones some women do not always have sufficient data on their phones to be able to access their digital record
- Do not assume that all women (or midwives) are aware of how to download an App or even know what the ‘App Store’ is
- Do not underestimate the support the women need. After Christmas we saw an enormous rise in calls from the women, because they had changed their phones and/or their numbers
- The women notice everything. If there is a spelling mistake or any other kind of mistake, they will let you know

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<th>Infrastructure/IT Support</th>
<th>Enablers</th>
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<td></td>
<td>• Direct contact for IT to ensure urgent response if system is down</td>
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• Ensure staff have access to appropriate hardware and address connectivity issues in the community
• Investment in 4G ipads have facilitated paper lite working

**Key Barriers**

• IT departments need to prioritise IT issues affecting maternity system. If the system goes down, it affects access to records
• iPads automatically lock after 5 mins, which disconnects the VPN if in use, making care in the community or home births very difficult
• Still many areas, with poor Wi-Fi connectivity
• iPad batteries can be poor. Need to consider availability / access to chargers
• Equipment needs to be reliable, particularly for community midwives when staff are working alone.
• Ensure midwives have smartphone and know how to use a ‘hotspot’ to tether to their laptops
• Ensure that the hardware is suitable for remote working

**Project Planning**

**Enablers:**

• Digital leadership and senior stakeholder buy-in (Head of Midwifery)
• Ensure training is close to Go Live and resources available in the clinical areas for support
• Arrange reduced clinics at time of go live to give staff more time to implement
• Engage GPs early on in the project
- Use social media, drop ins, newsletters and user groups to communicate the change to all staff
- Develop and maintain strong links with local IT departments. Creation of a Communications and Engagement plan targeting all members of the Multidisciplinary team.
- Ensure all stakeholders understand the benefits of the change

**Key Barriers:**

- Project planning was a challenge as the trust had several major IT projects planned and Maternity was not considered a priority
- IT Engagement. When the system went live, the Trust decided to send a large number of text messages to all women, which flagged an alert in ICT as it looked like someone had hacked into the text message servers
- Involve Information Governance early in the project planning to avoid delays to the project
- Allow sufficient time for penetration testing and resolving issues
- Identify all stakeholders affected by the change (all users of the maternity system, IT, Information Governance, GPs) and ensure robust communications and training plans
- Communication to ALL staff regarding the implementation of the patient portal so that everyone is fully informed of changes, how this will affect the clinician and what the woman has access to
- Consider phased roll out or big bang approach
- Didn’t do enough communications to women – for example, to explain that their registration would expire if they didn’t log on within 30 days
Appendix 2

SWAHSN: Research Findings & Analysis

Questions Raised

1. How has WDCR been approached in the different pilot Trusts and what can we learn from this?
2. What are the barriers and enablers to implementation of the digital care records?
3. What are the barriers and enablers to successful adoption of the digital care records?
4. Based on models of good practice, what strategies might be useful to consider for future roll out of WDCR?

Methods

The research involved a mixed methods approach, accounting for the views of women using the records, Trust and community-based maternity staff and local project teams. The evaluator was required to demonstrate usage data across the pilot Trusts and carry out some desk research to back recommendations based on findings with existing models of how to successfully adopt similar product.

Evaluation

The South West Health Academic Science Network report states “Whilst it is clear that while there are many benefits to be gained through the use of women’s digital care records for both maternity staff and women, there are also many factors that can disrupt the implementation of them, and just as many steps that can be taken to facilitate their uptake.

Key issues include a lack of appropriate devices for staff to use the digital records, lack of training in their use, the lack of interoperability with other systems, and a lack of understanding around the benefits and functionalities of the WDCR and why they were being implemented. However, all these issues have a counterpart addressing them which facilitates the uptake of WDCR, as demonstrated by the ongoing support provided suppliers, Digital midwives and super users to further the implementation of the digital records.
The user research shows that the role of the Digital Midwife can lead the way and ensure technology is used to enhance the care provided and improve outcomes for mothers and their babies. Such a role will enhance digital training and support staff to improve their digital skills and support the active use of IT systems, as well as implementing new developments and initiatives.

It is crucial that the WDCR used is fit for purpose. There are multiple digital care record systems available for use in maternity, and their different functionalities must be considered by each site looking to adopt them, as the women use them to different extents. Ensuring that the technology is useful to all stakeholders is essential, and work must be done to find out if the WDCR offers an advantage relative to paper to the different groups it impacts. Knowing the needs of these groups and how WDCR impact them allows for the delivery of effective support for all parties, which is crucial to the implementation and ongoing adoption of digital care records.

Above all, it is important to use this learning to inform the future roll out of women’s digital care records more widely, so as to ensure their implementation is effective, with minimal disturbance to the people who use them”.

SWAHSN Recommendations:

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<th>Recommendations</th>
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<td><strong>Staff and service users reported issues with the usability of the technology, including interoperability and user-friendliness</strong></td>
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<tr>
<td>• The digital record should have a user-friendly interface and must not be too difficult to use when there is a language barrier between maternity staff and the woman.</td>
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<td>• The digital records must have a clear advantage over paper records, in terms of cost or function.</td>
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<td>• The WDCR chosen must have a beneficial impact on the intended user’s work.</td>
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<td><strong>High rates of understanding were associated with high rates of engagement. Not all relevant stakeholders were informed and included at all stages of the implementation</strong></td>
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<td>• Stakeholders should be made to feel engaged by involving all staff and women who will be affected by the change, especially groups who may have been neglected previously, like GPs.</td>
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<td>• Positive impacts of the WDCR should be visible to stakeholders. This visibility can be increased by giving stakeholders a way to provide feedback on how the WDCR is working.</td>
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<td>Staff reported insufficient or ineffective training and resources to support change</td>
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| • Increasing people’s understanding of and confidence in using the digital records makes them more willing to engage with them, as well as enabling them to make better use of the technology.  
• WDCR should be supplied to Trusts with training and the ability to customise it to suit the site’s needs. As a priority, training should be sufficient in terms of quantity and quality.  
• WDCR should have time and funding allocated to training to support their implementation. |

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<tr>
<th>A key facilitator to implementation was having a trained and enthusiastic champion or ‘super user’ (Digital Midwife) There was inconsistency in available on-site support</th>
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<td>• A sufficient number of champions or super users should be trained to facilitate shared learning between them and others using the digital records, and to allow their enthusiasm for the records to spread.</td>
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<tr>
<th>Lack of adaptability in digital record software</th>
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| • WDCR should fit the context of each site where they are used. This can be enabled through small scale tests, allowing Trusts to learn what needs to be changed to best suit their specific situation.  
• This should be supported by the suppliers making requested changes in a timely manner. |

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<tr>
<th>A key and consistent barrier to implementation was a lack of appropriate infrastructure</th>
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| • Having the necessary hardware and internet access is essential in enabling the successful implementation of WDCR. Before going live, the site should have sufficient devices for staff to use the digital records.  
• There should be resources allocated to enable sufficient training and support for staff and women to learn how to use the digital records |