National Mobile Health Worker Project

Final Report

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National Mobile Health Worker Project Final Report

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Foreword

Community Services are the foundation of healthcare, providing health, well-being and care services from childhood through to the end of life and supporting some of the most vulnerable people. At their best they are innovative, flexible and personal.

As part of the Transforming Community Services programme, the National Mobile Health Worker Project nurses, carers and allied health professionals have demonstrated that they can utilise technology and information to transform their services and the care they provide.

Alongside improving efficiency and productivity, the pilot sites have been able to make services more responsive to patients' needs by changing the times services are available, embracing paper-light working, utilising online resources, engaging with patients much more and encouraging active participation of patients in their healthcare. By using mobile technology, Community staff have had access to the up-to-date information that they need to be able to safely and effectively deliver care, plan treatment and monitor outcomes.

Clinicians have been able to achieve more in their visits, resulting in patients having greater confidence and clinicians feeling satisfied in being able to fulfil their role effectively. Processes have been streamlined, communications improved and truly seamless care delivered.

The experiences of those involved in the project have shown clearly the benefits that can be achieved and an insight into the ways services can transform by utilising the available technology.

I would like to thank the Mobile Health Worker team, and all the people involved at the pilot sites for the hard work and dedication they have contributed to this project, delivering robust evidence to support all Community Services to make mobile working a reality.

Finally, I would like to encourage all those involved in providing or commissioning community services to read this report, and to consider how it might stimulate real service transformation across the NHS.

Viv Bennett
Director of Nursing/Government's Principal Advisor on Public Health Nursing
Department of Health

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Executive Summary

Background

Community Services provide essential care to many, often vulnerable, people, families and communities along the full spectrum from health promotion to end of life care

The Transforming Community Services programme – completed in March 2011 – was established to support providers and commissioners to make changes to community services that would provide better health outcomes for patients, families and communities, as well as increasing efficiency through modernisation of care.

The Mobile Health Worker Project (MHWP) formed part of the TCS programme's Reforming Systems work stream. When the TCS Programme came to a close the MHWP project continued in its own right.

The early findings from the project were published in an initial report that was presented in March 2011, which was followed by a detailed progress report, published in August 2011. This Final Report describes the findings and conclusions from:

- Measurement of benefits at the eleven original sites (Phase 1);
- Analysis at six sites addressing whole service transformation (Phase 2).

The aims of both phases of the study were to understand the requirements of mobile working, and to demonstrate that increased productivity and efficiency can be achieved by making changes to working processes. Formulating guidance from these findings will help to increase the rate of mobile working adoption by providing a solid economic basis for investment in and deployment of mobile solutions to community organisations.

Findings

Standard metrics were collected using a standard collection tool, both before deployment and at various points after the deployment of equipment. The data extends to a full year following deployment, therefore gives a good indication of the long-term gains that can be expected.

From the information collected during the 15 month period of the project, it is clear the adoption and long-term use of appropriate mobile solutions has the potential to significantly improve productivity, efficiency, safety and assist services to continue to provide good quality care and achieve good outcomes. The reported findings included:

- Significant increases in productivity can be achieved, as demonstrated by huge increases in contact activity (up to 142%)
- Significant increases in time spent with patients following deployment of mobile devices (up to 104%)
- Journeys can be reduced, even where clinical activity is increased (up to 11%)
- Time spent travelling can be reduced (up to 33%)
- Data duplication can be reduced significantly, freeing up clinical time (up to 92%)

- No Access visits can be reduced significantly (up to 50%)
- Significant saving in referrals can be achieved (up to 34%)
- Significant savings in admissions can be achieved (up to 91%).

Whilst there are some clear financial benefits associated with the adoption of mobile working, it is stressed that just as the solutions are not 'one size fits all', neither are the benefits. Financial savings will vary greatly across different services and different organisations.

The following example savings have, however, been demonstrated by sites in the project. Each figure represents a saving per clinician, per year:

- £ 978 savings from No Access visits saved (Northampton)
- £ 1,031 savings from avoidance of unnecessary referrals (Tower Hamlets)
- £ 16,707 savings from avoidance of unnecessary admissions (Tower Hamlets)
- £ 889 savings from avoidance of unnecessary mileage (Hartlepool)

Lessons Learned and Conclusions

There are many lessons that have been learned over the course of the MHWP, and it is important to share these, so that organisations planning mobile deployments in the future can benefit from this work. The lessons are transferable and not restricted to any particular location, clinical application, service or type of device:

- Where clinical engagement is achieved, benefits are delivered more consistently and to a higher level
- There needs to be a well communicated understanding of the expected outcomes of the project and the role of clinicians in driving the project forward
- Robust benefits measurement is essential to show the success of the deployment
- Organisational change will impact on the progress of a project and can affect the outcome, however a negative impact is not inevitable, and good planning and focus can limit the impact
- Accessible training to all users in the basic functionality of the devices being deployed is essential
- For mobile deployments to enjoy long-term success it is vital that solid ongoing support be in place.

Whilst the project has focused on service change, there are inevitably some technical aspects which have been identified in relation to: technical capability, equipment and connectivity and these need to be addressed.

The Department of Health information strategy "The Power of Information: Putting us all in control of the health and care information we need" [DH, May 2012] aims to harness information and new technologies to achieve higher quality care and improve outcomes for patients and services users, with one of its main ambitions being to promote the widespread use of modern technology to make health and care services more convenient, accessible and efficient. The findings and lessons learnt in this project should assist organisations in achieving this and make mobile working a reality for community staff.

Introduction

Project Origins

Effective and efficient community services are the foundation of healthcare in the NHS. They help people stay healthy and care for them through debilitating illness or at the end of life. Community services are a lifeline for some of the country's most vulnerable people, and at their best are innovative, flexible and personal.

The Transforming Community Services programme – completed in March 2011 – was established to support providers and commissioners to make changes to community services that would provide better health outcomes for patients, families and communities, as well as increasing efficiency through modernisation of care.

The Mobile Health Worker Project (MHWP) formed part of the TCS programme's Reforming Systems work stream. When the TCS Programme came to a close the MHWP project continued in its own right.

The early findings from the project were published in an initial report that was presented in March 2011. This was followed by a detailed progress report, published in August 2011 [National Mobile Health Worker Project: Progress Report, Department of Health, Publications Policy And Guidance: DH_129399].

Project Update

This Final Report describes

- Measurement of benefits at the eleven original sites (described here as Phase 1);

- Analysis at six sites which looked at whole service transformation (described here as Phase 2).

This document provides the key findings and conclusions arising from the two Phases. The attached Appendices provide supporting detail for Phase 1 (Appendix A) and Phase 2 (Appendix B).

Project Overview

As proposed in the Progress Report, the project has collected additional data for each of the original eleven sites. This additional data collection (Phase 1) took place at:

1. Ashton, Leigh and Wigan Community Health Care (ALWCH)
2. Avon IM&T Consortium (AIMTC): Bristol Community Health, South Gloucestershire Community Services and North Somerset Community Partnership
3. John Taylor Hospice CIC (NHS BEN)
4. NHS Calderdale
5. City and Hackney Teaching Primary Care Trust
6. Doncaster Community Healthcare (NHS Doncaster)
7. North Tees and Hartlepool NHS Foundation Trust
8. NHS Northamptonshire Provider Services
9. South West Essex Primary Care Trust
10. NHS Stoke on Trent
11. NHS Tower Hamlets

In addition, six of these sites were provided with additional equipment, with the aim of looking at 'whole-service transformation' 'Phase 2'.

Early findings from the project suggested that benefits were limited by only deploying equipment to small numbers of staff within a service or a team, so the aim of Phase 2 was to establish whether there were greater benefits to an organisation if it could implement mobile working across full teams

In total a further 448 devices were deployed in Phase 2, with some sites choosing to extend the reach of the initial deployment to cover full teams, and others choosing to deploy to a completely new cohort of staff.

The six sites involved in Phase 2 were:

1. Avon IM&T Consortium (AIMTC): Bristol Community Health, South Gloucestershire Community Services and North Somerset Community Partnership
2. John Taylor Hospice CIC (NHS BEN)
3. NHS Calderdale
4. North Tees and Hartlepool NHS Foundation Trust
5. South West Essex Primary Care Trust
6. NHS Tower Hamlets

Methodology

Phase 1 and Phase 2 both followed the same basic methodology, as detailed in the Progress Report.

Data Fields

A full description of each of the data fields can be found in the Progress Report.

Phase 1

Data Collection

Following on from the results presented in the Progress Report, the MHWP team continued to collect data from the eleven sites, to give an understanding of the impact of mobile working over a longer period of time.

The sites collected data for two further periods (Benefits 3 and Benefits 4), aiming to extend data collection over a nine to twelve month period (the sites had differing go-live dates, as discussed in the Progress Report).

Baseline	Benefits 1	Benefits 2	Benefits 3	Benefits 4
September 2010	22/11/2010-17/12/2010	17/01/2011-14/02/2011	20/6/2011 – 3/7/2011	12/9/2011 – 25/9/2011

The same benefits collection tool was used throughout the project, to enable comparative analysis of all data collection periods, even though it was acknowledged there were some issues with the tool's use (see Progress Report for further detail). However, it was possible to reduce the burden of data collection by reducing the data collection periods from a four week period to a two week period.

Data Analysis

In total, **14,560** days' worth of data were collected throughout Phase 1, from 377 clinicians in 16 different clinical services.

Details of **65,155** contacts and **64,532** journeys were recorded, with nearly 1,000 comments from both clinicians and patients

All data was analysed by analysts at the Health and Social Care Information Centre; the results are included as Appendix A to this report.

Phase 2

Data Collection

Data was collected over four periods – Baseline (this was a separate collection to the Phase 1 baseline data collection), and Benefits 1, 2 and 3, each of two weeks duration. Each site collected data over differing dates, as the go-live dates varied. Baseline was collected at least

two weeks prior to deployment of devices; Benefit 1 was around three months post go-live; Benefits 2, six months and Benefits 3, nine months post go-live.

The same Benefits tool was used in Phase 2; this was due to the sites already being familiar with this tool and also would allow data to be compared to the Phase 1 findings.

Data Analysis

In total, **7,910** days worth of data were collected throughout the Phase 2 project, from 387 clinicians in 11 different clinical services.

Details of **42,419** contacts and **21,662** journeys were recorded, with nearly 500 comments from both clinicians and patients.

All data was analysed by analysts at the Health and Social Care Information Centre. The results are included as Appendix B to this report.

Data Limitations & Assumptions

These are as already discussed in the Progress Report.

A major limitation is the journey data – all journeys were recorded in the project and not just those associated with direct clinical contacts – this makes it difficult to directly link the changes seen in activity to the changes seen in the number of journeys made.

Mileage was included in the early stages of the Phase 1 project, but it proved difficult for sites to submit this data with any confidence in its reliability.

The only reliable mileage data that was submitted was from a single site in Phase 2, therefore limited conclusions can be drawn from this.

Equality Impact Assessment (EQIA)

An EQIA was performed at each site, as discussed in the Progress Report.

Project Findings

Phase One Findings

Overall project findings have not been presented in this Final Report, as the analysis performed for the Progress Report highlighted the significant variations that were present across the sites and how the differing approaches affected the outcomes of the project. This along with the lower returns in the latter parts of the project, means there could not be any meaningful analysis performed from combining the data across the project.

The same applies to looking at data across Services, however we can see some interesting themes from the basic raw data presented.

Children's & Family Services, District Nursing and Specialist Nursing make up the three largest service types in the project, and unsurprisingly represent the largest contributors to the contact and journey data.

Palliative Services enter the top three for number of referrals made, with the MDTs being the third largest contributor of admissions, however they have made significantly less than the top two services: Specialist Nursing and District Nursing.

Speech and Language therapy enter the top three for No Access visits, just fractionally ahead of Specialist Nursing.

These represent important findings when considering the types of savings that can be made for the different service types.

Ashton Leigh and Wigan Community Health Care (ALWCH)

The data returns from ALWCH were 54% at Baseline but reduced to 20% for the final benefit period.

The 49 clinical staff involved in the project recorded 984 days of data, capturing 4,221 contacts and 3,417 journeys.

As the project progressed ALWCH managed to reverse their early findings and by the end of the project showed a slight increase in contacts (5%), with a significant increase in time spent with patients (58%).

There was no change in the number of journeys made, but there was an increase of just over a third in time spent travelling. The increased productivity, without an associated increase in travel indicates greater efficiency in working patterns, and the increase in time spent travelling may reflect changes to the geographical area covered by the teams due to organisational change, rather than being an outcome of mobile working.

There was a slight increase in the duplication of data (12%), which is likely to be a reflection of the lack of an electronic clinical record and the small numbers of users in each service with a mobile device.

There were no changes seen in No Access visits across the project.

There was a small saving in referrals (3%), however a significant saving of nearly one third in admissions - this is likely to be a reflection of the types of users deployed to.

Avon IM&T Consortium

The data collections in Avon were affected in part by local reorganisation, but also because after the initial data collections (Benefits 2) the work was run as 'business as usual' rather than as a formal project. This may affect the results seen, as returns dropped from 98% to just 38% of the cohort by Benefits 4.

The 48 staff involved in the project recorded 1,445 days of data, capturing 3,933 contacts and 4,807 journeys.

As the project progressed, overall there was a drop in activity by up to a third. The MDT showed an increase in activity at the end of the project, although this had fallen from the initial increase seen at the Progress Report stage.

Journeys also dropped as the project progressed, as would be expected with a fall in activity. The total time spent travelling fell by nearly one third. There were falls in number of journeys across all services, even the MDT, who had shown an increase in activity, therefore indicating improved efficiency can be achieved, even where productivity is increased.

Avon reduced duplication significantly (41%), which is probably a result of the Rio Optimisation Project that was running alongside the Mobile Health Worker project in the latter stages.

No Access visits were also significantly reduced (47%).

There were no significant savings on referrals or admissions in Avon, which is likely to be a reflection of the types of services involved.

John Taylor Hospice CIC (NHS BEN)

John Taylor Hospice maintained consistent levels of returns throughout the project, with 81% at Baseline and 62% at Benefits 4.

The 18 community staff involved in the project recorded 1,225 days of data, capturing 2,550 contacts and 2,452 journeys.

Productivity had increased significantly by the end of the project (40%), with the time spent with patients increasing by over half.

As expected with such a large increase in activity, the number of journeys also increased, although slightly more than activity (49%). The time spent travelling also increased, but by a slightly larger amount (58%).

Duplication of data remained high at the end of the project, showing an increase of nearly three quarters from Baseline – this may reflect the recent introduction of an electronic clinical record and the new data recording processes not being fully established.

No Access Visits showed a significant rise of over two thirds by the end of the project – some of this increase can be attributed to the increase in activity, and it was felt locally that the baseline figures may not have been very accurate, as it was not something that had previously been routinely captured.

There was a small saving in referrals (4%), but no savings on admissions, which is reflective of the services involved.

NHS Calderdale

The team at Calderdale provided a high level of returns throughout the project, with an extremely high 96% at Baseline, dropping slightly to 88% at Benefits 4.

The 25 community staff involved in the project recorded 1,104 days of data, capturing 5,515 contacts and 5,573 journeys

Activity remained higher than Baseline by the end of the project (15%), but with only a slight increase in the time spent with patients (4%).

There was only a very slight increase in the number of journeys at the end of the project (1%), and although the time spent travelling increased a greater amount (10%), it still shows efficiencies were made.

Data duplication had fallen by the end of the project (6%), and may reflect the effect on the initial cohort of deploying additional mobile devices in the same services (in the second phase).

No Access visits increased by over a third by the end of the project; it is not clear why this might be.

There were small savings in referrals (6%) and bigger savings in admissions (13%), results likely to reflect the types of services involved.

City and Hackney Teaching Primary Care Trust

The site was unable to return any data for the third and fourth benefit periods, therefore there are no additional findings to report.

Doncaster Community Healthcare (NHS Doncaster)

Doncaster maintained a good level of returns throughout the project, dropping from an exceptionally high 100% at Baseline to 72% by Benefits 4. It is therefore anticipated these results will accurately reflect the project.

The 25 staff involved returned 1,594 days of data, capturing 5,816 contacts and 4,837 journeys.

Activity fell as the project progressed and was 15% down from Baseline by the end of the project. This compares with the slight increase in activity that was seen at the Progress Report stage.

Journeys fell by just slightly more than activity, and were also consistently falling through the latter stages of the project. This indicates an increase in efficiency around planning of travel as the project progressed.

Duplication of data fell by nearly two thirds, reflecting the improved use locally of the electronic record (SystmOne) and no access visits were also reduced (although total numbers of these were small anyway due to the way visits are planned and undertaken locally).

A good saving in referrals was seen (11%), although there were no significant savings in admissions due to the service deployed making limited admissions.

North Tees and Hartlepool NHS Foundation Trust

Hartlepool maintained a high level of returns throughout the project, returning 92% at Baseline, and 72% by Benefits 4.

The 50 staff returned 2,508 days of data, capturing 16,141 contacts and 18,955 journeys.

Activity increased significantly as the project progressed, and had increased by well over a third from Baseline by the end of the project, with time spent with patients being increased by nearly half. All services involved showed an increase in activity.

Journeys increased as the project progressed, as would be expected with the increase in activity; however the increase in journeys was to a lesser degree than contacts, indicating improved efficiency around travel. This is also supported by the figures for time spent on travelling, which shows the increase in total time spent travelling (11%) is much less than the increase in number of journeys undertaken (24%).

The journeys split by service varied, with two services showing a drop in journeys, and two showing an increase. All services showed improved efficiency when comparing the change in journeys to the change in activity.

Duplication of data was up by well over a third, reflecting the difficulties the local team experienced in embedding change and maintaining the initial benefits. These difficulties were largely due to the re-organisational change that happened during the project period, and corresponding loss of resources (manpower) to support the project.

No access visits remained steady compared to Baseline, which was an improvement from the earlier findings in the Progress Report, where an increase was seen.

There were small savings in referrals (4%), but significant savings of over a third in admissions.

NHS Northamptonshire Provider Services

The level of returns from Northamptonshire was 54% at Baseline, which reduced to 14% by Benefits 4. This will affect the reliability of the results.

The 50 staff involved in the project returned 1,176 days of data, capturing 7,608 contacts and 8,004 journeys.

Activity showed a consistent fall as the project progressed and reflects the difficulties experienced locally in supporting the project and making any changes to practice. Although number of contacts fell by nearly a quarter from Baseline to the end of the project, time spent with patients fell by less than half this (11%).

Journeys also fell, as expected, but by a lesser degree than activity. Time spent travelling dropped by nearly a fifth, indicating that there were some efficiency gains locally.

There was no change in duplication of data, reflecting the difficulties in embedding change into such a large service when only a small number have mobile devices; however no access visits fell by over a third.

There were good savings in both referrals (12%) and admissions (22%), reflecting the other site findings that the service deployed to will significantly affect the benefits that can be seen.

South West Essex Primary Care Trust

South West Essex returned data for 66% of the cohort at Baseline, falling to 46% by Benefits 3. Data was provided for Benefits 4, however the data was supplied in a different format and therefore could not be analysed.

All comparisons made are therefore between Baseline and Benefits 3.

The 50 staff involved in the project recorded 821 days of data, capturing 5,444 contacts and 4,817 journeys.

Activity had increased by a third at Benefits 3, with time spent with patients increasing by a similar amount, however this is a lower increase than earlier in the project, and may indicate that there is still work to be done to embed change fully across the services. This is highlighted by looking at the results broken down by service, where the smaller services have shown a huge increase of nearly three quarters, but the larger services have fallen by nearly a quarter.

Journeys increased by a similar amount to activity, as may be expected; although time spent travelling did increase by more (46%)**.**

Data duplication increased by Benefits 3 (18%), however once again there is a huge variation across the Services, with the smaller services showing much stronger results.

No Access visits fell slightly by the end of the project (4%), despite the increase in activity.

There were small savings in both referrals (3%) and admissions (6%).

NHS Stoke on Trent

Stoke maintained a relatively good level of returns throughout the project, with 100% at Baseline, dropping to 64% by Benefits 4.

The 25 staff involved in the project recorded 2,519 days of data, capturing 8,898 contacts and 8,157 journeys.

Activity increased consistently as the project progressed, achieving over one fifth more contacts by the end of the project than at Baseline, with a similar increase in time spent with patients.

There was variety across the Services, with District Nursing and Specialist Nursing showing significant increases of up to a half, but Children's Services and Palliative Services saw falls of up to a quarter.

Journeys also increased consistently throughout the project, but to a greater extent than activity (up nearly a third), however time spent travelling was up by a much smaller amount (14%), indicating improved efficiency in planning and execution of journeys.

All services showed an increase in journeys, even where activity fell, possibly reflecting local changes to the organisation and localities of some services during the project period.

Duplication of data increased significantly across the project, however this was not unexpected, as Stoke do not have an electronic shared clinical record in use across the area, and only small numbers of users were involved in the project.

No Access visits fell by nearly a quarter, despite the increase in activity.

There were good savings in referrals (10%) and huge savings in admissions of well over a half (58%).

NHS Tower Hamlets

Tower Hamlets had quite high returns of 70% at Baseline, but returns fell to under a half by Benefits 4 (45%).

The 20 staff involved in the project recorded 635 days of data, capturing 2,086 contacts and 2,081 journeys

Activity had increased significantly by the end of the project, and was nearly a third greater than at Baseline, but time spent with patients had more than doubled. The number of journeys increased by a much smaller amount than activity (9%), with time spent travelling increasing only fractionally (1%), indicating a much greater level of efficiency.

Despite activity increasing, no access visits were halved by the end of the project, as was data duplication. This is likely to be due to data capture methods in the electronic clinical application (SystmOne) being made to help support minimising duplication.

There were significant savings of over a third in Referrals, with a huge 91% saving in admissions.

Phase Two Findings

Overall project findings have not been presented in this Final Report, as the analysis performed for the Progress Report highlighted the significant variations that were present across the sites and how the differing approaches affected the outcomes of the project. This means there could not be any meaningful analysis performed from combining the data across the project.

The same applies to looking at data across Services, however we can see some interesting themes from the basic raw data presented.

Children's & Family Services, District Nursing & Community Matrons and Rapid Response make up the three largest service types in the project, but surprisingly do not all represent the largest contributors to the contact and journey data. District Nursing & Community Matrons, Palliative Services and Speech & Language Therapy make up the top 3 contributors to contact and Journey data.

District Nursing & Community Matrons, and Rapid Response are joined by Physiotherapy as the top 3 for number of referrals made, and also for admissions made, although the data for Physiotherapy around admissions looks questionable, with all the data coming in the Baseline collection period.

Speech and Language therapy once again enter the top three for No access visits, along with District Nursing & Community Matrons and Rapid Response.

These represent important findings when considering the types of savings that can be made for the different service types.

Avon IM&T Consortium

As for Phase 1, the data collections were affected for Phase 2. The reasons were the same as for Phase 1 - local reorganisations that occurred within the timescales of the project, but mainly because throughout Phase 2 the project was not run as a formal project and was part of 'business as usual'. This may affect the results seen, as returns dropped from 76% at Baseline to just 16% by Benefits 3.

The 77 staff involved in the project recorded 608 days of data, capturing 1,963 contacts and 2,262 journeys.

Of the services deployed to in Phase 2, only Rapid Response represented the whole service – the rest were sub teams of a service, which may have influenced the ability to transform the ways of working and derive maximum benefit from the mobile devices.

Activity remained relatively steady from Baseline to the end of the project, with only a very small drop seen (2%), despite a marked fall initially, however time spent with patients dropped by over a fifth.

Only two individual services returned sufficient data to allow comparisons to be made (one of which was Rapid Response), and both showed an increase in activity from Baseline.

Journeys across the site fell slightly (3%), with time spent travelling falling a significant amount (over a fifth), however both individual services showed an increase in journeys.

Rapid response showed a lower increase in journeys than in activity, proving they have increased their efficiency.

Duplication of data fell by nearly a half and is likely to be due to the Rio Optimisation Project that was taking place alongside mobile working.

No Access visits also fell significantly (38%).

A small saving was made in referrals (2%), but there was a large saving in admissions of nearly a quarter. This is in contrast to the Phase 1 results, where no savings were seen, and reflects the type of services involved.

John Taylor Hospice CIC (NHS BEN)

The additional deployment of equipment in phase two allowed John Taylor Hospice to provide mobile access to all their community staff. They achieved data returns of 89% at Baseline, which fell to 52% at Benefits 3.

The 21 staff involved in the project recorded 757 days of data, capturing 1,351 contacts and 1,586 journeys.

Activity increased by well over three quarters, with the time spent with patients increasing a huge 151%. As expected with such a large increase in activity, the number of journeys also increased, more than doubling by the end of the project (114%), although time spent travelling increased by just over three quarters.

Data duplication increased slightly (5%), which is likely to be a reflection of the recent implementation of the electronic clinical record (SystmOne) across all services, and new data capture processes not being fully embedded.

No Access visits increased, however the only data for these was captured in the final data collection period, so it is not certain how reliable this data is.

There were no savings on referrals or admissions in the project, and is likely to be a reflection of the types of services involved.

NHS Calderdale

Data collections were affected in Phase 2, mainly due to the local reorganisation that occurred within the timescales of the project, and also because throughout Phase 2 the project was not run as a formal project and was part of 'business as usual'. This may affect the results seen, as returns were only 40% at Baseline and dropped to just 23% by Benefits 3.

The 100 staff involved in the project recorded 1,373 days of data, capturing 8,199 contacts and 8,794 journeys.

There was only complete data to allow comparisons to be made for one service, District Nursing, of which approximately half of the Service had mobile access; although these users covered the majority of time worked (all staff working over 22.5hrs were allocated a device).

Activity increased and the time spent with patients increased by an equivalent amount compared to Baseline (15%).

In contrast total journeys dropped by a small amount (2%), indicating improved planning and execution of journeys.

Duplication of data increased a small amount (5%) and is probably due to not all the Service having access to a mobile device, therefore limiting the amount of change that could be embedded into practice.

No Access visits increased by nearly a half, although this appears to have been influenced by the dates of the Benefits 3 data collection, which fell just before Christmas, when it is generally accepted that the rate of no access visits increases.

There was a large saving in referrals of nearly a fifth, and a small saving in admissions (3%).

This is a reversal of the Phase 1 results where there was a small saving in referrals, but a large saving in admissions, and is likely to be due to the Services involved, with the Specialist Nurses involved in Phase 1 known to be responsible for the most admissions.

The rest of the results for Calderdale are similar across the Phase 1 and Phase 2 projects.

North Tees and Hartlepool NHS Foundation Trust

Data collections were affected in Phase 2 for baseline, probably due to the timing of this which was just before Christmas.

They only achieved data returns of 17% for Baseline, which had then increased to 68% by Benefits 3. This will affect the reliability of the data and the conclusions that can be drawn. In order to try and improve the data for contacts at Baseline, the local team managed to extract some supporting data from their clinical system (SystmOne), which improved the return for Baseline to 60%, however this was only supporting contact information.

The 95 staff returned 1548 days of data (2527 for contacts), capturing 10519 contacts and 8536 journeys.

Activity increased by a significant one third by the end of the project, compared to Baseline. There were comparative results for four of the six services involved, with two showing an increase in activity and two showing a fall (although one of these services was represented by only one user). The Specialist Nurses showed a huge 142% increase in activity from Baseline.

In contrast the total number of journeys fell by a good amount (15%), but the amount of time spent travelling fell by a smaller amount (5%).

This reflects the significant efficiency gains that have been made, even during a time of local changes to the organisation.

Duplication of data fell by over a half and showed consistent falls throughout the project. This reflects the efforts being made locally to improve the utilisation and standardisation of use of their electronic clinical record (SystmOne).

No Access visits increased hugely, although the low level of Baseline returns may have affected this. It is not fully understood why this result has occurred, and is in contrast to the

Phase 1 results, which showed no access visits to have remained steady, despite an increase in activity.

Significant savings were made in referrals (15%), with a huge saving of nearly three quarters in admissions. These have improved from Phase 1, showing the difference in benefits that can be derived from deployment to different services.

South West Essex Primary Care Trust

South West Essex were only able to return contact data for the second phase, that was derived directly from their clinical record. This meant that there was no data to support journeys, admissions or referrals; however the numbers of returns remained consistent at 100% across all data collection periods.

The 79 staff recorded 3160 days of data, capturing 18754 contacts.

Activity remained stable across the project with a very slight increase of just 1% by the end of the project, and time spent with patients increasing by slightly more (4%). In contrast to the Phase 1 results where activity increased, activity in the Respiratory service fell in Phase 2 – this may be a reflection of the numbers involved in each aspect of the project and the types of work undertaken.

No Access visits also remained steady across the project.

The site recognise the need for further process change in the Community Nursing service, but were limited in the changes that could be made as part of the project, as, despite the initial aim to deploy to whole services the deployment of these devices in Basildon only extended to 35% of the entire District Nursing Service .

NHS Tower Hamlets

Data collections were affected in Phase 2 with only 61% returns for Baseline. They were unable to return any data for the third data period, and returned only 6% for Benefit 2.

There is therefore a question about the reliability of the findings, and the data should be interpreted with caution.

The 70 staff returned 320 days of data, capturing 1,633 contacts and 484 journeys.

Activity fell slightly (4%) and the time spent with patients fell significantly, by over a third. This is in contrast to the Phase 1 findings, where activity increased by just under a third, and is likely to be a reflection of then differing services involved. Phase 2 contacts were mainly clinic based, where increasing productivity is limited.

Number of journeys fell by a similar amount to activity (3%) however the time spent travelling fell by a third.

No Access visits fell by half and data duplication was reduced by just over half, and is a reflection of the local optimisation project.

No savings were made in referrals or admission, but none were made either – a reflection of the type of service deployed to.

Summary of all Findings

Subjective findings

The project has shown that mobile deployments in community settings can be successful, and when correctly planned, implemented and supported are extremely popular with clinical staff.

Staff throughout the project have acknowledged the improvement in general communication, improved access to clinical information and improved access to IT equipment. This has improved working lives by reducing reliance on use of an office base, allowing greater flexibility in working patterns. It has also allowed service improvements to be introduced, which include working outside 'normal' hours and has contributed to improving the safety of lone workers, by avoiding un-necessary visits to un-manned offices.

Local audits have shown that mobile access has improved the quality of data entry, and there is greater confidence that records are more securely held on the mobile device than in existing systems, which were usually paper.

Users report having much more confidence at the point of contact with the patient due to the greater amount of up to date clinical information they have access to, particularly prescribing information, and clinical safety is improved as a consequence. There is also the great advantage of having access to supporting resources, such as online equipment ordering, online BNF and internet sites, which opens up access to resources available anywhere on the worldwide web.

Users report the flexibility introduced by having the mobile devices allows them to plan their workload and plan travel more efficiently, and in reducing the administrative burden and duplication of data, contributes significantly to improving job satisfaction.

Contrary to initial fears about the devices acting as 'barriers' between the clinician and patient, most users reported improved patient confidence and engagement when using the device, and patients were particularly happy where choice was improved due to the device e.g. in availability of appointments, views of equipment and choice of treatment brought about by having improved clinical information to hand.

Objective findings

Productivity

- Significant increases in productivity can be achieved, as demonstrated by huge increases in contact activity.

  This is particularly well demonstrated by the Specialist Nurses in Hartlepool (142% increase) and the Palliative Services in Birmingham (83-93% increase).

- Significant increases in time spent with patients following deployment of mobile devices, as demonstrated by the users at Tower Hamlets (104% increase)

- Productivity could be maintained even in the presence of significant organisational change, staff absence or bad weather, with the devices allowing business continuity throughout.

- The findings in this project appear to support that the type of device deployed in this project is particularly beneficial to lower volume, highly complex work, as performed by the specialist clinicians.

- Falls or maintenance of activity do not necessarily mean benefits have not been delivered, as many clinicians reported they were able to achieve their objectives earlier with the devices e.g. in less visits, therefore although the number of contacts may be stable, there may actually be a bigger turnover of patients within this figure.

Efficiency

- Journeys can be reduced, even where clinical activity is increased.

  This was demonstrated well in Hartlepool, particularly in the Speech and Language Therapists (8% reduction) and the Specialist Nurses (11% reduction)

- Time spent travelling can be reduced, as demonstrated well by Tower Hamlets (33% reduction)

- Data duplication can be reduced significantly, freeing up clinical time – most sites demonstrated this, and was especially significant where electronic patient records were established and use optimised.

- No access visits can be reduced significantly, as demonstrated well by Avon (38-47% reduction), Northampton (37% reduction) and Tower Hamlets (50% reduction).

Savings

Using the standardised costs taken from the 'Unit Costs of Health and Social Care 2010' published by the Personal Social Services Research Unit, University of Kent, examples of cost savings can be attributed.

Using the assumptions stated in the Progress Report;

- A No Access visit costs *at least* the cost of a visit (£42).

- A referral will generate *at least* one visit for assessment, therefore a saved referral will save this visit (£42)

- An admission will cost at least an assessment in triage or A&E, the transport to get the patient there and the cost of an 'average' non elective stay (£1735)

The following cost savings have been shown to be achievable in this project (unit costs are available for 2011, however to allow comparison with the data presented in the Progress Report, the 2010 costs have been used);

1. As well as providing efficiency savings, there are also cost savings to be made associated with No access visits.

In Northampton, over the 12 weeks of benefits periods an average of 16 staff submitted data.

There were 86 no access visits saved (compared to Baseline) = £3612.

This equates to £225.75 per clinician over the 12 weeks, or

- **Savings of £978.25 per clinician per year due to reduced No access visits**

2. Significant savings can be made by reducing unnecessary referrals

At Tower Hamlets, over the 12 weeks of benefits periods an average of 9 staff returned data.

There were 51 saved referrals = £ 2142

This equates to £238 per clinician over the 12 weeks, or

- **Savings of £ 1031.33 per clinician per year due to saved referrals**

3. Significant savings can be made by reducing unnecessary admissions.

This is highly dependant on the type of service deployed to, and the level of admissions made by the service must be assessed prior to deployment, in order to accurately predict possible savings that could be made.

At Tower Hamlets, over the 12 weeks of benefits periods an average of 9 staff (Respiratory Service) returned data.

There were 20 saved admissions = £ 34 700

This equates to £3855.56 per clinician over the 12 weeks, or

- **Savings of £ 16 707 per clinician per year due to saved admissions**

4. Significant savings can be made by reducing unnecessary travel.

At Hartlepool, the 33 staff that returned data at Baseline and Benefits 4 in Phase 2 saved 5438 miles (over a single 1 month period)

Using the HMRC standard mileage rate of 45 pence per mile, this can be calculated to give a saving of £ 2447

This equates to £74.15 per clinician over per month, or

- **Savings of £889.95 per clinician per year due to reduced mileage**

Challenges

The most commonly recorded complaint in the project was about connectivity. In many areas, the connectivity is not yet consistent enough to rely on. This is an issue that extends beyond the reach of the project and will only improve as mobile infrastructure evolves however there are ways of reducing the impact of connectivity problems. This increases the importance of process mapping and knowing exactly what reliance there is on having a constant connection, and looking at other alternatives to work alongside the connected solution.

Lessons Learned

There are many lessons that have been learned over the course of the MHWP, and it is crucial to share these, so that organisations planning mobile deployments in the future can benefit from this work. The lessons are transferable and not restricted to any particular location, clinical application, service or type of device.

The mobile working project has illustrated the range of possible changes that can be effected through the adoption of mobile working. The disciplines that fall under the umbrella of Community Services are necessarily diverse, and the adoption of one single type of device or one way of working will not necessarily prove to be the most effective. The project has also illustrated that it is not reasonable to have the expectation that the same benefits or level of benefits will be derived across all services.

Consideration of the type of service being deployed to, their requirements, their ways of working, their reasons for the implementation and the possible benefits is essential in every case.

Lessons learned

Clinical Engagement and Leadership: The project has confirmed that where clinical engagement is achieved, benefits are delivered more consistently and to a higher level. A message repeatedly received was that getting clinicians on board and supportive of using new technology is easily achieved, as long as they are fully involved in the project and understand what changes they can make, to achieve the benefits they identify.

Hands-on clinical leadership and direction through periods of change are essential components of a successful mobile solution.

The project has also shown that not involving clinicians in the planning phase and only involving them when the new technology is being implemented will greatly reduce the usefulness of the technology and limit the benefits that can be gained.

The project saw no evidence of 'cultural resistance' or that clinicians are resistant to change or resistant to the increased use of technology where they have been fully engaged in the project from the outset. A report published in Summer 2011 by NDL (Mobile Working Report) also found that cultural change is much less of a barrier in the health sector than in other areas such as local authorities, and concluded there is a more open attitude to change and willingness to accept new methods of working (in the health sector).

Business Change Management: The project has highlighted the importance of understanding business processes in being able to deliver benefits. As part of this there needs to be a well communicated understanding of the expected outcomes of the project and the role of clinicians in driving the project forward.

Factors such as the length of time using an electronic patient record prior to implementing mobile working, identifying possible positive changes in working process, identifying which

services are ready to make changes and which services are more comfortable with use of the application can all be identified with a good business change approach.

Good documentation of business change activities will also provide a stable platform and continuity during change – the project has highlighted that were this does not happen, significant knowledge and history can be lost, having a potentially profound impact on the outcome of the project.

There is a large variation in the availability of good business change resources across the NHS, and organisations should identify their business change resources early, so that adequate support can be found. Lack of business change management was found to be a consistent predictor of limited success in deploying mobile solutions.

Benefits Management: Robust benefits measurement is essential to show the success of the deployment. The project found that any data collection should be as simple and straightforward to collect as possible and that the longer that data is required to be collected the more difficult it becomes to maintain high levels of returns. The collection should avoid adding additional burden to the clinicians, and so, where possible, extracting data directly from a clinical system, or existing data collection system is likely to be the best approach and result in the most reliable data.

If data collection tools have to be developed they should be as simple and straight-forward to use as possible, with any fields that are open to interpretation being defined as precisely as possible to avoid misunderstanding and lack of consistency. Ease of collection should be considered and local skills available for analysis of the data also need to be considered. Consideration about whether additional training on the use of the developed tool will be required also needs to be factored in.

The timing of data collections and the length of collections also needs careful consideration.

Planning: It has been clear from this project that organisational change will impact on the progress of a project and can affect the outcome, however a negative impact is not inevitable, and good planning and focus can limit the impact. This is a crucial piece of learning in the current NHS, when ongoing change is a certainty.

Another key piece of learning from the project is the importance of short and long term planning to the success of mobile device deployment. This may seem an obvious statement, but it was observed at several sites in the project that there can still be a tendency in the NHS for predominantly technical project teams to assume the project is complete once the kit has been distributed. From the outset, every stage should be planned, from establishing the project team, engaging the right resources, establishing realistic expectations and timescales, training, ongoing technical support, planning the benefits, measuring the benefits and ensuring the benefits are delivered. Only through proper planning and full engagement of all the relevant services will organisations avoid the costly disappointments of the past.

All the indications are that establishing a formal project structure seems to assist with a more effective delivery of mobile working, and positive outcomes and benefits are realised earlier.

Included within the planning should be a consideration about the timing of deployment, with regard to the impact on the clinical service. The NHS experiences constant change, and some of this change may have an effect on projects, therefore should be factored into the planning stage – plan for change.

Good planning and communication of these plans can help avoid frustration and confusion in a project, and the communication aspect cannot be under-estimated.

Resource and capability: The project identified that there is a significant variation in both the levels of resourcing, and the capability of those resources, across organisations in the NHS. If resources do not exist locally or do not have the required skills, it is worth investing in finding resources that do have the skills needed to make the project a success, in advance of starting the project, and not waiting until the project hits problems to address this.

Training: Accessible training to all users in the basic functionality of the devices being deployed is essential. It cannot be assumed that because a user is familiar and confident in the use of a desktop, they will be able to use a mobile device without additional instruction. Without the confidence to use the devices, and exploit their full potential, clinicians will view the technology as more of a hindrance than an aid. Investing in, and planning a good training programme will reap rewards in the benefits that can be realised.

Most organisations would benefit from undertaking an IT Skills analysis of the workforce that mobile working will be deployed to, if this has not been performed previously to inform the training plan. Additional skills may be required if users are expected to complete a benefits measurement tool.

Ongoing support: The project has highlighted that, for mobile deployments to enjoy long-term success it is vital that solid ongoing support be in place. The project took place during a period of far reaching and extensive change in the NHS, and whilst this undoubtedly had an effect on the local projects, there was evidence that with good local support, benefits were maintained and continued to be delivered. Ongoing support does not have to be in the form of a formal project structure, and indeed, handing over the responsibility to the services to manage their own benefits has been shown to work, but a robust support structure needs to be in place for this to happen.

Organisations need to recognise that deploying mobile solutions will have wider implications for support than just maintaining the equipment – additional skills, extended hours and quicker responses to issues may all be required.

There may also be ongoing support required for none technical aspects e.g. support from Human Resources. Business process changes resulting from mobile working may need to be factored into policies e.g. acceptable use policies for the devices, working from home, base travel and so forth. As mobile working evolves there needs to be clear pathways in place for ongoing changes to be acknowledged and addressed formally by organisations.

Technical Aspects

Whilst the project has focused on service change, there are inevitably some technical aspects which have been identified.

Technical capability: Organisations need to assess whether they have the technical capability to effectively deploy mobile solutions to their clinical workforce. There are more considerations to make and consider when deploying to the clinical workforce than to management or administrative staff groups. A State of Readiness (SOR) assessment will allow the organisation to address any weaknesses identified in advance of planning to deploy a clinical mobile solution.

There may also be differences within an organisation in the readiness of services, with some services being more 'technologically advanced' than others – this will have a significant effect on the outcome of any mobile deployment and needs to be considered in the planning stage.

Equipment: Although, for reasons discussed in the Progress Report, this project used only one device, it is essential that the technical requirements of the services being deployed to are clearly identified, so that the most appropriate device can be selected and deployed. It should also be considered that different levels/grades of users within a service may have different requirements, and a mixture of devices may be needed to provide optimum return on investment.

There are many considerations for assessing the most appropriate piece of equipment including functionality, durability, battery life, security, size and weight, cost, ease of use.

Clearly listing your organisation's requirements of a piece of kit is the best place to start to decide which is the most appropriate to meet your needs.

Once devices have been selected, there are still decisions to make, for example what is the most appropriate configuration? How can we improve session persistence? How can we improve the log in/user experience?

Connectivity: The most commonly recorded complaint in the project was about connectivity. In many areas, the connectivity is not yet consistent enough to rely on. This is an issue that extends beyond the reach of the project and will only improve as mobile infrastructure evolves however there are ways of reducing the impact of connectivity problems.

Network coverage varies in reliability and strength depending on geographical location and network provider – we have seen in the project that the network coverage maps are not necessarily that accurate, and organisations should trial the different providers where possible. These trials should not just include signal strength tests, but also retrieval and entering of information into the clinical application in use. The initial inconvenience of performing these trials will be far outweighed by the benefits of improved connectivity when the devices are deployed.

It may also be necessary to consider using multiple network providers, especially across large geographical areas.

Combining connected and 'off-line' working should also be investigated. Off line working is already present in some clinical applications and is being developed in others, with major community system suppliers reporting it is a priority for them to develop their solutions further to meet increasing demand for flexibility around mobile working. There are also independent software developers that are selling solutions to work alongside the clinical applications to

assist mobile working. A paper written by Nottinghamshire Health Informatics Service in April 2011 (Mobile Clinical Working Solution: Liberating NHS Staff to Work Anywhere) describes how they addressed connectivity issues and developed a new software solution to improve user experience and provide intelligent network connectivity.

There are also companies that will provide the tools to help organisations develop their own in house solutions, and it is also possible to create simple off line workarounds such as pre built off line templates. It is essential that any proposed solutions are fully assessed by all the relevant teams to ensure they meet both the service requirements, as well as information governance standards, and are not merely introducing an un-necessary additional tier of complexity to the business process.

Support Materials

Alongside the project, the central team have worked with the DH Informatics Directorate to develop a website to support the implementation of mobile working – the NHS Mobile Working Knowledge Centre.

The site pulls together benefits evidence, good practice guidance and NHS experience of mobile working, and presents this in one easy to access place, with links to further guidance where appropriate.

It supports organisations by presenting a compelling case for change and a structured approach to implementing successful programmes, which is supplemented by a Community of Practice to enable peer to peer support and networking opportunities.

The target audience for the Knowledge Centre are directors, service improvement leads, change managers and project managers responsible for initiating and facilitating transformational change. It not only provides advice and guidance but practical tools that can provide a 'head start' with essential activities.

A huge amount of support materials have been collected, created and developed and can be found at the following address:

http://www.connectingforhealth.nhs.uk/systemsandservices/icd/assessment/mobile

Conclusions

Since commencing the project in the summer of 2010, there have been significant technological advances, with vastly improved accessibility to networks, increasingly innovative ways of using technologies to support care provision, and an ever increasing array of suitable equipment, available at ever reducing cost.

With the increasing consumerisation of IT, the cultural barriers that were initially perceived to be present have been proven not to exist, if technology is implemented to clinical users in the right way.

In times of intense pressure to deliver good care outcomes within increasingly tight budgets, the potential savings that have been proven to be achievable by the introduction of mobile working cannot be ignored. Engaging with remote workers is far better understood and the wealth of information, evidence and resources now published and available to local organisations is significant.

The recently published Department of Health strategy 'The Power of Information: Putting us all in control of the health and care information we need' [DH, May 2012] aims to harness information and new technologies to achieve higher quality care and improve outcomes for patients and services users, with one of it's main ambitions being to promote the widespread use of modern technology to make health and care services more convenient, accessible and efficient. It promotes the integration of information to provide more joined up, safer and better care, wherever possible capturing data at the point of care, with one of the specific actions documented in the paper being to encourage providers of care to increase the use of mobile technologies.

The findings and lessons learnt in this project should assist organisations in achieving this and make mobile working a reality for community staff.

Glossary of Terms

3G	3rd generation mobile communications
AIMTC	Avon IM&T Consortium
ALWCH	Ashton Leigh and Wigan Community Healthcare
BEN	Birmingham East and North
BNF	British National Formulary
BT	British Telecom
CIC	Community Interest Company
CIP	Community Information Project
DART	Disabled Adult Resource Team
eCAF	Electronic Common Assessment Framework
EMIS	Egton Medical Information Systems
EPR	Electronic Patient Record
EQIA	Equality Impact Assessment
GAC	Gemplus Authentication Client
GP	General Practitioner
GPRS	General Packet Radio Service
HIS	Health Information System
IM&T	Information Management and Technology
iPM	iSOFT Patient Management
IT	Information Technology
LAN	Local Area Network
MDT	Multi Disciplinary Team
MHW/P	Mobile Health Worker / Project
MIS	Management Information System
NHS	National Health Service
OOH	Out of Hours
OTP	One-time password
PAS	Patient Administration System
PDF	Portable Document Format
SDSD	Syringe Driver Survey Database
SHA	Strategic Health Authority
SIM card	Subscriber Identity Mobile card
SSL	Secure Sockets Layer
TCS	Transforming Community Services
TSS	Therapy Support Systems
VPN	Virtual Private Network
WLAN	Wireless Local Area Network