

**OVERVIEW OF EIGHT REMOTE TELE-
MONITORING PROJECTS
FINAL EVALUATION
COMMERCIAL IN CONFIDENCE**



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**EUROPEAN CENTRE FOR CONNECTED HEALTH
OVERVIEW OF EIGHT REMOTE TELE-MONITORING PROJECTS**

FINAL EVALUATION

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EXECUTIVE SUMMARY

1. Introduction

The Department of Health, Social Services and Public Safety's (DHSSPS) European Centre for Connected Health (ECCH) has commissioned BDO Stoy Hayward to evaluate eight tele-monitoring Service Pilot Projects, which were established in 2007/08 with an initial two year funding provision from the DHSSPS in Northern Ireland.

These pilots follow on from an announcement, in January 2008, by the Minister for Health, Social Care and Public Safety, of his intention to establish the European Centre for Connected Health (ECCH) within the DHSSPS, to promote improvements in patient care through the use of proven technology and to fast track new products and innovation in the health and social care system in Northern Ireland.

The primary purpose of the ECCH is to improve the patient and client experience, providing for better quality and more effective care.

The initial focus for the ECCH was the development and implementation of a Remote Tele-Monitoring Service for Northern Ireland, this being a clinical practice that involves remotely monitoring patients who are not at the same location as the healthcare provider. A Government target has been set to provide 5,000 people with access to Remote Tele-Monitoring Service by 2011¹.

In advance of this large scale application, a £1m pump-priming fund was established in 2006, to be used to promote telehealth and telemedicine initiatives across the HPSS, to stimulate new thinking about how technology can be used to further the reform and modernisation of acute and community services. Based upon this, each of the Trusts was invited to submit proposals for pilot projects that could be selected by 18 May 2007. The eight pilot projects being evaluated by BDO Stoy Hayward represent 8 of a total of 16 pilot projects selected for funding. Extension monies were subsequently set aside to fund the pilots up to March 2009.

The pilot projects were intended to demonstrate how remote monitoring could improve patient care. In addition, the intention was to develop the experience of patients, clinicians and managers in the use of technology for the effective management of older people and those with chronic conditions.

2. Background

The purpose of this evaluation is to independently evaluate 8 (of 16) tele-monitoring pilots. Preliminary evaluation of these pilot projects will inform the development of a large-scale tele-monitoring service which is currently being procured. In conducting this independent evaluation, we have also had regard to the internal evaluations conducted by HSC.

The methodology adopted for the evaluation is based upon both secondary and primary research. In particular, as part of the main primary research activities for all eight of the tele-monitoring projects, the evaluation team undertook:

- A telephone survey with participating clinicians (n=44 for the five remote tele-monitoring projects and n=52 for the full eight remote monitoring projects). These 52 consultations were out of a survey sample of 60 (86%);
- A telephone survey with participating patients (n=91 for the five remote tele-monitoring projects and n=165 for the full eight remote monitoring projects) - 100% sample;

¹ The Terms of Reference for this evaluation indicated that the procurement exercise to secure the main provider for this service commenced in August 2008.

- Ten group sessions with participating clinicians;
- Face-to face consultations with the two Service Providers appointed to facilitate the provision of the tele-monitoring service ; and
- Face-to-face consultations with the Tele-monitoring co-ordinators.

Individual evaluation reports have been prepared for each of the 8 pilot projects. This summary report is focused (in section 3 to 7) on 5 of the 8 projects with a focus on remote tele-monitoring of patients with chronic conditions. Details on these 5 pilots and participation levels, as included in the Terms of Reference, are as follows:

Belfast Health and Social Care Trust (BHSCT)	
COPD Remote Tele-Monitoring	In this pilot, 62 patients suffering from Chronic Obstructive Pulmonary Disease (COPD) in Belfast currently have their vital signs monitored at home. It has been indicated that the expansion of the scheme would provide for an additional 50 patients to benefit from home monitoring by December 2008.
Northern Health and Social Care Trust (NHSCT)	
Your Health Care at Home- Chronic Disease	This pilot operating in the North Coast, East Antrim and Mid Ulster areas involves remote monitoring of patients' vital signs in their own homes. Currently there are 38 patients on the pilot, suffering from a range of long term conditions such as COPD, diabetes, heart failure and asthma. In the last two years, over 100 patients have benefitted from using this service. It was indicated that the scheme is to be extended to include a further 49 patients by the end of December 2008.
Western Health and Social Care Trust (WHST)	
Technology Packs for People with Chronic Disease (including Type 1 & Type 2 Diabetes and COPD).	In this pilot, three schemes are in operation involving a total of 31 patients from Londonderry, Strabane and Newtownstewart suffering from a variety of long term conditions including heart failure, COPD, coronary heart disease and diabetes.
South Eastern Health and Social Care Trust (SEHSCT)	
Remote Tele-Monitoring for Chronic Disease (including COPD and Diabetes).	In the Lisburn area, 62 patients with COPD currently have their vital signs monitored at home. An additional 50 patients will be added to the home monitoring scheme by December 2008. As part of the pilot monitoring of diabetes, 36 patients are currently part of the remote monitoring service. A further 16 patients will be added to the scheme by the end of December 2008.
Southern Health and Social Care Trust (SHSCT)	
Patients as Partners in Care – COPD Remote Tele-Monitoring	As part of this pilot, 9 patients with COPD currently have their vital signs monitored at home. In addition, the scheme enables patients who live at home

As part of the Remote Tele-monitoring service, contracts were awarded to two Service Providers for the purpose of a remote monitoring service, as follows:

Name	Projects supported	Service Provided
Service Provider 1	BHSCT – COPD Remote Tele-Monitoring SEHSCT - Remote Tele-Monitoring for Chronic Disease (including COPD and Diabetes).	Clinical Triage
Service Provider 2	NHSCT - Your Health Care at Home- Chronic Disease WHST - Technology Packs for People with Chronic Disease (including Type 1 & Type 2 Diabetes and COPD). SHSCT – COPD Remote Tele-Monitoring	Non clinical Triage

In addition, a summary is included in this report (section 7) of the evaluation findings of the 3 remaining projects, namely:

Belfast Health and Social Care Trust (BHSCT)	
ICD for Heart Failure	In this pilot, 490 patients across Northern Ireland with implantable cardiac devices for heart failure and arrhythmias are being monitored remotely. Using equipment installed in their own homes and the readings uploaded to a secure website, their vital signs are monitored and uploaded to a secure website. The scheme is being extended to include an additional 156 patients by the end of December 2008.
Remote Monitoring of Children with Congenital Heart	Based at the Royal Victoria Hospital, this pilot has enabled the remote monitoring of approximately 110 children with congenital heart disease outside the hospital environment via video links between their homes and the hospital. The scheme is being extended to include an

Disease	additional 40 patients by December 2008.
South Eastern Health and Social Care Trust (SEHSCT)	
Di@l-log	As part of this pilot, 70 patients currently use simple glucometers to take their own blood sugar readings and telephone the readings into the hospital on a daily basis. It was indicated that an additional 150 patients can be added by the end of December 2008.

3. Participation in pilot project

Participation levels increased significantly over the pilot period, with extension funding provided. Actual participation levels (as per most recent information presented in March 2009) is set out below.

Pilot	Service Provider	Actual Participation at date of TOR in December 2008	Target participation at December 2008	Participation at March 2009
Belfast Health and Social Care Trust – COPD Remote Tele-Monitoring	Service Provider 1	62	112	91
Belfast Health and Social Care Trust –ICD for Heart Failure	n/a	490	655	599
Belfast Health and Social Care Trust – Remote Monitoring of Children with Congenital Heart Disease	n/a	110*	150*	52**
Northern Health and Social Care Trust - Your Health Care at Home- Chronic Disease	Service Provider 2	38	87	117
Western Health and Social Care Trust - Technology Packs for People with Chronic Disease (including Type 1 & Type 2 Diabetes and COPD).	Service Provider 2	31	31	25
South Eastern Health and Social Care Trust - Remote Tele-Monitoring for Chronic Disease (including COPD and Diabetes).	Service Provider 1	98	164	172
South Eastern Health and Social Care Trust – Di@-log	n/a	70	220	123
Southern Health and Social Care Trust - Patients as Partners in Care – COPD Remote Tele-Monitoring	Service Provider 2	9	9	106
Total		908	1,428	1,285

* Total number utilising the scheme since commencement.

** Referrals between August 2008 and March 2009.

There were, therefore, a total of 1,285 patients participating in the 8 pilot projects at March 2009. The above highlights the significant increase in patient numbers (41%) from November 2008 to March 2009.

4. Key issues impacting upon Evaluation

Following the commencement of the assignment, a number of key issues were identified that impacted upon the evaluation, namely:

- The rates of hospital admissions/GP visits, hospital avoidance etc are either not recorded or recorded in a limited fashion;
- Trusts have experienced substantial changes in related service provision during the period of the Tele-monitoring pilot projects. This includes Organizational change (for example, in Lisburn (SEHSCT), the respiratory team structure has changed). The pilots have been operating within dynamic and evolving environments, with patient numbers referred to the tele-monitoring pilots increasing significantly during the pilot period. This has resulted in a number of clinicians, who have provided feedback as part of the external evaluation, not having had experience of the

system for a full cycle of care. Moreover, the tele-monitoring projects for a number of the pilots, (including the SEHSCT Community Diabetes pilot) were still in their infancy at the time of this evaluation. This will impact upon clinicians' views;

- It was noted that a number of the Trusts' tele-monitoring Co-ordinators were appointed latterly to the pilots, with this likely to have impacted upon the Trusts' support to clinicians etc;
- A number of Trusts highlight their deficiencies in respect of specialist nursing teams (for example, the Western Trust), with this impacting upon clinicians' experience of the pilot;
- During the consultations, it became apparent that some clinicians viewed the introduction of clinical triage as a potential threat to their employment, with this also potentially impacting upon the views of the triage service; and
- There are some issues around data collection and interpretation (within and between projects).

6. Key findings

The key finding from the external evaluation by BDO Stoy Hayward, is that patients are almost overwhelmingly positive about the perceived benefits they have derived from the Remote Tele-Monitoring' pilot projects, including impact upon their quality of life and general health and well-being.

A significant majority of clinicians also consider that the pilots have had a positive impact in terms of quality of patient life and on patient health and wellbeing, for example, helping them feel less anxious, more reassured and able to manage their illness better.

Similarly, a large majority of patients report their perception that participating in the remote tele-monitoring pilots has enabled them to reduce their reliance on hospital and nursing staff, including through a reduction in hospital admissions.

Approximately half of the clinicians surveyed had reported a similar benefit in terms of a reduction in hospital admissions, and length of stay in hospital. This view was however not held universally by clinicians.

There is, for many of the clinicians, a concern as to the impact that remote tele-monitoring has had on the clinicians' workloads, particularly with the significant ramp-up in caseload in the latter period of the pilots. Notwithstanding this, the level of concern varied, with more positive views from those clinicians who have had longer experiences with remote tele-monitoring. This is coupled with a concern from the clinicians that the pilot had still not achieved buy-in from GPs within the community.

Finally, in terms of the actual operation of the pilots, similar trends emerged: patients are positive as to how the remote tele-monitoring pilots had worked in practice, including their confidence in the triage service provided. Clinicians, too, report positive experiences, although concern as to their comfort with triage nursing, particularly amongst those Trusts not benefitting from clinical triage. There were also recommendations in terms of improvements in equipment adaptability and flexibility, as well as to the patient selection process.

The experiences of patients and clinicians are largely mirrored within the internal evaluations conducted by HSC. Specific findings are set out below.

6.1 Perceived Impact on patient care in terms of quality, safety and patient experience

Patients and clinicians are positive about the perceived benefits that patients have derived from the Remote Tele-Monitoring' pilot projects, including impact upon quality, safety and patient experience. In terms of quality of care, over 50% of clinicians, as compared to over 90% of patients, consider that the scheme has helped to improve the overall standard of care that patients received. This difference in perception was also prevalent in the views on clinical nursing – over 80% of

clinicians are not confident that clinical triage is suitable for monitoring patients from a distance where the nurse has not met the patient in person. This compares to 90% of patients who are satisfied with clinical triage. Patients report their satisfaction with the continuous monitoring with this making them feel safer and more content - 90% of patients and over 80% of clinicians report that remote tele-monitoring has provided reassurance to them and their carers and made them feel safer at home.

6.2 Perceived Impact on patient care in terms of utilisation of resources

About one third of clinicians were of the view that remote tele-monitoring had contributed to reduced utilization of hospital and community services, including reduced visits to GPs and contact with the community care nurses. The internal HSC evaluation was more positive, with 65% of professional workers reporting a reduction in hospital admissions, and over 70% reporting a reduction in the number of GP visits relating to the patient's chronic condition. This compares to the patient feedback, with circa 86% of patients reporting their view that the pilots have had a positive impact on utilization of Trust resources. This corresponds to the overall view of patients that the pilots have led to improvements in their health and well-being.

6.3 Perceived Impact on Staffing Resources

Around 50% of clinicians felt that remote tele-monitoring had a positive impact on organization effectiveness, but almost all clinicians were of the view that it increased their workload. This response would appear to be heavily influenced by the rapid growth in participant patient numbers and increases in case loads since November 2008.

Impact on staffing resources is also impacted by the patient selection process – inappropriate patient selection, for example, of those where disease severity will continue to warrant high intensity of specialist community care, with little impact upon resources.

Clinicians have benefitted from the support by each of the Trusts of Tele-monitoring Co-ordinators, although, for some, the Co-Ordinator was only appointed well into the pilot phase. Some Trusts also report the difficulty faced by not having a specialist nursing team for COPD, diabetes etc.

Clinicians also noted that negative aspect of operating the scheme in the absence of GP buy in to the service, with many feeling that GPs should play a role in setting clinical parameters. Whilst 70% of clinicians were of the view that patient parameters are appropriately set, it was acknowledged that in the absence of GP involvement, and, in particular, for new clinicians joining the scheme, there can be a tendency to set narrow parameters with resultant increased alerts.

6.4 Perceived Improvements in the quality of care patients receive

Generally, clinicians reported that patients continued to get the same, high, level of care regardless of the remote tele-monitoring scheme. However, over half of the clinicians did report that remote tele-monitoring had led to an improvement in the service that they personally provided to the patient and that it allows nurses to better target those patients that need more support.

6.5 Perceived Improvements in the quality of patient life

Patients are positive about the benefits from the Remote Tele-Monitoring' pilot projects, including perceived impact upon quality of life and general health and well-being. 75% of patients report that in their view remote tele-monitoring has led to an overall improvement in their quality of life and ensured that their quality of life did not deteriorate. In addition, over 50% of patients and clinicians agree that the pilots have led to patients making changes to their lifestyle and to an overall improvement in patient health and well being.

6.6 **Perceived Impact on informing patient centred case management, intermediate care schemes and medicines compliance, optimising the potential for independent living and enabling reductions in inpatient admissions to hospital**

There is a perception that remote tele-monitoring has had a positive impact on further developing a patient-centred case management approach, with 76% of clinicians reporting remote tele-monitoring pilot project to be a patient centred service.

Clinicians suggested that the project empowers patients to better manage their illness. For example, the survey indicates that the project has had a positive impact on patients' medicine compliance, with over half of the clinicians and three quarters of patients reporting a perception that remote tele-monitoring project encourages patients to take their medicine at the right times and in the right quantities. Over half of the clinicians and more than three quarters of patients report that the scheme has helped patients to become more independent in their day to day life, with this having a positive impact on their quality of life and general well-being.

Nearly 90% of patients and over one third of clinicians agree that the remote tele-monitoring pilot has reduced the number of times that the patient has been admitted (or readmitted) to hospital. There are similar differences in perception as to the impact on the length of time in hospital – over 70% of patients are of the view that tele-monitoring has reduced the length of time that they have had to stay in hospital, as compared to 13% of clinicians.

Furthermore, of the internal HSC evaluation, 65% of professional workers and 75% of patients reported that the remote monitoring system prevented their admission to hospital or use of A&E Services.

6.7 **Extent to which patients receive more and better targeted proactive support, enabling them to take greater control in the management of their own disease**

Clinicians were less positive about the extent to which patients receive more and better targeted proactive support under tele-monitoring. Around one third of clinicians considered that tele-monitoring enables them to focus more on one-to-one care by eliminating unnecessary visits and allows them to look after more patients than would otherwise have done. Moreover, over half of the clinicians agree that it allows them to better target those patients who need more support.

However, over 80% of patients and over 70% of clinicians report that in their view, remote tele-monitoring has enabled patients to manage their illnesses better and encourages them to think more about their symptoms.

Of the internal HSC evaluation, 91% of patients would agree that the monitoring system has assisted them in managing their health on a day to day basis.

6.8 **Extent to which there is improved quality assurance through auditable improvements in the flow of quality and timely information.**

Over 85% of clinicians are satisfied with the way that tele-monitoring operates in practice – the quality of information is perceived as being good, the timeliness of alerts is good and clinicians generally feel comfortable in setting clinical parameters. Initial teething problems have largely been addressed, with clinicians also reporting the support received from the Trust tele-monitoring Coordinators.

Whilst some improvements were suggested relating to the flexibility and adaptability of equipment, clinicians were generally content with the accuracy of the readings and ease of use of the equipment.

With regards to the support received from each of the Service Providers of the triage service, clinicians were generally positive. Two-thirds of clinicians agreed that the Service Providers provide a good service, with both of the Trusts having the clinical triage service and one of the Trusts having solely the triage service reporting satisfaction levels in excess of 80%.

6.9 Schemes which are working well and should continue to attract funding

All of the eight tele-monitoring pilots reviewed as part of this evaluation would appear to have worked well, with positive benefits reported in terms of quality of patient life.

Accordingly, it is the evaluator's view that all schemes should be considered for further funding.

The patient selection process is, however, all important, with clinicians confirming that tele-monitoring is not appropriate for all patients and that patient selection should be dependent on the severity of the disease as well as issues relating to patient dexterity etc.

Clinicians' concerns over increased workloads should also be addressed going forward, as should their concerns as to the lack of GP commitment to tele-monitoring.

There are mixed views for clinicians on the clinical triage service. The benefits of clinical triage should be further assessed.

7. Recommendations to ensure that lessons learned are transferred into the main tele-monitoring project

Recommendations following the evaluation of the 8 remote tele-monitoring pilot projects are:

- Appropriate Patient selection - the focus should be on identifying those patients with the best capacity to benefit from remote tele-monitoring, with the findings disseminated throughout all of the Trusts.
- Commitment and support – there is a need to ensure that GP commitment to the tele-monitoring service, and their support for clinicians in setting patient parameters etc. This should extend also to ensure that all clinicians are bought into the service.
- Resource Utilisation – there should be a baseline assessment of the resource utilization of patients as they are introduced into the remote tele-monitoring scheme, so as to enable a quantitative assessment of the impact of tele-monitoring on their use of health care services.
- Clinician Workload – monitoring should be introduced to assess the impact of the remote tele-monitoring scheme on the workload of clinicians and the use of their skills. There should also be a forum, facilitated by the Tele-Monitoring Coordinators by which difficulties faced by clinicians, and solutions identified, are shared across all of the clinicians within the Trusts. This increased level of communication will be critical to ensuring the clinicians are both supported and bought in to the tele-monitoring service. This will also ensure a Regional rather than a localized response to remote tele-monitoring.
- Flexibility of the product offering – the emphasis in selecting peripheral products for use in tele-monitoring should be on ensuring that these offer flexibility to meet the needs of the wide variety of patient characteristics and illnesses and to enforce the principle that “one size does not fit all”.
- Triage - the benefits of the clinical triage service should be assessed, the role and responsibilities of those charged with the clinical triage service, and their potential to support clinicians, particularly as the latter seek to manage their workloads.

1 INTRODUCTION AND BACKGROUND

1.1 Introduction

The Department of Health, Social Services and Public Safety's (DHSSPS) European Centre for Connected Health (ECCH) has commissioned BDO Stoy Hayward to evaluate eight tele-monitoring Service Pilot Projects, which were established in 2007/08 with an initial two year funding provision from the DHSSPS in Northern Ireland.

1.2 Policy and Operational Context

The demographics of Western Europe, and Northern Ireland, show an almost exponential increase in the elderly population over the course of the next 20 years. Growing longevity will lead to a significant increase in chronic diseases, which in turn is expected to place additional pressures on health and social care systems across Europe. Indeed, Northern Ireland's predicted population increase of the over 75s and 85s is steeper than that predicted for the rest of the United Kingdom, adding to cost pressures on the local health economy.

In light of this increasing demand, existing approaches to patient care are unlikely to meet public expectations in relation to the quality and accessibility of the care people will require. Therefore, in order to provide high quality care in a sustainable manner within an environment of significantly increasing demand and constrained resources, a new system will be necessary to monitor chronic illnesses, as well as providing better care to patients and reducing both hospital and nursing home admissions.

The introduction of healthcare technology to effectively manage issues associated with this changing demographic profile and increasing chronic disease, has the potential to greatly improve the quality, sustainability and cost efficiency of service provision.

The overall aim of the DHSSPS is to improve the health and wellbeing of the people of Northern Ireland. In pursuing this aim through the health and social care (HSC) system, the key objective of the Department is to improve the health and well-being outcomes through a reduction in preventable disease and ill-health through the provision of effective and high quality services, equitably and efficiently, to the whole population.

To this end, DHSSPS' Regional Strategy 'A Healthier Future- A Twenty Year Vision for Health and Wellbeing in Northern Ireland 2005-2025' provides a vision of how the health and social services will develop and function over the twenty-year period. It recognises the need for health and social services to change to reflect the changing needs of the population, particularly in terms of the increasing aging population. It recognises that the range and nature of healthcare service provision will also change to reflect new ways of working, new technologies and the development of new treatments.

Whilst it is recognised the population living longer is a positive development, an increase in age-related chronic diseases is also likely to occur, which may be further exacerbated by changing behaviours. Chronic diseases and conditions such as diabetes, cancers, heart disease, respiratory diseases and arthritis look set to grow in prevalence, although it is noted that a key aim of this new Regional Strategy was the reversal of such trends in relations to these conditions.

The use of technology will be key to meeting the needs of the increasing aging population in the future, particularly in relation to chronic disease management. Associated rapid advances in technology will impact on health and social care services in terms of the provision of (potentially costly) new forms of treatment and care. Such technologies are expected to allow some terminal illnesses to be treated as chronic conditions and also to provide cures for some chronic conditions. Furthermore, new information technologies will support service users by providing ready access to

information on conditions and treatment, whilst also supporting more effective and integrated working across the health and social services.

The next twenty years are therefore likely to see a greater provision of, and emphasis on, more holistic ‘generalist’ services provided in communities or on a day patient or outpatient basis than is the case at present. These will include primary care services, chronic disease management, as well as social services maintaining and enhancing independence.

DHSSPS’ Regional Strategy indicates that the Department’s focus going forward will be on tackling chronic diseases, as well as the social and economic disadvantage that gives rise to poor health. The majority of this will be managed within a community setting in partnership with service users. Therefore, services will be focused on supporting, protecting and promoting the quality of life of those least able to protect themselves, which will include: looked after children, vulnerable older people and people with disabilities or any other form of potential barrier to living a full life.

Within the Strategy’s objectives for the development of responsive integrated services, the following objective was set out:

Objective for Developing Responsive Integrated Services		
Objective	Community-Led Services	Contribution to Vision
By 2008,	promote independence for people who require care by facilitating independent living.	Improve the quality of life and independence of people in need so that 40 per cent of all people who received care managed community services and at least 88 per cent of people aged 75 years or older are supported, as necessary, in their own homes. This will also be supported by the use of Direct Payments for social care. This objective will also be supported by a focus on telecare provided in people’s homes.

DHSSPS’ Primary Care Strategy² recognises that the provision of a high quality primary care service has been, and will continue to be, subject to significant pressure, as the demands placed upon NI’s health service continue to grow. With this in mind, there is widespread recognition of the need to consider new ways of working, which will help meet both current and future needs.

Furthermore, the Strategy also recognises that over reliance is placed upon the hospital/acute sector. Therefore, a more responsive and dynamic primary care sector should be implemented which would provide the necessary care close to the homes of patients.

Like the Regional Strategy (as discussed previously), the Primary Care Strategy highlights the increasing growth in the elderly population as a considerable challenge. The over 85 population is expected to almost double over the next twenty years, meaning that major change will also be required in primary care provision in order to respond adequately to the needs of this group alone (as well as other’s suffering from chronic diseases), in seeking to maximise independent living and reduce the reliance on hospital and residential care.

As part of this, there will be a requirement for a much wider development of community-based alternatives to hospital admission, the establishment of flexible and innovative 24-hour crisis response services, more supported living opportunities and access to appropriately skilled and resourced community-based rehabilitation teams. This will also require an even greater emphasis on health promotion, enhanced social wellbeing and disease prevention.

This would provide support to people in making and sustaining lifestyle changes, helping to reduce future levels of chronic illness and where necessary, supporting people to manage their own condition, again with less reliance on the hospital sector and practitioners generally. In this regard,

² Caring for People Beyond Tomorrow: A Strategic Framework for the Development of Primary Health and Social Care for Individuals, Families and Communities in Northern Ireland

multi-disciplinary care teams will need to be in place with greater specialisation in areas such as diabetes, respiratory illness and heart disease.

Both the Primary Care Strategy and the Regional Strategy recognise the demographic and global challenges, and the resultant need for the development of new approaches to care delivery with a focus on:

- Increased health promotion, disease prevention and early intervention to better manage demand; *and*
- Shifting the balance of care towards the community and promoting the alternatives to hospital admission.

The harnessing of new technologies to enhance health monitoring and empower patients is highlighted in both the Regional and Primary Care Strategies. Remote Monitoring therefore has the potential to play an important role in delivering services locally and facilitating care at home, as appropriate, and in the implementation of these strategies. Furthermore, specific service frameworks including Cardio Vascular and Respiratory Frameworks are currently being developed.

Remote Tele-Monitoring will contribute to ensuring that higher standards of care are made available to people with long-term conditions and should link into and be reflected in these and other service frameworks for Northern Ireland.

For 2008-09 and beyond, the Minister for Health, Social Care and Public Safety indicated an expectation that NI will see continuing and substantial improvement to services in ten priority areas (e.g. ensuring fully integrated care and support in the community; improving health and well-being; and modernising the infrastructure), with resultant progress towards the objectives and targets set out in the Programme for Government 2008-2011 and associated Public Service Agreements (PSAs).

The introduction of remote monitoring also has the potential to make a direct contribution to the achievement of the Department’s Public Service Agreement/ Priorities for Action targets as follows:

<p>Priority 4: Ensuring Fully Integrated Care and Support in the Community (specifically under PSA 4.3):</p>
<p>By March 2009:</p> <ul style="list-style-type: none"> – Identify at least 1,000 people who had unplanned admission to hospital on two or more occasions during 2007-08, due to a severe or complex chronic condition. – Establish, in collaboration with the European Centre for Connected Health, these patients on a case management programme; – Identify the anticipated onflow during this period; – Reduce the unplanned admissions of these case-managed patients by 10%.
<p>By 2011:</p> <ul style="list-style-type: none"> – Secure a 50% reduction in unplanned hospital admissions for some 5,000 case-managed patients with severe chronic diseases (e.g. heart disease and respiratory conditions), these being the top 4% of patients who had unplanned admissions on two or more occasions in the year before they were case managed.

1.3 European Centre for Connected Health

In January 2008 the Minister for Health, Social Care and Public Safety announced his intention to establish the European Centre for Connected Health (ECCH) within the DHSSPS, to promote improvements in patient care through the use of proven technology and to fast track new products and innovation in the health and social care system in Northern Ireland.

The primary purpose of the ECCH is to improve the patient and client experience, providing for better quality and more effective care. By supporting the more efficient delivery of health and care services, it will also enable the care system to better respond to the future needs of the population. In addition to this, the ECCH aims to work to secure economic gains through the growth of knowledge-based high-value added businesses in Northern Ireland serving European markets.

Furthermore, the DHSSPS recognised that the application of new technology in the health and social care system has a significant role to play in the modernisation of services. Benefits which technological solutions can provide include:

- Improved patient experience through remote monitoring of vital signs;
- Improved service responses;
- Better communication across and between multidisciplinary care teams;
- Improved patient and client access to the information that they require to manage their conditions; *and*
- Better use of resources.

New technology is also playing an increasing role in the improvement of diagnostics and treatment within the secondary care setting. Furthermore, it is increasingly recognised that getting the right information to the right people in a timely manner, can also make a significant contribution to the improvement of patient safety.

1.4 **Background to the Tele-Monitoring Service Pilots**

There had been a growing volume of evidence for the use of technology in the provision of health and social care services. In particular, Home/Remote Tele-Monitoring is regarded as having the potential to offer significant benefits in the management of increasing numbers of the population with a chronic disease in the population.

Remote Tele-Monitoring is a clinical practice that involves remotely monitoring patients who are not at the same location as the healthcare provider. In general, a patient will have a number of monitoring devices at home, and these devices will transmit information on their vital signs via the telephone to the remote monitoring service provider and if necessary, to their healthcare provider. Portable devices are a further development of this type of technology. Remote Tele-Monitoring can be used for several clinical conditions which may require the recording of clinical parameters such as: Heart Failure; Constructive Pulmonary Obstructive Disease (COPD); Diabetes; High Risk Pregnancy; Mental Health Chronic Disease Management; Palliative Care; Asthma; and Hypertension.

The initial focus for the recently established ECCH in Northern Ireland was the development and implementation of a Remote Tele-Monitoring Service for Northern Ireland.

Furthermore, a Government target has been set to provide 5,000 people with access to Remote Tele-Monitoring Service by 2011³.

In advance of this large scale application, Minister Paul Goggins announced (on 5th December 2006) the creation of a £1m pump-priming fund for the development of Telehealth in NI. Specifically, the Minister said that the fund will be used to promote telehealth and telemedicine initiatives across the HPSS, to stimulate new thinking about how technology can be used to further the reform and modernisation of acute and community services.

The pilot projects were intended to demonstrate how remote monitoring could improve patient care. In addition, the intention was to develop the experience of patients, clinicians and managers in the use of technology for the effective management of older people and those with chronic conditions.

³ The Terms of Reference for this evaluation indicated that the procurement exercise to secure the main provider for this service commenced in August 2008.

1.5 Terms of Reference

The purpose of this project is to independently evaluate the 8 main of the 16 tele-monitoring pilots which were established in 2007/08 with an initial two year funding provision from the DHSSPS in Northern Ireland. Preliminary evaluation of these pilot projects will inform the development of a large-scale tele-monitoring service which is currently being procured.

Section 3 to 7 of this report is concerned with 5 of the 8 projects, the remote tele-monitoring projects for chronic conditions, namely:

- Belfast Health and Social Care Trust- COPD Remote Tele-Monitoring;
- Northern Health and Social Care Trust- Your Health Care at Home- Chronic Disease;
- South Eastern Health and Social Care Trust -Remote Tele-Monitoring for Chronic Disease (including COPD and Diabetes);
- Southern Health and Social Care Trust- Patients as Partners in Care – COPD Remote Tele-Monitoring; and
- Western Health and Social Care Trust- Technology Packs for People with Chronic Disease (including Type 1 & Type 2 Diabetes and COPD).

In addition, section 7 summarizes the evaluation findings of the 3 remaining projects, namely:

- Belfast Health and Social Care Trust – ICD for Heart Failure;
- Belfast Health and Social Care Trust – Children with Chronic Heart disease; and
- South Eastern Health and Social Care Trust –Di@-log.

The purpose of the evaluation project is to:

- Evaluate the impact on patient care in terms of quality, safety, patient experience and utilisation of resources of the investment to date;
- A number of potential benefits associated with the application of new technologies in health and social care provision have been identified. The evaluation should therefore test the extent to which the following benefits are being realised in the pilots and identify any issues or concerns:

- Improvements in the quality of care patients receive and in the quality of their life;
- Inform patient centred case management, intermediate care schemes and medicines compliance, such that patients receive more care at home rather than in a hospital, optimising the potential for independent living and enabling reductions in inpatient admissions to hospital;
- Patients receive more and better targeted proactive support, enabling them to take greater control in the management of their own disease;
- Optimal use of staffing resources; *and*
- Improved quality assurance through auditable improvements in the flow of quality and timely information.

- Identify schemes which are working well and should continue to attract funding and those which are not;
- Provide recommendations to ensure that lessons learned are transferred into the main tele-monitoring project.
- Provide a strategic overview assessment of the impact and benefits of all eight schemes; *and*
- Provide a more detailed assessment of each individual scheme to encompass the analysis of qualitative and quantitative held by Trusts and the assessment of the views and perspectives of clinicians, Trust and Board managers and service users.

In relation to data availability, the Terms of Reference indicated that Boards and Trusts would provide all relevant data to the evaluation team, to include:

- Number of patients on the scheme;
- Conditions being treated;
- Funding allocation and expenditure;
- Details on staff involved; *and*
- Patient feedback.

1.6 Key issues impacting upon Terms of Reference

Following the commencement of the assignment, a number of key issues were identified that impacted upon the evaluation, namely:

- The rates of hospital admissions/GP visits, hospital avoidance etc are either not recorded or recorded in a limited fashion;
- Trusts have experienced substantial changes in related service provision during the period of the Tele-monitoring pilot projects. This includes Organizational change (for example, in Lisburn (SEHSCT), the respiratory team structure has changed). The pilots have been operating within dynamic and evolving environments, with patient numbers referred to the tele-monitoring pilots increasing significantly during the pilot period. This has resulted in a number of clinicians, who have provided feedback as part of the external evaluation, not having had experience of the system for a full cycle of care. Moreover, the tele-monitoring projects for a number of the pilots, (including the SEHSCT Community Diabetes pilot) were still in their infancy at the time of this evaluation. This will impact upon clinicians' views;
- It was noted that a number of the Trusts' tele-monitoring Co-ordinators were appointed latterly to the pilots, with this likely to have impacted upon the Trusts' support to clinicians etc;
- A number of Trusts highlight their deficiencies in respect of specialist nursing teams (for example, the Western Trust), with this impacting upon clinicians' experience of the pilot;
- During the consultations, it became apparent that some clinicians viewed the introduction of clinical triage as a potential threat to their employment, with this also potentially impacting upon the views of the triage service; and
- There are some issues around data collection and interpretation (within and between projects).

1.7 Methodology

An overview of the approach undertaken to address the key aims and objectives of the evaluation is outlined below, with further detail provided in the following subsections.

- **Background research** - Before undertaking the main primary research activities, a variety of background research activities were undertaken, including establishing the logical and operational fit of the Project with DHSSPS' strategy and the context within which it operates. A detailed analysis was also undertaken of all available data relating to the Project's activity and performance for the period under review.
- **Primary Research** – As part of the main primary research activities for all eight of the tele-monitoring projects, the evaluation team undertook:
 - A telephone survey with participating clinicians (n=44 for the five remote tele-monitoring projects and n=52 for the full eight remote monitoring projects). These 52 consultations were out of a survey sample of 60 (86%);
 - Clinicians were drawn from specialist nursing staff, community (non specialist) nursing staff, hospital consultants and GPs;

- A telephone survey with participating patients (n=91 for the five remote tele-monitoring projects and n=165 for the full eight remote monitoring projects) - 100% sample;
- Ten group sessions with participating clinicians;
- Face-to face consultations with the two Service Providers appointed to facilitate the provision of the tele-monitoring service ; and
- Face-to-face consultations with the Tele-monitoring co-ordinators.

The telephone surveys were conducted with the following:

	Specialist Nurses	Community Nurses (Non Specialist)	Hospital Consultants	GPs	Total
BHSCT – COPD Remote Tele-monitoring	6	-	1	-	7
NHSCT – Your Healthcare at Home – Chronic Disease	10	2	-	-	12
WHSCT – Technology Pack for People with Chronic Disease	-	3	-	1	4
SEHSCT – Remote Tele Monitoring for Chronic Disease	6	-	-	-	6
SHSCT – Patients as Partners in Care	11	3	-	1	15
	33	8	1	2	44
HSCT – ICD for Heart Failure	6 ⁴	-	-	-	6
BHSCT – Remote Monitoring of Children with Congenital Heart Disease		-	-	-	⁵
SEHSCT – Di@l-log	1	-	1	-	2
	40	8	2	2	52

1.8 Structure of report

The remainder of this report is structured as follows:

Section	Name	Content
2	Project Overview & Activity	Overview of tele-monitoring pilots, aims and objectives, budget participation levels.
3	Five Remote Tele-Monitoring Projects - HSC Internal Evaluation	Feedback from patients, clinicians and carers from HSC Internal Evaluations
4	Five Remote Tele-Monitoring Projects - Operation of Pilots	Clinicians' and patients' views on the operation of the 5 Remote Tele-Monitoring pilots.
5	Five Remote Tele-Monitoring Projects - Impact on Organisation and Resource Utilisation	The impact that the 5 tele-monitoring pilots has had on the Trusts and Resource utilisation
6	Five Remote Tele-Monitoring Projects - Impact on Health and Wellbeing	The impact that the 5 tele-monitoring pilots has had on patients' health and well-being
7	Overview of Three Additional Remote Projects	Overview of the evaluation of the 3 remaining pilots, - Belfast ICD for Heart Failure, Belfast Children with Chronic Heart disease and South Eastern Di@-log project.
8	Conclusion and Recommendations	Identification of the key conclusions arising from the evaluation, and recommendations for the way forward.

⁴ Cardiac Physiologists

⁵ Focus Group with Hospital Consultants

2 PROJECT OVERVIEW & ACTIVITY

This section presents an overview of the remote tele-monitoring projects as evaluated by BDO Stoy Hayward.

2.1 Background

As noted in section 1, the evaluation covered 8 projects in total. Of these, 5 were remote tele-monitoring projects for chronic disease, with details included of the pilots and participation levels, included in the Terms of Reference, as follows:

Belfast Health and Social Care Trust (BHSCT)	
COPD Remote Tele-Monitoring	In this pilot, 62 patients suffering from Chronic Obstructive Pulmonary Disease (COPD) in Belfast currently have their vital signs monitored at home. It has been indicated that the expansion of the scheme would provide for an additional 50 patients to benefit from home monitoring by December 2008.
Northern Health and Social Care Trust (NHSCT)	
Your Health Care at Home- Chronic Disease	This pilot operating in the North Coast, East Antrim and Mid Ulster areas involves remote monitoring of patients' vital signs in their own homes. Currently there are 38 patients on the pilot, suffering from a range of long term conditions such as COPD, diabetes, heart failure and asthma. In the last two years, over 100 patients have benefitted from using this service. It was indicated that the scheme is to be extended to include a further 49 patients by the end of December 2008.
Western Health and Social Care Trust (WHST)	
Technology Packs for People with Chronic Disease (including Type 1 & Type 2 Diabetes and COPD).	In this pilot, three schemes are in operation involving a total of 31 patients from Londonderry, Strabane and Newtownstewart suffering from a variety of long term conditions including heart failure, COPD, coronary heart disease and diabetes.
South Eastern Health and Social Care Trust (SEHST)	
Remote Tele-Monitoring for Chronic Disease (including COPD and Diabetes).	In the Lisburn area, 62 patients with COPD currently have their vital signs monitored at home. An additional 50 patients will be added to the home monitoring scheme by December 2008. As part of the pilot monitoring of diabetes, 36 patients are currently part of the remote monitoring service. A further 16 patients will be added to the scheme by the end of December 2008.
Southern Health and Social Care Trust (SHST)	
Patients as Partners in Care – COPD Remote Tele-Monitoring	As part of this pilot, 9 patients with COPD currently have their vital signs monitored at home. In addition, the scheme enables patients who live at home

Contracts were awarded to two Service Providers, as follows:

Name	Projects supported	Service Provided
Service Provider 1	BHSCT – COPD Remote Tele-Monitoring SEHST - Remote Tele-Monitoring for Chronic Disease (including COPD and Diabetes).	Clinical Triage
Service Provider 2	NHSCT - Your Health Care at Home- Chronic Disease WHST - Technology Packs for People with Chronic Disease (including Type 1 & Type 2 Diabetes and COPD). SHST – COPD Remote Tele-Monitoring	Non clinical Triage

A further 3 projects were reviewed as part of this evaluation, namely:

Belfast Health and Social Care Trust (BHSCT)	
ICD for Heart Failure	In this pilot, 490 patients across Northern Ireland with implantable cardiac devices for heart failure and arrhythmias are being monitored remotely. Using equipment installed in their own homes and the readings uploaded to a secure website, their vital signs are monitored and uploaded to a secure website. The scheme is being extended to include an additional 156 patients by the end of December 2008.
Remote Monitoring of Children with Congenital Heart Disease	Based at the Royal Victoria Hospital, this pilot has enabled the remote monitoring of approximately 110 children with congenital heart disease outside the hospital environment via video links between their homes and the hospital. The scheme is being extended to include an additional 40 patients by December 2008.
South Eastern Health and Social Care Trust (SEHSCT)	
Di@l-log	As part of this pilot, 70 patients currently use simple glucometers to take their own blood sugar readings and telephone the readings into the hospital on a daily basis. It was indicated that an additional 150 patients can be added by the end of December 2008.

2.2 Participation in project

Participation levels increased significantly over the pilot period, with extension funding provided. Actual participation levels (as per most recent information presented in March 2009) is set out below.

Pilot	Service Provider	Actual Participation at date of TOR in December 2008	Target participation at December 2008	Participation at March 2009
Belfast Health and Social Care Trust – COPD Remote Tele-Monitoring	Service Provider 1	62	112	91
Belfast Health and Social Care Trust –ICD for Heart Failure	n/a	490	655	599
Belfast Health and Social Care Trust – Remote Monitoring of Children with Congenital Heart Disease	n/a	110*	150*	52**
Northern Health and Social Care Trust - Your Health Care at Home- Chronic Disease	Service Provider 2	38	87	117
Western Health and Social Care Trust - Technology Packs for People with Chronic Disease (including Type 1 & Type 2 Diabetes and COPD).	Service Provider 2	31	31	25
South Eastern Health and Social Care Trust - Remote Tele-Monitoring for Chronic Disease (including COPD and Diabetes).	Service Provider 1	98	164	172
South Eastern Health and Social Care Trust – Di@-log	n/a	70	220	123
Southern Health and Social Care Trust - Patients as Partners in Care – COPD Remote Tele-Monitoring	Service Provider 2	9	9	106
Total		908	1,428	1,285

* Total number utilising the scheme since commencement.

** Referrals between August 2008 and March 2009.

There were therefore a total of 1,328 patients participating in the 8 pilot projects at March 2009. The above highlights the significant increase in patient numbers (41%) from November 2008 to March 2009.

3 FIVE REMOTE TELE-MONITORING PROJECTS - HSC INTERNAL EVALUATION

This section presents details of the findings of the internal evaluations conducted by HSC for the five remote tele-monitoring projects.

3.1 Number of Patients returning feedback to the Trusts

The number of patients surveyed from each Trust, who provided feedback, was:

Table 3.1: Patients surveyed per Trust

Trust Name	Patient Respondents
Belfast Health and Social Care Trust	20
Northern Health and Social Care Trust	31
South Eastern Health and Social Care Trust	30
Southern Health and Social Care Trust	21
Western Health and Social Care Trust	12
Total	124

A total of 124 patients provided feedback on the five remote tele-monitoring projects.

3.2 Patients' Feedback

3.2.1 Patient Feedback on Benefits of tele-monitoring

Patients were asked to give their views on the benefits of Tele-monitoring. Feedback from all of the Trusts (combined) was:

Table 3.2: Patient Feedback on Benefits – all Trusts

Patient Feedback on Benefits	Strongly Agree	Agree	Disagree	Strongly Disagree	N=
The monitoring system assisted me in managing my health on a day to day basis	42%	49%	8%	1%	114
The remote monitoring system has reduced the number of visits I made to my GP	41%	41%	16%	2%	105
I believe my own monitoring of my condition has reduced the number of nurse/ community team/health professional visits	36%	44%	19%	1%	104
I believe that during the monitoring period, the remote monitoring system prevented my admission to hospital or need to attend A&E Services (and/or GP Out of Hours)	30%	45%	21%	4%	105
The remote monitoring system has enabled me to better manage my own condition and become more involved in my health care	38%	49%	12%	1%	112

The feedback from patients was overwhelmingly positive. Patients strongly agreed or agreed:

- For 82%, the remote monitoring system has reduced the number of visits they made to their GP;
- For 80%, they believed that their own monitoring of their condition reduced the number of nurse/ community team/health professional visits;
- For 75%, they believed that during the monitoring period, the remote monitoring system prevented their admission to hospital or need to attend A&E Services (and/or GP Out of Hours); and

- For 87%, the remote monitoring system enabled them to better manage their own condition and become more involved in their own health care.

The following selected questions give the outcomes for each individual Trust.

Table 3.3: Patient Feedback per Trust - I believe that during the monitoring period, the remote monitoring system prevented my admission to hospital or need to attend A&E Services (and/or GP Out of Hours)

Patient Feedback -	Strongly Agree	Agree	Disagree	Strongly Disagree	N=
South Eastern Trust	48%	37%	11%	4%	27
Belfast Trust	16%	53%	26%	5%	19
Western Trust	27%	64%	9%		11
Southern Trust	22%	50%	28%		18
Northern Trust	30%	37%	27%	7%	30
Total					105

Whilst 75% of patients overall, were of the view that, during the monitoring period, the remote monitoring system prevented their admission to hospital or need to attend A&E Services (and/or GP Out of Hours), this view was most prevalent amongst the South Eastern Trust (at 85%). Even in the Northern Trust, where the lowest percentage (and absolute number) disagreed with this statement, there were still 67% who considered that the remote monitoring system had prevented their admission to hospital or need to attend A&E Services (and/or GP Out of Hours).

Table 3.4: Patient Feedback per Trust - The remote monitoring system has enabled me to better manage my own condition and become more involved in my health care?

Patient Feedback	Strongly Agree	Agree	Disagree	Strongly Disagree	N=
South Eastern Trust	53%	37%	10%		30
Belfast Trust	20%	60%	20%		20
Western Trust	25%	67%	8%		12
Southern Trust	32%	53%	16%		19
Northern Trust	42%	45%	10%	3%	31
Total					112

Whilst 87% of patients overall, were of the view that, during the monitoring period, the remote monitoring system enabled them to better manage their own condition and become more involved in their own health care, this view was most prevalent amongst the South Eastern Trust (at 90%) and Western Trust (at 92%) . Of the other Trusts, at least 80% agreed or strongly agreed that the remote monitoring system enabled them to better manage their own condition and become more involved in their own health care.

3.2.2 Patient Feedback on the ease of use of tele-monitoring equipment

Patients were also asked to give their views on the ease of use of the Tele-monitoring equipment. Feedback was:

Table 3.5: Patient Feedback on Ease of Use

Equipment	Strongly Agree	Agree	Disagree	Strongly Disagree	N=
The monitoring system was easy for me to use	56%	40%	3%	1%	111
I consider the installation was prompt, efficient and tidy	57%	38%	4%	1%	113
I believe the monitoring questions encouraged me to think about my symptoms	43%	48%	9%	-	100

Again, the results were overwhelming positive:

- 96% agreed or strongly agreed that the monitoring system was easy for them to use
- 95% considered that the installation was prompt, efficient and tidy
- 91% believed the monitoring questions encouraged them to think about their symptoms

3.3 Number of Carers providing Feedback to the Trusts

In addition, a total of 52 carers provided feedback to the Trusts as follows:

Table 3.6: Carers providing Feedback to the Trusts

Trust Name	Patient Respondents
Belfast Health and Social Care Trust	4
Northern Health and Social Care Trust	15
South Eastern Health and Social Care Trust	18
Southern Health and Social Care Trust	5
Western Health and Social Care Trust	10
Total	52

Carers provided feedback on the perceived benefits patients had derived from the tele-monitoring projects as well as one ease of use:

Table 3.7: Carers providing Feedback on Patient Benefits and ease of use

Patient Benefits	Strongly Agree	Agree	Disagree	Strongly Disagree	N=
I consider remote monitoring has improved the level of care given to the person I care for.	55%	43%	2%	0%	49
I consider remote monitoring has helped prevent the person I care for being admitted to hospital.	58%	33%	7%	2%	45
When assisting the person to operate the remote monitoring equipment, I found it easy to use.	69%	31%	0%	0%	42
Remote tele-monitoring gave me reassurance about the condition of the person I care for and supported me in my care for that person.	40%	60%	0%	0%	30

- 98% would consider that remote monitoring has improved the level of care given to the person they care for.
- 91% would consider remote monitoring has helped prevent the person they care for being admitted to hospital
- 100%, when assisting the person to operate the remote monitoring equipment, found it easy to use
- 100% considered that remote tele-monitoring gave them reassurance about the condition of the person the care for and supported them in their care for that person.

3.4 Number of Professional Workers providing feedback to Trusts

Finally, the internal evaluation also included 86 professional workers/ clinicians who provided feedback on the tele-monitoring pilots.

Table 3.8: Professional workers providing Feedback on the Impact on Resource Utilisation within Trusts

Trust Name	Patient Respondents
Belfast Health and Social Care Trust	8
Northern Health and Social Care Trust	27
South Eastern Health and Social Care Trust	22
Southern Health and Social Care Trust	17
Western Health and Social Care Trust	12
Total	86

Feedback on Resource utilisation was:

Table 3.9: Professional workers' Feedback on the Impact on Resource Utilisation within Trusts

Professional Worker	Strongly Agree	Agree	Disagree	Strongly Disagree	N=
Introduction of remote monitoring has decreased the number of hospital admissions relating to the patient's chronic condition	22%	43%	29%	6%	72
Introduction of remote monitoring has decreased the number of GP visits relating to the patient's chronic condition	19%	54%	23%	4%	81
Introduction of remote monitoring has decreased the number of nurse visits relating to the patient's chronic condition	19%	49%	29%	4%	76
Total					229

The above demonstrates that of the professional workers providing feedback on Resource Utilisation arising from the tele-monitoring projects:

- 65% considered that the introduction of remote monitoring has decreased the number of hospital admissions relating to the patient's chronic condition
- 73% considered that the introduction of remote monitoring has decreased the number of GP visits relating to the patient's chronic condition
- 68% consider that the introduction of remote monitoring has decreased the number of nurse visits relating to the patient's chronic condition

The following selected questions give the outcomes for each individual Trust.

Table 3.10: Professional workers' Feedback per Trust- Introduction of remote monitoring has decreased the number of hospital admissions relating to the patient's chronic condition?

Professional Workers	Strongly Agree	Agree	Disagree	Strongly Disagree	N=
South Eastern Trust	32%	58%	5%	5%	19
Belfast Trust	-	-	80%	20%	5
Western Trust	-	43%	57%	-	7
Southern Trust	-	47%	53%	-	15
Northern Trust	38%	38%	15%	8%	26
Total					72

In the Southern Eastern Trust and Northern Trust, the majority (90% of the Southern Eastern Trust (n=19) and 76% of the Northern Trust (n=26)) consider that the introduction of remote monitoring has decreased the number of hospital admissions relating to the patient's chronic condition.

Whilst 65% of professional workers, overall, considered that the introduction of remote monitoring has decreased the number of hospital admissions relating to the patient's chronic condition, none of the professional workers in the Belfast Trust agree with this statement (although the sample size is relatively low at 5).

Table 3.10: Professional workers' Feedback per Trust- Introduction of remote monitoring has decreased the number of nurse visits relating to the patient's chronic condition?

Professional Worker	Strongly Agree	Agree	Disagree	Strongly Disagree	N=
South Eastern Trust	29%	62%	10%	-	21
Belfast Trust	12%	38%	25%	25%	8
Western Trust	-	33%	67%	-	3
Southern Trust	12%	65%	24%	-	17
Northern Trust	19%	33%	44%	4%	27
Total					76

68% of professional workers, overall, considered that the introduction of remote monitoring has decreased the number of nurse visits relating to the patient's chronic condition. This is the majority view in 3 of the Trusts, with 90% of the Southern Trust agreeing with this statement. Of the Belfast Trust, 1 professional worker agreed with the statement whilst 2 workers disagreed that the introduction of remote monitoring has decreased the number of nurse visits relating to the patient's chronic condition.

3.5 Conclusion on Internal Evaluations

In conclusion, the internal evaluations provided positive feedback on the five remote tele-monitoring projects:

- 75% of patients, 91% of carers, and 65% of professional workers consider that, during the monitoring period, the remote monitoring system prevented the patients' admission to hospital for the patients' chronic illness.
- For 91% of patients, the monitoring system assisted them in managing their health on a day to day

-
- 100% of carers consider that remote tele-monitoring gave them reassurance about the condition of the person the care for and supported them in their care for that person.

4 FIVE REMOTE TELE-MONITORING PROJECTS - OPERATION OF THE PILOTS

Section 4 considers clinicians’ and patients’ views on the operation of the five tele-monitoring pilots, including the patient selection and recruitment processes, the criteria that were utilised during the pilot projects, the ease of use of the equipment, and the level of support from the Service Providers.

The findings below are taken from the individual consultations with patients and clinicians. Detailed questions and findings are included in Appendix 1 (Clinical Questionnaire Statistical Analysis) and Appendix 2 (Patient Questionnaire Statistical Analysis). The relevant question from each of the Appendices is referenced in the figures below.

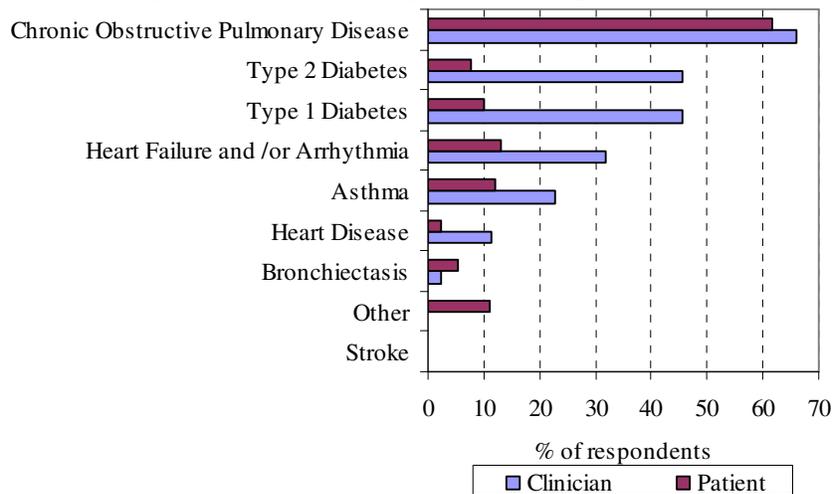
4.1 Profile of Respondents

There were 44 clinicians and 91 patients who participated in the consultations for the five tele-monitoring projects.

Of the 44 clinicians included in this consultation process, 29 (66% N=44) are responsible for Chronic Obstructive Pulmonary Disease (COPD); 20 (45% N=44) are responsible for Type 1 Diabetes and Type 2 Diabetes; 14 (32%, N=44) are responsible for Heart Failure/Arrhythmia, and a further 10 (23%, N=44) are responsible for Asthma.

Most (62%, N=91) of the patients consulted with are using tele-monitoring equipment to monitor Chronic Obstructive Pulmonary Disease (COPD), 13% (N=91) of respondents use the equipment to monitor heart failure/arrhythmia; 11 (12%, N= 91) use the equipment to monitor asthma, 9 (10%, N=91) for Type 1 Diabetes, and 7 (8%, N=91) for Type 2 Diabetes.

Figure 4.1: Illnesses Responsible for (Q1 - Patient & Clinician)

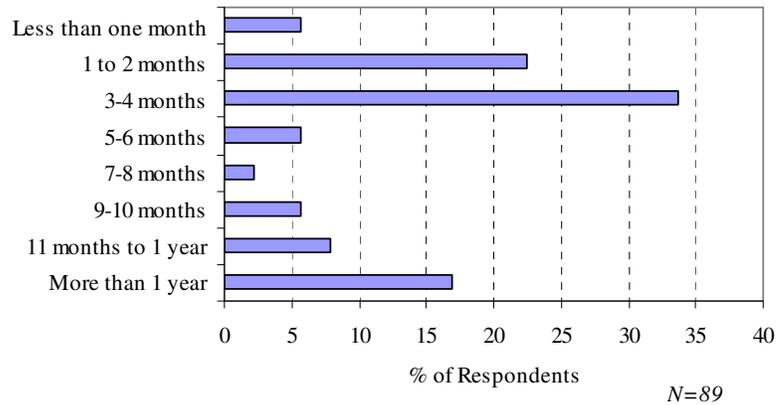


Patients have been using the equipment for a range of periods up to over one year:

- The majority of patients (34%, N=89) have been using the tele-monitoring equipment for a period of 3-4 months;
- 22% (N=89) have been using the equipment for a period of 1-2 months;
- 17% for more than one year;
- 8% for 11 months to one year; and

- 6% each (N=89) have been using the equipment for less than one month, 5-6 months, and 8-9 months.

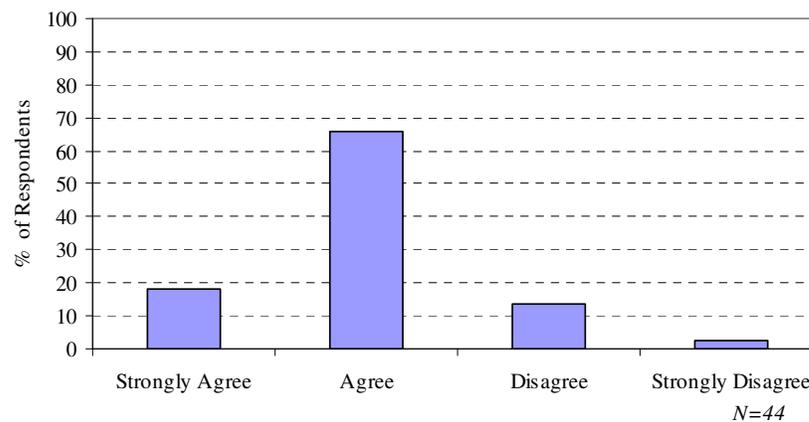
Figure 4.2: Duration of use of tele-monitoring equipment (Q2 - Patient)



4.2 Appropriateness of Patients Selected

The majority of clinicians agree that the patients that were selected or recruited to participate in the Pilot were appropriate to participate - 18% (N=44) ‘strongly agreed’ and 66% (N=44) ‘agreed’ that the patients that were selected or recruited to participate in the Pilot were appropriate to participate; a small minority (16%, N=44) disagreed with this.

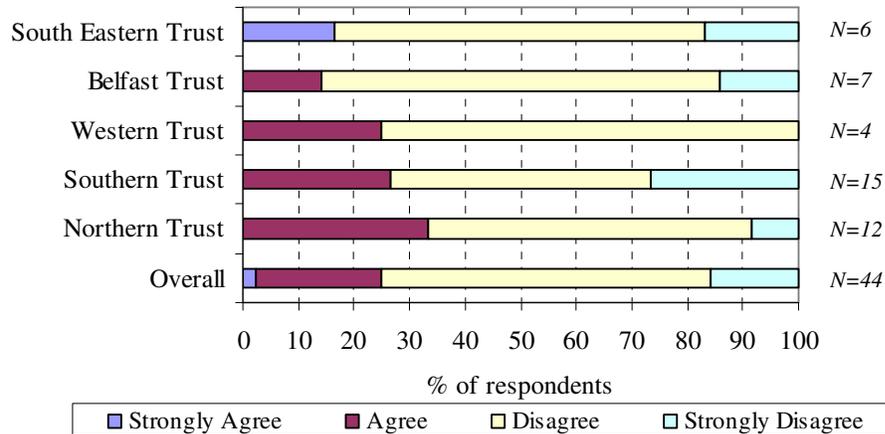
Figure 4.3: Appropriate Patient Recruitment/Selection (Q2b - Clinician)



4.3 Appropriateness of Tele-Monitoring

75% of clinicians (N=44) agreed that tele-monitoring would not be appropriate for all patients with the primary condition that they have responsibility for. Rather, clinicians reported that the appropriateness of the tele-monitoring treatment will depend on the severity of the patient’s condition, dexterity/agility, level of dependency and individual patient attitude.

Figure 4.4: Appropriate for Primary Condition (Q3a Clinician)



There were differing opinions as to whether or not tele-monitoring was appropriate for those at mild disease level, ie mild COPD, ie some clinicians felt that those with mild COPD should be able to manage on their existing care plan.

It is noted that the comments provided are set in the context of a number of clinicians not having had experience of the system for a full cycle of care.

Moreover, the tele-monitoring programme for a number of the pilots, including the South Eastern Community Diabetes pilot, is still in its infancy. Accordingly, there was concern by the Community Diabetes nurses in the South Eastern Trust that tele-monitoring was not appropriate for the patients that they had selected, due to the fact that there was a high level of contact with these patients anyway. The view was that whilst the programme might be more appropriate for diabetic patients taking insulin once daily (which was stated to be consistent with the Ulster Hospital diabetes team within the South Eastern Trust), these are not high users of the community nurses’ time and hence the impact on nursing contact would be minimal. Conversely, diabetic patients taking insulin once daily could generally adjust their insulin themselves, and hence the need to monitor this group may be less apparent. Severe diabetic patients would normally be visited twice a week, and this is continuing, as patients require changes to their medication etc. For diabetic patients, it was noted that diet is the key issue, and failure to make lifestyle and behavioral choices will mean that there may be no improvements in the non compliant patient’s health under the tele monitoring programme.

In addition, the Western Trust has a tele-monitoring programme for gestational diabetic patients who are more likely to be compliant with dietary instructions. Clinicians therefore noted the opportunities for tele-monitoring could work for diabetic patients on new medication, seeking weight loss, gestational patients and newly diagnosed patients.

Clinicians provided some characteristics of patients that tele-monitoring is appropriate for or not appropriate for:

<i>Characteristics</i>	Appropriate For and why?	Not Appropriate For and why?
<i>Age</i>	<ul style="list-style-type: none"> Gestational diabetic patients 	<ul style="list-style-type: none"> Elderly patients can feel even more isolated Younger patients sometimes do not want the equipment in their home as it is a constant reminder of their condition
<i>Cormorbidity</i>		<ul style="list-style-type: none"> Arthritic patients can find it very difficult to handle the equipment Patients with reduced mental capacity would struggle to monitor regularly, although they may have carers who can assist in the operational aspects
<i>Disease status/severity</i>	<ul style="list-style-type: none"> More appropriate for patients with mild to severe severity, as long as the equipment would not cause the patient any more stress 	<ul style="list-style-type: none"> Less appropriate for patients with severe disease status – who may have complex needs, who will continue to be regularly reviewed by professional healthcare workers and may not be able to use equipment
<i>Patient Agility</i>	<ul style="list-style-type: none"> Patients who have the manual dexterity to use the equipment 	<ul style="list-style-type: none"> Patients who do not have the manual dexterity to use the equipment
<i>Other</i>	<ul style="list-style-type: none"> Those diabetic patients willing to make dietary changes 	<ul style="list-style-type: none"> Blind diabetes patients, unless the equipment can speak the instructions Stroke patients who may not be able to speak properly Deaf patients can have difficulty in deciphering words when the volume is increased

Comments from clinicians included:

“Tel-monitoring (for COPD) is most appropriate for patients who have moderate to severe COPD, and are at Level 2 in their care management plan. Tele-monitoring is also particularly appropriate for patients who live alone, and who have just left the hospital, in order to monitor patients for early detection of infection. Those with severe COPD are likely to require one to one professional clinician care on a regular basis, thus mitigating the impact of tele-monitoring”.

Clinician Respondents

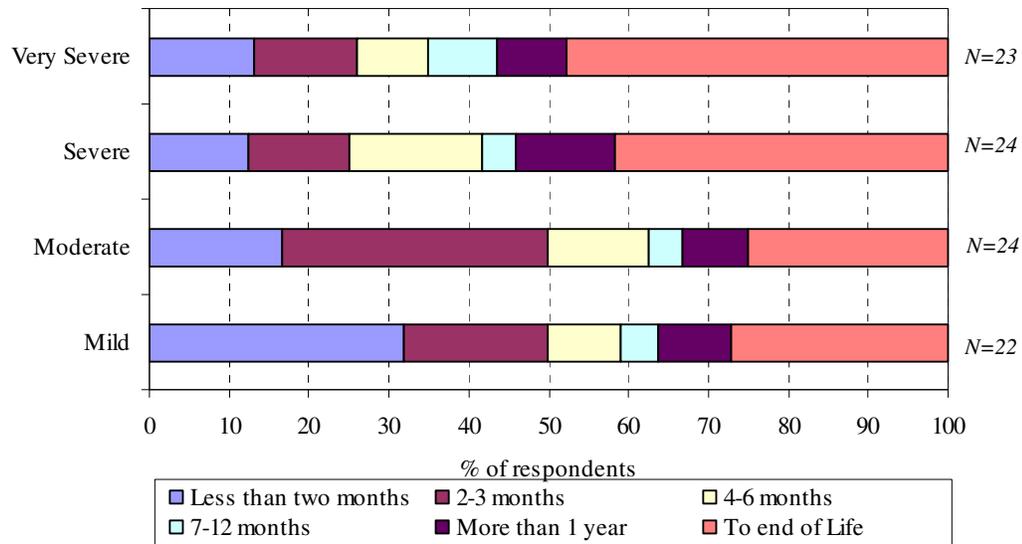
4.4 **Appropriate Timescale for Patients’ use of Tele-Monitoring**

Tele-monitoring equipment is currently provided in 12 week cycles, although this can be extended to two or three episodes of care etc. Clinicians provided views on the most appropriate timescale for the following types of patients to use tele-monitoring equipment:

4.4.1 COPD

Views on the appropriateness of the timescale for COPD patients to use tele-monitoring equipment varied, depending on severity of the disease:

Figure 4.5: Timescale of tele-monitoring use for varying levels of COPD Severity (Q6a - Clinician)



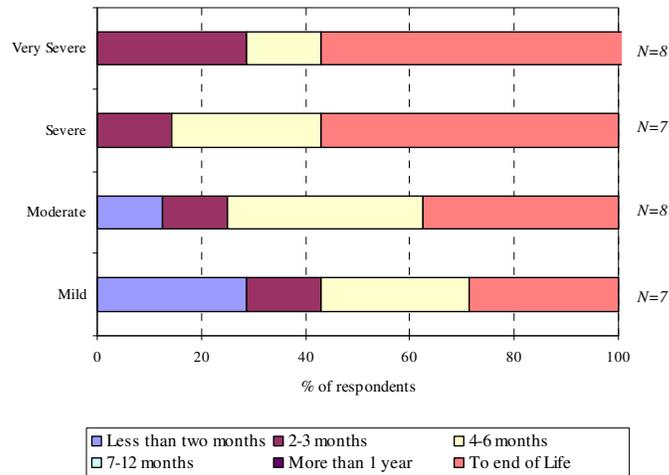
- Half (50%, N=22) of the clinicians with responsibility for COPD stated that patients with ‘mild’ COPD should use the tele-monitoring equipment for ‘less than three months’, 27% (N=22) stated it should be used to end of life;
- Half (50%, N=24) of the clinicians stated that patients with ‘moderate’ COPD should use the tele-monitoring equipment for ‘less than three months’; 25% (N=24) stated it should be used to end of life;
- Over 40% of clinicians (42%, N=24) stated that patients with ‘severe’ COPD should use the tele-monitoring equipment ‘to end of life’;
- Half (48%, N=23) of the clinicians stated that patients with ‘very severe’ COPD should use the tele-monitoring equipment ‘to end of life’.

Overall, there appeared to be consensus that tele-monitoring was most appropriate for patients with moderate severity of COPD and was of less benefits to those patients with severe COPD due to the intensive care which this grouping typically required.

4.4.2 Congestive Heart Failure (CHF)

Only 8 clinicians commented on the appropriate timescale for patients with CHF. Views on the appropriateness of the timescale for CHF patients to use tele-monitoring equipment also varied, although the majority agreed that it should be from 4 months to end of life for moderate, severe and very severe CHF:

Figure 4.6: Timescale of tele-monitoring use for varying levels of CHF (Q6b - Clinician)

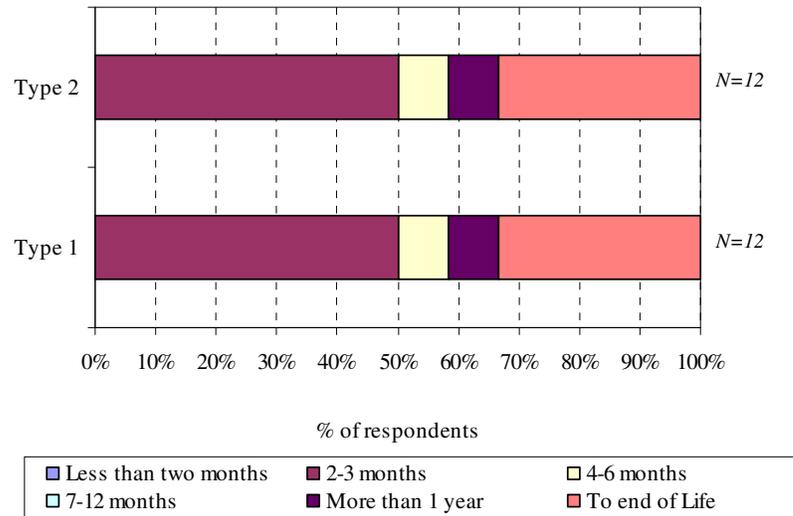


- The majority (71%, N=7) of the clinicians with responsibility for CHF stated that patients with ‘mild’ CHF should use the tele-monitoring equipment for ‘less than six months’, 29% (N=7) stated it should be used to end of life;
- The majority (63%, N=8) clinicians stated that patients with ‘moderate’ CHF should use the tele-monitoring equipment for ‘less than six months’; 38% (N=8) stated it should be used to end of life;
- Over half of clinicians (57%, N=7) stated that patients with ‘severe’ CHF should use the tele-monitoring equipment ‘to end of life’;
- The majority (71%, N=8) of the clinicians stated that patients with ‘very severe’ CHF should use the tele-monitoring equipment ‘to end of life’.

4.4.3 Diabetes

There was mixed views by the 12 clinicians who commented on the appropriate timescale for patients with Diabetes.

Figure 4.7: Timescale of tele-monitoring use for varying levels of Diabetes Severity (Q6c – Clinician)



Half (50%, N=12) of the clinicians stated that patients with ‘Type 1 and Type 2’ diabetes should use the tele-monitoring equipment for ‘2-3 months; whilst 33% stated it should be used ‘to end of life’. The appropriate timescale will however vary depending on the severity of the disease, level of non compliance, whether or not the patient is newly diagnosed etc.

4.5 Improvements to Patient Selection

Clinicians suggested some improvements that could be made to the Patient selection process, including:

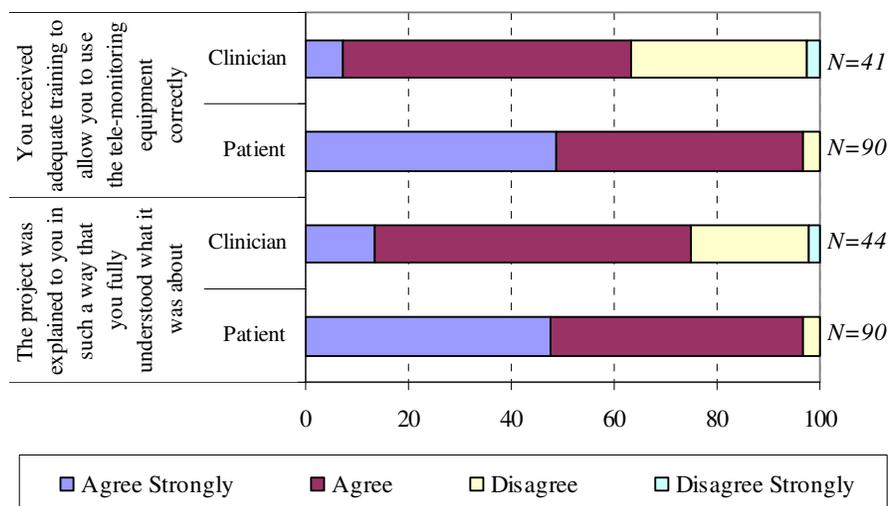
- Patient selection should be refined, with guidance on the appropriateness of patients depending on the severity of their disease, dexterity, disabilities and whether or not the equipment should be used as an educational tool, for instance to help diabetes patients stop smoking and lose weight;
- Patient selection could be improved if the tele-monitoring equipment was adaptable. The equipment should be adaptable to those people with a disability (ie impaired sight, hearing, stroke); and
- Targeting of those leaving hospital after a hospital admission, and heavy users of the community respiratory teams (excluding those with severe conditions), newly diagnosed diabetic and gestational diabetic patients.

4.6 Satisfaction with Project Implementation

4.6.1 Information and Training

- Most clinicians (75%, N=44) and patients (97%, N=90) were in agreement that the project was explained to them in such a way that they fully understood what it was about, one-quarter (25%, N=44) of clinicians disagreed with this;
- Most clinicians (63%, N=41) and patients (97%, N=90) ‘were in agreement that they received adequate training to allow them to use the tele-monitoring equipment. 37% of clinicians ‘disagreed’ with this.

Figure 4.8: Implementation of the tele-monitoring project (Q7a – Clinician/Q3a – Patient)



As demonstrated above, patients have positive opinions towards the implementation of the tele-monitoring equipment and subsequent training. Comments include:

“The nature of the scheme was fully explained to me. Installation was on time and I was shown how to use it properly.”

Patient Respondents

4.6.2 Processes relating to Ordering Equipment and its use in the Home (Q7a – Clinician)

63% (N=38) of clinicians ‘strongly agreed’ or ‘agreed’ that the way in which tele-monitors were ordered for placement was straightforward and efficient; whilst 37% (N=38) disagreed.

There were issues relating to the timeliness of installation and notification to Trust Clinicians of installation, with the clinicians’ preference being to get a text from the Service Providers on the day that the equipment is installed.

It was also noted that there should be procedures for removing equipment where the patient is in hospital, on holiday etc, subject to the cost implications of moving such equipment for a temporary period.

4.6.3 Fitting of Equipment (Q3a – Patient)

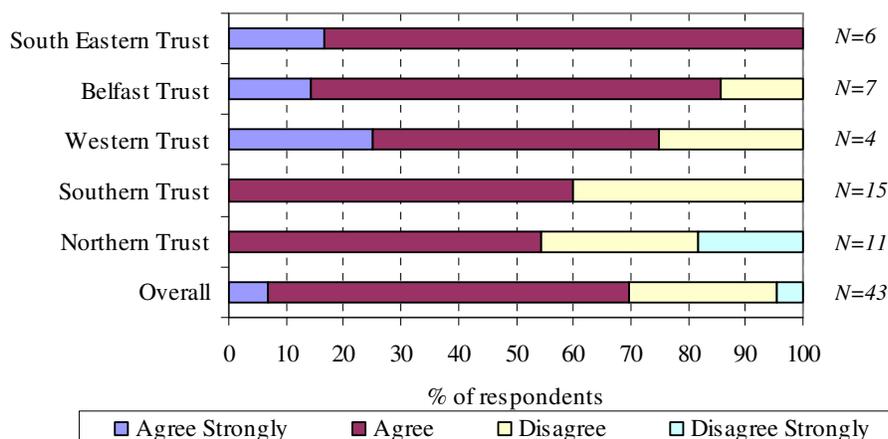
98% of patients either strongly agreed (51%, N=90) or agreed (47%, N=90) that the equipment was installed in their house in an efficient manner.

4.6.4 Issues around Patient Parameters

General clinical guidelines are utilised in setting parameters for use within the remote monitoring project, which are then tailored to individual patients. There were noted to be issues with the setting of parameters at the start of the pilots, with a lot of patients alerting on a frequent basis. It was noted that a ‘bedding in’ period was necessary in order that clinicians and patients could become familiar with the use of the scheme and more specifically, the parameters within which it operated. Clinicians reported a growing level of confidence among specialist nurses in setting parameters.

Clinician views were, therefore, sought on whether or not patient parameters were appropriately established, i.e.; the patient measurements which would create an alert if they fell outside the specific criteria. The feedback varied by Trust:

Figure 4.9a: Patients parameters were appropriately established (Q7a – Clinician)

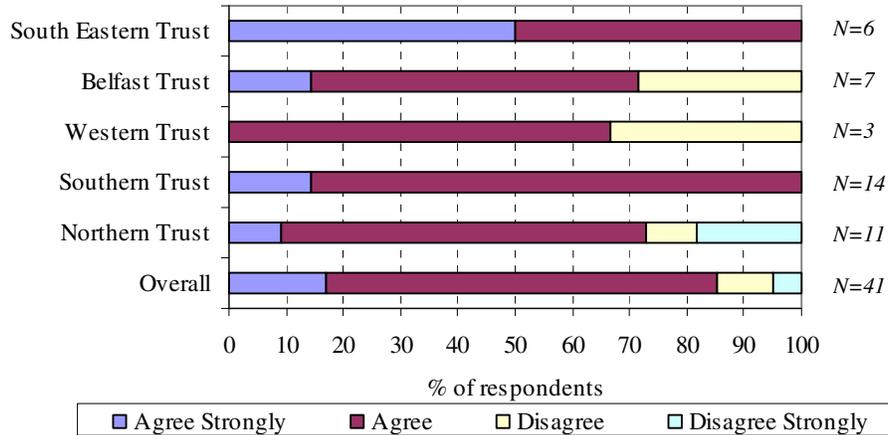


- 70%, (N=43) of clinicians ‘strongly agreed’ or ‘agreed’ that the patients parameters were appropriately established i.e. the patient measurements which would create an alert if they fell outside the specific criteria.

Generally, clinicians in the South Eastern Trust and Belfast Trust were positive about aspects of the Project that related to patients’ parameters. Clinicians in the Northern Trust and Southern Trust were least positive, although it is noted that these represented 26 of the 43 responses.

Clinician views were sought on whether or not they felt comfortable setting patient parameters:

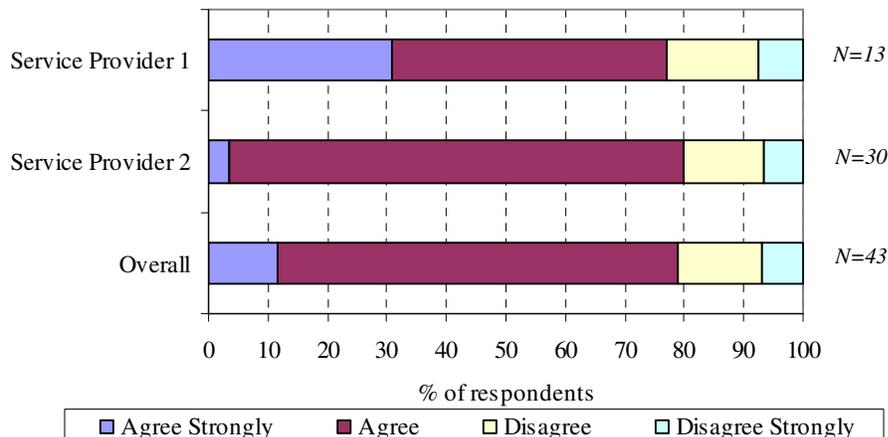
Figure 4.9b: You feel comfortable setting patient parameters (Q7a – Clinician)



- 85%, (N=41) of clinicians ‘strongly agreed’ or ‘agreed’ that that they feel comfortable setting patient parameters. There was a higher level of comfort in the South Eastern Trust and Southern Trust, with the Western Trust being recorded as the least comfortable (although this represents the views of only 3 clinicians).

Clinicians were asked for their views on the patient information and whether or not this is easy to interpret. The results can be analysed by the source of data, ie, either Service Provider 1 (for the Belfast Trust and the South Eastern Trust) or Service Provider 2 (for the Northern, Western and Southern Trusts), with there being no significant variations:

Figure 4.9c: The patient information provided by the tele-monitoring equipment is easy to interpret (Q7a – Clinician)



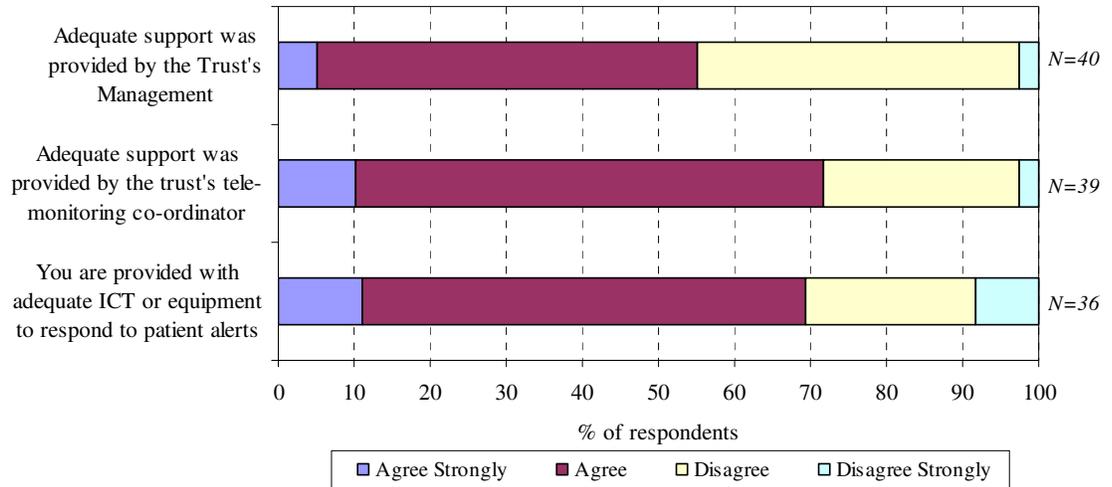
- 79% (N=43) of clinicians ‘strongly agreed’ or ‘agreed’ that the patient information provided by the tele-monitoring equipment is easy to interpret.

Clinicians did report some instances where information received is difficult to interpret (see para 4.7.5).

4.6.5 Level of Support Offered

Clinicians were asked for their views on the level of support from the Trust management, the Trust Tele-monitoring co-ordinator and the ICT support provided:

Figure 4.10: Implementation of the tele-monitoring project (Q7a – Clinician)



Clinicians were generally positive about the level of support that was provided to them during the implementation of the tele-monitoring project:

- 55% (N=40) ‘strongly agreed’ or ‘agreed’ that adequate support was provided by the Trust’s Management, whilst the remaining 45% (N=40) ‘disagreed’ that this was the case;
- 72%, (N=39) ‘strongly agreed’ or ‘agreed’ that adequate support was provided by the Trust’s tele-monitoring co-ordinator; and
- 69% (N=36) ‘strongly agreed’ or ‘agreed’ that they are provided with adequate ICT or equipment to respond to patient alerts. Others noted that they do not rely on ICT for patients’ alerts, receiving notification to their mobile from the Service Providers.

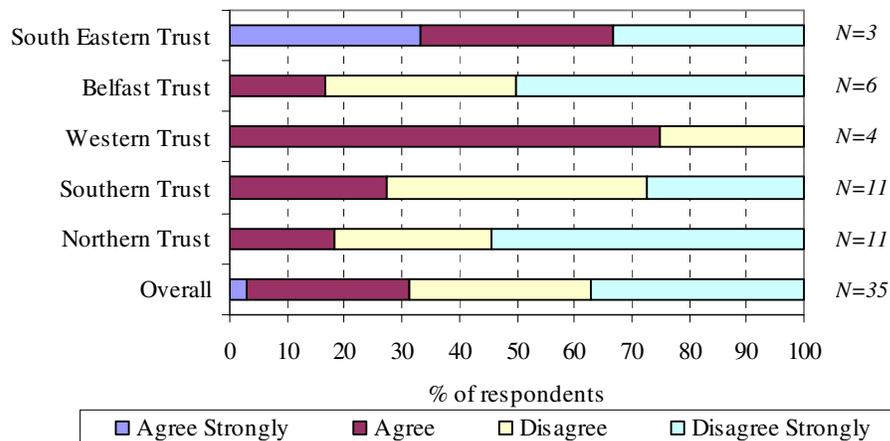
It was noted that a number of the Trust’s tele-monitoring co-ordinators were appointed latterly to the pilot and this was likely to have influenced results. Many clinicians did not see the direct input of the Trust management, but, rather, were aware of the pressure to increase targets and meet these challenging targets.

4.6.6 Degree of GP Ownership

This question reflected the clinician’s perception as to the level of ownership taken by patients’ GPs.

There was a mixed view as to the extent to which **GPs have taken ownership of the tele-monitoring project** – Only one third of the clinicians (31%, N=39) ‘agreed’ that patients’ GPs are positive about and have taken some ownership of the tele-monitoring project. However, 69% of clinicians ‘disagreed’.

Figure 4.11: Implementation of the tele-monitoring project – GP Ownership (Q7a – Clinician)



Comments from clinicians included:

“GPs don’t know anything about the pilot, they should have been notified by the provider when one of their patients became involved in the project.”

“In most cases, GPs are not really involved.”

Clinician Respondents

It was noted that communication with GPs could be improved, with notification when their patients are participating in the tele-monitoring programme.

4.7 Satisfaction with the Service provided by the two Service Providers

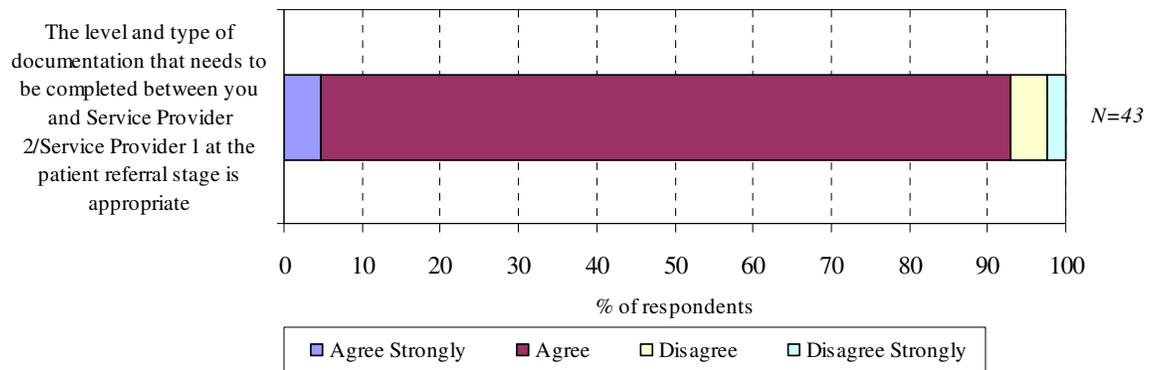
As part of the Remote Tele-monitoring service, contracts were awarded to two Service Providers for the purpose of a remote monitoring service, as follows:

Name	Projects supported	Service Provided
Service Provider 1	BHSCT – COPD Remote Tele-Monitoring SEHSCT - Remote Tele-Monitoring for Chronic Disease (including COPD and Diabetes).	Clinical Triage
Service Provider 2	NHSCT - Your Health Care at Home- Chronic Disease WHSCT - Technology Packs for People with Chronic Disease (including Type 1 & Type 2 Diabetes and COPD). SHSCT – COPD Remote Tele-Monitoring	Non clinical Triage

4.7.1 Documentation at Patient Referral Stage

The majority of clinicians 93%, (N=43) agree that the level and type of documentation at the patient referral stage is appropriate.

Figure 4.12 Clinicians’ views on the level and type of documentation at the patient referral stage (Q8a – Clinician)



There were some comments on the lack of review of the referral documentation. Comments include:

“No-one has looked at the appropriateness of the information provided at referral stage. The information given at this stage has remained the same over the last two years. This doesn’t mean that it is wrong, but its appropriateness should be confirmed.”

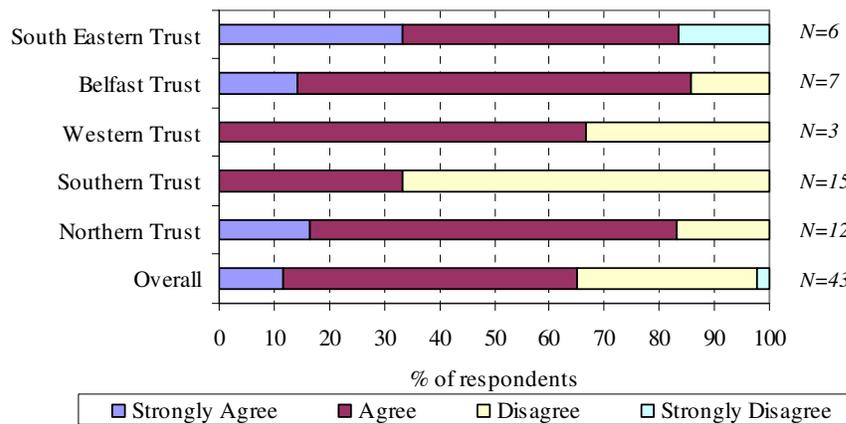
Clinician Respondents

4.7.2 The Support Provided by the Service Providers

Clinicians’ agree that the Service Providers’ service and communication was good:

- Two-thirds of clinicians (65%, N=43) ‘strongly agreed’ or ‘agreed’ that, in general, the Service Providers provided a good service. However, 35% (N=43) disagreed that the service provided was good, with the Southern Trust and the Western Trust being the least satisfied:

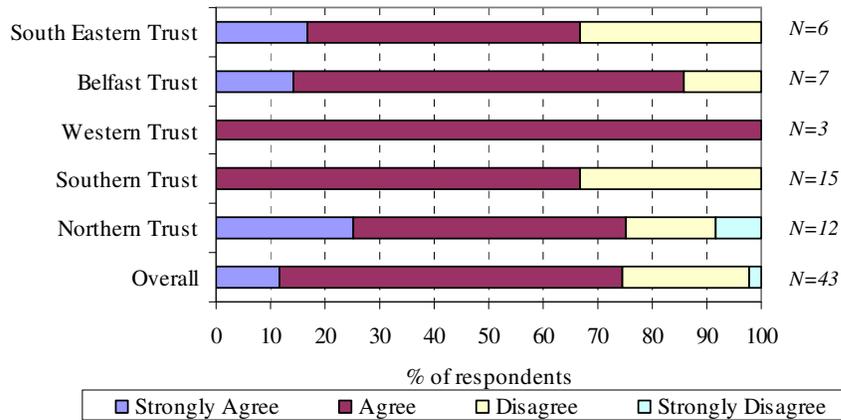
Figure 4.13a: Generally the Service Providers provided a good service (Q8a – Clinician)



Of the above, the South Eastern Trust and the Belfast Trust are serviced by Service Provider 1 and are the most positive overall. The Western, Southern and Northern Trusts are serviced by Service Provider 2. Only Service Provider 1 offers a clinical triage service. Overall, the Southern Trust was the least positive.

Furthermore, the majority of clinicians (74%, N=43) ‘strongly agreed’ or ‘agreed’ the level (quantity) of communication from the Service Providers was good. In this instance, the South Eastern Trust and the Southern Trust were the least satisfied.

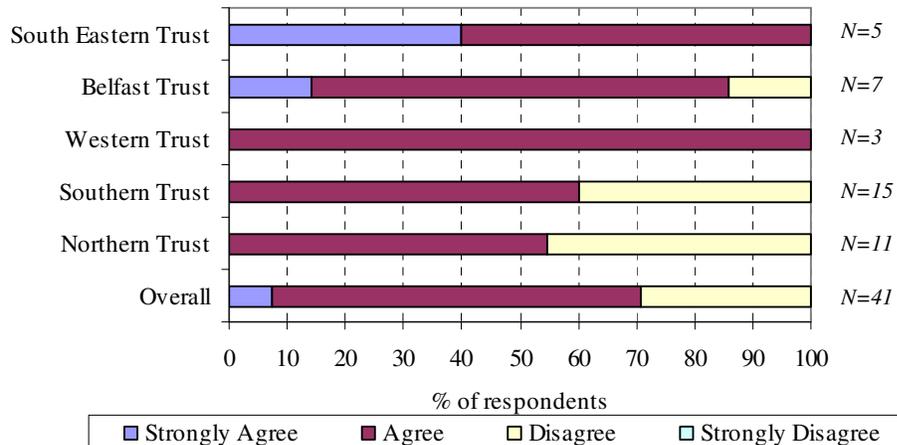
Figure 4.13b: Generally the level (quantity) of communication from the Service Providers was good (Q8a – Clinician)



4.7.3 Mode & Timeliness of Patient Alerts

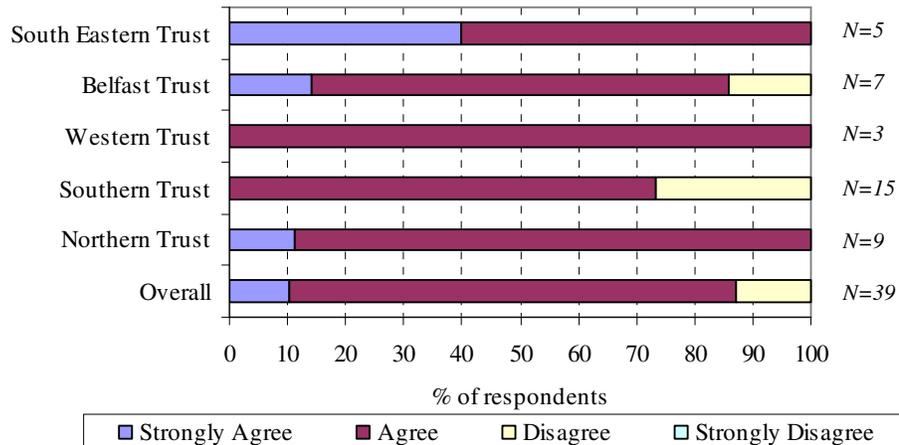
Generally, clinicians were positive about the mode of patient alerts:

**Figure 4.14a: Clinicians’ views on the mode and timeliness of patient alerts
Generally the mode (eg: telephone call, text, email) of patients alerts received from the Service Providers is appropriate? (Q8a – Clinician)**



Clinicians were also positive about the timeliness of patient alerts:

Figure 4.14b: Clinicians’ views on the mode and timeliness of patient alerts
Generally the timeliness of receipt of patient alerts from the Service Providers was good?
(Q8a – Clinician)



87% (N=39) of clinicians ‘strongly agreed’ or ‘agreed’ that the timeliness of receipt of patient alerts from the Service Providers was good and that the mode (71%, N=41) (e.g. telephone call, text, email) of patients alerts received from the Service Providers is appropriate.

The South Eastern Trust and the Belfast Trust were the most positive on the mode of patient alerts (both Service Provider 1). The Northern Trust was the least positive.

Comments include:

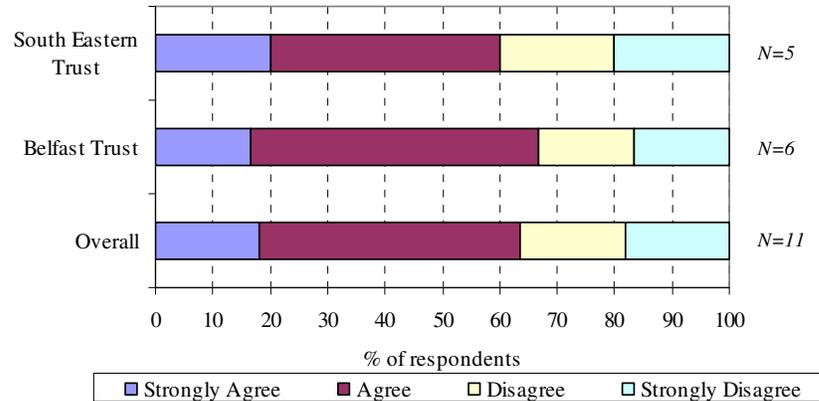
“The level of communication is good. I get a phone call to my mobile from one of the triage nurses when one of my patients’ alerts. Every Monday, I receive a printout by email from the previous week which provides details on trends”

Clinician Respondents

4.7.4 **Appropriate screening of alerts**

Only Service Provider 1 provides a clinical triage service. The majority (64%) of clinicians (N=11) ‘strongly agreed’ or ‘agreed’ that Service Provider 1 appropriately screens alerts before making contact with them; 18% (N=11) ‘disagreed’, and 18% (N=11) ‘strongly disagreed. Opinion does not vary much between the Belfast and South Eastern Trust clinicians.

Figure 4.15: Clinicians’ views on Service Provider 1 appropriately screens alerts (Q8a – Clinician)

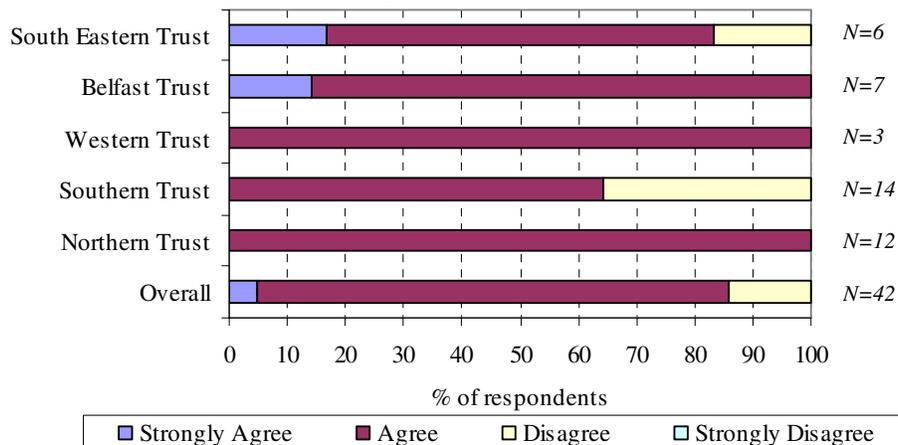


It was acknowledged that the majority of alerts sent through by Service Provider 1 are relevant, i.e. most are vetted correctly by the triage nurses.

4.7.5 **Monitoring Information**

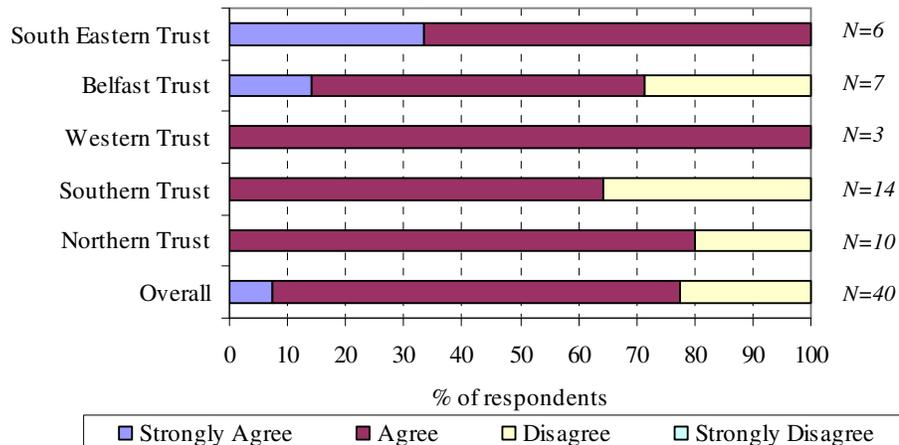
Clinicians were positive on the quality of the monitoring information provided.

Figure 4.16a: Clinicians’ views on the quality and timeliness of monitoring information Generally the quality of monitoring information provided the Service Providers is good (Q8a – Clinician)



Clinicians were also positive on the timeliness of the monitoring information provided:

Figure 4.16b: Clinicians’ views on the quality and timeliness of monitoring information
Generally the timeliness of monitoring information provided by the Service Providers is good (Q8a – Clinician)



The vast majority (86%, N=42) clinicians ‘strongly agreed’ or ‘agreed’ that the quality of monitoring information provided by the Service Providers is good.

78% (N=40) ‘strongly agreed’ or ‘agreed’ that the timeliness of monitoring information provided by the Service Providers is good.

Comments include:

“We are getting more information on vital signs and trends. We never had this level of information before.”

Clinician Respondents

It was noted by the South Eastern Trust that where a second reading is done, the printouts provided on a Monday still give the first reading with an explanation that this is incorrect. It was considered preferable that the correct reading was included for the trend analysis etc.

There were some concerns over the presentation of information received:

“All readings are in one line, when I would prefer to get morning readings together, evening readings together, to see the trend. Hence, I have to write these out manually.”

Clinician Respondents

Furthermore, clinicians require information on the timing of the readings, and if before or after meal times. It is noted that there are four readings a day but only the morning reading is recorded on the weekly printout.

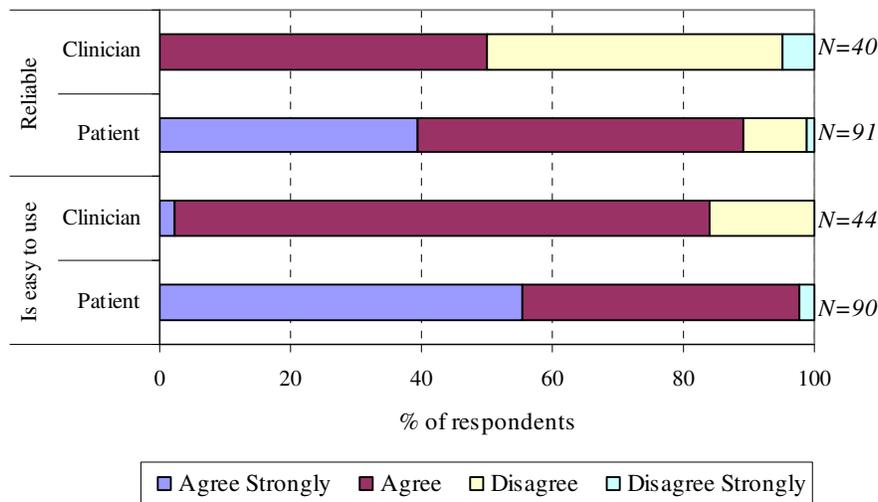
4.8 Satisfaction with the Tele-Monitoring Equipment and/or Software

4.8.1 Reliability and Ease of Use

Patients and clinicians are largely positive about the ease of use and reliability of the tele-monitoring equipment:

- Half of clinicians (50%, N=40) and most (89%, N=91) patients were in agreement that the equipment is reliable, whereas 50% of clinicians and 11% of patients disagreed; and
- Almost all clinicians (84%, N=44) and patients (98%, N=90) are in agreement that the equipment is easy to use.

Figure 4.17: Opinions on the tele-monitoring equipment (Q9a – Clinicians/Q4a – Patients)

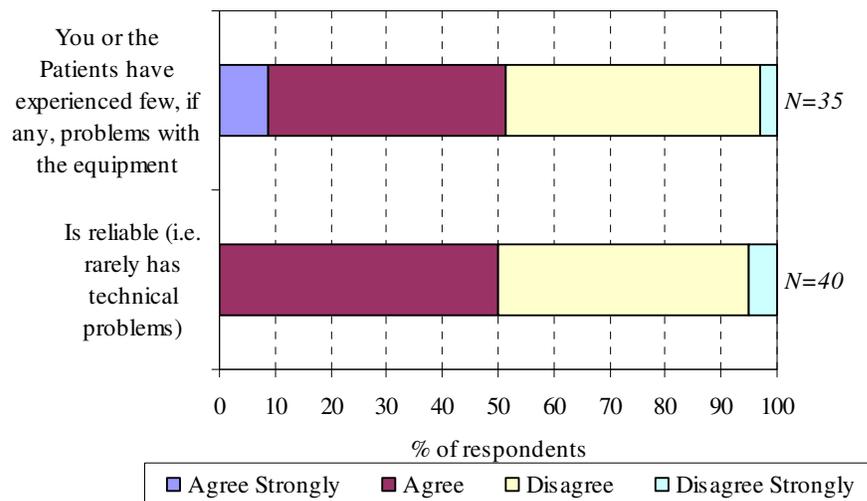


It was noted that it typically takes patients between one week and 10 days to get used to the Remote Monitoring scheme.

Patients and clinicians are largely positive about the technical aspects of the tele-monitoring equipment.

- Half of clinicians (50%, N=40) ‘agreed’ that the equipment rarely has technical problems, 50% disagreed.
- Half of clinicians (49%, N=35) ‘disagreed’ that they or the patients have experienced few, if any, problems with the equipment. The remaining 51% of clinicians (N=35) agreed.

Figure 4.18: Clinicians’ views on aspects the tele-monitoring equipment (Q9a – Clinician)



Clinicians reported that some patients have had difficulty with the equipment. Comments include:

“In the majority of cases, questions could be more specific. Composite questions are difficult to answer and often result in creating unnecessary alerts”

“A patient has had difficulty with measuring saturations. Whilst it may be that the patient’s hands are unusually cold, an earlobe probe was requested but not yet received”

“I have experienced some technical problems with the equipment, including transmission problems and the readings provided.”

“Some patients have experienced a lot of difficulties relating to and altering their blood pressure and temperature.”

Clinician Respondents

4.8.2 Accuracy of Readings

93% (N=86) of patients either strongly agreed or agreed that the equipment provides accurate readings, a small minority (7%) disagreed with this statement. (Q4a – Patients)

Clinicians’ are mainly positive about the accuracy of tele-monitoring equipment readings - The majority of clinicians ‘agreed’ or ‘strongly agreed’ that the tele-monitoring equipment provided accurate readings. The main differences were in respect of the temperature readings and peak flow:

Figure 4.19a: Clinicians’ views on accuracy of tele-monitoring equipment readings – Weight & Heart Rate (Q9c – Clinicians)

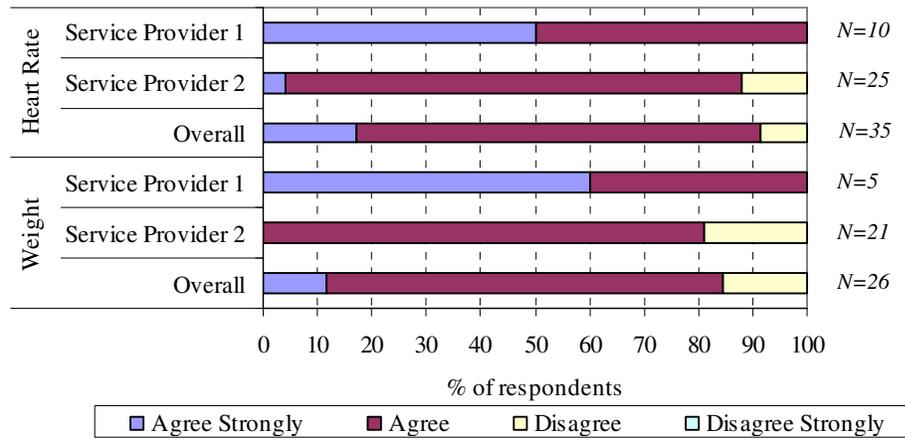


Figure 4.19b: Clinicians’ views on accuracy of tele-monitoring equipment readings – Temperature & Blood Pressure (Q9c – Clinicians)

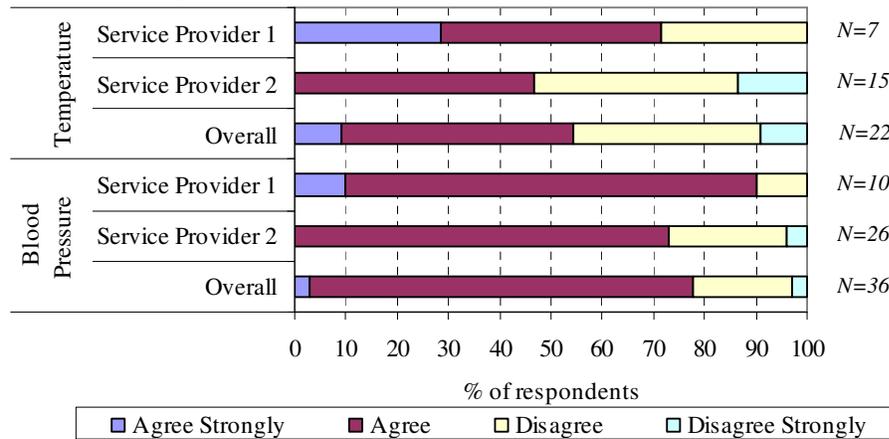
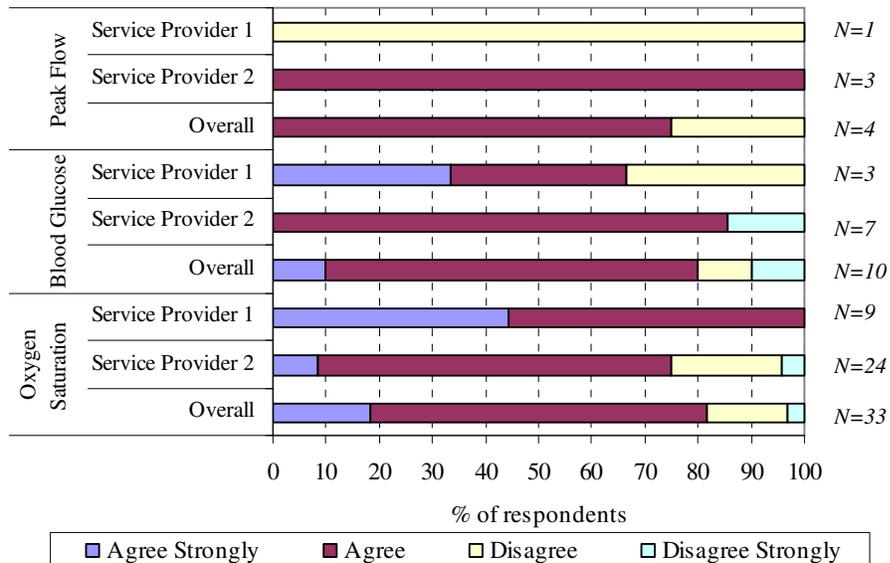


Figure 4.19c: Clinicians’ views on accuracy of tele-monitoring equipment readings –Peak Flow, Blood Glucose & Oxygen Saturation (Q9c – Clinicians)



The small number of respondents, for a number of the questions, is noted. Comments include:

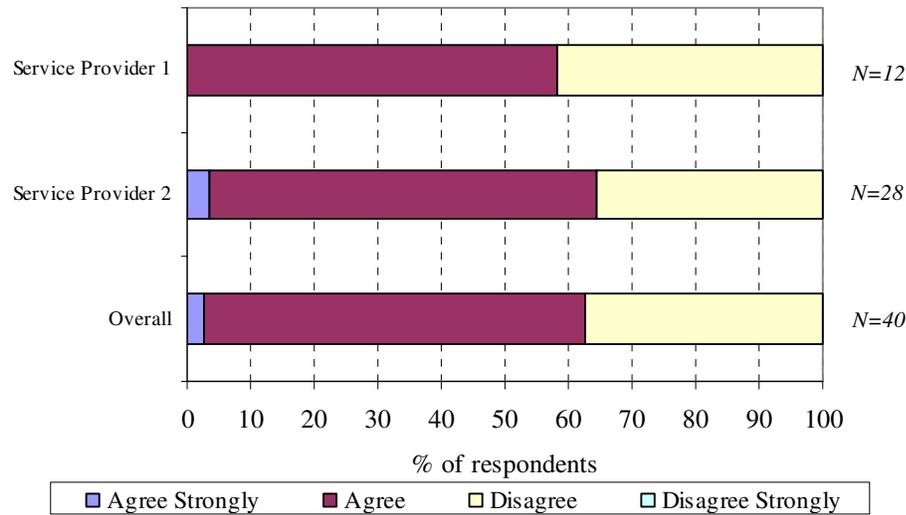
“For the blood pressure reading, I have sometimes wondered if this is accurate. If the patient’s arms are too thin, a different BP cuff size is needed – there needs to be a wider range. The reading is also always taken when the probe is first attached, rather than say, after a short delay, as the patient might initially be adjusting this on their finger to ensure that it is fitted properly”

Clinician Respondents

4.8.3 Equipment – Clinicians’ Views on Questions Asked

The clinicians had mixed views as to the questions asked to patients whilst they used the tele-monitoring equipment.

Figure 4.20: Clinicians’ views on aspects the tele-monitoring equipment
The Tele-Monitoring equipment currently asks appropriate questions for the patients conditions? (Q9a – Clinicians)



- The majority (62%, N=40) of clinicians ‘agreed’ that the tele-monitoring equipment currently asks appropriate questions about the patients conditions; the remaining 38% (N=40)disagreed (**Q9a – Clinicians**);
- The vast majority (85%, N=41) ‘strongly agreed’ or ‘agreed’ that the tele-monitoring equipment asks questions that encourage patients to think about their symptoms. The remaining 15% ‘disagreed’ that this was the case (**Q9a – Clinicians**); and
- 80% of clinicians (N=40) ‘agreed’ that the tele-monitoring equipment asks questions that are easily understood by the patients; whilst 20% (N=40) disagreed. (**Q9a – Clinicians**)

Clinicians reported that some patients have had difficulty with the equipment. Comments include:

*“The questions could be worded in a better manner as they are quite impersonal or open to misinterpretation, ie questions on coughing should be “are you coughing **more** than normal” and questions on inhalers should be “are you using your **blue** inhaler more than normal”. It is important to keep questions simple. When dealing with the elderly, continuing training is sometimes required to stop them getting confused.”*

“Educational questions could be included”.

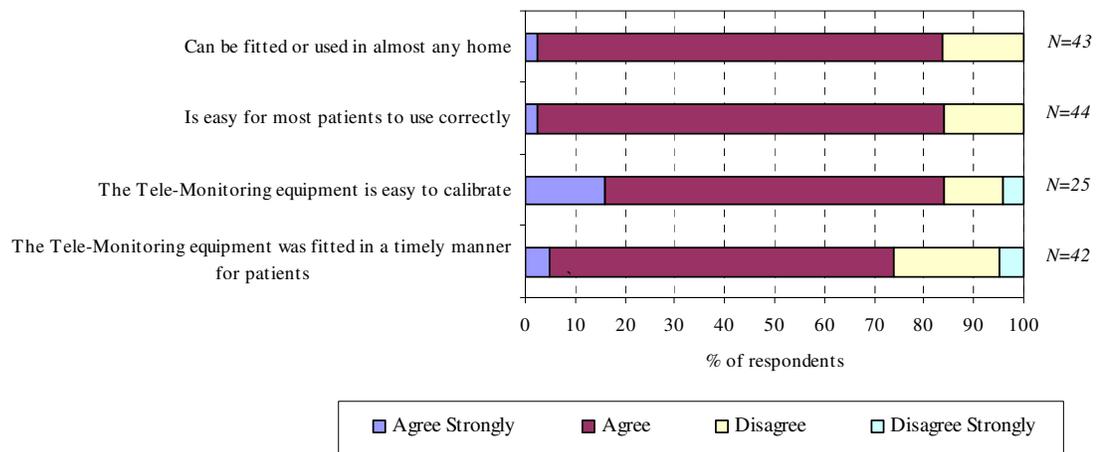
Clinician Respondents

4.8.4 Other aspects of Equipment – Clinicians’ Views

Clinicians were positive about the technical aspect of the tele-monitoring equipment:

- Most (84%, N=43) clinicians ‘agreed’, whilst only 16% ‘disagreed’ that the tele-monitoring equipment can be fitted or used in almost any home;
- Most (84%, N=25) clinicians ‘agreed’ that the tele-monitoring equipment is easy to calibrate;
- 84% (N=44) ‘agreed’ that the tele-monitoring equipment was easy for most patients to use correctly; and
- 74% (N=42) of clinicians ‘agreed’ that the Tele-Monitoring equipment was fitted in a timely manner for patients.

Figure 4.21: Clinicians’ views on aspects the tele-monitoring equipment (Q9a – Clinicians)



Clinicians reported that some patients did have had difficulty with the equipment. Comments include:

“The equipment can only be used with a land line – it is not suitable for patients with a mobile phone only. Hence, some patients are excluded”

“Where the telephone land line is in the hall, patients may have to sit here for circa 15 minutes to complete the monitoring. The patient must also be sitting before the monitor talks to them, to ensure that movement does not affect their oxygen saturation levels. The use of a mobile phone in the normal sitting area of a home would be preferable.”

Clinician Respondents

As per para 4.6.2, there have been issues over timeliness of the fitting of equipment.

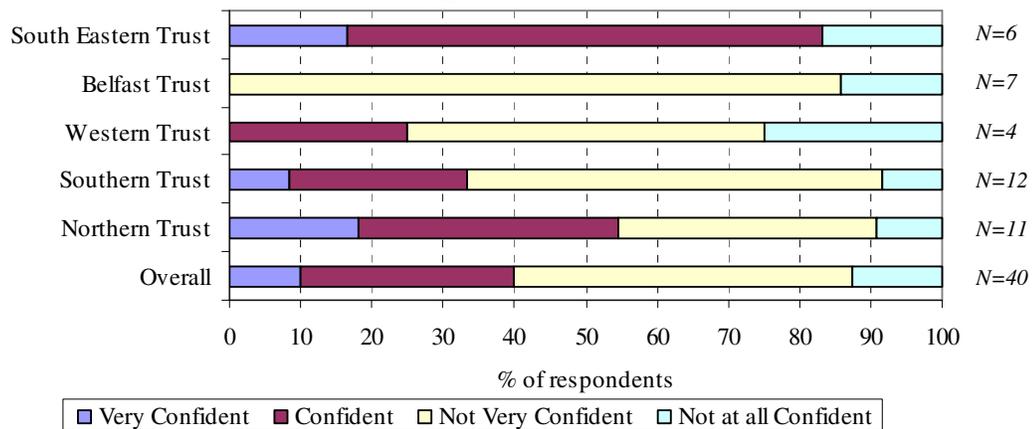
As a separate matter, there is a lack of clarity as to how long equipment should be left in the patient’s home in the event of their admission to hospital. Access to the home following admission is difficult if the patient lives alone.

4.9 Views relating to Clinical Triage

4.9.1 Satisfaction with clinical triage

Clinicians are generally not confident that tele-monitoring allows the provision of clinical triage to a patient from a distance – The majority (60%, N=40) of clinicians are ‘not very confident’ or ‘not confident at all’ that tele-monitoring allows the provision of clinical triage to a patient from a distance.

Figure 4.22: Tele-monitoring - Clinical triage to a patient from a distance (Q18a – Clinicians)

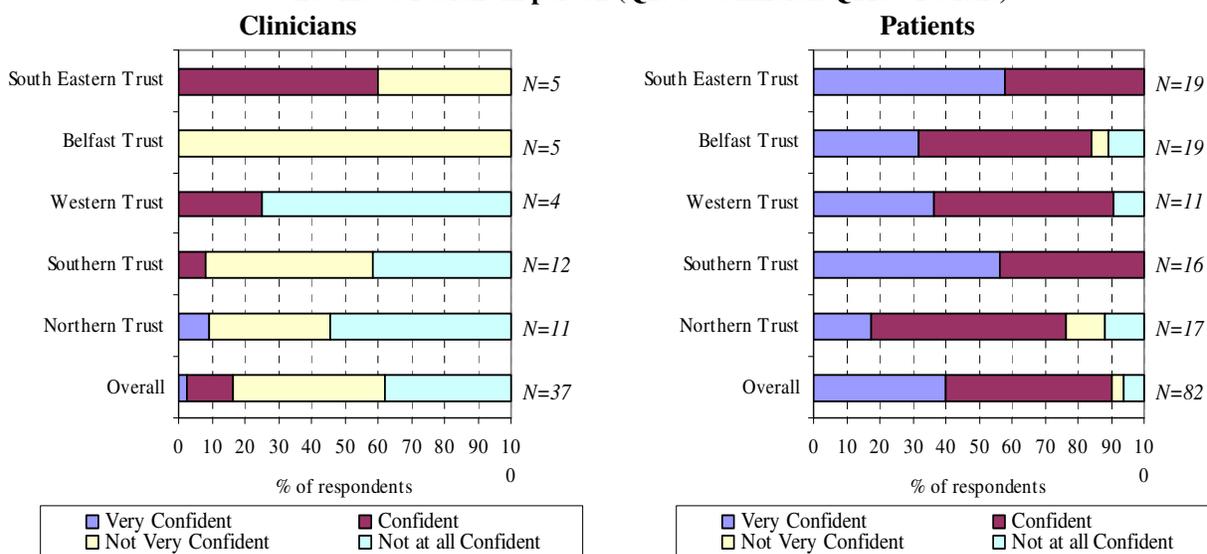


Interestingly, clinicians who are least confident that clinical triage can be provided to a patient from a distance, are based in the Belfast Trust, whilst the South Eastern Trust is most confident about clinical triage being provided from a distance – both are serviced by Service Provider 1. Clinicians from the Belfast Trust reported, in their opinion, an alert often results in a visit from the respiratory nurse anyway, and it is felt that they need to visit to see the patient in person.

The Western, Southern and Northern Trusts, who do not have clinical triage, are between 25% and 55% confident that clinical triage can be provided from a distance.

Clinicians’ and patients’ confidence levels vary significantly regarding the provision of clinical triage to a patient from a distance by a nurse who has not met a Patient in person - The majority of clinicians (84%, N=37) are ‘not very confident’ or ‘not confident at all’ that tele-monitoring does allow the provision of clinical triage to a patient from a distance by a nurse who has not met a Patient in person. However, 90%, (N=82) of patients are ‘confident’ that tele-monitoring allows the provision of clinical triage to a patient from a distance by a nurse who has not met a Patient in person.

Figure 4.23: Tele-monitoring - Clinical triage to a patient from a distance by a nurse who has not met a Patient in person (Q19a – Clinician/Q11a - Patient)



Comments include:

“ I would wonder if the triage nurse has enough information to be asking questions of the patient, I have never had the opportunity to meet the triage nurses, ask for feedback, determine what questions they ask, ensure that they feel that they have the correct information on patients”
Clinician Respondents

“I feel very confident taking the advice from any nurse but would prefer that it was a nurse that I know.”
“I have found that all the nurses that I have spoken to are good at their jobs and know what they are talking about.”
Patient Respondents

Clinical triage was considered to be appropriate for instructing patients to take an extra puff (for example, for COPD patients) but not for advising on medicines.

The lack of communication between the triage nurse and the Trust clinician is an area which clinicians feel should be addressed. For example, given the regular contact between Service Provider 1 and the patient, some clinicians are of the view that there should be protocols for the service provider to contact the clinician on matters other than alerts, ie, if the patient states that they generally feel unwell, or if the monitor is not working.

Overall, with a view to considering the Value for Money aspect of the clinical triage service, clinicians indicated that a comparison could be drawn with the cost of a nursing auxiliary travelling around patient homes to take similar readings, compared to the cost of the service operating under clinical triage.

It was suggested that the Trusts have to consider how capacity could be increased. The other alternative to the current model of service provision was identified as triage being conducted within the Trust. In addition, a query was raised as to whether or not a regional clinical triage service would be incorporated within the Regional Contract for Tele-monitoring or whether individual Trusts would be responsible for taking this forward.

It was noted that for the diabetes programme, that a specialist diabetic nurse could be employed to look at trends, ask patients about their diet, stress etc and adjust medication on a real time basis.

4.10 Overall Satisfaction and Recommendations

Clinicians and patients recorded what they like Most about the Tele-monitoring project, which included:

Clinicians	Patients
<ul style="list-style-type: none"> • It is generally easy for the patient to use; • The reassurance that tele-health nurses are monitoring the readings and contacting the patients when necessary. • Advantage to patients in that they can manage their condition; • Reassures patients and gives them more confidence and trends over a period of time. • Enhanced patient support and care; • Improved patient monitoring and empowerment; • Decreased travel time visiting patients. • The observations are there before you go out to visit. • It has potential to manage long term conditions. 	<ul style="list-style-type: none"> • Alarm to remind you to monitor; • Contact with health sector personnel if there are any problems; • Easy to use and accessible; • Helps build confidence; • Reduced hospital visits; • Provides reassurance and a ‘peace of mind’; and • Provides continuous monitoring of conditions – continuous daily assessment.

Clinicians and patients recorded what they like least about the Tele-monitoring project, which included:

Clinicians	Patients
<ul style="list-style-type: none"> • It does not add a great deal to patient care; • Equipment can need modification, ie for volume control. • Patient selection process needs improved – some patients do not need the equipment; • Reduction in personal contact; • Can be alerts when not required. • Increased clinician workload; • Difficult to make ethical decisions based on data provided; • Occasional inaccurate data readings; • Poor communication between those implementing the project and the care team; 	<ul style="list-style-type: none"> • Found the blood pressure probe difficult to use; • It has to be connected to the telephone line; • Can be in the way; • Being restricted to using the system daily and at the same time every day;

Clinicians	Patients
<ul style="list-style-type: none"> • More could have been invested in IT, personnel and training; • It makes people dwell too much on their condition; • Patients can become more anxious and stressed about their condition. 	

The build up in patients participating in the pilot are noted in Section 2. There has been a tremendous effort made to increase levels of participants, hence some clinicians have felt rushed in the implementation process.

4.11 Clinician and Patients' Recommendations

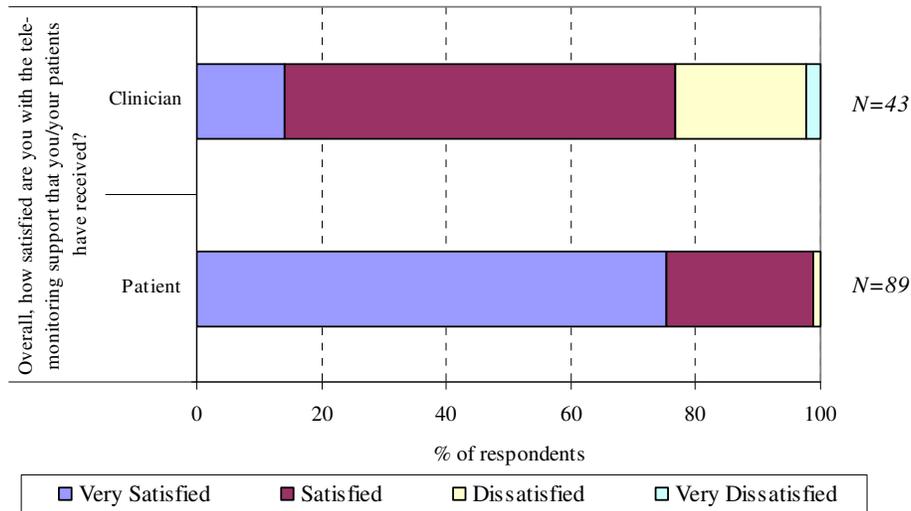
Clinicians and patients recorded recommendations for improvements on how the tele-monitoring pilot is delivered and on its content, which included:

Clinicians	Patients
<ul style="list-style-type: none"> • More flexible equipment and adaptable questions; • Quicker installation of equipment and notification when equipment is installed; • More clinician education and training; • Technology to allow patients to use the monitors, who do not have landline telephones; • More interface with the triage nurses and feedback on the quality of referral information, and questions being asked; • Greater buy-in at clinician stage and with GPs. • Better/stricter patient selection criteria; • Better communication between the clinicians and the Trust. • Increased allocation of resources/capacity and provision of fully functional equipment/IT; • More flexibility regarding the length of time patients will be using the equipment • Objectives and benefits understood by all. 	<ul style="list-style-type: none"> • More flexible times for monitoring especially at the weekend; • Longer notification when the machine would be removed. • More compact equipment; • Provision of a 'redo' option when undertaking readings.

4.12 Overall Satisfaction

The vast majority (77%, N=43) of clinicians and almost all patients (99%, N=89) stated that they were ‘very satisfied’ or ‘satisfied’ with the tele-monitoring support that patients received.

Figure 4.24: Satisfaction with tele-monitoring support received (Q24a – Clinicians/Q15 - Patients)



4.13 Conclusion and Operation of Pilots

In conclusion, clinicians and patients are, generally, satisfied with the way tele-monitoring operates in practice.

Around 80% of clinicians are satisfied with the way that tele-monitoring operates in practice – the quality of information is perceived as being good, the timeliness of alerts is good and clinicians generally feel comfortable in setting clinical parameters. Initial teething problems have largely been addressed, with clinicians also reporting the support received from the Trust tele-monitoring Co-ordinators, although, for some, the Co-Ordinator was only appointed well into the pilot phase. Some Trusts also report the difficulty faced by not having a specialist nursing team for COPD, diabetes etc.

Whilst some improvements were suggested relating to the flexibility and adaptability of equipment, clinicians were generally content with the accuracy of the readings and ease of use of the equipment.

With regards to the support received from each of the Service Providers of the triage service, clinicians were generally positive. Two-thirds of clinicians agree that the Service Providers provide a good service, with both of the Trusts having the clinical triage service and one of the Trusts having solely the triage service reporting satisfaction levels in excess of 80%. However, there are differences in perception between clinicians and patients in respect of the use of clinical triage – over 80% of clinicians are not confident that clinical triage is suitable for monitoring patients from a distance where the nurse has not met the patient in person. This compares to 90% of patients who are satisfied with clinical triage.

Clinicians noted the need to have a structured patient selection process and that tele-monitoring should be directed at those with the highest capacity to benefit. The patient selection process is all important, with clinicians confirming that tele-monitoring is not appropriate for all patients and that patient selection should be dependent on the severity of the disease as well as issues relating to patient dexterity etc.

Clinicians also noted that negative aspect of operating the scheme in the absence of GP buy in to the service, with many feeling that GPs should play a role in setting clinical parameters. Whilst 70% of clinicians were of the view that patient parameters are appropriately set, it was acknowledged that in the absence of GP involvement, and, in particular, for new clinicians joining the scheme, there can be a tendency to set narrow parameters, with resultant increased alerts.

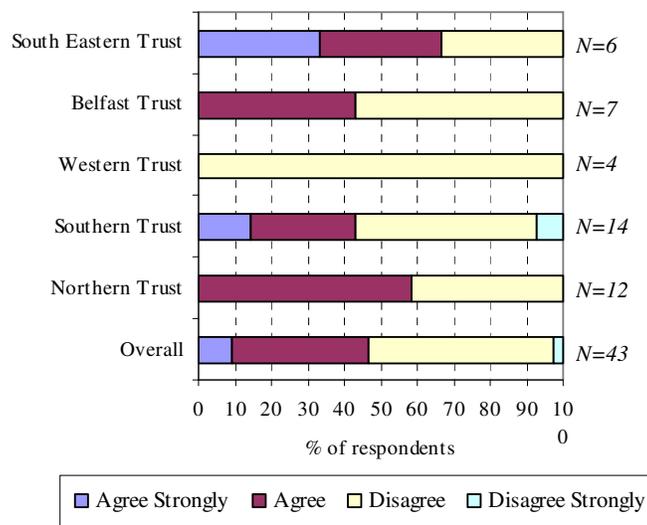
5 FIVE REMOTE TELE-MONITORING PROJECTS – PERCEIVED IMPACT ON ORGANISATION AND RESOURCE UTILISATION

Section 5 considers the perceived impact of the tele-monitoring pilots on the Trust itself, ie the Organization and on Resource Utilisation.

5.1.1 Patient-Centered

The majority of clinicians (70%, N=43) feel that the tele-monitoring pilot project was a patient centred service.

Figure 5.1: Tele-monitoring pilot project a patient centred service (16a – Clinicians)

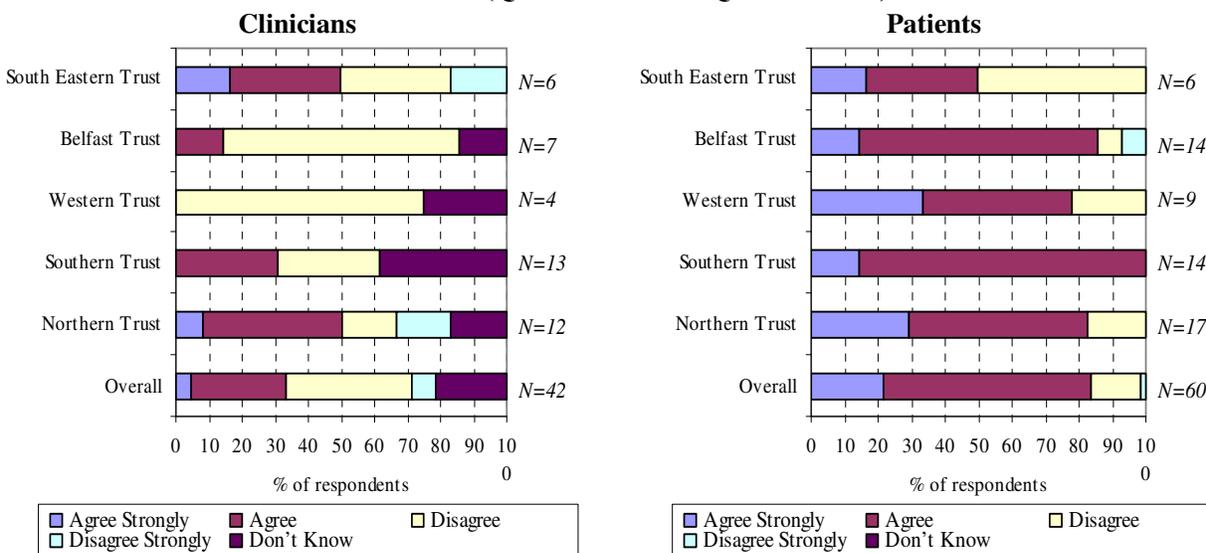


The one thirds of clinicians (30%, N=43) who disagreed or disagreed strongly that the tele-monitoring pilot project was a patient centred service felt that the focus was on meeting hospital targets.

5.2 Perceptions on Admissions to Hospital

Patients’ and clinicians’ perceptions vary in relation to the impact that the tele-monitoring pilot project has made on the number of times that the patients has been admitted (or readmitted) to hospital:

Figure 5.2: Perceived Impact on visits that patients have made to or received from health sector personnel – Admittance (re-admittance) to Hospital (Q10a – Clinicians/Q5a – Patients)



- One-third of clinicians (33%, N=42) and the majority of patients (83%, N=60) perceived that tele-monitoring has reduced the number of times that the participant patients have been admitted or readmitted to hospital. One-fifth (21%, N=42) of clinicians were unaware of the impact on patients. It was noted that the measurements of success vary between COPD and diabetic patients. For COPD patients, reductions in hospital admittances for acute episode was a critical measurement of success, whilst for patients with diabetes, it would be longer term health gains and immediate improvements in control over the disease;
- In addition, 13% of clinicians (N=39) perceived that tele-monitoring has reduced the length of time that participant patients have had to stay in hospital (if they have been admitted to hospital since they received the tele-monitoring equipment), 33% did not know whilst 54% disagreed that it had. Most patients (71%, N=24) agreed that it has reduced the length of time they had to stay in hospital. **(Q10a – Clinicians/Q5a – Patients)**

Comments include:

“It has cut down on overnight stays in hospital. Patients can deal with their condition better and only require hospital when necessary.”

Clinician Respondents

Clinicians acknowledged the impact that remote monitoring can have on hospital admissions. For example, through alerts, they can prescribe medication or physiotherapy which might prevent hospital admission or mean that the patient’s period in hospital is shorter. Where patients are admitted to hospital, it is generally the case that such admissions are appropriate.

5.3 Perception on Referral to A&E (Q10a – Clinicians)

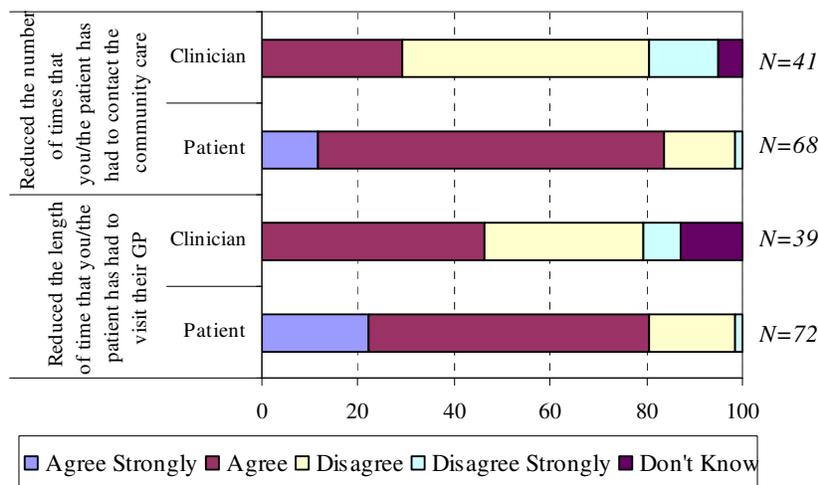
31% (N=42) of clinicians ‘agreed’ that in their view, tele-monitoring has reduced the number of times that the participant patients have self-referred themselves to A&E, 43% disagreed that it had led to a reduction, whilst the remaining 26% stated that they did not know.

5.4 Perception on GP visits and Community Care Nurse Contact

There were positive responses in relation to the perceived reductions in GP visits, although differences in opinion as to the impact on reductions in community nursing contact:

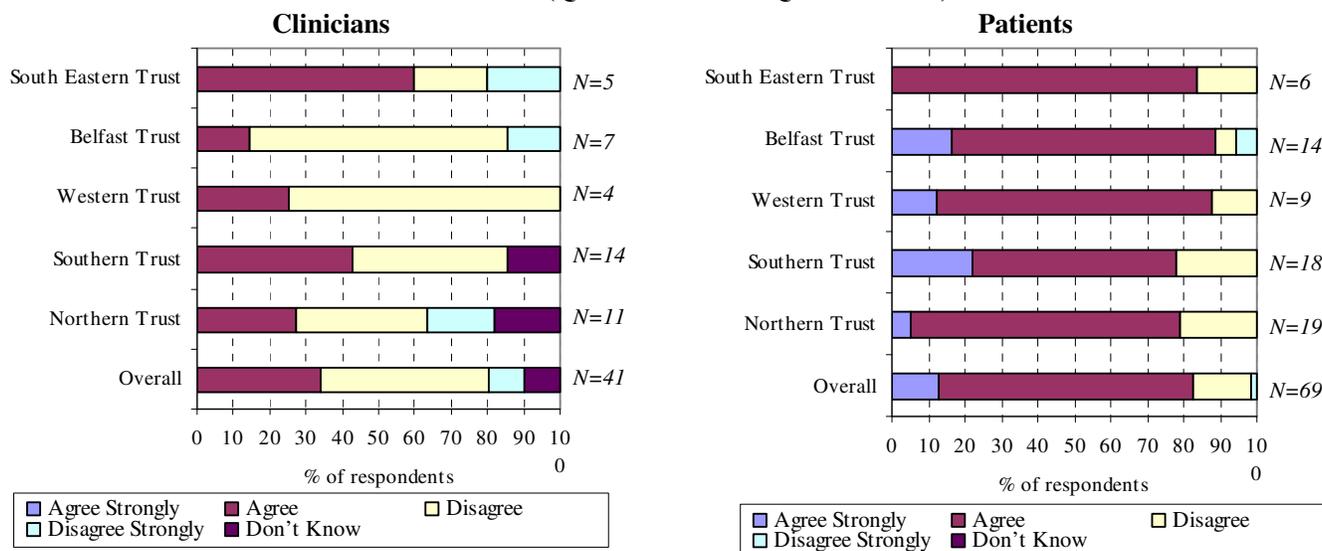
- Almost half of clinicians (46%, N=39), and most 81%, N=72) patients are in agreement that tele-monitoring reduced the number of times that the patient has had to visit their GP.
- 29% (N=41) of clinicians and 84% (N=68) of patients ‘agreed’ that tele-monitoring has reduced the number of times that participant patients have had to contact their community care nurse by phone; 66% of clinicians ‘disagreed’ with this statement, whilst 5% did not know.

Figure 5.3: Perceived Impact on visits that patients have made to or received from health sector personnel (Q10a – Clinicians/Q5a – Patients)



Clinicians and patients have varying views on the impact on the number of visits that the patient has needed from the community care nurse. One-third of clinicians (34%, N=41) and the majority of patients (83%, N=69) perceived that tele-monitoring has reduced the number of visits that participant patients have needed. 56% of clinicians disagreed with this statement, citing an increase in the number of visits.

Figure 5.4: Perceived Impact on visits that patients have made to or received from health sector personnel – Reduction in number of visits from community care nurse (Q10a – Clinicians/Q5a – Patients)



Overall, Belfast Trust disagreed most with the statement that visits by the community nurse had been reduced. In contrast, 60% of clinicians in the South Eastern Trust considered that their number of visits had reduced. There was mixed views from these delivering diabetes care, with this partially reflecting the length of time involved in the pilot. Accordingly, community diabetes nurses from SEHSCT reported increased workloads, whilst conversely the consultants administering remote monitoring for diabetic patients from the hospital setting, noted the increased throughput of patients.

Comments include:

“For Diabetes, I had included my most severe cases, but the level of my input has not reduced at all”

“Since the project commenced, patients tend to contact me more with an increased level of queries.”

“Remote monitoring has increased the number of diabetic patients I can see at the virtual clinic.”

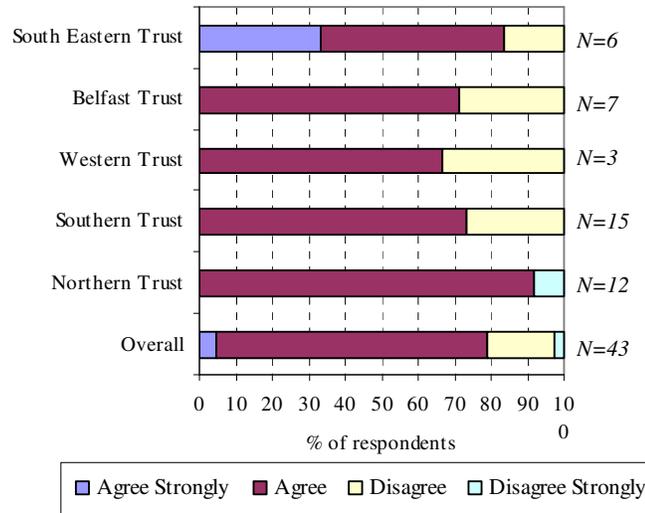
Clinician Respondents

5.5 **Impact on the Trust**

5.5.1 **Access to Information**

The vast majority of clinicians (79%, N=43) ‘agree’ or ‘strongly agree’ that tele-monitoring provides them with ready access to useful information on their patients' conditions and treatment.

Figure 5.5: Impact tele-monitoring has had on clinician’s Trust – access to useful information (Q17a – Clinicians)



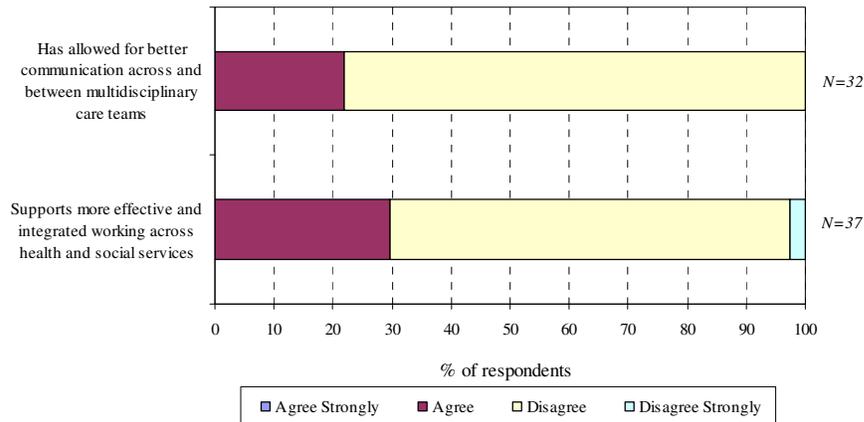
5.5.2 **Promotion of Effective and Integrated Working or Better Communication**

Communication would appear to be an area requiring attention, with clinicians also raising concerns as to their increased work loads rather than effective workings across the Trust.

The majority of clinicians (70%, N=37) ‘disagree’ or ‘strongly disagree’ that tele-monitoring supports more effective and integrated workings across health and social services.

Furthermore, over three quarters (78%, N=32) ‘disagree’ that it has allowed for better communication across and between multidisciplinary care teams.

Figure 5.6: Impact tele-monitoring has had on clinician’s Trust (Q17a – Clinicians)



Comments include:

“It has greatly increased our workload, particularly the administrative burden.”

“All GPs are not ‘on board’. They need to be better informed.”

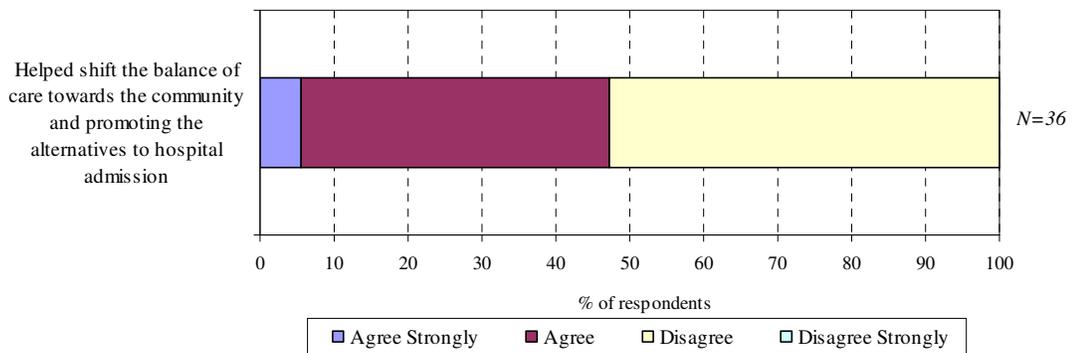
“There is little scope for integration – tele-monitoring is the responsibility of the specialist nursing teams”

Clinician Respondents

5.5.3 Promotion of Alternative to Hospital Admission

Almost half of clinicians (47%, N=36) ‘agreed or strongly agreed’ with the perception that tele-monitoring has helped shift the balance of care towards the community and promoting the alternatives to hospital admission. The remaining 53% (N=36) ‘disagreed’ with this statement.

Figure 5.7: Perceived Impact tele-monitoring has had on clinician’s Trust (Q17a – Clinicians)



5.5.4 Perceived Impact on Resources and Service Provision

There are mixed views on the perceived impact on resources and whether or not tele-monitoring has allowed for a better use of clinician resources.

- 45% (N=42) of clinician ‘agreed’ or ‘strongly agreed’ whilst over half (55% N=42) of clinicians either ‘strongly disagreed’ or ‘disagreed’ that tele-monitoring improved the service that they personally provide to their patients; **(Q17a – Clinicians)**
- 39% of clinicians (N=33) ‘strongly agreed’ or ‘agreed’ with the perception that tele-monitoring allows for a better use of other health practitioner resources. The majority of clinicians (61% N=33) ‘strongly disagreed’ or ‘disagreed’ that tele-monitoring allows for a better use of other health practitioner resources; and
- 43% (N=42) of clinicians either ‘strongly agreed’ or ‘agreed’ that the project allows for a better use of their resources. The remaining 57% (N=42) of clinicians either ‘strongly disagreed’ or ‘disagreed’ that the project allows for a better use of their resources.

The results show a level of consistency across the Trusts. The COPD clinicians within the South Eastern Trust, who conducted the initial pilot and thus were more familiar with tele-monitoring, were the most positive:

Figure 5.8a: Perceived Impact tele-monitoring has had on clinician’s Trust – Allows for a better use of your resources (Q17a – Clinicians)

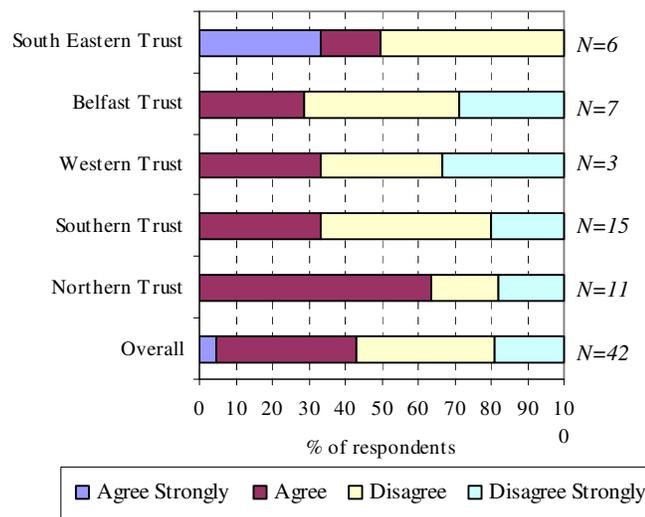
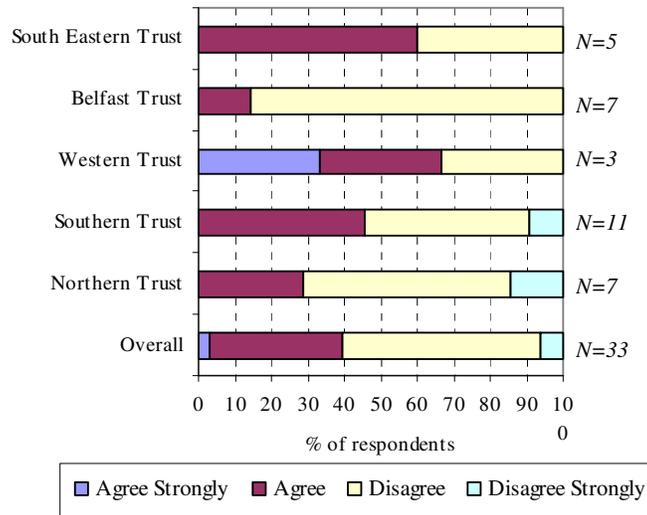


Figure 5.8b: Perceived Impact tele-monitoring has had on clinician’s Trust – Allows for a better use of other health practitioner resources (Q17a – Clinicians)



Comments include:

“You are able to focus on one to one care by staying in touch.”

“It can allow for better use of resources in some cases, but has increased the workload in other cases.”

Clinician Respondents

5.5.5 Perceived Impact on Clinicians' Workload

All or almost all of the clinicians 'agree' or 'strongly agree' with the view that tele-monitoring had increased their workload (96%, N=43). 47% (N=42) of clinicians 'agreed' or 'strongly agreed' that they have adequate time to address patients' needs arising from tele-monitoring, with the remainder disagreeing.

Figure 5.9a: Perceived Impact tele-monitoring has had on clinician's Trust – Increased clinician workload (Q17a – Clinicians)

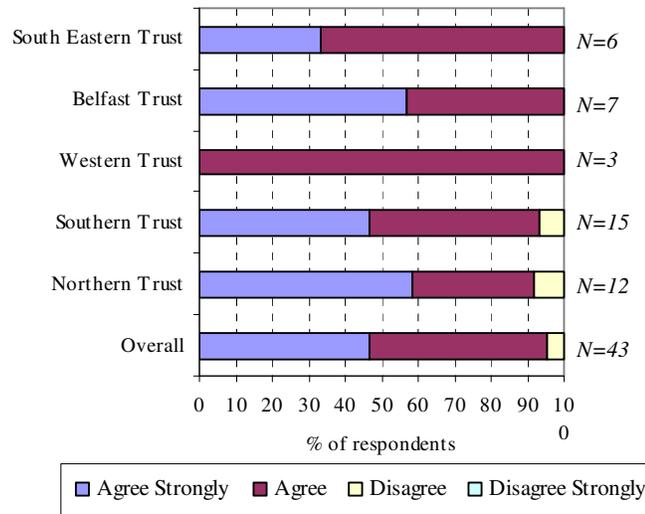
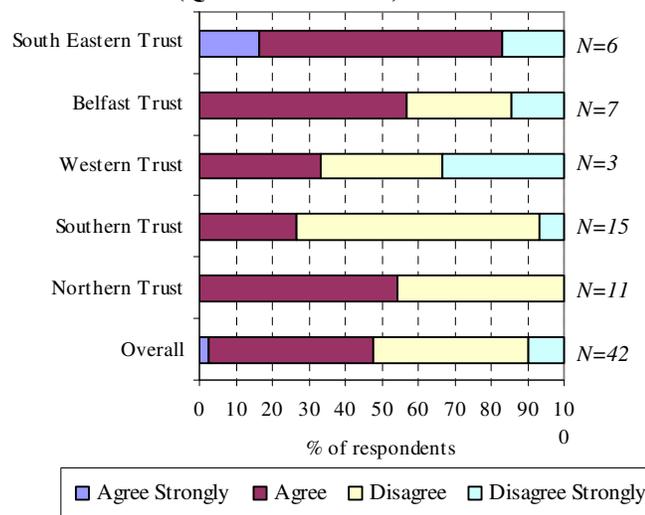


Figure 5.9b: Perceived Impact tele-monitoring has had on clinician's Trust - adequate time is provided to address patients' needs arising from tele-monitoring (Q17a – Clinicians)



The Southern Trust disagreed most that they have adequate time to address patients' needs, whilst the South Eastern Trust were most comfortable that they were addressing patients' needs. As noted above, the South Eastern Trust (and specifically the COPD clinicians in the South Eastern Trust) were most familiar with the tele-monitoring project. Comments include:

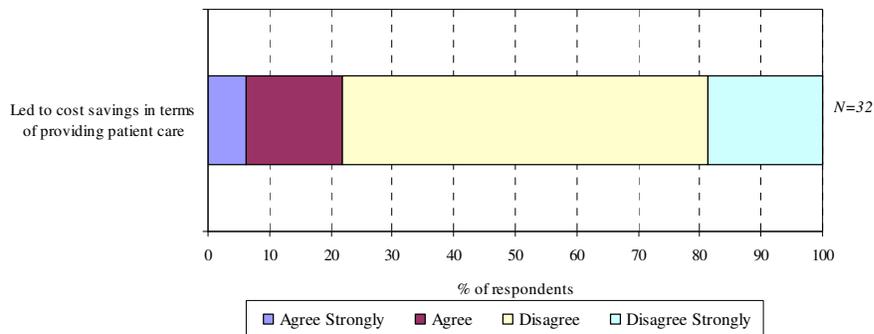
“The project has increased our workload, through the administration (referral system), receiving of alerts, making time to follow up with alerts. This must be balanced against more information on patients and a better service for patients”

Clinician Respondents

5.5.6 Perceived Impact on Costs

The majority of clinicians (78%, N=32) ‘disagree’ or strongly disagree’ with the view that tele-monitoring has led to costs savings in terms of providing patient care. However, 22% (N=32) did agree that cost savings had been achieved.

Figure 5.10: Perceived Impact tele-monitoring has had on clinician’s Trust (Q17a – Clinicians)



5.5.7 Perceived Impact on Nursing Care

There were mixed views on the perceived impact on nursing care:

- Over one quarter (27% N=41) of clinicians either ‘strongly agreed’ or ‘agreed’ with the view that tele-monitoring allowed them to focus more on one-to-one care by actually reducing the daily visit schedule and eliminating unnecessary visits; the remaining 73% (N=41) either ‘strongly disagreed’ or ‘disagreed’;
- The majority (70% N=40) of clinicians stated they either ‘strongly disagreed’ or ‘disagreed’ that it allows nurses to look after more patients than they would otherwise be able to; and
- Half (50% N=40) of clinicians stated the project allows nurses to better target those patients that need more support; the remainder ‘strongly disagreed’ or ‘disagreed’.

Figure 5.11a: Perceived Impact tele-monitoring has had on clinician’s Trust - Allowed clinicians to focus more on one-to-one care by actually reducing he daily visit schedule and eliminating unnecessary visits (Q17a – Clinicians)

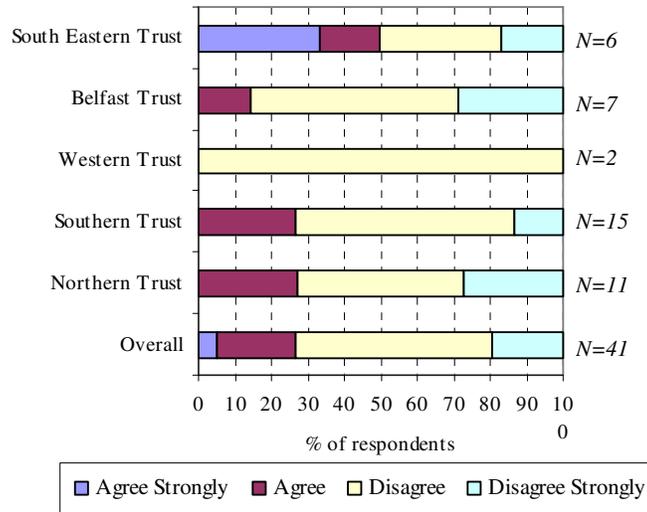


Figure 5.11b: Perceived Impact tele-monitoring has had on clinician’s Trust - Allows nurses to look after more patients than they would otherwise be able to (Q17a – Clinicians)

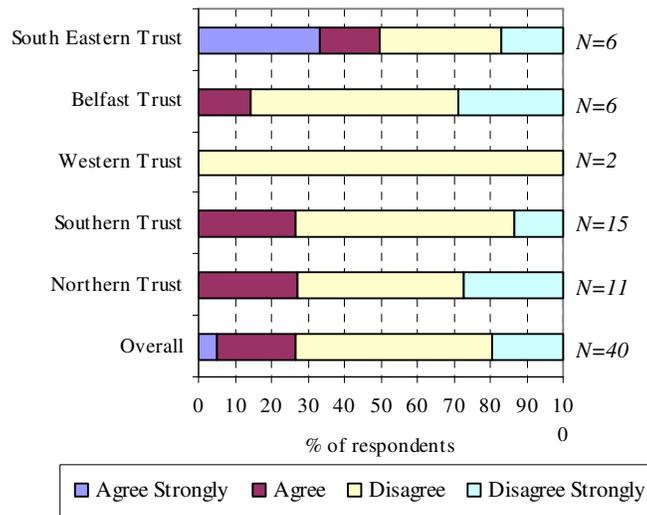
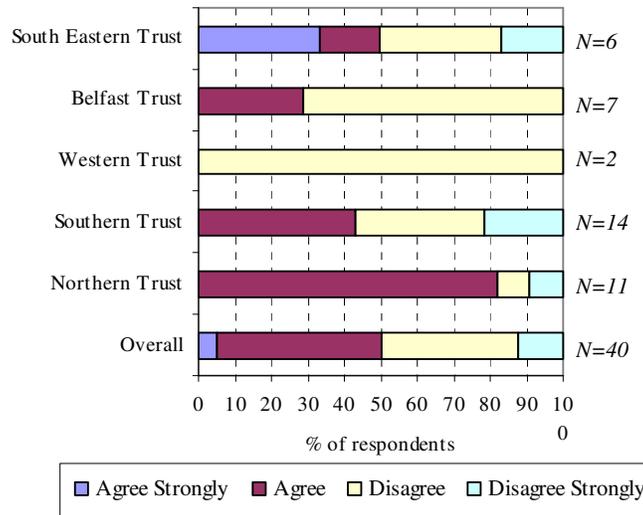


Figure 5.11c: Perceived Impact tele-monitoring has had on clinician’s Trust - Allows nurses to better target those patients that need more support (Q17a – Clinicians)

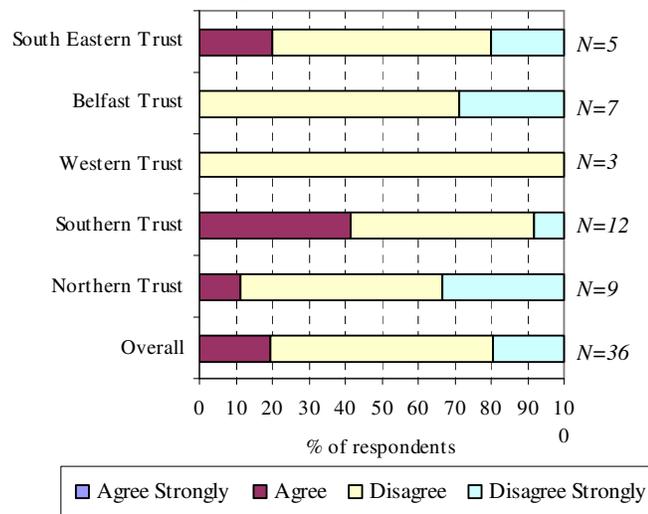


5.5.8 Degree to which Tele-Monitoring is Accepted

The majority of clinicians ‘disagree’ or ‘strongly disagree’ that tele-monitoring:

- Is viewed as a way of replacing traditional nursing services with more a impersonal service (57%, N=42) (Q17a – Clinicians); and
- Is accepted by the medical community at large (81%, N=36).

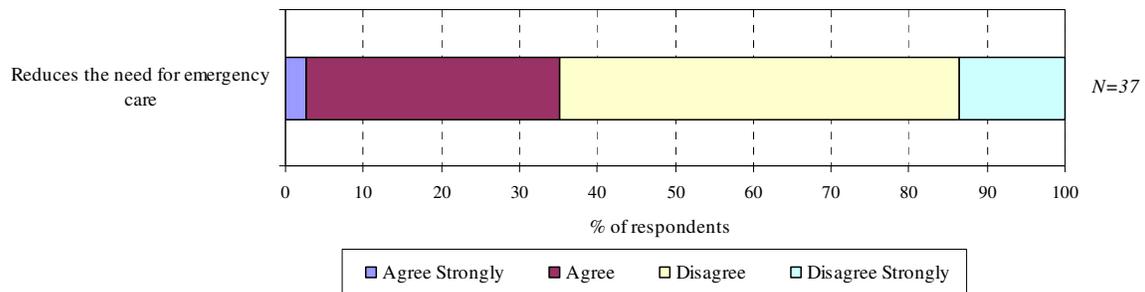
Figure 5.12: Impact of tele-monitoring on the Trust – acceptance (Q17a – Clinicians)



5.5.9 Perceived Impact on Need for Emergency Care

The majority (65%, N=37) clinicians ‘disagreed’ or ‘strongly disagreed’ that tele-monitoring reduces the need for emergency care. The remaining 35% (N=37) agreed.

Figure 5.13: Perceived Impact tele-monitoring has had on clinician’s Trust (Q17a – Clinicians)



5.5.10 Perceived Impact on Patient Management and Visits

Clinicians agree that tele-monitoring enhances patient management:

- Over half of the clinicians (52%, N=42) ‘agreed’ or ‘strongly agreed’ with the view that tele-monitoring enhances patient management and home visit planning, whilst the remainder disagreed;
- The majority of clinicians (70%, N=40) ‘agreed’ or ‘strongly agreed’ that instances of alerts created by patient measurements falling outside of specific guidelines have resulted in additional visits for them. The remaining 30% disagreed.

Figure 5.14a: Perceived Impact tele-monitoring has had on clinician’s Trust - Tele-Monitoring enhances patient management and home visit planning (Q17a – Clinicians)

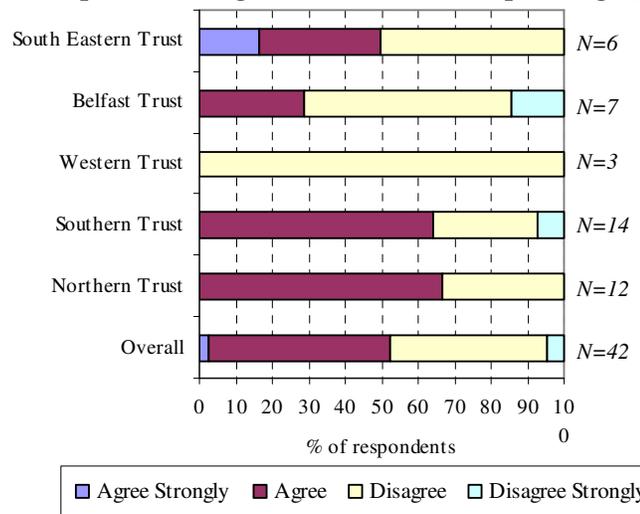
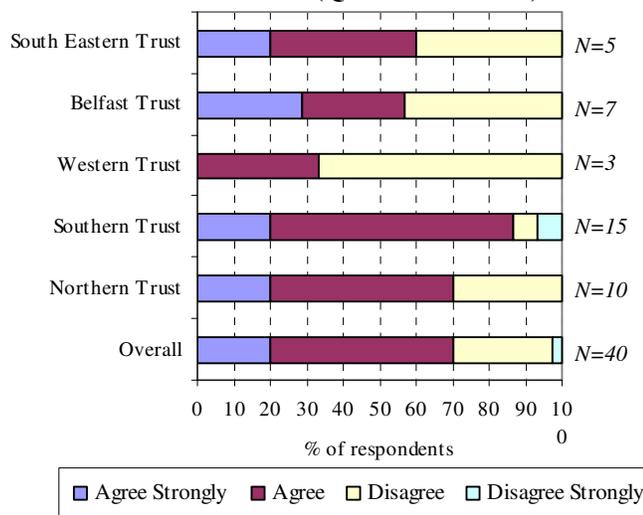


Figure 5.14b: Perceived Impact tele-monitoring has had on clinician’s Trust - Instances of alerts created by patient measurements falling outside of specific guidelines have resulted in additional visits (Q17a – Clinicians)



Clinicians reported changes to a Trust’s resources that could improve the rollout of the service:

- Being able to use different types of diabetes metre, rather than the one stipulated by the tele-health provider;
- Better provision of information and training at the outset;
- Extra Staff.

5.6 Conclusion on Organisation and Resource Utilisation

In general, there were differences in perceptions amongst clinicians and patients as to the impact of remote tele- monitoring on the Trusts and on resource utilization, with one third to one half of the clinicians reporting a positive impact, as compared to the majority of patients.

Around 50% of clinicians felt that remote tele-monitoring had a positive impact on organization effectiveness. In particular, about one third of clinicians were of the view that remote tele-monitoring had contributed to reduced utilization of hospital and community services, including reduced visits to GPs and contact with the community care nurses. This compares to the patient feedback, with circa 80% of patients reporting their perceptions that the pilots have had a positive impact on utilization of Trust resources. There are similar differences in perception as to the impact on the length of time in hospital – over 70% of patients are of the view that tele-monitoring has reduced the length of time that they have had to stay in hospital, as compared to 13% of clinicians.

The majority of clinicians did agree that the projects had a positive impact on further developing a patient-centred case management approach, with 70% of clinicians reporting remote tele-monitoring pilot project to be a patient centred service. Generally, however, clinicians reported that patients continued to get the same, high, level of care regardless of the remote tele-monitoring scheme. However, almost half of the clinicians did report that remote tele-monitoring had led to an improvement in the service that they personally provided to the patient and that it allows nurses to better target those patients that need more support.

However, almost all clinicians were of the view that remote tele-monitoring increased their workloads, with this being a particular concern of those clinicians who were still relatively new to the scheme. This response would appear to be heavily influenced by the rapid growth in participant patient numbers and increases in case loads since November 2008.

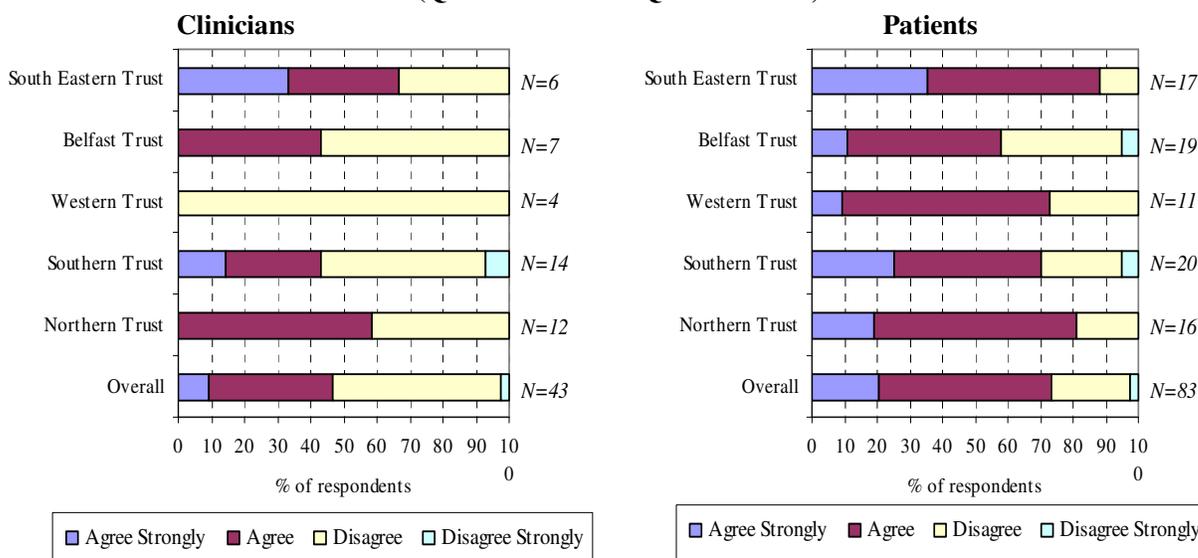
6 FIVE REMOTE TELE-MONITORING PROJECTS – PERCEIVED IMPACT ON HEALTH AND WELLBEING

Section 6 considers the perceived impact that the remote tele-monitoring projects has had on patients’ health and wellbeing.

6.1 Perceived Impact on Quality of Life

Clinicians and patients report varying impacts on life and wellbeing, with patients being largely positive.

Figure 6.1: Perceived Impact on life and wellbeing Improved overall quality of Life (Q11a – Clinicians/Q6a – Patients)



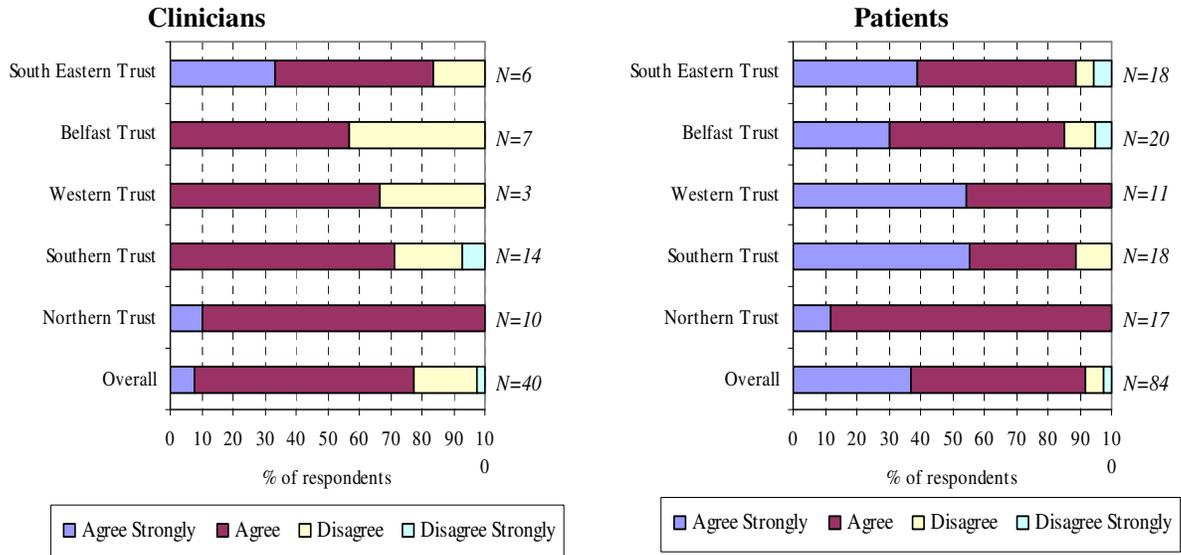
- Almost half of the clinicians (47%, N=43) and the three quarters of patients (73%, N=83) are in agreement that tele-monitoring has improved the patients’ overall quality of life; and
- Similarly, the majority of clinicians (53%, N=40) and patients (75%, N=75) are in agreement that tele-monitoring has ensured that patients’ quality of life did not deteriorate.

6.2 Perceived Impact on Levels of Stress and Anxiety

Clinicians and patients were in agreement that tele-monitoring makes patients less anxious and providing reassurance:

- The majority of clinicians (74%, N=42) and patients (85%, N=85) are in agreement that the tele-monitoring project made patients feel less anxious or stressed about their health and has provided them with 'peace of mind'; and
- Similarly, the majority of clinicians (78%, N=40) and patients (92%, N=84) are in agreement that the tele-monitoring project provided patients with reassurance and helped them feel safer at home.

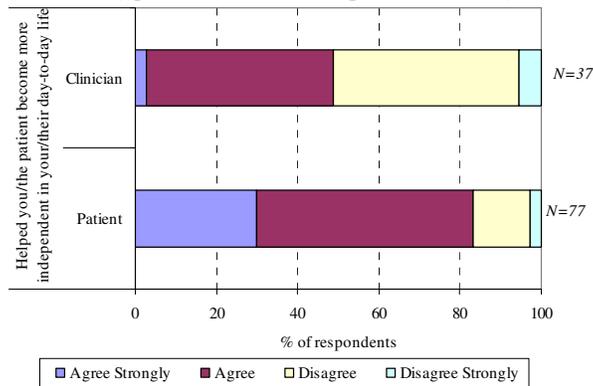
**Figure 6.2: Perceived Impact on life and wellbeing
Provided you with reassurance and helped you feel safer at home
(Q11a – Clinicians/Q6a – Patients)**



6.3 Perceived Impact on Patients’ Independence

Clinicians and patients vary in their views as to the impact tele-monitoring has had on patients’ independence:

**Figure 6.3: Perceived Impact on life and wellbeing
(Q11a – Clinicians/Q6a – Patients)**



Almost half of clinicians (49%, N=37) and the vast majority (83%, N=77) of patients are in agreement that tele-monitoring has allowed them to become more independent. The remaining clinicians and patients disagreed that this was the case.

“Patients are much more relaxed as they have access to readings on their condition. They are less stressed and feel safer, but not independent in their day to day life.”

Clinician Respondents

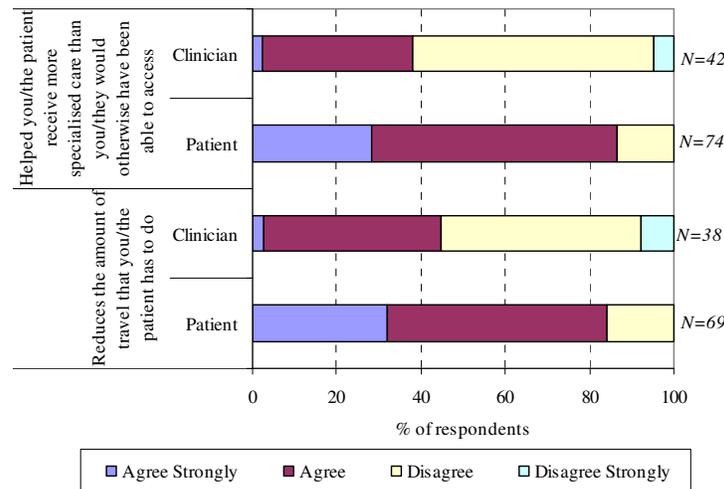
It was noted that patients with very severe conditions might not go outside of the home, or go on holidays, and tele-monitoring might have minimal impact in this respect. The Trusts would

however need to have a system of notification if equipment was likely to be idle because patients were on holiday.

6.4 Perceived Impact on Specialist Care and Travel

Opinions again differ in relation to the impact that the project has had on the level of specialised care that patients receive as a result of the project. This largely reflects clinicians' view that the level of specialized care was already high, whilst patients take added comfort from the tele-monitoring service:

Figure 6.4: Perceived Impact on patients (Q14a – Clinicians/Q9a – Patients)



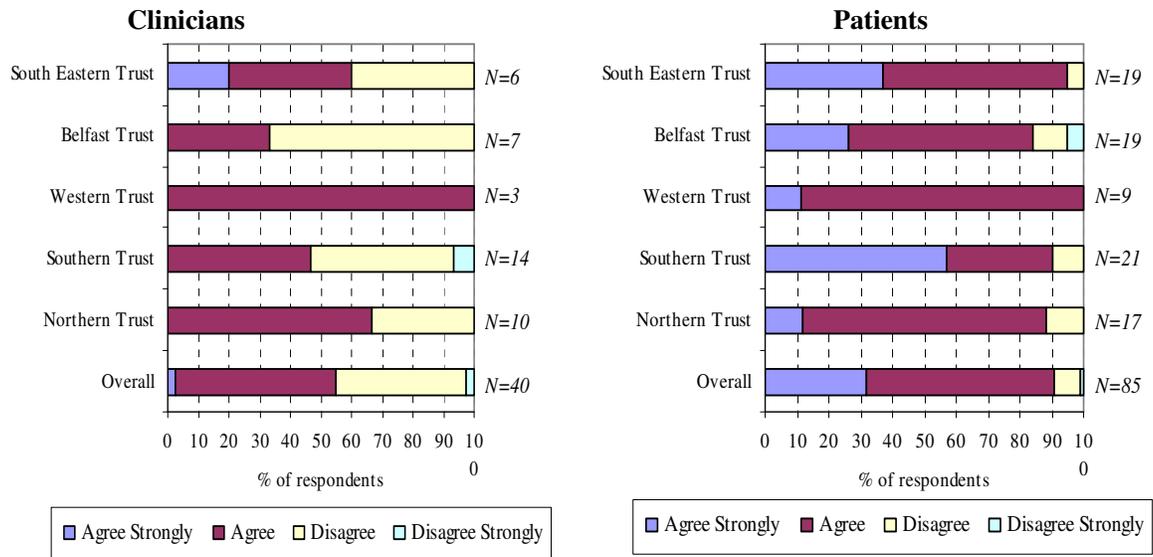
Clinicians and patients report their perception of an impact on aspects of the patient's health relating to the Patients' Chronic conditions:

- Almost half of clinicians (45%, N=38) and the majority (84%, N=69) of patients were in agreement that the tele-monitoring project reduces the amount of travel that they have to do to visit health professionals relating to their chronic condition;
- Almost two fifths of clinicians (38%, N=42) and the vast majority (86%, N=74) of patients were in agreement with the view that tele-monitoring helps patients receive more specialised care than they would otherwise have been able to access e.g.: because of geography, transport issues or infirmity; and
- The majority of patients (80%, N=79) ‘strongly agreed’ or ‘agreed’ that the tele-monitoring project saves them time.

6.5 Perceived Impact on Overall Care Received

The majority of clinicians (55%, N=40) and the vast majority (91%, N=85) of patients were in agreement, that tele-monitoring helps to improve the overall standard of care that patients receive.

**Figure 6.5: Perceived Impact on patients
Helped to improve the overall standard of care that you receive
(Q14a – Clinicians/Q9a – Patients)**



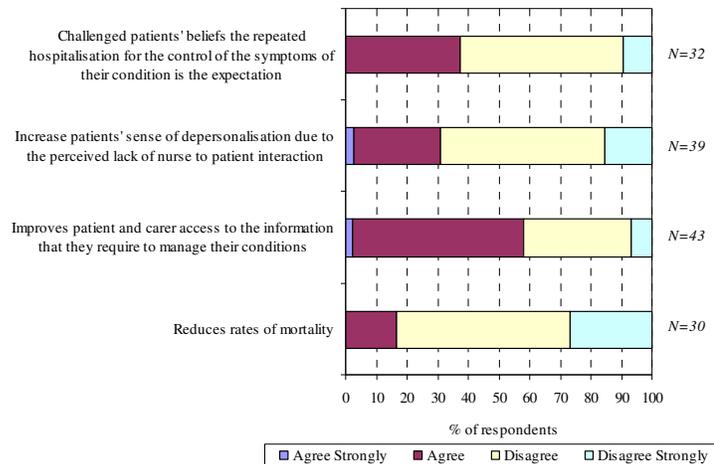
6.6 Perceived Impact on Patients' Beliefs, Mindsets and Mortality

Tele-monitoring has had varying impact on aspects of the patient's health relating to the Patients' Chronic conditions – The majority of clinicians ‘disagreed’ or ‘strongly disagreed’ that the tele-monitoring project:

- Reduces rates of mortality (83%, N=30); and
- Challenged patients' beliefs that repeated hospitalisation for the control of the symptoms of their condition is the expectation (63%, N=32).

However, the majority of clinicians (58%, N=43) ‘agreed’ that the tele-monitoring project improves patient and carer access to the information that they require to manage their conditions and felt that it did not increase patients’ sense of depersonalisation due to the perceived lack of nurse to patient interaction (69%, N=39).

Figure 6.6: Perceived Impact on patient's health relating to the Patients' Chronic conditions (Q14a – Clinicians)



Comments include:

“The project helps patients receive more care from the Trust; there is actually an increase in nurse/patient interaction.”

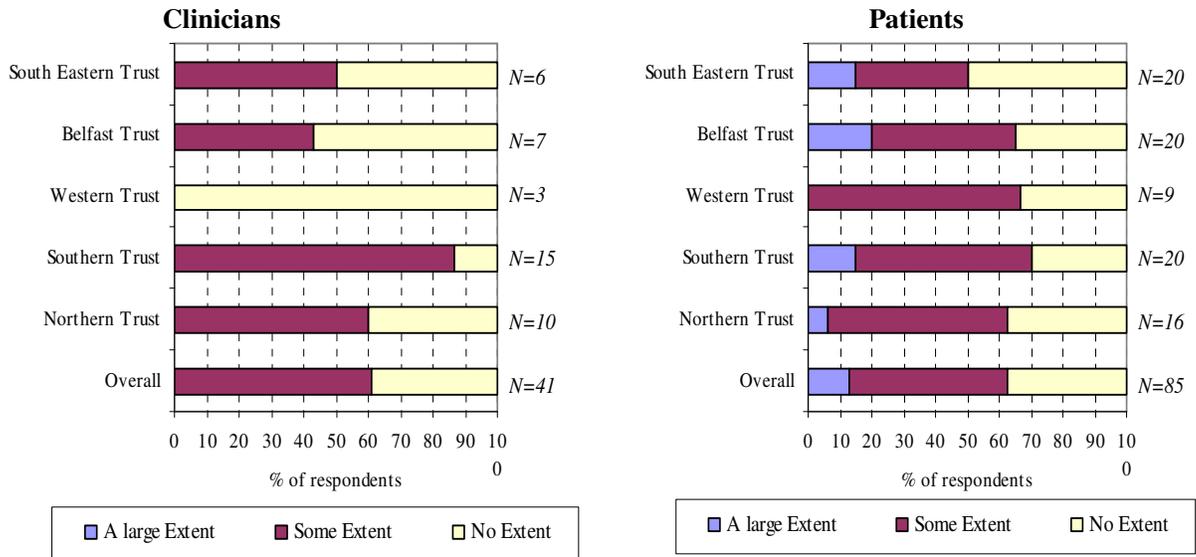
“Patients already received a good amount of care. But possibly has opened them up to receiving more information or seeking it out for themselves.”

Clinician Respondents

6.7 Perceived Impact on Patients' Lifestyles

Almost two thirds of clinicians (61%, N=41) and patients (62%, N=85) reported that tele-monitoring has changed patients lifestyles to ‘some’ or ‘a large’ extent. The remaining clinicians and patients disagreed that there has been an impact on the patient’s lifestyle. The results from clinicians were similar across all Trusts with the exception of the Western Trust, although all Western Trust clinicians (n=3) do acknowledge that the pilot has resulted in a positive impact on patients health, has encouraged patients to take their medicine at the right time and to think more about their symptoms.

Figure 6.7: Changes to patient lifestyle (Q15a – Clinicians/ Q10a – Patients)

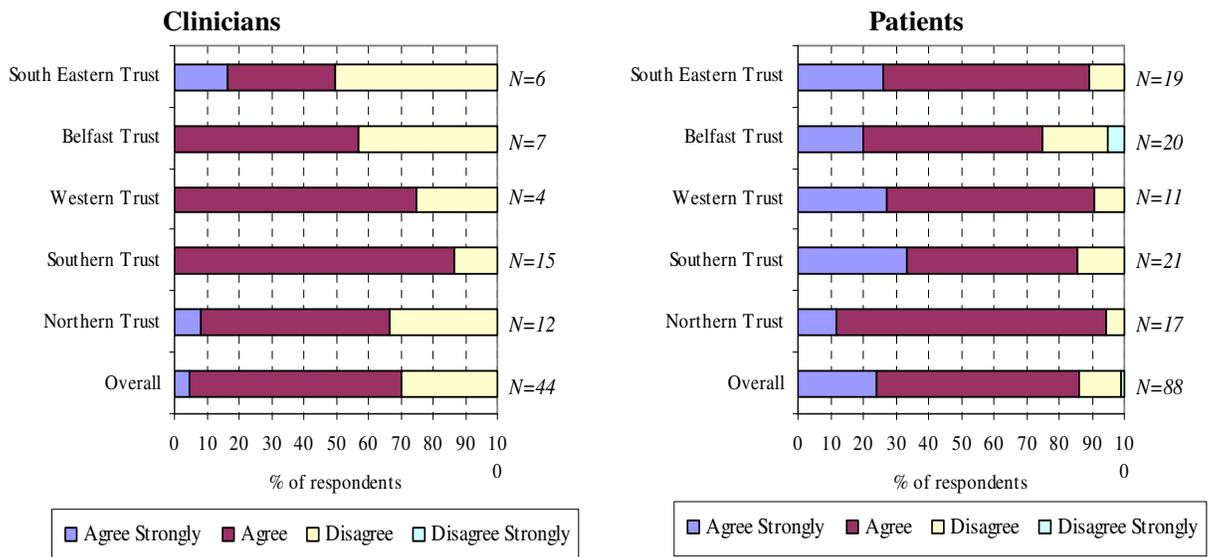


6.8 Perceived Impact on Patients’ Health

Clinicians and patients report positive perceptions on impacts on patients’ health:

- 70% of clinicians (N=44) and the vast majority of patients (86%, N=88) are in agreement that the tele-monitoring project has helped patients manage their illness better;
- Almost half of clinicians (43%, N=42) and over half of the patients (57%, N=77) are in agreement that the tele-monitoring project led to improvements in their health. The remaining clinicians and patients disagreed that this is the case. (Q12a – Clinicians/ Q7a – Patients)

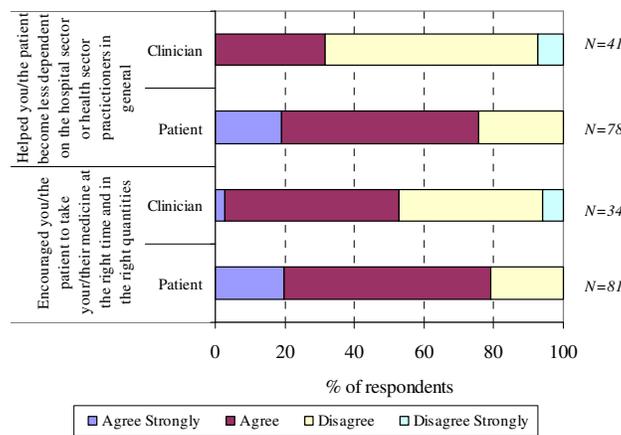
Figure 6.8a: Perceived Impact on patient health - Helped manage illness better (Q12a – Clinicians/ Q7a – Patients)



6.9 Perceived Impact on Patients’ Medicine Compliance and Reliance on Health Sector

- Over half of clinicians (53%, N=34) and the vast majority of patients (79%, N=81) are in agreement that the project has encouraged patients to take their medicine at the right times and in the right quantities;
- Almost one third of clinicians (32%, N=41) and the majority of patients (76%, N=78) agree that the tele-monitoring project has helped them become less reliant on the hospital sector or health sector practitioners in general. 68% (N=41) of clinicians disagreed that this was the case.

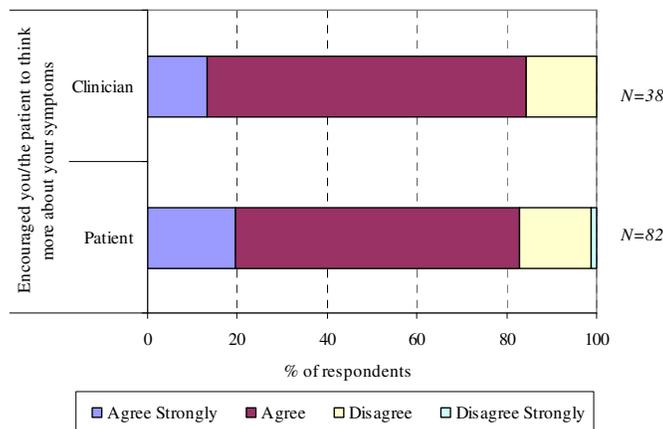
Figure 6.8b: Perceived Impact on patient health (Q12a – Clinicians/ Q7a – Patients)



6.10 Perceived Impact on Patients’ Awareness of their Symptoms

Encouragingly, over four fifths of clinicians (84%, N=38) and the vast majority of patients (83%, N=82) are in agreement that tele-monitoring has encouraged patients to think more about their symptoms.

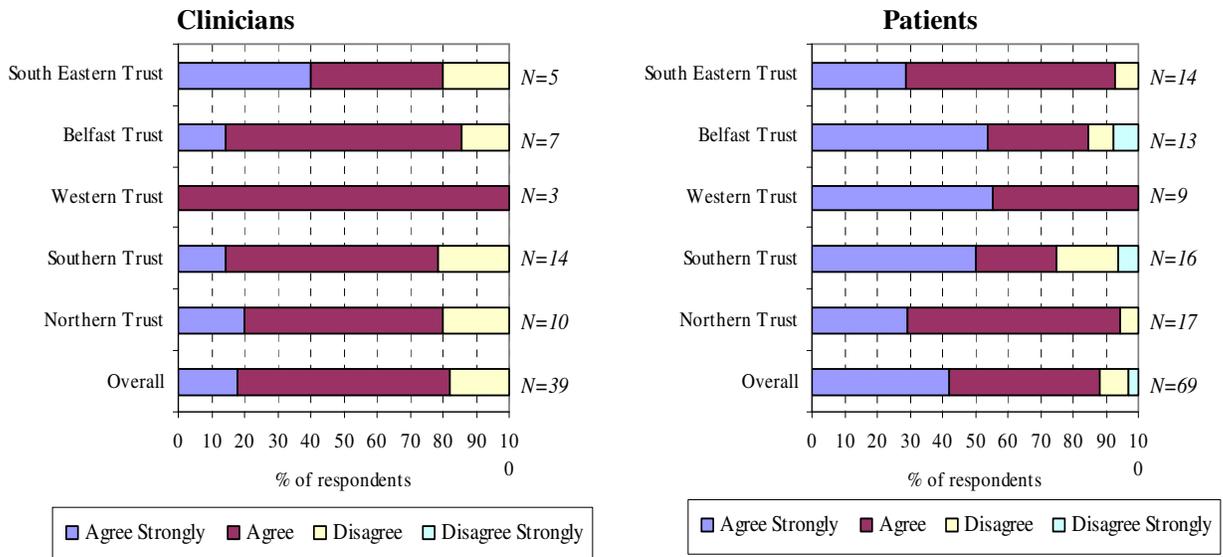
Figure 6.9: Perceived Impact on patient health (Q12a – Clinicians/ Q7a – Patients)



6.11 Perceived Impact on Patients’ Families and Carers

Moreover, the majority of clinicians (82%, N=39) and patients (88%, N=69) are in agreement that the tele-monitoring project has been of benefit to their family and carers.

Figure 6.10: Perceived Impact on family and carers (Q13a – Clinicians/ Q8a – Patients)



Comments from patients included:

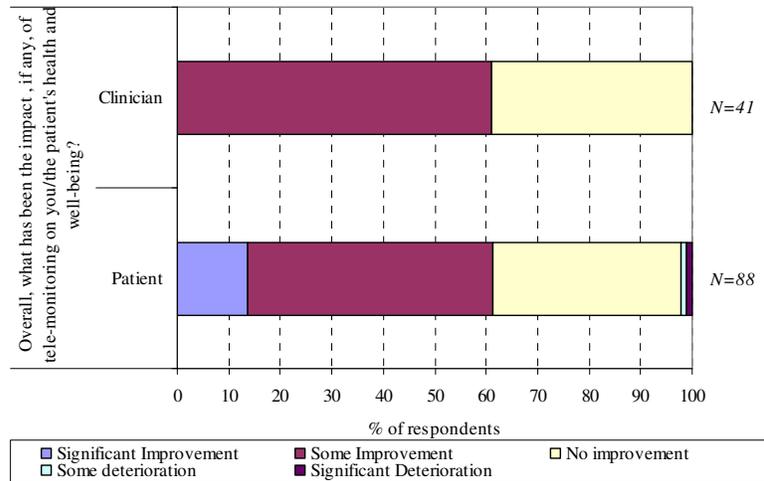
“It gives my family great peace of mind knowing that I am being monitored.”
Patient Respondents

6.12 Overall Impact on Patient Health and Well-Being

Clinicians and patients report positive impact of tele-monitoring on patients’ overall health and wellbeing:

- Almost two thirds (61%, N=41) of clinicians state that overall there has been ‘some improvement’ in their patients’ health and well being; the remaining 39% (N=41) state there has been ‘no improvement’. This compares to almost two-thirds (62%, N=88) of patients who stated that overall tele-monitoring has led to a ‘significant’ or ‘some improvement’ in their overall health and wellbeing.

Figure 6.11: Perceived Impact of tele-monitoring on patient health and wellbeing (Q23a – Clinicians/ Q14a – Patients)



6.13 Conclusion on Health and Wellbeing

Patients and clinicians are positive about the benefits that patients have derived from the Remote Tele-Monitoring’ pilot projects, including impact upon quality, safety and patient experience. In terms of quality of care, over 50% of clinician and over 90% of patients, consider that, in their view, the scheme has helped to improve the overall standard of care that patients receive. Patients report their satisfaction with the continuous monitoring with this making them feel safer and more content - over 80% of patients and 70% of clinicians report that remote tele-monitoring has provided reassurance to them and their carers and made them feel safer at home.

Patients are positive about the benefits from the Remote Tele-Monitoring’ pilot projects, including impact upon quality of life and general health and well-being. Over 70% of patients report their perceptions that remote tele-monitoring has led to an overall improvement in their quality of life and ensured that their quality of life did not deteriorate. In addition, over 60% of patients and clinicians agree that the pilots have led to patients making changes to their lifestyle and to an overall improvement in patient health and well being.

7 OVERVIEW OF THREE ADDITIONAL MONITORING PROJECTS

This section sets out an overview of the three remaining remote monitoring projects.

7.1 Belfast Health & Social Care Trust – ICD for Heart Failure

Under the ICD for Heart Failure pilot, patients across Northern Ireland with implantable cardiac devices for heart failure and arrhythmias were being monitored remotely. Using equipment installed in their own homes and the readings uploaded to a secure website, their vital signs are monitored and uploaded to a secure website. At March 2009, there were 599 patients being monitored under this scheme.

The evaluation of the ICD for Heart Failure pilot took the form of:

- A telephone survey with participating clinicians (n=6);
- A telephone survey with participating patients (n=38);
- A focus group session with participating clinicians; and
- A face-to-face consultation with the BHSCCT's ICD for Heart Failure co-ordinator.

Findings are set out below.

7.1.1 Key issues for the Operation of the Pilot

Clinicians agree that remote-monitoring for ICD patients is likely to become mainstream for all patients- 100% (N=6) of clinicians, either 'strongly agreed' or 'agreed' that remote-monitoring is likely or has become mainstream for all patients.

100% (N=6) of the clinicians either 'strongly agreed' or 'agreed' that remote-monitoring should become mainstream for patients with heart failure, arrhythmia and cardio-myopathy.

Ease of use was reported in respect of the equipment. All clinicians agreed that the Patient information uploaded to the secure website can be easily analysed and is easy to interpret, over 80% of clinicians and over 95% of patients were in agreement that the equipment is easy to use.

7.1.2 Key issues: Perceived Impact on Organisation and Resource Utilisation

Clinicians feel that the Remote-monitoring pilot project was a patient centred service – Over four fifths (83%, N=6) of clinicians either 'strongly agreed' or 'agreed' that the Remote-monitoring pilot project was a patient centred service.

All clinicians and almost all patients (97%, N=36) 'strongly agreed' or 'agreed' with the view that Remote-monitoring has reduced the number of the number of hospital outpatient appointments;

16 of the 38 patients 'strongly agreed' or 'agreed' with the perception that the remote-monitoring project had helped reduce the number of times that they have been admitted or readmitted to hospital. Reduction in hospital admissions may be, however, attributable to the ICD device rather than the remote monitoring – the response does indicate the comfort patients take from the additional service.

The vast majority of clinicians (83%, N=6) either 'strongly agreed' or 'agreed' with the view that remote-monitoring has reduced the number of times that the participant patients have self-referred themselves to A&E; 17% (N=6) did not know.

- All clinicians (100%, N=5) ‘agree’ or ‘strongly agree’ that Remote-monitoring supports more effective and integrated working across health and social services;
- All clinicians (100%, N=5) ‘agree’ that Remote-monitoring has allowed for better communication across and between multidisciplinary care teams;
- 83% (N=6) of clinicians ‘strongly agreed’ that Remote-monitoring improved the service that they personally provide to their patients;
- 83% (N=6) of clinicians ‘agreed’ that Remote-monitoring allows for a better use of their resources; and
- 100% (N=4) ‘agreed’ that the project allows for a better use of other health practitioner resources.
- 83% (N=6) of clinicians ‘agreed’ that the Remote-monitoring project is accepted by the medical community at large; and
- 100% (N=6) of clinicians stated they ‘strongly agreed’ or ‘agreed’ that the project allows them to recall "at risk" patients more speedily.

7.1.3 **Key issues: Perceived Impact on Health and Wellbeing**

All clinicians (N=6) and the majority of patients (72%, N=32) are in agreement with the view that Remote-monitoring has improved their overall quality of life.

- All clinicians (N=6) and the majority of patients (81%, N=31) are in agreement that the Remote-monitoring project made patients feel less anxious or stressed about their health; and
- All clinicians (N=6) and the majority of patients (86%, N=37) are in agreement that the Remote-monitoring project has provided them with 'peace of mind'.
- Similarly, all clinicians (N=6) and the majority of patients (85%, N=33) are in agreement that the Remote-monitoring project provided patients with reassurance and helped them feel safer at home.
- All clinicians (N=4) and the majority (71%, N=34) of patients are in agreement that Remote-monitoring has allowed them to become more independent.
- All clinicians (N=6) and all patients (N=36) were in agreement that the Remote-monitoring project reduces the amount of travel that they have to visit health professional relating to their condition
- All patients (N=37) ‘strongly agreed’ or ‘agreed’ that the Remote-monitoring project saves them time through reduced hospital appointments/clinic attendances;

Remote-monitoring project has had a positive impact on family and carers –All clinicians (N=6) and the vast majority of patients (81%, N=27) either ‘strongly agreed’ or ‘agreed’ with the view that the Remote-monitoring project has been of benefit to patients family and carers.

7.2 **Belfast Health & Social Care Trust - Remote Monitoring of Children With Congenital Heart Disease**

Based at the Royal Victoria Hospital, this pilot enabled the remote monitoring of approximately children with congenital heart disease outside the hospital environment via video links between their homes and the hospital. The scheme has been used for 150 children since commencement, with 52 children referred between August 2008 and March 2009.

The evaluation of the BHSCT pilot “Remote Monitoring of Children with Congenital Heart Disease” took the form of:

- A telephone survey with participating carers (N=17);

- A face to face session with the two participating clinicians; and
- A face-to-face consultation with the BHSC's Tele-monitoring co-ordinator.

The findings below are in respect of the consultations with the carers:

7.2.1 **Key issues for the Operation of the Pilot**

The majority of carers 'strongly agreed' or 'agreed' that:

- The equipment was easy to use (100%, N=16);
- The equipment was reliable (88%, N=17);
- The sound quality was good (94%, N=16);
- The picture quality was good (88%, N=16);

All (N=16) carers stated that they were 'very confident' or 'confident' about receiving clinical advice from a clinician who is viewing their child over a distance through the means of video-conferencing.

All (100%, N=16) of the carer respondents 'strongly agreed' or 'agreed' that:

- The doctor was able to understand their concerns during the video-conferencing consultation; and
- The problem and/or questions that they had were satisfactorily resolved following the consultation.
- All (100%, N=16) of the carer respondents stated that they were 'very satisfied' with the tele-monitoring support that they and their child received.

7.2.2 **Key issues: Perceived Impact on Organisation and Resource Utilisation**

It is evident that the video-conferencing project has had a positive impact on the number/frequency of visits that carers and their child have made to, or received from, health sector personnel, with the majority of carers in agreement that the video conferencing project:

- Reduced the number of times that the carer's child has been admitted or readmitted to hospital (86%, N=14);
- Reduced the number of times that the carer's child has had to attend the emergency department at the local hospital (100%, N=13); and
- Reduced the number of times that the carers child has had to attend the paediatric cardiology department at the Royal Hospital (92%, N=13)

Furthermore, the majority of carers 'strongly agreed' or 'agreed' that the video conferencing project:

- Reduced the number of times that the carer's child has had to visit their GP (84%, N=12);
- Reduced the number of times that the carer has had to contact their Community Paediatric Nurse and/or Health Visitor by phone (85%, N=13); and
- Reduced the number of visits that the carer's child has needed from the Community Paediatric Nurse and/or Health Visitor (83%, N=12).

7.2.3 Key issues: Perceived Impact on Health and Wellbeing

It would appear that the video conferencing project has had a positive impact on the life and wellbeing of carers and their children, with the majority of carers 'strongly agreeing' or 'agreeing' with the view that the tele-monitoring project had:

- Improved their or their child's overall quality of life (93%, N=14);
- Ensured that their or their child's quality of life did not deteriorate (93%, N=15);
- Made them feel less anxious or stressed about their child's health (94%, N=16);
- Provided them with 'peace of mind' (94%, N=16); and
- Provided them with reassurance and helped them feel that their child is safer at home (94%, N=16).

It would appear that the video conferencing project has had a positive impact on participant children's health, with the majority of carers 'strongly agreeing' or 'agreeing' that the project has:

- Led to improvements in their child's health (83%, N=12);
- Helped the carer manage their child's illness better (100%, N=15);
- Helped the carer become less dependent on the hospital sector or health sector practitioners in general (92%, N=13); and
- Encouraged the carer to think more about their child's symptoms (93%, N=15).

All carers (100%, N=16) 'strongly agreed' or 'agreed' that the video conferencing project has been of benefit to them.

Furthermore, all carers (100%) 'strongly agreed' or 'agreed' that the video conferencing project:

- Saves them time (N=15);
- Reduce the amount of travel that they have to do (N=15);
- Helped their child receive more specialised care than they would otherwise have been able to access (N=15); and
- Helped to improve the overall standard of care that their child receives (N=16).

7.3 South Eastern Health and Social Care trust - Di@I-log Pilot Project

As part of this pilot, patients use simple glucometers to take their own blood sugar readings and telephone the readings into the hospital on a daily basis. There were 123 patients using the Di@I-log service at March 2009.

The evaluation of the SEHSCT Di@I-log pilot project took the form of:

- A telephone survey with participating clinicians (n=2);
- A telephone survey with participating patients (n=19);
- A face to face session with one of the participating clinicians; and
- A face-to-face consultation with the SEHSCT's Tele-monitoring co-ordinator.

7.3.1 Key issues for the Operation of the Pilot

All clinicians and all patients (100%, N=17) stated that they were 'very satisfied' or 'satisfied' with the support that patients received under the Di@I-log scheme.

Clinicians agree that patients' GPs are positive about and have taken some ownership of the Di@l-log project – both of the clinicians ‘agreed’ that patients' GPs are positive about and have taken some ownership of the Di@l-log project.

All clinicians and all patients (100%, N=17) stated that they were ‘very satisfied’ or ‘satisfied’ with the support that patients received under the Di@l-log scheme.

- Both of the two clinicians and the relevant patients (100%, N=3) ‘strongly agreed’ or ‘agreed’ that Di@l-log has reduced the number of times that the participant patients have been admitted or readmitted to hospital;
- One clinician and one patient ‘agreed’ that Di@l-log has reduced the length of time that participant patients have had to stay in hospital.

7.3.2 **Key issues: Perceived Impact on Organisation and Resource Utilisation**

One clinician and almost three quarters of patients (73%, N=11) ‘agreed’ or ‘strongly agreed’ with the view that Di@l-log has reduced the number of outpatient clinic appointments/attendances that the patient would have to make.

Clinicians ‘agree’ or ‘strongly agree’ that Di@l-log has impacted positively upon resources:

- that Di@l-log improved the service that they personally provide to their patients;
- that Di@l-log allows for a better use of other health practitioner resources; and
- that the project allows for a better use of their resources.

Both clinicians ‘agree’ that Di@l-log has led to costs savings in terms of providing patient care. Furthermore, both clinicians and the majority (58%, N=12) of patients were in agreement that Di@l-log helps patients receive more specialised care than they would otherwise have been able to access e.g.: because of geography, transport issues or infirmity.

7.3.3 **Key issues: Perceived Impact on Health and Wellbeing**

Both clinicians and the vast majority (86%, N=14) of patients were in agreement with the view that Di@l-log helps to improve the overall standard of care that patients receive.

- Both clinicians and the vast majority of patients (89%, N=19) are in agreement that the Di@l-log project has helped patients manage their illness better; and
- Both clinicians and the majority of patients (73%, N=15) are in agreement that Di@l-log has improved their overall quality of life;
- Similarly, both clinicians and the majority of patients (69%, N=16) are in agreement that Di@l-log has ensured that their quality of life did not deteriorate;
- One of the clinicians and the majority (57%, N=7) of patients were in agreement that the Di@l-log project reduces the amount of travel that they have to do to attend hospital or clinic appointments; and
- Half of patients (50%, N=6) ‘strongly agreed’ or ‘agreed’ that the Di@l-log project saves them time through reduced hospital appointments/clinic attendances.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

This section sets out the Conclusions from the evaluation of the eight ‘Remote Monitoring’ pilot projects, whilst also drawing upon the findings from the internal evaluation of the five Remote Tele-Monitoring pilot projects for chronic disease as conducted by HSC and referred to in section 3.

In terms of the external evaluation, patients are almost overwhelmingly positive about the perceived benefits they have derived from the Remote Tele-Monitoring’ pilot projects, including impact upon their quality of life and general health and well-being. A significant majority of clinicians also consider that the pilots have had a positive impact in terms of quality of patient life. A significant majority of clinicians also consider that the pilots have had a positive impact in terms of quality of patient life and on patient health and wellbeing, for example, helping them feel less anxious, more reassured and able to manage their illness better.

Similarly, a large majority of patients report their perception that participating in the remote tele-monitoring pilots has enabled them to reduce their reliance on hospital and nursing staff, including through a reduction in hospital admissions. Approximately half of the clinicians surveyed had reported a similar benefit in terms of a reduction in hospital admissions, and length of stay in hospital. This view was, however, not held universally by clinicians. There is, from many of the clinicians, a concern as to the impact that remote tele-monitoring has had on the clinicians’ workloads, with the level of concern varying and reflecting the more positive views of those clinicians who have had longer experiences with remote tele-monitoring as well as the impact on workloads from the significant ramp-up in case load in the latter period of the pilots. This is coupled with a concern from the clinicians that the pilot had still not achieved buy-in from GPs within the community. Finally, in terms of the actual operation of the pilots, similar trends emerged: patients are positive as to how the remote tele-monitoring pilots had worked in practice, including their confidence in the triage service provided. Clinicians, too, report positive experiences, although concern as to their comfort with triage nursing, particularly amongst those Trusts not benefitting from clinical triage. There were also recommendations in terms of improvements in equipment adaptability and flexibility, as well as to the patient selection process.

The experiences of patients and clinicians are largely mirrored within the internal evaluations. Specific findings are set out below.

8.1.1 Perceived Impact on patient care in terms of quality, safety and patient experience

Patients and clinicians are positive about the perceived benefits that patients have derived from the Remote Tele-Monitoring’ pilot projects, including impact upon quality, safety and patient experience. In terms of quality of care, over 50% of clinicians, as compared to over 90% of patients, consider that the scheme has helped to improve the overall standard of care that patients received. This difference in perception was also prevalent in the views on clinical nursing – over 80% of clinicians are not confident that clinical triage is suitable for monitoring patients from a distance where the nurse has not met the patient in person. This compares to 90% of patients who are satisfied with clinical triage. Patients report their satisfaction with the continuous monitoring with this making them feel safer and more content - 90% of patients and over 80% of clinicians report that remote tele-monitoring has provided reassurance to them and their carers and made them feel safer at home.

8.1.2 Perceived Impact on patient care in terms of utilisation of resources

About one third of clinicians were of the view that remote tele-monitoring had contributed to reduced utilization of hospital and community services, including reduced visits to GPs and contact with the community care nurses. The internal HSC evaluation was more positive, with 65% of professional workers reporting a reduction in hospital admissions, and over 70% reporting a reduction in the number of GP visits relating to the patient's chronic condition. This compares to the patient feedback, with circa 86% of patients reporting their view that the pilots have had a positive impact on utilization of Trust resources. This corresponds to the overall view of patients that the pilots have led to improvements in their health and well-being.

8.1.3 Perceived Impact on Staffing Resources

Around 50% of clinicians felt that remote tele-monitoring had a positive impact on organization effectiveness, but almost all clinicians were of the view that it increased their workload. This response would appear to be heavily influenced by the rapid growth in participant patient numbers and increases in case loads since November 2008.

Impact on staffing resources is also impacted by the patient selection process – inappropriate patient selection, for example, of those where disease severity will continue to warrant high intensity of specialist community care, with little impact upon resources.

Clinicians have benefitted from the support by each of the Trusts of Tele-monitoring Co-ordinators, although, for some, the Co-Ordinator was only appointed well into the pilot phase. Some Trusts also report the difficulty faced by not having a specialist nursing team for COPD, diabetes etc.

Clinicians also noted that negative aspect of operating the scheme in the absence of GP buy in to the service, with many feeling that GPs should play a role in setting clinical parameters. Whilst 70% of clinicians were of the view that patient parameters are appropriately set, it was acknowledged that in the absence of GP involvement, and, in particular, for new clinicians joining the scheme, there can be a tendency to set narrow parameters with resultant increased alerts.

8.1.4 Perceived Improvements in the quality of care patients receive

Generally, clinicians reported that patients continued to get the same, high, level of care regardless of the remote tele-monitoring scheme. However, over half of the clinicians did report that remote tele-monitoring had led to an improvement in the service that they personally provided to the patient and that it allows nurses to better target those patients that need more support.

8.1.5 Perceived Improvements in the quality of patient life

Patients are positive about the benefits from the Remote Tele-Monitoring' pilot projects, including perceived impact upon quality of life and general health and well-being. 75% of patients report that in their view remote tele-monitoring has led to an overall improvement in their quality of life and ensured that their quality of life did not deteriorate. In addition, over 50% of patients and clinicians agree that the pilots have led to patients making changes to their lifestyle and to an overall improvement in patient health and well being.

8.1.6 Perceived Impact on informing patient centred case management, intermediate care schemes and medicines compliance, optimising the potential for independent living and enabling reductions in inpatient admissions to hospital

There is a perception that remote tele-monitoring has had a positive impact on further developing a patient-centred case management approach, with 76% of clinicians reporting remote tele-monitoring pilot project to be a patient centred service.

Clinicians suggested that the project empowers patients to better manage their illness. For example, the survey indicates that the project has had a positive impact on patients' medicine compliance, with over half of the clinicians and three quarters of patients reporting a perception that remote tele-monitoring project encourages patients to take their medicine at the right times and in the right quantities. Over half of the clinicians and more than three quarters of patients report that the scheme has helped patients to become more independent in their day to day life, with this having a positive impact on their quality of life and general well-being.

Nearly 90% of patients and over one third of clinicians agree that the remote tele-monitoring pilot has reduced the number of times that the patient has been admitted (or readmitted) to hospital. There are similar differences in perception as to the impact on the length of time in hospital – over 70% of patients are of the view that tele-monitoring has reduced the length of time that they have had to stay in hospital, as compared to 13% of clinicians.

Furthermore, of the internal HSC evaluation, 65% of professional workers and 75% of patients reported that the remote monitoring system prevented their admission to hospital or use of A&E Services.

8.1.7 Extent to which patients receive more and better targeted proactive support, enabling them to take greater control in the management of their own disease

Clinicians were less positive about the extent to which patients receive more and better targeted proactive support under tele-monitoring. Around one third of clinicians considered that tele-monitoring enables them to focus more on one-to-one care by eliminating unnecessary visits and allows them to look after more patients than would otherwise have done. Moreover, over half of the clinicians agree that it allows them to better target those patients who need more support.

However, over 80% of patients and over 70% of clinicians report that in their view, remote tele-monitoring has enabled patients to manage their illnesses better and encourages them to think more about their symptoms.

Of the internal HSC evaluation, 91% of patients would agree that the monitoring system has assisted them in managing their health on a day to day basis.

8.1.8 Extent to which there is improved quality assurance through auditable improvements in the flow of quality and timely information.

Over 85% of clinicians are satisfied with the way that tele-monitoring operates in practice – the quality of information is perceived as being good, the timeliness of alerts is good and clinicians generally feel comfortable in setting clinical parameters. Initial teething problems have largely been addressed, with clinicians also reporting the support received from the Trust tele-monitoring Co-ordinators.

Whilst some improvements were suggested relating to the flexibility and adaptability of equipment, clinicians were generally content with the accuracy of the readings and ease of use of the equipment.

With regards to the support received from each of the Service Providers of the triage service, clinicians were generally positive. Two-thirds of clinicians agreed that the Service Providers provide a good service, with both of the Trusts having the clinical triage service and one of the Trusts having solely the triage service reporting satisfaction levels in excess of 80%.

8.1.9 Schemes which are working well and should continue to attract funding

All of the eight tele-monitoring pilots reviewed as part of this evaluation would appear to have worked well, with positive benefits reported in terms of quality of patient life.

Accordingly, it is the evaluator's view that all schemes should be considered for further funding.

The patient selection process is, however, all important, with clinicians confirming that tele-monitoring is not appropriate for all patients and that patient selection should be dependent on the severity of the disease as well as issues relating to patient dexterity etc.

Clinicians' concerns over increased workloads should also be addressed going forward, as should their concerns as to the lack of GP commitment to tele-monitoring.

There are mixed views from clinicians on the clinical triage service provided. The benefits of clinical triage should be further assessed.

8.2 Recommendations to ensure that lessons learned are transferred into the main tele-monitoring project

Recommendations following the evaluation of the 8 remote tele-monitoring pilot projects are:

- Appropriate Patient selection - the focus should be on identifying those patients with the best capacity to benefit from remote tele-monitoring, with the findings disseminated throughout all of the Trusts.
- Commitment and support – there is a need to ensure that GP commitment to the tele-monitoring service, and their support for clinicians in setting patient parameters etc. This should extend also to ensure that all clinicians are bought into the service.
- Resource Utilisation – there should be a baseline assessment of the resource utilization of patients as they are introduced into the remote tele-monitoring scheme, so as to enable a quantitative assessment of the impact of tele-monitoring on their use of health care services.
- Clinician Workload – monitoring should be introduced to assess the impact of the remote tele-monitoring scheme on the workload of clinicians and the use of their skills. There should also be a forum, facilitated by the Tele-Monitoring Coordinators, by which difficulties faced by clinicians, and solutions identified, are shared across all of the clinicians within the Trusts. This increased level of communication will be critical to ensuring the clinicians are both supported and bought in to the tele-monitoring service. This will also ensure a Regional rather than a localized response to remote tele-monitoring.
- Flexibility of the product offering – the emphasis in selecting peripheral products for use in tele-monitoring should be on ensuring that these offer flexibility to meet the needs of the wide

variety of patient characteristics and illnesses and to enforce the principle that “one size does not fit all”.

- Triage - the benefits of the clinical triage service should be assessed, the role and responsibilities of those charged with the clinical triage service, and their potential to support clinicians, particularly as the latter seek to manage their workloads.

Combined – 5 Projects

**DHSSPS/ECCH
Telemonitoring Service Pilots
Clinician Questionnaire**

It is noted that the N varies as, in some instances, the question is not applicable to all consultees, and in some cases questions were not answered by all.

Q1. What conditions/illnesses do you have responsibility for?

(PARA 4.1)

	%	N =
Constructive Pulmonary Obstructive Disease (COPD)	66%	44
Heart Failure and/or arrhythmia	32%	44
Heart Disease	11%	44
Type 1 Diabetes	45%	44
Type 2 Diabetes	45%	44
Asthma	23%	44
Bronchiectasis	2%	44
Other	-	44

Q2b. To what extent would you agree that the patients that were selected or recruited to participate in the Pilot were appropriate to participate?

(PARA 4.3)

Strongly Agree	Agree	Disagree	Strongly Disagree	N =
18%	66%	14%	2%	44

Q3a. To what extent would you agree that tele-monitoring is appropriate for all patients with the primary condition that you have responsibility for?

(PARA 4.4)

Strongly Agree	Agree	Disagree	Strongly Disagree	N =
2%	23%	59%	16%	44

Q6. Approximately, what is the most appropriate timescale for the following types of patients to use tele-monitoring equipment?

(PARA 4.5.1)

6a	COPD			
	<i>Mild</i>	<i>Moderate</i>	<i>Severe</i>	<i>Very Severe</i>
Less than two month	32%	17%	13%	13%
2-3 months	18%	33%	13%	13%
4-6 months	9%	13%	17%	9%
7-12 months	5%	4%	4%	9%
More than 1 year	9%	8%	13%	9%
To end of life	27%	25%	42%	48%
N =	22	24	24	23

(PARA 4.5.2)

6b	Congestive Heart Failure (CHF)			
	Level I	Level II	Level III	Level IV
	Mild	Moderate	Severe	Very Severe
Less than two month	29%	13%	-	-
2-3 months	14%	13%	14%	29%
4-6 months	29%	38%	29%	14%
7-12 months	-	-	-	-
More than 1 year	-	-	-	-
To end of life	29%	38%	57%	71%
N =	7	8	7	8

(PARA 4.5.3)

6c	Diabetes	
	Type 1	Type 2
Less than two month	-	-
2-3 months	50%	50%
4-6 months	8%	8%
7-12 months	-	-
More than 1 year	8%	8%
To end of life	33%	33%
N =	12	12

6d	Stroke		
	Mild	Moderate	Severe
Less than two month	33%	33%	33%
2-3 months	33%	33%	33%
4-6 months	33%	33%	33%
7-12 months	-	-	-
More than 1 year	-	-	-
To end of life	-	-	-
N =	3	3	3

Q7a. To what extent would you agree with the following statements about how the tele-monitoring project was implemented?

	Strongly Agree	Agree	Disagree	Strongly Disagree	N =
The Project was explained to you in such a way that you fully understood what it was about (PARA 4.7.1)	14%	61%	23%	2%	44
You received adequate training to allow you to use the tele-monitoring equipment (PARA 4.7.1)	7%	56%	34%	2%	41
The way in which tele-monitors were ordered for placement was straightforward and efficient (PARA 4.7.2)	5%	58%	32%	5%	38
Patients' parameters were appropriately established i.e. the patient measurements which would create an alert if they fell outside the specific criteria (PARA 4.7.4)	7%	63%	26%	5%	43
You feel comfortable setting Patients' parameters (PARA 4.7.4)	17%	68%	10%	5%	41

The patient information provided by the tele-monitoring equipment is easy to interpret (PARA 4.7.4)	12%	67%	14%	7%	43
You are provided with adequate ICT or equipment to respond to Patient alerts (PARA 4.7.5)	11%	58%	22%	8%	36
Adequate support was provided by the Trust's Telemonitoring Coordinator (PARA 4.7.5)	10%	62%	26%	3%	39
Adequate support was provided by the Trust's Management (PARA 4.7.5)	5%	50%	43%	3%	40

	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't know	N =
The Patients' GPs are positive about and have taken some ownership of the Telemonitoring Project	3%	29%	31%	37%	3%	35

Q8a. To what extent would you agree with the following statements about the service provided by the Service Providers during the tele-monitoring project?

For Specific Pilots	Strongly Agree	Agree	Disagree	Strongly Disagree	N =
Generally the Service Provider 1/Service Provider 2 provided a good service (PARA 4.8.2)	12%	53%	33%	2%	43
Generally the level (quantity) of communication from Service Provider 1/Service Provider 2 was good (PARA 4.8.2)	12%	63%	23%	2%	43
Generally the mode (e.g. telephone call, text, e-mail) of Patient alerts received from Service Provider 1/Service Provider 2 is appropriate (PARA 4.8.3)	7%	63%	29%	-	41
Generally the timeliness of receipt of Patient alerts from Service Provider 1/Service Provider 2 was good (PARA 4.8.3)	10%	77%	13%	-	39
Generally the quality of monitoring information provided by Service Provider 1/Service Provider 2 is good (PARA 4.8.5)	5%	81%	14%	-	42
Generally the timeliness of monitoring information provided by Service Provider 1/Service Provider 2 is good (PARA 4.8.5)	8%	70%	23%	-	40
The level and type of	5%	88%	5%	2%	43

documentation that needs to be completed between you and Service Provider 1/Service Provider 2 at the Patient referral stage is appropriate (PARA 4.8.1)					
For Service Provider 1 only	Strongly Agree	Agree	Disagree	Strongly Disagree	N =
Service Provider 1 appropriately screens alerts before making contact with you (PARA 4.8.4)	9%	59%	18%	14%	22

Q9a. To what extent would you agree with the following statements about the tele-monitoring equipment and/or software?

The Tele-Monitoring Equipment	Strongly Agree	Agree	Disagree	Strongly Disagree	N =
Is easy to calibrate (PARA 4.9.4)	16%	68%	12%	4%	25
Was fitted in a timely manner for Patients (PARA 4.9.4)	5%	69%	21%	5%	42
Is easy for most Patients to use correctly (PARA 4.9.1)	2%	82%	16%	-	44
Can be fitted or used in almost any home (PARA 4.9.4)	2%	81%	16%	-	43
Currently asks appropriate questions for the Patients' conditions (PARA 4.9.3)	3%	60%	38%	-	40
Asks questions that are easily understood by the Patients (PARA 4.9.3)	5%	75%	20%	-	40
Asks questions that encourage patients to think about their symptoms (PARA 4.9.3)	2%	83%	12%	2%	41
Is reliable (i.e. rarely has technical problems) (PARA 4.9.1)	-	50%	45%	5%	40
You or the patients have experienced few, if any, problems with the equipment (PARA 4.9.1)	9%	43%	46%	3%	35

Q9c. To what extent would you agree with the following statements about the tele-monitoring equipment and/or software?

(PARA 4.9.2)

It Provides accurate readings for:	Strongly Agree	Agree	Disagree	Strongly Disagree	N =
Weight	12%	73%	15%	-	26
Heart rate	17%	74%	9%	-	35
Blood pressure	3%	75%	19%	3%	36
Temperature	9%	45%	36%	9%	22
Oxygen saturation	18%	64%	15%	3%	33
Blood Glucose	10%	70%	10%	10%	10
Peak flow	-	75%	25%	-	4
Other	-	-	-	-	-
Other	-	-	-	-	-

Q10a. To what extent would you agree with the following statements about the impact that tele-monitoring has had on the number or frequency of visits that your patients have made to or received from health sector personnel relating to the Patients' Chronic conditions ?

Tele-Monitoring has.....	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't know	N =
Reduced the number of times that the participant patients have been admitted or readmitted to hospital (PARA 5.2)	5%	29%	38%	7%	21%	42
Reduced the number of times that the participant patients have self-referred themselves to A&E (PARA 5.3)	-	31%	36%	7%	26%	42
Reduced the length of time that participant patients have had to stay in hospital (if they have been admitted to hospital since they got the telemonitoring equipment) (PARA 5.2)	3%	10%	46%	8%	33%	39
Reduced the number of times that participant patients have had to visit their GP (PARA 5.4)	-	46%	33%	8%	13%	39
Reduced the number of times that participant patients have had to contact their Community Care Nurse by phone (PARA 5.4)	-	29%	51%	15%	5%	41
Reduced the number of visits that	-	34%	46%	10%	10%	41

participant patients have needed from their Community Care Nurse (PARA 5.4)						
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Q11a. To what extent would you agree with the following statements about the impact that tele-monitoring has had on your patients' life and wellbeing relating to the Patients' Chronic conditions?

Tele-Monitoring has.....	Strongly Agree	Agree	Disagree	Strongly Disagree	N =
Improved Patients' overall Quality of Life (PARA 6.1)	3%	29%	31%	37%	35
Ensured that their Quality of Life did not deteriorate	3%	50%	45%	3%	40
Made them feel less anxious or stressed about their health i.e. has provided them with 'peace of mind'	7%	67%	21%	5%	42
Provided them with reassurance and helped them feel safer at home (PARA 6.2)	8%	70%	20%	3%	40
Helped them become more independent in their day-to-day life (PARA 6.3)	3%	46%	46%	5%	37

Q12a. To what extent would you agree with the following statements about the impact that tele-monitoring has had on your patients' health relating to the Patients' Chronic conditions?

Tele-Monitoring has.....	Strongly Agree	Agree	Disagree	Strongly Disagree	N =
Led to improvements in their health (PARA 6.8)	-	43%	52%	5%	42
Helped them manage their illness better (PARA 6.8)	5%	66%	30%	-	44
Encouraged them to take their medicine at the right times and in the right quantities (PARA 6.9)	3%	50%	41%	6%	34
Helped them become less reliant on the hospital sector or health sector practitioners in general (PARA 6.9)	-	32%	61%	7%	41
Encouraged them to think more about their symptoms (PARA 6.10)	13%	71%	16%	-	38

Q13a. To what extent would you agree with the following statements about the impact that tele-monitoring has had on the patients' family or carers relating to the Patients' Chronic conditions?

Tele-Monitoring has.....	Strongly Agree	Agree	Disagree	Strongly Disagree	N =
Has been of benefit to the families and/or carers (PARA 6.11)	18%	64%	18%	-	39

Q14a. To what extent would you agree with the following statements about the impact that tele-monitoring has had on patients relating to the Patients' Chronic conditions?

Tele-Monitoring	Strongly Agree	Agree	Disagree	Strongly Disagree	N =
Reduces the amount of travel that they have to do to visit health professional relating to their chronic conditions (PARA 6.4)	3%	42%	47%	8%	38
Helps them receive more specialised care than they would otherwise have been able to access e.g. because of geography, transport issues or infirmity (PARA 6.4)	2%	36%	57%	5%	42
Helps to improve the overall standard of care that they receive (PARA 6.5)	3%	53%	43%	2%	40
Reduces rates of mortality (PARA 6.6)	-	17%	57%	27%	30
Improves patient and carer access to the information that they require to manage their conditions. (PARA 6.6)	2%	56%	35%	7%	43
Will increase patients' sense of depersonalisation due to the perceived lack of nurse to patient interaction. (PARA 6.6)	3%	28%	54%	15%	39
Has challenged patients' beliefs that repeated hospitalization for the control of the symptoms of their condition is the expectation. (PARA 6.6)	-	38%	53%	9%	32

Q15a. To what extent has tele-monitoring led to patients making changes in their lifestyles?

(PARA 6.7)

A large Extent	Some Extent	No Extent	N =
-	61%	39%	41

Q15b. If changes have occurred, have these been positive or negative changes?

Positive	Negative	N =
82%	18%	28

Q16a. To what extent would you agree that the tele-monitoring pilot project was a patient centred service?

(PARA 5.1.1)

Strongly Agree	Agree	Disagree	Strongly Disagree	N =
5%	65%	19%	12%	43

Q17a. To what extent would you agree with the following statements about the impact that tele-monitoring has had on you or the Trust?

Tele-Monitoring	Strongly	Agree	Disagree	Strongly	N =
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	Agree			Disagree	
Provides you with ready access to useful information on your patients' conditions and treatment (PARA 5.5.1)	5%	74%	19%	2%	43
Supports more effective and integrated working across health and social services. (PARA 5.5.2)	-	30%	68%	3%	37
Has allowed for better communication across and between multidisciplinary care teams. (PARA 5.5.2)	-	22%	78%	-	32
Has helped shift the balance of care towards the community and promoting the alternatives to hospital admission. (PARA 5.5.3)	6%	42%	53%	-	36
Has improved the service that you personally provide to your patients (PARA 5.5.4)	5%	40%	45%	10%	42
Allows for a better use of your resources (PARA 5.5.4)	5%	38%	38%	19%	42
Allows for a better use of other health practitioner resources (PARA 5.5.4)	3%	36%	55%	6%	33
Has increased your workload (PARA 5.5.5)	47%	49%	4%	-	43
You have adequate time to address patients' needs arising from tele-monitoring (PARA 5.5.5)	2%	45%	43%	10%	42
Has led to cost savings in terms of providing patient care (PARA 5.5.6)	6%	16%	59%	19%	32
Allowed you to focus more on one-on-one care by actually reducing the daily visit schedule and eliminating unnecessary visits. (PARA 5.5.7)	5%	22%	54%	20%	41
Allows nurses to look after more Patients than they would otherwise be able to (PARA 5.5.7)	3%	28%	50%	20%	40
Allows nurses to better target those Patients that need more support (PARA 5.5.7)	5%	45%	38%	13%	40
Is viewed as a way of replacing traditional nursing services with more impersonal service. (PARA 5.5.8)	2%	40%	38%	19%	42
Is accepted by the medical community at large (PARA 5.5.8)	-	19%	61%	19%	36
Reduces the need for emergent care (PARA 5.5.9)	3%	32%	51%	14%	37
Enhances your patient	2%	50%	43%	5%	42

management and home visit planning (PARA 5.5.10)					
Instances of alerts created by patient measurements falling outside of specific guidelines have resulted in additional visits for you. (PARA 5.5.10)	20%	50%	28%	3%	40

Q18a. To what extent would you be confident that tele-monitoring allows the provision of clinical triage to a patient from a distance?

(PARA 4.10.1)

Very Confident	Confident	Not Very Confident	Not at all Confident	N =
10%	30%	48%	12%	40

Q19a. To what extent would you be confident that tele-monitoring allows the provision of clinical triage to a patient from a distance by a nurse who has not met a Patient in person?

(PARA 4.10.1)

Very Confident	Confident	Not Very Confident	Not at all Confident	N =
5%	13%	45%	37%	38

Q23a. Overall, what has been the impact, if any, of tele-monitoring on your patients' health and wellbeing?

(PARA 6.12)

Significant improvement	Some improvement	No improvement	N =
-	61%	39%	41

Q24a. Overall, how satisfied are you with the tele-monitoring support that your patients have received?

(PARA 4.13)

Very Satisfied	Satisfied	Dissatisfied	Very Dissatisfied	N =
14%	63%	21%	2	43

Combined – 5 Projects

**DHSSPS/ECCH
Telemonitoring Service Pilots
Patient Questionnaire**

It is noted that the N varies as in some instances the question is not applicable to all consultees, and in some cases questions were not answered by all.

Q1. What conditions/illnesses is the tele-monitoring equipment being used to monitor?

(PARA 4.1)

	%	N =
Constructive Pulmonary Obstructive Disease (COPD)	62%	91
Heart Failure and/or arrhythmia	13%	91
Heart Disease	2%	91
Type 1 Diabetes	10%	91
Type 2 Diabetes	8%	91
Asthma	12%	91
Bronchiectasis	5%	91
Emphysema	-	91
Other	10%	91

Q2. Approximately, for how many months have you been using the tele-monitoring equipment?

(PARA 4.1)

	%
Less than one month	6%
1 to 2 months	22%
3-4 months	34%
5-6 months	6%
7-8 months	2%
9-10 months	6%
11 months to 1 year	8%
More than 1 year	17%
N =	89

Q3a. To what extent would you agree with the following statements about how the tele-monitoring project was implemented?

	Strongly Agree	Agree	Disagree	Strongly Disagree	N =
The Project was explained to you in such a way that you fully understood what it was about (PARA 4.7.1)	48%	49%	3%-	-	90
You received adequate training to allow you to use the tele-monitoring equipment correctly (PARA 4.7.1)	49%	48%	3%	-	90
The Equipment was installed in your house in an efficient manner (PARA 4.7.3)	51%	47%	2%	-	90

Q4a. To what extent would you agree with the following statements about the tele-monitoring equipment?

The Tele-Monitoring Equipment	Strongly Agree	Agree	Disagree	Strongly Disagree	N =
Is easy to use (PARA 4.9.1)	56%	42%	-	2%	90
Reliable (PARA 4.9.1)	40%	49%	10%	1%	91
Provides accurate readings (PARA 4.9.2)	42%	51%	6%	1%	86

Q5a. To what extent would you agree with the following statements about the impact that tele-monitoring has had on the number or frequency of visits that you have made to or received from health sector personnel?

Tele-Monitoring has.....	Strongly Agree	Agree	Disagree	Strongly Disagree	N =	N/A
Reduced the number of times that you have been admitted or readmitted to hospital (PARA 5.2)	22%	62%	15%	2%	60	30
Reduced the length of time that you have had to stay in hospital (if you have been admitted to hospital since you got the telemonitoring equipment) (PARA 5.2)	17%	54%	29%	-	24	64
Reduced the number of times that you have had to visit your GP (PARA 5.4)	22%	58%	18%	1%	72	19
Reduced the number of times that you have had to contact by phone your Community Care Nurse (PARA 5.4)	12%	72%	15%	1%	68	22
Reduced the number of visits that you have needed from your Community Care Nurse (PARA 5.4)	13%	70%	16%	1%	69	21

Q6a. To what extent would you agree with the following statements about the impact that tele-monitoring has had on your life and wellbeing?

Tele-Monitoring has.....	Strongly Agree	Agree	Disagree	Strongly Disagree	N =
Improved your overall Quality of Life (PARA 6.1)	20%	53%	24%	2%	83
Ensured that your Quality of Life did not deteriorate (PARA 6.1)	20%	55%	24%	1%	75
Made you feel less anxious or stressed about your health (PARA 6.2)	41%	44%	13%	2%	85
Has provided you with 'peace of mind'	40%	49%	9%	2%	86
Provided you with reassurance and helped you	37%	55%	6%	2%	84

feel safer at home (PARA 6.2)					
Helped you become more independent in your day-to-day life (PARA 6.3)	30%	53%	14%	3%	77

Q7a. To what extent would you agree with the following statements about the impact that tele-monitoring has had on your health?

Tele-Monitoring has.....	Strongly Agree	Agree	Disagree	Strongly Disagree	N =
Led to improvements in your health (PARA 6.8)	13%	44%	42%	1%	77
Helped you manage your illness better (PARA 6.8)	24%	63%	13%	1%	88
Encouraged you to take your medicine at the right time and in the right quantities (PARA 6.9)	20%	59%	21%	-	81
Helped you become less reliant on the hospital sector or health sector practitioners in general (PARA 6.9)	19%	56%	24%	-	78
Encouraged you to think more about your symptoms (PARA 6.10)	20%	63%	16%	1%	82

Q8a. To what extent would you agree with the following statements about the impact that tele-monitoring has had on your family or carers?

Tele-Monitoring has.....	Strongly Agree	Agree	Disagree	Strongly Disagree	N =
Has been of benefit to your family and/or carers (PARA 6.11)	42%	46%	9%	3%	69

Q9a. To what extent would you agree with the following statements about the impact that tele-monitoring has had on you?

Tele-Monitoring	Strongly Agree	Agree	Disagree	Strongly Disagree	N =
Saves you time (PARA 6.4)	30%	49%	20%	-	79
Reduces the amount of travel that you have to do (PARA 6.4)	32%	52%	16%	-	69
Helped you receive more specialised care than you would otherwise have been able to access e.g. because of geography, transport issues or infirmity (PARA 6.4)	28%	58%	14%	-	74
Helped to improve the overall standard of care that you receive (PARA 6.5)	32%	59%	8%	1%	85

Q10a. To what extent has tele-monitoring led to making changes in your lifestyle?

(PARA 6.7)

A large Extent	Some Extent	No Extent	N =
13%	49%	38%	85

Q11a. To what extent would you be confident about receiving clinical advice from a Nurse who has read the results of your tele-monitoring reports, but has not come out to visit you in person?

(PARA 4.10.1)

Very Confident	Confident	Not Very Confident	Not at all Confident	N =
40%	50%	40	6	82

Q14a. Overall, what has been the impact, if any, of tele-monitoring on your health and wellbeing?

(PARA 6.12)

Significant improvement	Some improvement	No Change	Some Deterioration	Significant Deterioration	N =
14%	48%	36%	1%	1%	88

Q15a. Overall, how satisfied are you with the tele-monitoring support that you received?

(PARA 4.13)

Very Satisfied	Satisfied	Dissatisfied	Very Dissatisfied	N =
75%	24%	1%	-	89