



University of the  
West of England

WARWICK

# **An Evaluation of an In Reach Model of Care in LA Care Homes**

## **REPORT 2**

### **Audit of In-Reach Nursing Team for Residential Care Homes: Activity, Costs, Benefits & Impact on Long-Term Care**

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## **Reference for Abbreviations and Terms**

<b>BANES</b>	<b>Bath and North East Somerset</b>
<b>COREC</b>	<b>Central Office for Research Ethics Committee</b>
<b>DN</b>	<b>District Nurse</b>
<b>GP</b>	<b>General Practitioner</b>
<b>IRT</b>	<b>In Reach Team</b>
<b>LA</b>	<b>Local Authority</b>
<b>NHS</b>	<b>National Health Service</b>
<b>NToW</b>	<b>New Type of Worker</b>
<b>NVQ</b>	<b>National Vocational Qualification</b>
<b>PCT</b>	<b>Primary Care Trust</b>

## Executive Summary

The quantitative results presented in this report can be compared with the findings presented in the previous qualitative evaluation report (*The In Reach Model Described from the Perspectives of Stakeholders, Home Managers, Care Staff, and the In Reach Team*, May 2007) in order to draw conclusions.

### 1 Prevention of Hospital Admissions vs Overall Admissions from Participant Homes

The analysis of audit data presented in this report indicates that the joint NHS-Local Authority initiative to provide a dedicated nursing team to group of residential care homes with 131 residents in Bath and North East Somerset was able to avert between 81 and 197 potential hospital admissions between July 2005 and June 2007. Examination of hospital stay also shows some decrease in longer admissions (greater than 48 hours) and some increase in those of less than 48 hours. This suggests a positive impact of the in-reach nursing team both in preventing longer admissions and in facilitating early discharge. However, the time span of the study was too short to demonstrate a meaningful trend in either type of hospital stay. Interview evidence presented in the previous qualitative evaluation report suggests that enabling residents to stay in their home during an illness episode was preferred by care staff, managers, and most importantly by residents.

### 2 Prevention of Nursing Home Transfers

Audit also indicates that the nursing and physiotherapy expertise from a dedicated in-reach team (IRT), in combination with new type of worker (NToW) development of care home staff, has been successful in preventing 20 (or possibly up to 28) residents from being transferred to a nursing home. Total saving to the Local Authority and PCT will vary depending on whether these represent a delaying mechanism or a longer-term maintenance measure. In total, delays in transfer to nursing homes resulting from IRT activity during the period July 2005 to June 2007 produced a saving of £207,598 plus an additional £103,798 for each extra year's delay. It was not possible to prevent some avoidable transfers during the period of major home closures, so numbers might have been higher in a more stable context.

### 3 Facilitating Early Hospital Discharge

Audit indicates that the IRT service facilitated 20 early safe discharges from hospital during the period July 2005 to June 2007. Approximately two thirds were admitted to an IRT bed and others were triaged to short-term IRT support only. The average length of stay in an IRT bed was 20.3 days. The total number of days these residents spent in an IRT bed following discharge was 264 days. If it is assumed that this figure is similar to the number of hospital inpatient days avoided, savings of £66,000 are estimated for residents admitted to IRT beds. Assuming the other early

discharges for which IRT provided support only, saved one tenth of this figure (ca. 2 inpatient days per resident) this would provide an additional saving of £1,575, producing a total saving of £67,575. The majority (60%) of early hospital discharge referrals to IRT were made by the care home managers, following their first line contact from the hospital discharge service. In the remainder, first-line contact with IRT was made by the Hospital Trust.

#### **4 Resident Dependency**

The nursing assessment MDS scores indicate nursing needs in a majority of residents, whereas care staff's routine Barthel ADL assessment scores indicate dependency needs in a minority of residents drawn from the same population. As the two scores measure different things, this should not be viewed as conflicting evidence. For example, a resident with dementia can be functionally independent yet have major often un-communicated health/nursing needs. The findings suggest the importance of residents receiving a more comprehensive routine health assessment than one focussed on functional ADL alone, as the precursor for better care planning and intervention. This has implications both for the knowledge level required by NToWs and the level of support that they may require from a nurse.

#### **5 Detection of Illness**

The early detection of illness and consequential opportunity for early intervention by IRT appears to have been a major part of their work (as also reported in qualitative evaluation report). This accounted for a high number of visits to residents to deal with conditions uncovered (on average 3 times more than that originally envisaged). Although it is possible to estimate the impact of this in terms of cost (per visit) it is not possible to determine savings. Indeed it could be that uncovering often complex health needs will increase initial costs but create long term savings in the prevention of deterioration. However, benefits to residents are likely in terms of improved quality of life, in particular for individuals where communication of illness and its symptoms could be problematic.

#### **6 IRT Contribution to Teaching and Learning**

A further important area of work for IRT is enhancing the NToW workforce towards new roles and responsibilities. Our qualitative evaluation report documented early challenges to IRT and care staff in its first year. It also documented improvements in relationships and in the professional growth and confidence of NToWs. The related audit and quality assurance data presented here support these improvements by providing evidence of the extensive amount of time given by IRT to teaching and clinical supervision in both a formal environment and in the care homes.

## 7 Costs and Savings of IRT

Estimated figures suggest that even in the ‘worst case scenario’ the cost of IRT in its present form (ca. £302,313 per annum or £43.94 per resident per week) would exceed the estimated savings made in the same period by £18,325, equivalent to an extra expenditure of £2.69 per resident per week. However, in a more optimistic scenario, introduction of the dedicated nursing team is estimated to have led to an overall saving of £36.90 per resident per week.

The principal savings (estimated as up to £239,552 per annum) relate to avoided hospital admissions, followed by avoided transfers to nursing homes (estimated as up to £155,699 per annum). Annual savings due to early discharges from hospital (est. £33,788) are lower, though there would appear to be the potential for this to be increased. Early detection of illness is difficult to quantify in monetary terms, but may add a saving of £72,000 - £120,000 per annum.

These saving patterns are based on audit data from the first 2 years activity. Account should be taken of the concurrent difficulties in year 1 of recruitment to IRT and NToW which delayed service development, some care staff’s resistance to change, and the effects of major organisational changes (see qualitative evaluation report *The In Reach Model Described from the Perspectives of Stakeholders, Home Managers, Care Staff, and the In Reach Team*). Cumulatively, these challenges appear to have had an inhibiting effect on cost saving activities at an early stage, which in a short-term project of 2 years could lead to a sizeable underestimation of its true potential over a longer period of time.

Similarly, it would appear with the experience gained that IRT costs might be reduced through refinement of team size and membership without a major loss in effectiveness.

The ultimate question would seem to be whether an small increase in cost associated with the provision of a dedicated nursing team to residential care homes (if any) is worthwhile in terms of the following additional unquantifiable benefits:

- improvements in long term quality of life and quality of care of residents;
- new role workforce development in the residential care homes (still at an early stage) to the point when the need for IRT in its present form can be reduced.



## **1. Introduction**

### **1.1. Purpose of this Report: Inclusions and Exclusions**

This report has been prepared to provide the economic (costs and savings) evidence, derived from prospective audit, to enable an assessment of the impact of the In-Reach Team (IRT) service upon LA care homes' staff and residents. As such, the focus is upon the analysis of audit data related to IRT and its activities rather than those related to the LA homes and their staff. However, as health outcomes for residents are integral to IRT activities, these have been included in the analyses.

Although this report is presented as a 'stand-alone' document, it is complimentary to the earlier qualitative evaluation report *The In Reach Model Described from the Perspectives of Stakeholders, Home Managers, Care Staff, and the In Reach Team* presenting the evaluation's predominantly qualitative findings. Thus, cross-referencing of the present findings to those of the earlier report will be made where appropriate, to enhance understanding of any specific issues arising.

### **1.2. The Local Context**

The LA homes included in this study provide care to a largely non-affluent population. As a result, the context for audit is likely to be representative of many 'standard' care homes throughout the country which are trying to provide the best care for residents who are unable to pay for additional services. Thus, the context is not one in which *efficacy* of IRT (i.e. the level of benefit in an 'ideal' environment) is being measured. But, rather it represents an environment in which *effectiveness* can be assessed (i.e. the level of likely benefit in a context generalisable to other settings). The care homes also included care home staff who were initially resistant to change, rather than highly motivated. Thus the IRT audit provides evidence on the level of success which can be achieved through this form of local LA/PCT partnership in an 'average' setting.

### **1.3. The Research Team**

The research team comprises: research associate Ms Sara Nelson and Mrs Deidre Wild from the University of the West of England, Bristol, and Professor Ala Szczepura from the University of Warwick.

### **1.4. Background to the Overall Evaluation.**

In 2004 The University of the West of England was invited by a collaborative group from Bath and North East Somerset Local Authority (BANES LA) with BANES Primary Care Trust (PCT) to submit a proposal to meet their specification related to the evaluation of an in reach team (IRT) providing nursing and physiotherapy to support up to 15 beds for residents in a group of Local Authority (LA) residential care homes with 131 residents. In addition, the IRT members would support enhanced health training to NVQ3 for designated IRT support care staff. A shortfall in BANES funding for the evaluation study was ultimately met by the Joseph Rowntree Foundation.

The Evaluation commenced in December 2005 for a period of two years. Centre of Research Ethics Committee (COREC) and local PCT ethical approvals were sought and gained during the stage 1 set up of the study. A summary of the study's key aims and objectives is given at Appendix 1.

## **2. Overview of Evaluation Methodology Including Audit**

### **2.1. Summary of the Overall Evaluation Design**

The overall evaluation design is exploratory and descriptive. It brings together multiple sources of qualitative and quantitative evidence obtained from key stakeholders, IRT members, care home managers, care staff, and resident groups in BANES. The inclusion of a control care home (not in receipt of IRT) in addition to three experimental care homes in receipt of IRT (one home withdrew early in the IRT project) has provided some comparative data for key performance indicators. An economic evaluation is included to estimate the cost of the IRT model and the cost savings realised through its activities.

Following a *set up stage 1 of three months*, evaluation activities have included repeated methods (audit, interviews, focus groups, diaries) during *stage 2* (baseline data collection) and *stage 3* (interim data collection). *Stage 4* - final data collection - will utilise similar methods to collect information on the final new model created following major organisational change (see below at 2.4 and 1.5, respectively).

### **2.2. Economic Evaluation Considerations**

Provision of the IRT model of care has a range of cost consequences. These include the actual cost of IRT service provision and, balanced against this, any savings in terms of avoided hospital admissions or reduced hospital bed stay through early discharge to IRT care. Other longer term resource consequences will be linked to improved preventive care e.g. earlier identification of particular conditions and prompt treatment, and delay or prevention of transfer to a more expensive nursing home setting.

For care homes themselves there may be economic benefits associated with reduced staff turnover and a more content workforce, with lower sickness rates. In contrast, up-skilling of care staff may eventually lead to a requirement for higher levels of remuneration, increasing care home costs. Within the context of the major organisational and other changes experienced in this study, it would be difficult to interpret any trends in sickness rates, although these have been recorded.

This report considers the costs and marginal savings following the introduction of the IRT model. Costs are considered from a broad perspective to include NHS costs (including hospital, GP and community care), care home costs, and local authority costs.

A full economic evaluation would usually involve a comparison of any incremental costs with added benefits to residents (e.g. improved quality of life). At this stage, such a comparison can only be provided in a summary form where costs and cost savings are presented alongside key outcomes in a 'disaggregated' manner.

### **2.3. Key Areas of Inquiry for the Development of Audit Methods and Materials**

The following were identified as the key areas of audit inquiry, and materials and systems to gather relevant information were put in place.

- Number of residents referred to IRT, reason for referral, outcome of IRT triage (e.g. admission to IRT bed, non-bed care), length of stay in IRT, type of IRT intervention (if any).
- IRT outcomes in terms of: number of referrals to hospital & number of prevented hospital admissions, with clinical conditions; facilitation of early hospital discharges with type of admission; detection of hitherto unknown illnesses with conditions identified.
- Residents' quality assurance responses following admission to IRT beds.
- Total number of unplanned hospital admissions from participant homes; length of stay for each admission; clinical reason for admission.

- For all hospital admission the discharge destination (i.e. original LA home or move to nursing home).
- Residents' health status e.g. from IRT MDS assessments and care staff's Barthel (modified for LA homes).
- IRT staff retention/recruitment rates.
- IRT contribution to teaching and care staff's quality assurance responses following NVQ3 training courses.
- Comparison of pre-IRT audit data with comparable data during IRT evaluation phase.

## 2.4. Audit Methods and Materials

The key areas of enquiry formed the basis for early discussions between the research team with IRT members and care home staff as to the most efficient (in time) ways to capture information. Audit data that were already collected, either by IRT members or by care home staff, were reviewed by the research team to avoid duplication. Where audit data collection proformas either did not exist or existed in part, new audit or enhanced data collection methods were developed collaboratively with those with responsibility for IRT or the care homes' audit processes. The audit data collected are listed in Appendix 1. Individual items have not been replicated within this report but can be obtained following request by letter or e-mail to the report's authors.

Monthly collection of audit data from care homes was undertaken by the researcher. IRT audits were completed by individual IRT members. Audit forms were collated by the IRT administrator for computer entry. Following data entry, quality checks were undertaken. For items requiring a professional judgement, the reliability of categorization by IRT members was increased by the researcher (a nurse with independent sector experience) acting as an independent validator.

### 2.4.1. Audit Sources, Type and Collection Time-frame

Table 1 shows the three sources of audit data, the type of audit data collected, and the time period covered each type of audit.

**Table 1: Audit Sources, Type and Time-Frame**

Data Sources	Type	*Time-frame
<i>IRT</i>	Outcomes of IRT triages, admissions to service, reason for referral, length of stay in service, undetected illness, visit activities.	July 2005-June 2007
<i>PCT</i>	IRT admissions, referrals, interventions, episodes	July 2005-June 2007
<i>LA Homes</i>	MDS Resident dependency assessments	2006

To produce comparative descriptive statistics, all quantitative audit data collected from the IRT and LA Homes were entered into SPSS. Some data received from other sources were not in SPSS format and these were either re-entered or converted into SPSS format.

## 2.5. Ethical Considerations

The principles of full written and verbal study explanation, consent, right to withdraw, doing no harm, confidentiality and anonymity have been adhered to throughout the study (Merril & Williams 1995<sup>1</sup>). Ethical approval was sought from LREC and the University Ethics Committee for the study.

To render residents anonymous and to protect information held by both the homes and IRT, residents were given code numbers by home managers; this information was only shared with IRT members. Thus,

<sup>1</sup> Merrill J, Williams A (1995). Benefice, respect for autonomy and justice: principles in practice. *Nurse Researcher*, 3, 24-3

IRT members entered their audit data against the resident's code number but were also aware of the resident's name. In contrast, the researcher only used the resident's code number and at no time had access to the resident's name. The participant homes were also given a unique identifying code to protect their identity. The responsibilities of the researchers within the project's ethical frame-work formed a part of the initial project orientation. All data was safely stored under the provisions of the Data Protection Act (1998). The data collected during the course of the project will be destroyed following its completion.

### 3. Intervention Cost

The cost of providing the new model of nursing care is shown in Table 2, estimated based on the annual cost once the intervention was relatively stabilised (2005/06). The estimated annual cost of the intervention during this period was just over £302,000 to support a total of 131 residents; this equates to an average £44.38 per resident per week. These costs were borne by the ODPM grant (Invest to Save). NVQ assessment was funded separately.

The final column shows the predicted annual cost (2007/08 prices) for a 'Shared Care' model. In this model the In-Reach Team would include core nursing staff who work in partnership with existing community professionals, drawing on various staff (e.g. OT, Physiotherapy and RMN) when required rather than including these in a core team. This is probably more representative of the future model.

**Table 2: Cost of Intervention (IRT Model)**

<b>Cost Item</b>	<b>Annual Expenditure (2005/06)</b>	<b>'Shared Care/ Locality' Model<sup>★</sup> (2007/08 prices)</b>
Salaries <sup>1</sup> : IRT Nursing staff	242,368 <sup>2</sup>	218,000 <sup>3</sup>
Salary Physiotherapist	6,601	N/A
Salaries IRT Admin <sup>4</sup>	18,704	9,500
Travel/ lease cars	12,335	12,000
Uniforms/ Clothing allowance	629	629
Accom & Services	5,000 <sup>5</sup>	5,000
Office costs e.g. telephone, mobile, stationery etc	1,992	1,900
Office equipment e.g. PCs, photocopier etc	11,958	3,000
Clinical equipment & consumables	2,726	2,800
<b>TOTAL COST</b>	<b>302,313</b>	<b>252,829</b>

<sup>1</sup> Salaries include overhead costs (such as employer's National Insurance Contributions and pensions). Expenditure excludes one nurse assessor for 12 months (Skills for Care funding)

<sup>2</sup> Core team (not fully established until November 2005) consisted of 5 WTE band 5 nurses, 3 WTE band 6 nurses & 1 WTE band 7 nurse. In addition 18hrs per week Physiotherapist.

<sup>3</sup> Core team for Shared Care/ Locality Model consisting of: 4 WTE band 5 nurses working 7am – 9pm 7 days/ week &

1 WTE band 7 nurse. Team draws on community staff, including physiotherapists.

<sup>4</sup> WTE administrator in 2005/6; 0.5 WTE administrator in Shared Care/ Locality Model.

<sup>5</sup> Based on actual charge to be levied for accommodation in new Resource Centre (2007)

<sup>★</sup> In Shared Care/ Locality model, IRT draws on existing Community staff (i.e. OTs, Physios & RMNs) on 'as and when' required basis

## 4. Audit Findings

### 4.1. Number of Residents Referred to IRT

In total 733 referrals were made to IRT over a 2 year period, between July 2005 and June 2007, from among a total of 131 residents. During this period, the number of referrals for an individual resident ranged between 1 and 26. The mean number of referrals per resident was 5.6 (SD = 4.8).

Of the 131 residents, 94 (72%) were females who represented 71% of the total referrals, and 37 (28%) were males representing 29% of the referrals.

The mean age of residents was 87 years (range 71-104 years, SD = 6.6). For female residents the mean age was 87 (range 74-101 years, SD = 6.4); for males mean age was 87 years (range 71-98 years, SD 6.9).

### 4.2. Reason for Referral to IRT

For each referral, the person responsible for referring the resident to IRT (normally a home manager or a senior carer) was required to specify a reason in accordance with 6 categories provide by BANES PCT (see Table 3). Analysis shows that 206 (27%) of referrals were aimed at preventing a hospital inpatient admission or A&E attendance. For 20 residents (3% of referrals) the IRT team aimed to facilitate an early discharge. The largest group of referrals, 486 (66%) were aimed at maintaining the resident's independence in the care home; in addition, 17 (2%) referrals specifically aimed to prevent admission to a Nursing Home.

In terms of the underlying clinical condition, there was a huge variety of clinical reasons for referral. However, the diagnostic code was not always recorded on the PCT database at the time of referral. Thus, in order to establish this, an IRT retrospective review panel was convened comprising the senior manager, at least one senior IRT nurse, and the researcher from UWE acting as an independent validator. All referral notes were scrutinised before being coded with a diagnostic code from the PCT code book. Owing to the complex nature of some of these cases, a secondary diagnostic code was recorded for referrals where appropriate as well as the primary diagnosis.

**Table 3: Primary Categories - Reasons for Referral to IRT (N=733)**

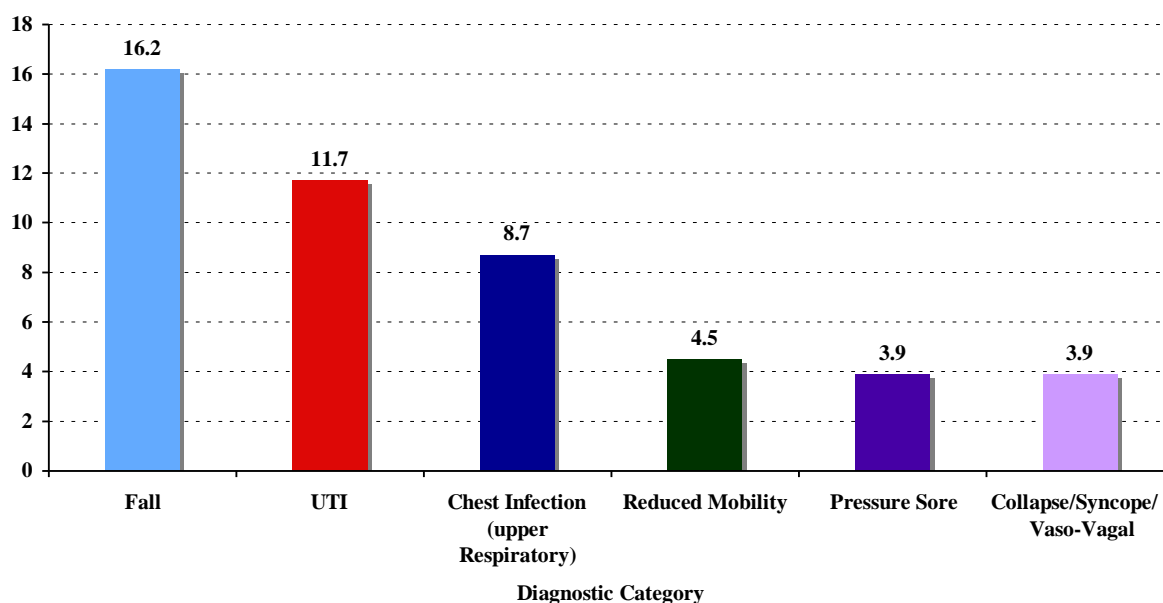
Reason for Referral	Percentage of Referrals N (%)
To maintain independence in residential home	486 (66)
To prevent hospital admission	198 (27)
Prevent A&E attendance	8 (1)
Prevent admission to Nursing Home	17 (2)
Facilitate early/safe discharge	20 (3)
Routine observations	4 (0.5)
<b>Total</b>	<b>733 (100)</b>

All 733 referral records have been reviewed. For 334 (46%) of these referrals, a formal clinical primary diagnosis could be identified; for 259 (35%) a secondary diagnosis could also be given.

The 5 most frequent primary and secondary diagnoses identified are given in Figure 1. Falls and infections (upper chest and UTI) constituted the majority of these 5 most frequent diagnoses (83%). Amongst the 5 most common secondary diagnoses, dementia and Alzheimer's disease made up 60% of identified conditions.

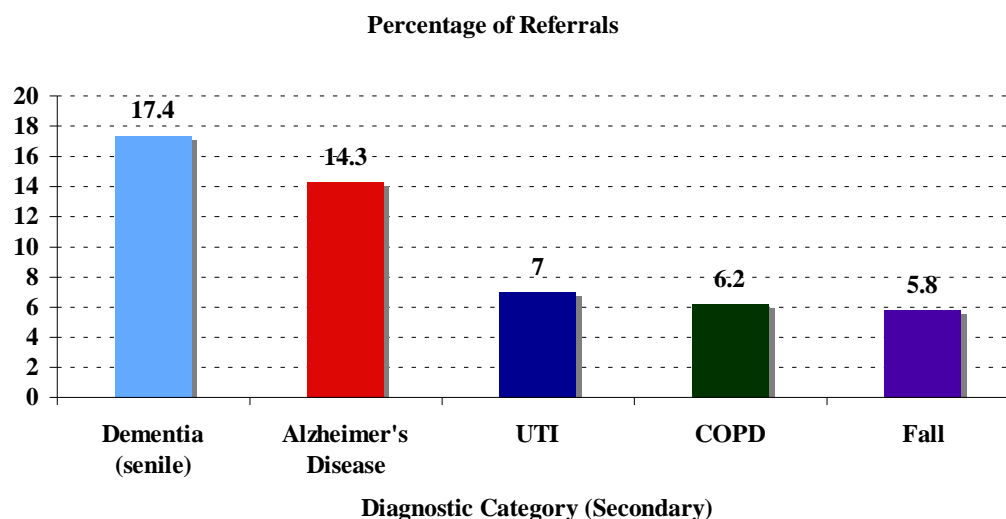
**Figure 1: Main Primary and Secondary Diagnoses for IRT Referrals**

**(a) Primary Diagnoses (Percentage of 334 cases with primary clinical diagnosis coded)**



*Fall N = 54; UTI N = 39; Chest Infection (upper respiratory) N = 29; Reduced Mobility N = 15; Pressure Sore N = 13; Collapse/Syncope N = 13*

**(b) Secondary Diagnoses (Percentage of 259 cases with secondary diagnosis coded)**



*Dementia (Senile) N = 45; Alzheimer's Disease N = 37; UTI N = 18; COPD N = 16; Fall N = 15*

Thus, for 399 referrals a specific clinical diagnosis could not be identified or was not relevant. The review panel developed additional categories to describe such referrals as shown in Table 4 below. Because no clinical diagnosis could be attached to these referrals, it was **not possible to assess** whether or not a hospital visit or nursing home transfer was avoided.



**Table 4: Description (Additional Categories) of Non Diagnostic Coded Referrals (N=399)**

Description (Additional Categories)	Frequency of Occurrence	
	N	(%)
Opportunistic partnership (DNs/Practice nurse)	217	(54%)
Advice only (includes telephone triage)	102	(26%)
Incomplete paperwork	27	(7%)
Physiotherapy only (advice and assessment)	20	(5%)
Inappropriate referral	22	(6%)
Care home staff unable to facilitate discharge	3	(0.8%)
Care home staff reluctant for IRT involvement	2	(0.5%)
Uncertain diagnosis	2	(0.5%)
Minor nursing task (venflon removal)	1	(0.3%)
Home closure requiring move to NH	1	(0.3%)
Minor ailment (no diagnostic category)	1	(0.3%)
D&V outbreak in home	1	(0.3%)
<b>Total</b>	<b>399</b>	<b>(100%)</b>

The majority (54%) of referrals which could not be clearly linked to a diagnostic category (i.e. clinical reason) were identified as opportunistic partnership activity for district nurses or practice nurses i.e. referral to the IRT to deal with something which would normally be done by another professional. For example, in cases where a resident's fall resulted in a minor skin abrasion/ skin flap that would normally be dealt with by the district nurse. This could not be avoided as the IRT often picked up through holistic assessment underlying illnesses/conditions and so did not discourage such referrals. The second largest group (26%) fell into the category of 'advice only' or 'telephone triage'. A common example in this category related to medication for pain or indigestion prescribed on an 'as required' basis. In such cases, care home staff might seek advice from the IRT staff as to the appropriateness of the timing of issue of such medication or indeed its adequacy in reducing pain. Inappropriate referrals, i.e. those not requiring the input of a qualified nursing team, were low (6%). Incomplete paperwork was identified as a reason for IRT referral in a similar percentage of cases (7%), mainly where IRT had advised that residents be referred to their GP for diagnostic tests. Where results of these tests had not been fed back to IRT, the team were unable to provide a diagnostic code from the PCT audit.

#### **4.3. Outcome of IRT Triage and Admissions to the IRT Service and Seasonal Variation**

Table 5 gives the outcome for all referrals to IRT (N = 733) following initial triage. The 733 referrals to IRT related to 131 residents. A total of 602 / 733 (82%) of referrals were assessed to require short-term IRT support, but not admission to an IRT bed. Much of the IRT work is about early detection and prevention and therefore can be done within the maximum 3 contacts that this form of support allowed. After 3 contacts, residents were again assessed as to their appropriateness for admission to IRT. During the early part of the project these cases often exceeded the 3 contacts and could become quite lengthy. This was, in part, due to lack of assessment tools to ascertain a resident's level of risk e.g. for hospital admission. This accounted for some inappropriate decision-making until a revised Clinical Risk Stratification (see Appendix 2) was introduced in March 2006. Risk stratification gave more clarity to both nurses and residential care managers in their triage decision-making about the need for IRT services or referral to external community health professionals.

Table 5 shows that in total 118 (16% of referrals) were identified for admission to IRT beds. These admissions comprised 70 residents, thus some residents had more than one admission. Year-by-year analysis of referrals shows no significant difference in the percentage of referrals in each category.

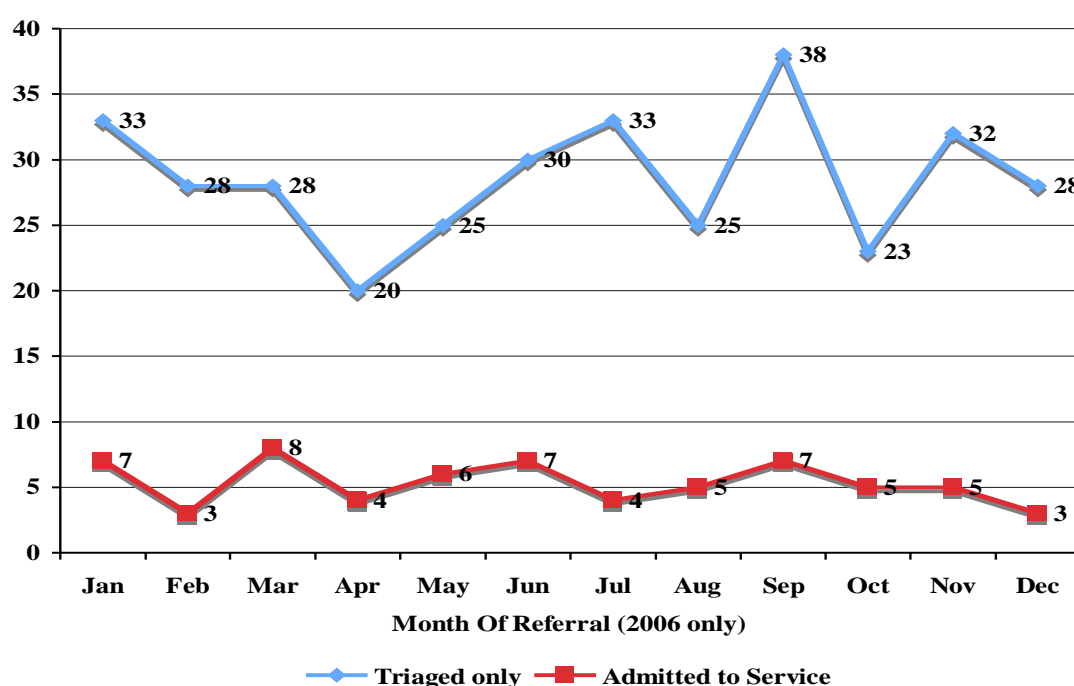
**Table 5: Outcomes of Triage Process and Admissions to IRT**

Outcomes of Referral	Frequency of Occurrence	
	N	(%)
Short-term IRT support only <sup>1</sup>	602	(82)
Accepted into IRT bed service	118	(16)
Inappropriate referral	5	(<1)
GP call out	4	(<1)
Emergency services call out	2	(<1)
Not recorded	2	(<1)
<b>Total</b>	<b>733</b>	<b>(100)</b>

<sup>1</sup>Includes some cases with more than 3 contacts (originally set as limit) – these might be categorised as ‘IRT monitoring’ rather than short-term support i.e. periodic assessment & care co-ordination.

Figure 2 below depicts the seasonal variation in the number of admissions to service and triage outcomes (2006 only). The total number of residents triaged in this period was 351, and the number of referrals admitted to an IRT bed was 63. 2006 has been used as a standalone year as it is, as yet, the only full year in which the IRT service has run at full complement.

**Figure 2: Seasonal Variation in Outcomes of Triage and Admissions to IRT**





#### 4.4. Type of IRT Intervention

All activities associated with resident contacts and with referrals to the team were recorded on the PCT database in accordance with the diagnostic coding system (shown in Tables 3 and 4). The **733 referrals** to IRT resulted in a total of **6,528 visits** by members of the team (mean IRT visits per referral = 8.9; average number of visits per month to all care homes = 272). Thus IRT has surfaced a high level of unmet need, over and above that previously provided via existing community nursing services. A one month audit (February 2007) recorded 28 visits by District Nurses totalling 449 mins (average 14 min per visit), equivalent to 336 visits per annum. It should be noted, that from May 2007, IRT also delivered half of the out of hours service for the locality.

Table 6 below indicates the types of activities carried out by the In Reach Service and the New Type of Worker (NToW) during these visits. Over one third of contacts were associated with general nursing care. Assessment and observation represented a further 12% of activities. The table shows that remaining activities were wide ranging, mostly covering aspects of clinical care. Activities that were recorded fewer than 100 times are not identified separately. Examples included: basic monitoring, bowel care, continence care, skin care, non-surgical wound care, and liaising with other health care professionals.

**Table 6: IRT Activities During Residential Home Visits**

Visit Activity	Frequency of Occurrence	
	N	(%)
General nursing care	2,372	(36)
Assessment	431	(7)
Basic Observations	292	(5)
Nursing Intervention	279	(4)
Diet and Fluid Intake	249	(4)
Pressure area care	212	(3)
GP liaison	203	(3)
Discharge visit	177	(3)
Medication	172	(3)
Terminal Care	166	(2)
Catheter Care	154	(2)
Support Worker training	105	(2)
Other (e.g. recorded < 100 times)	1,611	(29)
<b>Total</b>	<b>6,528</b>	<b>(100)</b>

#### 4.5. Diagnostic Codes for Residents Triaged and Admitted to IRT

All triage episodes (602) have been reviewed by the review panel. Overall, 213 could be given a formal diagnosis and the remaining 389 were classified as opportunistic partnerships or unclassified due to incomplete paperwork etc. Table 7 provides data for referrals which were triaged but **not** admitted to an IRT bed. The most common conditions are falls and chest/urinary tract infections. Other conditions dealt with by the IRT team without admission included diabetes, constipation, vomiting, head or other injury, joint pain and COPD. Reasons for those admitted to an IRT bed are shown in Table 8.

**Table 7: Most Common Diagnoses for Residents Triaged to Short-Term IRT Care**

Condition	N	%
Fall	40	19
UTI	29	14
Chest Infection	26	12
Collapse (syncope)	10	5
Diabetes (IDDM & NIDDM)	8	4
Constipation	8	4
Vomiting	8	4
Pressure Sore	7	3
Head Injury	6	3
Joint Pain (NOS)	6	3
Superficial Wound or Injury	6	3
COPD	5	2
Reduced Mobility	5	2
Alzheimer's Disease	4	2
Cellulitis	3	1
Dehydration	3	1
Eczema	3	1
Oedema (Localised)	3	1
TIA	3	1
Hip Pain (unexplained or NOS)	3	1
Other (< 2 cases)	27	13
<b>Total</b>	<b>213</b>	<b>100</b>

**Table 8: Most Common Diagnoses for Residents Admitted to IRT Beds**

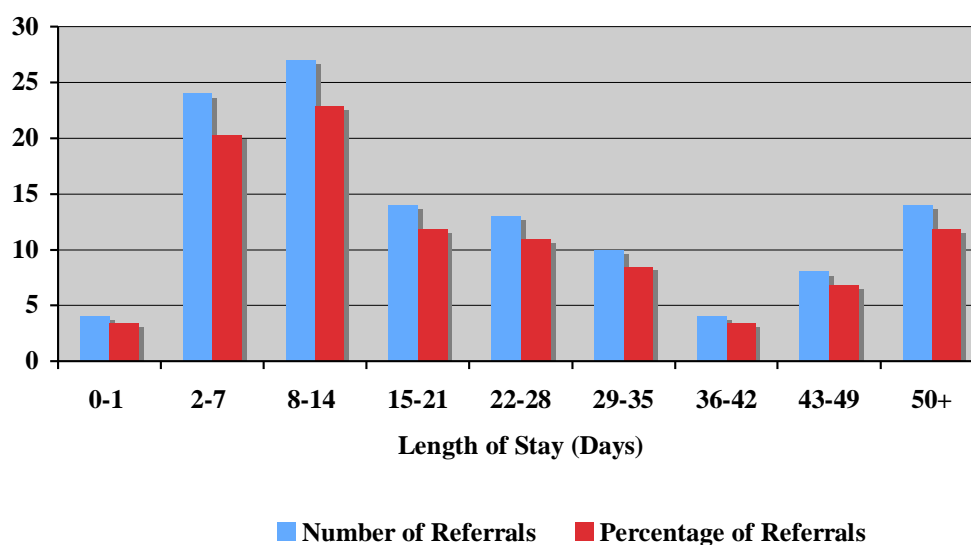
Diagnostic Coded Condition	N	%
Fall	13	11
Chest Infection	11	9
UTI	10	9
Reduced Mobility	10	9
Palliative Care	7	6
Pressure Sore	6	5
Depression	4	3
Collapse/Syncope	3	2
CVA/Stroke	3	2
Dementia (Senile)	3	2
Hypotension	3	2
Urinary Retention	3	2
Others ( $\leq 2$ cases)	42	36
<b>Total</b>	<b>118</b>	<b>100</b>

The most common reasons for admission to an IRT bed are falls, infections (chest and urinary tract infections (UTI)) or reduced mobility. There were also 7 cases of palliative care managed through by IRT admission. Examples of the 'other' category included: angina, carcinoma, chronic congestive cardiac failure, cerebral infarction, pneumonia, anxiety and abnormal weight loss. The percentages in the tables above relate to the 213 cases *with* a diagnosis; percentage figures are rounded to the nearest whole number.

#### 4.6. Length of Stay in the IRT Service

Length of stay was calculated for all 118 referrals admitted to the IRT service. Residents who were admitted spent an average 25 days in a 'virtual' IRT bed. The most frequent length of stay (mode) was 7 days; the range was very wide, from 1 day to 125 days (SD = 23.7 days). Figure 3 below shows that length of stay exhibited a bimodal distribution. In total, the 15 'IRT beds' (beds with IRT support, 5 per care home) were occupied for 2,949 days out of a potential capacity of 10,950 days (notional occupancy rate 25%). Occupancy levels fluctuated with a peak of 18 'beds' occupied at any one time.

**Figure 3: Distribution of Length of Stay in IRT Beds**



Further analysis shows that the cumulative sum of bed days per annum rose from 1,121 days in 2005/06 to 1,581 in 2006/07 (41% increase) as the service became established. Cases also became more complex with median stay rising from 12 to 25.5 days.

#### 4.7. Prevention of Hospital Admissions

Whilst there is no validated method for identifying a hospital admission which has been prevented through access to the IRT, by re-using the *clinical risk strategy* (see page 11 and Appendix 2) with the following four classifications: 'Yes' (hospital admission was prevented); 'Yes probable'; 'Improbable'; and 'No' (full definitions are provided in Appendix 3, care documents for each referral to IRT were retrospectively reviewed by an IRT Review Panel (the senior manager, a senior nurse and the researcher from UWE acting as a process validator). The analysis included respite residents. The aim was to achieve a consensus level of certainty about whether an admission to hospital had been prevented for that resident. The analysis reviewed all acute (i.e. unplanned) admissions from the IRT homes, and included admissions to UBHT, RUH and Mental Health Care Trusts. Of the 733 referrals reviewed, 398 could not be coded with a diagnosis and are therefore excluded from the following table since it was not possible to specify whether or not an admission had been prevented.

Table 9 below shows the outcome for the 335 referrals to IRT which could be classified. Referral to IRT was judged to have certainly or probably prevented hospital admissions in 34% of these referrals (115 averted admissions). Of these, there was consensus that in just under half (47 cases) admission had definitely been prevented. For the 399 referrals which could not be classified, if a sixty per cent *pro rata* incidence figure is assumed for hospital admissions prevented (just over half that observed in the cases which could be classified), then this would equate to upper range total figures of between 81 (definite) and 197 (including probable) admissions prevented. Table 3 shows that in terms of the actual reason for

referral to IRT, overall 198 referrals (27%) were aimed at preventing admission to hospital, giving an upper figure for avoidable admissions.

**Table 9: Hospital Admissions Prevented – For Referrals to IRT (N=335)**

Has a Hospital Admission been Prevented?	Frequency of Occurrence	
	N	(%)
Yes	47	(14)
Yes, Probable	68	(20)
Improbable	82	(24)
No	30	(9)
N/A	108	(32)
<b>Total</b>	<b>335</b>	<b>(99)</b>

Table 10 shows a similar classification for all residents *admitted* to IRT beds. As might be expected, admission to an IRT bed was judged to have certainly or probably prevented hospital admissions in a higher proportion of referrals (61%). In the majority of these, there was consensus that admission had definitely been prevented. For the 72 cases where IRT bed admission definitely or probably prevented hospital admissions, an appraisal of the likely length of the hospital stay (i.e. less than or more than 48 hours) was undertaken. Very few cases (4% of the 69 residents for whom this could be assessed) were predicted to require a hospital stay of less than 48 hours.

**Table 10: Hospital Admissions Prevented – For Residents Admitted to IRT Bed**

Has a Hospital Admission been Prevented?	Frequency of Occurrence	
	N	(%)
Yes	39	(33)
Yes, Probable	33	(28)
Improbable	18	(15)
No	10	(9)
N/A	18	(15)
<b>Total</b>	<b>118</b>	<b>(100)</b>

#### 4.8. Estimated Cost Saving Due to Prevented Hospital Admissions

If it is assumed that, since July 2005, 81-197 (max) admissions have been prevented as an initial estimate (see section 4.7), then these can be viewed as generating cost saving to be set against the cost of the IRT service provision.

Because these admissions do not (by their very nature) take place, there is no direct cost saving estimate available. However, in 2005 the reported cost saving to the PCT of an admission avoided was an average £2,000. *Assumption 1:* If it is assumed that admissions would on average have cost £2,000, this would indicate a *possible cost saving* of £162,000 – £394,000 during the period July 2005– June 2007 to set against an estimated 2 year spend of £604,626.

Under the new PBR regime, the charge to the PCT for an inpatient episode became £800 for a stay less than 48 hours and £2,500 for a stay longer than 48 hours. *Assumption 2* to re-calculate the *possible cost saving* due to avoided admissions. Section 4.7 indicates that during the study period only a very small minority (4%) of averted admissions would have resulted in a length of stay less than 48 hours. If 96% of avoided admissions would have resulted in an inpatient stay of over 48 hours, this would indicate an average saving of £2,432 per avoided admission and a *possible total cost saving* of £196,992 – £479,104 to set against an estimated 2 year spend of £604,626.

It is also evident that the average cost saving will be dependent on the specialty of the admission ward (*Assumption 3*). This will influence the average length of stay (LOS) for an inpatient episode and

therefore predicted cost. In 2006/07, the average LOS in BANES for General Medical admissions (the most likely destination of care home admissions) was 7 days. Assuming a cost to the PCT of £250 per inpatient day, this would equate to an average £1,750 per admission for a total of 567 – 1,379 bed days avoided. If this figure were used, this would indicate a *possible cost saving* of £141,750 – £344,750 to set against an estimated spend of £604,626.

Thus, although there is *no robust method* of costing an avoided admission, by using the three approaches above and comparing their results, we should be able to provide an estimate of the *likely range* of any cost savings resulting from avoided hospital admissions. At present, based on incomplete information, the cost saving due to avoided admissions would appear to be in the broad range of £141,750 – £479,104 over two years. In addition, there may be a saving in ambulance call out costs.

#### 4.9. Early Hospital Discharge and Estimated Cost Saving

Not only did residents access the IRT service during periods of ill health in the care home, where the aim was to prevent a hospital admission, the service was also used to *facilitate an earlier discharge from hospital* in some cases. Of the 733 referrals to the IRT service, 20 facilitated an early safe discharge from hospital. Table 11 shows the IRT outcomes for referrals deemed as early discharges from hospital.

**Table 11: Outcome for Early Hospital Discharge Referrals**

Outcome of Referral	N	%
Accepted into IRT bed service	13	65
Short-term IRT support only	1	5
Failed to meet IRT criteria	4	20
Deferred for review capacity	2	10
<b>Total</b>	<b>20</b>	<b>100</b>

Approximately two thirds (65%) were admitted to an IRT bed and one in twenty (5%) were triaged to short-term IRT support only. For the remainder, one fifth did not meet the criteria for IRT admission, mainly because they were more suited to hand over to community nursing services; and a further one in ten were capable of a direct return to the home without community nursing support but with advice to the home manager to re-contact IRT if any problems arose.

Table 12 details the types of agency making early hospital discharge referrals to IRT. A majority (60%) were made by the care home managers, following their first line contact from the hospital discharge service. In the remaining 40% of cases, first-line contact with IRT was made by the Hospital Trust.

**Table 12: Referring Agency for Early Hospital Discharge Referrals**

Referring Agency	N	%
Residential LA Home Managers	12	60
Royal United Hospital	7	35
Bristol Royal Infirmary	1	5
<b>Total</b>	<b>20</b>	<b>100</b>

For the 13 early discharges admitted to an IRT bed, there was a wide range in terms of length of stay (2-78 days). The average length of stay was 20.3 days (SD = 14.4 days), with a modal (most frequent) length of stay of 7 days. The total number of days these residents spent in an IRT bed following discharge was 264 days.

Thus, if it is assumed that approximately 264 hospital inpatient days were avoided through these earlier discharges at a cost of £250 per day, this would equate to a further saving to the PCT of £66,000 over the period. Assuming the 3 further early discharges for whom IRT provided support saved only one tenth of this figure (i.e. 2.1 inpatient days each) this would provide an additional saving of £1,575, producing a total saving of £67,575.

#### 4.10. Nursing Home Transfers Prevented and Estimated Cost Saving

Of the 733 referrals to the IRT service, Table 3 indicated that 17 were primarily aimed at preventing transfer to a nursing home. However, as shown in Table 13, 31% of the admissions to an IRT bed reviewed to date by the Review Team were retrospectively judged to have contributed to *preventing transfer to a nursing home*; 21% with a high level of certainty.

**Table 13: Nursing Home Transfers Prevented – For Residents Admitted to IRT Bed**

Has a Nursing Home Transfer been Prevented?	Frequency of Occurrence	
	N	(%)
Yes	25	(21)
Yes, Probable	12	(10)
Improbable	16	(14)
No	12	(10)
N/A	53	(45)
<b>Total</b>	<b>118</b>	<b>(100)</b>

Estimating the cost saving associated with this data is problematic, since transfer may be delayed but not necessarily avoided entirely in the long term. In addition, more than one episode may relate to the same resident. These cases were therefore examined in more detail. Analysis identified 20 separate residents for whom transfer was prevented and a further 8 for whom it was probably prevented. Overall delay (calculated up to June 2007) equated to 2 to 23 months for individual residents (average 11.9 months). For many it appeared that transfer had been prevented for the foreseeable future.

A *crude figure* for potential savings can be estimated based on in-house care home unit cost figures provided by BANES. These are: LA Residential care (£479.63 per week); LA Dementia care (£526.35); the maximum contribution to care in the independent sector which the council will pay for Residential & Dementia care (£388.00) and Nursing care (£494.00). A move from residential LA care to an independent sector nursing home could increase LA expenditure from £479.63 to £494.00 per week, or £747.24 per year. The LA continue to fund nursing home transfers unless there is a continuing care need (PCT).

If it is assumed that in addition to the average 12 months delay to the end of the observation period, there is a further 12 months delay as a result of IRT intervention in transfer to a nursing home for all 28 residents (see Table 13 above), this would equate to a £36,023 saving in the LA budget. For every further year's delay, a further saving of £18,011 in the LA budget would occur for these same residents. In addition, further savings would accrue if new residents were maintained in the care home. For the PCT, following transfer payment from the NHS funded nursing care budget will also be required depending on the Registered Nurse Contribution to Care (RNCC) banding *equivalence group* into which these individuals would fall. Assessment of a cross-section of residents (see section 4.1.2) has shown that 56% fall into the low equivalence band and the remaining 44% the medium banding. Average RNCC payment per week for residents in this mix of bands is £58.92 (2006 RNCC rates). For the delays estimated above this would equate to a saving of £171,575 and £85,787 for each subsequent 12 month delay. In total, delays in transfer to nursing homes resulting from IRT activity during the period July 2005 to June 2007 might have produced a saving of £207,598 plus an additional £103,798 for each extra year's delay.

#### 4.11. GP Visits Prevented and Estimated Cost Saving

Again, those referrals admitted to an IRT bed were looked at to see whether or not during their stay in the service, at least one visit from the GP had been avoided. Table 14 shows the percentages for each classification for the 118 residents admitted.

**Table 14: GP Visits Prevented –Residents Admitted to IRT Bed (N=118)**

Has at least one GP visit been avoided during resident's stay in IRT bed?	Frequency of Occurrence	
	N	(%)
Yes	80	(68)
Yes, Probable	3	(3)
No	28	(24)
N/A	7	(6)
<b>Total</b>	<b>118</b>	<b>(100)</b>

Overall, ca 68% of IRT bed admissions also prevented at least one GP visit. If between 1 and 3 GP visits were avoided per IRT episode (i.e. 80-240 in total), the cost saving associated with these is estimated at £1,088-£3,264 (based on a cost of £13.6 per consultation)<sup>2</sup>.

#### 4.12. Previously Undetected Illnesses & Resident Assessments

An important potential benefit provided by IRT and the NToW might be improved preventive care, such as the identification of previously undetected illnesses or conditions. The review panel has examined all 334 cases out of the 733 referrals to IRT which had a formal, clinical primary diagnosis to see whether or not a previously undetected illness has been identified. In 192 of the 334 cases (57%), an undetected illness was identified by the IRT.

Table 15 shows the types of previously undetected illnesses identified in these 192 cases. The most common were UTI, constipation and chest infections. The 'Other' category (conditions with fewer than 5 cases) included: malnutrition, abnormal weight loss, pneumonia, CVA, polypharmacy and cellulitis. There was evidence of a small year-on-year increase in the number of previously undetected illnesses identified from 2005/06 to 2006/07.

It is difficult to estimate the consequences in terms of health benefits, quality of life and cost savings of this form of early intervention. However, for the 192 cases if the consequence is equivalent to between 36 and 60 hours hospital stay avoided per resident per annum during this period, this would represent a cost saving of between £72,000 and £120,000 each year (see section 4.8). If the number of cases of illness detected is higher (since this figure is only for the 334/733 referrals which had a formal, clinical primary diagnosis), the annual saving will be higher.

<sup>2</sup> Unit Costs of Health and Social Care 2006; PSSRU, University of Kent, Canterbury. Based on Table 1.4: Local authority residential care for older people.



**Table 15: Previously Undetected Illness in Cases with Clinical Diagnosis Recorded (N=192)**

Type of Undetected Illness	N	%
UTI	44	23
Constipation	22	12
Chest Infection (upper respiratory)	17	9
Chest Infection (lower respiratory)	9	5
Dehydration	9	5
Localised oedema	8	4
Pressure Sore	7	4
Hypotension	5	3
Other (<5 cases)	71	37
<b>Total</b>	<b>192</b>	<b>100</b>

Sixty-three residents consented to IRT nurse assessment using **MDS** (see Appendix 5); no dementia care cases were included. Of the sixty-three, 36 have completed data entry to date. The component scores were used to classify residents, based on an algorithm, into a Registered Nurse Contribution to Care (RNCC) banding *equivalence group* (see Appendix 5). Of the 36 banded to date, 20 (56%) fall in the low equivalence band and the remaining 16 (44%) were placed in the medium banding. These banding outcomes demonstrate that the residents assessed so far have a level of nursing care need.

Modified *Barthel* scores, completed by care staff, were also used to assess an individual's level of independence in a more limited range (excludes mental health and pain) of ADLs (see Appendix 5). These were collected from April 2005 until February 2007 with some inconsistency in numbers assessed of the same 63 consenting residents. This measure differs from MDS in that, although it records aspects of functional performance, these cannot be directly related to health specific needs.

## 5. Staff Retention and Recruitment Findings

The IRT project began recruitment in December 2004. The IRT Manager had been seconded from the PCT prior to the team recruitment. The first two IRT nurses were employed in April 2005, and a further 7 nurses enabled commencement of the full service in July 2005. The remaining 2 members of the team were appointed between 3 and 5 months after the IRT project started, indicative of a slow recruitment to achieve full capacity. The IRT members comprised 12 nurses, the equivalent of 8 whole time equivalents (WTE) and one 0.2 WTE physiotherapist. The team provide 24 hour cover 7 days a week. In the original planning stage, 4 homes were designated as IRT homes but one withdrew within the first 6 months of the project. By June 2007, 4 nurses and the physiotherapist had left the IRT. The full time administrator for the Team had also left.

## 6. IRT Contribution to Teaching & Clinical Care

In addition to providing clinical care, the in-reach team also has an educational role. Ideally, the cost of IRT staff time devoted to this activity should be removed from the total IRT cost in order to compare the IRT 'clinical care' costs with clinical benefits such as hospital admissions avoided, early discharges facilitated, undetected illnesses identified, and nursing home transfers prevented or delayed.

From May 2005 to February 2007, IRT members contributed to a small paper-based audit to document the types of teaching activities, number of teaching contacts, and time (in minutes) per contact. In total, 263 IRT teaching contacts were made in the 22 months. These contacts took 260.25 hours of IRT members' time (mean time per contact = 59 minutes), excluding travel time. Of the total number of contacts, 157 (60%) were directly related to NVQ3 training for the NToW role. The remaining teaching



activities were less formal and mainly included health enhancing clinical teaching in the home setting, e.g. supervision of clinical competencies, explanations of clinical issues arising. A small number of contacts were made to explain IRT to other professional groups, i.e. GPs, community nurses, and to provide informal support for student nurses on placement in the homes. The 260.25 hours devoted to teaching equates to approximately 12 hours per month or 18 days per annum. This equates to £2,982 per annum (2006/07 prices), based on a band 5 nurse.

IRT educational activities also included a small number of contacts to explain IRT to other professional groups, i.e. GPs, community nurses; providing educational support for student nurses on placement in the homes; and involvement in NToW training (NVQ3) with the NVQ Assessor. A quality assurance exercise for a recent NVQ training course indicated care staff participants' enthusiasm for the new learning acquired, a growth in confidence in basic nursing clinical skills practiced (e.g. vital observations, tissue viability, continence promotion), and a recognition of their future new role benefit to residents.

The part-time physiotherapist provided 77 group exercise classes to resident groups, with a range of 2-12 residents across the participating homes from November 2005 - May 2007. Each group session lasted one hour. Jointly with the nurses, the physiotherapist also ran a falls prevention programme for care staff; introducing falls registers in each home, care staff teaching sessions on use of the PCT Falls Assessment Tool, and creating 'The Pocket Guide to Falls Prevention'. Her contribution to the IRT also included early discharge assessments for residents in hospital and rehabilitation care needs of individual residents with impaired mobility and chronic conditions

Finally, residents/ relatives views on quality assurance were explored following admission to IRT beds. Fourteen residents receiving IRT support, or their relatives, completed a short questionnaire asking:

- what they liked most
- what they liked least about IRT care and,
- what they thought could improve the service

All of the returned questionnaires were positive in their responses. Key aspects included good information and communication, a professional approach, and appreciation of being able to avoid hospital.

These findings support the positive responses recorded by the UWE researcher from a resident focus group held in November 2006 where the same questions were asked<sup>3</sup>.

## 7. Discussion of Findings

The IRT model aims to provide flexible, strategic nursing input into residential care homes to enable them to achieve a level of continuity of care. Residential homes provide personal and social care. Nursing and medical care is usually provided through District Nurses and GPs. Nursing care homes provide on-site nursing care, along with personal and social care, with qualified nurses employed to provide the nursing care. In a residential home, if a resident subsequently requires nursing care she or he will not need to move to a different home. Thus, the IRT model aims to provide a 'bridge' for residential homes through delivery of on-site, structured nursing care in a manner which can maintain residents *in situ*, delaying transfers to a nursing home, preventing unnecessary admissions to hospital, and facilitating early discharge from hospital care. The evidence presented in the Wanless report indicates that community-based services can substitute for specialist health care (mainly hospital care), and that 'this substitution can be cost effective, that is, total health and social care costs are either lower or outcomes are improved

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<sup>3</sup> May 2007 Interim Report, 'The In Reach Model Described from the Perspectives of Stakeholders, Home Managers, Care Staff, and the In Reach Team' (Pages 40-42).

or both'.<sup>4</sup> The economic evaluation of the IRT model would appear to indicate a similar conclusion for strategic provision of nursing services to residential homes.

Table 16 provides an indication in summary form of the overall costs of IRT (once health and social care savings are taken into account) together with other potential outcomes (non-cost benefits). The three left hand columns present IRT cost figures plus estimated cost savings; the right hand column lists non-cost benefits in a disaggregated manner.

Examination of cost figures on the left of the table shows that the overall *added incremental cost* of providing IRT is estimated at between a maximum of £2.69 *per resident per week* and a possible cost saving of £36.90 *per resident per week*. The actual value will depend on the annual cost of the IRT service and the size of the various savings. Table 16 shows that the highest savings relate to avoided hospital admissions, followed by avoided transfers to nursing homes. Early detection of illness is difficult to quantify in monetary terms, but may add a similar level of saving. Annual savings due to early discharges from hospital are less significant, although there would appear to be the potential for these to be increased.

The cost saving estimates are based on activity in the first two years of IRT service. Estimates exclude any annual savings associated with district nurse/practice nurse time saved and ambulance call outs avoided. They also make no allowance for the fact that IRT delivered half of the community nursing out of hours service from May 2007. The final incremental annual cost figures in Table 16 should be placed in the context of reported national costs<sup>5</sup> for *ad hoc* community nursing input to LA residential care i.e. between £13.91 and £102.14 per resident per week (2006/7 prices<sup>6</sup>).

Balanced against any final incremental cost (or cost saving) there are also the additional non-cost benefits provided by IRT, some of which are listed at the right of the table. For residents, as well as improved quality of life, there is enhanced quality of care with the opportunity for access to a wider range of services, and the benefits of better preventative and nursing care enabling them to stay in familiar surroundings rather than spending time in hospital or being transferred unnecessarily to a nursing home. Similarly, for the LA and PCT there are a number of potential benefits. These range from care staff development, improved job satisfaction, improved care provision through to better partnership working between the LA and PCT.

Finally, as with any new service, improvements are possible to increase the effectiveness of the intervention. During the course of the study, changes were made to the original criteria for admission to the IRT service (see Appendix 2). At present, there is a formal care plan only for admissions to the service. There may be a need to be a similar way of formalising the emerging category i.e. 'IRT monitoring' and also discharge from the service. Account should also be taken of the concurrent difficulties in year 1 of recruitment to IRT and NToW which delayed service development, some care staff's resistance to change, and the effects of major organisational changes (see the qualitative evaluation report *The In Reach Model Described from the Perspectives of Stakeholders, Home Managers, Care Staff, and the In Reach Team*). Cumulatively, these challenges appear to have had an inhibiting effect on cost saving activities at an early stage, which in a short-term project of 2 years could lead to a sizeable underestimation of its true potential over a longer period of time.

Similarly, it would appear that the cost of the IRT team could be an overestimation. The annual IRT team cost used in the calculations above (£303,313) is based on the core team available in 2005/06. As Table 2 shows, the cost of a 'Shared Care/ Locality' Model is predicted to be significantly lower (£252,829 at

<sup>4</sup> Wanless D, Fernandez J, Poole T, Beesley L, Henwood M, Moscone F (2006). *Securing Good Care for Older People: Taking a long-term view*. King's Fund London. ISBN 1 85717 544 1

<sup>5</sup> Unit Costs of Health and Social Care 2006; PSSRU, University of Kent, Canterbury. Based on Table 1.4: Local authority residential care for older people.

<sup>6</sup> Assuming +4% per annum increase [Personal Social Services (Local Authority, Adults) from Figure 40; Wanless D et al (2006). *Securing Good Care for Older People: Taking a long-term view*. King's Fund London]

2007/08 prices). It would appear that IRT costs could be reduced through refinement of team size and membership without a major loss in effectiveness. Furthermore, with the development of practice based commissioning the impetus for GPs to identify areas of service currently provided by acute hospitals which could be effectively managed within the primary care setting will increase. Along with increased use of intermediate care services for patients resident in their own homes, structured IRT provision to residential care homes may also become more attractive.

With these points in mind, the question would seem to be whether any final incremental cost associated with the IRT service is worthwhile in terms of the following benefits:

- promoting long term quality of life and quality of care of residents;
- providing a firm foundation for new role workforce development (still at an early stage) to the point when the need for IRT in its present form can be reduced in line with savings.

## **8. Acknowledgements**

The Evaluation research team would like to thank the following persons for their generous ongoing co-operation and support in the completion and provision of audit information.

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Mr David Smallacombe – Consultant to LA for In Reach Project  
Ms Sue Bendall- IRT Administration Assistant  
Ms Linda Frankland- LA Finance  
Ms Tina Clarke – LA Finance  
Ms Ann Brooks – NVQ Assessor LA  
Ms Sian Walker – Group Manager, Adult Care Housing and Health, LA  
Ms Corinne Edwards - Intermediate Care & Commissioning Manager, PCT  
Ms Vicky Hickson – Management Accountant, PCT  
Ms Jacky Hawkins – Information Analyst, PCT  
Mrs Julia Hyde - PA Prof Szczepura, Warwick Medical School

**Table 16: IRT Costs and Cost Savings vs Benefits**

Costs & Cost Savings			Non-Cost Benefits
<i>Cost item</i>	<i>Lower</i>	<i>Upper</i>	<b>Resident:</b> Able to stay in familiar surroundings/ continuity of care Avoid unneeded hospital admissions/ limit length of stay Improved <i>quality of life</i> Opportunity for access to wider services Undetected illnesses identified & treated Enhanced <i>quality of care</i>
Annual total IRT cost	302,313	302,313	
Annual IRT non-clinical (training) time	2,982	2,982	
<b>Annual IRT clinical service</b>	299,331	299,331	
Annual saving due to avoided hospital admissions	70,875	239,552	<b>LA/PCT:</b> Education & skills development for care home staff On-site clinical supervision & support Improved job satisfaction/ reduced turnover Improved relationships with DNs & GPs Improved record keeping Better infection control, falls prevention, palliative care LA/PCT partnership working
Annual saving due to early discharges	33,788	33,788	
Annual saving due to delayed/ prevented nursing home transfers	103,799	155,699 ♦	
Annual saving due to GP visits avoided	544	1,632	
Annual saving due to early detection of illness	72,000	120,000	
<b>Annual cost saving p.a. †</b>	281,006	550,671	
<b>Incremental cost p.a. (IRT cost – annual saving)</b>	<b>+£18,325</b>	<b>- £251,340<sup>2</sup></b>	<b>National:</b> Major contribution to national policy debate (PCT/LA)
<b>Av. cost of IRT/ resident/ week</b>	<b>+£43.94</b>	<b>+£43.94</b>	
<b>Av. incremental cost/ resident/ week ♦</b>	<b>+£2.69</b>	<b>-£36.90<sup>2</sup></b>	

♦ Upper figure assumes additional 12 month delay in transfer per resident

† **Excludes:** DN/Practice nurse call out avoided (145 total); and annual saving in ambulance call out costs. In addition, ignores that from May 2007 IRT also delivered half of out of hours service.

♦ 131 residents.

<sup>1</sup> Includes part-time NVQ assessor cost as well as other IRT time dedicated to direct training i.e. 18 days p.a.<sup>2</sup> Negative number indicates cost saving.

## **Appendix 1**

### **Summary of Audit Materials**

#### **IRT Members**

Staff retention, recruitment and sickness  
Educational support to NToW  
IRT Quality Assurance for admitted residents /relatives  
Complaints and appreciations  
Budget and expenditure

#### **IRT Residents in the Service**

Date of Admission to IRT Service, length of stay, and date of discharge

Reason for admission

Admission: *Source of referral*  
*Rationale for prevention of hospital admission*  
*Rationale for prevention of transfer to nursing home*  
*Rationale for facilitation of early hospital discharge*  
*Involvement of GP/DN/ hospital OPD*  
*Care activities/outcomes*  
*Primary and secondary diagnoses*  
*Rationale for detection of illness*

Short-term IRT support:

*Date of triage*  
*Source of referral*  
*Reason for triage*  
*Source of referral*  
*Involvement of GP/DN*  
*Primary and secondary diagnoses*  
*Care activities/outcomes*  
*Involvement/referral GP/DN/ hospital OPD*  
*Rationale for detection of illness*

#### **Care Home Residents from Home Manager**

Bed capacity monthly

Admissions and date

Discharge and date

Deaths: date and place

Hospital admissions; date of and readmission to home date

Transfers to nursing homes

#### **Care Home Staff from Home Manager**

Staff retention, recruitment and sickness  
Educational provision NVQ2 and 3 and specific to NToW  
Complaints and appreciations  
Budget and expenditure

## Appendix 2: Original and Revised Criteria for IRT service

### 2A: Original Criteria for IRT service



## In-Reach Nursing service

We are a 24 hour Nursing Service (a Physiotherapist and RMN are still to be appointed) working in partnership with Goldney House, Hawthorn House and Marjorie Whimster Residential Homes.

Our aims are to:

- Prevent admission to hospital
- Enable early discharge from hospital
- Prevent inappropriate transfer to nursing home.

**For further information or to refer a patient please contact**

**Administrator:**

Ginny Tettmar  
01225 396378

**Out of hours contact:**

Nurses Mobile Phone  
07767 441592

#### Criteria for In Reach Care

- At recognised immediate risk of acute admission  
i.e Moving from: Stable to Unstable  
Predictable to Unpredictable  
(see below)
- Exacerbation of chronic illness
- Known risk of medical decline e.g. Bereavement  
Terminal Care  
Recent falls
- Deterioration in physical ability or mental state
- A Nursing intervention outside of that which is available from the District Nursing service.

#### Unpredictable

Patient response to their health or disease process/disorder or to any internal or external triggers cannot be anticipated with certainty through existing intervention or care plan

#### Unstable

Where health or disease process, including emotional, physical behavioural or psychological needs are in an unsteady state and are likely to deteriorate if correct treatment or care regimes are not made available.

#### Nursing Interventions may include

- IV Drug Therapy- Including Cannulation
- Medication monitoring including checking of blood levels
- Phlebotomy
- Wound Care
- Nutrition monitoring - To include Supplementary feeding, Gastrostomy/PEG feeding
- Subcutaneous fluid replacement
- Care of Hickman/PIC line
- Syringe Driver
- Palliative care
- Rehabilitation following hospital admission

**If you would like to discuss a possible referral or for more information about the service, please contact**

**Carole Williams• 01225 396832**

**Nurses: 01225 396833**



## **2B: Revised Criteria for IRT service: CLINICAL RISK STRATIFICATION – IN REACH SERVICE**

**Purpose of Tool:** 1. Assess resident's risk of hospitalisation or transfer to Nursing Home  
2. Prioritisation for clinical management

**Resident Name:** ..... **Date:**.....

*\* Please circle all that apply*

Risk Category	Criteria	Suggested Clinical Strategies for Guidance
<b>❖ HIGH</b>  <b>Admit to In Reach Service if any one or more apply</b>	Early discharge Significant illness or injury Deterioration of chronic condition Significant change in functional or cognitive status/decline in condition IV/Subcutaneous therapy Two or more falls in past 30 days Receiving treatment/investigations with significant risk (e.g. chemotherapy) Significant deterioration in mobility Evidence of significant infection with unexplained symptoms Terminal Care	Nursing and physiotherapy assessment A minimum of 2 contacts per day. Consider more contacts as needed Review medical care plan with GP/DN and revise as indicated. Review changes with Resident, family, Care Home Manager and other team members Review star chart for trigger factor with Resident, Care Home Manager and NTOW and key worker to ensure notification of changes Review Resident preferences for care with appropriate parties and document changes including consent/end of life plan Review high-risk Residents with GP and all care providers Plan care with NTOW and key worker Links with CMHCT
<b>MODERATE</b>  <b>If 3 or more apply consider admission to In Reach Service</b>	Dehydration Unstable/change in social situation Complex multi-agency involvement History of lung infection in past 60 days Hospital discharge/readmission in past 30 days A & E transfer in past 30 days Change in functional or cognitive status/decline in condition Minor illness or injury Unexplained Fall or change in mobility Deterioration in condition from baseline status Palliative Care Recurrent infections Weight loss/unexplained and/or continued New Resident to service Significant cognitive disability Unlikely to contact care staff with changes Polypharmacy (6 or more medicines) Undergoing diagnostic studies	Nursing and physiotherapy assessment A minimum of three contact Review medical care plan with GP/speciality nurse as needed If medical plan of care changes review changes with Resident, family & NTOW Review Resident's preferences and document as needed Propose Balance and Agility therapy group Complete falls assessment Review administration of medication
<b>LOW</b>	Needs can be met by other health care providers	Discuss with and refer to appropriate community team services

clinical risk stratification /GT/forms/ 19306

**Risk assessed by:** .....

**Agreed with:** ..... (Title)

Adapted from Eldercare Project in Cornwall (EPIC)

Print Name & Title



## Appendix 3

### Classification Used to Identify Prevention of Hospital Admissions

The following review classification was used:

#### **Was hospital admission prevented?**

##### **Yes**

Where documented evidence clearly indicated that i] the episode of care supported acute illness/injury/palliative care or end of life needs that were clearly discussed with a GP, Community Nurse and/or Registered Care Manager and ii] there was inter-professional agreement that the resident could only remain in the home with the support of IRT.

##### **Yes, Probable**

Where documented evidence clearly indicated that i] an episode of care had a focus upon illness prevention and early detection to avoid deterioration of complex ill health, that ii] without intervention of IRT, was likely to necessitate a hospital admission. Decision-making for these resident episodes was strengthened by the use of the PCT's Clinical Risk Stratification (CRS) i.e. where there were three or more '*moderate risk*' areas, or a '*high risk*' of hospital admission

##### **Improbable**

Using the CRS, an episode of care that was not complex and rated as '*low risk*' or with two or less '*moderate risks*' with an evidence-based rationale that the resident was unlikely to require an acute hospital admission, even without In Reach intervention and admission was not expected or likely. The level of input from In Reach was aimed at supporting the residential care staff team to cope with increased needs ranging from reduced nutritional input to reduced mobility. Physiotherapy was often part of this episode. However the team note that in some instances even though admission is not necessary there are negative influences such as the time of day and the day of the week that can result in inappropriate hospital admission. For example the 'out of hours' GP services have minimal medical history and residents with high dementia care needs are often difficult to assess. GP's can be influenced by the residential care home staff to arrange an admission either on a busy Friday evening or over a weekend. This can be due to low staff numbers or shift rotas predominantly made up of 'agency'. It becomes an easier option to admit the resident to hospital. The existence of the In Reach team can have a positive influence on these scenarios.

##### **No**

Episodes where:

- There was an entirely appropriate hospital admission.
- An admission occurred without the involvement of IRT, e.g. if residential care staff identify an 'emergency' situation and report direct to the GP that the resident is 'unresponsive' they will be advised to call 999. If an IRT assessment had occurred this may have been managed differently. Use of language has definitely influenced outcomes for residents.
- The illness/injury was not assessed as serious/complex enough and was manageable without hospital admission.

It is of note that where '*No*' has been recorded, this may also include those referrals for which a hospital admission would not have been appropriate in any circumstance. Thus, the panel are now in the progress of reclassifying some of the 'no' responses into 'not applicable'.

## Appendix 4

### Data on Overall Hospital Admissions from IRT Participating Care Homes

**Table 4A - Hospital Admissions (all homes) with month of admission, HRG coding and Length of Stay (more or less than 48 hours) July 2004 – June 2005**

Month/Year of Admission	HRG code	Less than 48 hours	48 hours +
July 2004	E99	0	1
	H63	1	0
	T07	0	1
	U07	0	1
Aug 2004	F35	1	0
	F46	0	1
	T09	0	1
Sept 2004	A22	0	1
	E99	0	1
	L09	0	1
	T09	0	1
	U01	0	1
Oct 2004	D41	0	1
	L09	0	1
Nov 2004	F46	0	1
Dec 2004	F64	0	1
	S28	0	1
	S31	0	1
Jan 2005	A22	0	2
	C17	1	0
	F46	0	1
	F48	0	1
	J34	0	1
	S24	1	0
	S31	0	1
	U01	0	1
Feb 2005	D33	0	1
	L18	0	1
	R15	1	0
March 2005	A13	1	0
	A22	0	1
	L09	1	0
April 2005	E12	0	1
	H84	0	1
May 2005	A13	0	1
	K07	0	1
	L09	0	1
	M99	0	1
June 2005	E31	0	1
	F46	0	1
	F48	0	1
Totals		7	35
Total number of admissions for period July 2004-June 2005 = 42			

**Table 4B - Hospital Admissions (all homes) with month of admission, HRG coding and Length of Stay (more or less than 48 hours) July 2005 – June 2006**

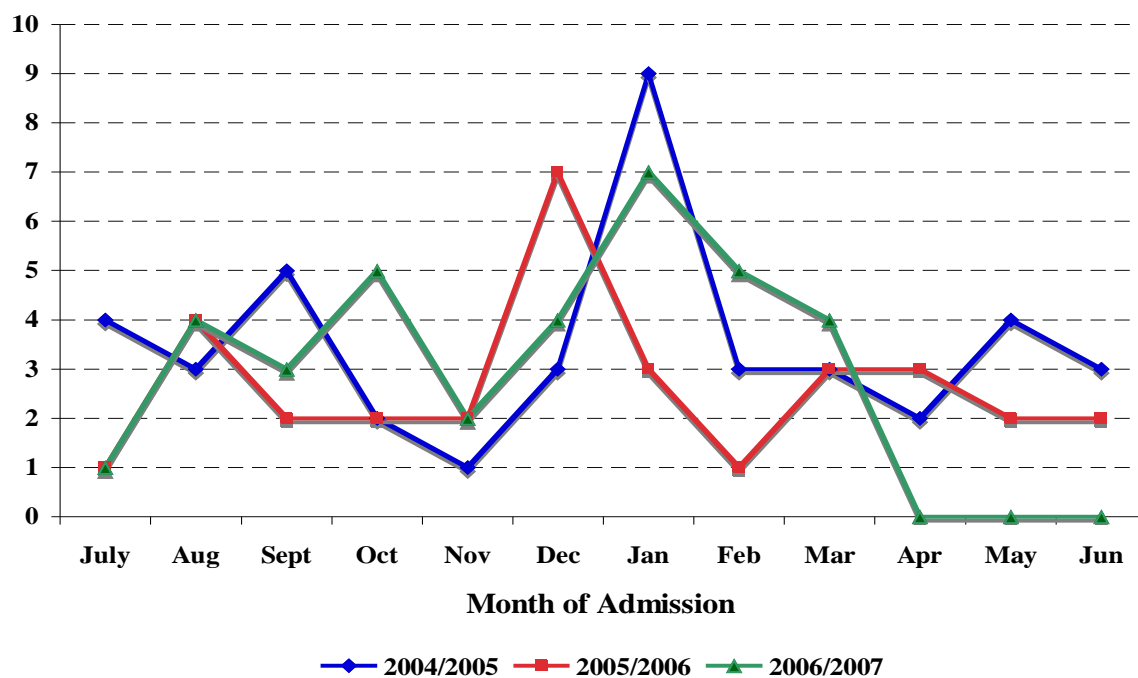
Month/Year of Admission	HRG code	Less than 48 hours	48 hours +
July 2005	E35	1	0
Aug 2005	H41	2	0
	H85	0	1
	S05	1	0
Sept 2005	H41	1	0
	H99	0	1
Oct 2005	F36	0	1
	H86	0	1
Nov 2005	E29	0	1
	H41	0	1
Dec 2005	D41	0	1
	E29	0	1
	H99	0	1
	J34	0	1
	S19	1	1
	F36	1	0
Jan 2006	D41	0	1
	J34	0	1
	L09	0	1
Feb 2006	E99	0	1
March 2006	D14	1	0
	F64	0	1
	H41	0	1
April 2006	E29	1	1
	K07	0	1
May 2006	D39	0	1
	E29	1	0
June 2006	H41	1	0
	S35	1	0
Totals		12	20
Total number of admissions for period July 2005-June 2006 = 32			

**Figures for Home 3:** (Sunnyside did not commence IRT until the very end of that time period, May 2006; figures presented below).

July 2005 – 0 admissions  
 Aug 2005 – 1 admission (H41)  
 Sept 2005 – 0 admissions  
 Oct 2005 – 1 admission (F36)  
 Nov 2005 – 1 admission (E29)  
 Dec 2005 – 3 admissions (1x D41, 1x E29, 1x J34)  
 Jan 2006 – 0 admissions  
 Feb 2006 – 0 admissions  
 Mar 2006 – 1 admission (D14)  
 April 2006 – 3 admissions x K07, 2 x E29  
 May 2006 – 1 admission (E29)  
 Total of 11 admissions for Home 3 in this period.

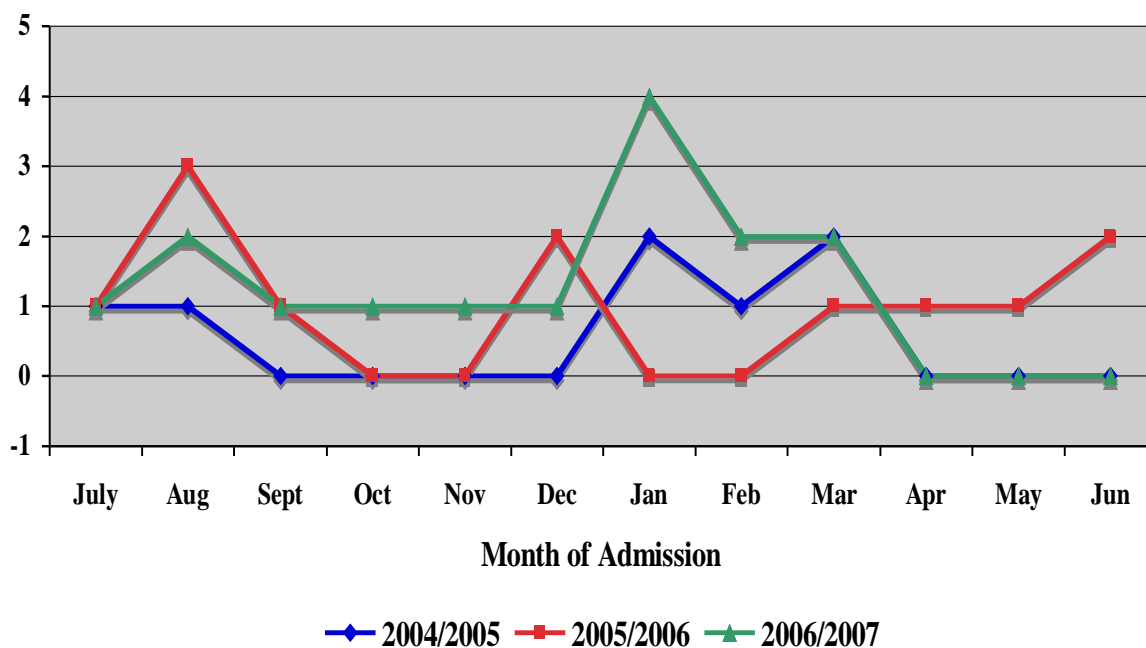
**Table 4C - Hospital Admissions (all homes) with month of admission, HRG coding and Length of Stay (more or less than 48 hours) July 2006 – June 2007**

Month/Year of Admission	HRG code	Less than 48 hours	48 hours +
July 2006	H31	1	0
Aug 2006	F33	0	1
	H41	1	0
	L44	1	1
Sept 2006	E31	1	0
	U01	0	2
Oct 2006U01	E18	0	1
	U01	0	1
	H36	0	1
	H63	1	0
	E31	0	1
Nov 2006	D99	0	1
	H41	1	0
Dec 2006	B19	0	1
	L20	0	1
	D99	0	1
	H41	1	0
Jan 2007	A99	1	0
	D23	0	1
	H41	1	0
	H99	1	0
	L09	0	1
	L21	1	0
	U01	0	1
Feb 2007	D41	1	1
	U01	0	1
	H31	1	0
	J46	0	1
March 2007	A22	0	1
	H39	1	0
	D99	0	1
	F46	1	0
April 2007	No admissions are documented for period April – June 2007.		
May 2007			
June 2007			
Totals		15	20
Total number of admissions for period July 2006-June 2007 = 35			



**Figure 4i – Total Number of Acute Hospital Admissions per Month from July 2004 – June 2007**  
(Excludes temporary (e.g. respite) residents & people on assessment)

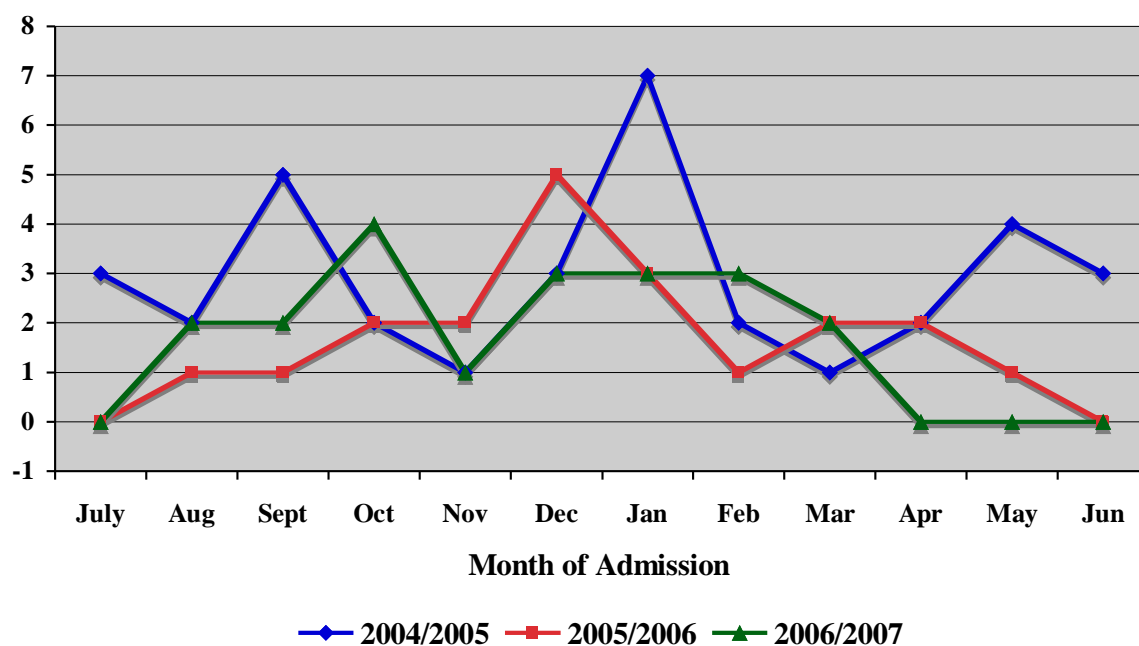
#### Acute Hospital Admissions - Less than 48 hours Stay



**Figure 4ii – Total Number of Acute Hospital Admissions with Stays Less than 48 hrs for each month from**  
**July 2004 – June 2007**

*(Excludes temporary (e.g. respite) residents & people on assessment)*

### Acute Hospital Admissions - 48 +hours stay



**Figure 4iii – Total Number of Acute Hospital Admissions with Stays More than 48 hrs for each month from**

**July 2004 – June 2007**

*(Excludes temporary (e.g. respite) residents & people on assessment)*

## Appendix 5

### Resident Assessments Used

#### **1. Minimum Data Set (MDS)/ Registered Nurse Contribution to Care (RNCC) Bandings**

The Minimum Data Set (MDS) Assessment groups individuals according to the level of resources required. RUG 111 (Resource utilisation group) is a 44-group model for classifying nursing home residents into homogenous groups according to common health characteristics. These categories sit within 7 hierarchical levels (reduced physical function, behavioural problems, impaired cognition, clinically complex, special care, extensive care and rehab). If a resident qualifies for more than one group, then they are placed in the classification that is the most resource intensive.

Using the RUG 111 classification (derived from a collection of scores), MDS produces 3 categories: Low, Standard and Enhanced Nursing. These are said to equate to the three Registered Nurse Contribution to Care (RNCC) bands i.e. low medium and high.

##### **The High Band**

People with high needs for registered nursing care will have complex needs that require frequent mechanical, technical and/or therapeutic interventions. They will need frequent intervention and re-assessment by a registered nurse throughout a 24 hour period, and their physical/mental health state will be unstable and/or unpredictable.

##### **The Medium Band**

People whose needs for registered nursing care are judged to be in the medium banding may have multiple care needs. They will require the intervention of a registered nurse on at least a daily basis, and may need access to a nurse at any time. However, their condition (including physical, behavioural and psychosocial needs) is stable and predictable, and likely to remain so if treatment and care regimes continue.

##### **The Low Band**

The low band of need for nursing care will apply to people *who are self-funding* whose care needs can be met with minimal registered nurse input. Assessment will indicate that their needs could normally be met in another setting (such as at home, or in a care home that does not provide nursing care, with support from the district nurse), but they have chosen to place themselves in a nursing home.

*NHS Funded Nursing – Care Practice Guide & Workbook*

1 Department of Health (2001) *The Single Assessment Process: Guidance for Local Implementation. Annex E, Stages of Assessment.*

#### **2. Barthel Scores**

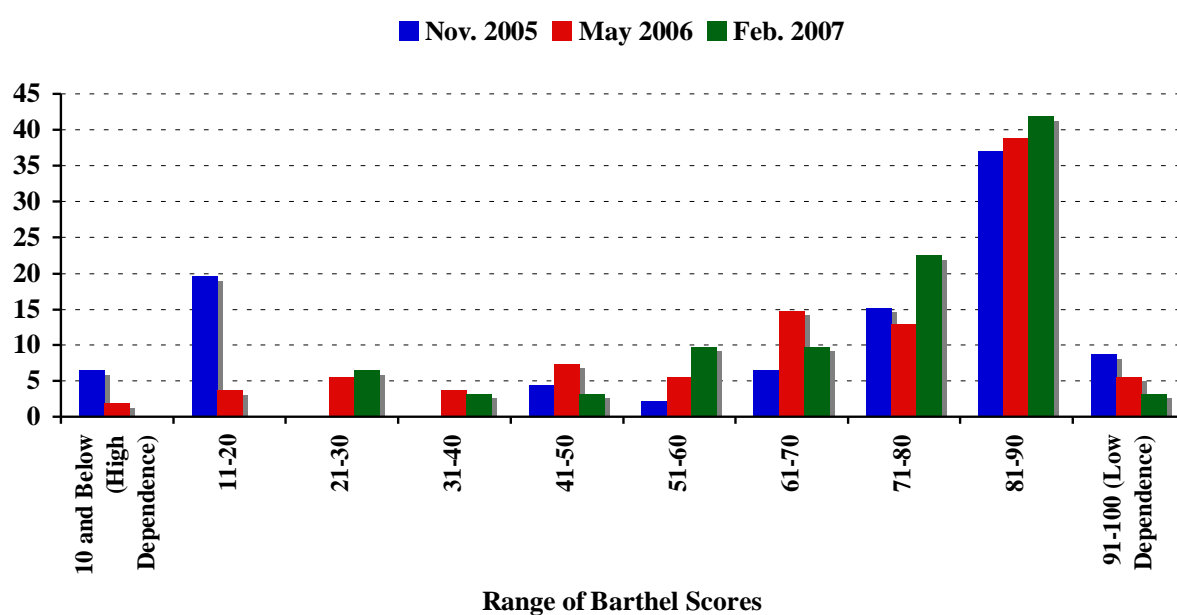
The Barthel index assesses an individual's level of independence in a range of ADLs. These include: Feeding, bathing, grooming, dressing, bowel and bladder continence, independence in toilet use, transfer (bed to chair and back), mobility on level surfaces and stair use. Scores range from 0 to 100. A higher score is indicative of a higher level of independence.

Statistics for one month from each of these years are shown in table 4A for the 63 residents reviewed to date.

**Table 4A – Statistics Relating to Barthel Scores for One Month from Each of the Years Assessed**

Date	Nov. 2005	May 2006	Feb 2007
Valid N	46	54	31
Missing	17	9	32
Mean	62.8	68.7	73
Median	80	78	80
Mode	83 and 85	90	90
SD	31.7	23	19.3
Minimum	7	5	23
Maximum	99	96	96

Figure 4i shows the percentage distribution of Barthel Scores for the 63 consenting residents.



*Figure 4i –Percentage Distribution of Barthel Scores for selected Months from 2005 – 2007.*