

APPENDIX



APPENDIX A: Network 1 – North Eastern

A.1 Introduction

The survey was undertaken in the North Eastern network on Wednesday 6th December 2006. This was the pilot survey undertaken. The feedback/consultation session was held the following week so that lessons learnt and feedback from the surveyors and the network could be incorporated into the approach for subsequent networks.

The North Eastern network provides acute care via five hospitals as listed below:

- Cavan
- Drogheda
- Louth
- Monaghan
- Navan.

With the exception of Monaghan, these hospitals are included in the casemix programme and are classified as casemix group 2.

Each hospital was allocated a survey sample size based on the number of beds supporting the specialties included in the exercise (medical and surgical). The following table lists for each hospital in this network, the applicable patient population on the day of the survey (Survey Population), the size of this population as a percentage of the full network population (% of Total Network Patients), the number of patients sampled from that population (Survey Sample), and the percentage of this sample with regards to the survey population (% of the Survey Population).

It shows that in the North Eastern network, Monaghan has the largest sample percentage, with 100% of its patients on the day of the survey being sampled, and Drogheda had the smallest sample percentage, with 43% of patients being selected as part of the survey sample.

Table A.1 North East network hospital sample

| Hospital | Survey Population | % of Total Network Patients | Survey Sample | % of the Survey Population |
|--------------|-------------------|-----------------------------|---------------|----------------------------|
| Cavan | 115 | 20% | 74 | 64% |
| Drogheda | 176 | 30% | 76 | 43% |
| Louth | 108 | 19% | 76 | 70% |
| Monaghan | 65 | 11% | 65 | 100% |
| Navan | 116 | 20% | 72 | 62% |
| Total | 580 | 100% | 363 | 63% |

A consultation session was held on Tuesday 6th February to review the raw survey data with managerial, clinical and nursing stakeholders from the North Eastern network. The objectives of this meeting were to:

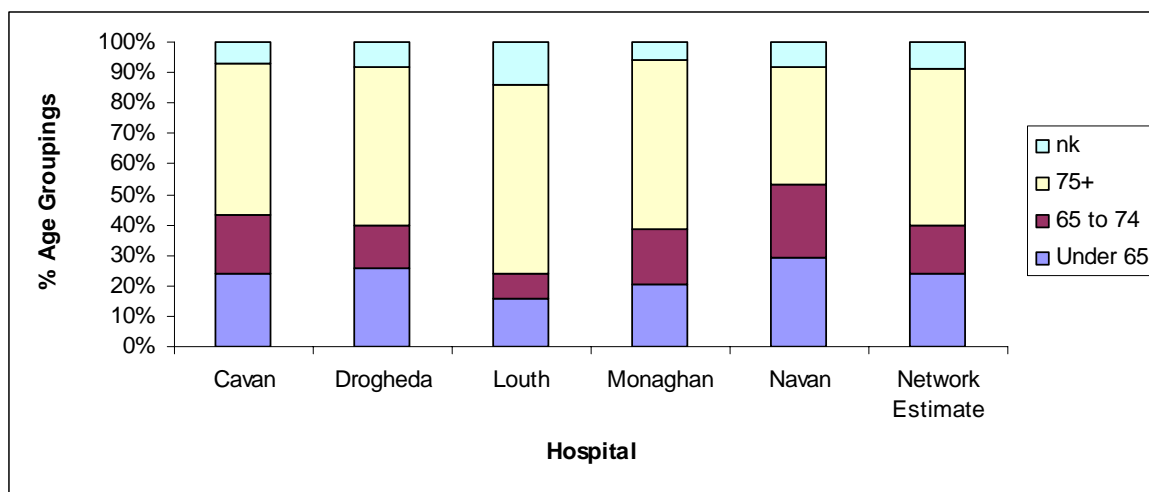
- Share the findings of the bed utilisation survey
- Understand the local factors influencing bed use
- Identify options for improving bed utilisation eg through process change and service reconfiguration
- Ensure lessons learnt from the pilot were incorporated into the approach.

The output of the session is incorporated into the analysis of the survey data in this report.

A.2 Patient Profile

A.2.1 Patient Age

Figure A.1 Patient age profile by hospital and network estimate

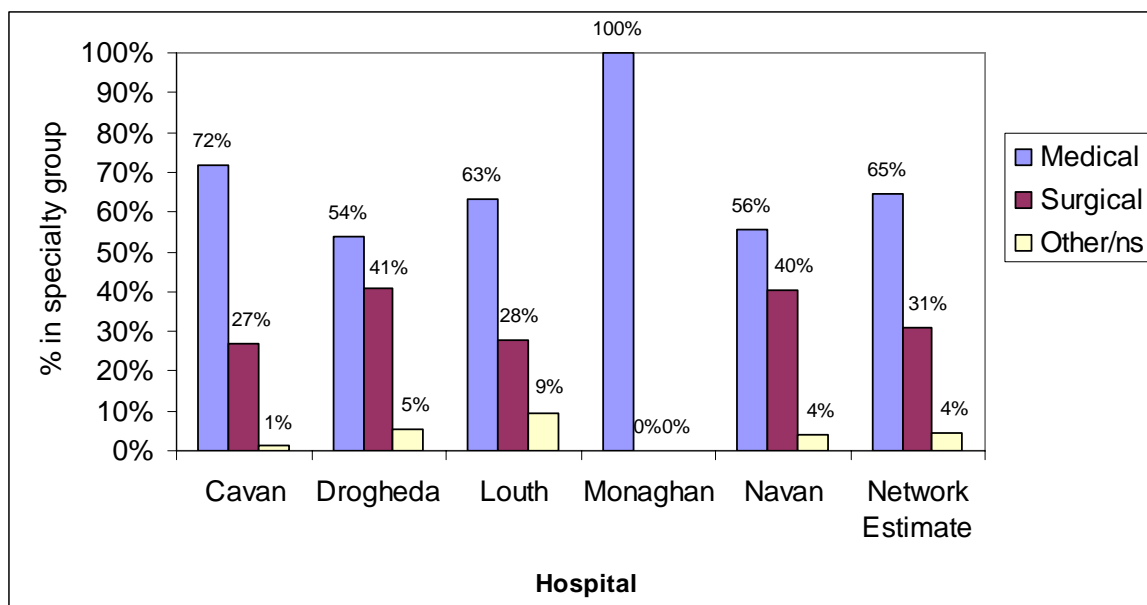


Across the network survey population, 76% of the patients were 65 years of age or over, which is significantly older than the Irish national population profile in general. The proportion of patients under 65 ranged from 16% in Louth to 29% in Navan. This age profile confirms the on-the-ground views of stakeholders in the North East. As these data were drawn from the patient notes there are some data missing and patient age was not available for 9% of patients surveyed.

Further analysis of the data shows that 63% of patients in the North East had a GMS card.

A.2.2 Patient Speciality

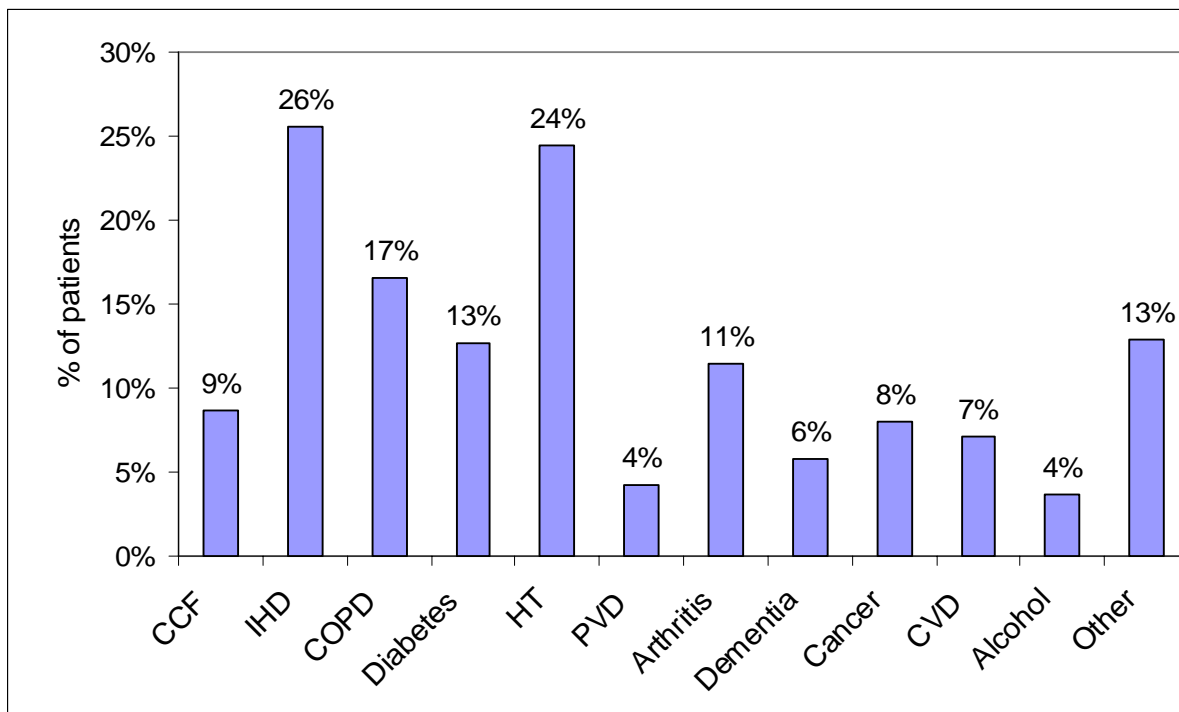
Figure A.2 Bed designation of patients on admission



The majority of patients at all sites surveyed were medical (65%). These data show that the proportion of medical patients ranged from 100% in Monaghan to 54% in Drogheda. Drogheda and Navan had the highest proportion of surgical patients – at 41% and 40% of the admitted patients surveyed.

A.2.3 Patient Comorbidity (Type)

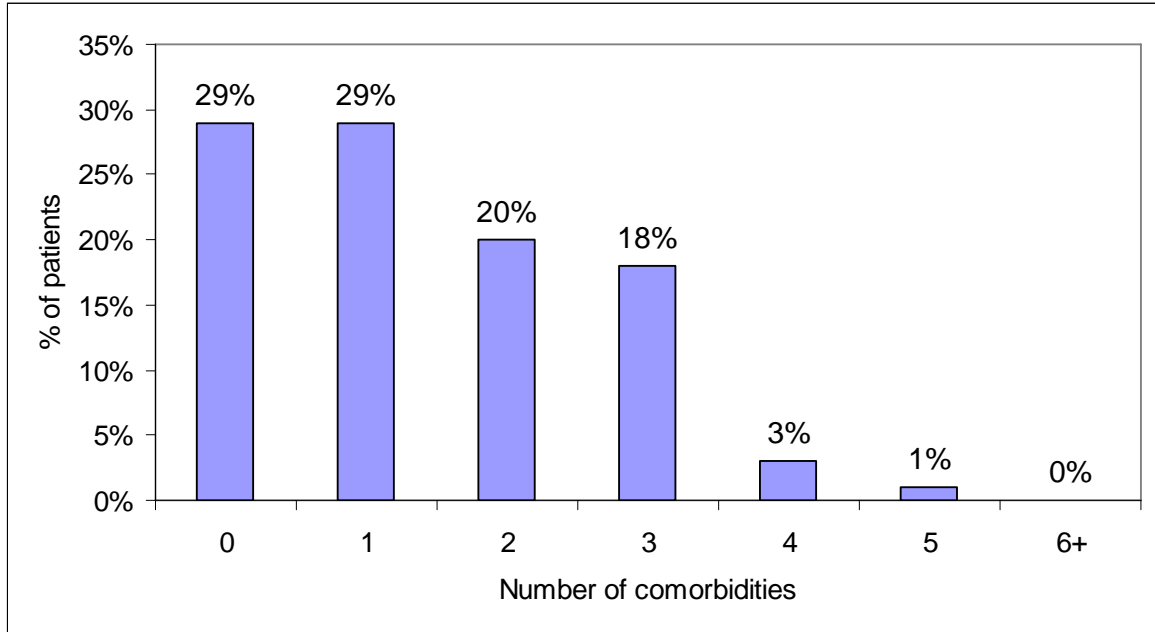
Figure A.3 Types and percentages of comorbidities presented by patients



Hypertension (HT) and Ischaemic Heart Disease (IHD) were the most common comorbidities recorded with approximately 25% of patients surveyed presenting with each. 17% of patients presented with Chronic Obstructive Pulmonary Disease (COPD).

A.2.4 Patient Comorbidity (Prevalence)

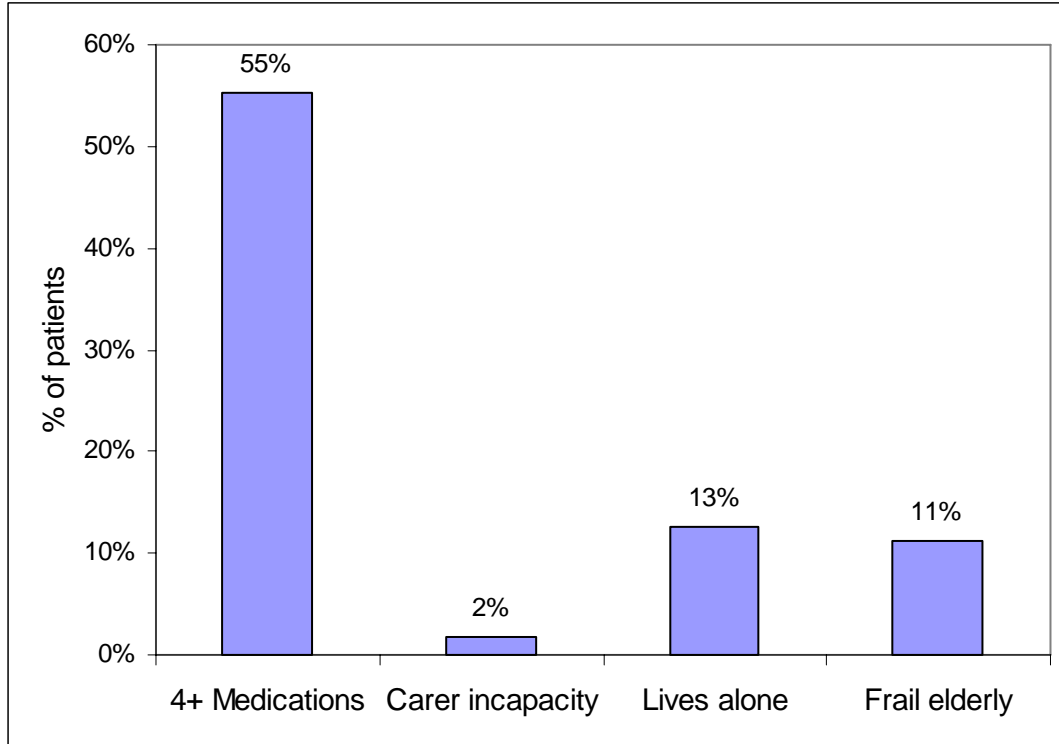
Figure A.4 Percentage of patients presenting with comorbidities



Additional analysis of prevalence of comorbidities shows that most admitted patients in the North East (71%) had at least one comorbidity and 42% of patients had at least two comorbidities.

A.2.5 Other Patient Conditions

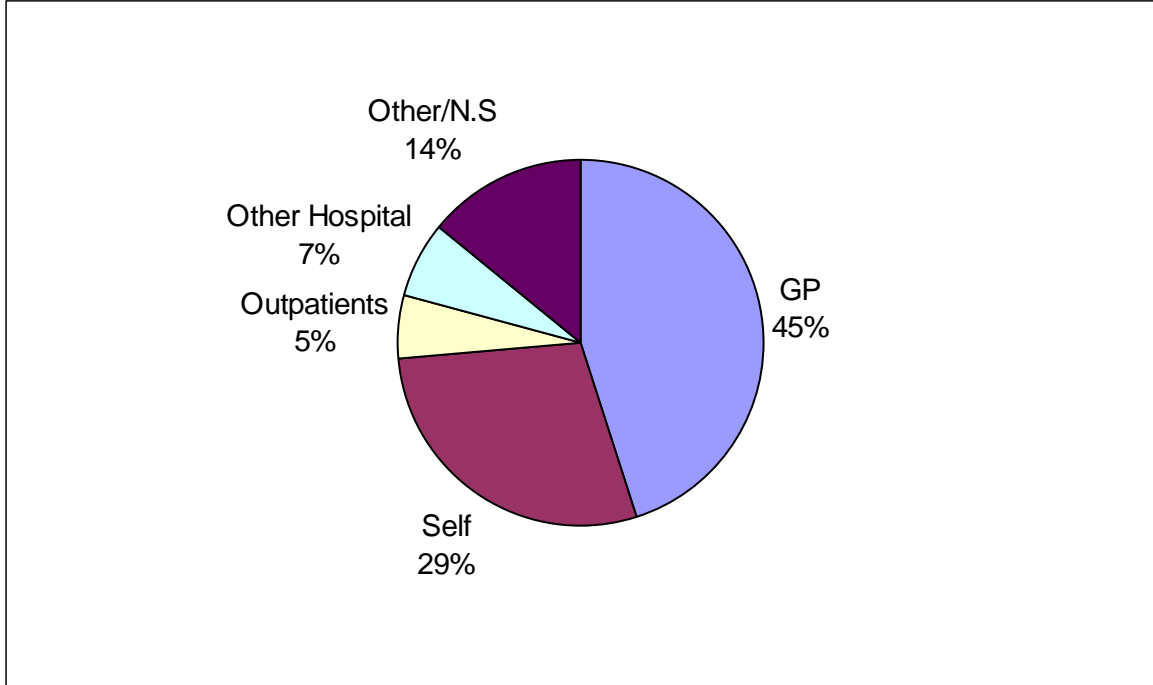
Figure A.5 Percentage of patients presenting with other conditions



A high proportion of patients surveyed (55%) were on multiple medication therapies. Lower numbers of the other risk factors were identified from the patient charts. The data show that most patients displayed one risk factor, with multiple drug therapy the most common.

A.2.6 Source of Referral

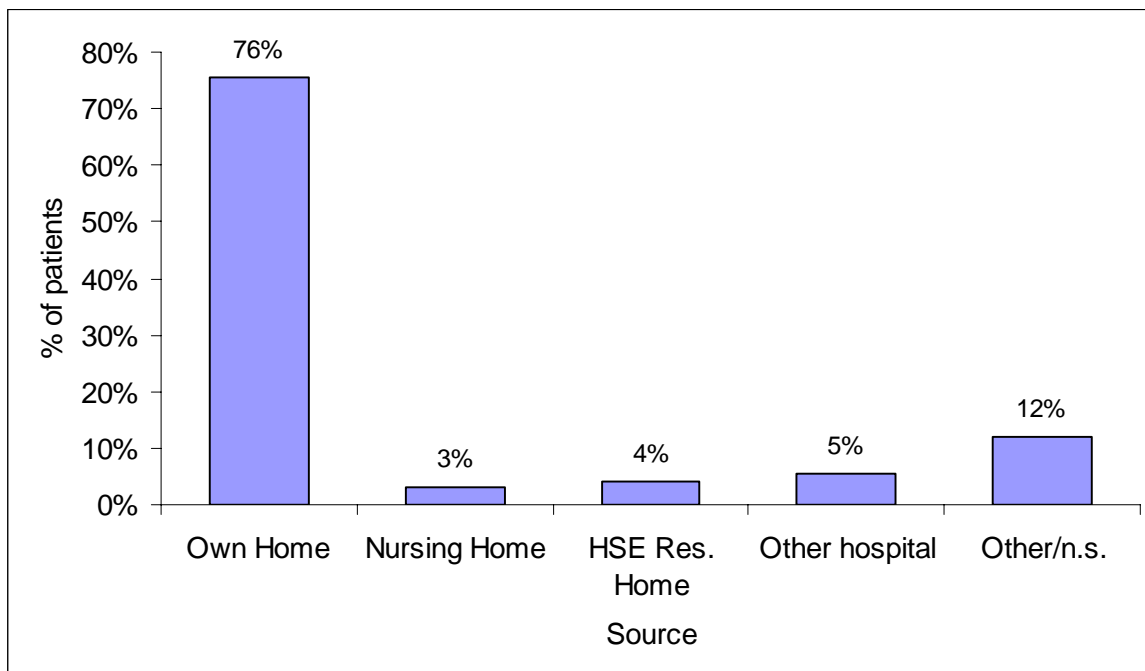
Figure A.6 Source of patient referral



Approaching half of admitted patients (45%) were referred to the acute hospital by a GP. Patient self-referral was the second most common source of referral, at 29%. The source of referral was not known/not recorded on the patient notes for 14% of patients.

A.2.7 Source of Admission

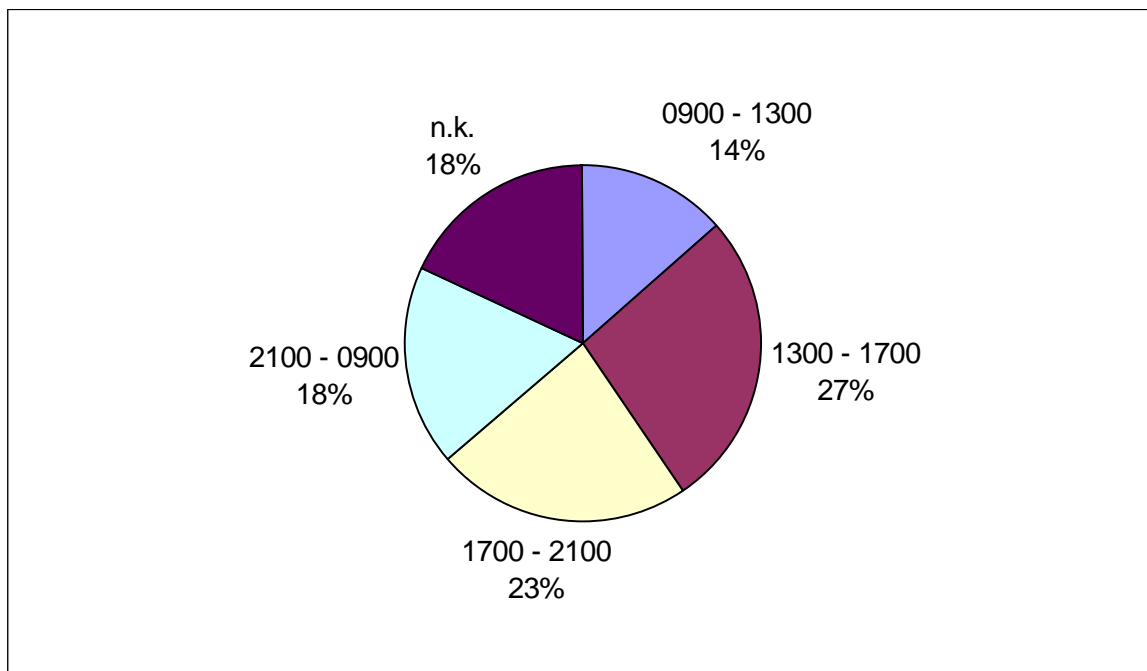
Figure A.7 Source of patient admission



The most common source of admission was the patient's own home, identified for 76% of patients surveyed. The data indicate a low level of intra-hospital transfers, with 5% admitted from other hospitals, more than half of which are within the North East network. Four percent were admitted from HSE Residential Homes, and 3% from Nursing Homes. The source of admission was not specified for 12% of patients.

A.2.8 Time of Arrival

Figure A.8 Time of patient arrival

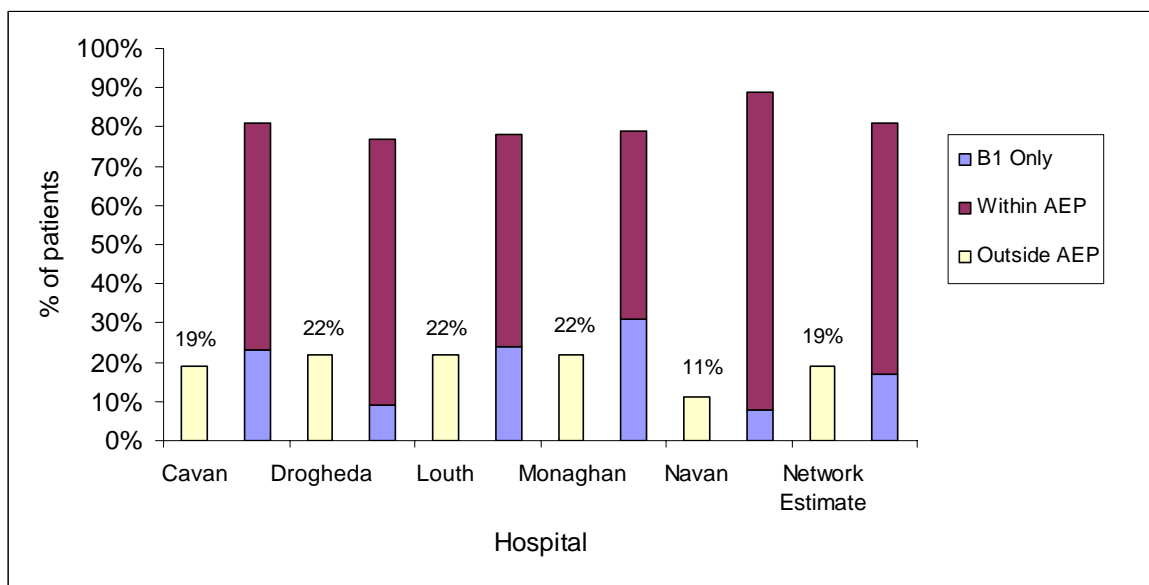


Half of all patient admissions occurred in the afternoon and evening where patient information was available (18% of admissions recorded no time of admission). 18% of admissions presented between 9PM and 9AM.

A.3 Day of Admission

A.3.1 AEP Results for Day of Admission

Figure A.9 Categorisation of patients with regards to AEP on day of admission



Across the network 19% of the patients admitted were outside the AEP Criteria, and in some instances could potentially have been treated outside an acute setting.

On average across the network the proportion of patients for whom i/v therapy was the only AEP criterion identified was 17%. This varied considerably between hospitals and was below 10% at Navan (8%) and Drogheda (9%). The proportion of patients for whom i/v therapy was the only AEP criterion identified was higher at Cavan (23%) and Louth (24%) and highest at Monaghan (31%).

a. *Statistical Analysis of influence of Characteristics on AEP results for admission*

In order to attempt to better understand why patients are admitted outside AEP, it was decided as in the national report to undertake a statistical analysis of the various characteristics that could potentially have an influence on this for patients at a network level. Unlike the national analysis however, only a univariate analysis was undertaken. The following table summarises the result of this univariate analysis for the North Eastern network and shows that the most likely characteristics to lead to admission outside AEP are:

- Treatment Speciality (medical patients are more likely to be admitted outside AEP than surgical patients)
- Healthcare insurance (patients without healthcare insurance are more likely to be admitted outside AEP than patients with healthcare insurance)

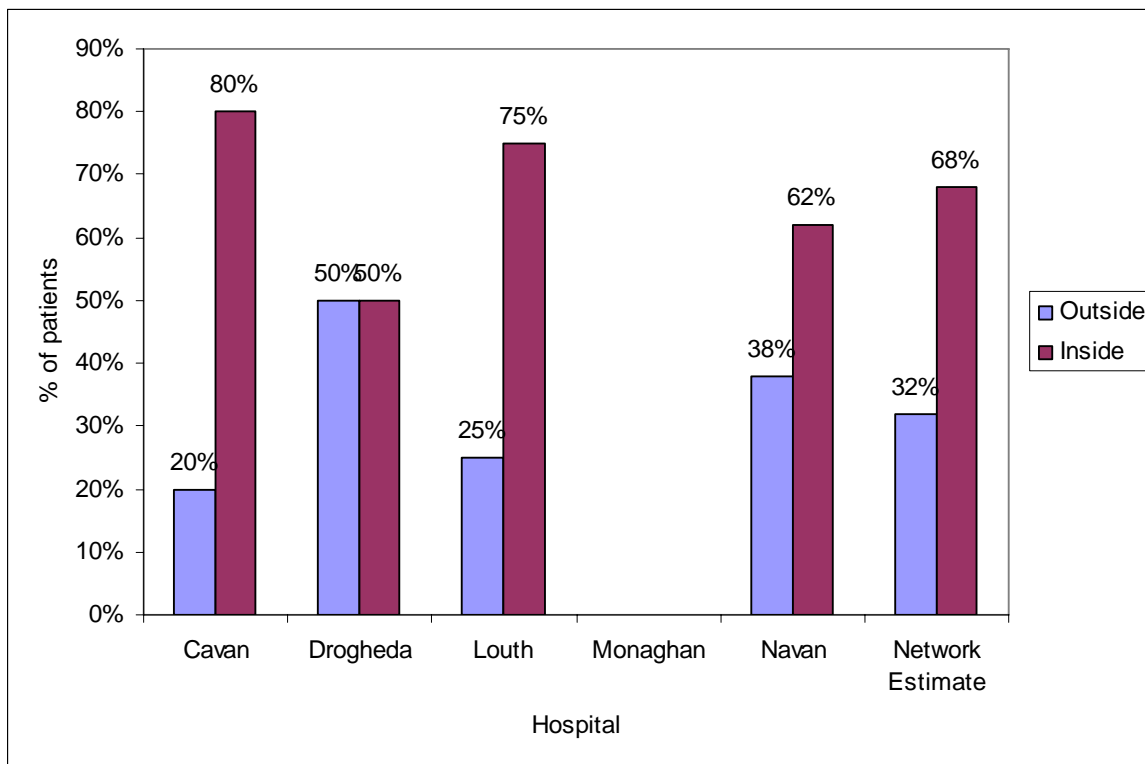
As with the national analysis however, It is recommended that whilst the analysis provides a set of useful indicators with regards to patient characteristics likely to be representative of admission and/or treatment outside AEP, they should not themselves form the basis around which explanations as to why patients are admitted outside AEP are sought. It should also be noted that all unknowns were excluded from this analysis.

Table A.2 Results of univariate analysis of the strongest relations between patient characteristics and lying outside AEP on admission

| Characteristic | χ^2 | df | P | Attribute | % Outside AEP | % Inside AEP |
|----------------------|----------|----|-------|-----------|---------------|--------------|
| Treatment Speciality | 18.676 | 2 | 0.00 | Medical | 84 | 63 |
| | | | | Surgical | 16 | 37 |
| Healthcare Insurance | 12.086 | 1 | 0.001 | No | 85 | 65 |
| | | | | Yes | 15 | 35 |

A.3.2 Elective Surgery Findings

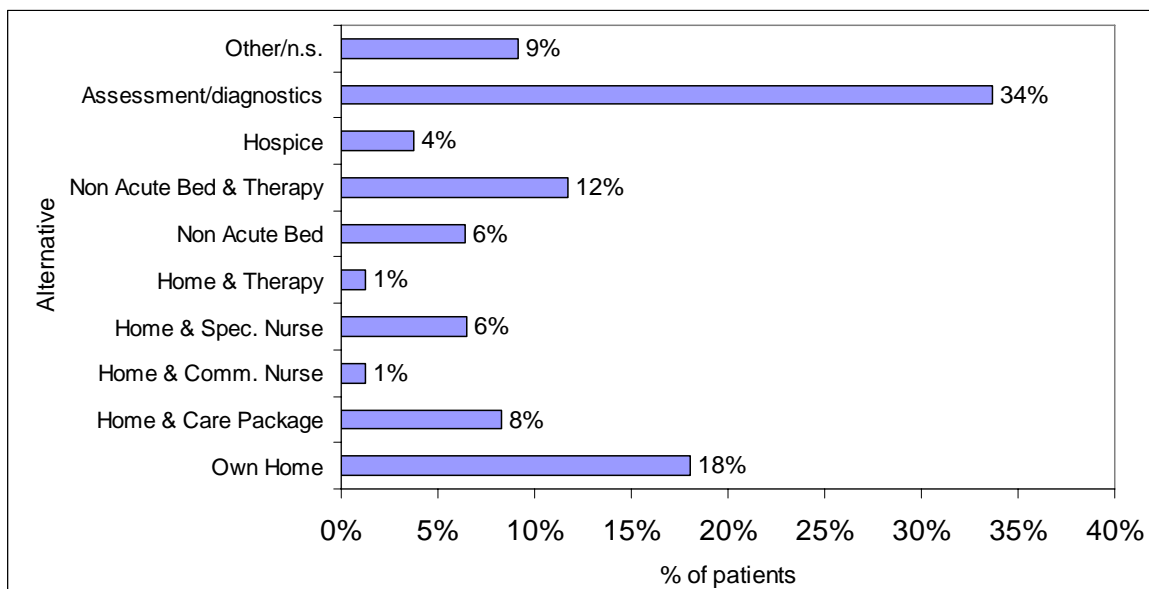
Figure A.10 Categorisation of patients with regards to elective surgery



Of the elective surgery patients surveyed in the North East, 74% did not meet the timeliness criteria and 32% did not meet the location criteria. This graph shows that 32% of patients did not meet both criteria.

A.3.3 Alternatives Identified to Admission

Figure A.11 Alternatives identified to admission for patients outside the AEP on day of admission

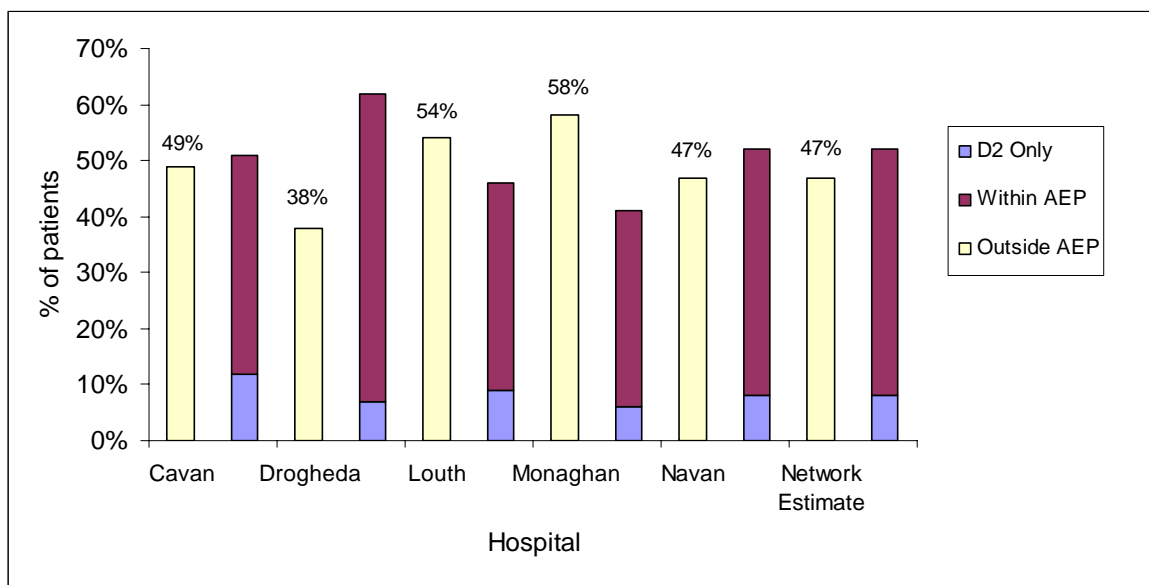


Analysis of the alternatives to acute admission identified to acute care for patients outside of the AEP criteria highlights access to assessment and diagnostics as the most common alternative (34%). Own home with GP support was considered an appropriate option for 18% of patients. Access to a non-acute bed with therapy support was identified as an alternative to acute admission for 12% of patients outside the AEP.

A.4 Day of Care

A.4.1 AEP Results for Day of Care

Figure A.12 Categorisation of patients with regards to the AEP on day of care



On the day of the survey, on average 47% of patients in the North East network could have been cared for in an alternative setting, if appropriate alternatives were available. This graph illustrates the degree of variance between hospitals. The proportion of patients outside of the AEP criteria was lowest at Drogheda (38%). Levels of admission outside AEP were 47% at Navan and 49% at Cavan. The results show that the highest proportions of patients outside of the AEP were at Louth (54%) and Monaghan (58%).

Of the patients outside of the AEP, 15% were receiving physiotherapy or occupational therapy.

The survey data show that on average i/v therapy was only AEP criterion identified for 8% of patients. This ranged between 6% at Monaghan and 12% at Cavan.

a. *Statistical analysis of influence of characteristics on AEP results for day of care*

In order to attempt to better understand why patients are treated outside AEP, it was decided as in the national report to undertake a statistical analysis of the various characteristics that could potentially have an influence on this for patients at a network level. Unlike the national analysis however, only a univariate analysis was undertaken. The following table summarises the result of this univariate analysis for the North Eastern network and shows that the most likely characteristics to lead to a day of care outside AEP are:

- Patient Age (patients over the age of 75 years, are more likely to be outside AEP on the day of care, than those under 65 years of age)
- Presence of Other Conditions (the presence of other conditions is more likely to result in the patient being outside AEP on the day of care).

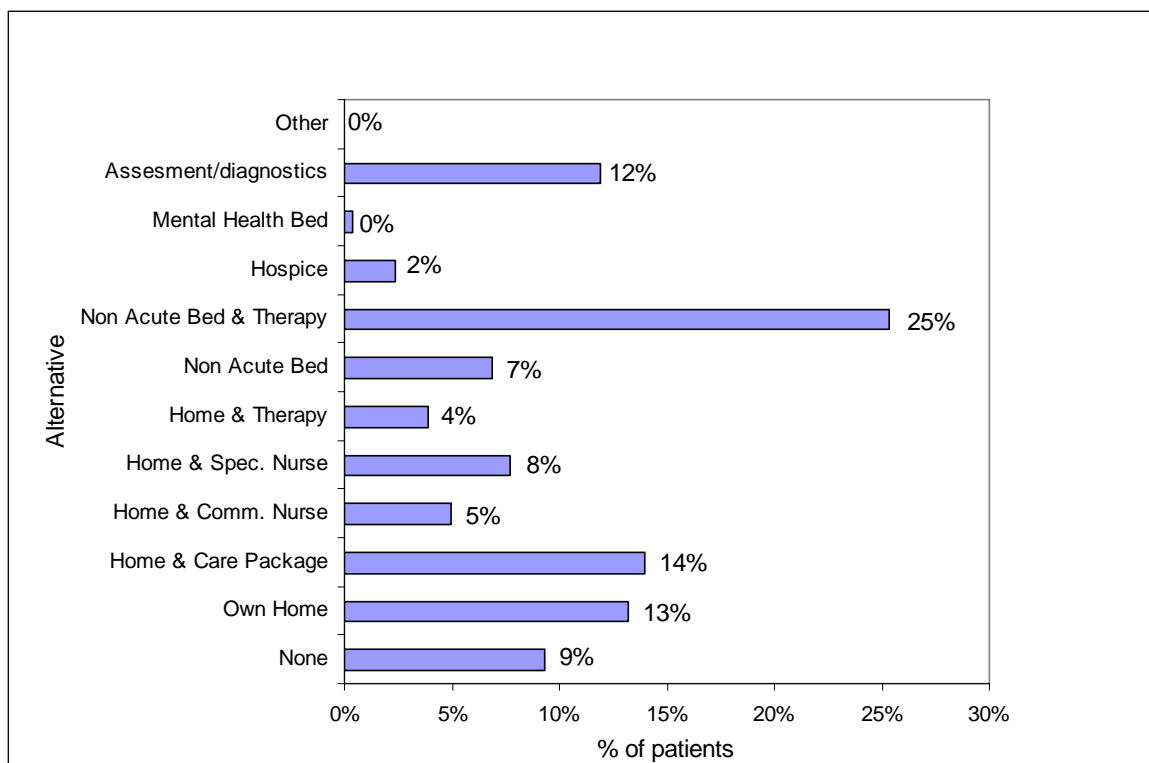
As with the national analysis however, It is again recommended that whilst the analysis provides a set of useful indicators with regards to patient characteristics likely to be representative of admission and/or treatment outside AEP, they should not themselves form the basis around which explanations as to why patients are treated outside AEP are sought. Again, all unknowns were excluded from this analysis.

Table A.3 Results of univariate analysis of the strongest relations between patient characteristics and lying outside AEP on day of care

| Characteristic | χ^2 | df | P | Attribute | % Outside AEP | % Inside AEP |
|------------------|----------|----|-------|-----------|---------------|--------------|
| Patient Age | 20.926 | 2 | 0.000 | Under 65 | 23 | 41 |
| | | | | 65 – 74 | 17 | 16 |
| | | | | 75 + | 60 | 43 |
| Other Conditions | 22.536 | 3 | 0.000 | 0 | 28 | 46 |
| | | | | 1 | 53 | 41 |
| | | | | 2 | 15 | 12 |
| | | | | 3 | 4 | 1 |

A.4.2 Alternatives Identified to Acute Care

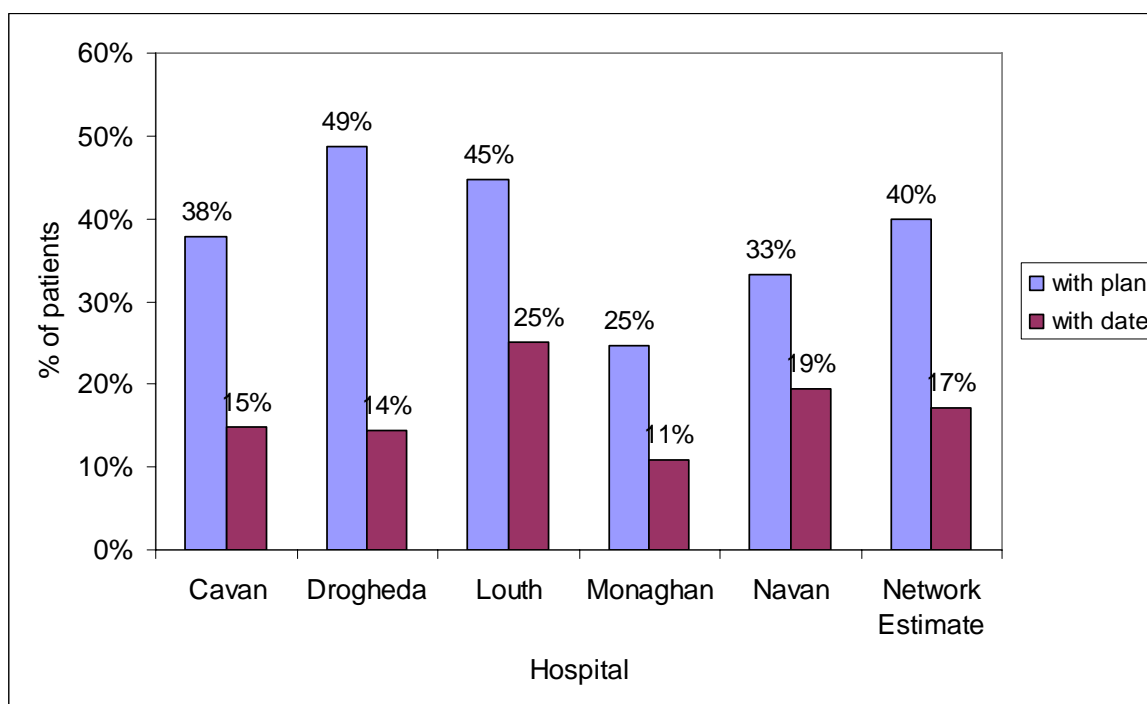
Figure A.13 Alternatives identified for patients outside the AEP on day of care



Analysis of the alternatives to acute care shows a high level of demand (25%) for ‘non-acute bed with therapy support’ was identified. Home with a care package was considered an appropriate option for 14% of patients and patient’s own home, without support, was suggested for 13%. Access to assessment and diagnostics was the alternative to acute inpatient acute care identified for 12% of patients.

A.4.3 Discharge Planning

Figure A.14 Percentage of patients with evidence of discharge planning



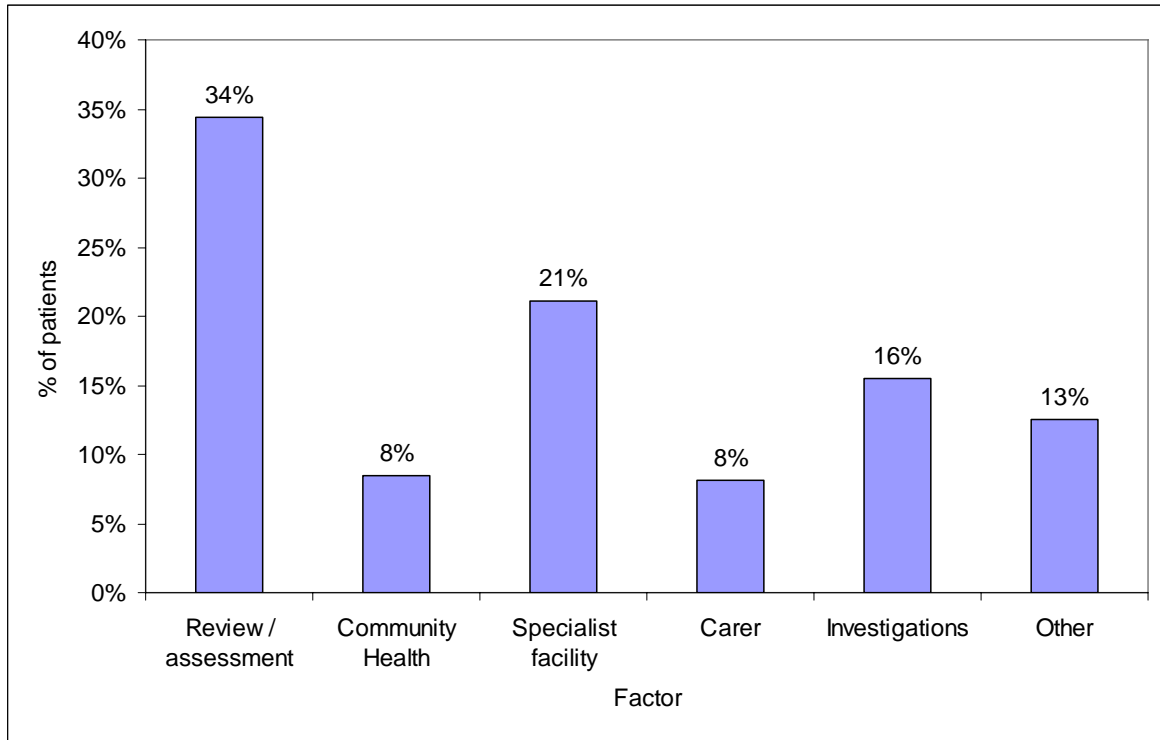
Discharge planning was in evidence for 40% of patients. Surveyors identified whether or not there was any form of discharge plan in each patient’s notes taking a liberal definition of ‘discharge plan’ that was not confined to a specific format. Any evidence that discussions or consideration of discharge arrangements had taken place was deemed to count.

The occurrence of discharge planning varied between a high of almost half of patients at Drogheda (49%) to a quarter of patients at Monaghan (25%).

The minority of patients had a predicted date of discharge (17%). This varied by hospital, ranging between 11% and 25%.

A.4.4 Factors Affecting Discharge

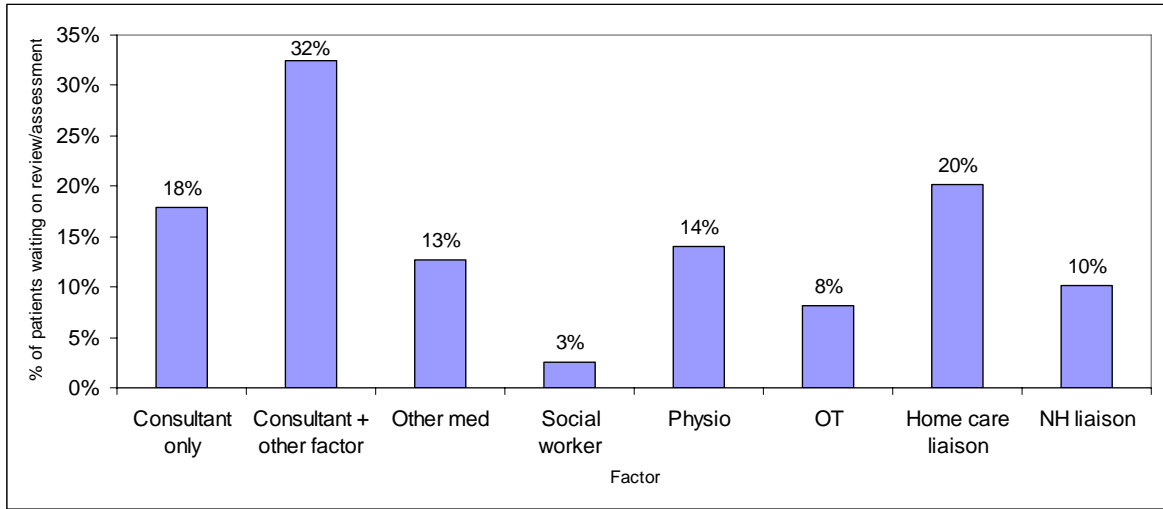
Figure A.15 Factors affecting discharge for patients outside the AEP



Analysis of the factors affecting discharge highlights patient review and assessment as the most prevalent factor, impacting 34% of patients. A further 21% of patients are waiting for a specialist facility and 16% of patients are awaiting investigations.

a. Breakdown of the Review/Assessment factor

Figure A.16 Breakdown of the review/assessment element of discharge



Most patients awaiting review or assessment were waiting to see one or a number of clinical staff, and in 63% of the occurrences, the involvement of a medical member of staff was identified.

The data gathered refer to delays noted on the day of survey irrespective of whether the patient was declared medically fit for discharge or not, and again any individual patient may have had more than one reason noted contributing to delay.

A.5 Assessment of Implications

A.5.1 AEP on Admission

The level of patient admission outside of the AEP criteria of 19% is similar to that found in previous surveys in Ireland and elsewhere. It is above the national average for this survey (13%) and the North East had a higher proportion of patients outside the AEP than the other networks.

As discussed earlier in this document, these data should not be interpreted as suggesting that 19% of patients should not have been admitted to acute hospitals in the North East. Rather, for some of these patients non-acute alternatives to admission might have been more appropriate, had they been available. Each hospital requires a certain level or 'buffer' of inappropriate admissions. This is to reduce risk of non-admission of appropriate patients. The size of this buffer is determined by the acceptable level of risk defined by the hospital and its balance between demand and capacity.

In addition to the patients who did not meet any AEP criteria on admission, surveyors identified 17% of patients for whom i/v therapy was the only AEP admission criterion met. There is a growing body of evidence that supports provision of such therapy for many patients outside an acute location.

The results of the surgical variant of the AEP indicate that patients are not being admitted on the day of surgery, as 74% of patients did not meet the timeliness criteria.

A.5.2 AEP on Day of Care

The review found that 49% of patients could potentially have been cared for outside of the acute hospital setting on their day of care. This result is not atypical of findings from other AEP surveys, however it is above the national average for this study (39%) and the North East also had a higher level of patients outside the AEP than any other network. As with the admission criteria it should not be interpreted as meaning that patients should *necessarily* be in other care settings - only that there exists potential for this.

A.5.3 Alternatives to Acute Care

The most common potential alternative identified to acute hospital admission in the North East was access to assessment and diagnostics, which was considered appropriate for 34% of patients outside the AEP. Own home with GP support was considered an appropriate option for 18% of patients. Access to a non-acute bed with therapy support was identified as an alternative to acute admission for 12% of patients outside the AEP.

The need to consider alternative settings for i/v therapy is underlined by the high proportion of patients admitted for whom this was the only AEP criterion met (17%).

Analysis of the alternatives to the acute hospital for patients on their day of care shows a high level of demand (25%) for access to a non-acute bed with therapy support. Home with a care package was considered an appropriate option for 14% of patients and patient's own home, without support, was suggested for 13%. Access to assessment and diagnostics was the alternative to acute inpatient care identified for 12% of patients.

The patient age profile in the North East was older than any other network surveyed. Communities with older populations typically require more home and community care services, and this is confirmed by the range of home and community based care options identified by surveyors. Most patients are over 65 years of age, and admitted patients in the North East are likely to present with comorbidities and at least one risk factor. The network highlighted that in December the amount of acutely sick people was disproportionately high, and this may be reflected in the comorbidity rate.

A.5.4 Planning and Delivery of Acute Care

The level of discharge planning was average when compared to other networks (40%), however this is low when considered in the context of the current operational pressures on acute beds in the North East. Predicted dates of discharge were evident for only 17% of patients. Some hospitals in the network reported high volumes of discharges on Mondays driven by a build up of emergency patients over the weekend, rather than daily discharge over the weekend, in part due to locum consultant weekend cover reluctance to discharge patients.

Access to assessment and diagnostics was the most common alternative to admission identified, and was also a prevalent factor in admitted patients staying in acute beds inappropriately. The network expressed the view that current pathways do not support the necessary levels of diagnostics via outpatients, and this has led to a practice of admitting patients as inpatients to access diagnostics. This may be reflected in the high proportion of GP referrals (45%).

Most patients awaiting review or assessment were waiting to see one or a number of clinical staff and in 63% of the occurrences, the involvement of a consultant was identified. The network consultation confirmed that some internal hospital processes were creating delay including review, ward rounds and investigations.

A.6 Conclusions and Recommendations

The conclusions and recommendations set out in the national report for this review apply to all networks. This section highlights some of the key findings for the North East and the priority areas for the network to address, based on the survey data combined with the consultation undertaken with the North East Network and the features of international best practice healthcare delivery.

Conclusion A1: Improved access to the following alternatives to acute hospital care would reduce avoidable admissions and increase the appropriate placement of patients in the North East:

- Access to a non-acute bed with therapy support
- Home-based patient care with GP support and home care packages
- Access to assessment and diagnostics without acute admission.

Recommendation A1: In the context of the current service re-configuration underway in the North East, consider how to meet the demand for each of these alternatives to acute care. Based on the survey findings and network consultation session, this should include:

- Confirmation of the scale of the requirement for additional access to non-acute bed capacity and consideration of how any increase in capacity could be addressed
- Extended hours access to diagnostics
- Improved GP access to diagnostics
- Access to home-based care such as GP support and home care packages.

Conclusion A2: Based on the survey data, the only AEP criterion met by a high proportion of admitted patients in the North East is receipt of i/v therapy.

Recommendation A2: At network level, develop a plan for building capability to provide i/v therapy services outside of the acute setting.

Conclusion A3: The level of discharge planning in the North East is low in the context of the current demand for acute bed capacity.

Recommendation A3: Implement discharge planning for all patients in all acute hospitals in the North East, including:

- Use of estimated dates of discharge
- Multi-disciplinary, team-based working to reduce delay during care and at discharge
- Early involvement of PCCC in the planning of patient discharge and transition to non-acute care.

Conclusion A4: Patient length of stay is increased by current internal hospital processes, such as patient review and assessment.

Recommendation A4: Review internal processes to identify opportunities to identify actions to reduce patient delay.

APPENDIX B: Network 2 – Dublin Midlands

B.1 Introduction

The survey was undertaken in the Dublin Midlands network on Thursday 14th December 2007 (note AMNCH was surveyed on Friday 19th January). This network provides acute care via five hospitals as listed below. Of these AMNCH is a casemix group 1 hospital and Tullamore, Portlaoise and Mullingar are casemix group 2 hospitals. Naas is not included in the casemix programme.

- Tullamore
- Mullingar
- Portlaoise
- Naas
- AMNCH

As detailed in the methodology, each hospital was allocated a survey sample size based on the number of beds supporting the specialties included in the exercise (medical and surgical). The following table lists for each hospital in this network, the applicable patient population on the day of the survey (Survey Population), the size of this population as a percentage of the full network population (% of Total Network Patients), the number of patients sampled from that population (Survey Sample), and the percentage of this sample with regards to the survey population (% of the Survey Population).

It shows that in the Dublin Midlands network, Portlaoise has the largest sample percentage, with 76% of its patients on the day of the survey being sampled, and AMNCH had the smallest sample percentage, with 26% of patients being selected as part of the survey sample.

Table B.1 Dublin Midlands network hospital sample

| Hospital | Sample Frame | % of Total Network Patients | Sample | % of the Sample Frame |
|--------------|--------------|-----------------------------|------------|-----------------------|
| Mullingar | 128 | 13% | 75 | 59% |
| Naas | 163 | 16% | 75 | 46% |
| Portlaoise | 66 | 6% | 50 | 76% |
| Tullamore | 197 | 19% | 75 | 38% |
| AMNCH | 476 | 46% | 125 | 26% |
| Total | 1030 | 100% | 400 | 39% |

A consultation session was held on Tuesday 6th February to review the raw survey data with managerial, clinical and nursing stakeholders from the Dublin Midlands Network. The objectives of this meeting were to:

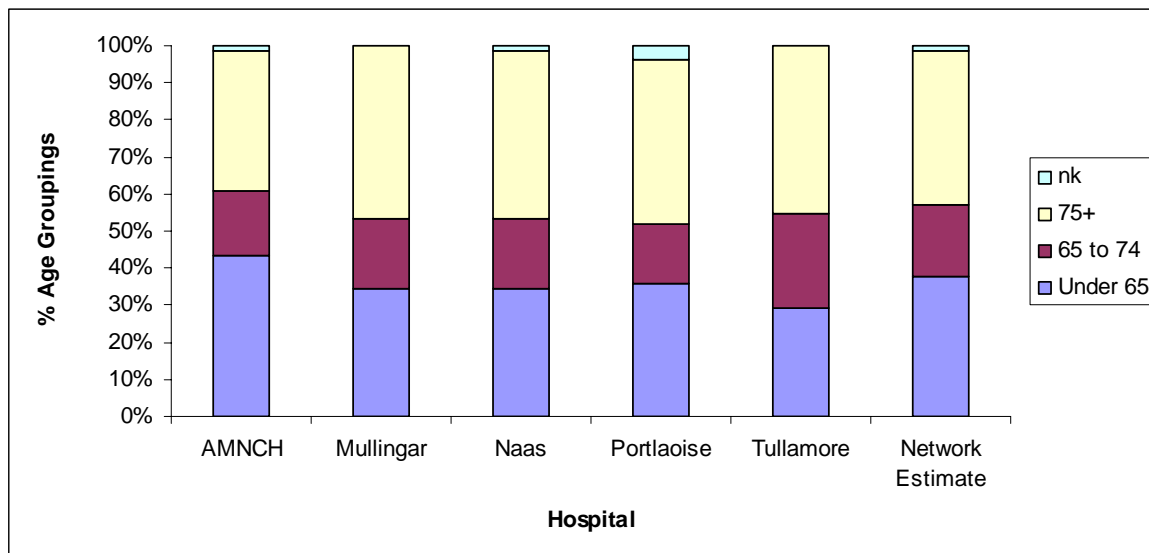
- Share the findings of the bed utilisation survey
- Understand the local factors influencing bed use
- Identify options for improving bed utilisation eg through process change and service reconfiguration.

The output of the session is incorporated into the analysis of the survey data in this section of the report.

B.2 Patient Profile

B.2.1 Patient Age

Figure B.1 Patient age profile by hospital and network estimate

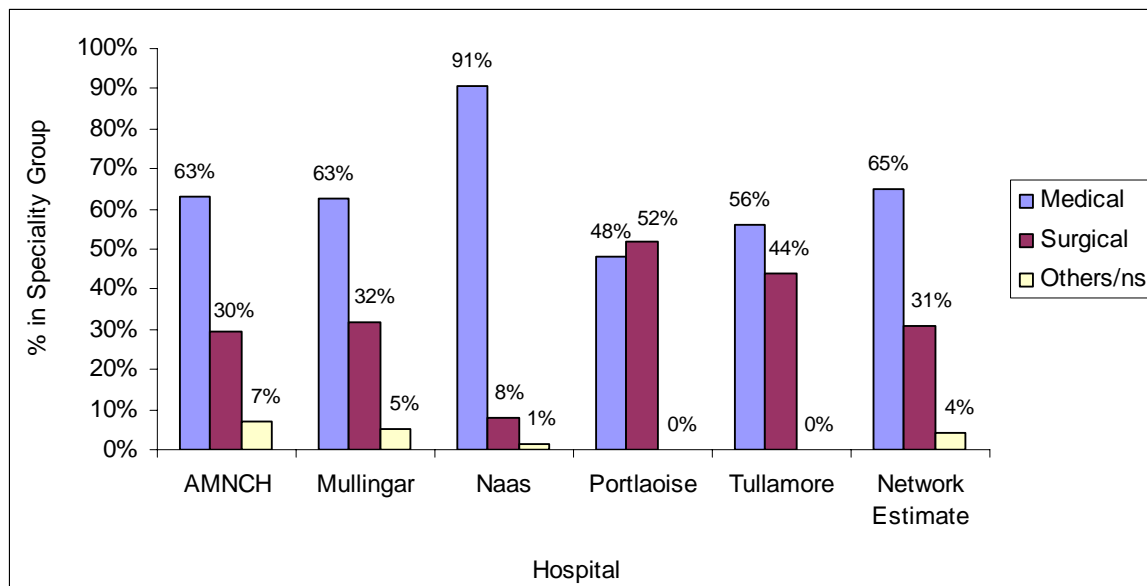


The graph above shows that 62% the Dublin Midlands survey population were 65 years of age or over. There was some variance between hospital survey populations, with the proportion of patients under 65 ranging from 29% in Tullamore to 43% in AMNCH.

In Dublin Midlands, 57% of patient surveyed had a GMS card.

B.2.2 Patient Speciality

Figure B.2 Bed designation of patients on admission

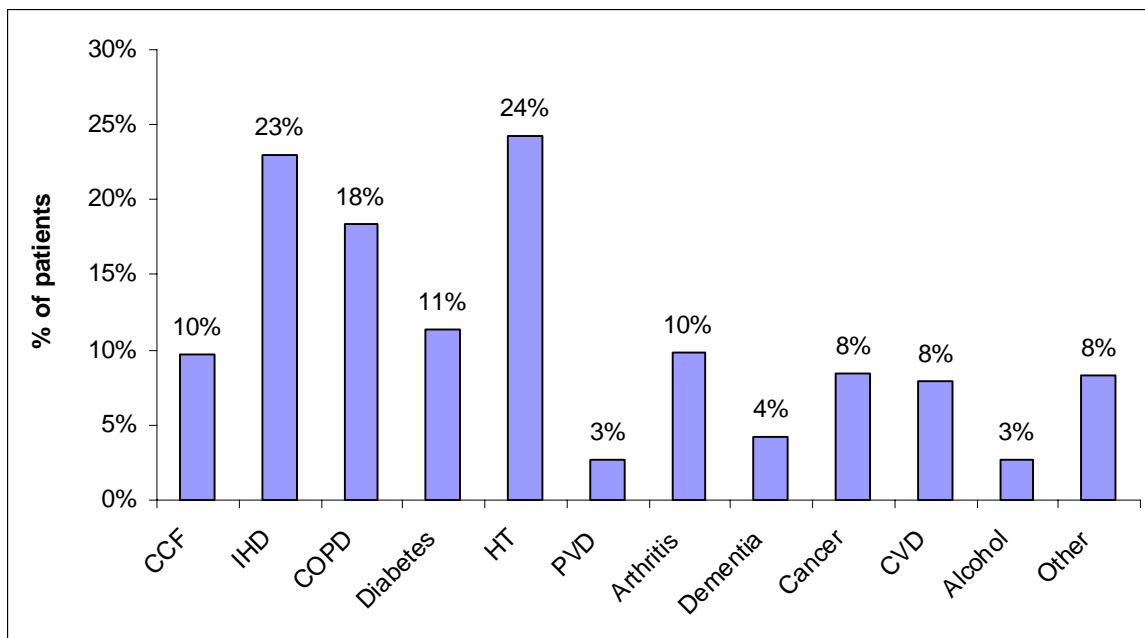


The majority of patients surveyed in Dublin Midlands (65%) were medical. Again, this aspect of the patient profile varied at different providers. Naas had the highest proportion of medical patients at 91%. At AMNCH and Mullingar, 63% of patients were medical.

Portlaoise and Tullamore had the lowest proportions of medical patients (at 48% and 56% respectively) and the highest proportions of surgical patients – at 52% and 44% of the admitted patients surveyed.

B.2.3 Patient Comorbidity (Type)

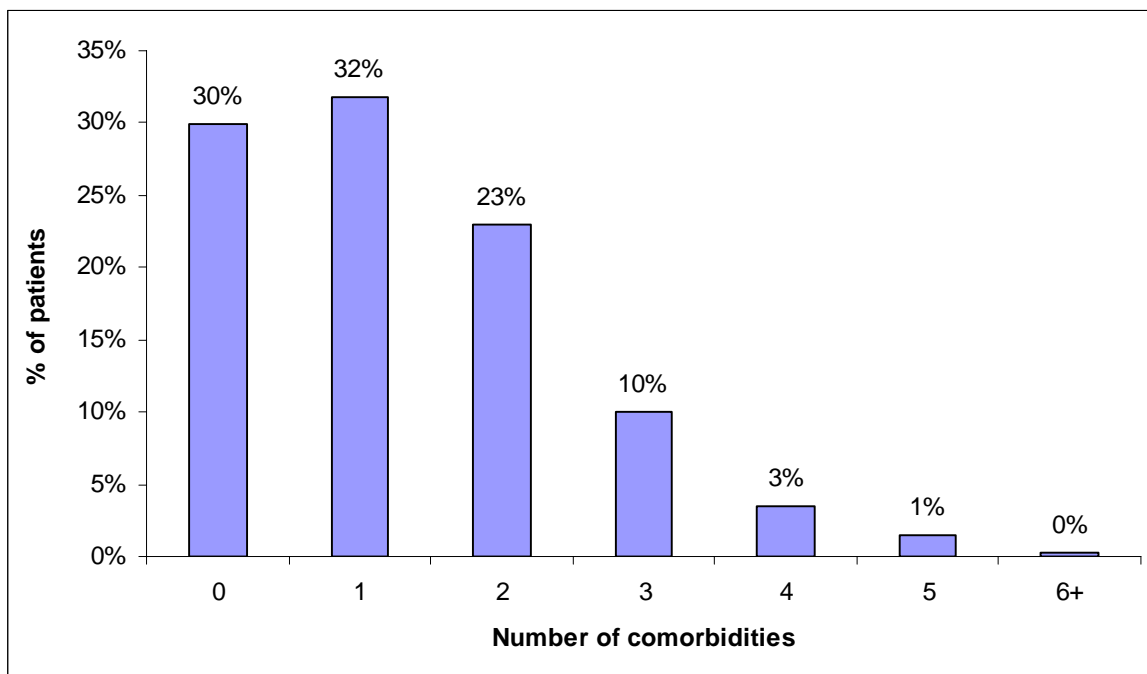
Figure B.3 Type and percentages of comorbidities presented by patients



Hypertension (HT in the above graph) and Ischaemic Heart Disease (IHD) were the most common comorbidities recorded with approximately 23-24% of patients surveyed presenting with each. Chronic Obstructive Pulmonary Disease (COPD) was present amongst 18% of patients. A number of other comorbidities were identified amongst approximately 10% of patients, namely CCF, Diabetes and Arthritis.

B.2.4 Patient comorbidity (Prevalance)

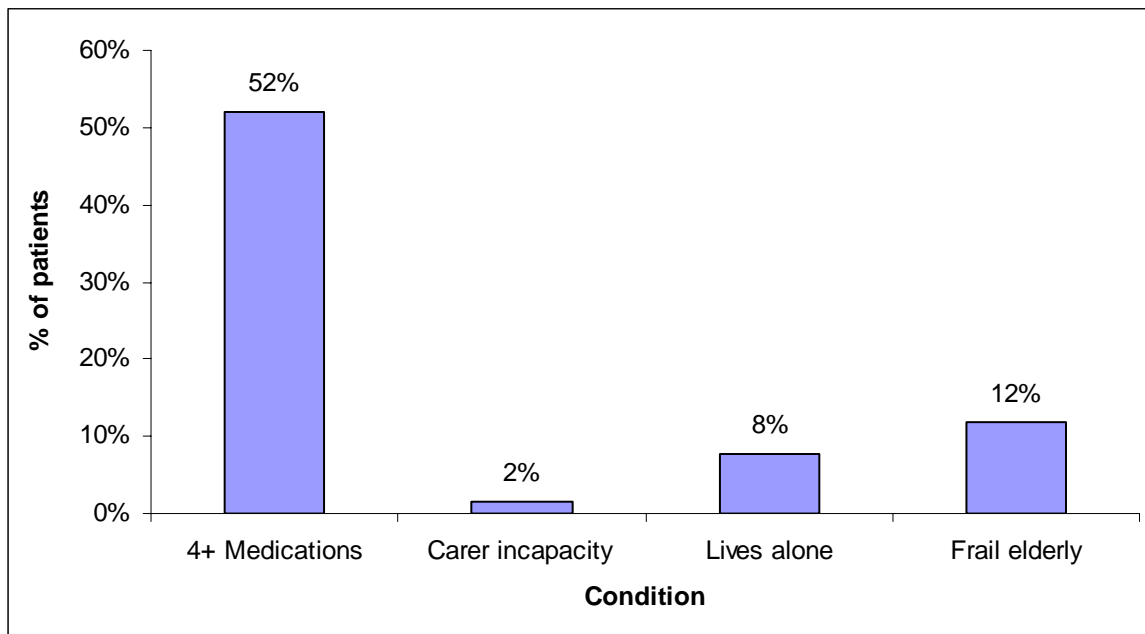
Figure B.4 Percentage of patients presenting comorbidities



This graph shows how prevalent comorbidities are amongst admitted patients in Dublin Midlands - 70% of patients were admitted with at least one comorbidity and 38% of patients had at least two.

B.2.5 Other Patient Conditions

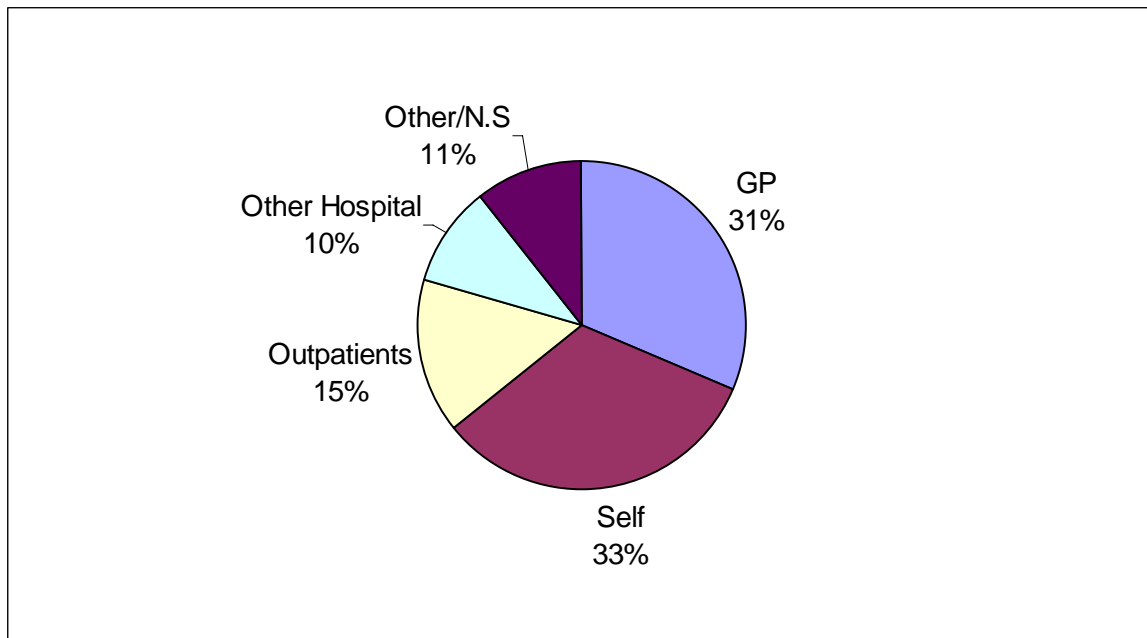
Figure B.5 Percentage of patients presenting with other conditions



Most patients surveyed displayed one risk factor at the point of admission. A high proportion of patients surveyed (52%) were on multiple medication therapies. Lower numbers of the other risk factors were identified from the patient charts.

B.2.6 Source of Referral

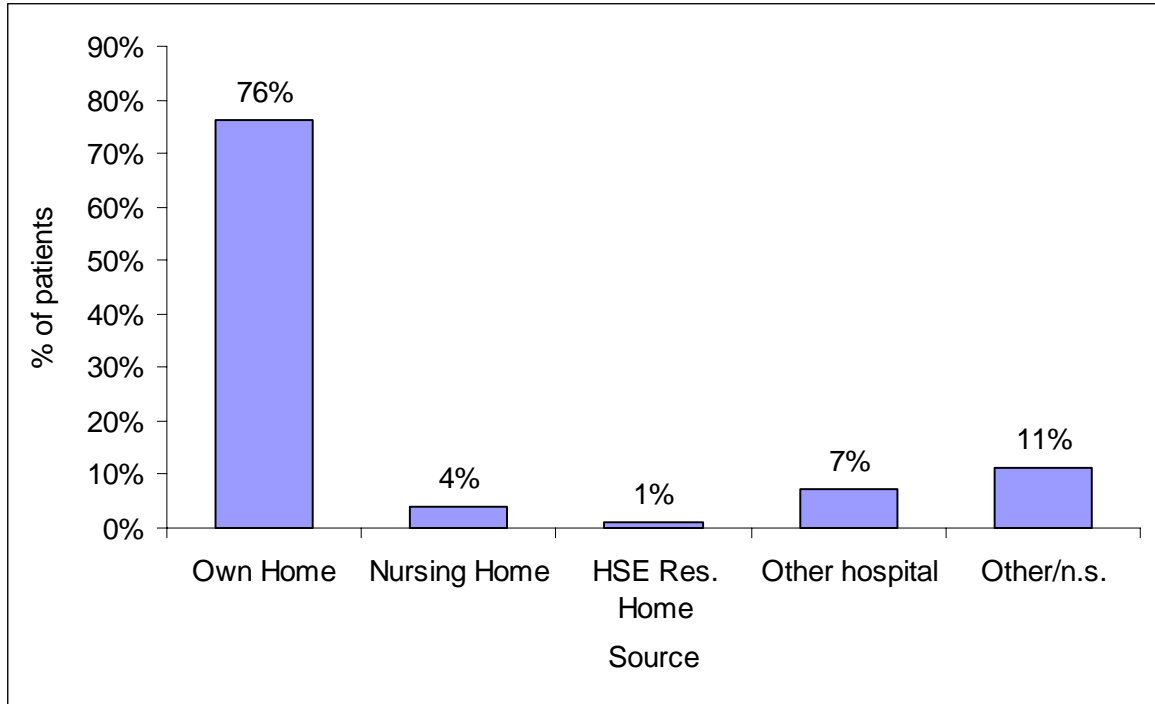
Figure B.6 Source of patient referral



Similar proportions of patients were self-referred (33%) as were referred by their GP (31%). The source of referral was not known or not recorded on the patient notes for 11% of patients.

B.2.7 Source of Admission

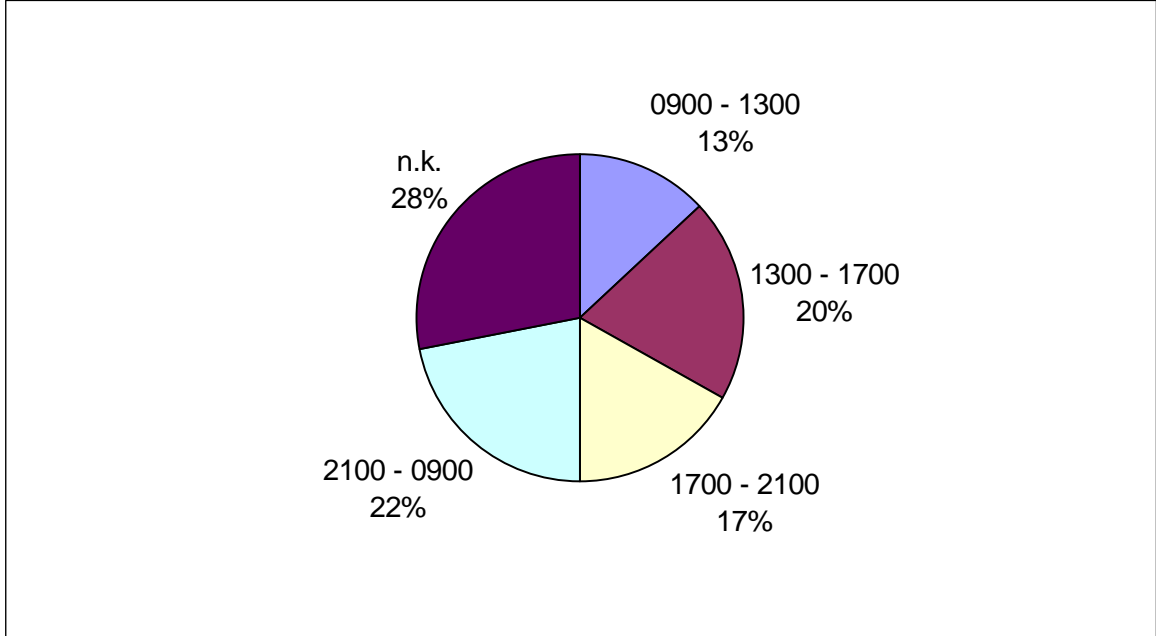
Figure B.7 Source of patient admission



The vast majority of patients (76%) were admitted from their own homes. The data indicate 7% admitted from other hospitals. One percent were admitted from HSE Residential Homes, and 4% from other Nursing Homes. The source of admission was not specified for 11% of patients.

B.2.8 Time of Arrival

Figure B.8 Time of patient arrival

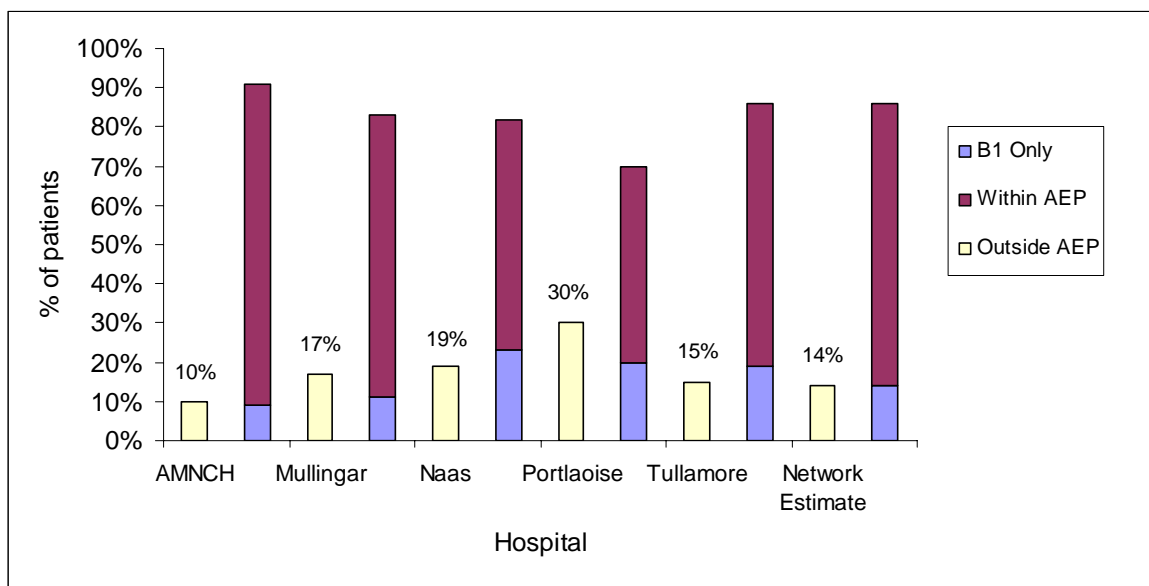


This graph shows that 37% of patients who were admitted, arrived at the hospital in the afternoon and evening. Just over one fifth of patients presented at night, between 9PM and 9AM. Time of arrival data were not available for 28% of admissions.

B.3 Day of Admission

B.3.1 AEP Results for Day of Admission

Figure B.9 Categorisation of patients with regards to the AEP on day of admission



Across Dublin Midlands 14% of admitted patients were outside of the AEP Criteria. This suggests that these patients could potentially have avoided acute admission and been treated outside an acute setting, if appropriate alternatives were available. The survey results vary considerably between the hospitals in the network. AMNCH had the lowest percentage of patients outside the criteria (10%) and Portlaoise had the highest (30%). The remaining hospitals ranged between 14% and 19%.

I/v therapy was the only AEP criterion identified for 14% of patients. Again, the survey results varied between hospitals. The proportion was lowest in AMNCH at 9%, while it reached approximately one fifth at three hospitals: Naas (23%), Portlaoise (20%) and Tullamore (19%).

a. *Statistical analysis of the influence of characteristics on AEP results for admission*

In order to attempt to better understand why patients are admitted outside AEP, it was decided as in the national report to undertake a statistical analysis of the various characteristics that could potentially have an influence on this for patients at a network level. Unlike the national analysis however, only a univariate analysis was undertaken. The following table summarises the result of this univariate analysis for the Dublin Midlands network and shows that the most likely characteristics to lead to admission outside AEP are:

- Source of Referral (Patients referred from Other Hospitals or Outpatients are more likely to be admitted outside AEP)
- Source of Admission (Patients admitted from other hospitals or nursing homes are more likely to be admitted outside AEP).

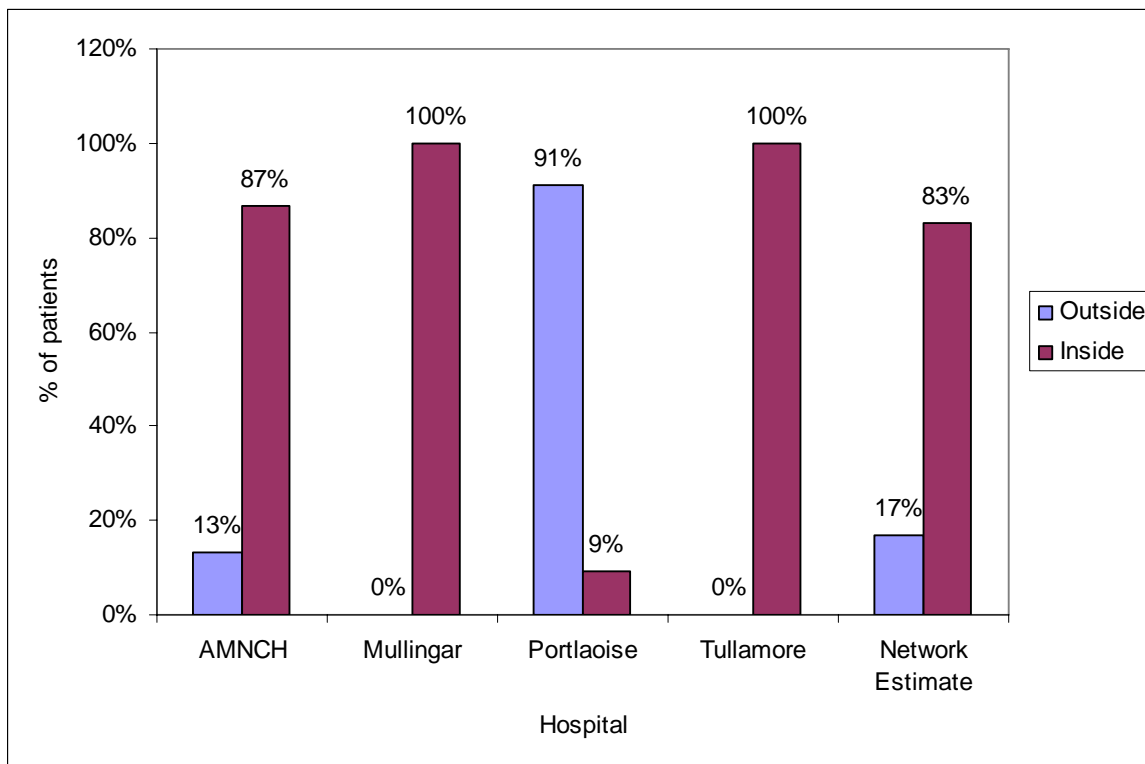
As with the national analysis however, it is recommended that whilst the analysis provides a set of useful indicators with regards to patient characteristics likely to be representative of admission and/or treatment outside AEP, they should not themselves form the basis around which explanations as to why patients are admitted outside AEP are sought. It should also be noted that all unknowns were excluded from this analysis.

Table B.2 Results of univariate analysis of the strongest relations between patient characteristics and lying outside AEP on admission

| Characteristic | χ^2 | df | P | Attribute | % Outside AEP | % Inside AEP |
|---------------------|----------|----|-------|----------------------|---------------|--------------|
| Source of Referral | 42.902 | 5 | 0.000 | GP | 36 | 37 |
| | | | | Other Hospital | 15 | 6 |
| | | | | Outpatients | 25 | 16 |
| | | | | Self | 24 | 41 |
| Source of Admission | 43.757 | 3 | 0.000 | Other Hospital | 14 | 2 |
| | | | | Own Home | 79 | 93 |
| | | | | Nursing Home | 6 | 4 |
| | | | | HSE Residential Home | 1 | 1 |

B.3.2 Elective Surgery Findings

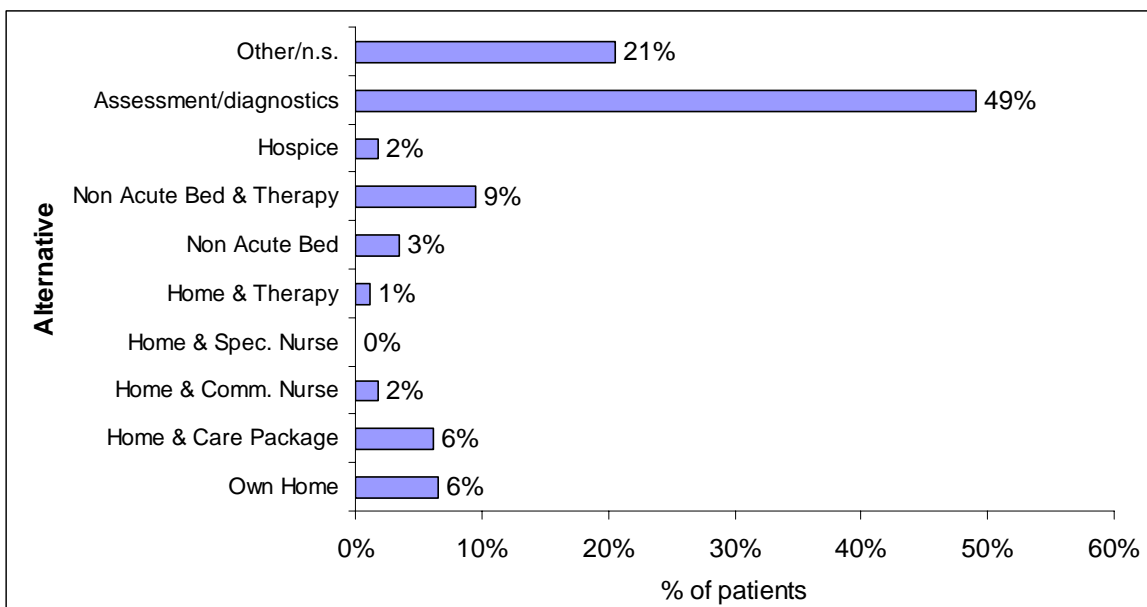
Figure B.10 Categorisation of patients with regards to elective surgery



Of the elective surgery patients surveyed, 74% did not meet the timeliness criteria and 23% did not meet the location criteria. This graph shows that 17% of patients did not meet both criteria.

B.3.3 Alternatives Identified to Admission

Figure B.11 Alternatives identified to admission for patients outside the AEP on day of admission

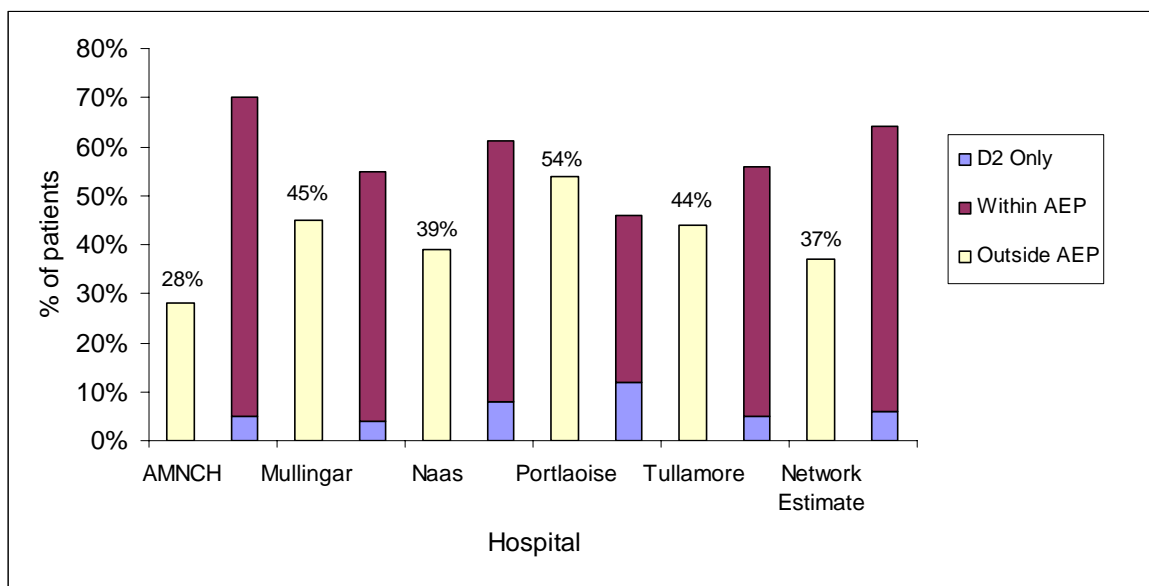


Access to hospital based (but not bed based) assessment and diagnostics could potentially have avoided admission for 49% of patients outside the AEP criteria. Non acute bed (3%) and non acute bed with therapy (9%) were considered appropriate care alternatives for 12% of patients in total. Own home with a care package could have been an appropriate care delivery option for 6% of patients, and own home without support was considered appropriate for a further 6% of patients.

B.4 Day of Care

B.4.1 AEP Results for Day of Care

Figure B.12 Categorisation of patients with regards to the AEP on day of care



This graph shows the proportion of patients surveyed that could have been treated in an alternative setting on the day of care, if appropriate alternatives were available. Whilst the average in Dublin Midlands was 37%, the chart clearly illustrates the variance between providers. AMNCH had the lowest proportion of patients outside of the AEP at 28%. Mullingar and Tullamore shared similar results at 45% and 44% respectively and Naas was slightly lower at 39%. Portlaoise had the highest proportion of patients outside AEP at 54%.

Further analysis of the Dublin Midlands data shows that 17% of the patients who outside the AEP were receiving physiotherapy and occupational therapy.

a. *Statistical Analysis of the influence of Characteristics on AEP results for day of care*

In order to attempt to better understand why patients are treated outside AEP, it was decided as in the national report to undertake a statistical analysis of the various characteristics that could potentially have an influence on this for patients at a network level. Unlike the national analysis however, only a univariate analysis was undertaken. The following table summarises the result of this univariate analysis for the Dublin Midlands network and shows that the most likely characteristics to lead to a day of care outside AEP are:

- Source of Admission (patients admitted from another hospital or HSE Residential Home are more likely to be outside AEP on the day of care).

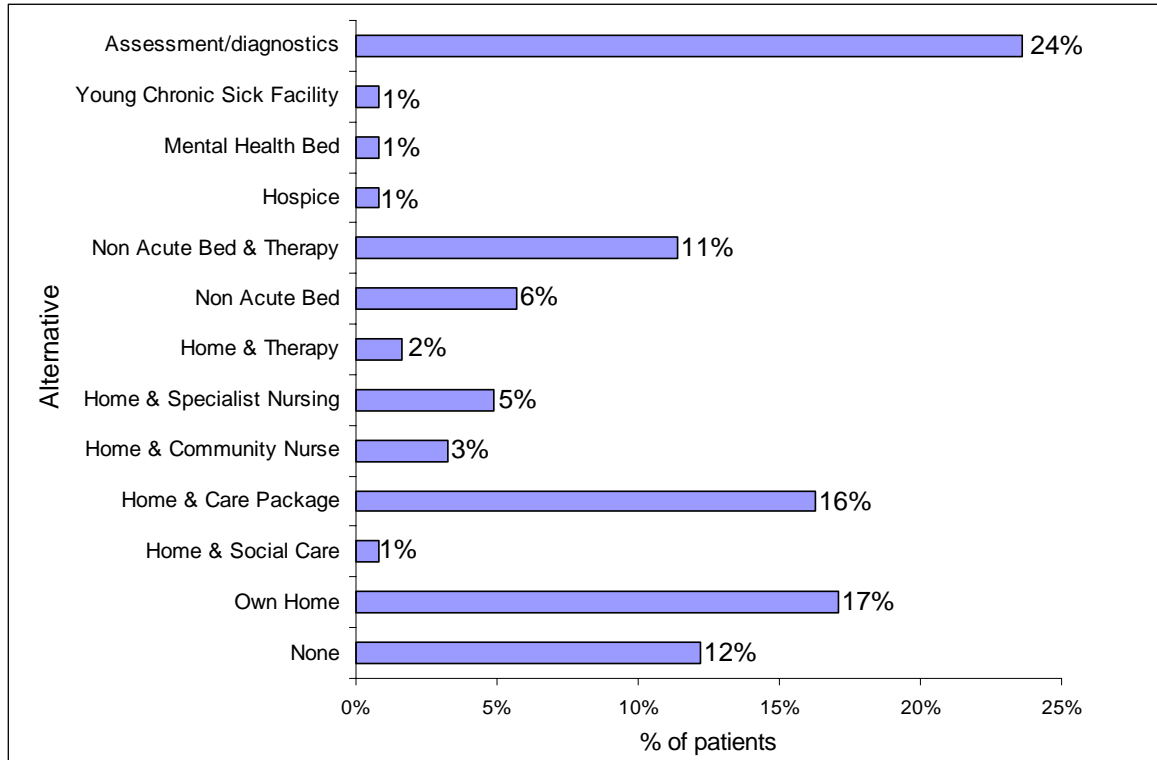
As with the national analysis however, It is again recommended that whilst the analysis provides a set of useful indicators with regards to patient characteristics likely to be representative of admission and/or treatment outside AEP, they should not themselves form the basis around which explanations as to why patients are treated outside AEP are sought. Again, all unknowns were excluded from this analysis.

Table B.3 Results of univariate analysis of the strongest relations between patient characteristics and lying outside AEP on day of care

| Characteristic | χ^2 | df | P | Attribute | % Outside AEP | % Inside AEP |
|---------------------|----------|----|-------|----------------------|---------------|--------------|
| Source of Admission | 17.607 | 3 | 0.001 | Other Hospital | 6 | 2 |
| | | | | HSE Residential Home | 2 | 0 |
| | | | | Own Home | 89 | 92 |
| | | | | Nursing Home | 3 | 6 |

B.4.2 Alternatives Identified to Acute Care

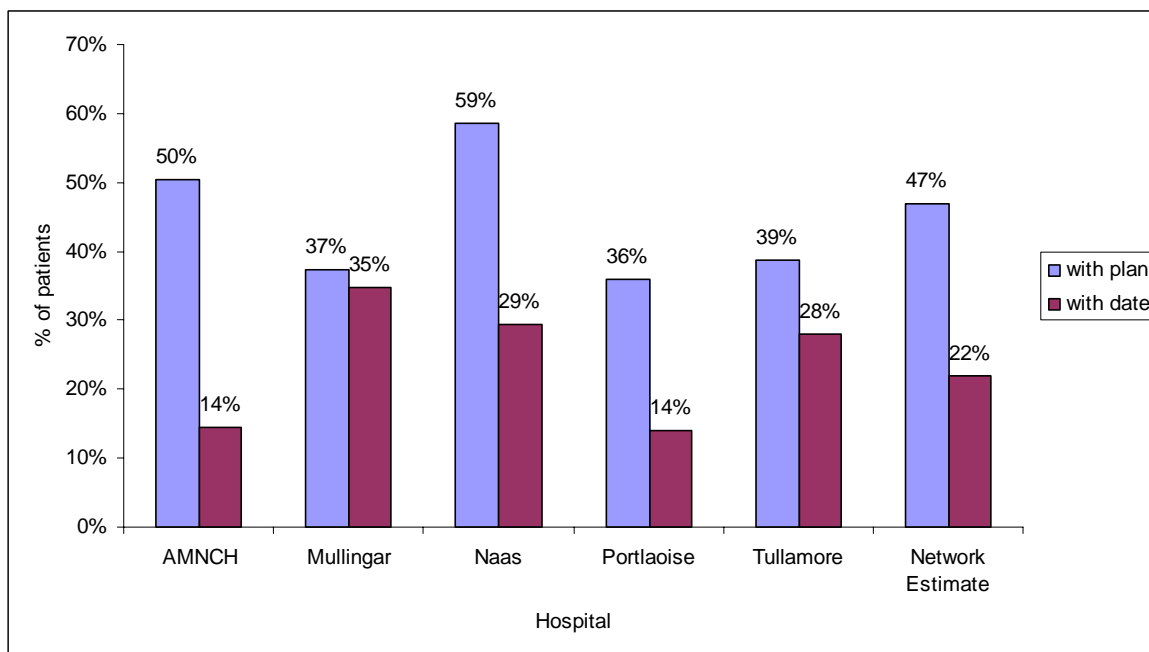
Figure B.13 Alternatives identified for patients outside the AEP on day of care



Access to assessment/diagnostics was the most frequently identified appropriate alternative to acute care, deemed suitable for 24% of patients. Own home was suggested for 17% of patients, while own home with a care package could have been an appropriate care delivery option for a further 16%. Non acute bed complemented by therapy support was suggested for 11% of admitted patients.

B.4.3 Discharge Planning

Figure B.14 Percentage of patients with evidence of discharge planning

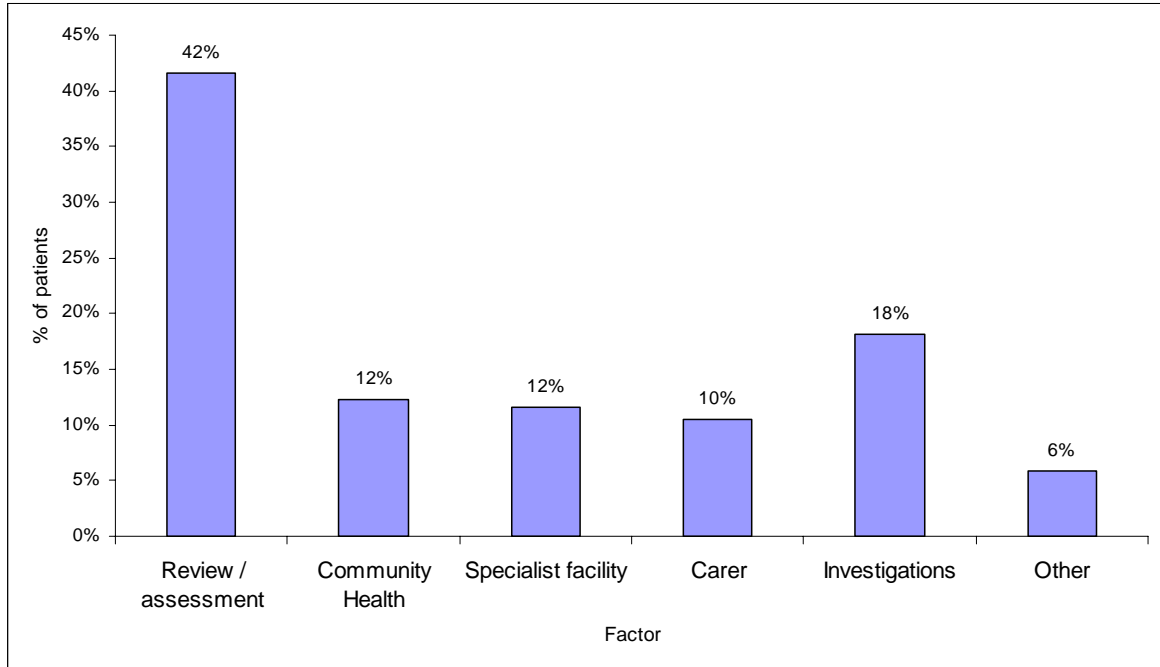


This graph shows the prevalence of discharge planning in the notes of surveyed patients at each hospital in the network. Surveyors did not look for a formal discharge plan, rather some evidence of plans or discussion to progress the patient towards timely discharge. Discharge planning was in evidence for 47% of patients on average in Dublin Midlands. As illustrated in the chart, the occurrence of discharge planning varied between a high of almost 60% at Naas to 37% at Mullingar and 36% at Portlaoise.

The majority of patients did not have predicted dates of discharge. The network average with a date was 22%, which varied between 14% at AMNCH and Portlaoise and 35% at Mullingar.

B.4.4 Factors Affecting Discharge

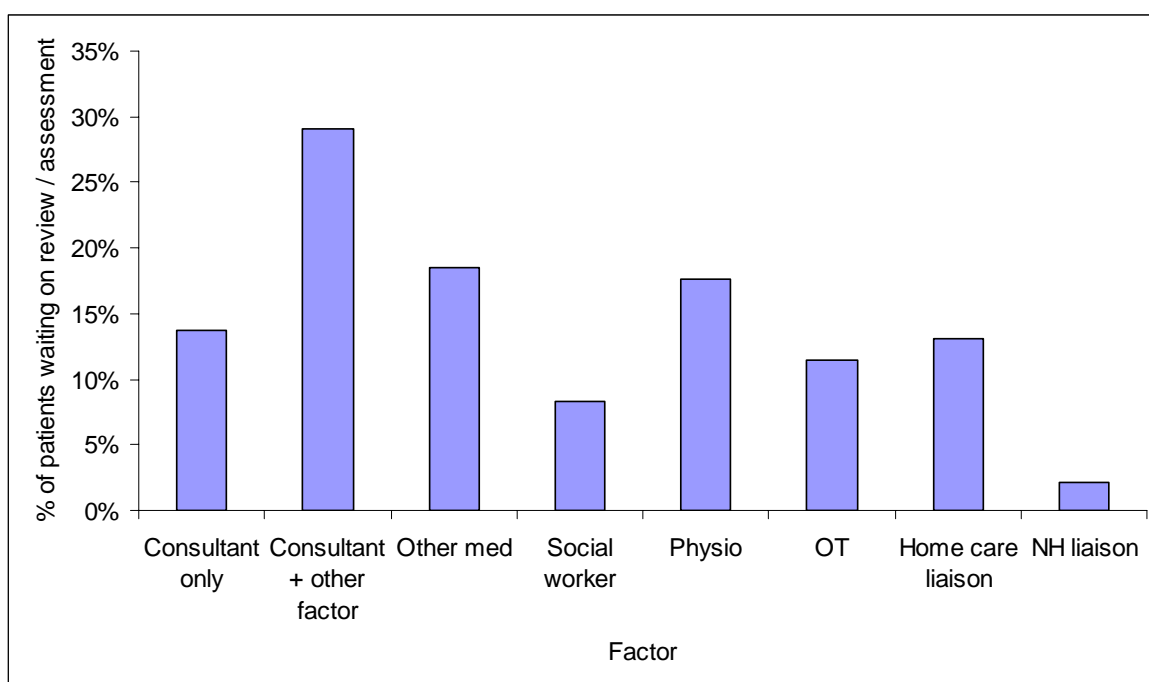
Figure B.15 Factors affecting discharge for patients outside the AEP



Analysis of the factors affecting discharge highlights patient review and assessment as the most prevalent factor, impacting 42% of patients. A further 18% of patients are awaiting investigations.

a. Breakdown of the Review/Assesmet Factor

Figure B.16 Breakdown of the review/assessment element of discharge



Most patients awaiting review or assessment were waiting to see one or a number of clinical staff, and in 61% of the occurrences, the involvement of a medical member of staff was identified.

B.5 Assessment of Implications

B.5.1 AEP on Admission

The proportion of patients admitted outside the AEP criteria in Dublin Midlands (14%) was slightly higher than the national average for this study (13%). These data indicate that acute admission could have been avoided for some patients if appropriate alternatives were available. As outlined earlier in this document, it should not be interpreted as suggesting that 14% of patients should not have been admitted.

Surveyors recorded 14% of patients across the network for whom i/v therapy was the only AEP admission criterion met. These are in addition to the 14% who did not meet any AEP admission criteria. The AEP is 'clinically conservative' in its definitions so patients admitted for i/v therapies only are regarded as meeting acute care criteria (and were recorded as such by surveyors). However, professional opinion now suggests that many of these patients could receive such therapy outside an acute location.

The results of the surgical variant of the AEP indicate that patients are not being admitted on the day of surgery, as 74% of patients did not meet the timeliness criteria. These data appear to confirm report of the practice of admitting patients in advance of surgery to secure an acute bed.

B.5.2 AEP on Day of Care

The finding that 37% of patients surveyed could potentially have been cared for outside of the acute hospital setting on their day of care is inline with the national average for this study of 39%.

B.5.3 Alternatives to Acute Care

The most common potential alternative identified to acute hospital admission was access to assessment/diagnostics, which was identified for 49% of patients outside of the AEP – compared to the national picture of 39%. The remaining patients had alternatives identified in a non-acute setting - non-acute bed and therapy (15%), and home-based care with GP support (7%).

Access to assessment and diagnostics was also the primary alternative to acute care identified for patients outside of the AEP on the day of care, considered appropriate for 24% of patients. This was followed by own home (17%) and home with a home care package (16%). Access to a non-acute bed with therapy was suggested for 11% of patients and Dublin Midlands was the only network where this option was not in the top three alternatives to acute care. The proportion of patients for whom 'own home' without support was identified (17%) is striking, and suggests an opportunity to discharge patients appropriately without any additional community capacity required.

The survey data highlight the need to consider alternatives pathways for provision of i/v therapy, as for 14% of admitted patients this was the only AEP criterion met.

B.5.4 Planning and Delivery of Acute Care

At the network consultation session there was a strong consensus that access to assessment/ diagnostics is an issue across the network, with access to angiograms in

particular causing a concern. The network is considering options such as extension of diagnostics working hours, or changing working hours to match typical patient demand. This would also require arrangements for results interpretation. The option of working with GPs to structure surgeries so that referrals would arrive at hospitals in time to access diagnostics was also raised. Streaming of admitted/non-admitted patients waiting for diagnostics, and perhaps prioritising non-admitted patients so that admission could be avoided, was also considered.

The survey data suggest that there is scope for reviewing discharge planning procedures on a systemic basis across hospitals in Dublin Midlands, as discharge planning was in place for less than half of patients (40%). There are examples of good practice in the network, for example 60% of patients surveyed in Naas had a discharge plan. A high quality of discharge planning is essential if patients are to be closely monitored and appropriately progressed along their care pathway and through their hospital stay with a clear focus kept on their target health status and discharge destination. Reducing length of stay by just one day for a high volume of patients would have a major positive impact, and could be achieved through better planning, not necessarily more capacity. Some hospitals in the network reported that patient choice and preference with regard to their next care location (eg which nursing home) often resulted in delay.

Most patients awaiting review or assessment were waiting to see one or a number of clinical staff, and in 61% of the occurrences, the involvement of a consultant was identified. This would suggest opportunity to improve the internal hospital processes including review, ward rounds and investigations.

B.6 Conclusions

The conclusions and recommendations set out in the national report for this review apply to all networks. This section highlights some of the key findings for Dublin Midlands and the priority areas for the network to address, based on the survey data combined with the consultation undertaken with the Dublin Midlands Network and the features of international best practice healthcare delivery.

Conclusion B1: Difficulties accessing diagnostics are leading to avoidable admissions in Dublin Midlands and increasing length of stay.

Recommendation B1: Improve access to diagnostics and assessment without admission to the acute hospital setting. Based on the study findings this could include:

- Extended hours access to hospital based diagnostics
- Roll-out of MAUs to facilitate assessment without admissions where clinically appropriate and protocol based access to diagnostics
- Protocol based GP access to hospital and community diagnostics to reduce delays and avoid unnecessary admissions.

Conclusion B2: Patients could be discharged sooner and some patients could avoid admission if the additional GP and home care package support required to enable patients to stay in their own homes was available in Dublin Midlands.

Recommendation B2: Review processes for providing GP support and home care package support to patients as an alternative to admission and in facilitation of timely discharge and identify opportunities to increase provision.

Conclusion B3: The data indicates that there is opportunity to increase the level of discharge planning in Dublin Midlands to maximise bed utilisation. This is based on the levels of discharge planning identified and also the proportion of patients surveyed that could have been discharged to their own homes without additional support.

Recommendation B3 Implement protocol-based discharge planning and use of estimated dates of discharge across all hospitals in Dublin Midlands.

APPENDIX C: Network 3 – Mid West

C.1 Introduction

The survey was undertaken in the Mid West network on Wednesday 10th January 2007. This network provides acute care via four hospitals as listed below. Of these Dooradoyle is the only casemix hospital with a grouping of 2.

- Dooradoyle
- St. John's
- Ennis
- Nenagh

As detailed in the methodology, each hospital was allocated a survey sample size based on the number of beds supporting the specialities included in the exercise (medical and surgical). The following table lists for each hospital in this network, the applicable patient population on the day of the survey (Survey Population), the size of this population as a percentage of the full network population (% of Total Network Patients), the number of patients sampled from that population (Survey Sample), and the percentage of this sample with regards to the survey population (% of the Survey Population).

It shows that in the Mid West network, Nenagh has the largest sample percentage, with 74% of its patients on the day of the survey being sampled, and Dooradoyle had the smallest sample percentage, with 46% of patients being selected as part of the survey sample.

Table C.1 Mid West network hospital sample

| Hospital | Survey Population | % of Total Network Patients | Survey Sample | % of the Survey Population |
|--------------|-------------------|-----------------------------|---------------|----------------------------|
| Ennis | 102 | 15% | 52 | 65% |
| Dooradoyle | 336 | 56% | 138 | 46% |
| Nenagh | 86 | 13% | 52 | 74% |
| St John's | 84 | 17% | 50 | 56% |
| Total | 540 | 100% | 292 | 54% |

A consultation session was held on Wednesday 7th February to review the raw survey data with managerial, clinical and nursing stakeholders from the Mid West Network. The objectives of this meeting were to:

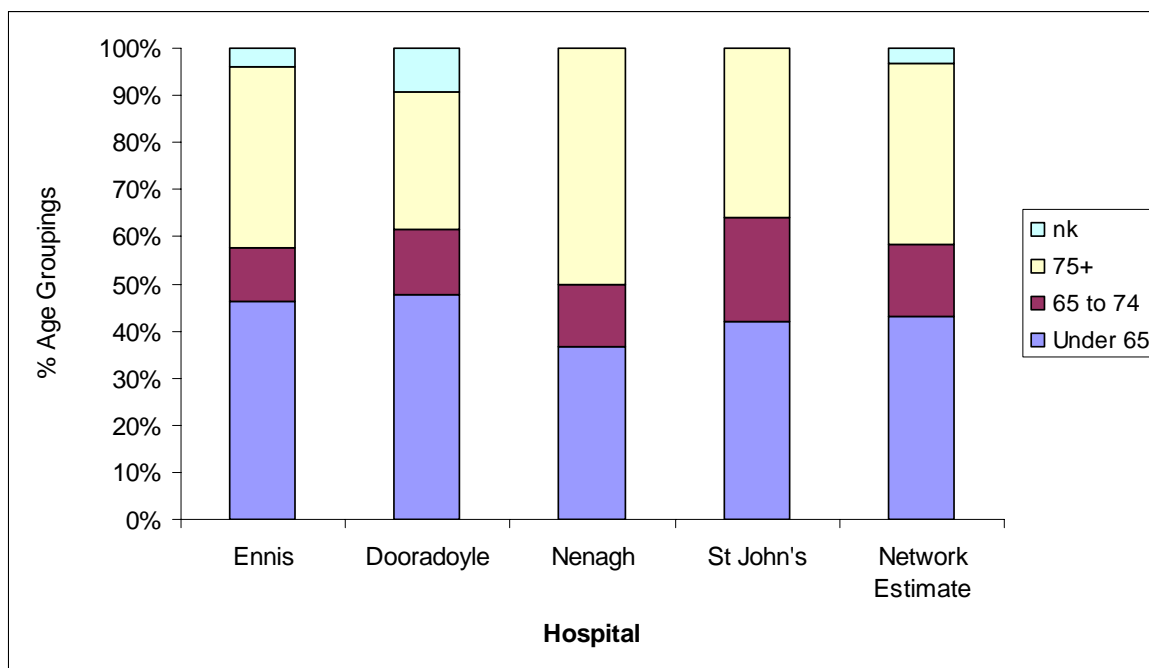
- Share the findings of the bed utilisation survey
- Understand the local factors influencing bed use
- Identify options for improving bed utilisation eg through process change and service reconfiguration.

The output of the session is incorporated into the analysis of the survey data in this section of the report.

C.2 Patient Profile

C.2.1 Patient Age

Figure C.1 Patient age profile by hospital and network estimate

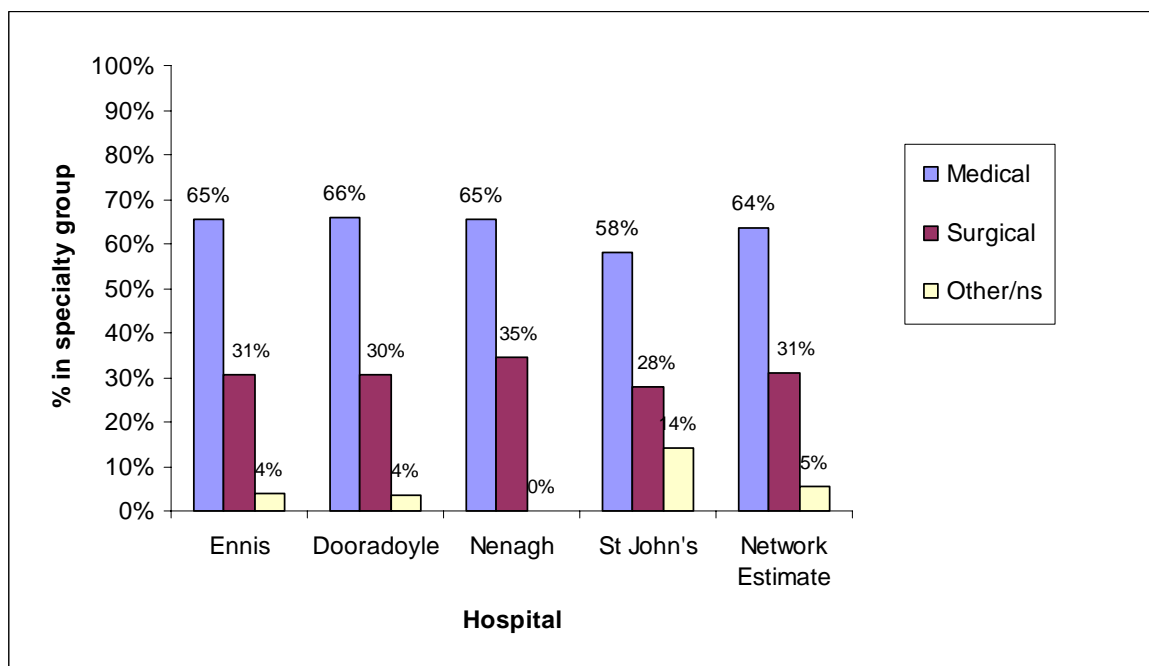


Of the patients surveyed, 55% were 65 years of age or over. The proportion of patients under 65 ranged from 37% in Nenagh to 48% in Dooradoyle. Patient age was not available from the notes of 5% of patients surveyed.

The survey data show that 62% of patients in the Mid West had a GMS card.

C.2.2 Patient Speciality

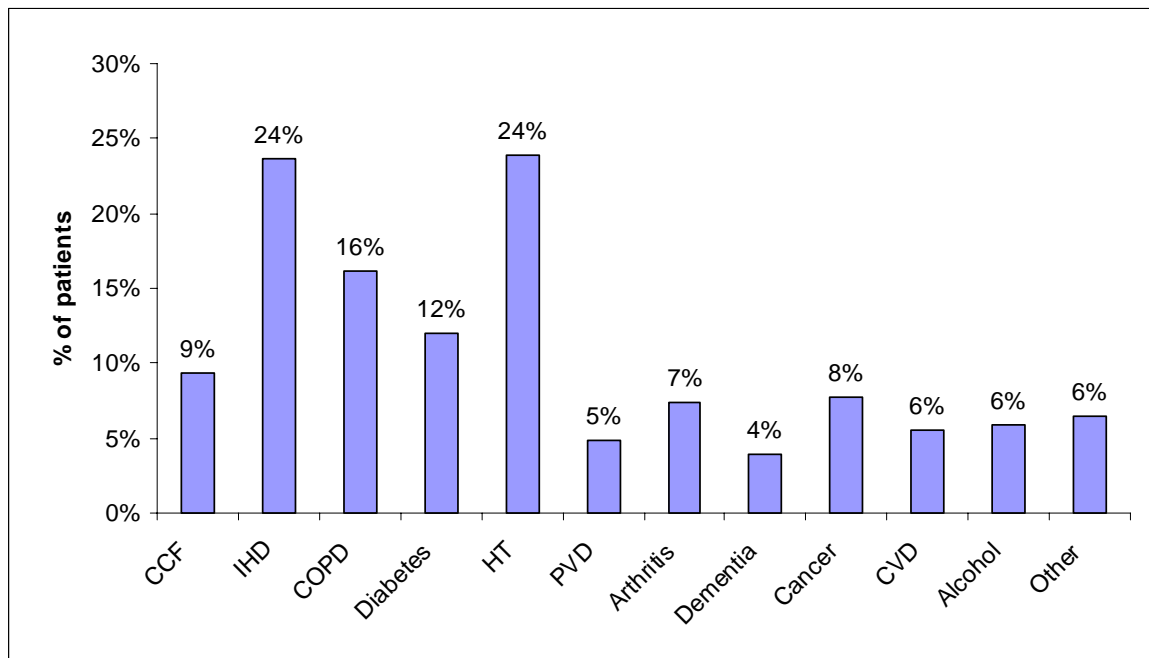
Figure C.2 Bed designation of patients on admission



The majority of patients at all sites surveyed were medical. Ennis (65%), Nenagh (65%) and Dooradoyle (66%) had similar levels of medical patients. St. John's had a lower proportion of medical patients (58%). Nenagh had the highest proportion of surgical patients – at 35% of the admitted patients surveyed.

C.2.3 Patient Comorbidity (Type)

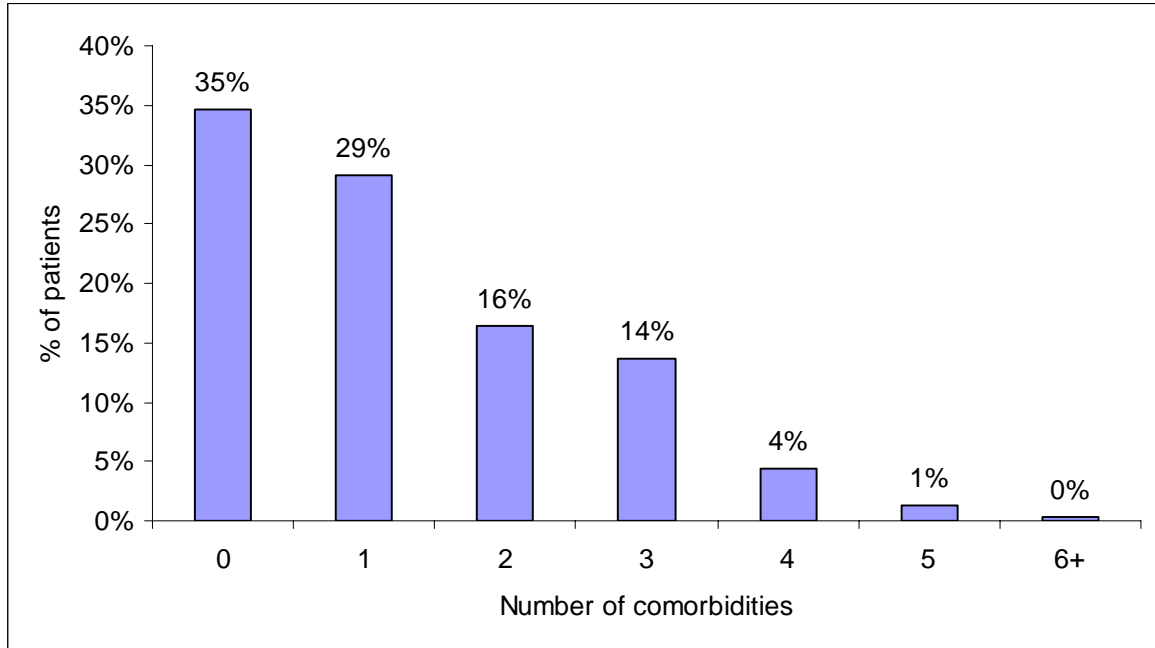
Figure C.3 Type and percentage of comorbidities presented by patients



This graph shows the range of comorbidities amongst admitted patients. Ischaemic Heart Disease (IHD) and Hypertension (HT) were the most common comorbidities recorded and just less than one quarter of patients surveyed presenting with each. Chronic Obstructive Pulmonary Disease (COPD) was prevalent amongst 16% of patients.

C.2.4 Patient Comorbidity (Prevalence)

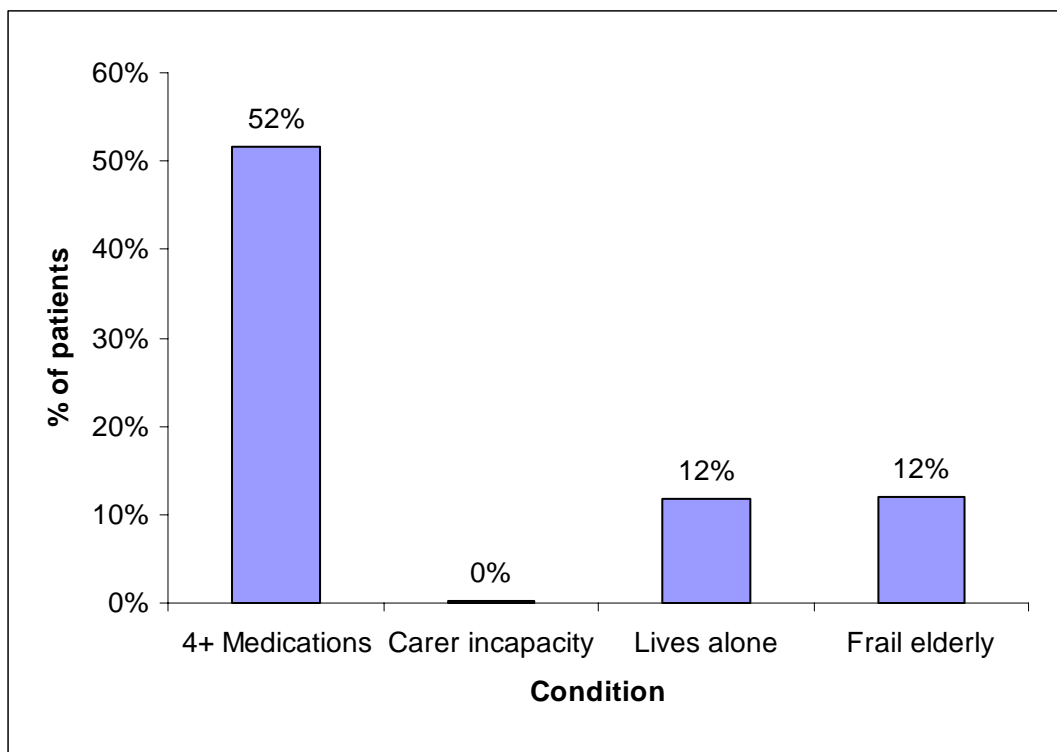
Figure C.4 Percentage of patients presenting comorbidities



A high proportion (65%) of patients admitted in the Mid West presented with at least one comorbidity and a 36% displayed at least two comorbidities.

C.2.5 Other Patient Conditions

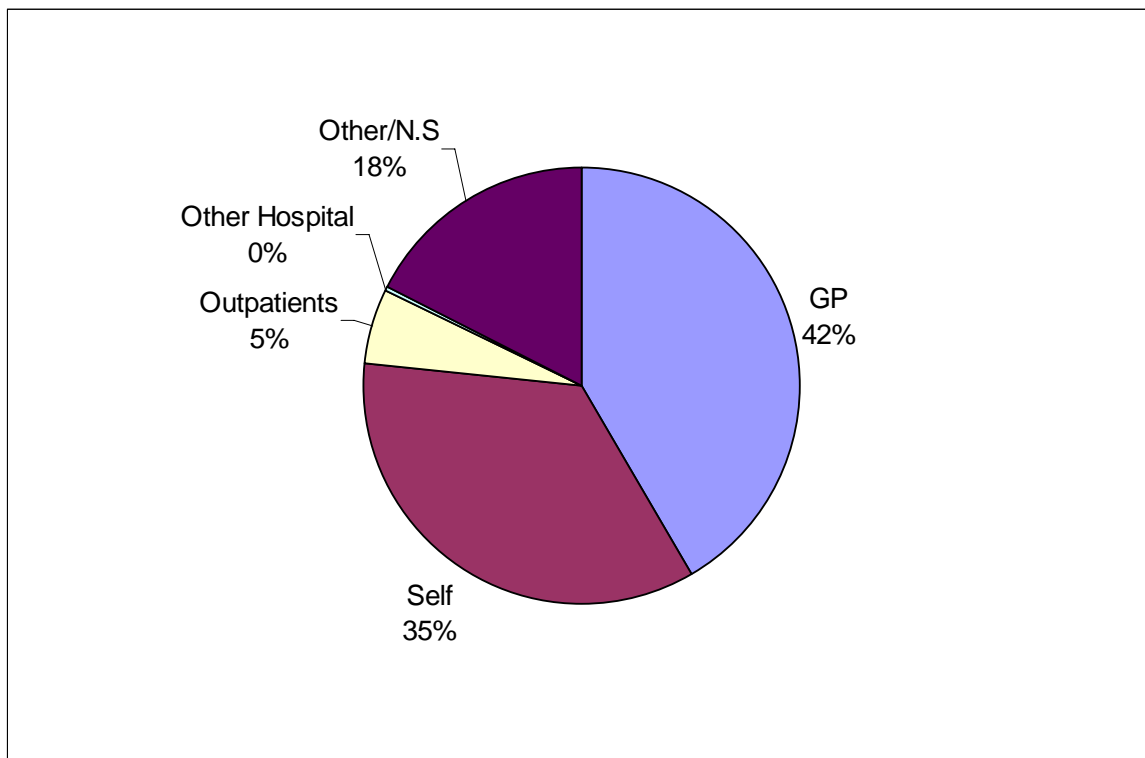
Figure C.5 Percentage of patients presenting with other conditions



These data show that over half of patients surveyed in the Mid West (52%) were on multiple medication therapies. Lower numbers of other risk factors such as living alone (12%) and frail elderly (12%) were also identified. No instances of carer incapacity were recorded from the patient notes.

C.2.6 Source of Referral

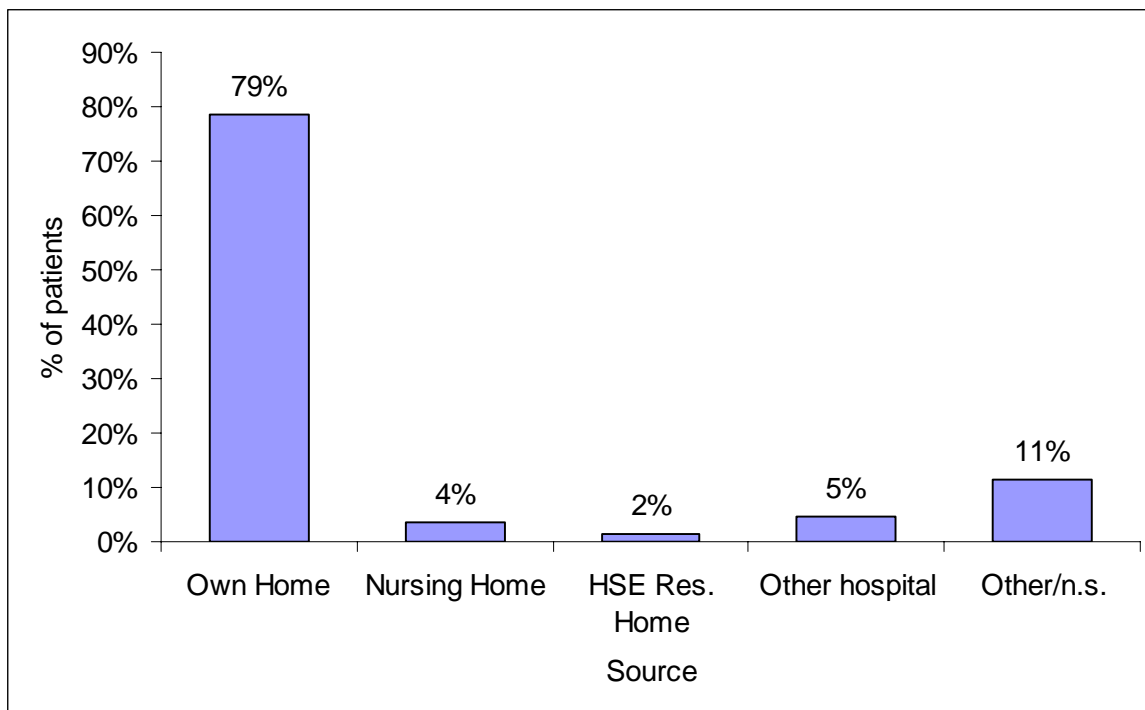
Figure C.6 Source of patient referral



GPs were the largest source of referral in the Mid West, accounting for 42% of acute hospital admissions. Patient self-referral was the second most common source of referral, at 35%. The source of referral was not known/not recorded on the patient notes for 18% of patients.

C.2.7 Source of Admission

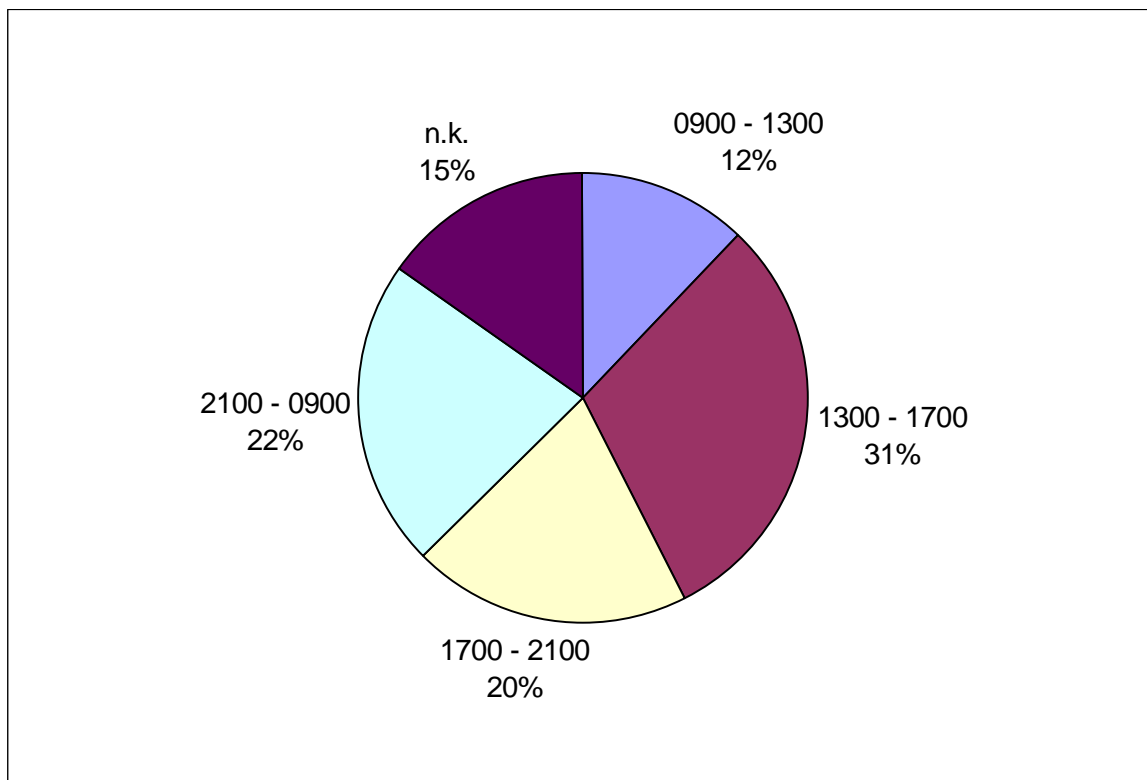
Figure C.7 Source of patient admission



The majority of surveyed patients (79%) were admitted from their own homes. The data indicate a low level of hospital transfers, with 5% admitted from other hospitals. Nursing homes were the source of admission for 4% of patients and a further 2% were admitted from HSE residential homes.

C.2.8 Time of Arrival

Figure C.8 Time of patient arrival



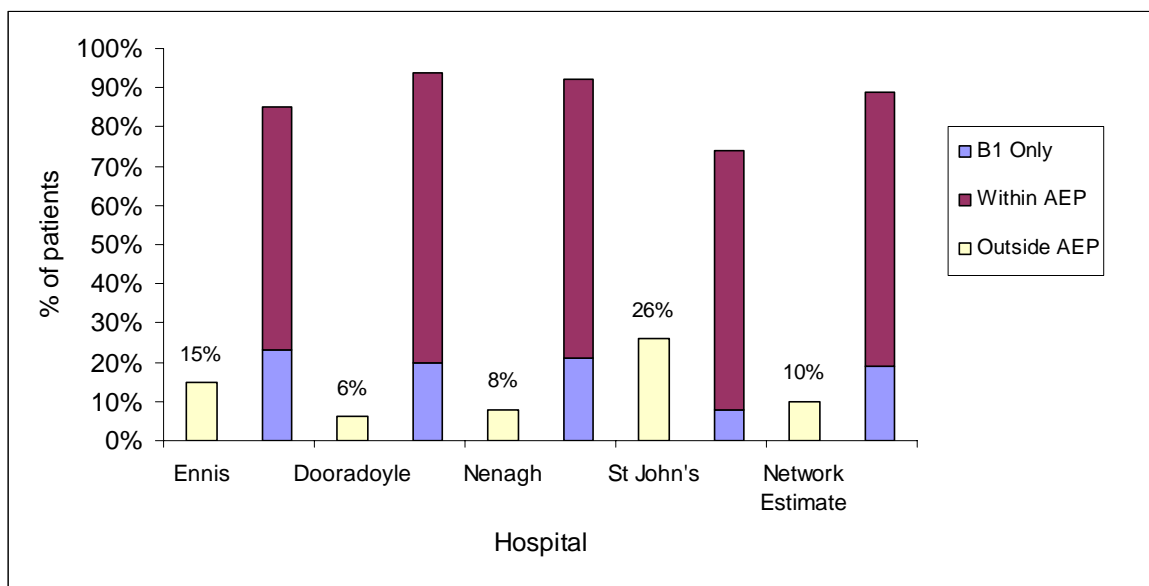
Analysis of the time of arrival for admitted patients shows that almost one third of patients (31%) arrived in the afternoon. A further 20% of admissions arrived between 5PM and 9PM, and 22% arrived at night, between 9PM and 9AM.

Time of arrival was not available from the notes of 15% of patients

C.3 Day of Admission

C.3.1 AEP Results for Day of Admission

Figure C.9 Categorisation of patients with regards to the AEP on day of admission



The network average in the Mid West for patients admitted outside the AEP criteria was 10%. These data indicate that these patients could potentially have been treated outside an acute setting, if alternatives were available. The proportion of patients admitted outside of the AEP criteria varied considerably across the hospitals. At Dooradoyle (6%) and Nenagh (8%), the level of admission outside AEP was less than 10%. This increased to 15% at Ennis and 26% at St. John's.

The proportion of patients for whom i/v therapy was the only was the AEP criterion identified was above 20% in three hospitals: Ennis (23%), Nenagh (21%) and Dooradoyle (20%). This was significantly lower at St. John's (8%) and the network estimate was 19%.

a. *Statistical analysis of the influence of characteristics on AEP results for admission*

In order to attempt to better understand why patients are admitted outside AEP, it was decided as in the national report to undertake a statistical analysis of the various characteristics that could potentially have an influence on this for patients at a network level. Unlike the national analysis however, only a univariate analysis was undertaken. The following table summarises the result of this univariate analysis for the Mid West network and shows that the most likely characteristics to lead to admission outside AEP are:

- Time of Arrival (patients arriving between 09:00 and 13:00 are more likely to be admitted outside AEP)
- County of Residence (patients from Clare and Kerry are more likely to be admitted outside AEP).

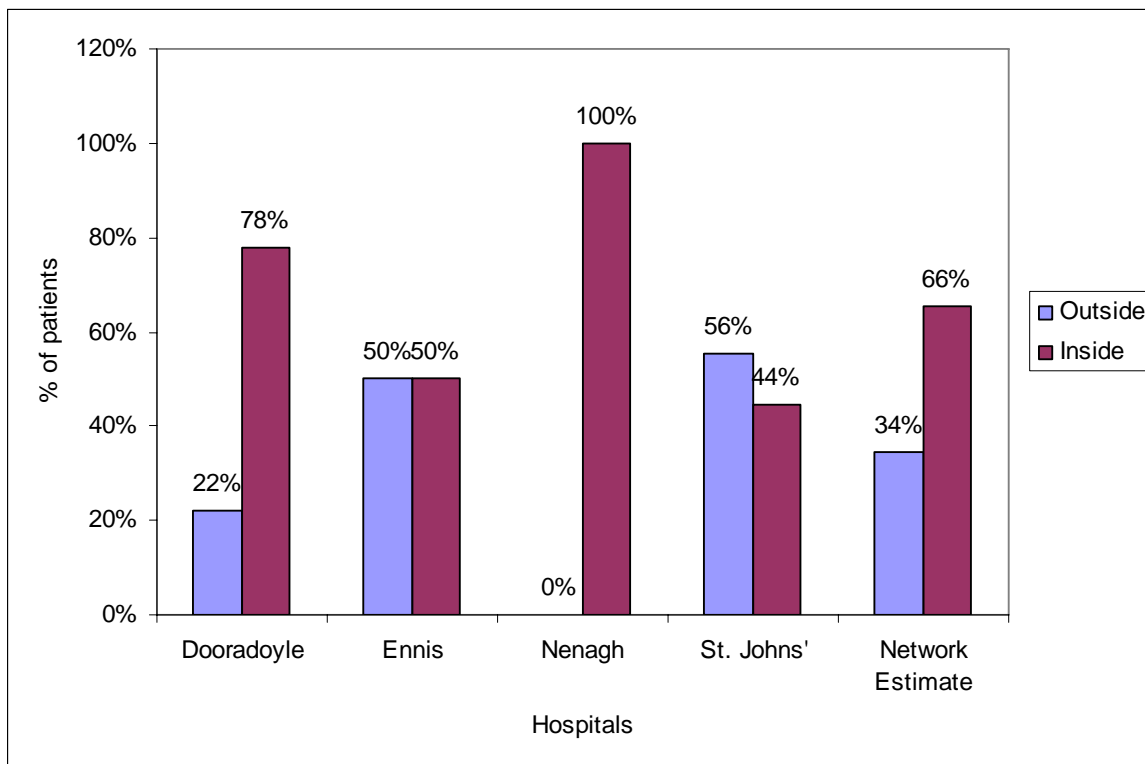
As with the national analysis however, It is recommended that whilst the analysis provides a set of useful indicators with regards to patient characteristics likely to be representative of admission and/or treatment outside AEP, they should not themselves form the basis around which explanations as to why patients are admitted outside AEP are sought. It should also be noted that all unknowns were excluded from this analysis.

Table C.2 Results of univariate analysis of the strongest relations between patient characteristics and lying outside AEP on admission

| Characteristic | χ^2 | df | P | Attribute | % Outside AEP | % Inside AEP |
|---------------------|----------|----|-------|---------------|---------------|--------------|
| Time of Arrival | 29.019 | 3 | 0.000 | 09:00 – 13:00 | 36 | 11 |
| | | | | 13:00 – 17:00 | 36 | 36 |
| | | | | 17:00 – 21:00 | 16 | 25 |
| | | | | 21:00 – 09:00 | 11 | 28 |
| County of Residence | 31.147 | 7 | 0.000 | Clare | 31 | 27 |
| | | | | Limerick | 52 | 50 |
| | | | | Tipperary | 8 | 20 |
| | | | | Kerry | 6 | 0 |

C.3.2 Elective Surgery Findings

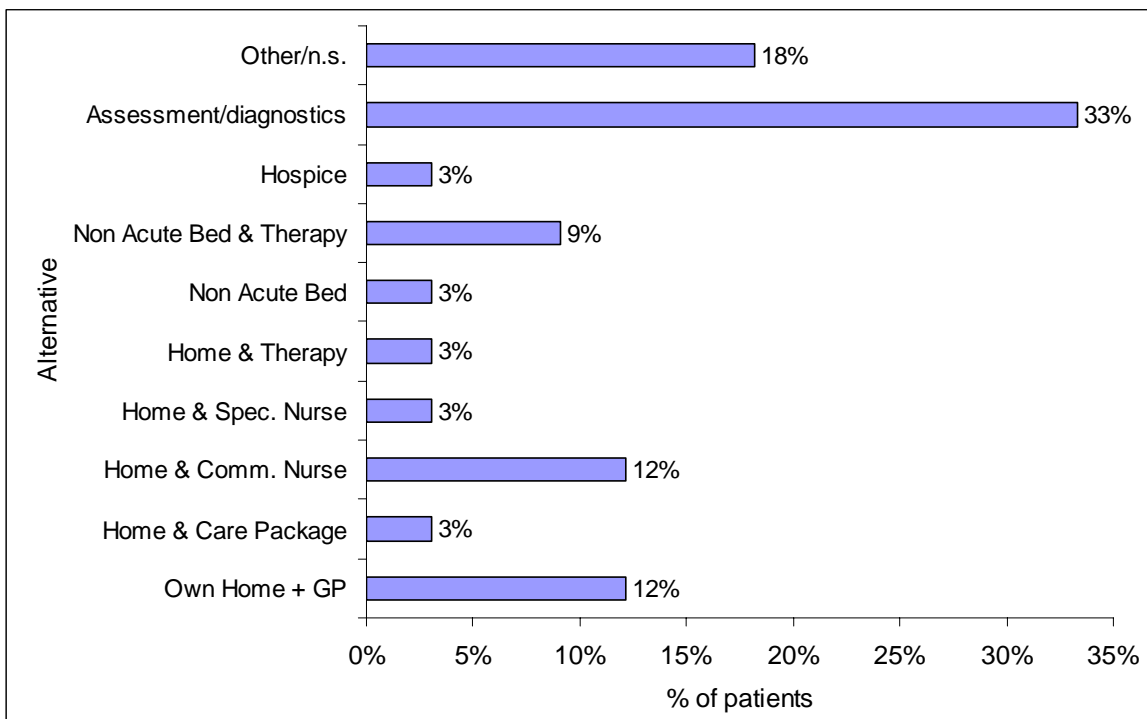
Figure C.10 Categorisation of patients with regards to elective surgery



Of the elective surgery patients surveyed, 79% did not meet the timeliness criteria and 43% did not meet the location criteria. This graph shows that 34% of patients did not meet both criteria.

C.3.3 Alternatives Identified to Admission

Figure C.11 Alternatives identified to admission for patients outside the AEP on day of admission

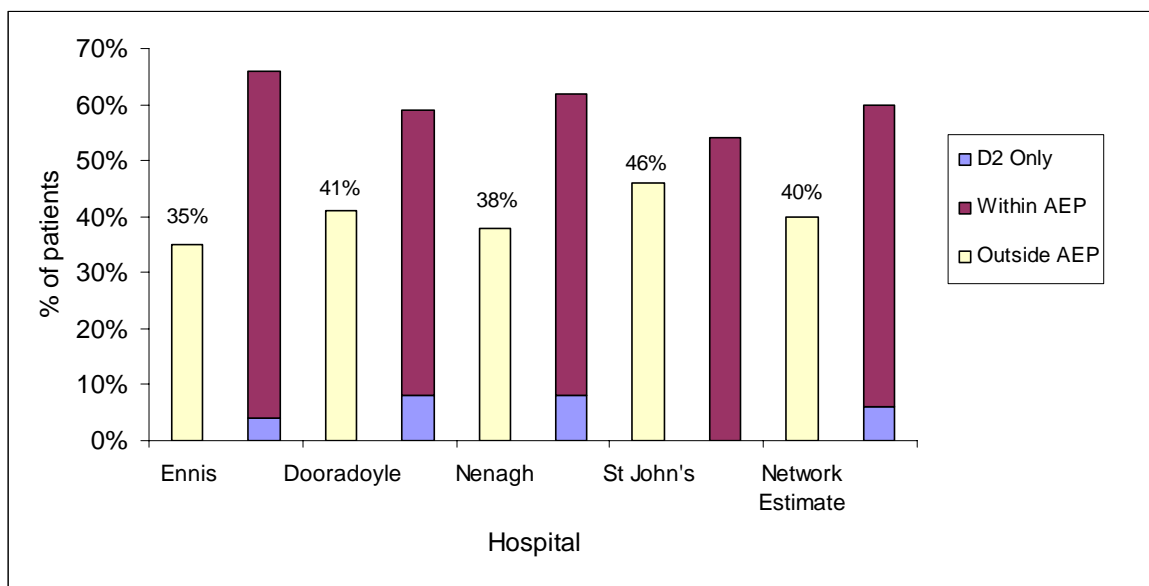


Analysis of potential alternatives to acute hospital admission in the Mid West highlights access to assessment and diagnostics as the most common factor, identified for 33% of patients outside the AEP. Home with community nurse support and own home with GP support were equally prevalent options, each deemed appropriate for 12% of patients. Access to a non-acute bed and therapy could have prevented acute admission for 9% of patients outside of the AEP.

C.4 Day of Care

C.4.1 Results for Day of Care

Figure C.12 Categorisation of patients with regards to the AEP on day of care



On average across the Mid West network, 40% of patients surveyed could have been treated in an alternative setting on the day of care, if appropriate alternatives were available. There was some variance in the results across hospitals. Ennis had the lowest proportion of patients outside of the AEP, at 35%. Results at Nenagh (38%) and Dooradoyle (41%) were clustered around 40%. At St. John's, the proportion rose to 46%.

A small proportion (6%) of the patients identified as outside the AEP criteria were receiving physiotherapy or occupational therapy support.

I/v therapy was the only AEP criterion identified for 6% of patients, accounting for 8% of patients surveyed at Dooradoyle and Nenagh and 4% at Ennis. All of the patients within the AEP criteria at St. John's receiving i/v therapy also met additional criteria.

a. *Statistical analysis of the influence of characteristics on AEP results for day of care*

In order to attempt to better understand why patients are treated outside AEP, it was decided as in the national report to undertake a statistical analysis of the various characteristics that could potentially have an influence on this for patients at a network level. Unlike the national analysis however, only a univariate analysis was undertaken. The following table summarises the result of this univariate analysis for the Mid West network and shows that the most likely characteristics to lead to a day of care outside AEP are:

- Source of Referral (patients self referring are more likely to be outside AEP on the day of care).

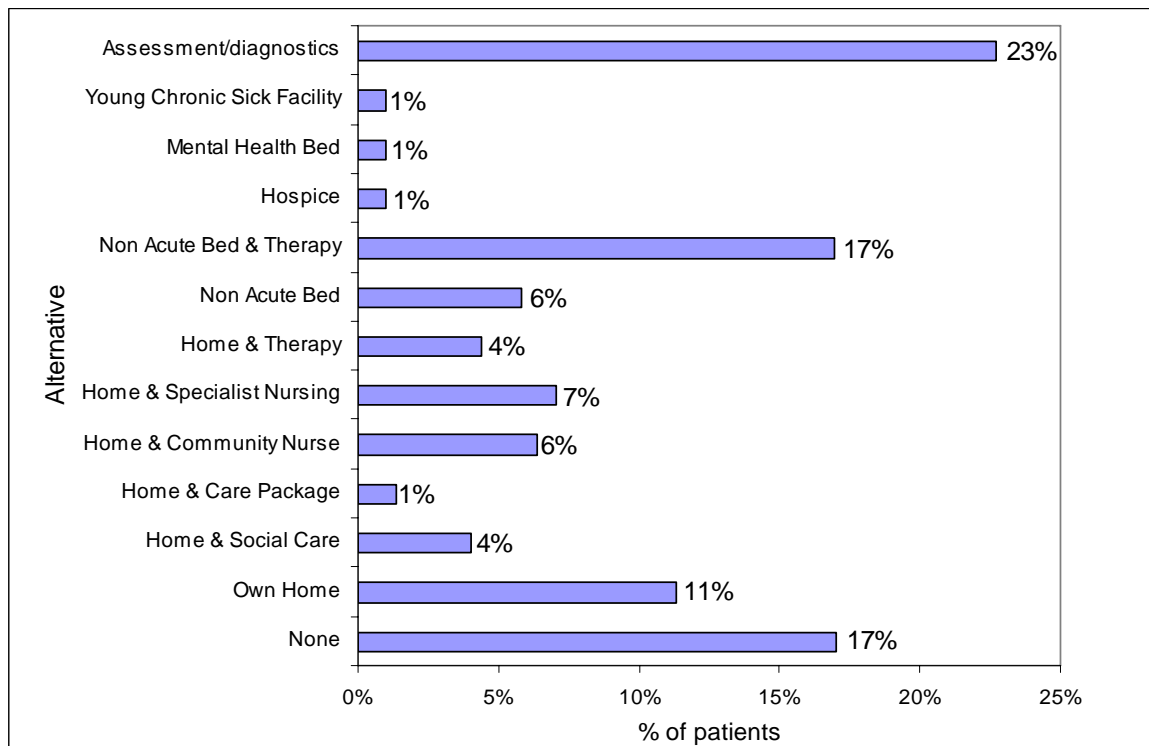
As with the national analysis however, It is again recommended that whilst the analysis provides a set of useful indicators with regards to patient characteristics likely to be representative of admission and/or treatment outside AEP, they should not themselves form the basis around which explanations as to why patients are treated outside AEP are sought. Again, all unknowns were excluded from this analysis.

Table C.3 Results of univariate analysis of the strongest relations between patient characteristics and lying outside AEP on day of care

| Characteristic | χ^2 | df | P | Attribute | % Outside AEP | % Inside AEP |
|--------------------|----------|----|-------|-------------|---------------|--------------|
| Source of Referral | 14.689 | 4 | 0.005 | GP | 47 | 52 |
| | | | | Self | 49 | 37 |
| | | | | Outpatients | 4 | 10 |

C.4.2 Alternatives Identified to Acute Care

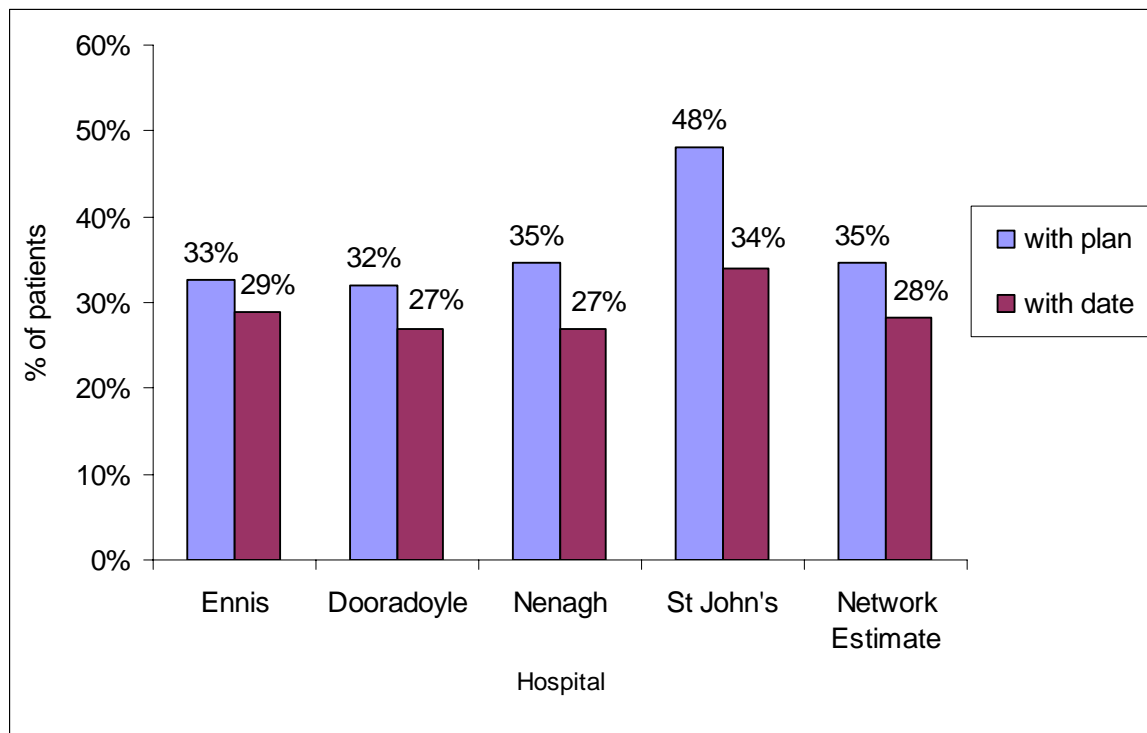
Figure C.13 Alternatives identified for patients outside the AEP on day of care



Analysis of alternative care options for patients outside of the AEP highlights access to assessment/diagnostics, identified for 23% of patients and access to non-acute beds with therapy support (17%). Own home with GP support was considered appropriate for 11% of patients outside the AEP.

C.4.3 Discharge Planning

Figure C.14 Percentage of patients with evidence of discharge planning



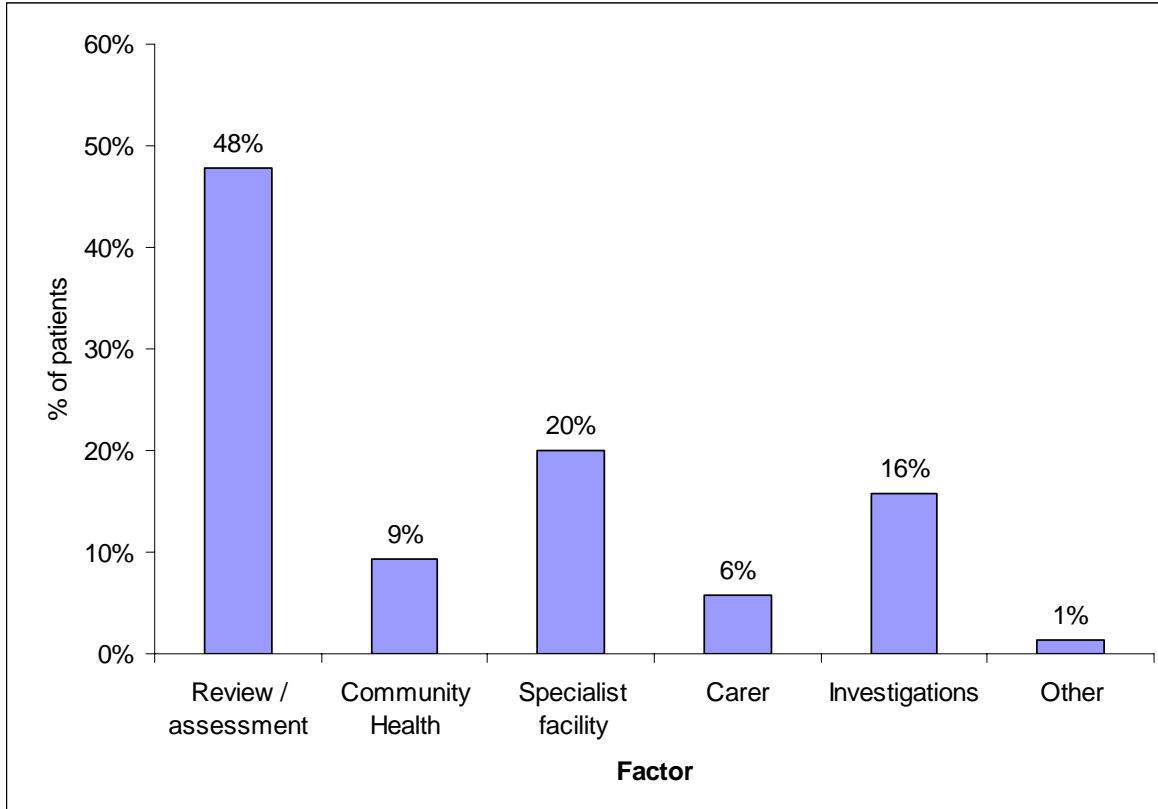
There was evidence of discharge planning in the patient notes for 35% of patients. For the purposes of the survey, this refers to any indication in the notes of plans or arrangements for discharge and was not confined to any specific format.

The occurrence of discharge planning was highest at St. John's (48%). The level of discharge planning was clustered in the mid- to low-thirties in the other three hospitals: 35% at Nenagh, 33% at Ennis and 32% at Dooradoyle.

The majority of patients did not have predicted dates of discharge. The network average use of predicted discharge dates was 28%. This was highest at St. John's (34%). Levels were lower at Ennis (29%) and Dooradoyle (27%) and Nenagh (27%).

C.4.4 Factors Affecting Discharge

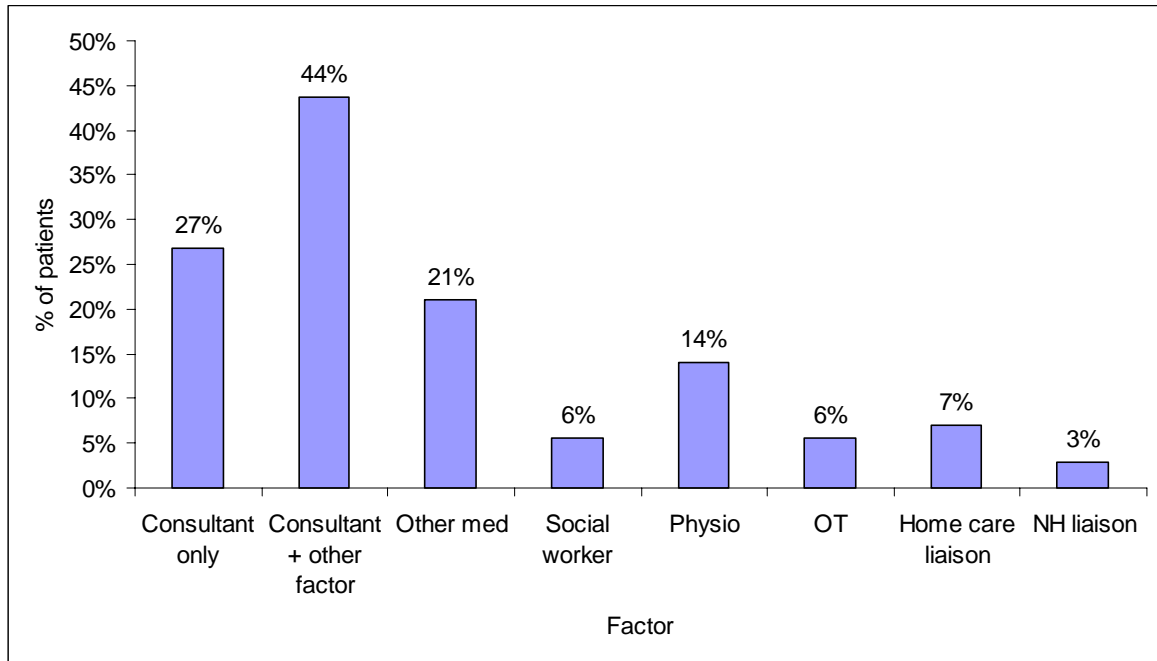
Figure C.15 Factors affecting discharge for patients outside the AEP



Analysis of the factors affecting discharge highlights patient review and assessment as the most prevalent factor, impacting 48% of patients. A further 20% of patients are waiting for access to a specialist facility and 16% of patients are awaiting investigations.

a. Breakdown of the review/assessment factor

Figure C.16 Breakdown of the review/assessment element of discharge



Most patients awaiting review or assessment were waiting to see one or a number of clinical staff, and in 92% of the occurrences, the involvement of a medical member of staff was identified.

The data gathered refer to delays noted on the day of survey irrespective of whether the patient was declared medically fit for discharge or not, and again any individual patient may have had more than one reason noted contributing to delay.

C.5 Assessment of Implications

C.5.1 AEP on Admission

The overall figure of 10% of patients admitted outside the AEP criteria in the Mid West is similar to that found in surveys elsewhere and is lower than the national average of 13% found in this study.

It should be emphasised that these results should not be interpreted as suggesting that all of these patients might have had alternatives to acute admission. Each hospital requires a certain level or 'buffer' of inappropriate admissions. This is to reduce risk of non-admission of appropriate patients. The size of this buffer is determined by the acceptable level of risk defined by the hospital and its balance between demand and capacity.

Surveyors recorded 19% patients across the network for whom i/v therapy was the only AEP admission criterion met. This is higher than the national average of 12% and was higher than any other network surveyed. These results were clustered around 20% for most of the hospitals in the network. These patients are in addition to the 10% who did not meet any AEP admission criteria. Models of care in Ireland and elsewhere now provide such therapy outside an acute location. At the Mid West consultation session the option of administering i/v in nursing homes, reducing the dependency on the acute setting, was discussed.

Whilst the number of elective surgery patients was small in the Mid West due to the time of year, the findings provide an indication of the current pathway for these patients. The data confirm that patients are admitted in advance of their surgery, with 79% of those surveyed not meeting the timeliness criteria.

C.5.2 AEP on Day of Care

The proportion of patients surveyed who potentially could have been cared for outside of the acute hospital setting on their day of care was 40%, which is similar to the national average of 39%. A small number (6% - the lowest network level in the study) were undergoing some form of rehabilitation which did not require an acute care setting. The network reported that therapy was not available in some hospitals.

C.5.3 Alternatives to Acute Care

Access to assessment and diagnostics was identified as the most common alternative for patients outside of the AEP criteria on both day of admission and day of care (33% on admission and 23% on day of care).

The survey findings confirm the importance of providing a broad spectrum of home and community based services. Whilst the Mid West had the youngest age profile in the survey, most patients were still over 65 years of age, and admitted patients in the Mid-West are likely to present with comorbidities and at least one risk factor. Own home with GP support was amongst the top three alternatives to acute care for patients outside AEP both on admission (12% of patients) and day of care (again, for 12% of patients). Own home and community nurse was also considered an alternative to admission for 12% of patients. The network highlighted that home care packages were not yet fully embedded in the Mid West service provision.

The high proportion of patients for whom i/v therapy was the only AEP criterion met (19%) highlights the need to consider alternatives setting for i/v.

Access to a non-acute bed with therapy support was the second most common alternative for patients outside of the AEP on their day of care, considered an appropriate option for 17% of patients.

C.5.4 Planning and Delivery of Acute Care

The survey data identified some internal hospital processes to address.

The network highlighted that the majority of admissions present between 3pm and 9pm, thus patients are arriving at the time when diagnostics are closing. This signals a clear opportunity to reduce delay and potentially avoid admissions by extending the hours diagnostics are available and working with primary care to attempt to manage the time of patient presentation. The current insurance arrangements, whereby some investigations are only paid for if undertaken as an inpatient, were seen as contributing to a practice of patient admission to access diagnostics.

The survey data suggest that there is scope for reviewing discharge planning procedures on a systemic basis across hospitals in the Mid West. Whilst the network had the highest level of use of predicted discharge dates (28%), it had one of the lowest levels of discharge planning overall (35%). A high quality of discharge planning is essential if patients are to be closely monitored and appropriately progressed along their care pathway and through their hospital stay with a clear focus kept on their target health status and discharge destination. A factor that may contribute to delay however, is that hospitals in the Mid West have neither occupational therapy nor speech therapy support.

The survey results show that 48% of discharge delays were linked to patient access to review or assessment. In 92% of cases (the highest of any network), this review involved a member of medical staff (who could in turn be waiting for test results etc.). Some hospitals in the network highlighted the need to try to arrange staffing to ensure availability of senior decision-makers and that some internal hospital processes could be improved to reduce delay.

C.6 Conclusions and Recommendations

The conclusions and recommendations set out in the national report for this review apply to all networks. This section highlights some of the key findings for the Mid West and the priority areas for the network to address, based on the survey data combined with the consultation undertaken with the Mid West Network and the features of international best practice healthcare delivery.

Conclusion C1: Difficulties accessing assessment and diagnostics are leading to avoidable admissions in the Mid West and increasing length of stay.

Recommendation C1: Improve access to diagnostics and assessment without admission to the acute hospital setting. Based on the survey data, this should include extended hours/seven-day access to diagnostics.

Conclusion C2: Based on the survey data, the only AEP criterion met by a high proportion of patients in the Mid West was receipt of i/v therapy.

Recommendation C2: At network level, develop a plan for building capability to provide i/v therapy services outside of the acute setting.

Conclusion C3: Patient length of stay is increased by current internal hospital processes, such as patient review and assessment.

Recommendation C3: Review internal processes to identify opportunities to identify actions to reduce patient delay and improve access to senior decision-makers.

APPENDIX D: Network 4 - Southern

D.1 Introduction

The survey was undertaken in the Southern Network on Thursday 11th January 2007. This network provides acute care via six hospitals as listed below. Of these Cork is a casemix group 1 hospital, Mercy, SIVU, Mallow and Kerry are casemix group 2 hospitals. Bantry is not included in the casemix programme.

- Mercy
- SIVU
- Mallow
- Cork
- Kerry
- Bantry

As detailed in the methodology, each hospital was allocated a survey sample size based on the number of beds supporting the specialities included in the exercise (medical and surgical). The following table lists for each hospital in this network, the applicable patient population on the day of the survey (Survey Population), the size of this population as a percentage of the full network population (% of Total Network Patients), the number of patients sampled from that population (Survey Sample), and the percentage of this sample with regards to the survey population (% of the Survey Population).

It shows that in the Southern Network, Bantry had the largest sample percentage, with 100% of its patients on the day of the survey being sampled, and Cork had the smallest sample percentage, with 28% of patients being selected as part of the survey sample.

Table D.1 Southern Hospital Sample

| Hospital | Survey Population | % of Total Network Patients | Survey Sample | % of the Survey Population |
|--------------|-------------------|-----------------------------|---------------|----------------------------|
| Bantry | 50 | 5% | 50 | 100% |
| Cork | 469 | 42% | 130 | 28% |
| Mallow | 84 | 7% | 51 | 61% |
| Mercy | 159 | 14% | 82 | 52% |
| SIVU | 168 | 15% | 75 | 45% |
| Kerry | 192 | 17% | 75 | 39% |
| Total | 1122 | 100% | 463 | 41% |

A consultation session was held on Wednesday 7th February to review the raw survey data with managerial, clinical and nursing stakeholders from the Southern Network. The objectives of this meeting were to:

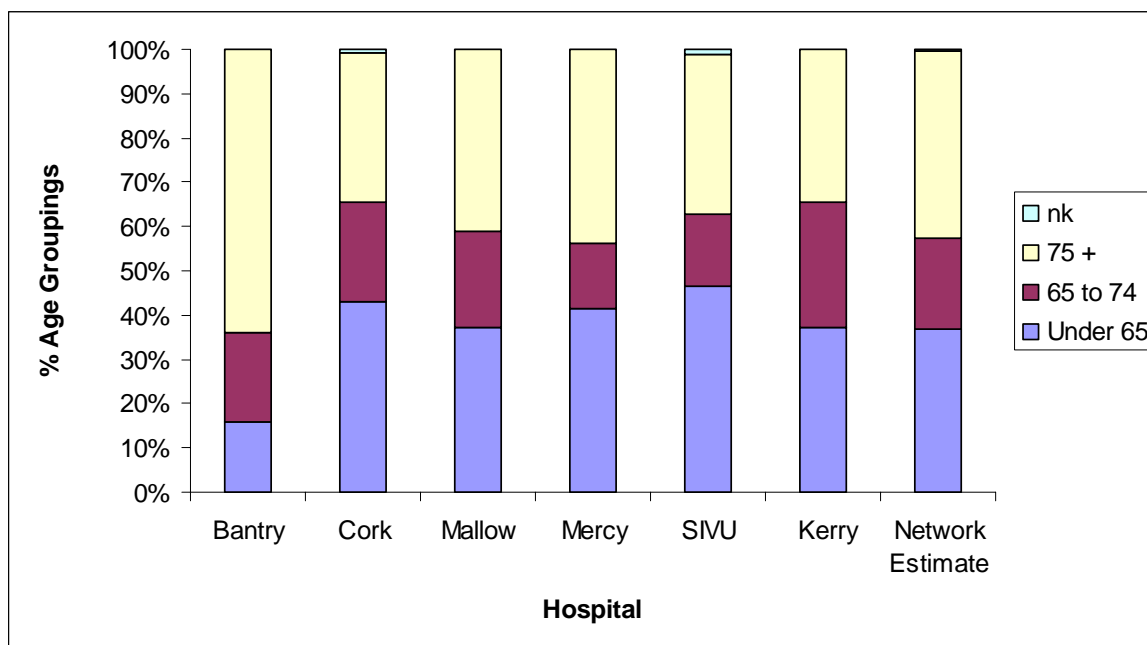
- Share the findings of the bed utilisation survey
- Understand the local factors influencing bed use
- Identify options for improving bed utilisation eg through process change and service reconfiguration.

The output of the session is incorporated into the analysis of the survey data in this section of the report.

D.2 Patient Profile

D.2.1 Patient Age

Figure D.1 Patient age profile by hospital and network estimate

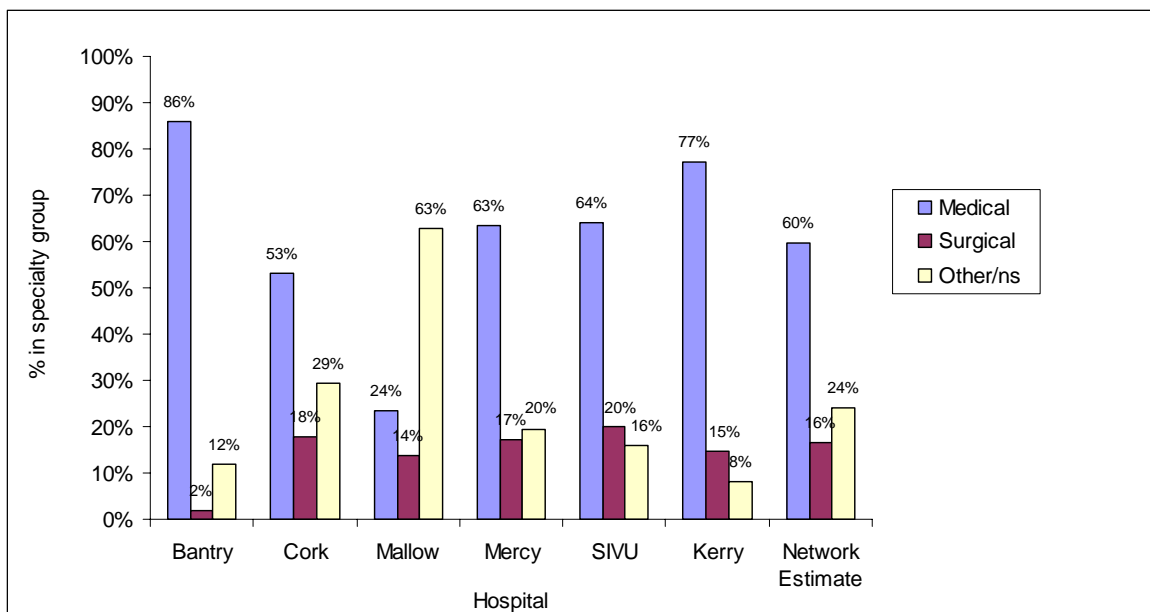


The age profile of surveyed patients varied across the Southern network. The average proportion of patients over 65 years of age was 59%. Bantry had the lowest percentage of patients aged under 65, at 16%. This was much higher at the other hospitals and was over 40% at Mercy (41%), CUH (43%) and SIVU (47%). Patient age was not recorded in the notes for 1% of patients surveyed.

Based on the data in the patient charts, 56% of patients surveyed in the Southern network had a GMS card.

D.2.2 Patient Speciality

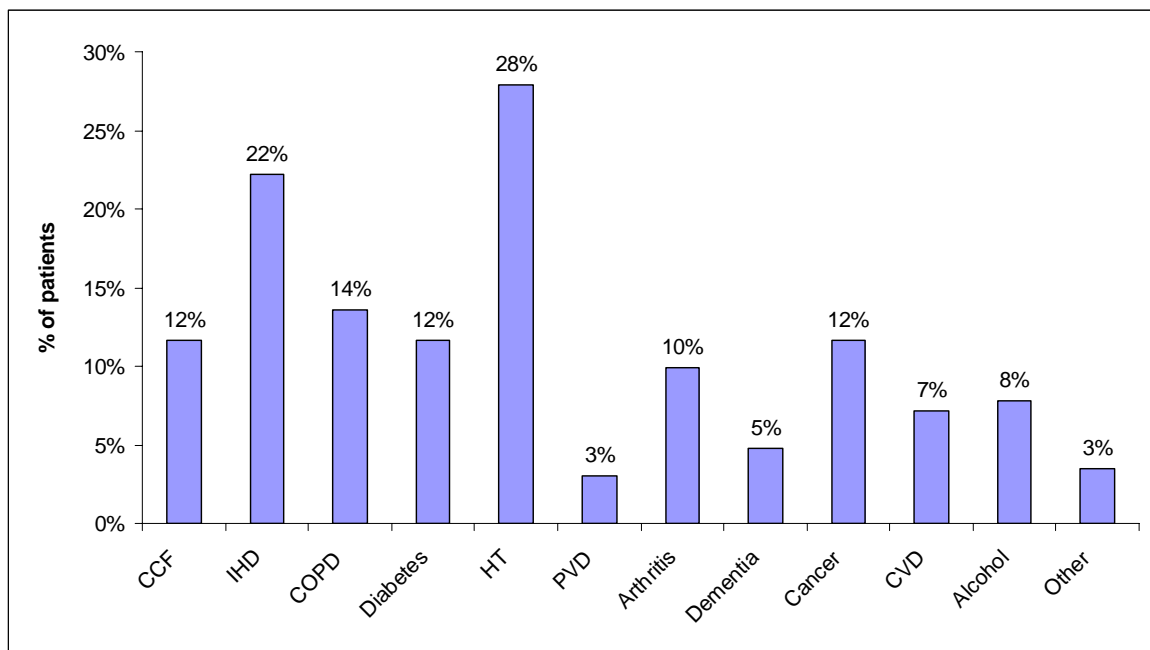
Figure D.2 Bed designation of patients on admission



Most of the patients surveyed in the Southern network were medical (60%). This split between specialties varied by hospital. These data show that the proportion of medical patients ranged from 24% in Mallow to 86% in Bantry. SIVU, Cork and Mercy had the highest proportions of surgical patients – at 20%, 18% and 17% of the admitted patients surveyed.

D.2.3 Patient Comorbidity (Type)

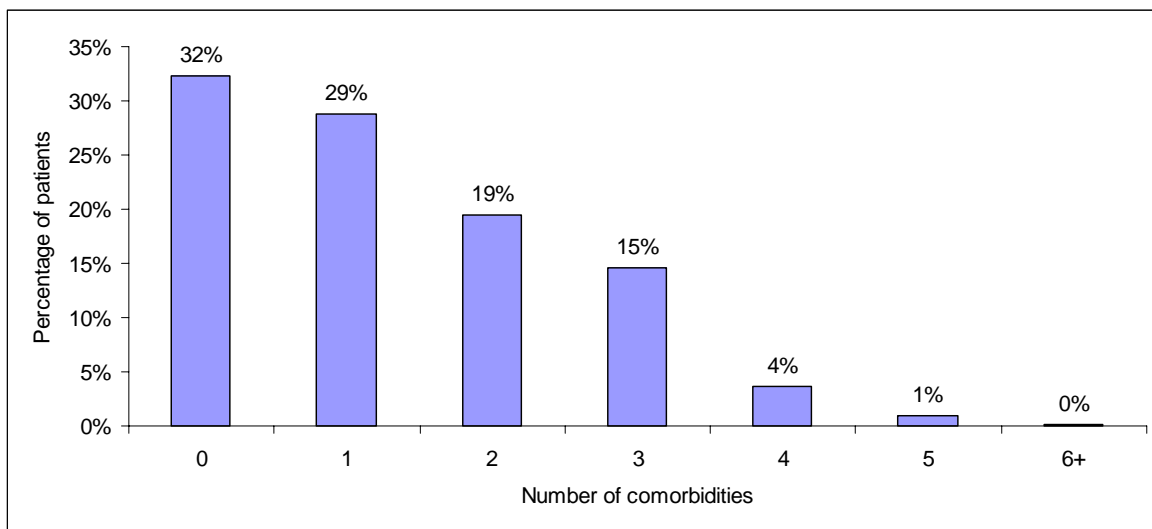
Figure D.3 Types and percentages of comorbidities presented by patients



This graph presents the range of comorbidities amongst the patients surveyed. The most prevalent comorbidity was Hypertension (HT) at 28%, followed by Ischaemic Heart Disease (IHD) at 22%. Several other comorbidities were prevalent in over 10% of patients, namely, Chronic Obstructive Pulmonary Disease (COPD) at 14%, Congestive Cardiac Failure (CCF), diabetes and cancer at 12% and arthritis at 10%.

D.2.4 Patient Comorbidity (Prevalance)

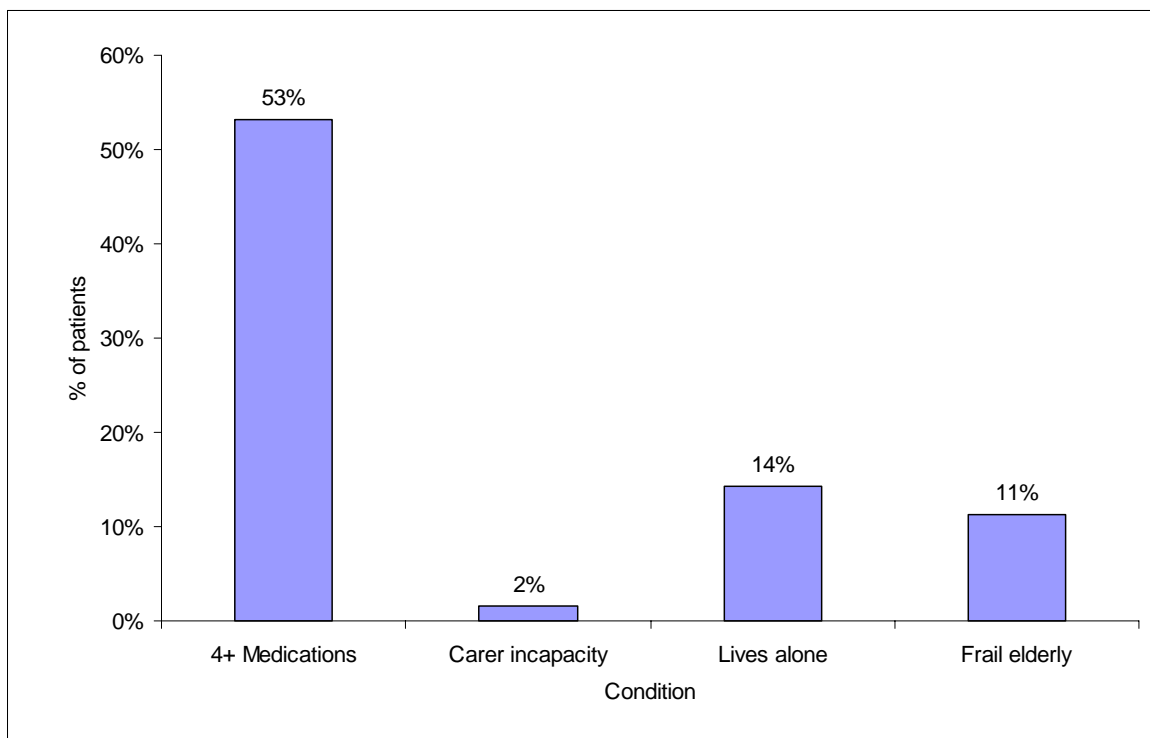
Figure D.4 Percentage of patients presenting comorbidities



Further analysis of the prevalence of comorbidities reveals that 68% of patients presented with at least one comorbidity and 39% of patients had at least two.

D.2.5 Other Patient Conditions

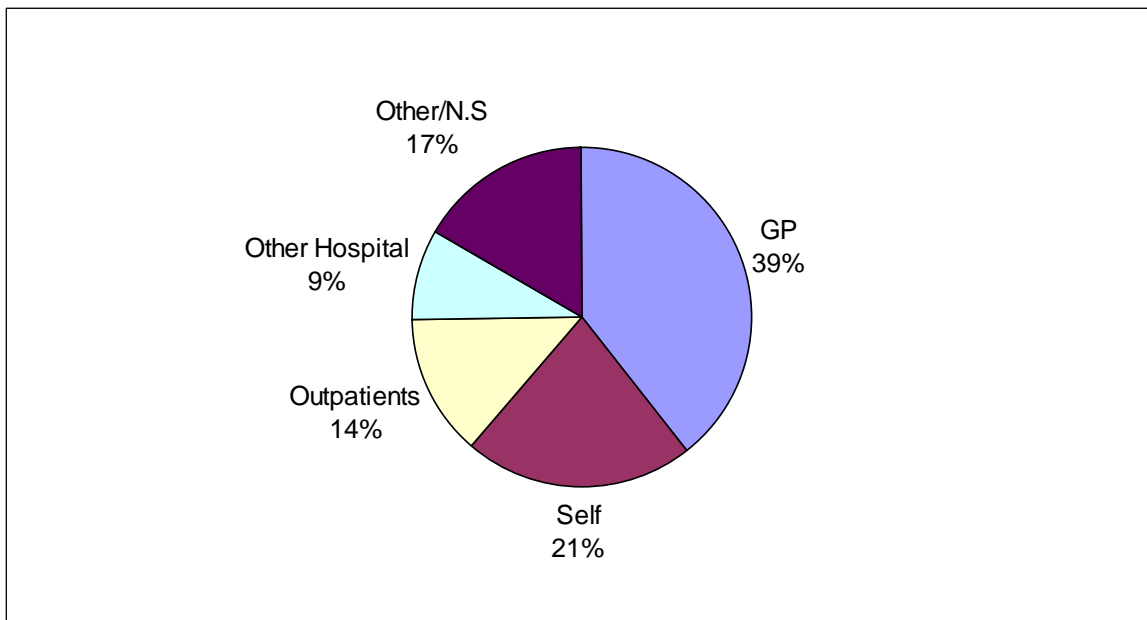
Figure D.5 Percentage of patients presenting with other conditions



Just more than half of patients surveyed (53%) were on multiple medication therapies at the time of admission. These data also show that 14% of patients were identified as living alone and a further 11% were considered frail elderly based on their charts. Carer incapacity was in evidence for 2% of surveyed patients.

D.2.6 Source of Referral

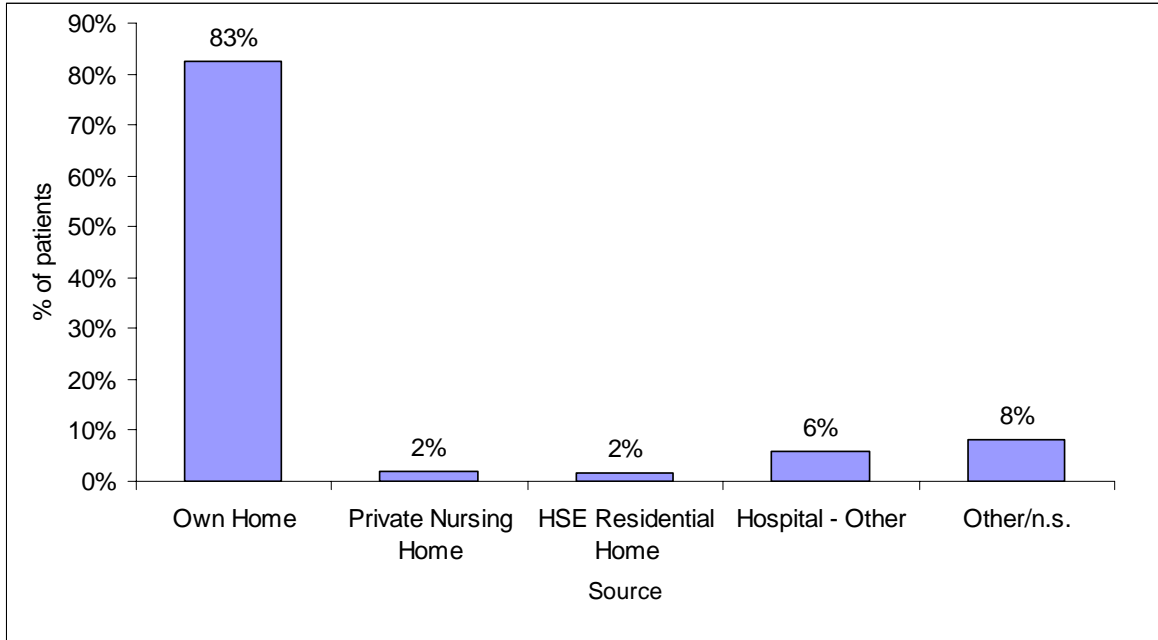
Figure D.6 Source of patient referral



This graph presents the sources of referral for the admitted patients surveyed. GP referral was the most common source at 39%. More than one fifth of patients (21%) self-referred to an acute hospital. A further 14% of patients were referred from Outpatients. The source of referral was not known/not recorded on the patient notes for 17% of patients.

D.2.7 Source of Admission

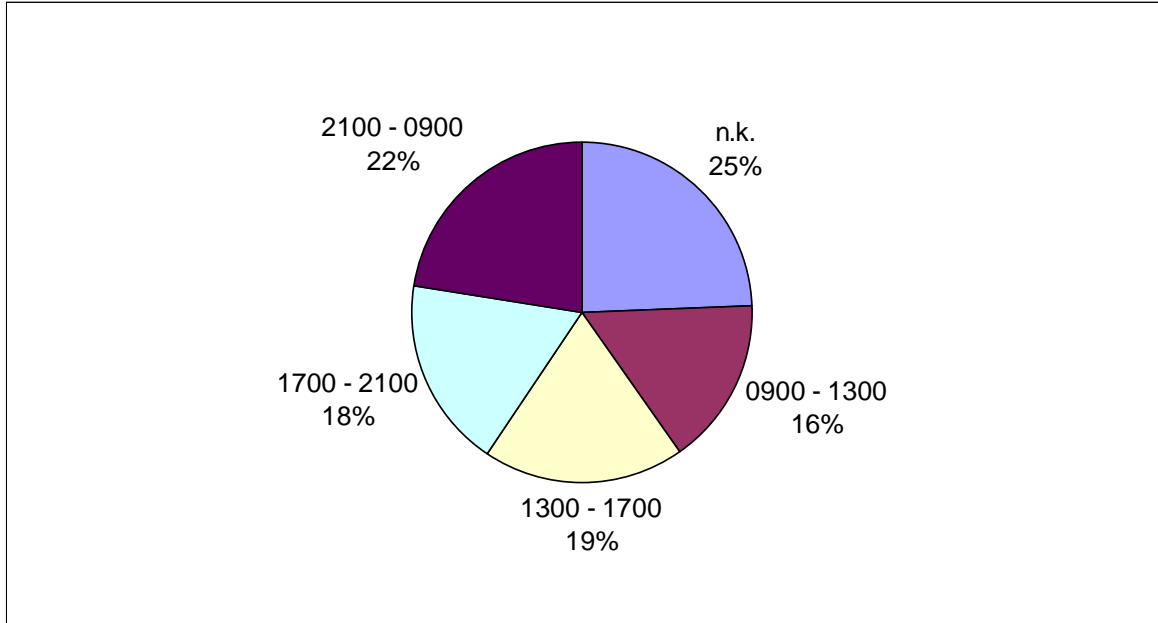
Figure D.7 Source of patient admission



The majority of patients surveyed in the Southern network were admitted from their own homes (83%). The remainder of the patients surveyed were admitted from other hospitals (6%), nursing homes (2%) and HSE residential homes (2%). The source of admission was not specified in the patient notes for 8% of patients.

D.2.8 Time of Arrival

Figure D.8 Time of patient arrival

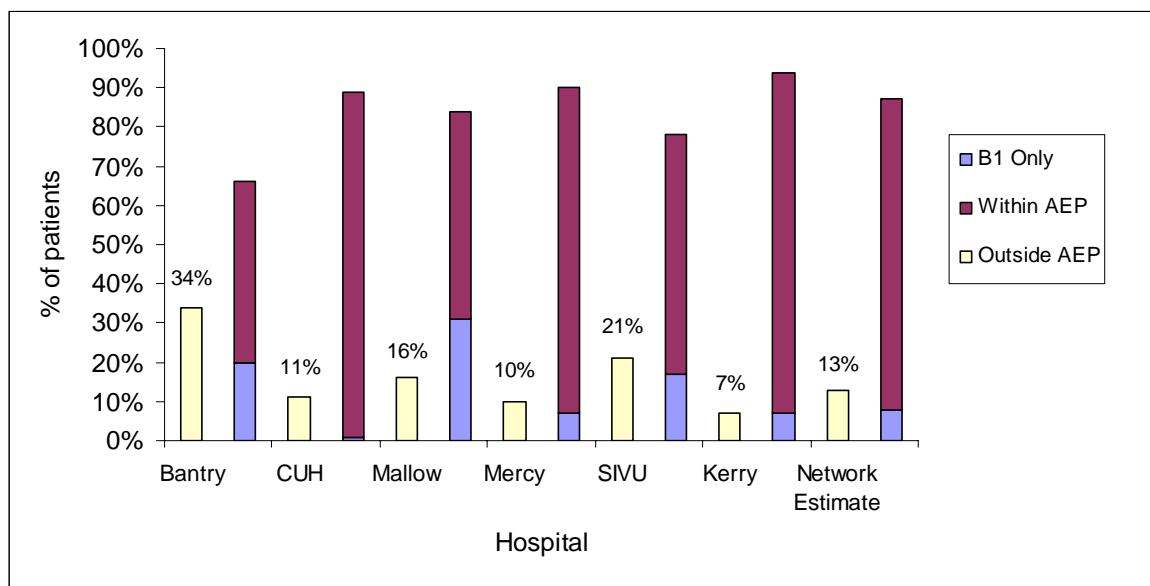


Analysis of the arrival times of admitted patients shows that in total 35% of admitted patients arrived in the afternoon and evening, between 1PM and 9PM. A further 22% of patients arrived at night, between 9PM and 9AM. Time of arrival was not available for 25% of admissions.

D.3 Day of Admission

D.3.1 AEP Results for Day of Admission

Figure D.9 Categorisation of patients with regards to the AEP on day of admission



The Southern network average proportion of patients admitted outside the AEP criteria was 13%. Admission could potentially have been avoided for these patients if alternatives to the acute setting were available. The survey results varied considerably between the different hospitals. The proportion of patients admitted outside of the AEP criteria was lowest in Kerry (7%), Mercy (10%) and Cork (11%). Levels of admission outside AEP were higher in Mallow (16%) and SIVU (21%). Bantry had the highest proportion of admission outside AEP at 34%.

On average across the network, i/v therapy was the only AEP criterion identified for 8% of admitted patients. Again, this varied between hospitals, with levels of just 1% in Cork, rising 20% in Bantry and 31% in Mallow.

a. *Statistical analysis of the influence of characteristics on AEP results for admission*

In order to attempt to better understand why patients are admitted outside AEP, it was decided as in the national report to undertake a statistical analysis of the various characteristics that could potentially have an influence on this for patients at a network level. Unlike the national analysis however, only a univariate analysis was undertaken. The following table summarises the result of this univariate analysis for the Southern network and shows that the most likely characteristics to lead to admission outside AEP are:

- Treatment speciality (patients with a bed designation other than medical or surgical are more likely to be admitted outside AEP)
- Source of referral (patients referred from outpatients are more likely to be admitted outside AEP).

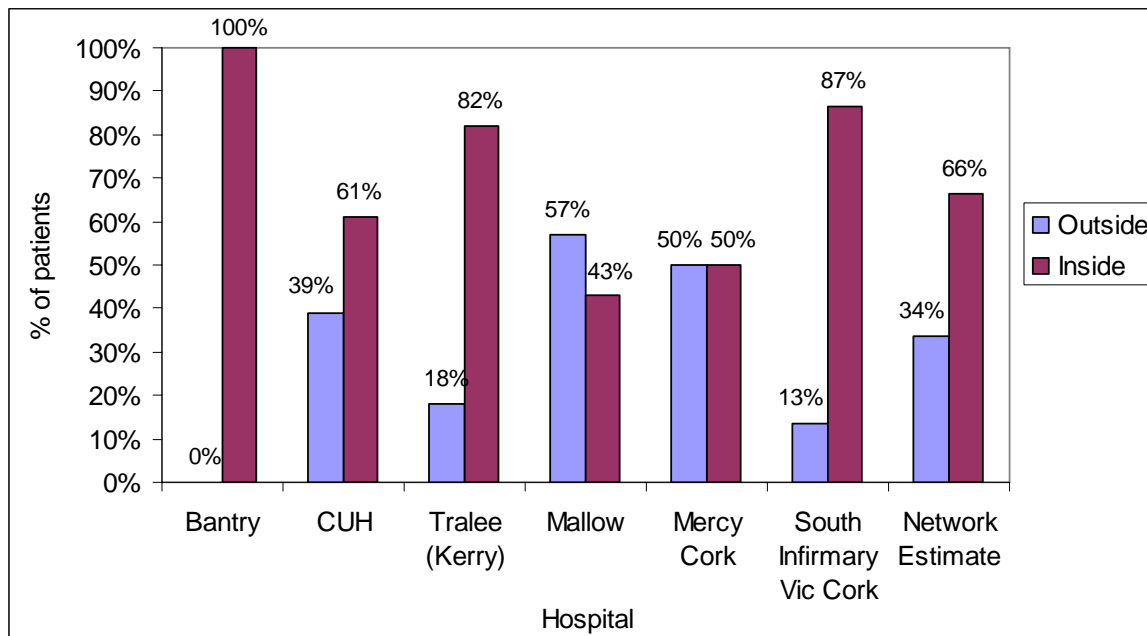
As with the national analysis however, It is recommended that whilst the analysis provides a set of useful indicators with regards to patient characteristics likely to be representative of admission and/or treatment outside AEP, they should not themselves form the basis around which explanations as to why patients are admitted outside AEP are sought. It should also be noted that all unknowns were excluded from this analysis.

Table D.2 Results of univariate analysis of the strongest relations between patient characteristics and lying outside AEP on admission

| Characteristic | χ^2 | df | P | Attribute | % Outside AEP | % Inside AEP |
|----------------------|----------|----|-------|-------------|---------------|--------------|
| Treatment Speciality | 17.570 | 2 | 0.000 | Medical | 26 | 42 |
| | | | | Surgical | 28 | 28 |
| | | | | Other | 46 | 30 |
| Source of Referral | 52.916 | 3 | 0.000 | GP | 45 | 52 |
| | | | | Outpatients | 40 | 19 |
| | | | | Self | 15 | 29 |

D.3.2 Elective Surgery Findings

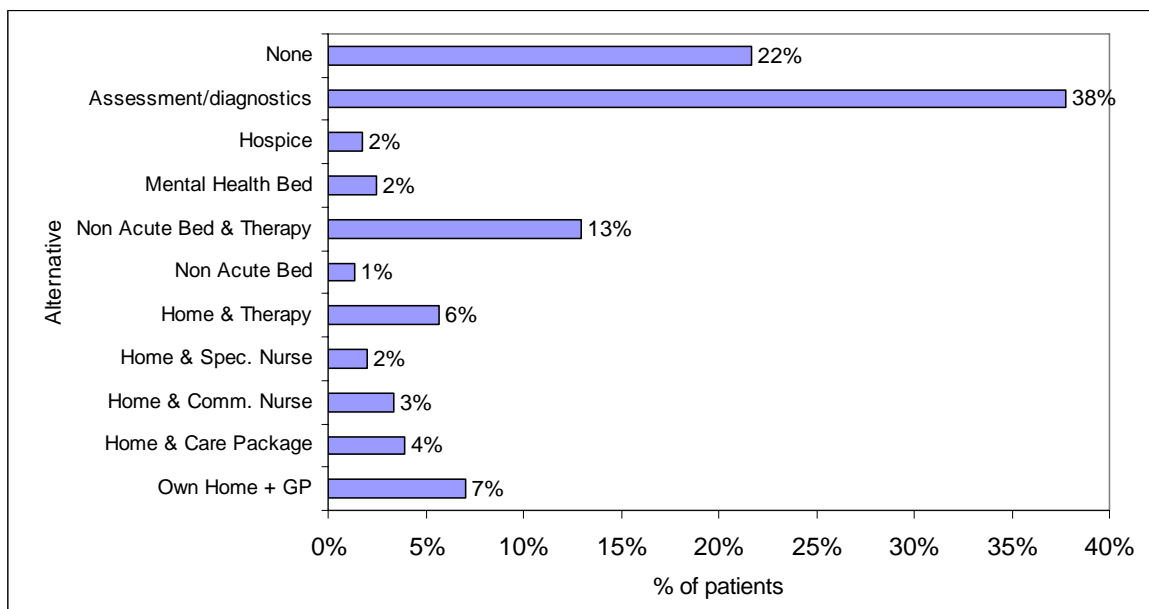
Figure D.10 Categorisation of patients with regards to elective surgery



Of the elective surgery patients surveyed, 80% did not meet the timeliness criteria and 36% did not meet the location criteria. This graph shows that 34% of patients did not meet both criteria.

D.3.3 Alternatives Identified to Admission

Figure D.11 Alternatives identified to admission for patients outside the AEP on day of admission

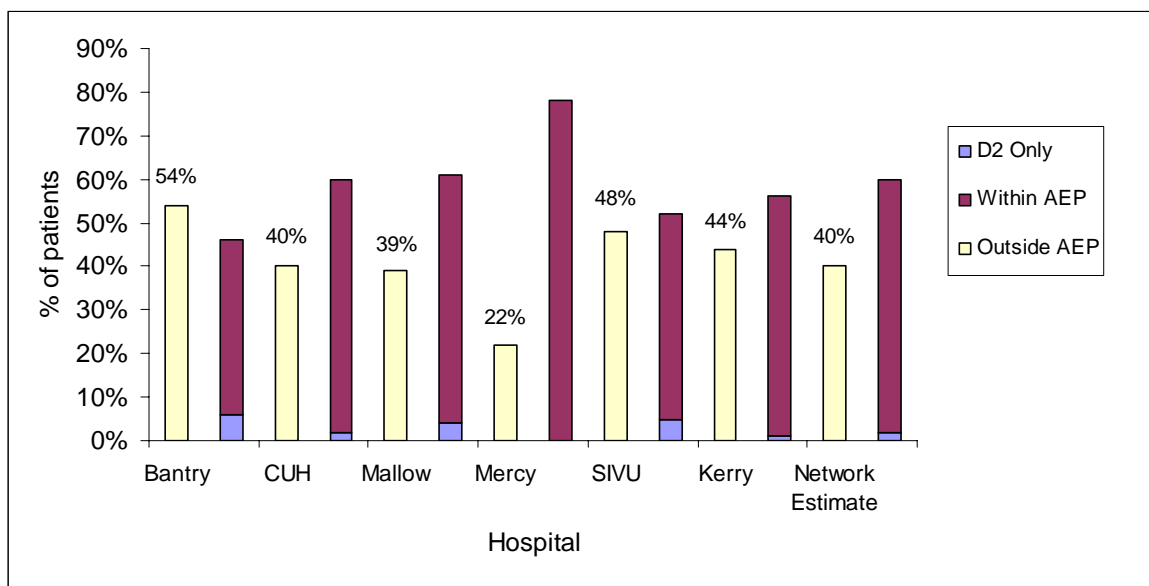


Reviewing the alternatives that could have averted admission for patients outside of the AEP criteria highlights access to assessment and diagnostics as the most common alternative - identified for 38% of patients. Non-acute bed and therapy was the second most common option, considered appropriate for 13% of patients outside the AEP. Own home with GP support was identified for a further 7% of patients.

D.4 Day of Care

D.4.1 AEP Results for Day of Care

Figure D.12 Categorisation of patients with regards to the AEP on day of care



On the day of the survey, some 40% of patients could have been cared for in an alternative setting, if appropriate alternatives were available. This graph illustrates the degree of variance between hospitals. The proportion of patients outside of the AEP criteria was lower at the Mercy (22%). Most of the hospitals in the Southern network were clustered around 40%. The results show that the highest proportions of patients outside of the AEP were at SIVU (48%) and Bantry (54%).

One tenth of the patients outside of the AEP were receiving physiotherapy or occupational therapy.

The survey data show that on average i/v therapy was only AEP criterion identified for 2% of patients. This ranged between 0% at the Mercy and 6% at Bantry.

a. *Statistical analysis of the influence of Patient characteristics on AEP results for day of care*

In order to attempt to better understand why patients are treated outside AEP, it was decided as in the national report to undertake a statistical analysis of the various characteristics that could potentially have an influence on this for patients at a network level. Unlike the national analysis however, only a univariate analysis was undertaken. The following table summarises the result of this univariate analysis for the Southern network and shows that the most likely characteristics to lead to a day of care outside AEP are:

- Source of referral (patients referred from their GP are more likely to be outside AEP on the day of care).

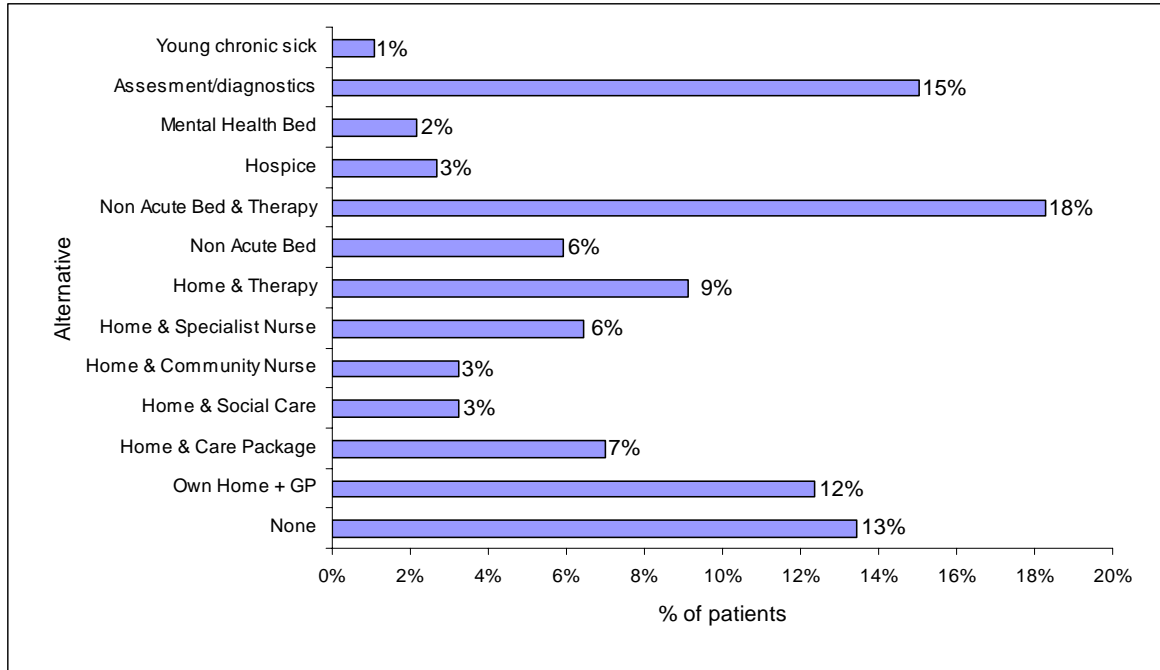
As with the national analysis however, it is again recommended that whilst the analysis provides a set of useful indicators with regards to patient characteristics likely to be representative of admission and/or treatment outside AEP, they should not themselves form the basis around which explanations as to why patients are treated outside AEP are sought. Again, all unknowns were excluded from this analysis.

Table D.3 Results of univariate analysis of the strongest relations between patient characteristics and lying outside AEP on day of care

| Characteristic | χ^2 | Df | P | Attribute | % Outside AEP | % Inside AEP |
|--------------------|----------|----|-------|----------------|---------------|--------------|
| Source of Referral | 24.954 | 3 | 0.000 | GP | 59 | 46 |
| | | | | Other Hospital | 1 | 0 |
| | | | | Outpatients | 17 | 24 |
| | | | | Self | 23 | 30 |

D.4.2 Alternatives Identified to Acute Care

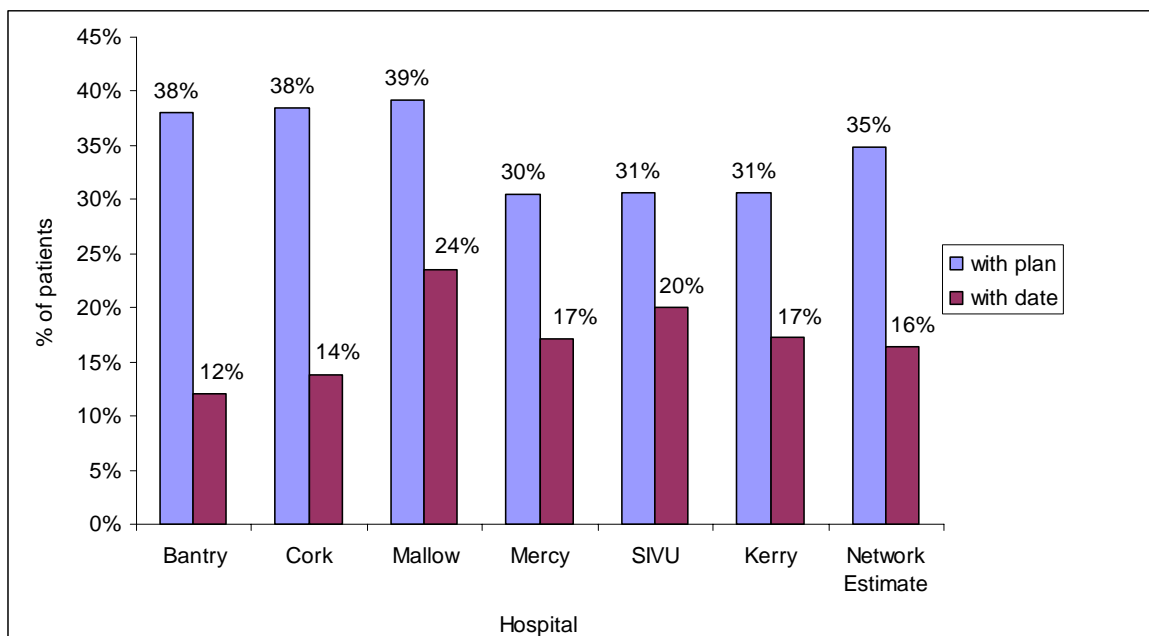
Figure D.13 Alternatives identified for patients outside the AEP on day of care



The most common alternative to acute care identified for patients outside of the AEP in the Southern networks was non-acute bed with therapy support, considered an appropriate option for 18% of patients. This was followed by access to assessment/diagnostics (15%) and own home with GP support (12%).

D.4.3 Discharge Planning

Figure D.14 Percentage of patients with evidence of discharge planning

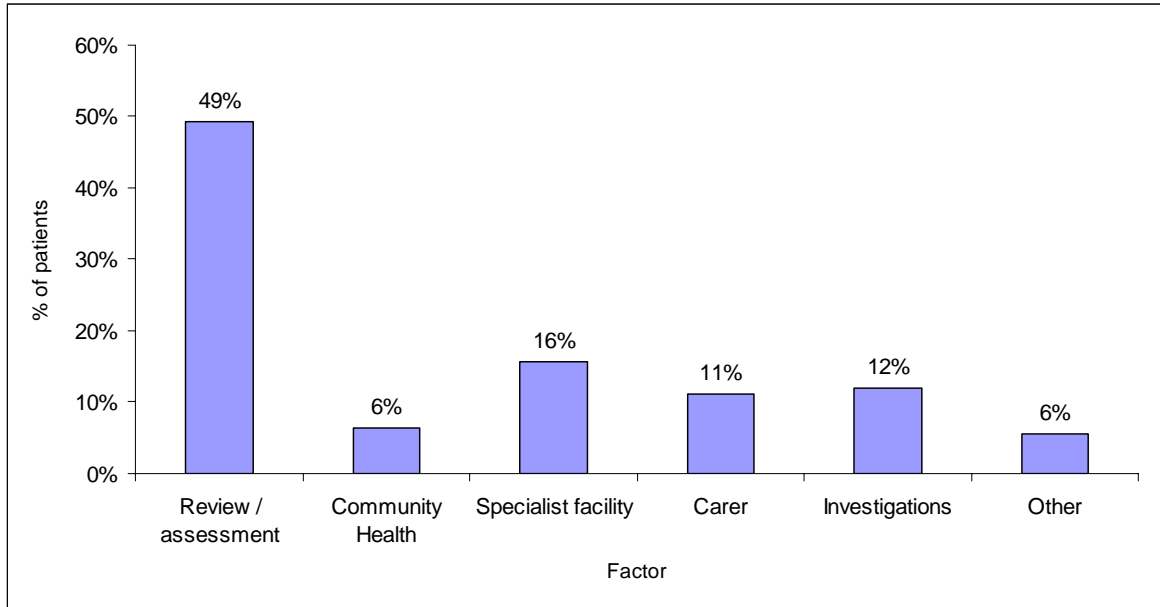


Analysis of the patient charts showed that some form of discharge planning was in evidence for 35% of patients. A formal discharge plan was not required to meet this criterion, rather any indication of consideration or planning of discharge arrangements. The occurrence of discharge planning varied hospitals and was below 40% at all providers. At the Mercy (30%), SIVU (31%) and Kerry (31%), approximately 30% of patients had a discharge plan. Discharge planning was more prevalent in Bantry (38%), Cork (38%) and Mallow (39%).

A small proportion of patients had a predicted date of discharge (16%). This ranged from 12% at Bantry to 20% at SIVU and 24% at Mallow.

D.4.4 Factors Affecting Discharge

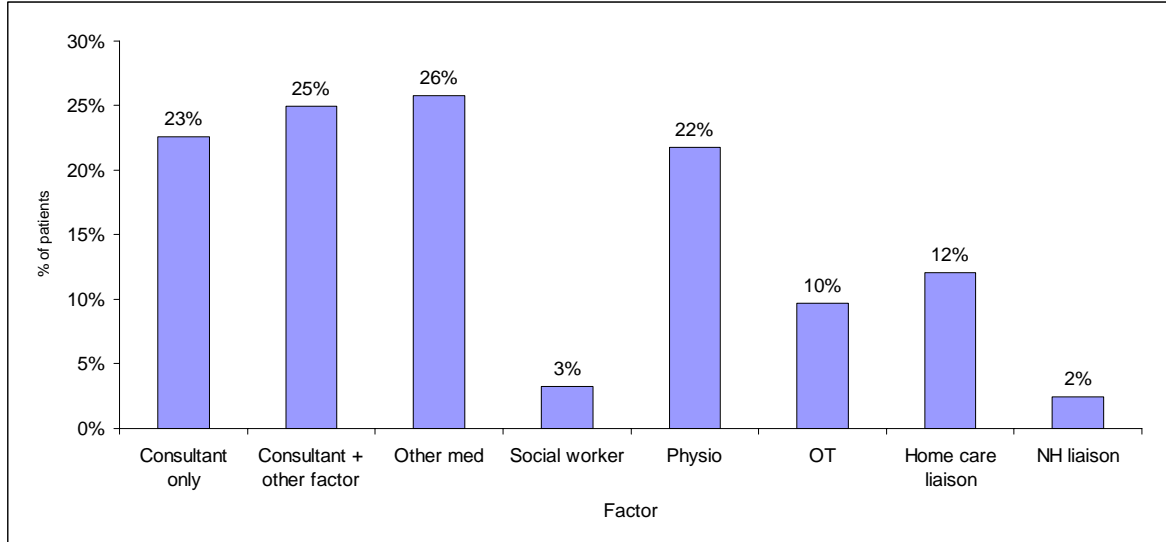
Figure D.15 Factors affecting discharge for patients outside the AEP



Analysis of the factors affecting discharge highlights patient review and assessment as the most prevalent factor, impacting 49% of patients. A further 16% of patients are awaiting access to a specialist facility.

a. Breakdown of the review/assessment factor

Figure D.16 Breakdown of the review/assessment element of discharge



Analysis of the factors affecting discharge shows that most patients awaiting review or assessment were waiting to see one or a number of clinical staff, and in 74% of the occurrences, the involvement of a medical member of staff was identified.

The data gathered refer to delays noted on the day of survey irrespective of whether the patient was declared medically fit for discharge or not, and any individual patient may have had more than one reason noted contributing to delay.

D.5 Assessment of Implications

D.5.1 AEP on Admission

The survey found that 13% of patients did not meet the AEP criteria on admission. This figure is similar to that found in surveys elsewhere and is the same as the national average for this study. This level varied between the Southern hospitals and at the network consultation session it was raised that the hospitals may have differing admission thresholds, based on the demand for admission and capacity pressures at each site. This study does not suggest that all of these patients might have had alternatives to acute admission, as a certain level of inappropriate admissions are considered necessary to reduce the risk of non-admission of appropriate patients.

Surveyors recorded 8% of patients across the network for whom i/v therapy was the only AEP admission criterion met. This was the lowest network level when compared to the national findings. These patients are in addition to the 13% who did not meet any AEP admission criteria. Professional opinion now suggests that many of these patients could receive such therapy outside an acute location.

Analysis of the timeliness of admission for elective surgery patients shows that 80% of patients did not meet the timeliness criteria, highlighting that the practice of admitting patients in advance of surgery to secure a bed continues in the Southern network.

D.5.2 AEP on Day of Care

The survey of patients against AEP criteria on the day of care show that 40% of patients could potentially have been cared for outside of the acute hospital setting if alternatives were available. Again, this result is similar to the national average result of 39%. The network stressed that this must be considered from a whole health community point of view: in some cases, it is better for the patient to remain in the acute hospital to receive non-acute care for a short period of time, rather than move to a non-acute setting and have an overall longer length of stay. As with the admission criteria it should not be interpreted as meaning that patients should *necessarily* be in other care settings - only that there exists some potential for this. A relatively small proportion these patients (10%) were receiving therapy support.

D.5.3 Alternatives to Acute Care

Access to assessment/diagnostics was the most common potential alternative identified to acute hospital admission, suggested for 38% of patients outside of the AEP. This was followed by non-acute bed and therapy (13%) and patient's own home with GP support (7%). The Southern network had the highest level of patients admitted from their own home (83%) in the national study and the survey results suggest that the alternatives to acute admission/care could be home-based.

These were the same 'top three' alternatives considered for patients outside of the AEP on the day of care, in a different priority order: non-acute bed with therapy support was identified for 19% of patients, followed by access to assessment and diagnostics (15%) and own home with GP support (13%).

At the network consultation session, the role of the community hospital in providing alternatives to acute care was highlighted. Rather than transferring patients from the

community to the acute, care such as i/v therapy provision and physiotherapy could be provided to patients in community hospitals. This is one example of the need to integrate community and acute providers in taking forward the findings of this study.

D.5.4 Planning and Delivery of Acute Care

The survey data suggest that there is scope for increasing discharge planning on a across hospitals in the Southern Network, as the network had one of the lowest levels of discharge planning in the study (35%) and the use of predicted discharge dates was also low (16%). At the consultation session, it was confirmed that although at times the discharge plan is not clear in the patient notes, the multi-disciplinary team involved are all aware of the patient next steps. The need to discharge plan 'pre-emptively', ie before or at the point of patient admission, was also discussed.

For almost half of patients (49%) awaiting review or assessment was a factor delaying their discharge. In 73% of these instances, the involvement of a member of medical staff was identified. The consultation session confirmed examples of good practice within the network regarding team-based working on the ward to facilitate review, ward rounds and investigations.

D.6 Conclusions and Recommendations

Conclusion D1: Difficulties accessing assessment and diagnostics are leading to avoidable admissions in the Southern network and increasing length of stay.

Recommendation D1: Improve access to diagnostics and assessment without admission to the acute hospital setting. This includes:

- Extended hours/seven day access to hospital based diagnostics
- Improved GP access to diagnostics.

Conclusion D2: Patients could be discharged sooner and some patients could avoid admission if the GP support required to enable patients to stay in their own homes was available.

Recommendation D2: Review processes for providing GP support to patients as an alternative to admission and in facilitation of timely discharge.

Conclusion D3: Patient length of stay is increased by current internal hospital processes, such as patient review and assessment.

Recommendation D3: Review internal processes to identify opportunities to identify actions to reduce patient delay.

Conclusion D4: Successful implementation of these recommendations will require joint working across the continuum of patient care between the acute setting and primary, community and continuing care.

Recommendation D4: Develop a network approach to joint working between PCCC and acute hospitals and strengthening the links between the community and acute hospitals.

APPENDIX E: Network 5 – West/North West

E.1 Introduction

The survey was undertaken in the West/North West network on Tuesday and Wednesday 16th and 17th January 2007. This network provides acute care via seven hospitals as listed below: Of these, UCHG is a casemix group 1 hospital, Letterkenny, Sligo, Portiuncula, Mayo and Merlin are casemix group 2 hospitals and Roscommon is not included in the casemix programme.

- Letterkenny
- Sligo
- Roscommon
- Portiuncula
- UCHG
- Mayo
- Merlin

As detailed in the methodology, each hospital was allocated a survey sample size based on the number of beds supporting the specialities included in the exercise (medical and surgical). The following table lists for each hospital in this network, the applicable patient population on the day of the survey (Survey Population), the size of this population as a percentage of the full network population (% of Total Network Patients), the number of patients sampled from that population (Survey Sample), and the percentage of this sample with regards to the survey population (% of the Survey Population).

It shows that in the West/North West network, Portiuncula had the largest sample percentage, with 64% of its patients on the day of the survey being sampled, and Letterkenny had the smallest sample percentage, with 35% of patients being selected as part of the survey sample.

Table E.1 West/North West Hospital Sample

| Hospital | Survey Population | % of Total Network Patients | Survey Sample | % of the Survey Population |
|--------------|-------------------|-----------------------------|---------------|----------------------------|
| Letterkenny | 213 | 15% | 74 | 35% |
| Mayo | 216 | 15% | 79 | 37% |
| Merlin | 124 | 9% | 73 | 59% |
| Portiuncula | 117 | 8% | 75 | 64% |
| Roscommon | 93 | 7% | 50 | 54% |
| Sligo | 224 | 16% | 75 | 33% |
| UCHG | 437 | 31% | 128 | 29% |
| Total | 1424 | 100% | 554 | 39% |

A consultation session was held on Tuesday 20th February to review the raw survey data with managerial, clinical and nursing stakeholders from the West/North West Network. The objectives of this meeting were to:

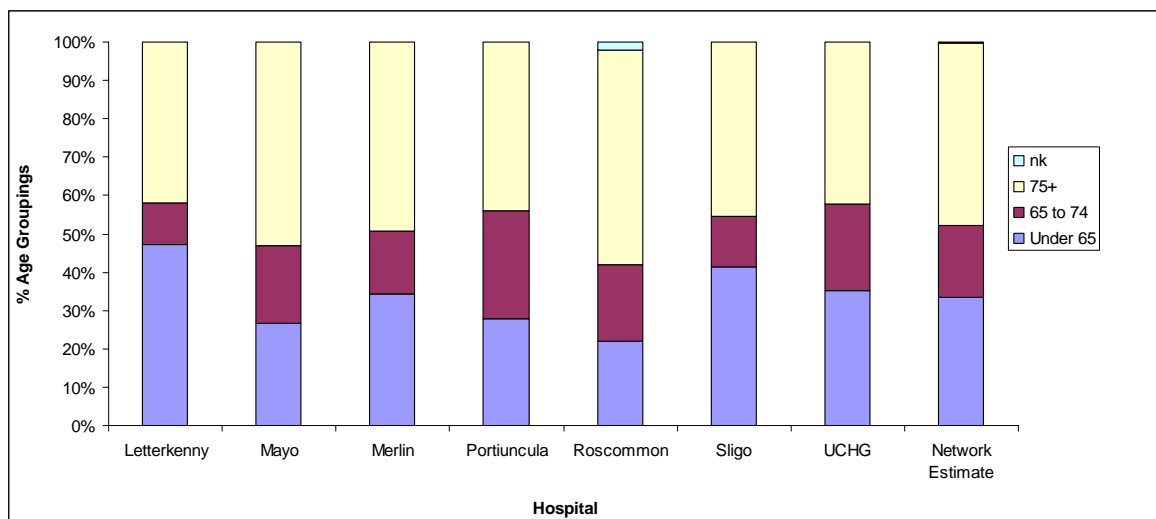
- Share the findings of the bed utilisation survey
- Understand the local factors influencing bed use
- Identify options for improving bed utilisation eg through process change and service reconfiguration.

The output of the session is incorporated into the analysis of the survey data in this section of the report.

E.2 Patient Profile

E.2.1 Patient Age

Figure E.1 Patient age profile by hospital and network estimate

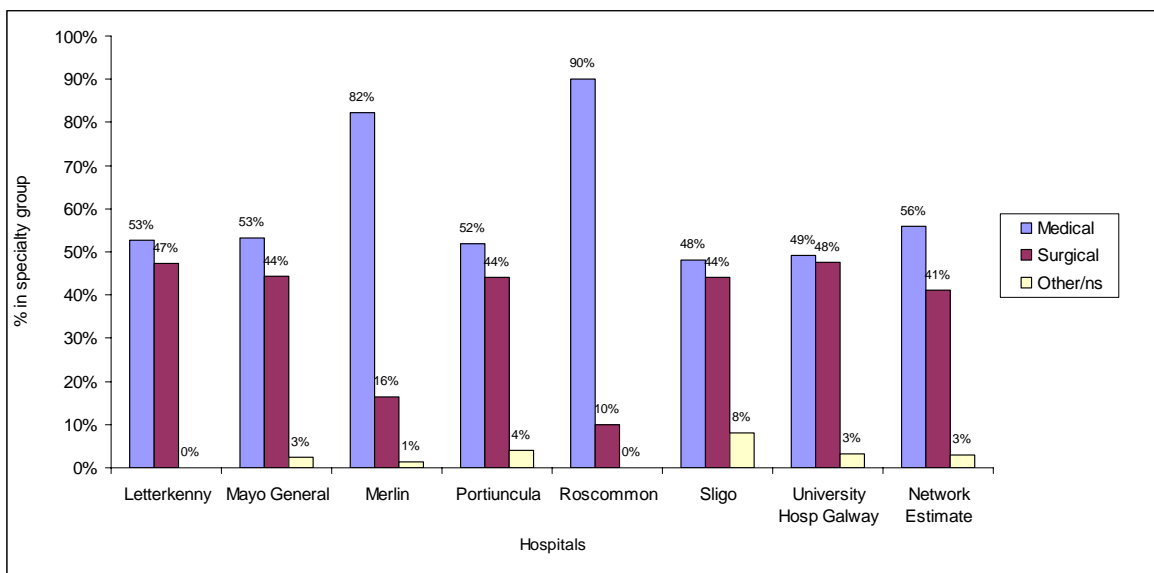


This graph illustrates the variation in patient age profile across the West/North West network. On average, 65% of the patients surveyed were aged 65 or older. The proportion of patients under 65 was lowest at Roscommon (22%), Mayo (27%) and Portiuncula (28%) and was higher at Sligo (41%) and Letterkenny (47%).

The survey data indicate that 67% of patients in the West/North West had a GMS card.

E.2.2 Patient Speciality

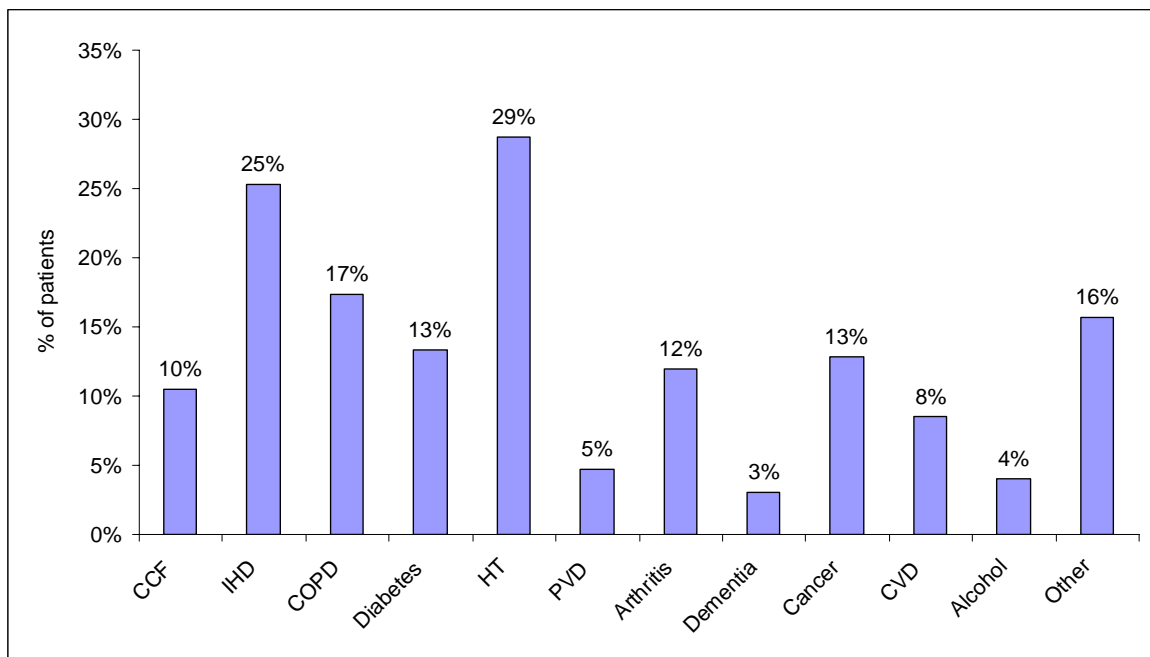
Figure E.2 Bed designation of patients on admission



Analysis of the West/North West patient survey reveals that more patients were medical (56%) than surgical (41%). At all hospital survey sites, the majority of patients surveyed were medical, however the balance of the split between specialties varied. Roscommon (90% medical; 10% surgical) and Merlin Park (82% medical; 16% surgical) had the highest proportions of medical patients and the lowest proportions of surgical patients. Galway had the lowest proportion of medical patients (49%) and the highest proportion of surgical patients (48%).

E.2.3 Patient Comorbidity (Type)

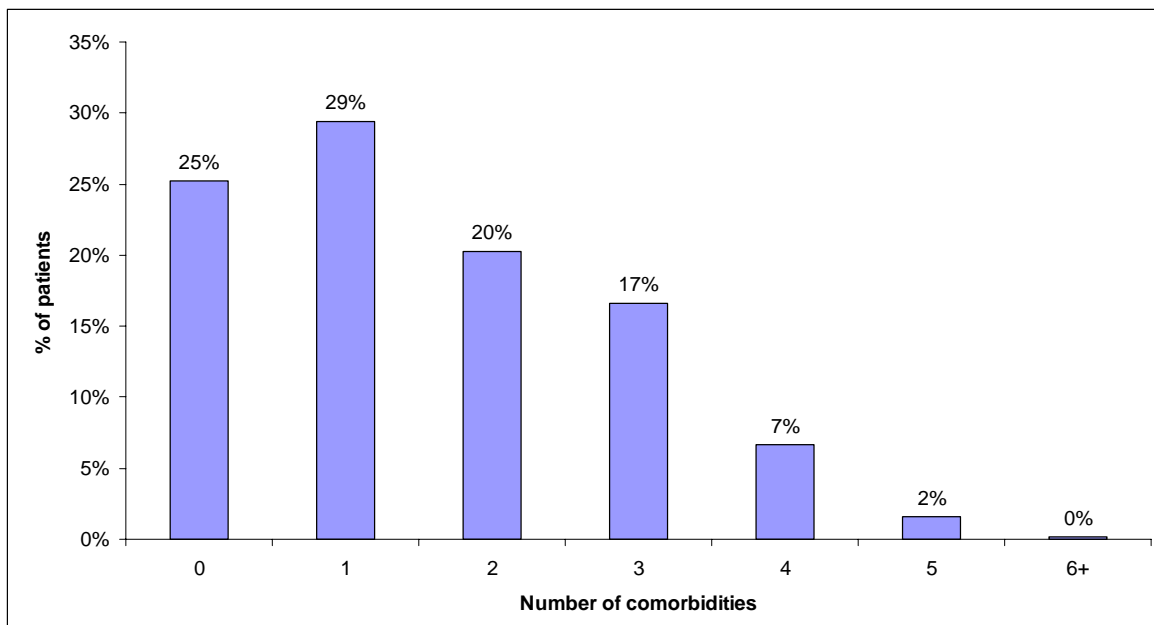
Figure E.3 Types and percentages of comorbidities presented by patients



A wide range of comorbidities were recorded amongst the patients surveyed in the West/North West. Hypertension (HT) was the most common comorbidity identified (29%) followed by Ischaemic Heart Disease (IHD) (25%). Chronic Obstructive Pulmonary Disease (COPD) was prevalent amongst 17% of patients surveyed. Diabetes (13%), cancer (13%) and arthritis (12%) were each in evidence in more than 10% of patients.

E.2.4 Patient Comorbidity (Prevalence)

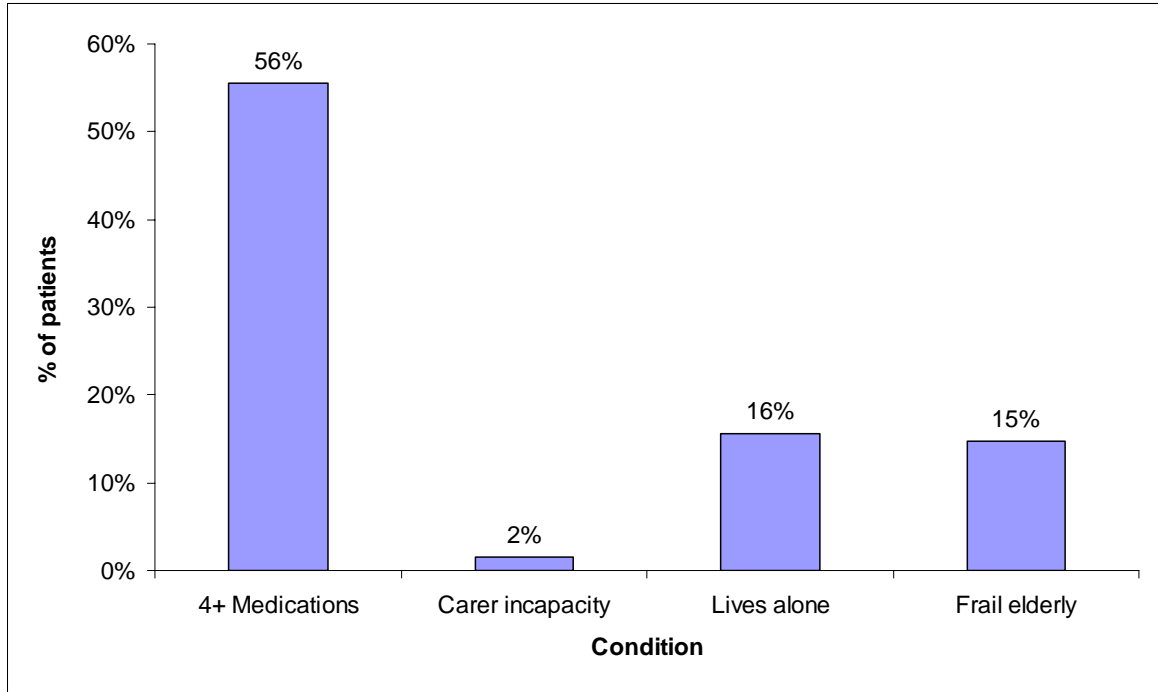
Figure E.4 Percentage of patients presenting comorbidities



Further analysis of the survey data underlines the prevalence of comorbidity amongst admitted patients in the West/North West - 75% of patients presented with at least one comorbidity and 46% of patients had at least two.

E.2.5 Other Patient Conditions

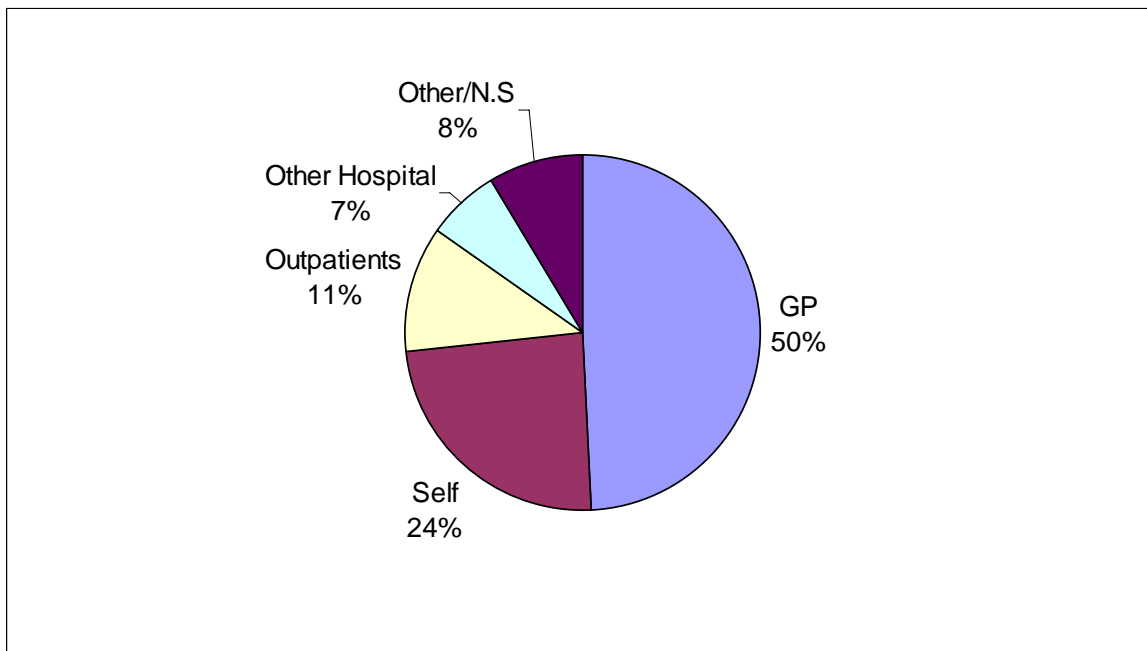
Figure E.5 Percentage of patients presenting with other conditions



Review of the patient notes shows that a high proportion of patients surveyed (56%) were on multiple medication therapies at the time of their admission. Other defined risk factors were in evidence, with 16% of patients identified as living alone and a further 15% considered frail elderly.

E.2.6 Source of Referral

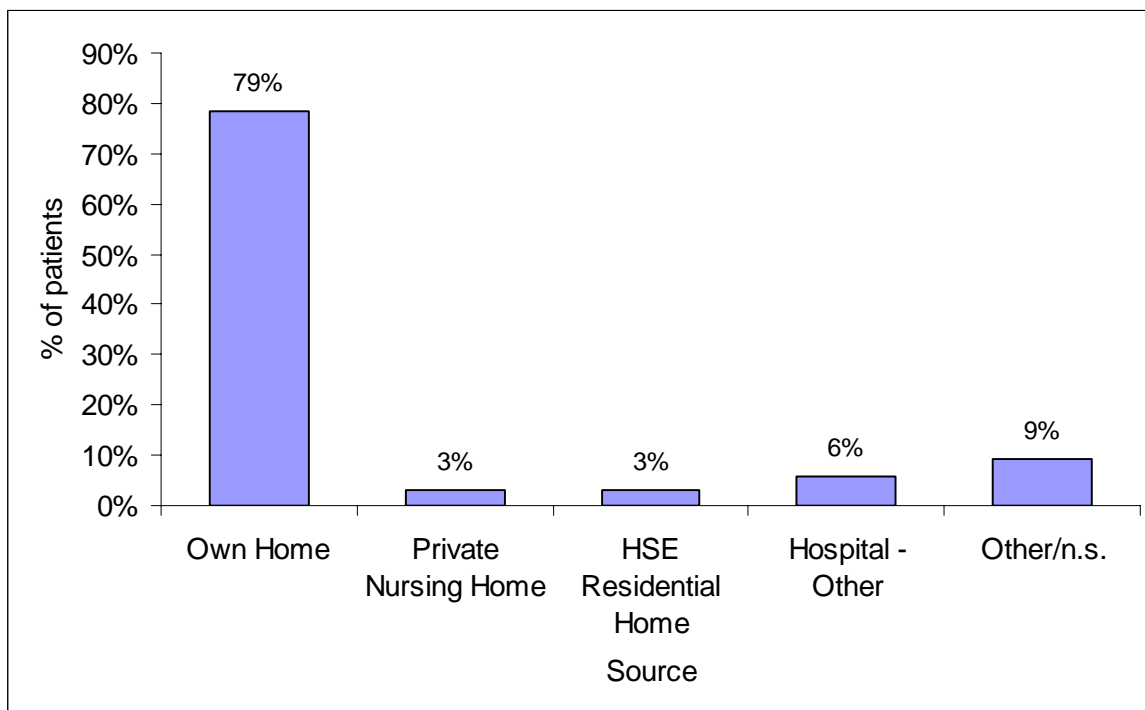
Figure E.6 Source of patient referral



The most common source of patient referral to acute hospital in the West/North West is GP referral (50%). Patient self-referral was the second most common source of referral, at 24%. A further 11% of admitted patients were referred via Outpatients. The source of referral was not known or not recorded on the patient notes for 8% of patients.

E.2.7 Source of Admission

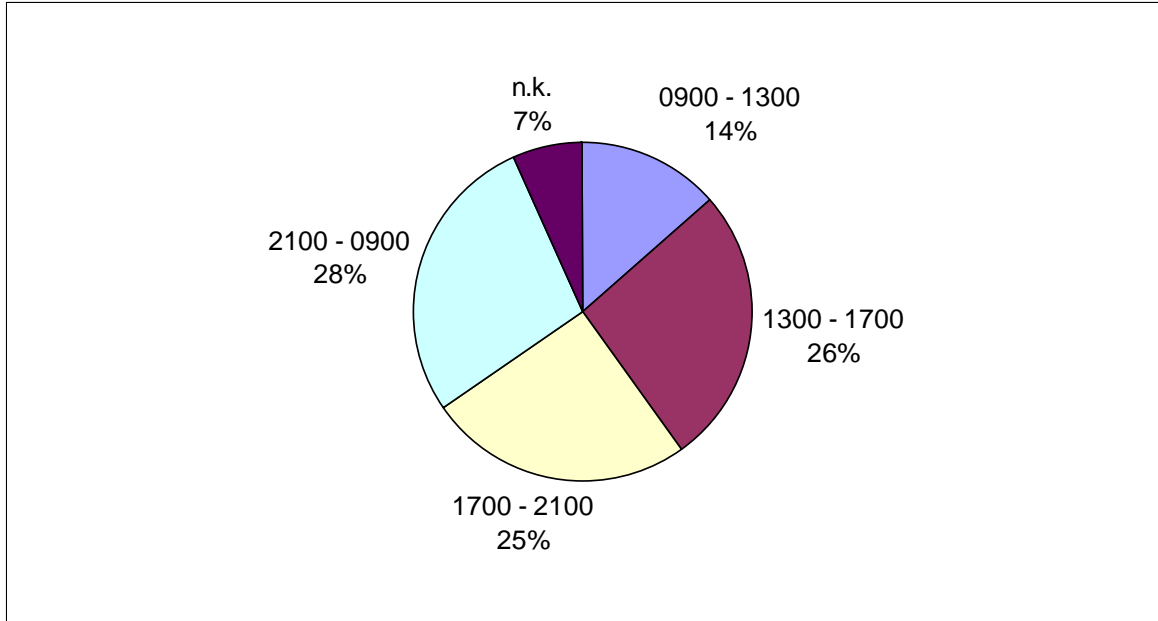
Figure E.7 Source of patient admission



Analysis of the source of patient admission shows that the majority of patients surveyed (79%), were admitted from their own homes. This analysis indicates a low level of intra-hospital transfers, with 6% of admissions arriving from other hospitals. The data show similar levels of demand from HSE residential homes and nursing homes, with each source accounting for 3% of admissions. The source of admission was not specified for 9% of patients.

E.2.8 Time of Arrival

Figure E.8 Time of patient arrival

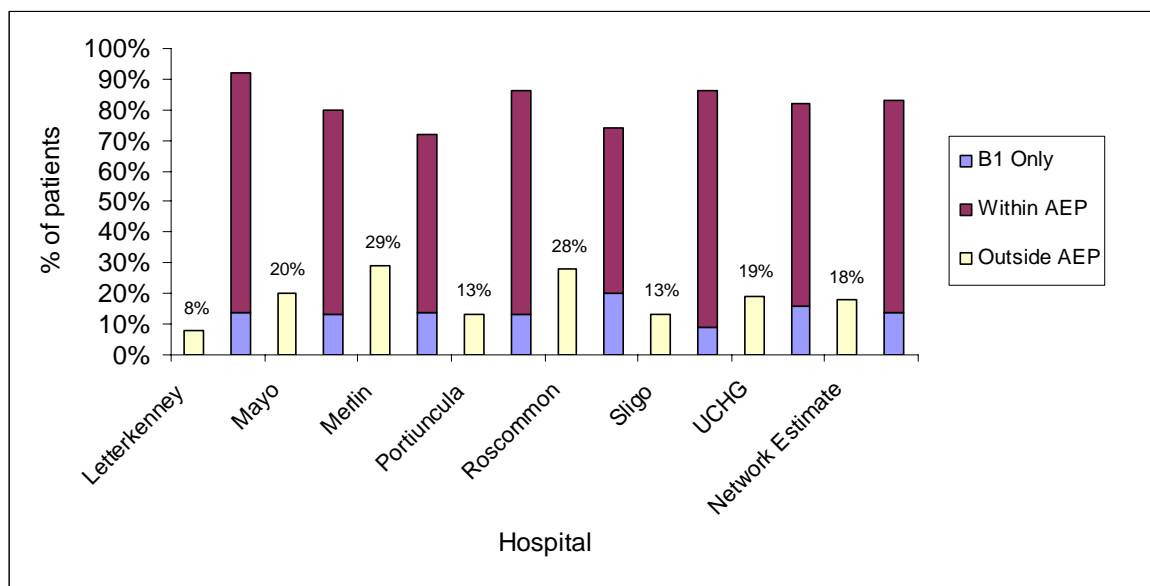


The time of arrival for admitted patients was available in most (93%) of the patient charts. Analysis of these data show that approximately half (51%) of all patients arrived in the afternoon and evening, between 1PM and 9PM. A high number of admissions arrived at night (between 9PM and 9AM), accounting for 28% of all admitted patients surveyed.

E.3 Day of Admission

E.3.1 AEP Findings

Figure E.9 Categorisation of patients with regards to the AEP on day of care



Across the network 18% of the patients admitted were outside the AEP Criteria, and in some instances could potentially have been treated outside an acute setting. This graph illustrates the variance in the survey results across hospital sites. Levels of admission outside the AEP were lower at Letterkenny (8%), Portluncula (13%) and Sligo (13%). At UCHG (19%) and Mayo (20%) approximately 20% of admitted patients did not meet any AEP criteria, and this rose to 28% at Roscommon. The highest proportion of patients admitted outside the AEP was at Merlin Park, which reflects the less acute nature of the majority of patients cared for at that site.

Across the network, receipt of i/v therapy was the only AEP criterion identified for 14% of admitted patients. This varied between in 9% at Sligo to 20% at Roscommon, and at the remaining hospitals was clustered between 13% and 16%.

a. *Statistical analysis of the influence of characteristics on AEP results for admission*

In order to attempt to better understand why patients are admitted outside AEP, it was decided as in the national report to undertake a statistical analysis of the various characteristics that could potentially have an influence on this for patients at a network level. Unlike the national analysis however, only a univariate analysis was undertaken. The following table summarises the result of this univariate analysis for the West/North West network and shows that the most likely characteristics to lead to admission outside AEP are:

- County of residence (patients from Mayo and Roscommon are more likely to be admitted outside AEP)
- Time of Admission (patients arriving between 09:00 and 17:00 are more likely to be admitted outside AEP).

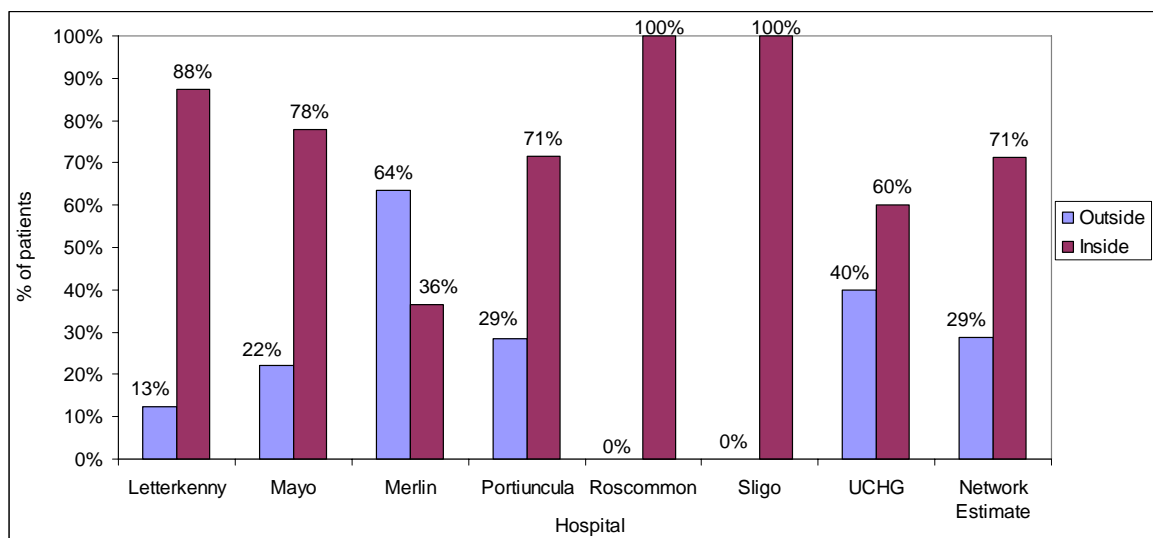
As with the national analysis however, it is recommended that whilst the analysis provides a set of useful indicators with regards to patient characteristics likely to be representative of admission and/or treatment outside AEP, they should not themselves form the basis around which explanations as to why patients are admitted outside AEP are sought. It should also be noted that all unknowns were excluded from this analysis.

Table E.2 Results of univariate analysis of the strongest relations between patient characteristics and lying outside AEP on admission

| Characteristic | χ^2 | df | P | Attribute | % Outside AEP | % Inside AEP |
|---------------------|----------|----|-------|---------------|---------------|--------------|
| County of Residence | 65.838 | 14 | 0.000 | Clare | 4 | 2 |
| | | | | Donegal | 8 | 17 |
| | | | | Galway | 29 | 32 |
| | | | | Mayo | 24 | 18 |
| | | | | Roscommon | 18 | 10 |
| | | | | Sligo | 6 | 11 |
| Time of Admission | 19.672 | 3 | 0.000 | 09:00 – 13:00 | 21 | 14 |
| | | | | 13:00 – 17:00 | 34 | 25 |
| | | | | 17:00 – 21:00 | 22 | 30 |
| | | | | 21:00 – 09:00 | 23 | 31 |

E.3.2 Elective Surgery Findings

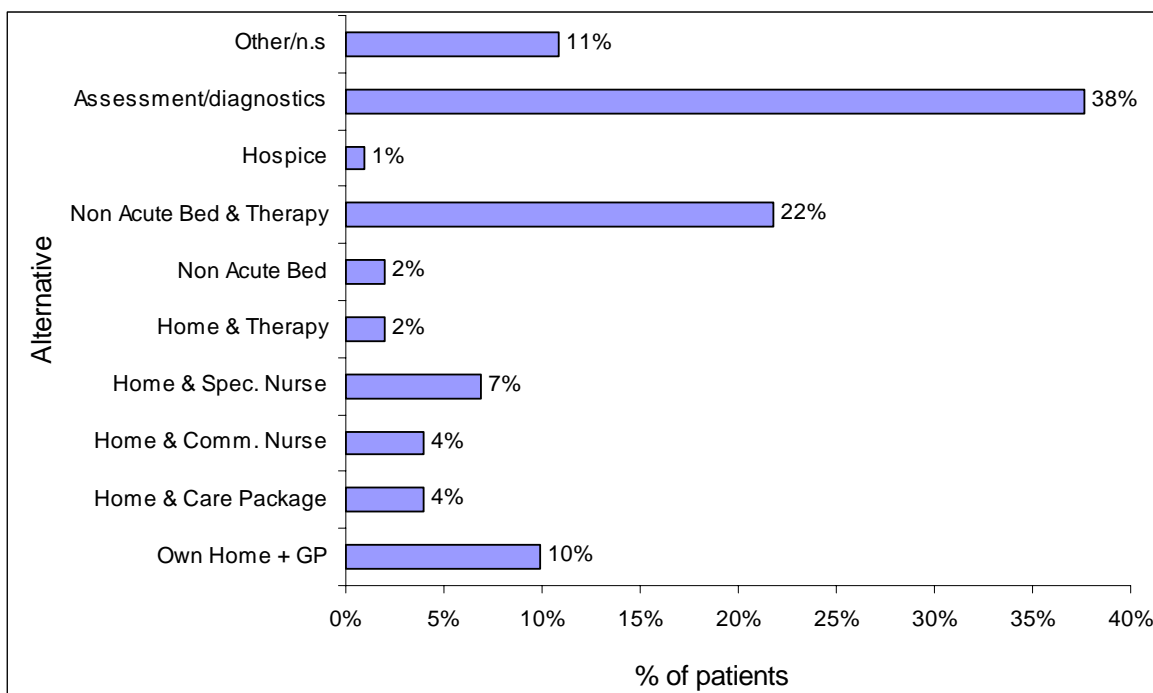
Figure E.10 Categorisation of patients with regards to elective surgery



Of the elective surgery patients surveyed, 79% did not meet the timeliness criteria and 37% did not meet the location criteria. This graph shows that 29% of patients did not meet both criteria.

E.3.3 Alternatives Identified to Admission

Figure E.11 Alternatives identified to admission for patients outside the AEP on day of care

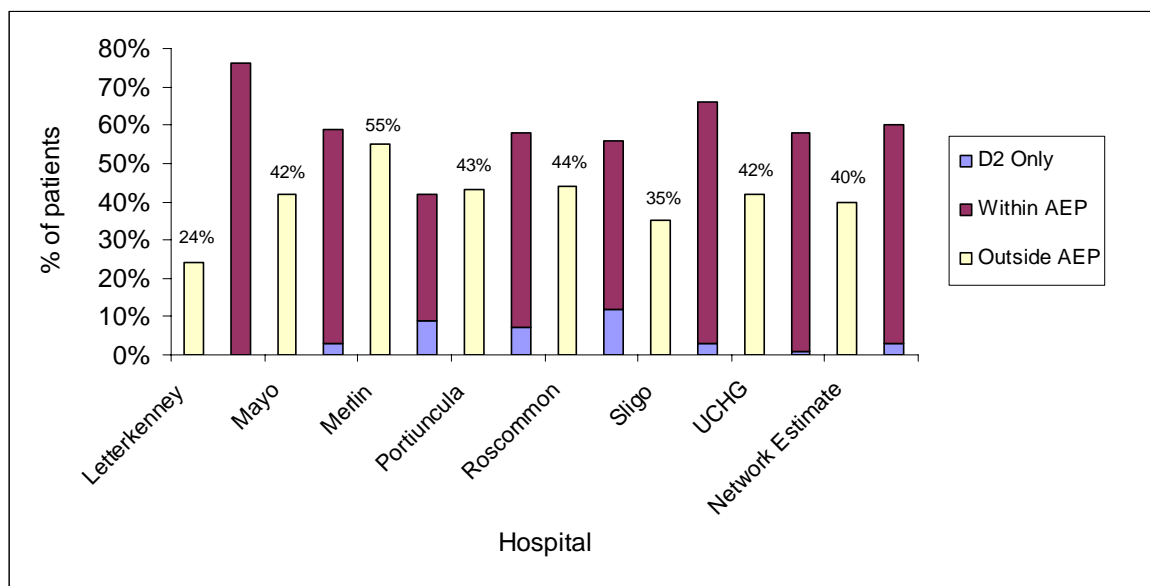


Surveyors identified alternatives to acute admission for the patients who did not meet any AEP criteria. For 38% of these patients, access to hospital assessment and diagnostics was an appropriate alternative. Access to a non-acute bed with therapy support was the second most common alternative, suitable for 22% of patients. Own home with GP support was considered appropriate for a further 10% of patients.

E.4 Day of Care

E.4.1 AEP Results for Day of Care

Figure E.12 Categorisation of patients with regards to the AEP on day of care



This graph shows that 40% of patients surveyed in the West/North West network could have been treated in an alternative setting on the day of care, if appropriate alternatives were available. Results at four of the hospitals were very similar with UCHG (42%), Mayo (42%), Portiuncula (43%) and Roscommon (44%) clustered between 40% and 45%. Merlin Park had the highest proportion of patients outside of the AEP criteria (55%) and again this result reflects the different mix of patients cared for at that site. Sligo (35%) and Letterkenny (24%) had the lowest levels of patients outside of the AEP.

A small proportion (9%) of these patients identified as outside the AEP criteria were receiving physiotherapy or occupational therapy support.

I/v therapy was the only AEP criterion identified for 3% of patients on average in the West/North West network, however three hospitals were significantly above this average: Portiuncula (7%), Merlin (10%) and Roscommon (12%).

a. *Statistical analysis of the influence of patient characteristics on aep results for day of care*

In order to attempt to better understand why patients are treated outside AEP, it was decided as in the national report to undertake a statistical analysis of the various characteristics that could potentially have an influence on this for patients at a network level. Unlike the national analysis however, only a univariate analysis was undertaken. The following table summarises the result of this univariate analysis for the West/North West network and shows that the most likely characteristics to lead to a day of care outside AEP are:

- County of Residence (patients from Galway, Leitrim and Roscommon are more likely to be outside AEP on the day of care).

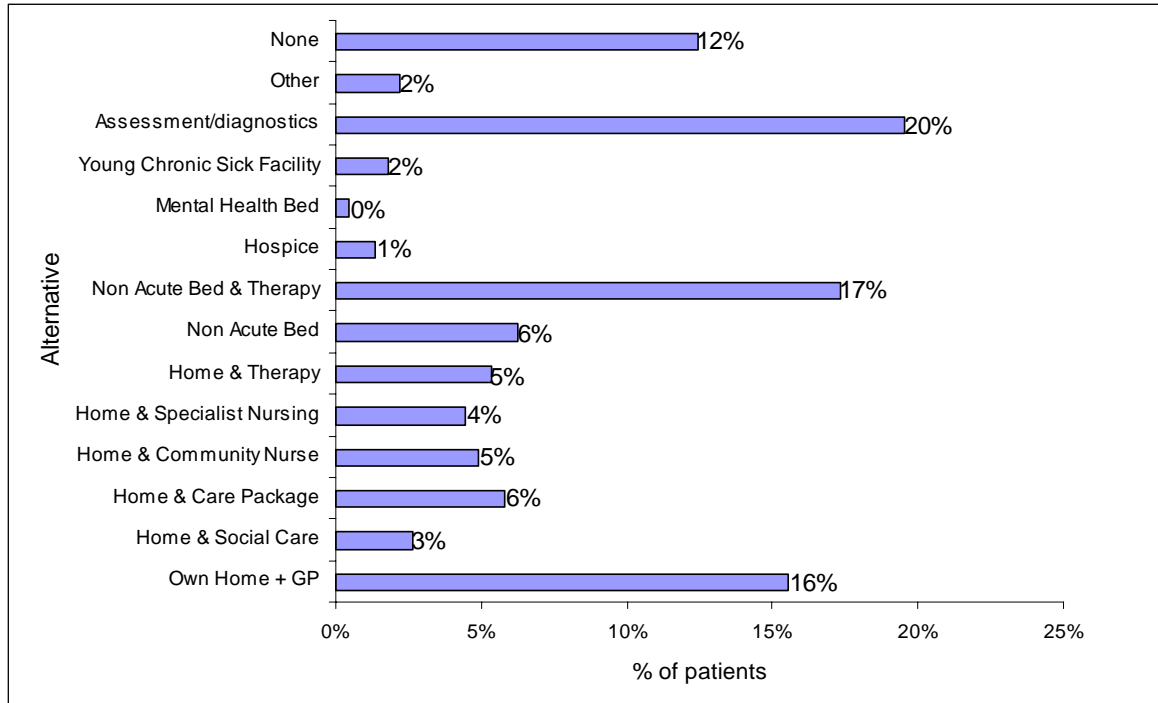
As with the national analysis however, it is again recommended that whilst the analysis provides a set of useful indicators with regards to patient characteristics likely to be representative of admission and/or treatment outside AEP, they should not themselves form the basis around which explanations as to why patients are treated outside AEP are sought. Again, all unknowns were excluded from this analysis.

Table E.3 Results of univariate analysis of the strongest relations between patient characteristics and lying outside AEP on day of care

| Characteristic | χ^2 | df | P | Attribute | % Outside AEP | % Inside AEP |
|---------------------|----------|----|-------|-----------|---------------|--------------|
| County of Residence | 55.537 | 14 | 0.000 | Donegal | 10 | 19 |
| | | | | Galway | 35 | 30 |
| | | | | Leitrim | 6 | 2 |
| | | | | Roscommon | 13 | 10 |
| | | | | Sligo | 8 | 12 |

E.4.2 Alternatives Identified to Acute Care

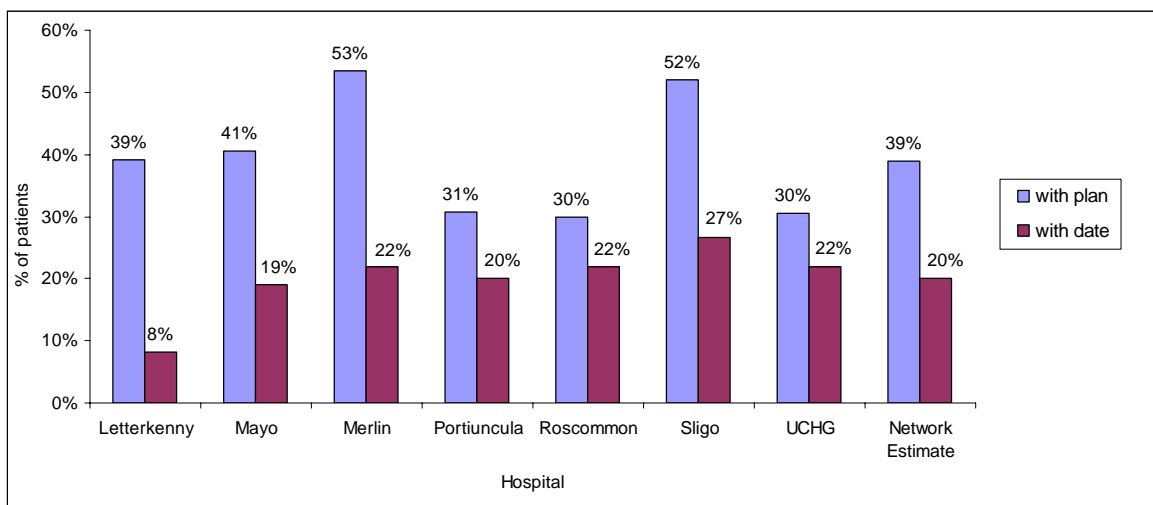
Figure E.13 Alternatives identified for patients outside the AEP on day of care



Analysis of the potential alternatives identified for patients outside of the AEP in the West/North West highlights three options. Access to assessment and diagnostics was the most common, considered an appropriate option for 20% of patients. This was followed by non-acute bed with therapy support (17%) and own home with GP support (16%).

E.4.3 Discharge Planning

Figure E.14 Percentage of patients with evidence of discharge planning

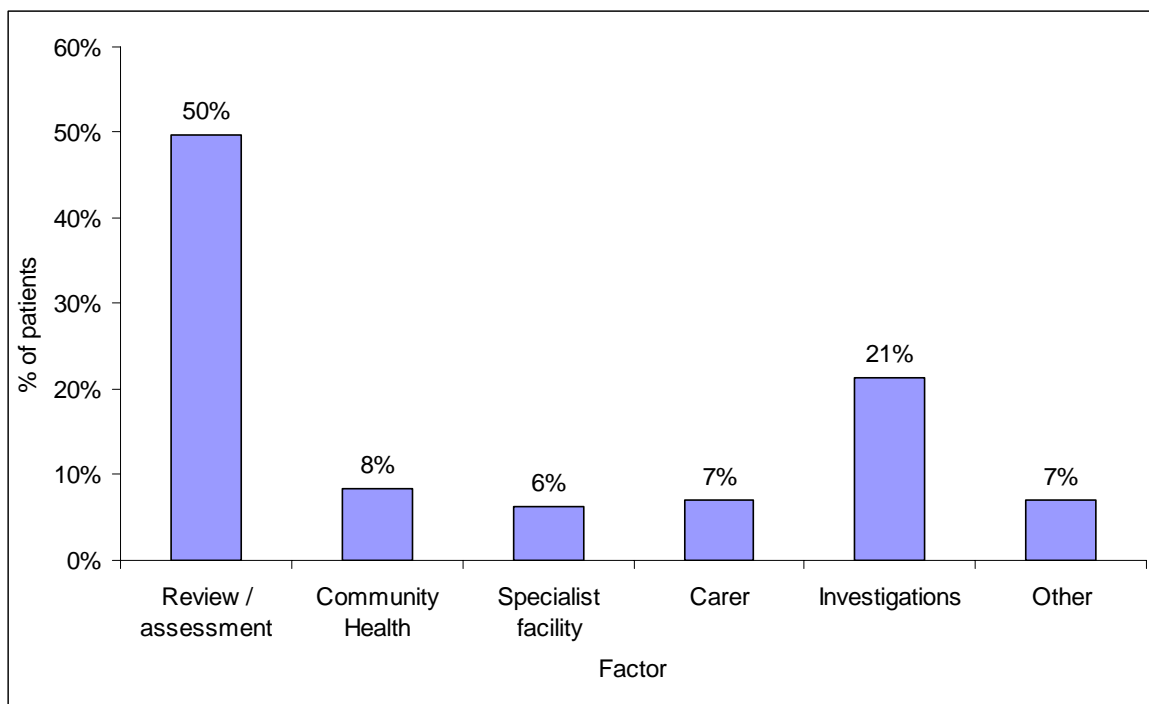


Discharge planning was in evidence for 39% of patients on average in the West/North West. For the purposes of the survey, a formal discharge plan was not required to meet this criterion, rather any evidence that discussions or consideration of discharge arrangements had taken place. This graph shows the varying levels of discharge planning across the hospitals. The occurrence of planning varied between a high of over a half of patients at Merlin (53%) and Sligo (52%) to 30% at UCHG and Roscommon.

A small proportion of patients had predicted dates of discharge (20%). Again, analysis of the data shows the differing hospital practice. Use of predicated dates of discharge varied between 8% at Letterkenny and 27% at Sligo. At the remaining hospitals, approximately 20% of patients of patients had predicted dates of discharge.

E.4.4 Factors Affecting Discharge

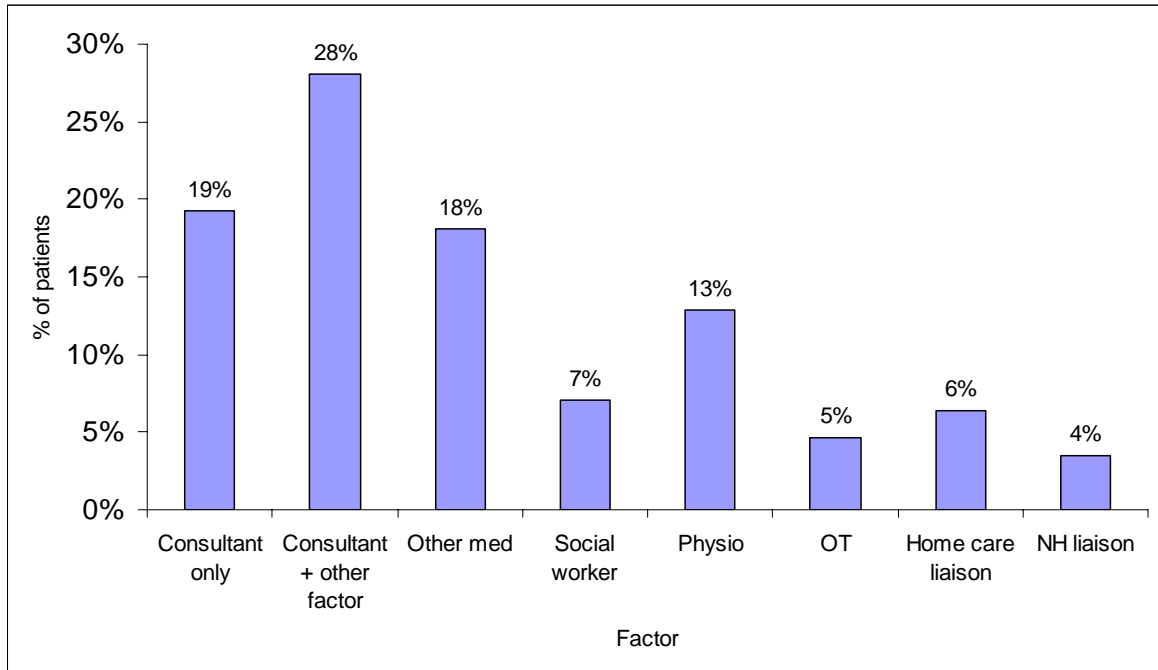
Figure E.15 Factors affecting discharge for patients outside the AEP



Analysis of the factors affecting discharge highlights patient review and assessment as the most prevalent factor, impacting 50% of patients. A further 21% of patients are awaiting investigations.

a. Breakdown of the review/assessment factor

Figure E.16 Breakdown of the review/assessment element of discharge



Most patients awaiting review or assessment were waiting to see one or a number of clinical staff, and in 65% of the occurrences, the involvement of a medical member of staff was identified.

E.5 Assessment of Implications

E.5.1 AEP on Admission

The level of admission outside the AEP criteria in the West/North West was 18%. This was above the national average of 13% but is not atypical of AEP surveys undertaken previously in Ireland and elsewhere. The result should not be interpreted as suggesting that 18% of admissions could have been avoided, rather that some of these patients could have been treated outside of the acute setting if appropriate alternatives were available. Results at hospitals in the network ranged between 8% and 28%. It was suggested at the network consultation that the lower proportions of patients outside the AEP in Letterkenny (8%) and Sligo (13%) were in part due to the community hospitals in those areas.

Surveyors recorded 14% patients across the network for whom i/v therapy was the only AEP admission criterion met. These are in addition to the 18% who did not meet any AEP admission criteria. Professional opinion now suggests that many of these patients could receive such therapy outside an acute location.

The results of the surgical variant of the AEP indicate that patients are not being admitted on the day of surgery, as 79% of patients did not meet the AEP timeliness of admission criteria.

E.5.2 AEP on Day of Care

The finding that 40% of patients surveyed could potentially have been cared for outside of the acute hospital setting on their day of care is similar to the national average for this study of 39%. As with the admission criteria it should not be interpreted as meaning that patients should *necessarily* be in other care settings - only that there exists some potential for this. Approximately 9% of these patients were undergoing some form of rehabilitation, such as physiotherapy.

E.5.3 Alternatives to Acute Care

The West/North West was the only network in the survey where the potential alternatives identified for patients outside of the AEP criteria on admission and on the day of care, and their relative priority, were the same. The list below shows the alternatives and in brackets the proportion of patients outside the AEP on admission and day of care they were considered for:

- Access to assessment/diagnostics (38% on admission; 20% on day of care)
- Non-acute bed and therapy (22% on admission; 18% on day of care)
- Own home with GP support (10% on admission; 16% on day of care).

These data provide the network with a clear steer on the services to develop to reduce the demand for acute care.

The proportion of patients for whom i/v therapy was the only criterion met (14%) highlights the need to consider alternatives setting for i/v.

E.5.4 Planning and Delivery of Acute Care

The survey data suggest that there is scope for reviewing discharge planning procedures on a systemic basis across hospitals in the West/North West. The network consultation session confirmed that there were opportunities to increase discharge planning from the current level of 39%. Consultants reported spending a disproportionate amount of time trying to organise complex discharges at the end of the patient stay. Availability of patient transport, particularly of ambulances to return hospital transfers, was highlighted as a factor causing delay, especially in the case of Galway due to its role as a tertiary referral centre.

The survey findings underline the importance of improving access to assessment and diagnostics. The network expressed the view that current pathways do not support the necessary levels of diagnostics via outpatients, and this has led to a practice of admitting patients as inpatients to access diagnostics. GPs do not have direct referral or access to diagnostics. Short-term booking of diagnostics via the MAU is available to GPs in Roscommon and Castlebar however, and it was reported that this approach works well.

The survey results show that 50% of discharge delays were linked to patient access to review or assessment. In 65% of cases, this review involved a member of medical staff (who could in turn be waiting for test results etc.). The network consultation confirmed that timeliness and frequency of ward rounds could be reviewed and that this would also support improvement of discharge processes.

E.6 Conclusions and Recommendations

Conclusion 1: Difficulties accessing assessment and diagnostics are leading to avoidable admissions in the West/North West and increasing length of stay.

Recommendation 1: Improve access to diagnostics and assessment without admission to the acute hospital setting. This includes:

- Extended hours/seven day access to hospital based diagnostics
- Improved GP access to diagnostics without patient admission.

Conclusion 2: Patients could be discharged sooner and some patients could avoid admission if the GP support required to enable patients to stay in their own homes were available.

Recommendation 2: Review processes for providing GP support to patients as an alternative to admission and in facilitation of timely discharge.

Conclusion 3: Improved access to non-acute beds would reduce avoidable admissions and increase the appropriate placement of patients in the West/North West.

Recommendation 3: Confirm the scale of the capacity gap for non-acute beds at network level and develop a plan to close this gap.

Conclusion 4: There is opportunity to increase the level of discharge planning in the West/North West to improve bed utilisation.

Recommendation 4: Implement discharge planning for all patients in all acute hospitals in the West/North West

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APPENDIX F: Network 6 – South Eastern

F.1 Introduction

The survey was undertaken in the South East network on Thursday 18th January 2007. This network provides acute care via 3 hospitals as listed below, all of which have a casemix grouping of 2.

- Waterford
- St. Luke's
- Wexford

As detailed in the methodology, each hospital was allocated a survey sample size based on the number of beds supporting the specialities included in the exercise (medical and surgical). It should however be noted that due to an administrative error, 48 rather than 75 patients were surveyed in Wexford, and that Cashel and Clonmel were omitted from the survey as they were undergoing reorganisation at the time.

The following table lists for each hospital in this network, the applicable patient population on the day of the survey (Survey Population), the size of this population as a percentage of the full network population (% of Total Network Patients), the number of patients sampled from that population (Survey Sample), and the percentage of this sample with regards to the survey population (% of the Survey Population).

It shows that in the South Eastern network, St. Luke's had the largest sample percentage, with 38% of its patients on the day of the survey being sampled, and Wexford had the smallest sample percentage, with 30% of patients being selected as part of the survey sample.

Table F.1 South Eastern network hospital sample

| Hospital | Survey Population | % of Total Network Patients | Survey Sample | % of the Survey Population |
|--------------|-------------------|-----------------------------|---------------|----------------------------|
| St. Luke's | 196 | 28% | 75 | 38% |
| Wexford | 159 | 23% | 48 | 30% |
| Waterford | 349 | 49% | 125 | 36% |
| Total | 704 | 100% | 248 | 35% |

A consultation session was held on Tuesday 20th February to review the raw survey data with managerial, clinical and nursing stakeholders from the South Eastern network. The objectives of this meeting were to:

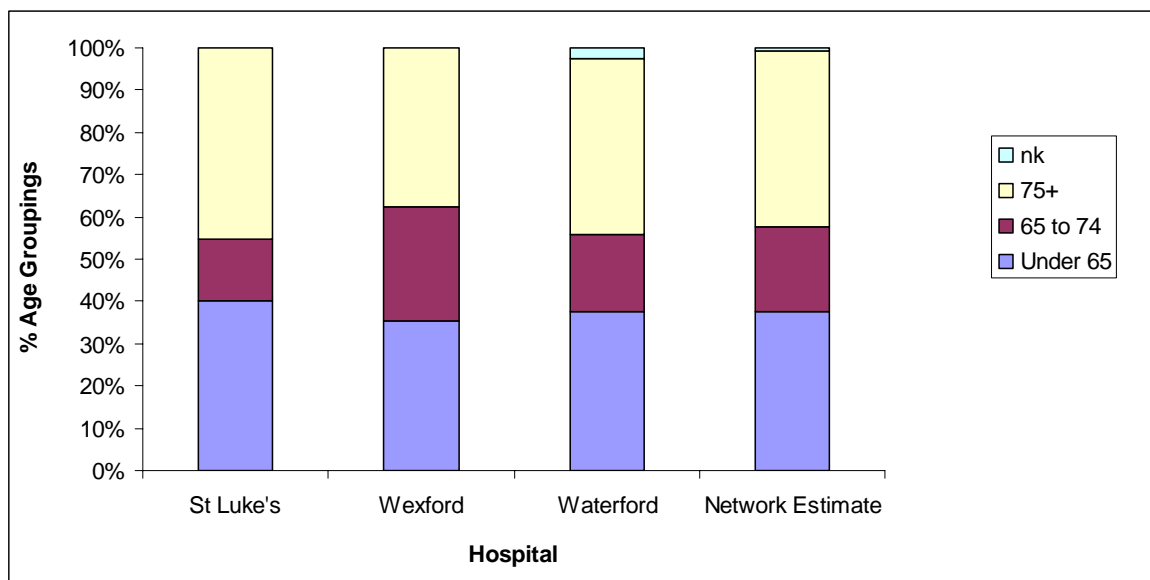
- Share the findings of the bed utilisation survey
- Understand the local factors influencing bed use
- Identify options for improving bed utilisation eg through process change and service reconfiguration.

The output of the session is incorporated into the analysis of the survey data in this section of the report.

F.2 Patient Profile

F.2.1 Patient Age

Figure F.1 Patient age profile by hospital and network estimate

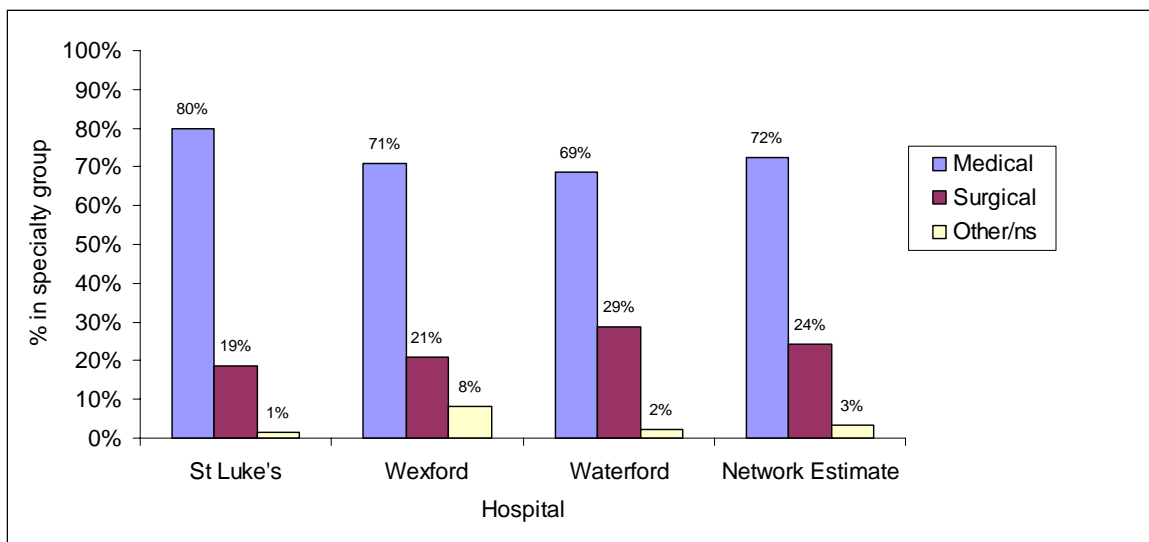


This graph shows that the three hospitals surveyed in the South Eastern network shared a similar patient age profile. On average across the network, 62% of the patients were 65 years of age or over. The proportion of patients under 65 ranged from 35% in Wexford, to 38% Waterford and 40% in St Luke's.

In the South Eastern network, 67% of patients surveyed had a GMS card.

F.2.2 Patient Speciality

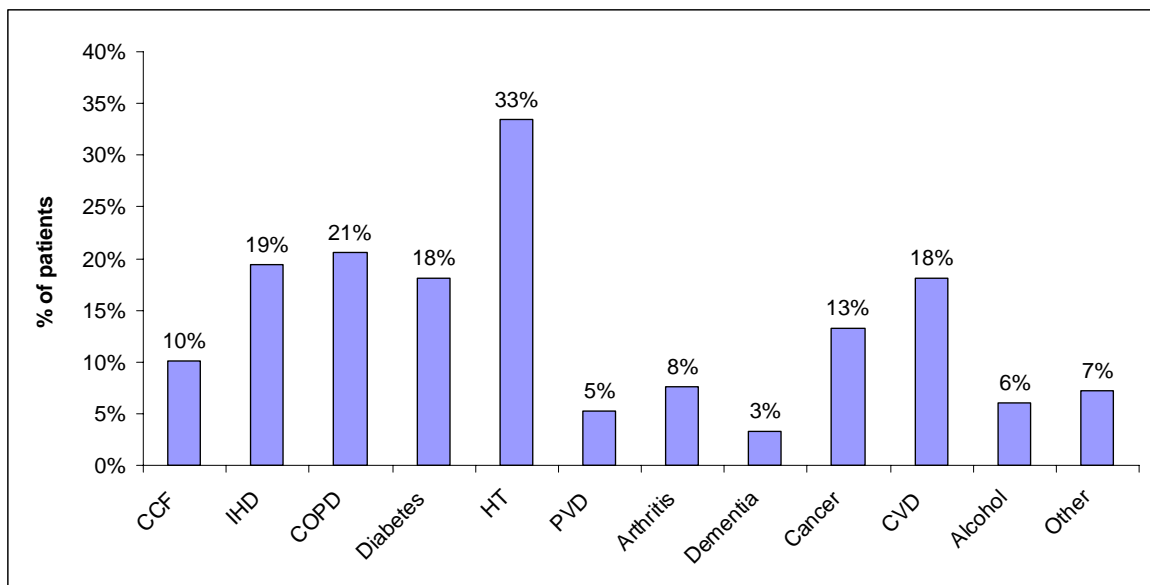
Figure F.2 Bed designation of patient in admission



The majority of patients (72%) at all sites surveyed were medical. These data shows that the proportion of medical patients ranged from 69% in Waterford to 80% in St Luke's. Across the network, 24% of patients were surgical. Waterford had the highest proportion of surgical patients at 29%.

F.2.3 Patient Comorbidity (Type)

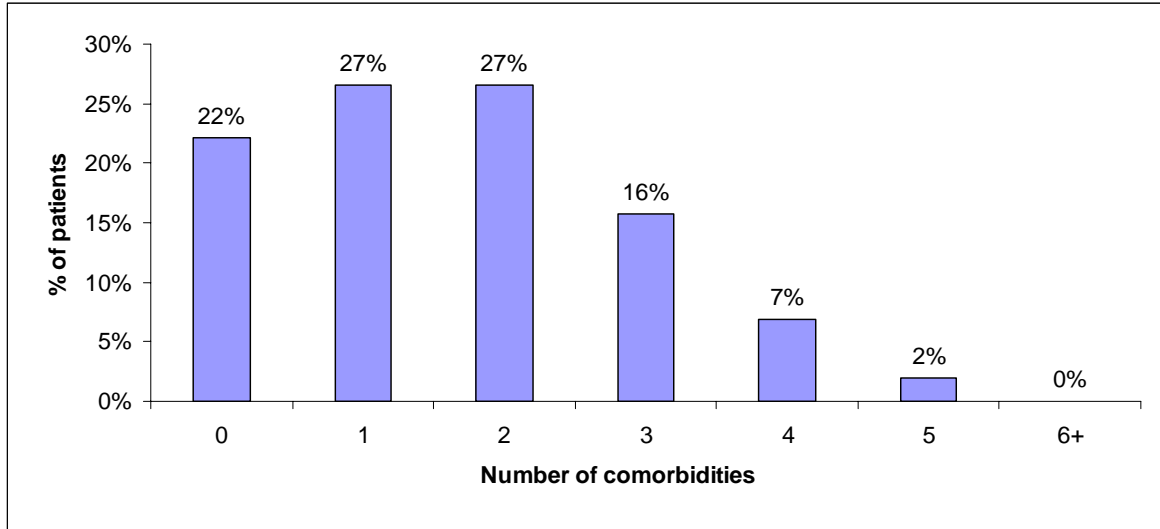
Figure F.3 Types and percentages of comorbidities presented by patients



The admitted patients surveyed in the South Eastern network had a range of comorbidities, as illustrated by this graph. Hypertension (HT) was the most common comorbidity at 33%. Chronic Obstructive Pulmonary Disease (COPD), Ischaemic Heart Disease (IHD), Diabetes and Cerebrovascular Disease (CVD) were also prevalent, with each recorded for approximately 20% of patients surveyed.

F.2.4 Patient Comorbidity (Prevalence)

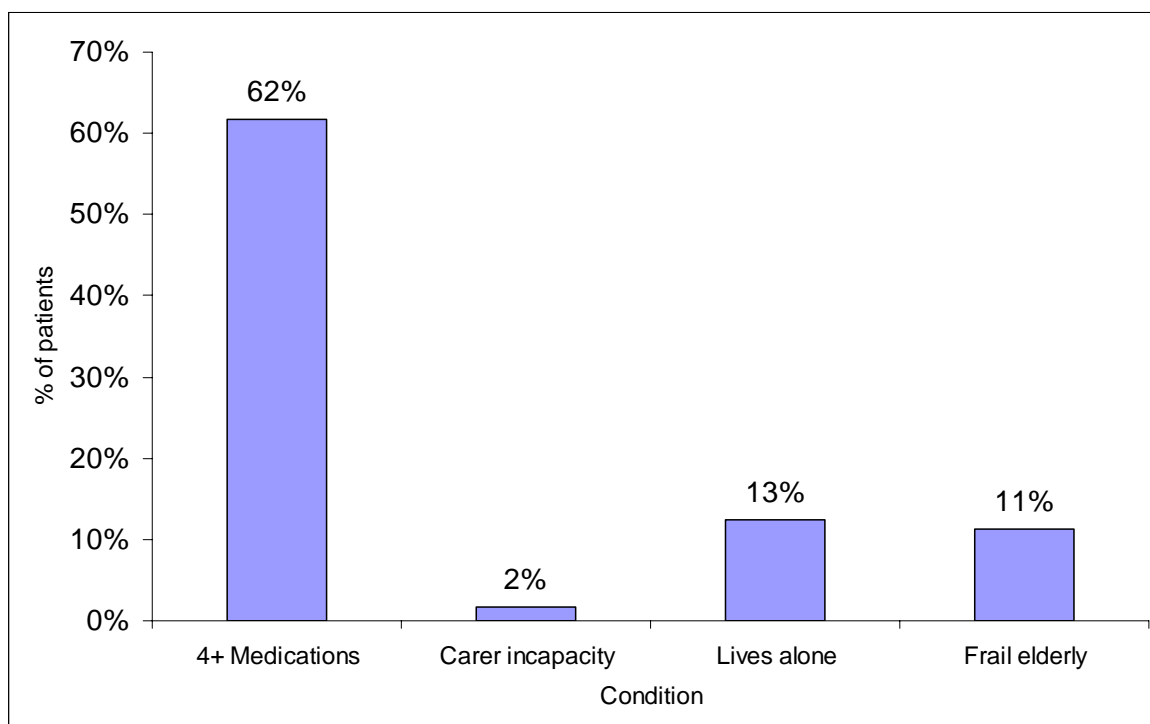
Figure F.4 Percentage of patients presenting comorbidities



Further analysis of the comorbidities amongst admitted patients reveals a high level of prevalence, as 78% of patients presented with at least one comorbidity and more than half (51%) of admitted patients had at least two.

F.2.5 Other Patient Conditions

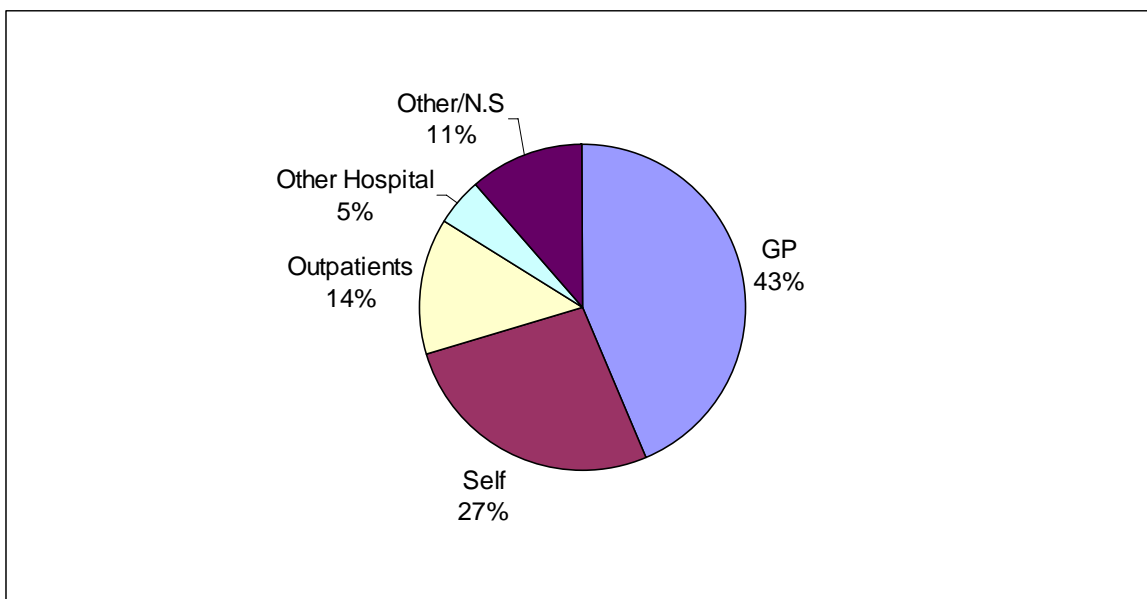
Figure F.5 Percentage of patients presenting with other conditions



This graph presents the risk factors that were identified from the charts of surveyed patients. A high proportion of these patients (62%) were on multiple medication therapies at the point of admission. Lower numbers of the other risk factors were identified from the patient charts, with 13% of patients identified as living alone and a further 11% considered frail elderly. The levels of carer incapacity were low, relative to the other risk factors, at 2%.

F.2.6 Source of Referral

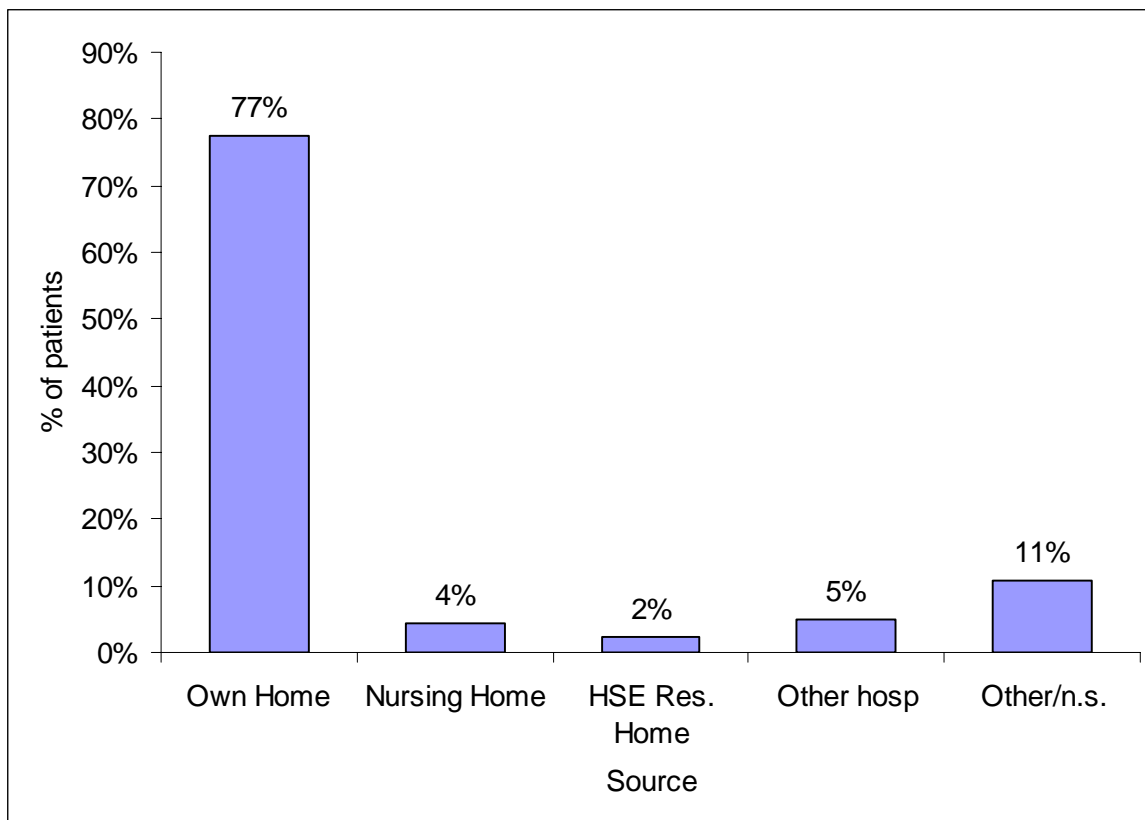
Figure F.6 Source of patient referral



Analysis of the source of patient referrals in the South Eastern network highlights GP referral as the most common, with 43% of admitted patients referred to the acute hospital by a GP. Patient self-referral was the second most common source, at 27%. A further 14% of patients were referred from outpatient clinics. The source of referral was not known or not recorded on the patient notes for 11% of patients surveyed.

F.2.7 Source of Admission

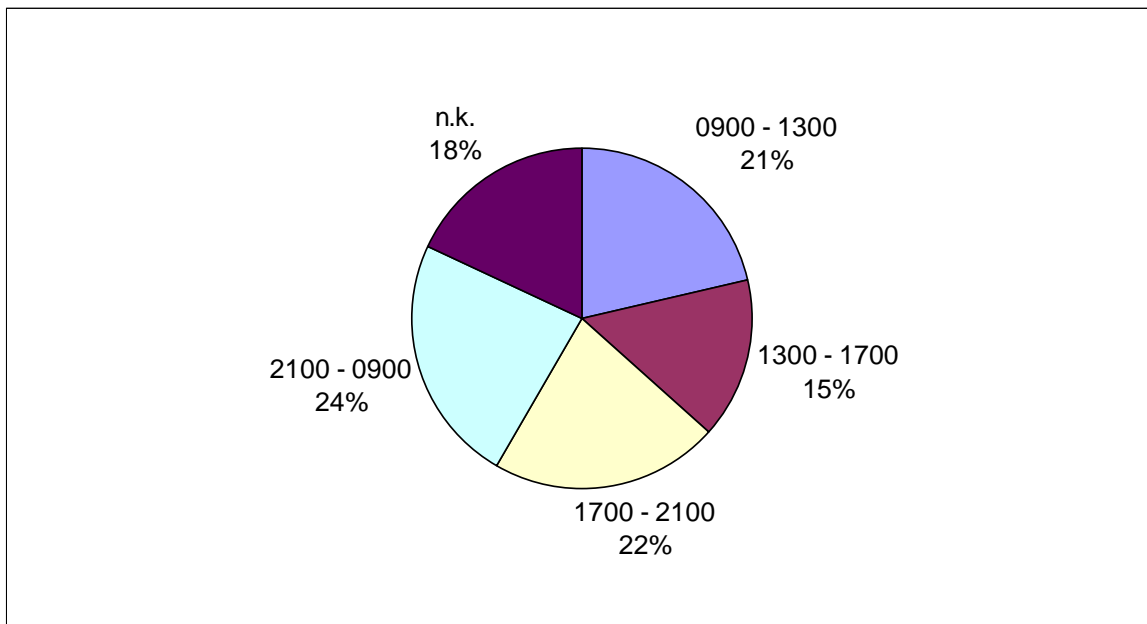
Figure F.7 Source of patient admission



Most patients in the South Eastern network were admitted from their own homes (77%). The data indicate a low level of hospital transfers, with 5% of patients admitted from other hospitals. Nursing homes were the source of admission for 4% of patients surveyed and 2% of patients were admitted from HSE residential homes. The source of admission was not specified for 11% of patients.

F.2.8 Time of Arrival

Figure F.8 Time of patient arrival



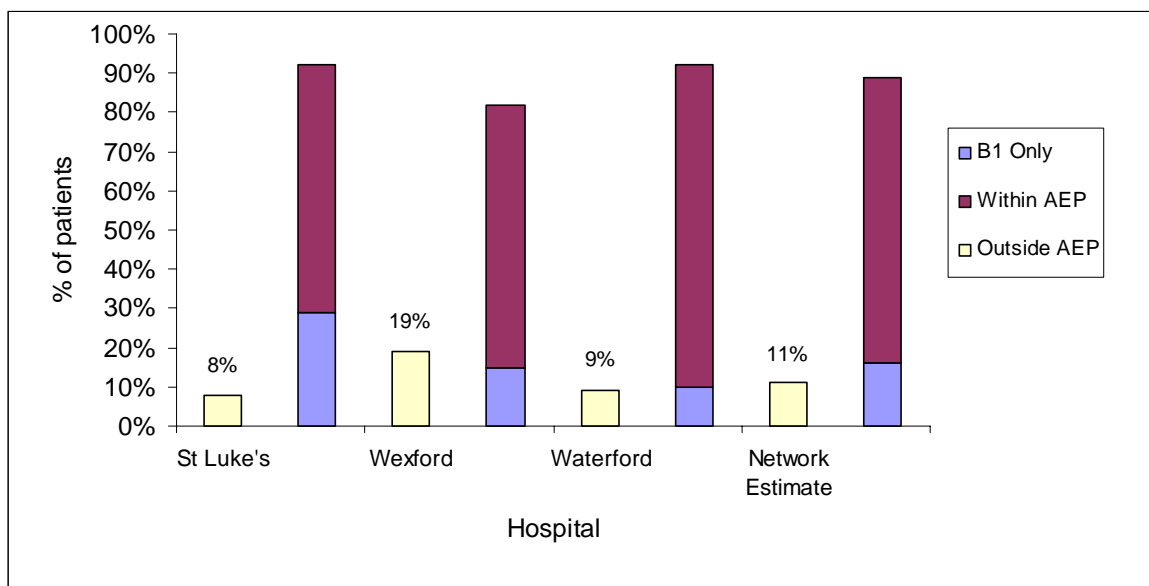
Analysis of the time of arrival for admitted patients shows that 37% patients arrived in the afternoon and evening, between 1PM and 9PM. A further 24% of admissions arrived at night, between 9PM and 9AM.

Time of arrival was not available from the notes of 18% of patients.

F.3 Day of Admission

F.3.1 AEP Results for Day of Admission

Figure F.9 Categorisation of patients with regards to the AEP on day of admission



Across the network 11% of the patients admitted were outside the AEP Criteria, and in some instances could potentially have been treated outside an acute setting. This graph illustrates the variance across the three hospitals surveyed. St. Luke's and Waterford had similar levels of admission outside the AEP criteria, at 8% and 9% respectively. This increased to 19% at Wexford.

Across the network, i/v therapy was the only AEP criterion evident in the notes for 16% of admitted patients. This varied considerably between hospitals, ranging from 10% in Waterford and 15% in Wexford, to 29% in St Luke's.

a. *Statistical Analysis of the Influence of Patient Characteristics on AEP Results for Admission*

In order to attempt to better understand why patients are admitted outside AEP, it was decided as in the national report to undertake a statistical analysis of the various characteristics that could potentially have an influence on this for patients at a network level. Unlike the national analysis however, only a univariate analysis was undertaken. The following table summarises the result of this univariate analysis for the South Eastern network and shows that the most likely characteristics to lead to admission outside AEP are:

- County of residence (patients from Wexford are more likely to be admitted outside AEP)
- Source of referral (patients who self refer or are referred from outpatients are more likely to be admitted outside AEP).

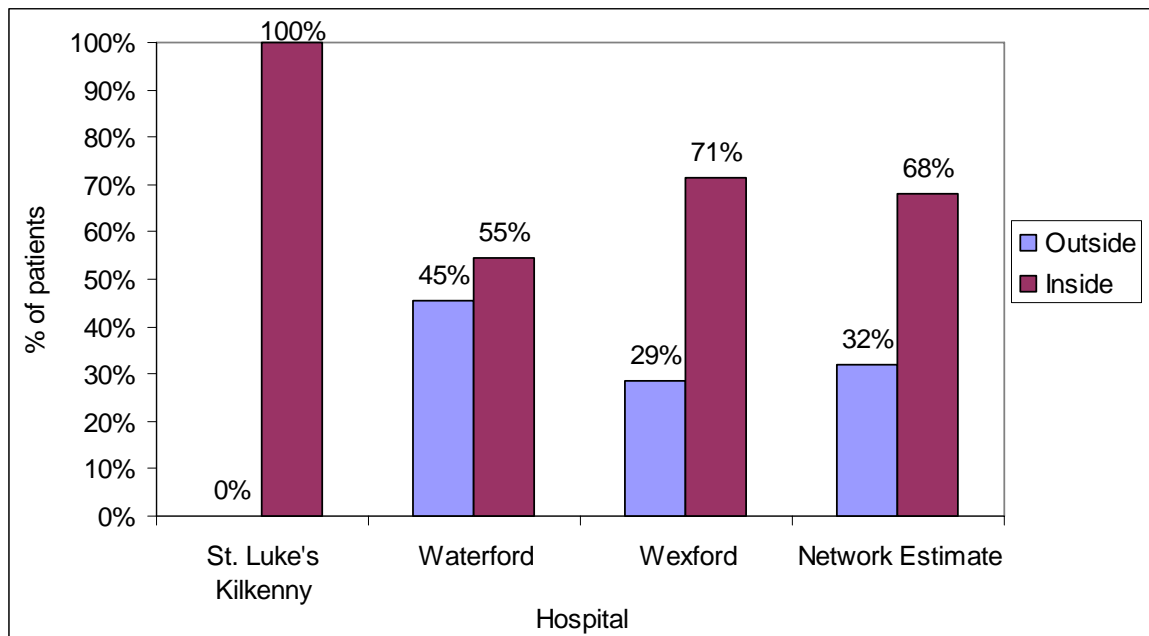
As with the national analysis however, it is recommended that whilst the analysis provides a set of useful indicators with regards to patient characteristics likely to be representative of admission and/or treatment outside AEP, they should not themselves form the basis around which explanations as to why patients are admitted outside AEP are sought. It should also be noted that all unknowns were excluded from this analysis.

Table F.2 Results of univariate analysis of the strongest relations between patient characteristics and lying outside AEP on admission

| Characteristic | χ^2 | df | P | Attribute | % Outside AEP | % Inside AEP |
|---------------------|----------|----|-------|-------------|---------------|--------------|
| County of Residence | 47.678 | 9 | 0.000 | Carlow | 0 | 11 |
| | | | | Tipperary | 0 | 5 |
| | | | | Kilkenny | 24 | 24 |
| | | | | Waterford | 18 | 26 |
| | | | | Wexford | 58 | 24 |
| Source of Referral | 24.144 | 3 | 0.000 | GP | 28 | 52 |
| | | | | Other | 0 | 4 |
| | | | | Outpatients | 25 | 15 |
| | | | | Self | 46 | 29 |

F.3.2 Elective Surgery Findings

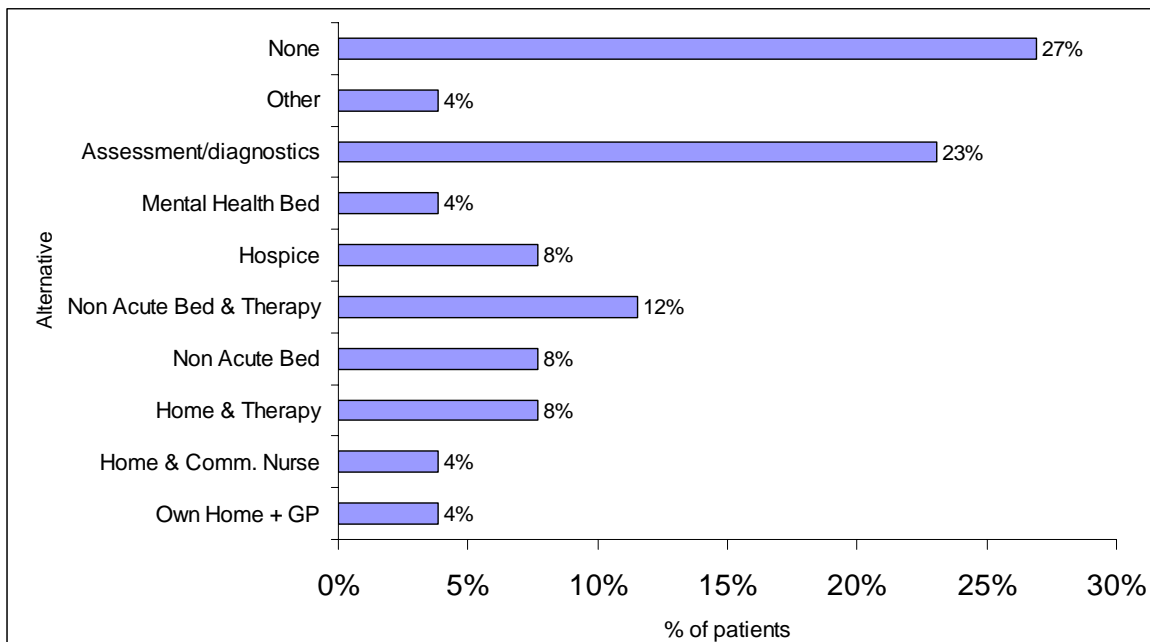
Figure F.10 Categorisation of patients with regards to elective surgery



Of the elective surgery patients surveyed, 79% did not meet the timeliness criteria and 32% did not meet the location criteria. This graph shows that 32% of patients did not meet both criteria.

F.3.3 Alternatives Identified to Admission

Figure F.11 Alternatives identified to admission for patients outside the AEP on day of admission

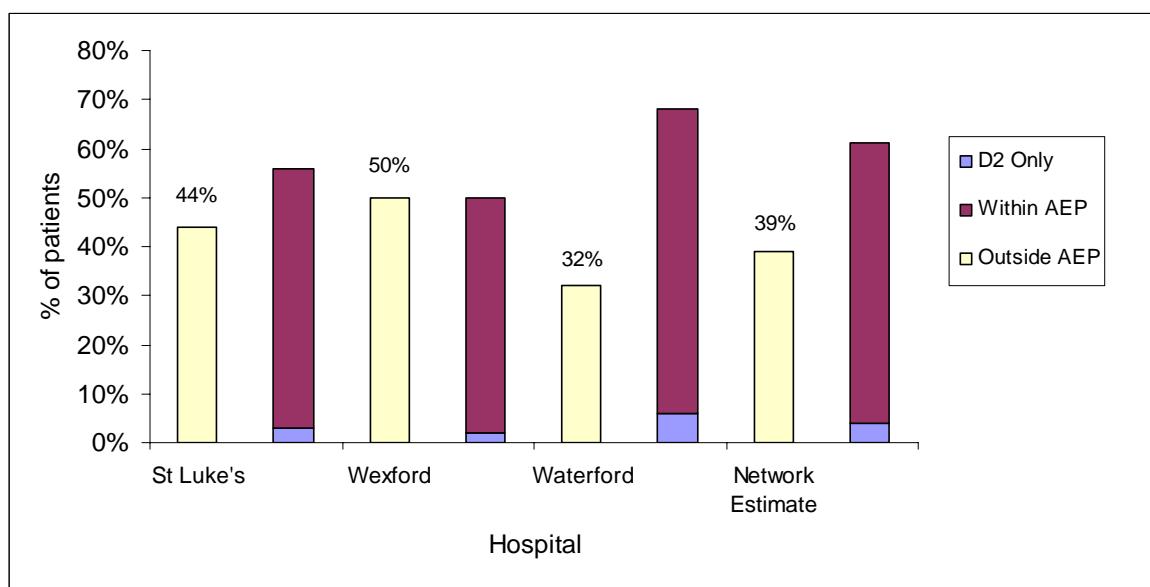


Potential alternatives to acute hospital care were identified for those patients whose admission did not meet the AEP criteria. Access to assessment and diagnostics was the most common alternative, identified for 23% of patients outside AEP. The remaining patients had alternatives identified in a non-acute setting and non-acute bed with therapy support was considered an appropriate option for 12%. No alternative was identified for 27% of patients.

F.4 Day of Care

F.4.1 Figure Results for Day of Care

Figure F.12 Categorisation of patients with regards to the AEP on day of care



On average 39% of patients surveyed in the South Eastern network could have been treated in an alternative setting on the day of care, if appropriate alternatives were available. There was some variance in the results across hospitals. Waterford had the lowest proportion of patients outside of the AEP, at 32%. The proportion of patients outside of the AEP on the day of the survey rose to 44% at St. Luke's and 50% at Wexford.

Of these patients outside the AEP criteria, 8% were receiving physiotherapy or occupational therapy support.

I/v therapy was the only AEP criterion identified for 3% of patients, accounting for 2% of patients surveyed at Wexford, 3% at St. Luke's and 6% at Waterford.

a. *Statistical analysis of the influence of patient characteristics on AEP results for day of care*

In order to attempt to better understand why patients are treated outside AEP, it was decided as in the national report to undertake a statistical analysis of the various characteristics that could potentially have an influence on this for patients at a network level. Unlike the national analysis however, only a univariate analysis was undertaken. The following table summarises the result of this univariate analysis for the South Eastern network and shows that the most likely characteristics to lead to a day of care outside AEP are:

- County of residence (patients from Wexford are more likely to be outside AEP on the day of care)
- Patient age (patients over the age of 75 years are more likely to be outside AEP on the day of care).

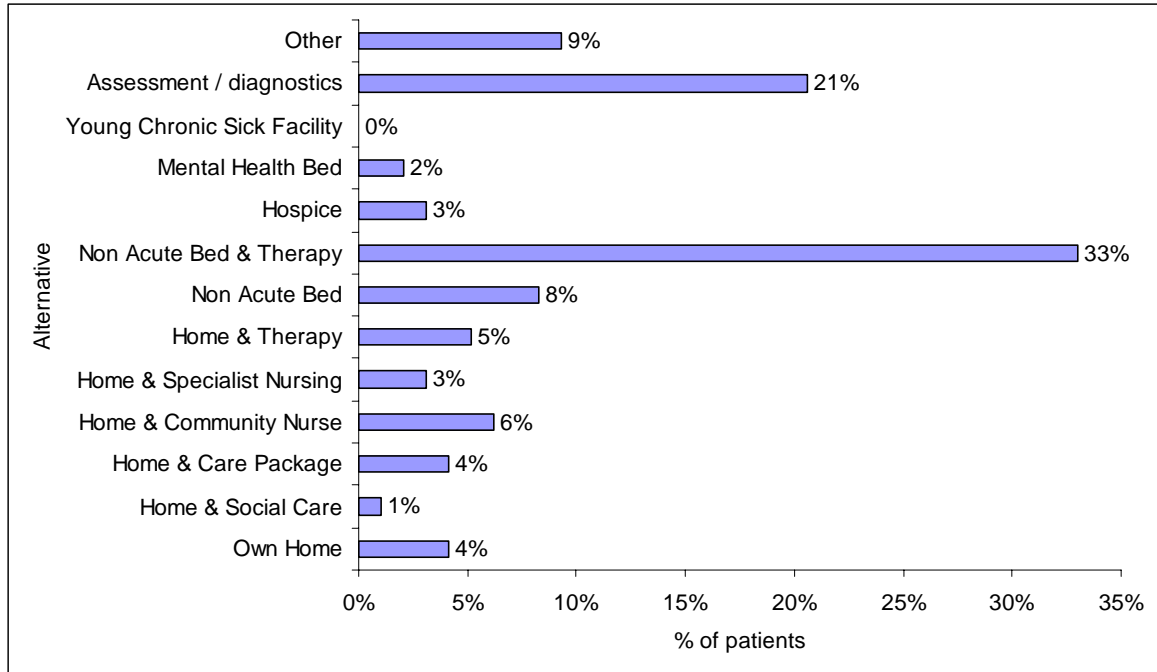
As with the national analysis however, it is again recommended that whilst the analysis provides a set of useful indicators with regards to patient characteristics likely to be representative of admission and/or treatment outside AEP, they should not themselves form the basis around which explanations as to why patients are treated outside AEP are sought. Again, all unknowns were excluded from this analysis.

Table F.3 Results of univariate analysis of the strongest relations between patient characteristics and lying outside AEP on day of care

| Characteristic | χ^2 | df | P | Attribute | % Outside AEP | % Inside AEP |
|---------------------|----------|----|-------|-----------|---------------|--------------|
| County of Residence | 37.103 | 9 | 0.000 | Kilkenny | 25 | 24 |
| | | | | Waterford | 17 | 31 |
| | | | | Wexford | 36 | 23 |
| Patient Age | 20.533 | 2 | 0.000 | Under 65 | 32 | 42 |
| | | | | 65 – 74 | 16 | 22 |
| | | | | 75+ | 52 | 36 |

F.4.2 Alternatives Identified to Acute Care

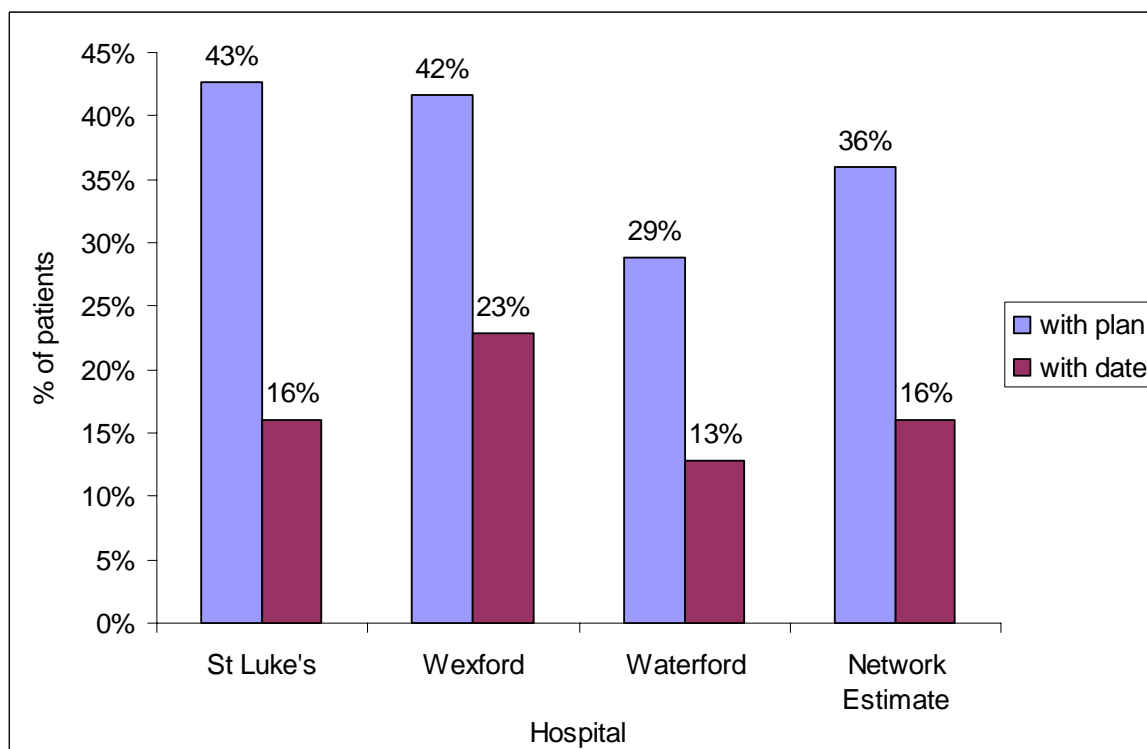
Figure F.13 Alternatives identified for patients outside the AEP on day of care



Analysis of the potential alternative to acute care identified for patients outside of the AEP highlight access to a non-acute bed with therapy support as the most common alternative (33%). The second most common alternative was access to assessment and diagnostics (21%).

F.4.3 Discharge Planning

Figure F.14 Percentage of patients with evidence of discharge planning



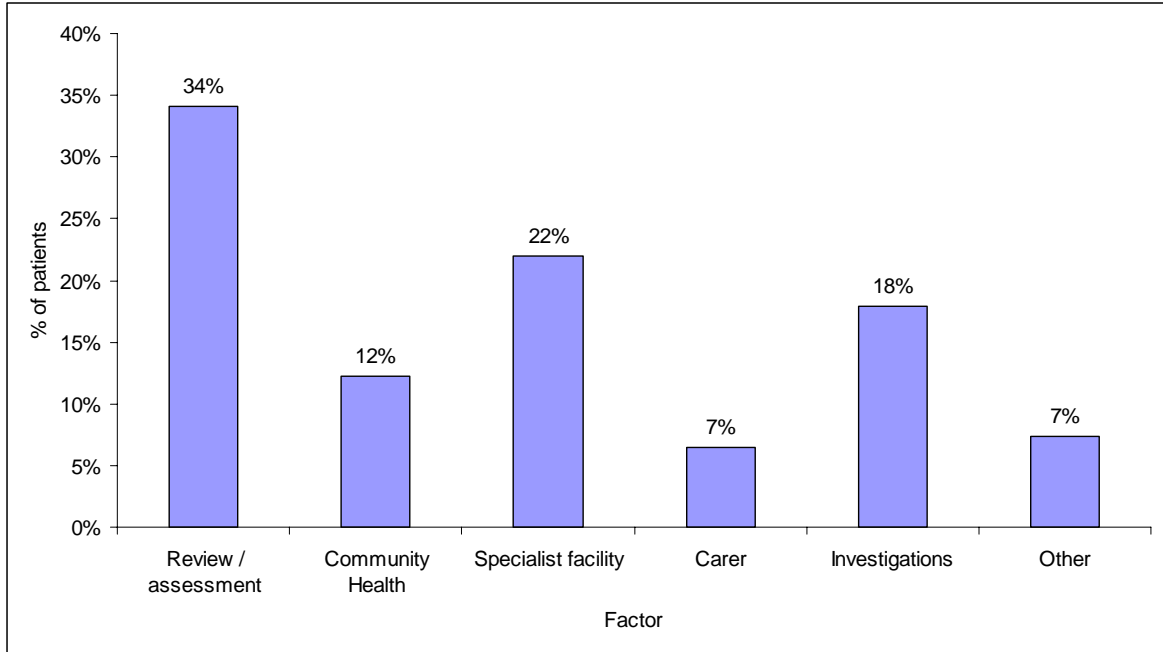
Discharge planning was in evidence for 36% of patients. For the purposes of the survey, this refers to any indication in the notes of plans or arrangements for discharge and a formal discharge plan or template was not required to meet this criterion.

The prevalence of discharge planning varied across hospitals, ranging from 43% (St Luke's) and 42% (Wexford) to 29% in Waterford.

Few patients surveyed had a predicted date of discharge – on average 16% in the South Eastern network. Wexford had the highest rate of predicted discharge date use at 23%, followed by St. Luke's at 16% and Waterford at 13%.

F.4.4 Factors Affecting Discharge

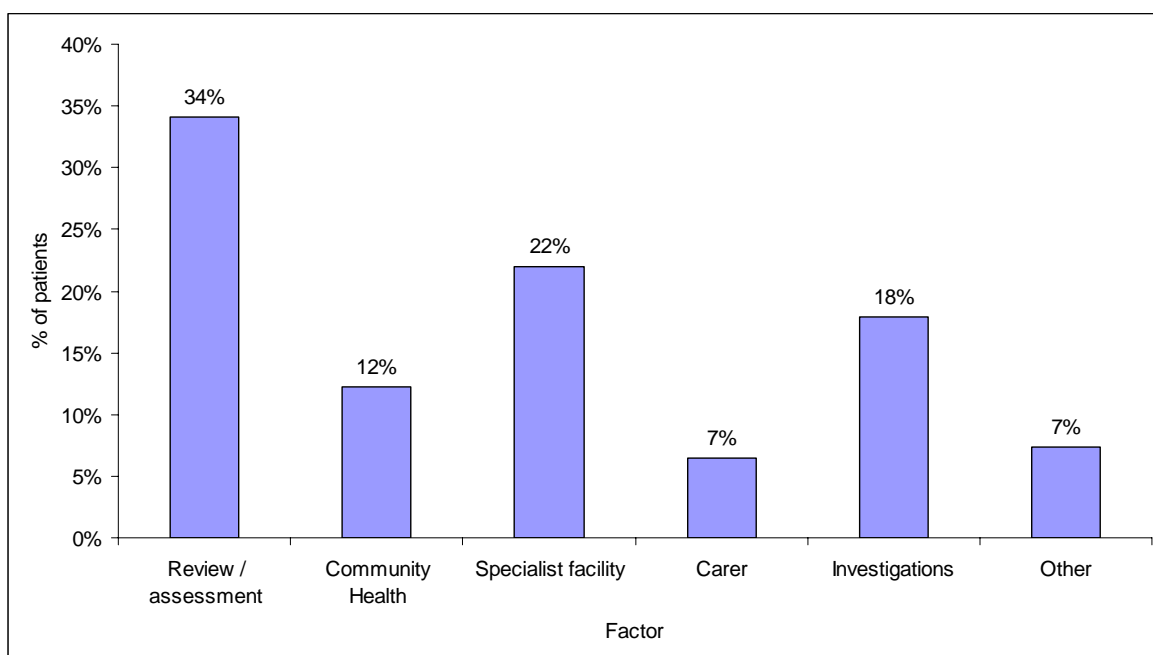
Figure F.15 Factors affecting discharge for patients outside the AEP



Analysis of the factors affecting discharge highlights patient review and assessment as the most prevalent factor, impacting 34% of patients. A further 22% of patients are awaiting access to a specialist facility and 18% are awaiting investigations.

a. Breakdown of the review/assessment factor

Figure F.16 Breakdown of the review/assessment element of discharge



These graphs show that the most common factor affecting discharge was awaiting review and assessment (34%). Most of these patients were waiting to see one or a number of clinical staff, and in 68% of the occurrences, the involvement of a medical member of staff was identified.

The data gathered refer to delays noted on the day of survey irrespective of whether the patient was declared medically fit for discharge or not, and again any individual patient may have had more than one reason noted contributing to delay.

F.5 Assessment of Implications

F.5.1 AEP on Admission

The overall figure of 11% of patients falling outside AEP on admission criteria is similar to that found in surveys elsewhere and is slightly lower than the national average of 13%.

It should be emphasised that it might not be known or obvious at the time of admission that the patient was outside the AEP criteria and the results should not be interpreted as suggesting that all of these patients might have had alternatives to acute admission. Each hospital also requires a certain level or 'buffer' of inappropriate admissions. This is to reduce risk of non-admission of appropriate patients. The size of this buffer is determined by the acceptable level of risk defined by the hospital and its balance between demand and capacity.

Surveyors recorded 16% patients across the network for whom i/v therapy was the only AEP admission criterion met. These patients are in addition to the 11% who did not meet any AEP admission criteria. Models of care in Ireland and elsewhere show that many of these patients could receive such therapy outside an acute location.

The application of the surgical variant of the AEP found that 79% of patients did not meet the timeliness criteria, which indicates that patients are not being admitted on the day of surgery.

F.5.2 AEP on Day of Care

The survey results show that 39% of patients surveyed could potentially have been cared for outside of the acute hospital setting on their day of care. Although this appears to be a large 'headline' figure, it is not atypical of findings from other survey locations and is the same as the national average. As with the admission criteria it should not be interpreted as meaning that patients should *necessarily* be in other care settings - only that there exists some potential for this. While some of these patients are medically fit for discharge, 8% were undergoing some form of rehabilitation.

F.5.3 Alternatives to Acute Care

The most common potential alternative identified to acute hospital admission was access to assessment and diagnostics, which was considered the appropriate option for 23% of patients outside of the AEP. This was followed by access to a non-acute bed and therapy, identified for 12% of patients. Access to a hospice bed (8%), a non-acute bed (8%) and home with therapy support (8%) were also common alternatives.

The alternatives to acute care suggested for patients outside of the AEP on the day of care were similar to those for admission, but with different prioritisation. Access to a non-acute bed was considered to be the appropriate alternative for 33% of patients. There was significant demand for access to assessment and diagnostics (21%). The third most common alternative was access to a non-acute bed (8%).

The network highlighted some service provision gaps that increase inappropriate use of acute beds. These include the current absence of adult social care provision in the South East and the lack of rehabilitation facilities for people under 65. In general, it was felt that

the network did not have sufficient community based care options and there was clear consensus on the benefits of developing community provision.

The emergent patient profile in the South Eastern network confirms the importance of providing a broad spectrum of home and community based non-acute services, targeted at higher risk populations such as those with chronic disease. The South Eastern network had the highest prevalence of comorbidity in the national study, as 78% of patients presented with at least one comorbidity and 51% had at least two. The network also had the highest proportion of patients on multiple medications (62%). The network also considered that the proportion of 'frail elderly' patients was in reality higher than the survey data suggested (12%), as this may not be captured in the patient notes in all instances.

F.5.4 Planning and Delivery of Acute Care

The high proportion of risk factors, combined with the elderly profile of the survey population and high prevalence of comorbidities increases the need for robust discharge planning. Risk factors can have an important bearing on the complexity of discharge arrangements - patients with two or more factors often remain longer in hospital as a result. The survey data suggest that there is scope for reviewing discharge planning procedures on a systemic basis across hospitals in the South East as discharge plans were in place for just 36% of patients. This finding was supported by the network. Some hospitals in the network reported difficulties with discharges over the weekend caused by internal factors (eg locum consultants at times reluctant to take responsibility for discharge) and external factors (access to facilities). It was suggested that some of these issues could be resolved through the implementation of clearly defined systems and protocols.

Access to assessment and diagnostics was the most common alternative to admission identified, and was also a prevalent factor in admitted patients staying in acute beds inappropriately. The network expressed the view that current pathways do not support the necessary levels of diagnostics via outpatients, and this has led to a practice of admitting patients as inpatients to access diagnostics. This may be reflected in the high proportion of GP referrals (43%). Access to more complicated diagnostics such as PET scans was highlighted as a particular constraint.

F.6 Conclusions and Recommendations

Conclusion F1: Difficulties accessing assessment and diagnostics are leading to avoidable admissions in the South East and increasing length of stay.

Recommendation F1: Improve access to diagnostics and assessment without admission to the acute hospital setting. This includes:

- Extended hours/seven day access to hospital based diagnostics
- Improved GP access to diagnostics.

Conclusion F2: There is opportunity to increase the level of discharge planning in the South East to improve bed utilisation.

Recommendation F2: Implement discharge planning for all patients in all acute hospitals in the South East

Conclusion F3: Improved access to non-acute beds would reduce avoidable admissions and increase the appropriate placement of patients in the South East.

Recommendation F3: Confirm the scale of the capacity gap for non-acute beds at network level.

APPENDIX G: Network 7 – Dublin North

G.1 Introduction

The survey was undertaken in the Dublin North Network on Friday and Thursday 12th and 25th January 2007. This network provides acute care via 3 hospitals as listed below, all of which have a casemix grouping of 1.

- MMUH
- Connolly
- Beaumont

As detailed in the methodology, each hospital was allocated a survey sample size based on the number of beds supporting the specialities included in the exercise (medical and surgical). The following table lists for each hospital in this network, the applicable patient population on the day of the survey (Survey Population), the size of this population as a percentage of the full network population (% of Total Network Patients), the number of patients sampled from that population (Survey Sample), and the percentage of this sample with regards to the survey population (% of the Survey Population).

It shows that in the Dublin North Network, Connolly had the largest sample percentage, with 37% of its patients on the day of the survey being sampled, and Beaumont and MMUH had the smallest sample percentages, with 21% of patients being selected as part of the survey sample in each.

Table G.1 Dublin North network hospital sample

| Hospital | Survey Population | % of Total Network Patients | Survey Sample | % of the Survey Population |
|--------------|-------------------|-----------------------------|---------------|----------------------------|
| Beaumont | 615 | 43% | 128 | 21% |
| Connolly | 204 | 15% | 75 | 37% |
| MMUH | 605 | 42% | 126 | 21% |
| Total | 1424 | 100% | 329 | 23% |

A consultation session was held on Thursday 8th March to review the raw survey data with managerial, clinical and nursing stakeholders from the Dublin North Network. The objectives of this meeting were to:

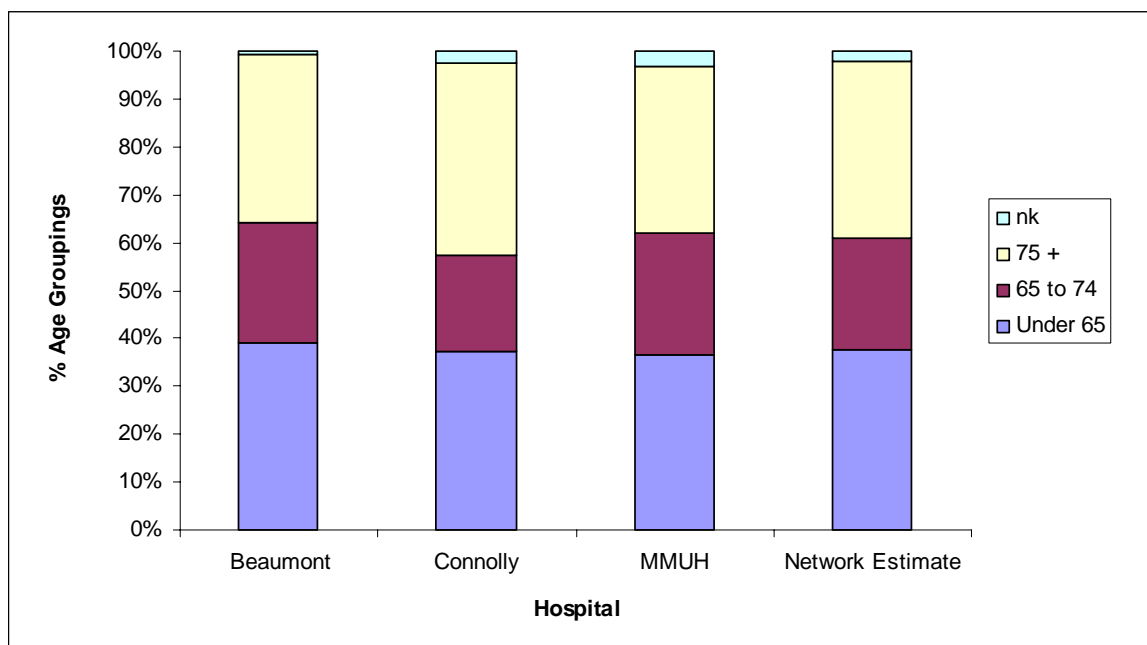
- Share the findings of the bed utilisation survey
- Understand the local factors influencing bed use
- Identify options for improving bed utilisation eg through process change and service reconfiguration.

The output of the session is incorporated into the analysis of the survey data in this section of the report.

G.2 Patient Profile

G.2.1 Patient Age

Figure G.1 Patient age profile by hospital and network estimate

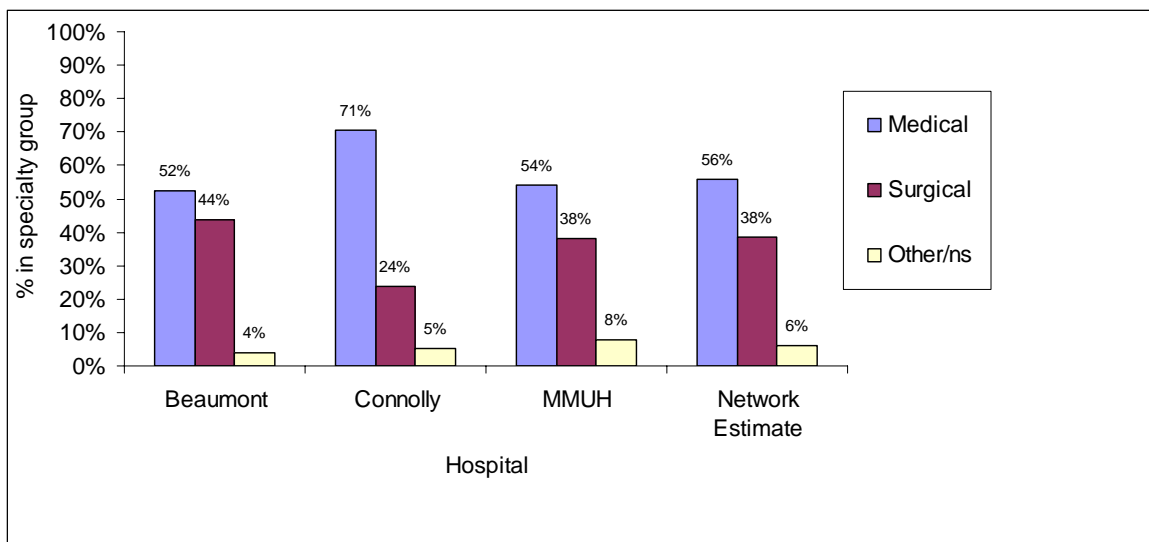


On average 62% of the patients surveyed in Dublin North were 65 years of age or over. The age profile at the three hospitals was similar. The proportion of patients under 65 was at 37% at Connolly and MMUH, and 39% at Beaumont. Patient age was not available from the notes for 2% of patients surveyed.

In Dublin North, 63% of the patients surveyed had a GMS card.

G.2.2 Patient Speciality

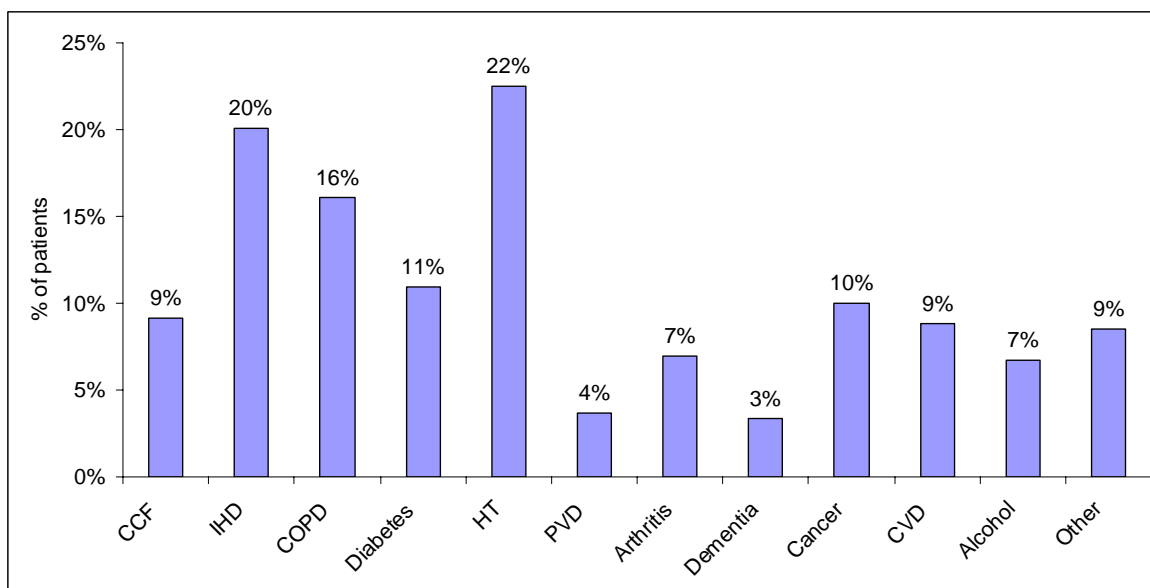
Figure G.2 Bed designation of patients on admission



Over half of patients surveyed in Dublin North were medical (56%) rather than surgical (38%). The graph illustrates the variance in the split between specialties by hospital. These data show that the proportion of medical patients ranged from 71% at Connolly to 54% at MMUH and 52% at Beaumont. Beaumont and MMUH had the highest proportion of surgical patients – at 44% and 38% of the admitted patients surveyed.

G.2.3 Patient Comorbidity (Type)

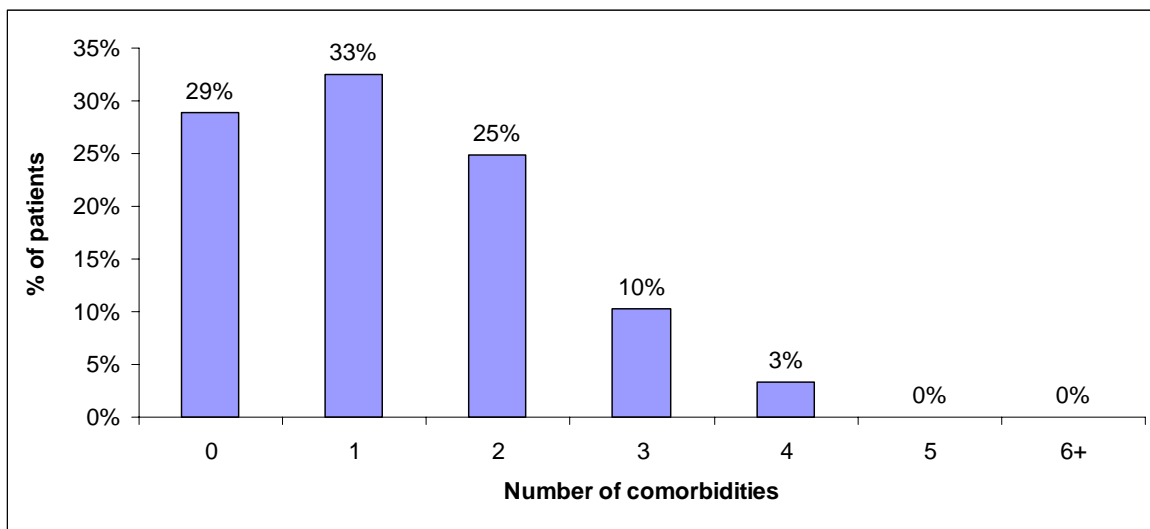
Figure G.3 Types and percentages of comorbidities presented by patients



This analysis confirms the range of comorbidities amongst admitted patients surveyed in Dublin North. Hypertension (HT) and Ischaemic Heart Disease (IHD) were the most common comorbidities recorded with approximately 20% of patients surveyed presenting with each. Chronic Obstructive Pulmonary Disease (COPD) was prevalent amongst 16% of patients surveyed. Diabetes (11%), cancer (10%), Congestive Cardiac Failure (CCF), (9%) and Cerebrovascular Disease (CVD), (9%) were each identified in approximately 10% of patients.

G.2.4 Patient Comorbidity (Prevalence)

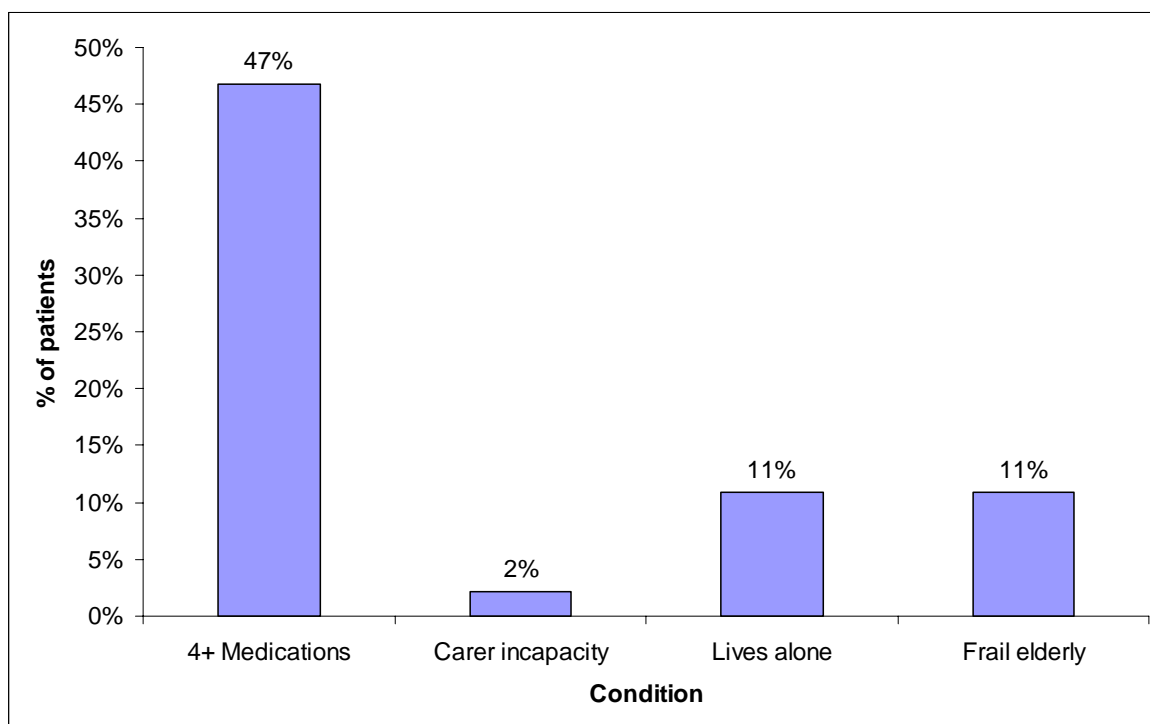
Figure G.4 Percentage of patients presenting comorbidities



Further analysis of the survey data highlights the prevalence of comorbidities in Dublin North - 71% of admitted patients presented with at least one comorbidity and 38% of patients had at least two.

G.2.5 Other Patient Conditions

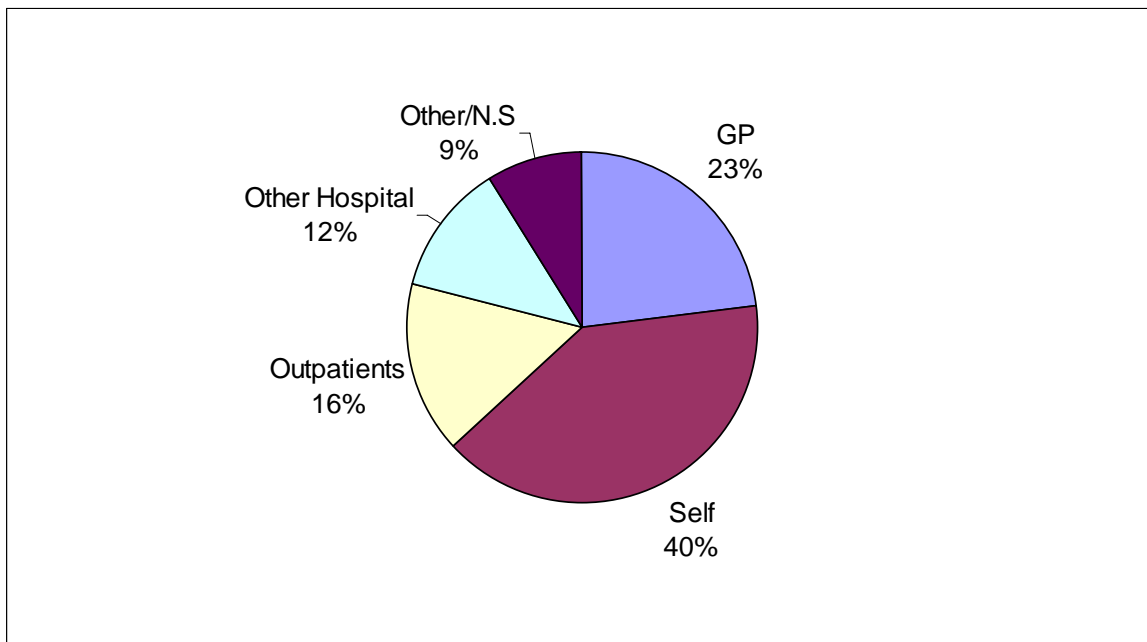
Figure G.5 Percentage of patients presenting with other conditions



Almost half of patients surveyed (47%) were on multiple medication therapies. Lower numbers of the other risk factors were identified from the patient charts, with 11% of patients living alone and 11% considered frail elderly.

G.2.6 Source of Referral

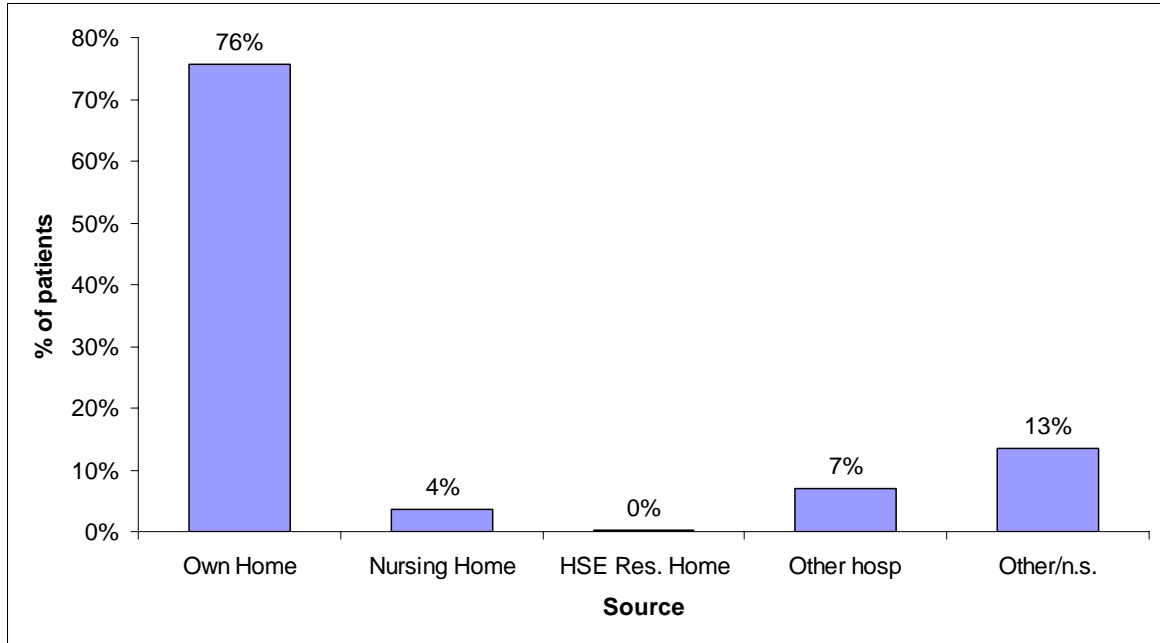
Figure G.6 Source of patient referral



Patient self-referral was the most common source of referral in Dublin North, at 40%. Almost a quarter of admitted patients (23%) were referred to the acute hospital by a GP. Referrals from Outpatients accounted for a further 16% of admissions and 12% of patients were referred by other hospitals. The source of referral was not known/not recorded on the patient notes for 9% of patients.

G.2.7 Source of Admission

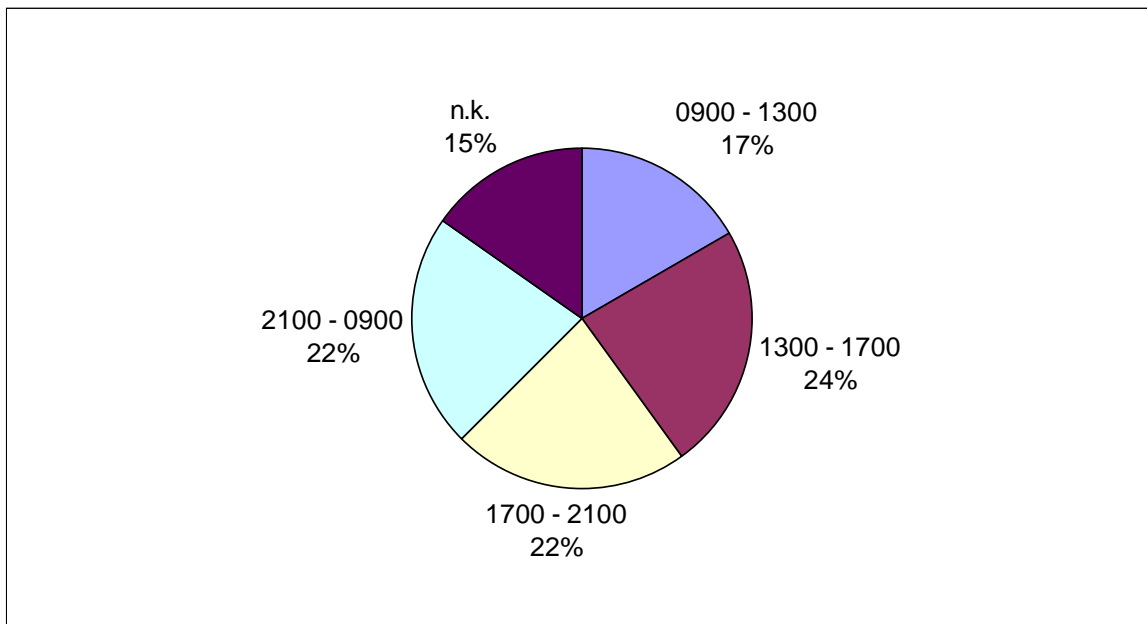
Figure G.7 Source of patient admission



Analysis of the source of admission for patients surveyed shows that 76% were admitted from their own homes. Other hospitals were the source of 7% of admissions. No patients were admitted from HSE Residential Homes, and 4% were admitted from Nursing Homes. The source of admission was not specified for 13% of patients.

G.2.8 Time of Arrival

Figure G.8 Time of patient arrival

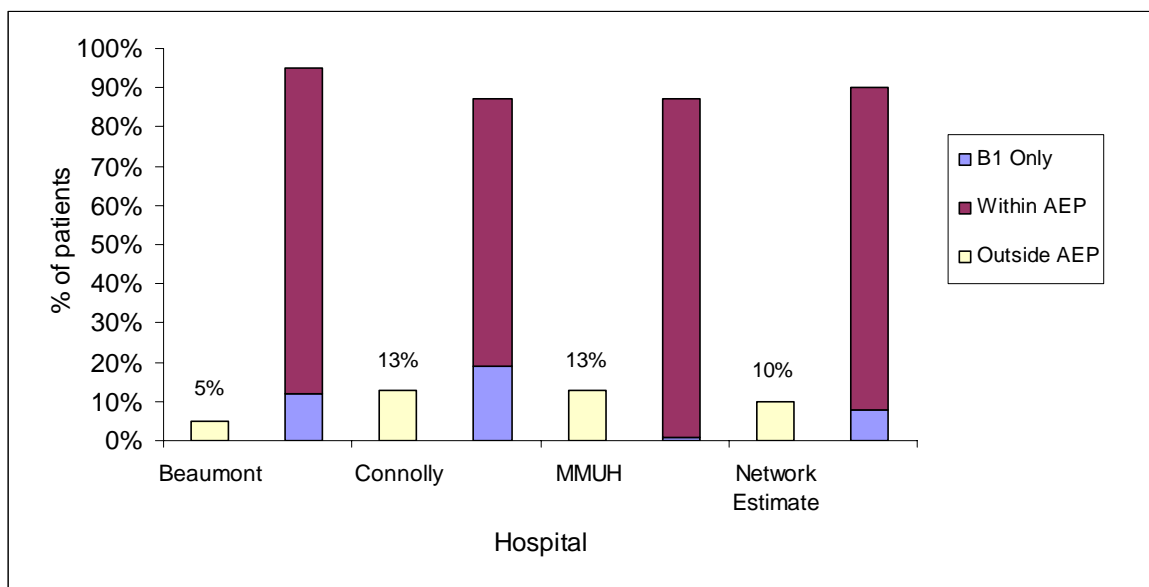


Analysis of time of arrival for admitted patients show that almost half (46%) arrived in the afternoon and evening, between 1PM and 9PM. More than one fifth of admissions arrived at night (between 9PM and 9AM), accounting for 22% of all admitted patients surveyed.

G.3 Day of Admission

G.3.1 AEP Results for Day of Admission

Figure G.9 Categorisation of patients with regards to the AEP on day of admission



On average 10% of the patients surveyed in Dublin North were admitted were outside the AEP criteria and in some instances could potentially have been treated outside an acute setting. The level of admission outside the AEP was 13% at MMUH and Connolly, and was considerably lower at Beaumont (5%).

Across the network, there were 8% of admitted patients for whom the only AEP criterion met was i/v therapy only (criterion B1). This varied between hospitals however and was extremely low at MMUH (1%) but more prevalent at Beaumont (12 %) and Connolly (19%).

a. *Statistical analysis of the influence of patient characteristics on aep results for admission*

In order to attempt to better understand why patients are admitted outside AEP, it was decided as in the national report to undertake a statistical analysis of the various characteristics that could potentially have an influence on this for patients at a network level. Unlike the national analysis however, only a univariate analysis was undertaken. The following table summarises the result of this univariate analysis for the Dublin North network and shows that the most likely characteristics to lead to admission outside AEP are:

- County of residence (patients from Clare, Cork and Kildare are more likely to be admitted outside AEP)

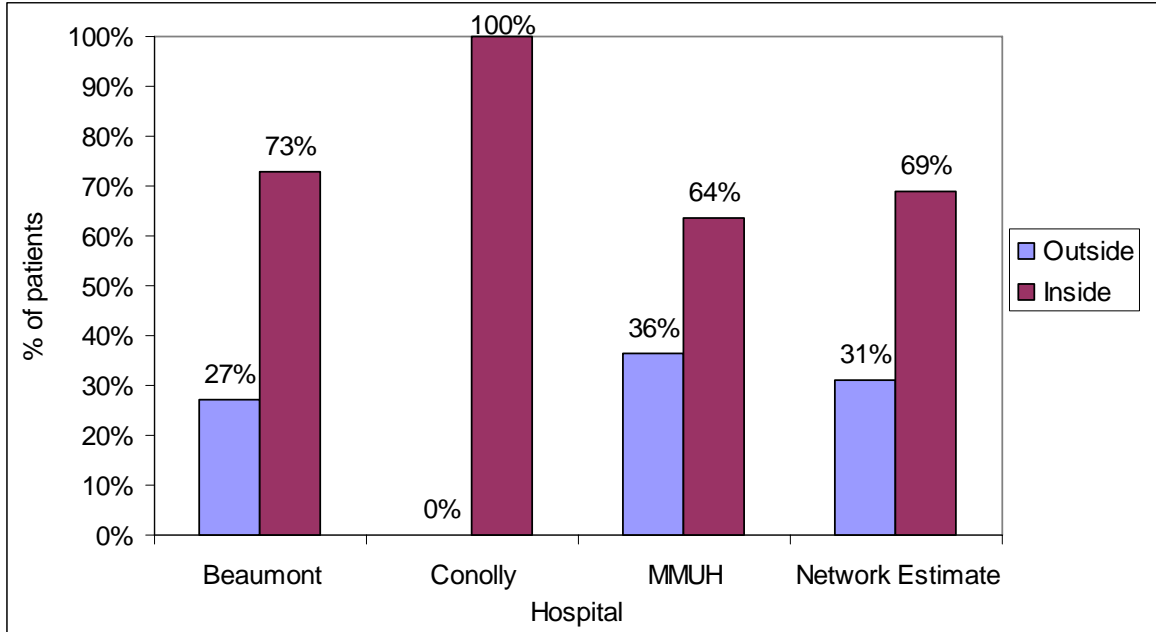
As with the national analysis however, it is recommended that whilst the analysis provides a set of useful indicators with regards to patient characteristics likely to be representative of admission and/or treatment outside AEP, they should not themselves form the basis around which explanations as to why patients are admitted outside AEP are sought. It should also be noted that all unknowns were excluded from this analysis.

Table G.2 Results of univariate analysis of the strongest relations between patient characteristics and lying outside AEP on admission

| Characteristic | χ^2 | df | P | Attribute | % Outside AEP | % Inside AEP |
|---------------------|----------|----|-------|-----------|---------------|--------------|
| County of Residence | 112.768 | 21 | 0.000 | Dublin | 77 | 76 |
| | | | | Clare | 3 | 0 |
| | | | | Cork | 3 | 0 |
| | | | | Kildare | 7 | 3 |
| | | | | Meath | 0 | 5 |

G.3.2 Elective Surgery Findings

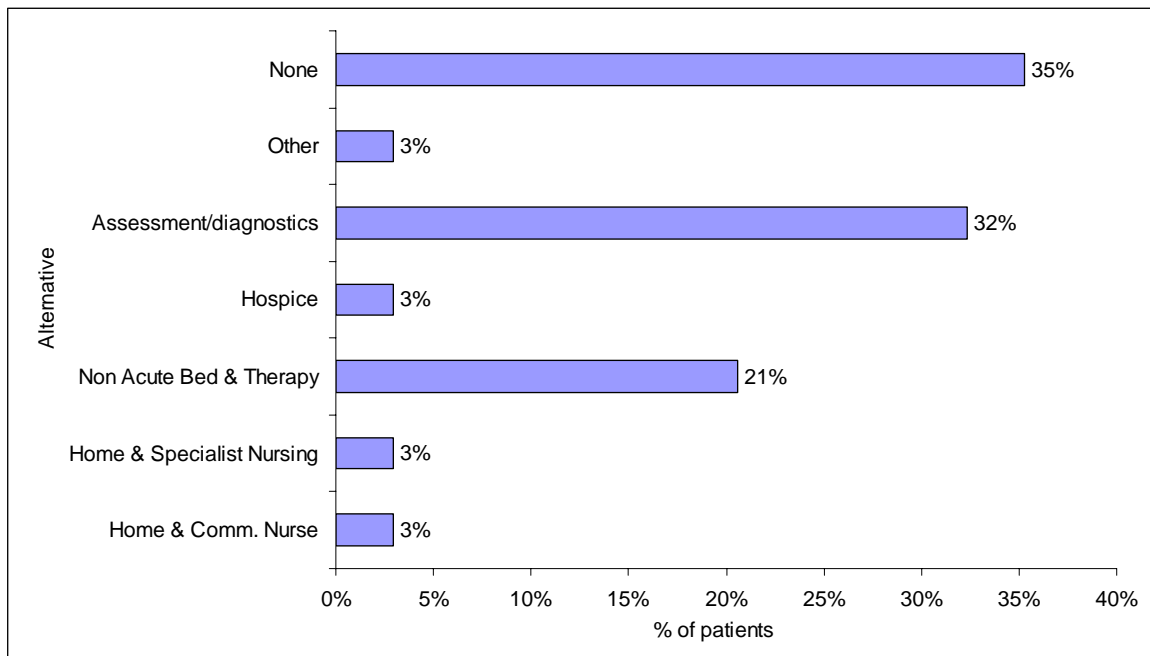
Figure G.10 Categorisation of patients with regards to elective surgery



Of the elective surgery patients surveyed, 70% did not meet the timeliness criteria and 40% did not meet the location criteria. This graph shows that 31% of patients did not meet both criteria.

G.3.3 Alternatives Identified to Admission

Figure G.11 Alternatives identified to admission for patients outside the AEP on day of admission

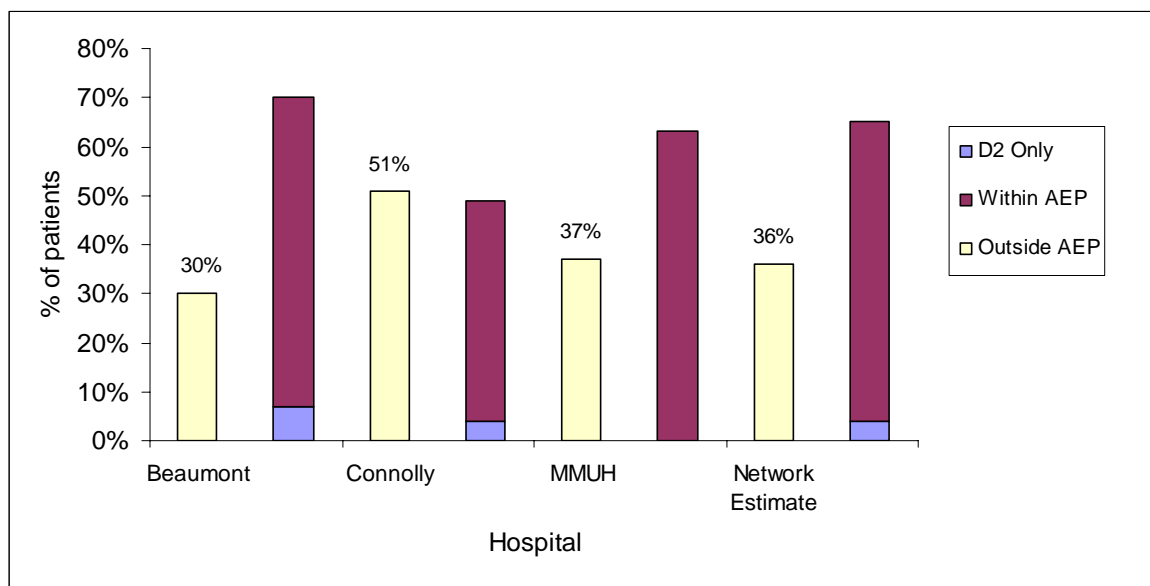


Surveyors identified potential alternatives to acute admission for those patients who were admitted outside of the AEP criteria. Access to assessment and diagnostics was the most common alternative, identified for 32% of these patients. Non-acute bed and therapy was identified for 21% of patients. The remaining patients had alternatives identified in a non-acute setting; however no alternative was identified for 35% of patients.

G.4 Day of Care

G.4.1 AEP Results for Day of Care

Figure G.12 Categorisation of patients with regards to the AEP on day of care



The results of the survey show that 36% of patients could have been cared for in an alternative setting, if appropriate alternatives were available. This graph illustrates the variance between hospitals in Dublin North. The proportion of patients outside of the AEP criteria was lowest at Beaumont (30%). The proportions of patients outside of the AEP were higher at MMUH (37%) and Connolly (51%).

Almost one fifth (18%) of the patients outside of the AEP were receiving physiotherapy or occupational therapy.

The survey data show that on average i/v therapy was only AEP criterion identified for 4% of patients. This ranged between 0% at MMUH, to 4% at Connolly and 7% at Beaumont.

a. *Statistical analysis of the influence of patient characteristics on AEP results for day of care*

In order to attempt to better understand why patients are treated outside AEP, it was decided as in the national report to undertake a statistical analysis of the various characteristics that could potentially have an influence on this for patients at a network level. Unlike the national analysis however, only a univariate analysis was undertaken. The following table summarises the result of this univariate analysis for the Dublin North network and shows that the most likely characteristics to lead to a day of care outside AEP are:

- Patient age (patients over the age of 75 are more likely to be outside AEP on the day of care)
- Source of referral (patients self referring are more likely to be outside AEP on the day of care).

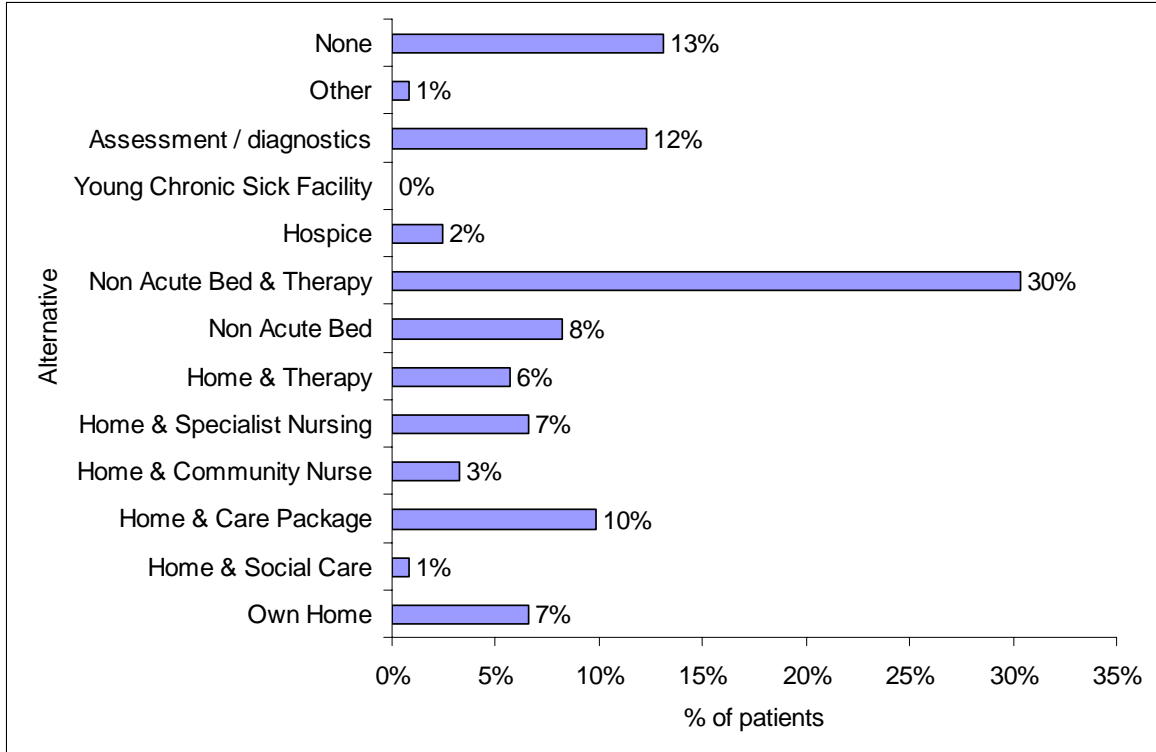
As with the national analysis however, it is again recommended that whilst the analysis provides a set of useful indicators with regards to patient characteristics likely to be representative of admission and/or treatment outside AEP, they should not themselves form the basis around which explanations as to why patients are treated outside AEP are sought. Again, all unknowns were excluded from this analysis.

Table G.3 Results of univariate analysis of the strongest relations between patient characteristics and lying outside AEP on day of care

| Characteristic | χ^2 | df | P | Attribute | % Outside AEP | % Inside AEP |
|--------------------|----------|----|-------|----------------|---------------|--------------|
| Patient Age | 85.795 | 2 | 0.000 | Under 65 | 26 | 46 |
| | | | | 65 – 74 | 23 | 26 |
| | | | | 75 + | 51 | 28 |
| Source of Referral | 63.418 | 4 | 0.000 | GP | 19 | 33 |
| | | | | Other Hospital | 6 | 3 |
| | | | | Outpatients | 15 | 23 |
| | | | | Self | 58 | 40 |

G.4.2 Alternatives Identified to Acute Care

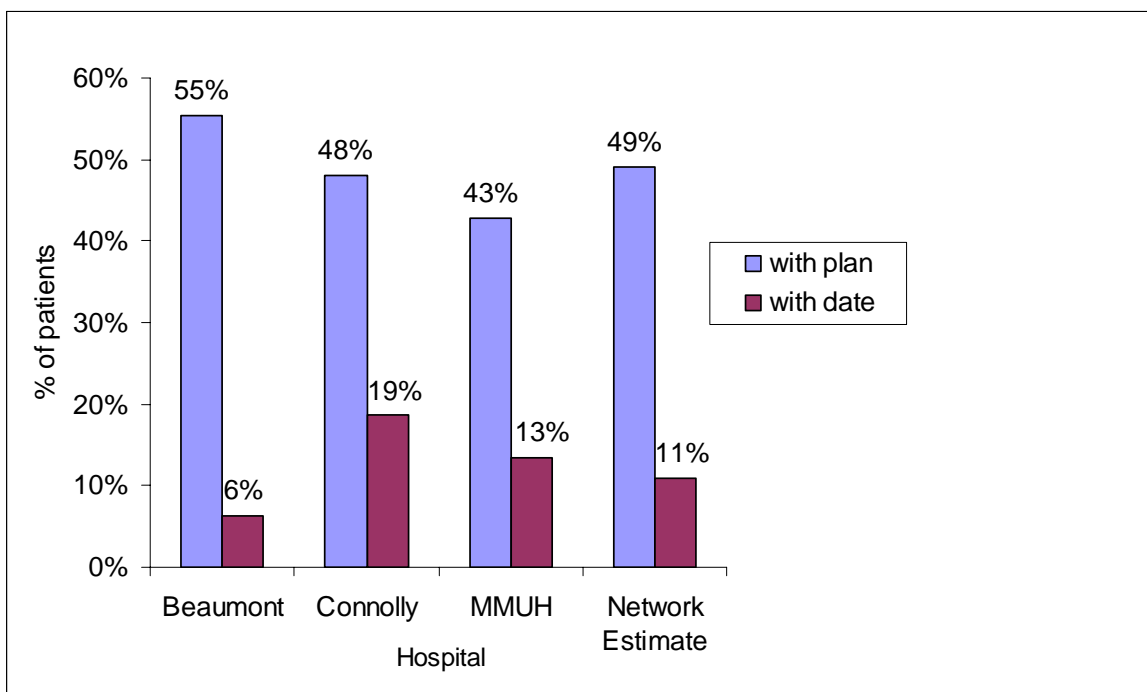
Figure G.13 Alternatives identified for patients outside the AEP on day of care



Non-acute bed with therapy support (30%) was the most significant alternative to acute care identified. This was followed by access to assessment and diagnostics (12%) and home and care package (10%).

G.4.3 Discharge Planning

Figure G.14 Percentage of patients with evidence of discharge planning



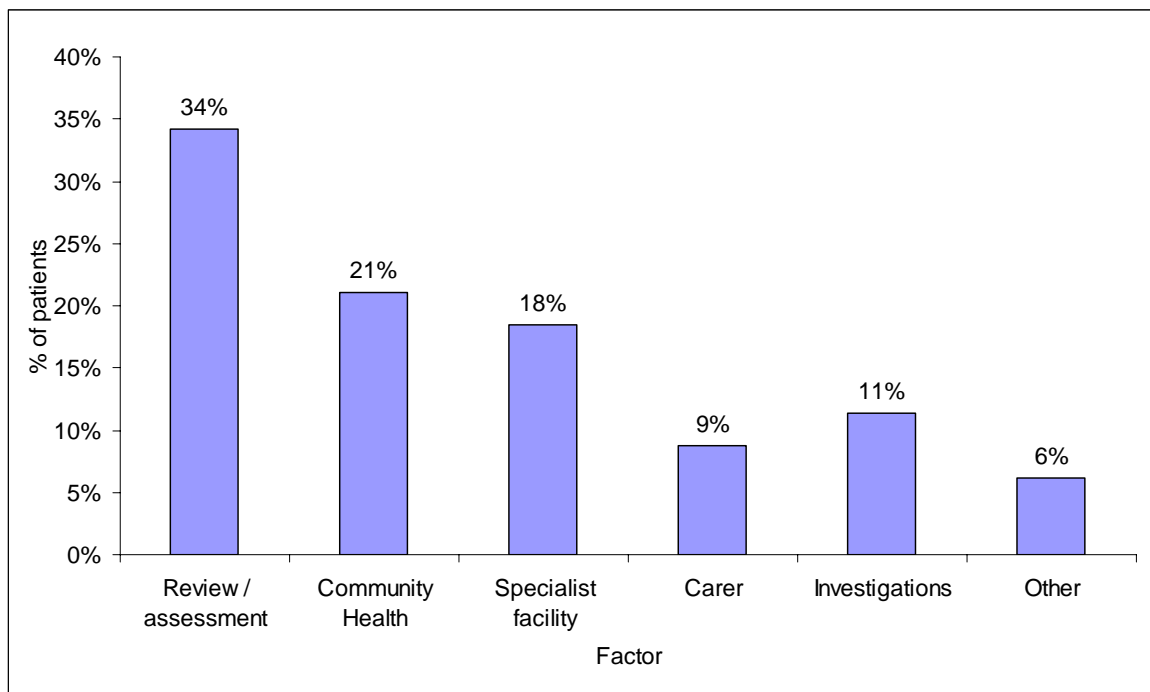
Discharge planning was in evidence for approximately half of patients surveyed in Dublin North (49%). Surveyors identified whether or not there was any evidence of planning or consideration of discharge arrangements. A formal discharge plan or pro-forma was not required to meet this criterion.

The occurrence of discharge planning varied between a high of 55% at Beaumont to a 43% of patients at MMUH.

A low proportion of patients had a predicted date of discharge. The network average was 11%. This varied between 6% and 19% at individual hospitals.

G.4.4 Factors Affecting Discharge

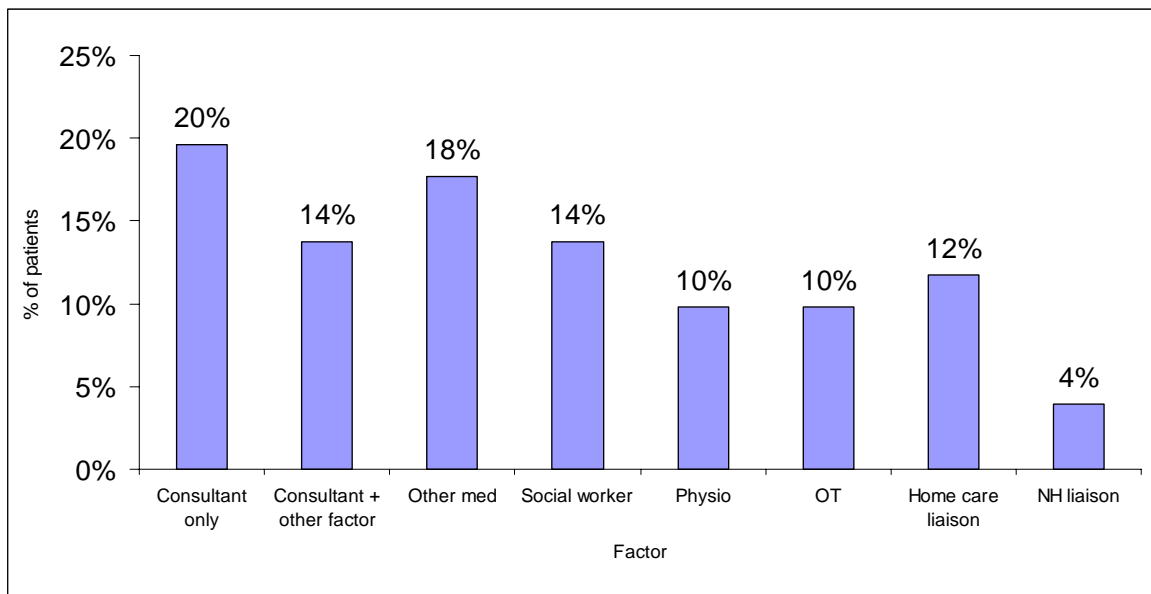
Figure G.15 Factors affecting discharge for patients outside the AEP



Analysis of the factors affecting discharge highlights patient review and assessment as the most prevalent factor, impacting 34% of patients. A further 21% of patients are awaiting access to community health support and 18% are awaiting access to a specialist facility.

a. Breakdown of the review/assessment factor

Figure G.16 Breakdown of the review/assessment element of discharge



Analysis of the factors affecting discharge shows that the most significant factor was awaiting review or assessment (34%). In 52% of the occurrences, the involvement of a medical member of staff was identified.

G.5 Assessment of Implications

G.5.1 AEP on Admission

The network level of 10% of admissions outside of the AEP criteria is similar to that found in surveys elsewhere and is lower than the national average of 13%. This level varied amongst the hospitals in the network and Beaumont had the lowest proportion of patients outside of the AEP in the national study (5%). Reasons for this low figure were suggested at the network consultation session, including the current pressure on the emergency department, the outreach programme for COPD which may reduce avoidable admissions and the pressure on acute beds caused by the high volume of long-stay non-acute patients resulting in a higher threshold for admission.

It should be emphasised that it might not be known or obvious at the time of admission that the patient was outside the AEP criteria and the results should not be interpreted as suggesting that all of these patients might have had alternatives to acute admission. Each hospital requires a certain level or 'buffer' of inappropriate admissions. This is to reduce risk of non-admission of appropriate patients. The size of this buffer is determined by the acceptable level of risk defined by the hospital and its balance between demand and capacity.

Surveyors recorded 8% of patients across the network for whom i/v therapy was the only AEP admission criterion met. This figure is lower than the national average of 12%. These patients are in addition to the 10% who did not meet any AEP admission criteria and professional opinion now suggests that many of these patients could receive such therapy outside an acute location. At MMUH, i/v therapy was the only criterion identified for just 1% of patients surveyed. It was thought this may reflect the benefits of some outreach initiatives implemented by the hospital.

The results of the surgical variant of the AEP show that 70% of patients did not meet the timeliness criteria, which suggests that patients are not being admitted on the day of surgery. This practice is proving difficult to change in the context of reported high cancellations of elective surgery, as patients are admitted early to secure an acute bed in advance of surgery.

G.5.2 AEP on Day of Care

The survey found that 36% of patients surveyed could potentially have been cared for outside of the acute hospital setting on their day of care. Although this appears to be a large 'headline' figure, it was the lowest level of any network in this study and is atypical of findings from other survey locations. As with the AEP on admission, it should not be interpreted as meaning that these patients should *necessarily* be in other care settings - only that there exists some potential for this. The study found that 18% of these patients (the highest level of any network) were undergoing some form of rehabilitation eg physiotherapy, which could have taken place in a non-acute setting if alternatives were available.

G.5.3 Alternatives to Acute Care

The most common potential alternative identified to acute hospital admission was access to assessment and diagnostics, which was considered the appropriate option for 32% of patients outside of the AEP. Access to a non-acute bed and therapy was identified for

21% of patients. This was followed in prevalence by a range of community and home based options: access to a hospice bed (3%), home with specialist nursing support (3%) and home with community nursing support (3%).

The most common alternative to acute care suggested for patients outside of the AEP on the day of care was access to a non-acute bed with therapy support, which was considered to be the appropriate alternative for 30% of patients. The network highlighted that in Beaumont particularly poor access to long-term care has effectively 'blocked' access to acute hospital beds. This issue is exacerbated by the accommodation of patient choice of long-term care provider.

Demand for access to assessment and diagnostics was identified for 12% of patients. The third most common alternative was patient home with home care package (10%).

The survey findings confirm the importance of providing a broad spectrum of home and community based services to reduce pressure on acute beds.

G.5.4 Planning and Delivery of Acute Care

Discharge planning was in evidence for 49% of patients surveyed, the highest level of any network however the use of predicted dates of discharge was low (12%). Even though this compares favourably to other networks surveyed, the fact that discharge planning is in place for less than half of patients suggests that there is scope to increase levels of discharge in Dublin North.

The network felt that the proportion of admissions from other hospitals (7%) was in reality higher than the data drawn from the patient notes indicated and that repatriation of intra-hospital transfers and out of area patients was a significant discharge delay factor in Dublin North.

Most patients awaiting review or assessment were waiting to see one or a number of clinical staff, and in 51% of the occurrences, the involvement of a consultant was identified. The network consultation confirmed that some internal hospital processes were creating delay including review, ward rounds and investigations.

Access to assessment and diagnostics was the most common alternative to admission identified, and was also a prevalent factor in admitted patients staying in acute beds inappropriately. The network expressed the view that current pathways do not support the necessary levels of diagnostics via outpatients, and this has led to a practice of admitting patients as inpatients to access diagnostics.

G.6 Conclusions and Recommendations

Conclusion G1: Difficulties accessing assessment and diagnostics are leading to avoidable admissions in Dublin North and increasing length of stay.

Recommendation G1: Improve access to diagnostics and assessment without admission to the acute hospital setting. This includes:

- Extended hours/seven day access to hospital based diagnostics
- Improved GP access to diagnostics.

Conclusion G2: Improved access to non-acute beds would reduce avoidable admissions and increase the appropriate placement of patients in Dublin North.

Recommendation G2: Confirm the scale of the capacity gap for non-acute beds at network level and develop a plan to close this gap.

Conclusion G3: There is an opportunity to increase the level of discharge planning in Dublin North, particularly for non-complex discharges, to improve bed utilisation.

Recommendation G3: Implement discharge planning for all patients in all acute hospitals in Dublin North.

Conclusion G4: Patients could be discharged sooner and some patients could avoid admission if the home-based care required to enable patients to stay in their own homes was available.

Recommendation G4: Review processes for providing home-based care to patients as an alternative to admission and in facilitation of timely discharge.

APPENDIX H: Network 8 – Dublin South

H.1 Introduction

The survey was undertaken in the Dublin South Network on Tuesday and Wednesday 23rd and 24th January 2007. This network provides acute care via four hospitals, as listed below. Of these St. Vincent's and St. James's are casemix group 1 hospitals, St Columcille's is a casemix group 2 hospital and St Michael's is not included in the casemix programme.

- St. Columcille's
- St. Vincent's
- St. Michael's
- St. James's

As detailed in the methodology, each hospital was allocated a survey sample size based on the number of beds supporting the specialities included in the exercise (medical and surgical). The following table lists for each hospital in this network, the applicable patient population on the day of the survey (Survey Population), the size of this population as a percentage of the full network population (% of Total Network Patients), the number of patients sampled from that population (Survey Sample), and the percentage of this sample with regards to the survey population (% of the Survey Population).

It shows that in the Southern Network, St. Michael's had the largest sample percentage, with 61% of its patients on the day of the survey being sampled, and St. James's had the smallest sample percentage, with 18% of patients being selected as part of the survey sample.

Table H.1 Dublin South network hospital sample

| Hospital | Survey Population | % of Total Network Patients | Survey Sample | % of the Survey Population |
|------------------|-------------------|-----------------------------|---------------|----------------------------|
| St. Columcille's | 130 | 9% | 75 | 58% |
| St. James's | 715 | 50% | 127 | 18% |
| St. Michael's | 82 | 6% | 50 | 61% |
| St. Vincent's | 503 | 35% | 134 | 27% |
| Total | 1430 | 100% | 386 | 27% |

A consultation session was held on Thursday 8th March to review the raw survey data with managerial, clinical and nursing stakeholders from the Dublin South Network. The objectives of this meeting were to:

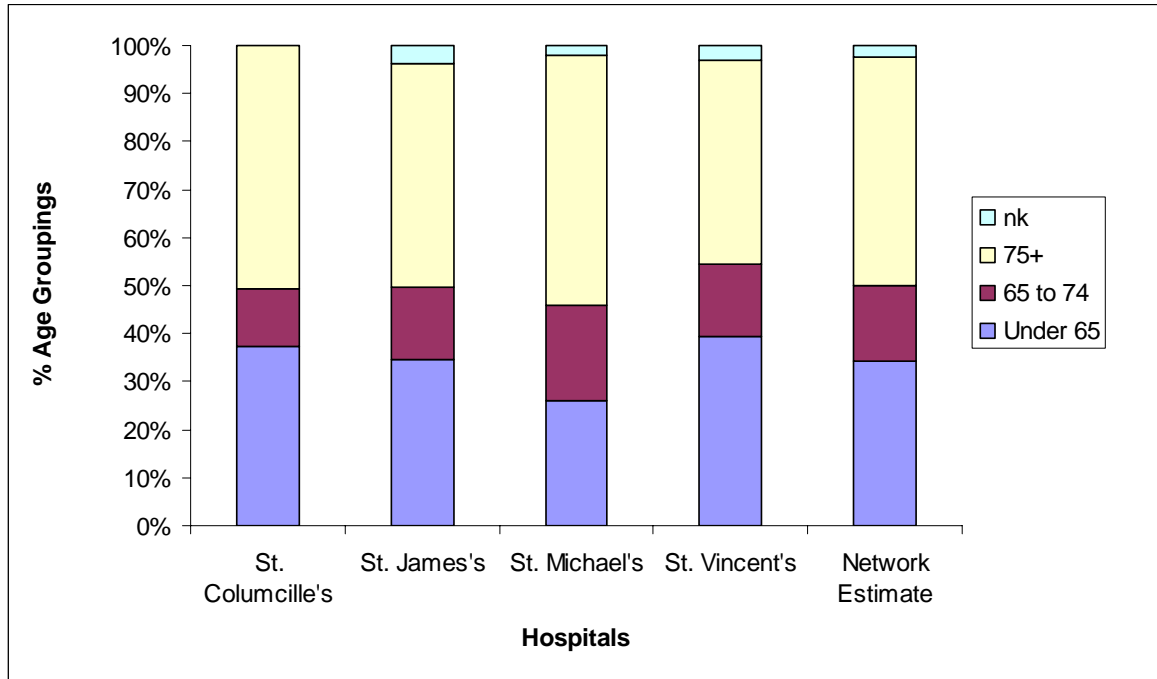
- Share the findings of the bed utilisation survey
- Understand the local factors influencing bed use
- Identify options for improving bed utilisation eg through process change and service reconfiguration.

The output of the session is incorporated into the analysis of the survey data in this section of the report.

H.2 Patient Profile

H.2.1 Patient Age

Figure H.1 Patient age profile by hospital and network estimate

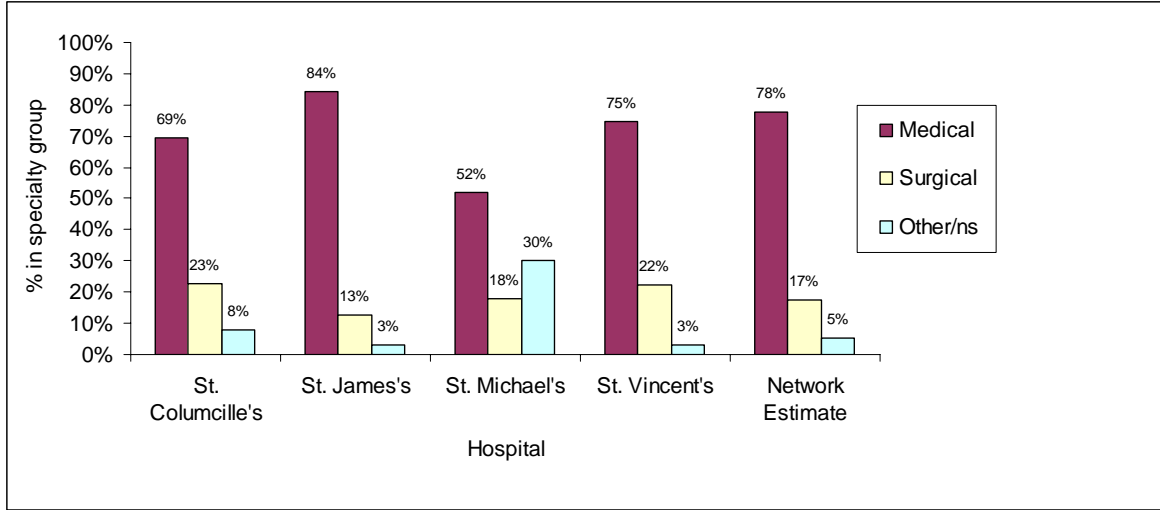


This graph presents the age profile of the patients surveyed in Dublin South and shows that on average 64% of these patients were 65 years of age or over. The proportion of patients under 65 was lowest at St. Michael's at 26% and was higher in the other hospitals, reaching 40% at St. Vincent's. Patient age was not available for 3% of patients surveyed.

Based on the data in the patient charts, 60% of patients surveyed in Dublin South had a GMS card.

H.2.2 Patient Speciality

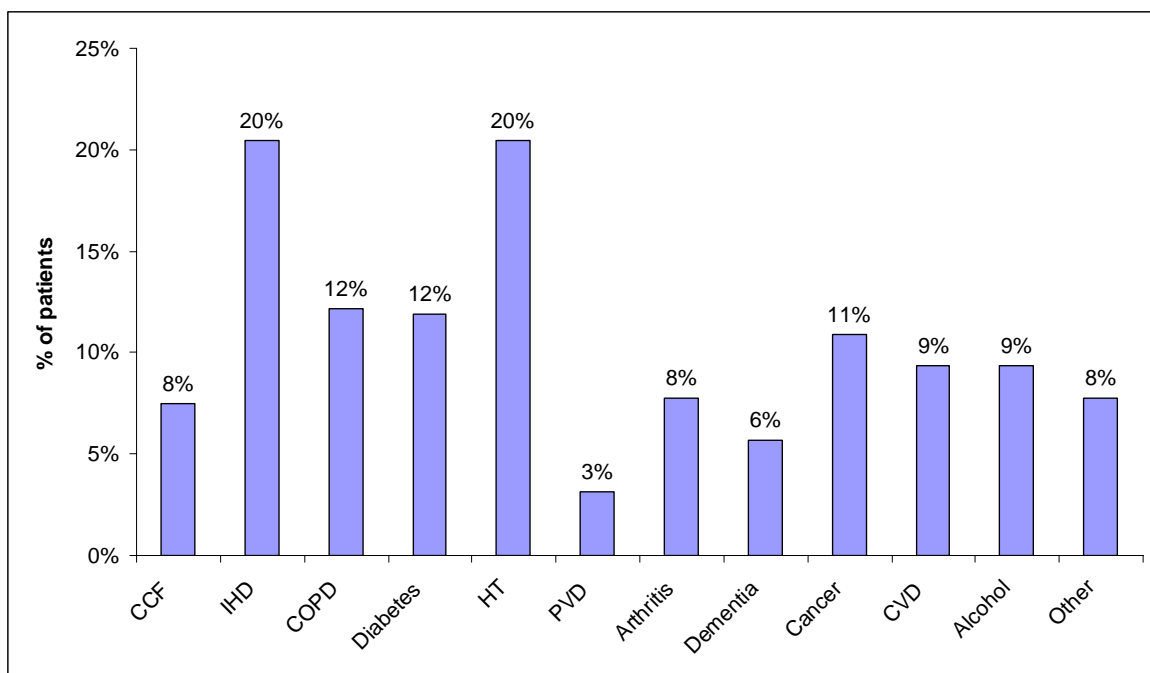
Figure H.2 Bed designation of patients on admission



The majority of patients (78%) at all sites surveyed were medical. The balance of surgical and medical patients varied across the hospitals however. These data show that the proportion of medical patients ranged from 84% in St. James's to 52% in St. Michael's. St. Vincent's and St. Columcille's had the highest proportion of surgical patients – at 22% and 23% of the admitted patients surveyed.

H.2.3 Patient Comorbidity (Type)

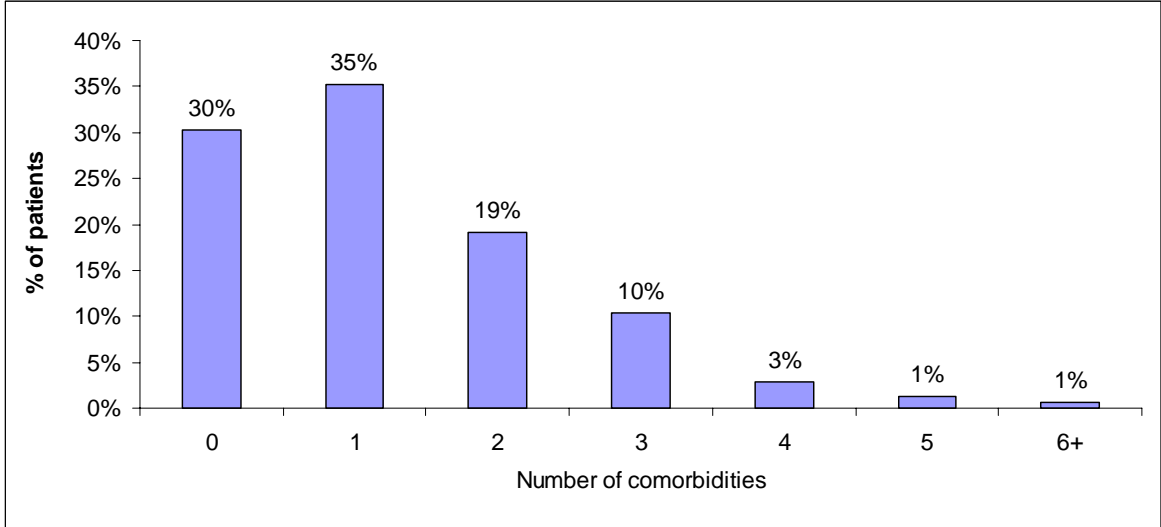
Figure H.3 Type and percentages of comorbidities presented by patients



Hypertension (HT) and Ischaemic Heart Disease (IHD) were the most common comorbidities recorded with 20% of patients surveyed presenting with each. As illustrated by this graph however, a range of other comorbidities were also prevalent: Chronic Obstructive Pulmonary Disease (COPD), Diabetes and Cancer were each prevalent amongst 11-12% of patients.

H.2.4 Patient Comorbidity (Prevalence)

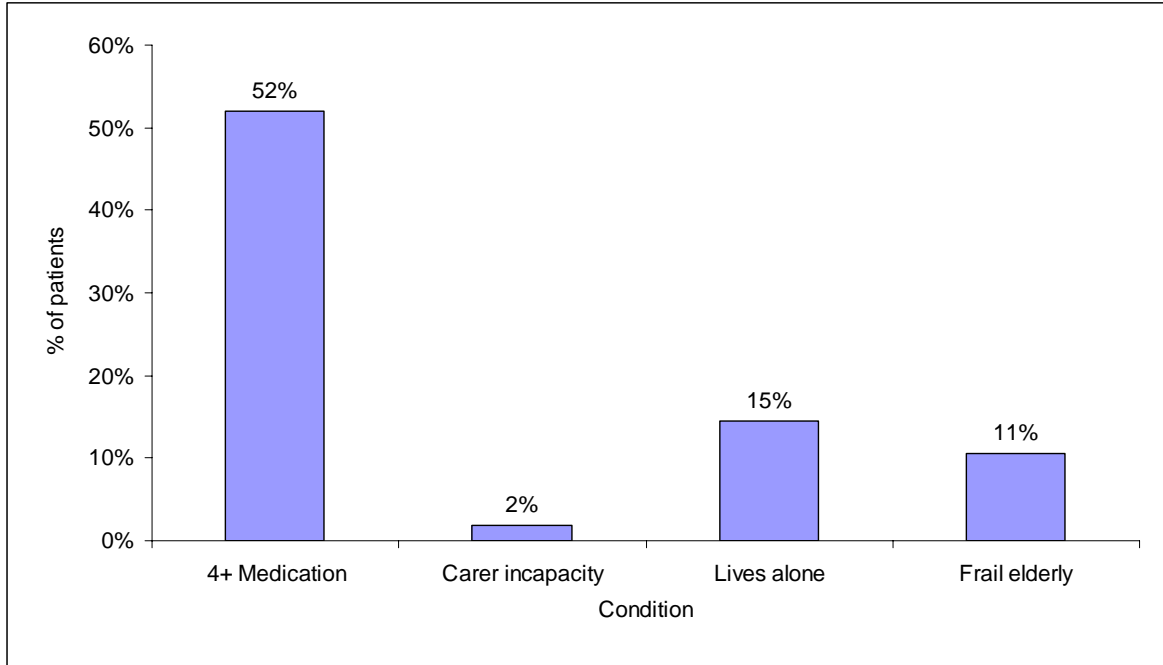
Figure H.4 Percentage of patients presenting comorbidities



Further analysis patient comorbidity underlines the extent of prevalence amongst admitted patients across the network, as 70% of patients presented with at least one comorbidity and 35% of patients had at least two.

H.2.5 Other Patient Conditions

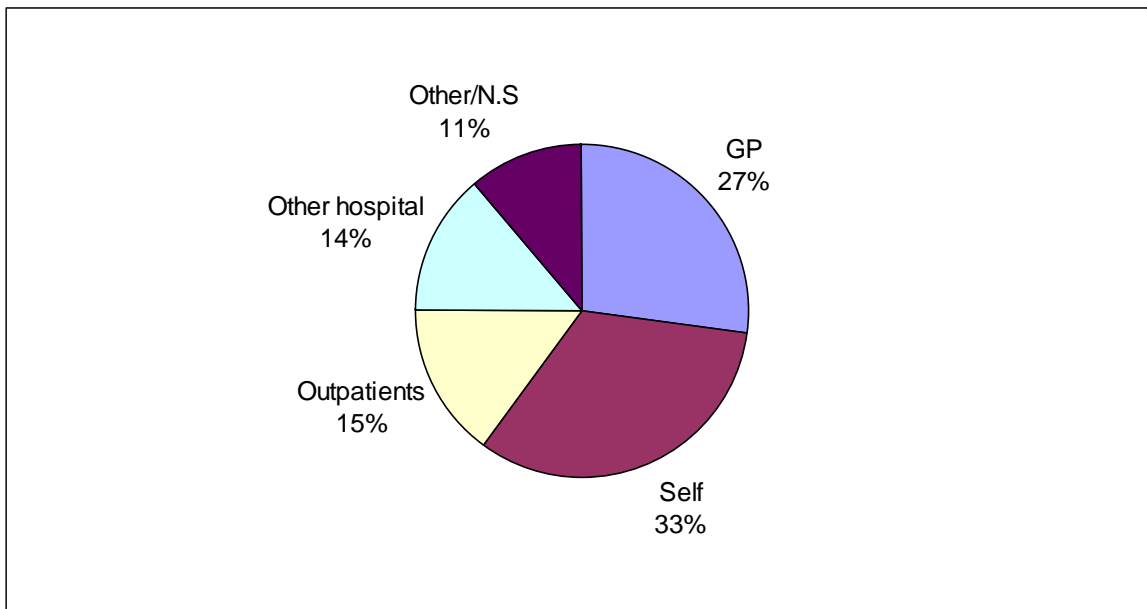
Figure H.5 Percentage of patients presenting with other conditions



Approximately half of patients surveyed (52%) were on multiple medication therapies. Other risk factors were also evident from the patient notes; 15% of patients were identified as living alone and 11% were considered frail elderly.

H.2.6 Source of Referral

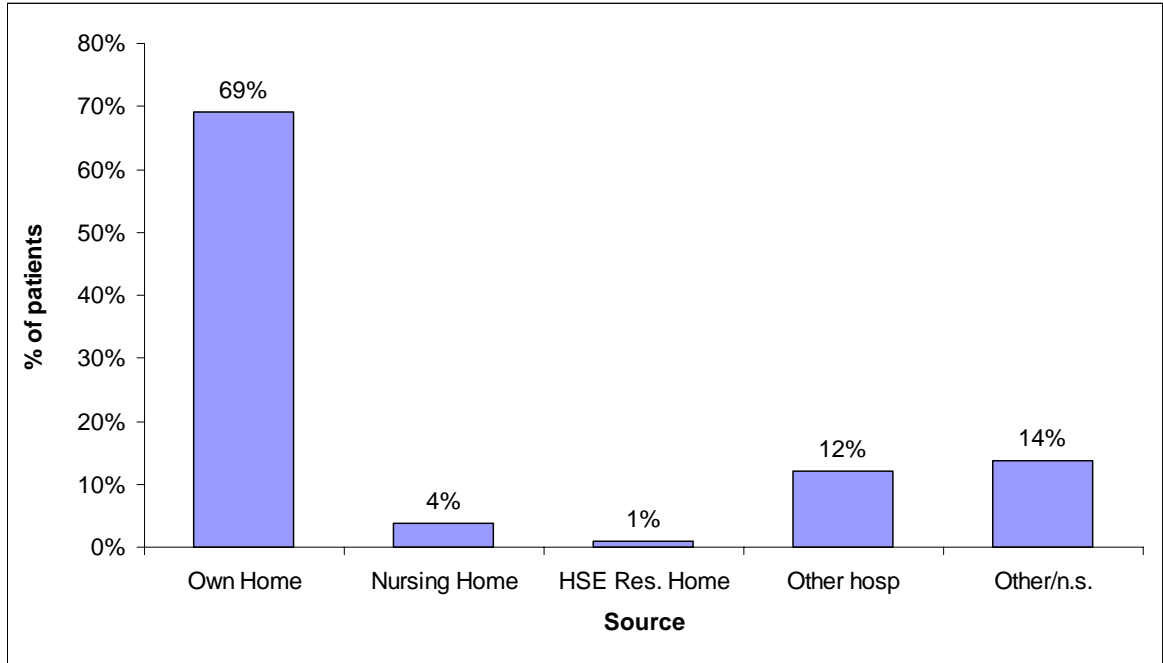
Figure H.6 Source of patient referral



Patient self-referral was the most common source of referral, at 33%. GP referrals accounted for 27% of acute hospital admissions. A further 15% of patients were referred from outpatients and almost the same proportion were referred from other hospitals. The source of referral was not known/not recorded on the patient notes for 11% of patients.

H.2.7 Source of Admission

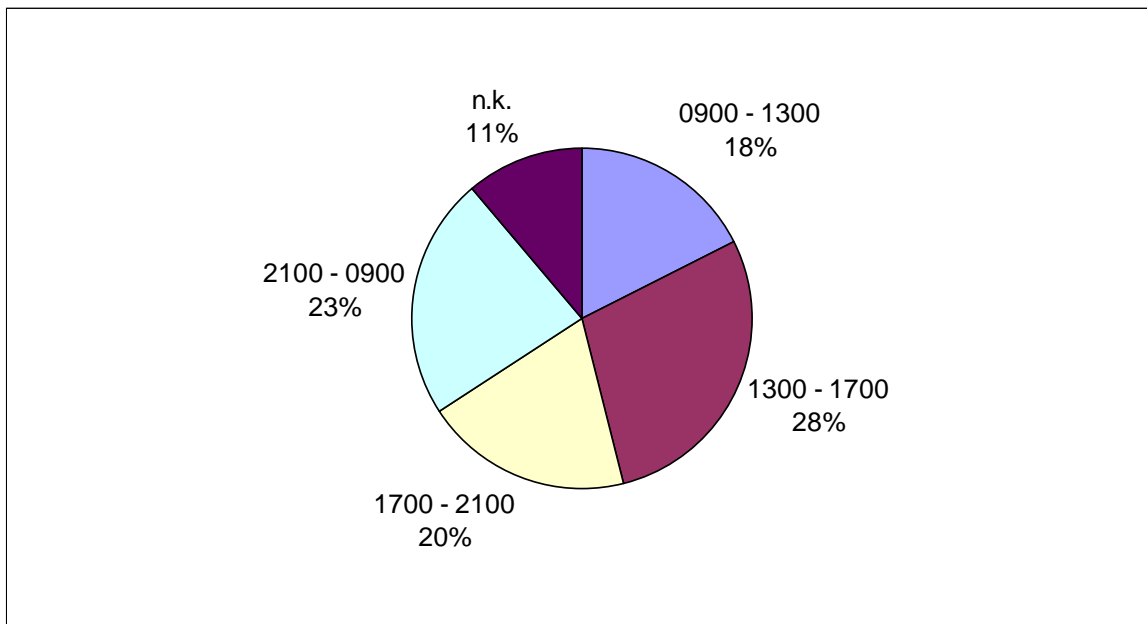
Figure H.7 Source of patient admission



The majority of patients surveyed (69%) were admitted from their own homes. The data indicate that 12% of patients were transferred from other hospitals. Nursing homes admissions accounted for 4%, with a further 1% of patients admitted from HSE residential homes. The source of admission was not specified for 14% of patients.

H.2.8 Time of Arrival

Figure H.8 Time of patient arrival

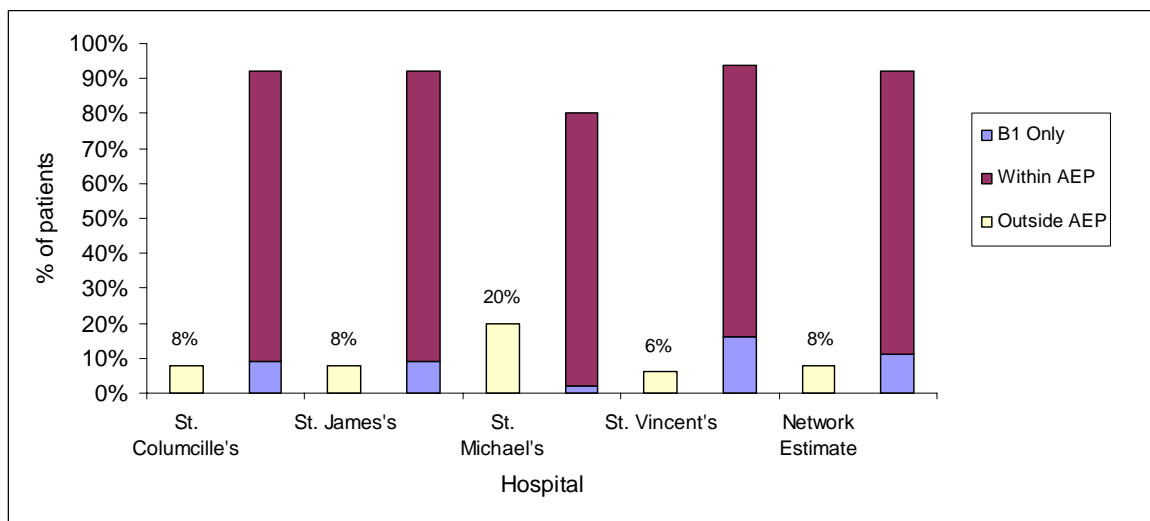


Almost half of all admitted patients (48%) arrived in the afternoon and evening, between 1PM and 9PM. Time of arrival was not available in the notes for 11% of admissions. Almost one quarter of admissions (23%) presented at night, between 9PM and 9AM.

H.3 Day of Admission

H.3.1 AEP Findings

Figure H.9 Categorisation of patients with regards to the AEP on day of admission



Across the Dublin South network 8% of the patients surveyed were admitted outside of the AEP Criteria, and in some instances could potentially have been treated in an alternative, non-acute setting. As illustrated in the graph above, the survey results varied by hospital. The level of admission outside the AEP was lowest at St. Vincent's at 6%. At both St. Columcille's and St. James's, 8% of patients were admitted outside the AEP. At St. Michael's, the proportion of patients admitted outside the AEP was 20%.

For 11% of patients surveyed, i/v therapy was the only AEP criterion met. Again, this varied considerably between hospitals – from 2% at St. Michael's, to 9% at both St. Columcille's and St. James's, to 16% at St. Vincent's.

a. *Statistical analysis of the influence of patient characteristics on aep results for admission*

In order to attempt to better understand why patients are admitted outside AEP, it was decided as in the national report to undertake a statistical analysis of the various characteristics that could potentially have an influence on this for patients at a network level. Unlike the national analysis however, only a univariate analysis was undertaken. The following table summarises the result of this univariate analysis for the Dublin South network and shows that the most likely characteristics to lead to admission outside AEP are:

- County of residence (patients from Kildare, Kilkenny and Longford are more likely to be admitted outside AEP)
- Time of arrival (patients arriving between 13:00 and 17:00 are more likely to be admitted outside AEP).

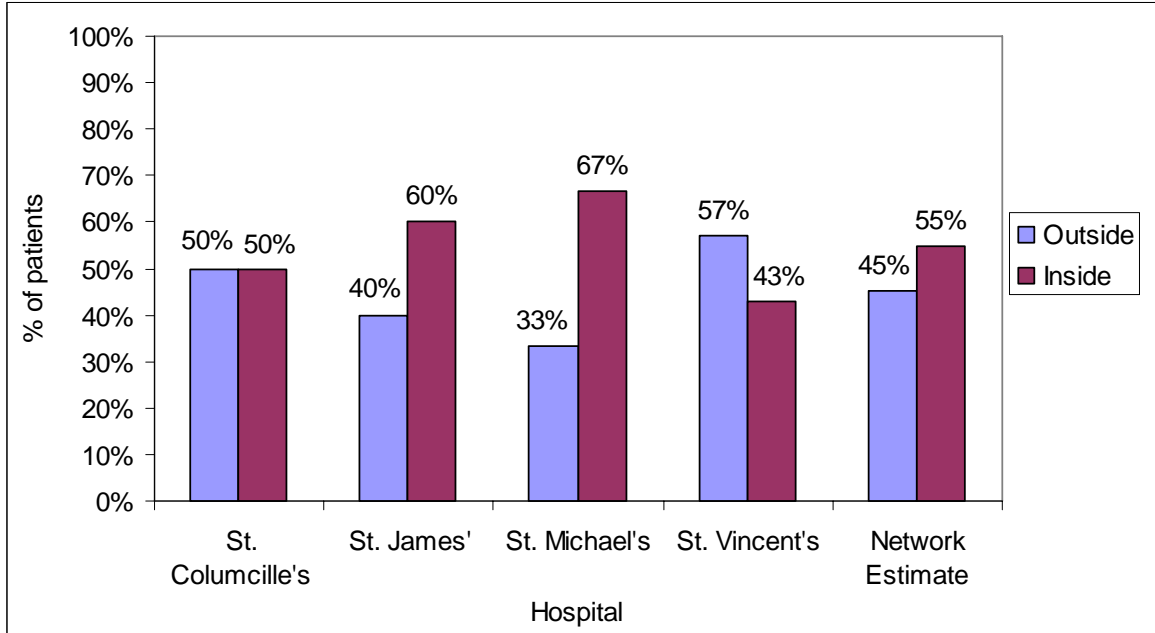
As with the national analysis however, it is recommended that whilst the analysis provides a set of useful indicators with regards to patient characteristics likely to be representative of admission and/or treatment outside AEP, they should not themselves form the basis around which explanations as to why patients are admitted outside AEP are sought. It should also be noted that all unknowns were excluded from this analysis.

Table H.2 Results of univariate analysis of the strongest relations between patient characteristics and lying outside AEP on admission

| Characteristic | χ^2 | df | P | Attribute | % Outside AEP | % Inside AEP |
|---------------------|----------|----|-------|---------------|---------------|--------------|
| County of Residence | 110.879 | 22 | 0.000 | Dublin | 63 | 65 |
| | | | | Kildare | 11 | 7 |
| | | | | Kilkenny | 3 | 0 |
| | | | | Longford | 4 | 1 |
| | | | | Wicklow | 7 | 11 |
| Time of Arrival | 31.933 | 3 | 0.000 | 09:00 – 13:00 | 15 | 23 |
| | | | | 13:00 – 17:00 | 54 | 31 |
| | | | | 17:00 – 21:00 | 23 | 19 |
| | | | | 21:00 – 09:00 | 8 | 27 |

H.3.2 Elective Surgery Findings

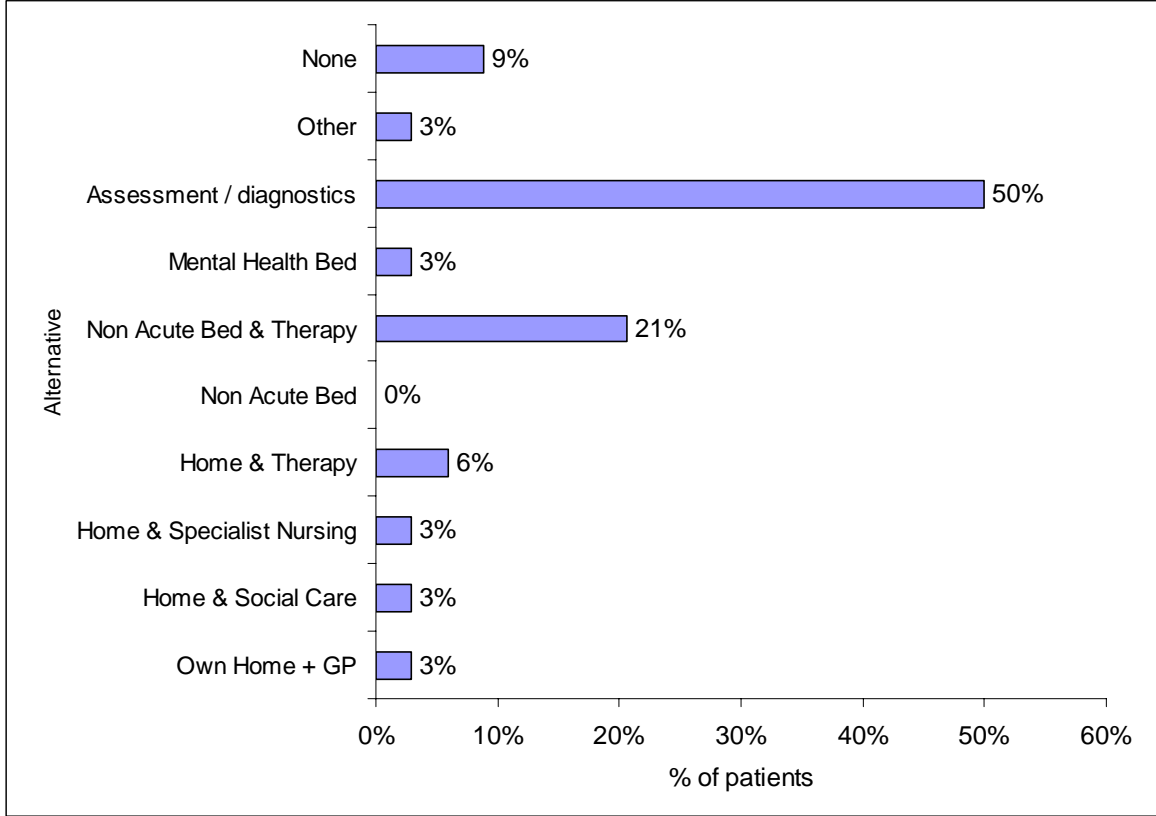
Figure H.10 Categorisation of patients with regards to elective surgery



Of the elective surgery patients surveyed, 65% did not meet the timeliness criteria and 50% did not meet the location criteria. This graph shows that 45% of patients did not meet both criteria.

H.3.3 Alternatives Identified to Admission

Figure H.11 Alternatives identified to admission for patients outside the AEP on day of admission

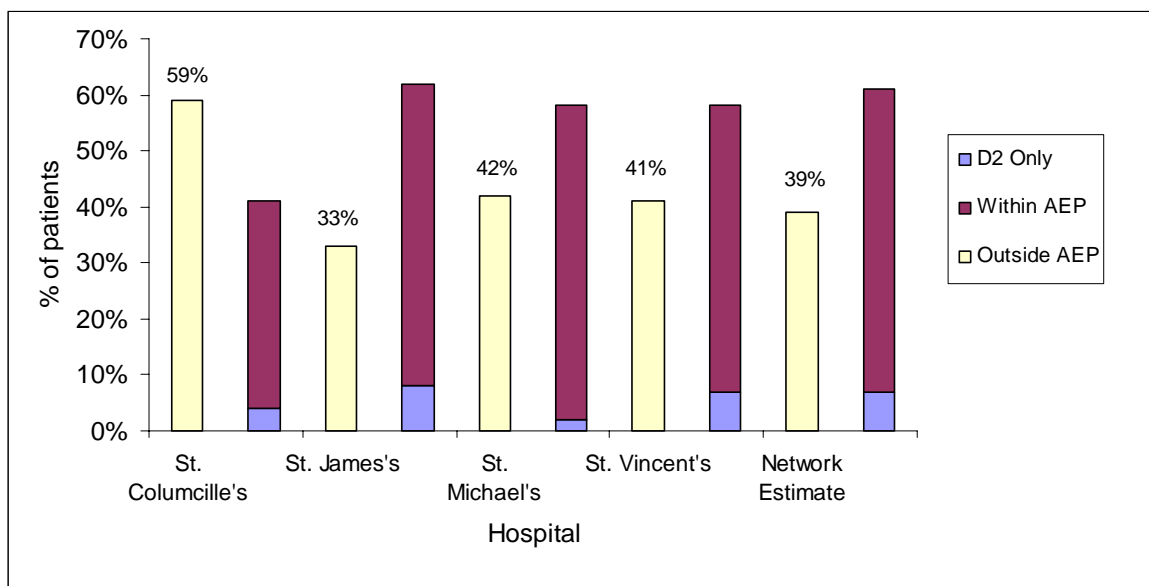


Reviewing the alternatives that could have averted admission for patients outside of the AEP criteria highlights access to assessment and diagnostics as the most common alternative - identified for 50% of patients. Non-acute bed and therapy was the second most common option, considered appropriate for 21% of patients outside the AEP. Home with therapy support was identified for a further 6% of patients.

H.4 Day of Care

H.4.1 AEP Results for Day of Care

Figure H.12 Categorisation of patients with regards to the AEP on day of care



The survey in Dublin South found that 39% of patients could have been cared for in an alternative setting, if appropriate alternatives were available. The results varied across the network. The proportion of patients outside of the AEP criteria was lowest at St. James's (33%). At both St. Michael's (42%) and St. Vincent's (41%), slightly more than 40% of patients were outside the AEP. The results show that the highest proportions of patients outside of the AEP were at St. Colmcille's (59%).

Of the patients outside of the AEP in Dublin South, 15% were receiving physiotherapy or occupational therapy.

The survey data show that on average i/v therapy was only AEP criterion identified for 7% of patients. This ranged between 2% at St. Michael's and 8% at St. James's.

a. *Statistical analysis of the influence of patient characteristics on AEP results for day of care*

In order to attempt to better understand why patients are treated outside AEP, it was decided as in the national report to undertake a statistical analysis of the various characteristics that could potentially have an influence on this for patients at a network level. Unlike the national analysis however, only a univariate analysis was undertaken. The following table summarises the result of this univariate analysis for the Dublin South network and shows that the most likely characteristics to lead to a day of care outside AEP are:

- County of residence (patients from Dublin are more likely to be outside AEP on the day of care)
- Source of referral (patients self referring are more likely to be outside AEP on the day of care).

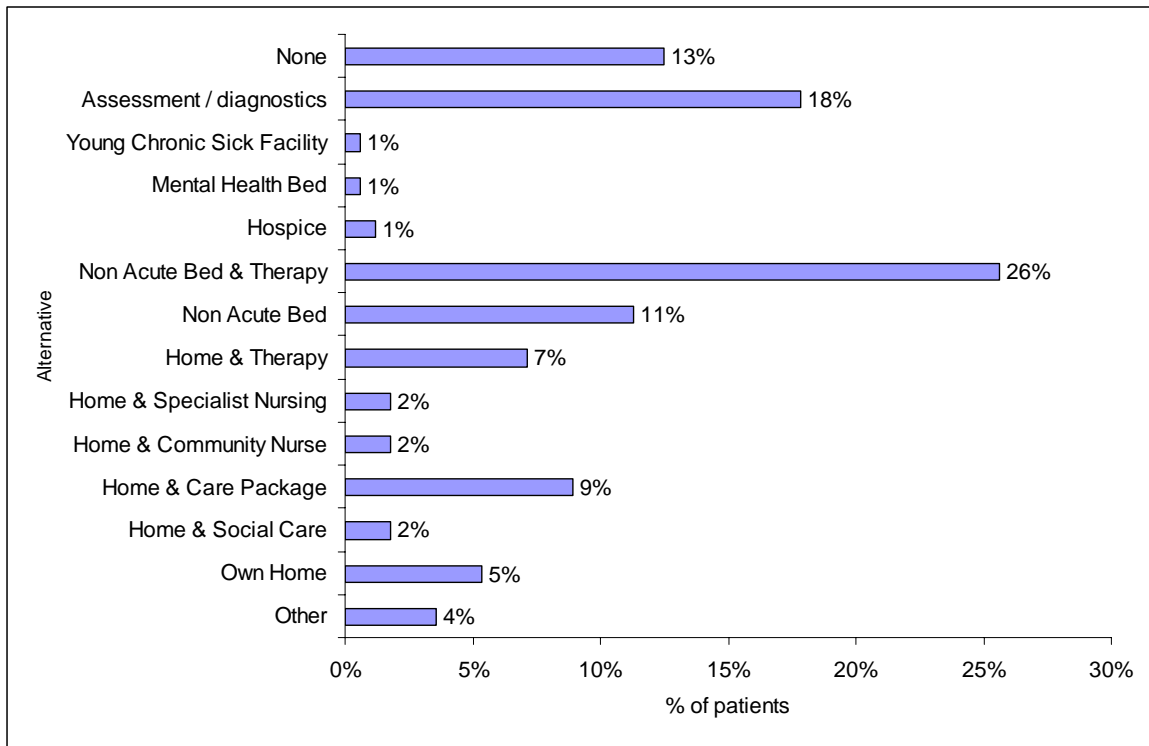
As with the national analysis however, it is again recommended that whilst the analysis provides a set of useful indicators with regards to patient characteristics likely to be representative of admission and/or treatment outside AEP, they should not themselves form the basis around which explanations as to why patients are treated outside AEP are sought. Again, all unknowns were excluded from this analysis

Table H.3 Results of univariate analysis of the strongest relations between patient characteristics and lying outside AEP on day of care

| Characteristic | χ^2 | df | P | Attribute | % Outside AEP | % Inside AEP |
|---------------------|----------|----|-------|-------------|---------------|--------------|
| County of Residence | 171.790 | 22 | 0.000 | Dublin | 76 | 58 |
| | | | | Kildare | 3 | 9 |
| | | | | Wicklow | 10 | 10 |
| Source of Referral | 47.600 | 3 | 0.000 | GP | 31 | 34 |
| | | | | Other | 2 | 4 |
| | | | | Outpatients | 13 | 26 |
| | | | | Self | 54 | 36 |

H.4.2 Alternatives Identified to Acute Care

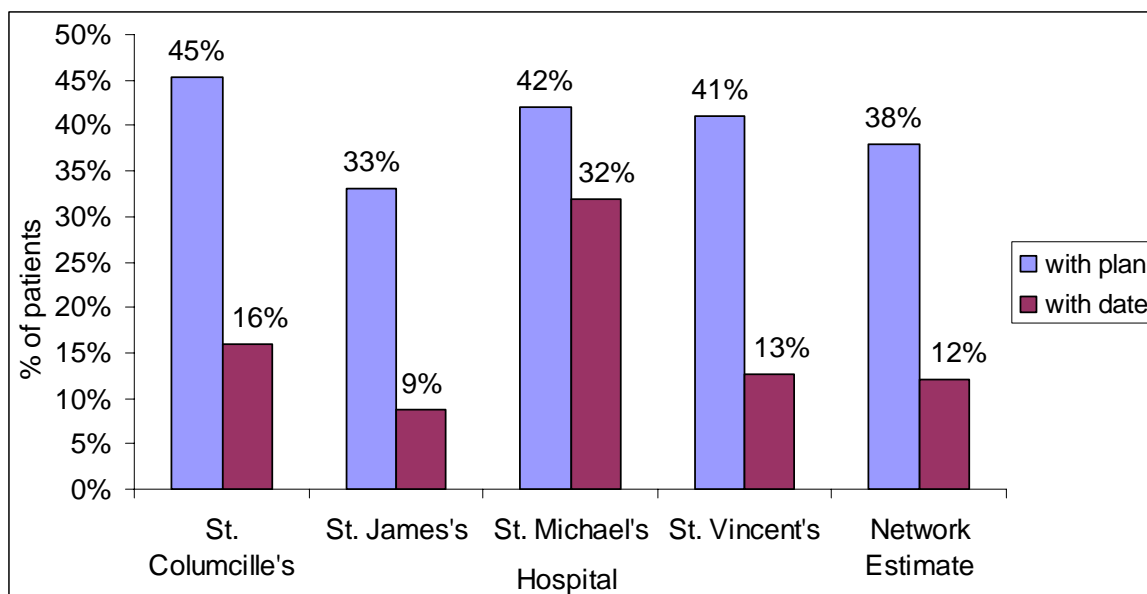
Figure H.13 Alternatives identified for patients outside the AEP on day of care



Analysis of the potential alternatives to acute care identified for the patients outside of the AEP criteria highlights access to a non-acute bed with therapy support as the most common alternative (26 %). Access to assessment and diagnostics was considered an appropriate option for 18% of patients outside the AEP and non-acute bed was identified for a further 11%.

H.4.3 Discharge Planning

Figure H.14 Percentage of patients with evidence of discharge planning



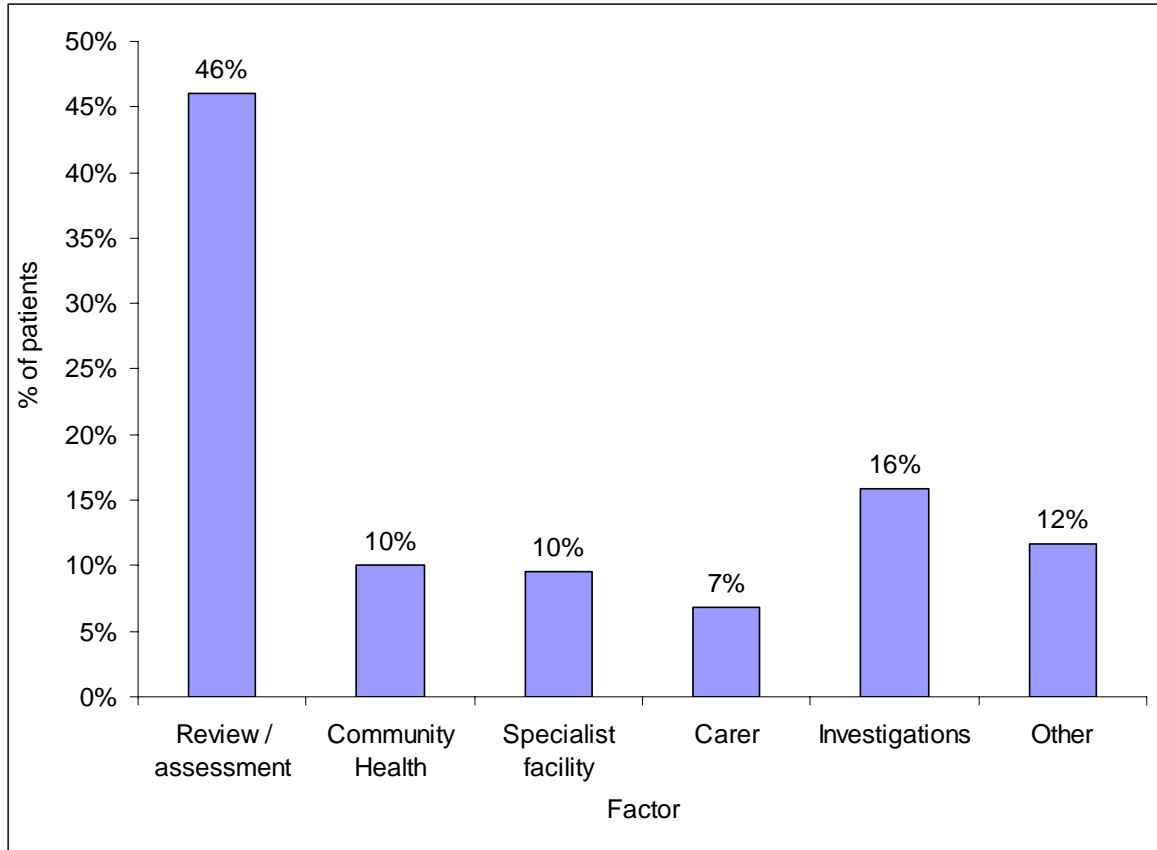
Discharge planning was in evidence for 38% of patients in Dublin South. Surveyors identified whether or not there was any form of discharge plan in each patient's notes taking a liberal definition of 'discharge plan' that was not confined to a specific format. Any record of discussions or consideration of discharge arrangements was sufficient to meet this criterion.

The occurrence of discharge planning varied between a high of 45% at St. Columcille's to a third of patients at St. James' (33%).

The proportion of patients with a predicted discharge date was low – 12% on average across the network. This varied widely, ranging between 9% at St. James's and 32% at St. Michael's.

H.4.4 Factors Affecting Discharge

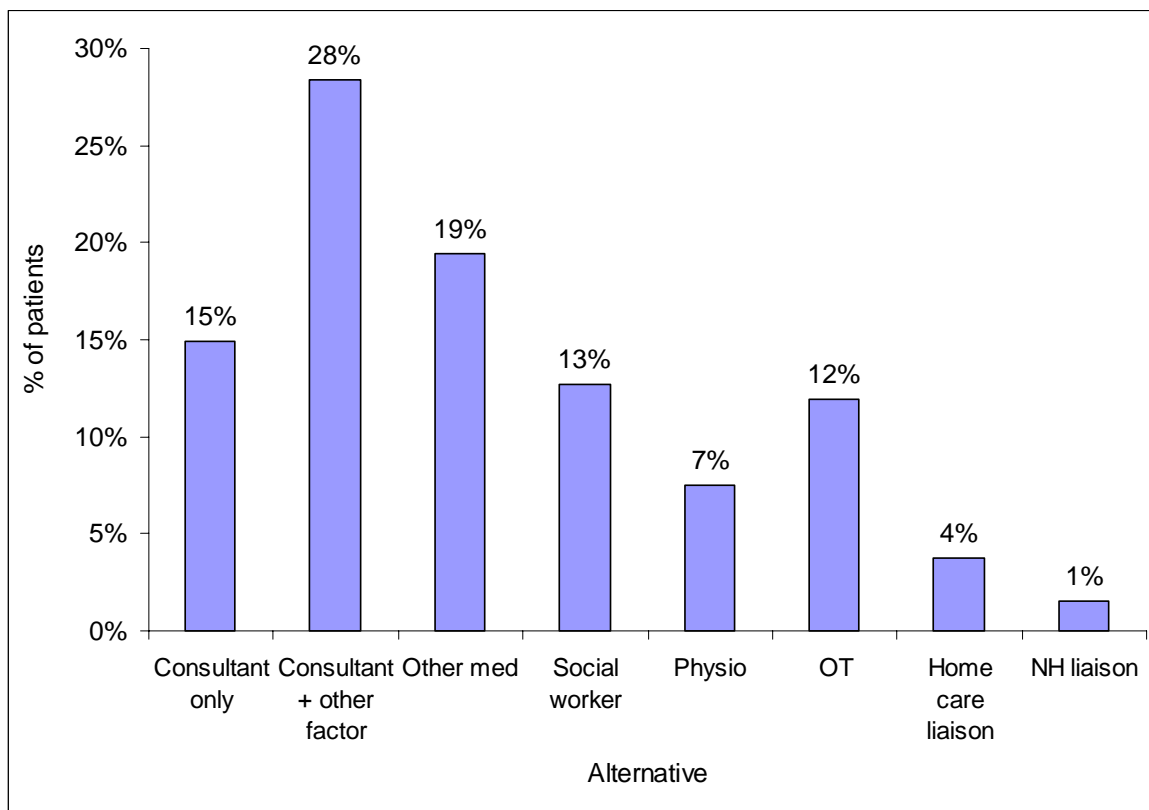
Figure H.15 Factors affecting discharge for patients outside the AEP on day of care



Analysis of the factors affecting discharge highlights patient review and assessment as the most prevalent factor, impacting 46% of patients. A further 16% of patients are awaiting investigations.

a. Breakdown of the Review/Assessment Factor

Figure H.16 Breakdown of the review/assessment element of discharge



The most significant factor affecting discharge was review/assessment (46%). Most patients awaiting review or assessment were waiting to see one or a number of clinical staff, and in 62% of the occurrences, the involvement of a medical member of staff was identified.

The data gathered refer to delays noted on the day of survey irrespective of whether the patient was declared medically fit for discharge or not, and again any individual patient may have had more than one reason noted contributing to delay.

H.5 Assessment of Implications

H.5.1 AEP on Admission

The overall figure of 8% of patients admitted outside the AEP criteria in Dublin South is lower than the national average of 13% and is the lowest network result in this study.

It should be emphasised that it might not be known or obvious at the time of admission that the patient was outside the AEP criteria and the results should not be interpreted as suggesting that all of these patients might have had alternatives to acute admission. Each hospital requires a certain level or 'buffer' of inappropriate admissions. This is to reduce risk of non-admission of appropriate patients. The size of this buffer is determined by the acceptable level of risk defined by the hospital and its balance between demand and capacity.

Surveyors recorded 11% patients across the network for whom i/v therapy was the only AEP admission criterion met. These were in addition to the 8% who did not meet any AEP admission criteria. There are now examples of models of care in Ireland that demonstrate how these patients can be streamed away from acute care and receive i/v therapy in an alternative location.

Of the elective surgery patients surveyed, 65% did not meet the timeliness criteria. Whilst this is the lowest network proportion of patients outside the criteria, and the volume of patients surveyed was low, it still indicates opportunity in Dublin South to admit elective surgery patients closer to their surgery time.

H.5.2 AEP on Day of Care

The study results show that 39% of patients surveyed could potentially have been cared for outside of the acute hospital setting on their day of care. Although this appears to be a large 'headline' figure, it is similar to results of other AEP surveys and is the same as the national average for the study. As with the admission criteria it should not be interpreted as meaning that patients should *necessarily* be in other care settings - only that there exists some potential for this. Analysis of the survey data shows that 15% of these patients receiving therapy support, which could have been provided in a non-acute setting if alternatives were available.

H.5.3 Alternatives to Acute Care

Access to assessment and diagnostics was the most common alternative to acute admission, considered an appropriate option for 50% of patients outside of the AEP. This was followed by non-acute bed with therapy support, identified for 21% of patients. Patient home with therapy support was the third most common option, identified for 6% of patients.

Similar alternatives were identified for patients outside of the AEP on the days of care. Access to a non-acute bed with therapy support was highlighted for 26% of patients. Access to assessment and diagnostics was suggested for 18% of patients and access to a non-acute bed was identified for 11% of patients.

The network highlighted the importance of streaming patients who require rehabilitation aware from the acute setting, both at the point of admission and discharge. This view is

supported by the findings of the study, which highlight the need for both access to non-acute care beds and therapy support (both home and bed-based).

H.5.4 Planning and Delivery of Acute Care

The survey found discharge planning in place for 38% of patients in Dublin North and predicted dates of discharge was in place for 12% of patients. Some hospitals in the network reported that introducing discharge planning was difficult in the context of a lack of community capacity, in particular for long-term care. Taking this constraint into consideration however, there are still gains to be made from small reductions in length of stay through discharge planning for non-complex discharges. The level of patient transfers from other hospitals in Dublin South was the highest recorded in the survey (12% of patients were admitted from other hospitals).

Access to assessment and diagnostics was the most common alternative to admission identified, and was also a prevalent factor in admitted patients staying in acute beds inappropriately. The network expressed the view that current pathways do not support the necessary levels of diagnostics via outpatients, and this has led to a practice of admitting patients as inpatients to access diagnostics.

H.6 Conclusions and Recommendations

Conclusion H1: Difficulties accessing assessment and diagnostics are leading to avoidable admissions in Dublin South and increasing length of stay.

Recommendation H1: Improve access to diagnostics and assessment without admission to the acute hospital setting. This includes:

- Extended hours/seven day access to hospital based diagnostics
- Improved GP access to diagnostics.

Conclusion H2: There is opportunity to increase the level of discharge planning in Dublin South, particularly for non-complex discharges, to improve bed utilisation.

Recommendation H2: Implement discharge planning for all patients in all acute hospitals in the Dublin South.

Conclusion H3: Improved access to non-acute beds would reduce avoidable admissions and increase the appropriate placement of patients in Dublin South.

Recommendation H3: Confirm the scale of the capacity gap for non-acute beds at network level and agree a plan to close this gap.

Conclusion H4: Patients could be discharged sooner and some patients could avoid admission if the home-based care required to enable patients to stay in their own homes was available.

Recommendation H4: Review processes for providing home-based care to patients as an alternative to admission and in facilitation of timely discharge.

APPENDIX I: Hospital Specific Results

The following table presents the AEP results for each hospital with regards to both Day of Admission and Day of Care, and these are presented in the form of % of patients outside AEP. The Standard Error associated with each of these figures are also included for each hospital, along with the sample and census sizes.

Table I.1 Hospital AEP Results for Admission and Day of Care

| Network | Name | Census Number | Sample Number | Outside AEP on Admission | | Outside AEP on Day of Care | |
|----------------------------|------------|---------------|---------------|--------------------------|------|----------------------------|------|
| | | | | % | S.E. | % | S.E. |
| 1 – North Eastern | | | | | | | |
| | Cavan | 115 | 74 | 19 | 3 | 49 | 3 |
| | Drogheda | 176 | 76 | 22 | 4 | 38 | 4 |
| | Louth | 108 | 76 | 22 | 3 | 54 | 3 |
| | Monaghan | 65 | 65 | 22 | 0 | 58 | 0 |
| | Navan | 116 | 72 | 11 | 2 | 47 | 4 |
| 2 – Dublin Midlands | | | | | | | |
| | Tullamore | 197 | 75 | 15 | 3 | 44 | 5 |
| | Mullingar | 128 | 75 | 17 | 3 | 45 | 4 |
| | Portlaoise | 66 | 50 | 30 | 3 | 54 | 3 |
| | Naas | 163 | 75 | 19 | 3 | 39 | 4 |
| | AMNCH | 476 | 125 | 10 | 2 | 28 | 3 |
| 3 – Mid West | | | | | | | |
| | Dooradoyle | 336 | 138 | 6 | 2 | 41 | 3 |
| | St Johns | 84 | 50 | 26 | 4 | 46 | 5 |
| | Ennis | 102 | 52 | 15 | 3 | 35 | 5 |
| | Nenagh | 86 | 52 | 8 | 2 | 38 | 4 |
| 4 – Southern | | | | | | | |
| | Mercy | 159 | 82 | 10 | 2 | 22 | 3 |

| | | | | | | | |
|----------------------------|------------------|-----|-----|-----------|---|-----------|---|
| | SIVU | 168 | 75 | 21 | 4 | 48 | 4 |
| | Mallow | 84 | 51 | 16 | 3 | 39 | 4 |
| | Cork | 469 | 130 | 11 | 2 | 40 | 4 |
| | Kerry | 192 | 75 | 7 | 2 | 44 | 4 |
| | Bantry | 50 | 50 | 34 | 0 | 54 | 0 |
| 5 – West/North West | | | | | | | |
| | Letterkenny | 213 | 74 | 8 | 3 | 24 | 4 |
| | Sligo | 224 | 75 | 13 | 3 | 35 | 5 |
| | Roscommon | 93 | 50 | 28 | 4 | 44 | 5 |
| | Portlincula | 117 | 75 | 13 | 2 | 43 | 3 |
| | UCHG | 437 | 128 | 19 | 3 | 42 | 4 |
| | Mayo | 216 | 79 | 20 | 4 | 42 | 4 |
| | Merlin | 124 | 73 | 29 | 3 | 55 | 4 |
| 6 – South Eastern | | | | | | | |
| | Waterford | 349 | 125 | 9 | 2 | 32 | 3 |
| | St. Luke's | 196 | 75 | 8 | 2 | 44 | 5 |
| | Wexford | 159 | 48 | 19 | 5 | 50 | 6 |
| 7 – Dublin North | | | | | | | |
| | MMUH | 605 | 126 | 13 | 3 | 37 | 4 |
| | Connolly | 204 | 75 | 13 | 3 | 51 | 5 |
| | Beaumont | 615 | 128 | 5 | 2 | 30 | 4 |
| 8 – Dublin South | | | | | | | |
| | St. Columcille's | 130 | 75 | 8 | 2 | 59 | 4 |
| | St. Vincent's | 503 | 134 | 6 | 2 | 41 | 4 |
| | St. Michael's | 82 | 50 | 20 | 4 | 42 | 4 |
| | St. James's | 715 | 127 | 8 | 2 | 33 | 4 |

The Standard Error computation incorporates a finite population correction factor.

APPENDIX J: Univariate Patient Characteristics

The following table presents a breakdown of patient characteristics, with associated percentages, that have been found to be statistically significant (greater than 99%) in characterising which patients are likely to be outside AEP on either admission or day of care. The basis for this has been a univariate analysis.

Table J.1 Percentage of patients per characteristic for both AEP on admission and AEP on day of care

| AEP on Admission | | | AEP on Day of Care | | |
|----------------------------|---------|--------|----------------------------|---------|--------|
| | Outside | Inside | | Outside | Inside |
| Treatment Specialty | | | Treatment Specialty | | |
| | | | Medical | 53% | 47% |
| | | | Other | 20% | 22% |
| | | | Surgical | 27% | 29% |
| Time of Arrival | | | Time of Arrival | | |
| 09:00-13:00 | 19% | 19% | 09:00-13:00 | 14% | 17% |
| 13:00-17:00 | 35% | 27% | 13:00-17:00 | 24% | 23% |
| 17:00-21:00 | 26% | 25% | 17:00-21:00 | 22% | 20% |
| 21:00-09:00 | 20% | 28% | 21:00-09:00 | 23% | 23% |
| Source of Admission | | | Source of Admission | | |
| Hospital - Other | 3% | 1% | | | |
| HSE Residential Home | 2% | 2% | | | |
| Own Home | 91% | 92% | | | |
| Private Nursing Home | 4% | 4% | | | |
| Source Of Referral | | | Source Of Referral | | |
| GP | 41% | 43% | GP | 42% | 44% |
| Hospital - Other | 6% | 4% | Hospital - Other | 5% | 4% |
| Outpatients | 23% | 16% | Outpatients | 12% | 19% |
| Self | 30% | 37% | Self | 41% | 33% |
| Elective Surgery | | | Elective Surgery | | |
| | | | No | 87% | 84% |

| | | | | | |
|----------------------------|-----|-----|----------------------------|------|-----|
| | | | Yes | 13% | 16% |
| | | | | | |
| | | | Patient Age | | |
| | | | 65 to 74 | 18 % | 20% |
| | | | 75 + | 49% | 41% |
| | | | Under 65 | 33% | 38% |
| | | | | | |
| | | | Other Conditions | | |
| | | | 0 | 35% | 43% |
| | | | 1 | 47% | 45% |
| | | | 2 | 16% | 10% |
| | | | 3 | 2% | 2% |
| | | | | | |
| Hospital Casemix | | | Hospital Casemix | | |
| None | 15% | 13% | None | 15% | 13% |
| 1 | 40% | 50% | 1 | 45% | 50% |
| 2 | 45% | 37% | 2 | 40% | 37% |
| | | | | | |
| County Of Residence | | | County Of Residence | | |
| Carlow | 0% | 1% | Carlow | 1% | 1% |
| Cavan | 2% | 2% | Cavan | 2% | 2% |
| Clare | 4% | 2% | Clare | 2% | 3% |
| Cork | 11% | 10% | Cork | 10% | 9% |
| Donegal | 2% | 3% | Donegal | 2% | 4% |
| Dublin | 21% | 29% | Dublin | 31% | 27% |
| Galway | 7% | 5% | Galway | 6% | 5% |
| Kerry | 2% | 3% | Kerry | 3% | 3% |
| Kildare | 5% | 4% | Kildare | 4% | 5% |
| Kilkenny | 2% | 2% | Kilkenny | 2% | 2% |
| Laois | 2% | 1% | Laois | 1% | 1% |
| Leitrim | 2% | 1% | Leitrim | 1% | 1% |
| Limerick | 4% | 5% | Limerick | 5% | 4% |

| | | | | | |
|---------------|----|----|---------------|----|----|
| Longford | 2% | 1% | Longford | 1% | 1% |
| Louth | 4% | 3% | Louth | 3% | 3% |
| Mayo | 6% | 3% | Mayo | 3% | 3% |
| Meath | 2% | 3% | Meath | 2% | 3% |
| Monaghan | 2% | 1% | Monaghan | 2% | 1% |
| Offaly | 3% | 2% | Offaly | 2% | 2% |
| Other_country | 0% | 1% | Other_country | 0% | 1% |
| Roscommon | 4% | 2% | Roscommon | 2% | 2% |
| Sligo | 1% | 2% | Sligo | 1% | 2% |
| Tipperary | 1% | 3% | Tipperary | 2% | 3% |
| Unknown | 2% | 2% | Unknown | 2% | 2% |
| Waterford | 2% | 2% | Waterford | 2% | 3% |
| Westmeath | 3% | 2% | Westmeath | 2% | 2% |
| Wexford | 4% | 3% | Wexford | 3% | 3% |
| Wicklow | 2% | 3% | Wicklow | 3% | 3% |

APPENDIX K: Sampling Framework and Process

K.1 Sampling Framework

As discussed in the main report, each hospital participating in the bed capacity review was allocated a sample size based on the number of patients supporting the specialties included in the exercise (medical and surgical). The number of patients to be included in a sample for an individual hospital was:

| Number of Qualifying Patients per Hospital | Number of Patients in Sample |
|--|------------------------------|
| Fewer than 100 | 50 |
| 100 - 299 | 75 |
| 300 and Over | 125 |

K.2 Sampling Process

To select a sample the following guidelines were provided:

1. Obtain as recent a listing as possible of the hospital's current inpatients by ward. This should be current on the afternoon before the survey.
2. Delete all categories being excluded from the survey (obstetrics, paediatrics, psychiatry, day cases)
3. Calculate the 'selection frequency' (P), which is the number of patients remaining after step 2 divided by the sample size
4. Round up (P) to the next integer value (N) and select every Nth patient from the patient listing
5. Repeat this process for the remaining unallocated patients and for any remaining unallocated sample size.

K.2.1 Example

Our Lady of Lourdes, Drogheda had a total listing of 306 patients (all specialities).

After exclusions the number of patients to sample from was 197.

Thus, adhering to the survey size guidelines as listed above, the sample size was 75.

To calculate $(P) = 197/75 = 2.62$. Therefore, rounding up: $(N) = 3$

Going right through the sample list, selecting every 3rd patient, gave us 65 patients, but we needed to select 10 more as follows:

Take 65 from 197 = 132.

Recalculate (P) which is now $132/10=13.2$ (and N is therefore = 14).

Go back to the listing and select every 14th patient from the remaining unallocated population to be surveyed.

If there was only one left to select after the first round then you can use any random method to select it.

If, on the day of the survey, patients in the sample had been discharged or transferred by the time the survey commences, then replacements were needed. It was agreed in all cases, excluding the hospitals surveyed as part of the Pilot in the North East Region (See Below), that the replacements should also be taken from the preceding day's list, ignoring subsequent admissions. This allowed a 'replacements list' to be established in advance that could be drawn from as required on the day. The steps to follow for this were:

6. Generate a further list of 10 patients using the approach above (ie continuing from step 5)
7. Write down these patients in a list (noting ward for future reference) and then arrange this list in a random order, (eg by shuffling, drawing lots, spreadsheet random numbers, etc)
8. If replacements are needed on the day then select them from this list in the order you have randomly generated
9. If more than 10 replacements are required on the day, go back to the first of the original replacement list and select the next available patient in the ward list.
10. Continue these steps until the sample size is achieved.

K.3 Variation Employed in the North East Region

For the North East Region which served as the Pilot, whilst original sample was selected using as a basis the same steps as previously described (Steps 1 – 5), on the day of the survey, the hospital lists were updated for discharges and admissions, and replacement patients sampled from the admissions list to replace those selected in the original sample, that had subsequently been discharged, using as a basis Steps 1 - 5. This process was however abandoned at the end of the Pilot as it proved to be too cumbersome.

As a result of this, It should however be noted that the census figures upon which the bed utilisation review are based, are for the North East Network the patient census on the day of the survey, but for all other networks they are the patient census on the day before the survey.

APPENDIX L: Inverse Sample Fraction

The sample selection process as described in Appendix K resulted in a total survey sample of 3035 patients being drawn from a total patient population of 8322, which equates to 36.4% of the total patient population.

However, In order to present the most representative picture of the results of the bed utilisation survey it is necessary to undertake a further weighting process as:

- The sample as a whole represents 36.4% of the total patient population, and as such, in order to gain the most representative size and scale of the results derived, it is necessary to scale the figures up for the full bed population.
- The way in which the sample has been drawn creates a bias towards the smaller hospitals, as a much larger percentage of their patient population has been surveyed than those of the larger hospitals. To give a specific example of the level of variation this has introduced in terms of sample percentages across the hospitals, **Bantry** had a sample of 50 patients drawn from a population of 50 patients, representing a **100%** sample, whilst **St. James'** had a sample of 127 patients drawn from a total population of 715 patients, representing a **16.5%** sample. It is worth noting that the biasing of the sample in this way was discussed at the outset of the activity, but it was felt by the HSE that the benefits of giving the smaller hospitals more statistically significant survey samples, outweighed any difficulties created at the network or national level.

The means by which the above issues have been addressed in this report is to weight each hospital, using as a basis its Inverse Sample Fraction which:

- Adjusts the results to reflect most accurately the picture for the full patient population, at a hospital, network and national level.
 - Removes the bias to the smaller hospitals that is inherent in the current sample, by applying a larger weighting to the bigger hospitals.

The formula that has been used for this weighting is as follows:

$$\text{Inverse Sample Fraction} = \text{Hospital Census Size} / \text{Hospital Sample Size}$$

Using by means of specific example two hospitals in the survey, the Inverse Sample Fraction process is as follows:

Mercy

82 patients sampled from a census of 159

$$\begin{aligned} \text{Inverse Sample Fraction} &= 159/82 \\ &= \mathbf{1.94} \end{aligned}$$

Cork

130 patients sampled from a census of 469

$$\begin{aligned} \text{Inverse Sample Fraction} &= 469/130 \\ &= \mathbf{3.61} \end{aligned}$$

This shows that the influence of this process on Mercy is 1.94 and for Cork it is 3.61, as 1 patient for every 1.94 patients in the census were sampled during the survey in Mercy,

and 1 patient for every 3.61 patients in the census were sampled during the survey in Cork.

APPENDIX M: List of Associated Deliverables

As referenced in the main body of this final report, whilst the report in itself represents the main deliverable associated to the bed utilisation review, a number of other deliverables have also been made to the HSE and these are summarised below:

1. **Database** - of all patients surveyed during the course of the bed utilisation review. This has been provided to the HSE in the form of a single Access Database, that could be used as the basis for further investigation at a national, network or Hospital level. From our experience, such databases remain largely valid for up to 24 months, or until the point where changes are introduced into the system.
2. **Surveyor Training Material** – used as a basis upon which to explain to the surveyors the concepts behind the AEP tool, the potential benefits that can be derived from the results generated and also the way in which the AEP form should be filled in.
3. **Surveyors Pack** – consisting of all the material needed by the surveyor to undertake an AEP based bed utilisation review. This includes:
 - The AEP Survey Form (see appendix F).
 - Completion Notes – explaining how each section of the form should be completed.
 - The AEP Criteria – the criteria against which to assess both Day of Admission and Day of Care.
 - The Elective Surgery Criteria – the criteria against which elective surgery patients are to be assessed, in addition to the AEP Criteria,
 - Surveyor Feedback Forms – the means by which relevant feedback from surveyors (eg quality of patient notes) can be recorded.
 - Materials Checklist – Checklist for surveyors to ensure that they have all the material necessary for them to be able to undertake the survey.
4. **Communications Material** – in the form of a poster that can be displayed in the hospitals in advance of the survey to inform the hospital staff of what the survey is, why it's being undertaken, and when it is to occur.

Together these deliverables not only afford hospitals, networks and the HSE to further analyse the data in combinations not addressed in this report, but also to undertake in the future equivalent bed utilisation reviews.

APPENDIX N: Literature Review of AEP

N.1 Introduction

The use of hospital beds is a major area of concern for all involved in their funding, provision and use (Liberati et al, 1995). In most countries the acute hospital sector accounts for a substantial part of the health care budget (Goddard et al, 2000). As a result the reduction of beds is seen as a powerful and immediate way of containing budgets. The pressures that these bed reductions generate have created tensions within the acute sector (Beech et al, 1987; Klein, 1993) as well as highlighting deficiencies in alternative community bed based care.

The strategic and operational solutions required to address these tensions need information that describes the current situation in terms of casemix, intensity and immediacy of care, the timeliness of delivery, the suitability of location and access to the processes of care and finally any delays or constraints to the delivery of necessary care (Restuccia, 2001).

Much of this has been subsumed into the concepts of appropriateness of care applied within a bed utilisation review (McDonagh et al, 2000). The problems in undertaking such a review reflect the complexity of the casemix and the care being delivered. For example, a two centre study (Coast et al, 1996) with almost identical percentages of inappropriateness for admission and current stay in hospital had very different factors contributing to the lack of appropriateness despite the explicit standardisation of the methodology across both sites and the use of the same validated assessment tool.

Studies of bed utilisation reviews have shown that they can impact on resource usage. One study showed a subsequent reduction of 13% in admissions and a 11% reduction in stay (Wickizer et al, 1989), and another clear and evidence based practical alternatives to manage inappropriate admissions such as urgent outpatient and domiciliary assessments, palliative care or rehabilitation in alternative settings (Hensher et al, 1999).

However, bed utilisation reviews are often focused on large bed based populations and the nature and sensitivity of bed utilisation reviews is such that unless they are done on a very local and focused group of patients it may be difficult to use the information directly in the change management process at a patient level (Sang & Severs, 1995). But this should not detract from their value in the clinical managerial process by highlighting the range of process issues that need to be addressed – this and the Hawthorn effect of any studies may be seen as the major benefits.

Within a bed utilisation review there are essentially two separate components: the appropriateness of the intervention, or the lack of it, and the appropriateness of the care setting within which that intervention is undertaken (Hunter, 1997). This relates the care processes to the structures and should avoid the trap that the two are necessarily the same. This may be very important in the subsequent creation and redesign of new and innovative models of care. For example, an acute hospital site may have care processes delivered that are not necessarily acute care and, depending on the context, may or may not be appropriately undertaken on that site.

This appendix describes the general nature and role of bed utilisation reviews and then goes on to outline the two principal sets of criteria that have been developed to support this process. The application and validation of these tools is discussed, and a range of results from studies using the criteria is presented, with a specific section devoted to Irish projects (*Irish material provided courtesy of Fiona McMahon, HSE*).

N.2 Background

Bed utilisation reviews are 'systematic audits of the use of acute beds through interrogation of clinical records' (Beech, 2005) and are usually undertaken to examine the potential for patients to avoid unnecessary admissions to acute hospital. Many of the same studies also explore the range of alternative services that might be more appropriately used instead. For example, there may be days spent in acute hospital care by patients waiting for diagnostic procedures that could be carried out in ambulatory or community care settings. Another example is patients in acute beds requiring rehabilitation or palliative care who may be better served in more specialised sub-acute beds or community-based settings.

The interrogation of medical records in a utilisation review is undertaken through the application of objective, diagnosis-independent 'acuity' criteria to patient records. The criteria used in the Appropriateness Evaluation Protocol (AEP) or in the Intensity-Severity-Discharge (ISD) instruments are the most widely used; their development was driven by the demands of the reimbursement processes in the US health care system from the 1960s onwards. Although the criteria sets and methods of application differ between them, both are used to assess whether patients require an acute care setting on their day of admission and on subsequent days of stay in hospital. They are intended to support evaluation of the use of health services, procedures and facilities including the service provision and the setting in which it is provided. While they provide clinical criteria for assessing acuity of care in the patient population they are not used to determine actual treatment and care regimes for an individual.

There can be a range of reasons for utilisation reviews: 'delayed discharges', 'demand for care', 'need for admission', 'bed blocking' often are terminologies used to describe symptoms of an acute system requiring investigation (O'Neill and Pearson, 1995). Cost containment of health services has been the main driver in the development of utilisation review in the US whereas, in the UK, reviews have also been driven by location of care issues, in particular use of acute hospital beds (Coast, 1996).

A few small-scale bed reviews took place as early as the late 1950s and early 1960s in the UK O'Neill and Pearson (1995), but it has only been in the past twenty years that a more significant number of published studies have taken place (see the systematic review by McDonagh et al, 2000). At the same time reviews have moved from being informal and based on locally determined criteria to becoming more rigorous and larger-scale processes with the development of 'explicit' and validated clinical criteria systems enabling benchmarking comparisons between different health economies and systems.

N.3 Assessment Tools

The two most widely used assessment tools are:

- the Appropriateness Evaluation Protocol (AEP) which also has several client group-specific variants and,
- the Intensity-Severity-Discharge: Adult (ISD-A; also known as 'Interqual')

Other assessment tools reported in the literature, such as the Oxford Bed Study Instrument, and the Managed Care Appropriateness Protocol (MCAP) are also noted below.

N.3.1 The Appropriateness Evaluation Protocol (AEP)

The AEP, developed by Gertman and Restuccia (1981), originated in the USA. It was subsequently the focus of a major pan-European exercise ('the Biomed project') which established and tested a European version (Lang et al, 1999). This was focused more on the appropriateness of hospital use rather than appropriateness of surgical procedures.

The AEP is used to assess a patient's appropriateness for admission to an acute bed, and to their continuing care in that setting. Two major groups criteria - which are both independent of diagnosis can be applied to a patient: one group relates to their admission; the other to the care they are receiving on the assessment day (or 'day of care'). Each of these criteria groups is itself sub-divided. There are two subsets of admission criteria ('severity of illness' and 'intensity of service'); and three subsets of 'day of care' criteria ('medical services', 'nursing/ life support services' and 'patient's condition'). The threshold for requiring admission to acute care requires the patient to meet at least one criterion from either admission subset while the threshold for the patient remaining appropriately in acute care requires them meeting at least one criterion from any of the three 'day of care' subsets (**See Appendix P for full list of AEP criteria**).

Direct variants of the AEP specific to certain client groups have also been developed including paediatrics (P-AEP; Esmail et al, 2000) and sub-acute care. Donald et al (2001) report on a 'community hospital' version they developed and tested for sub-acute care - Community Hospital Appropriateness Evaluation Protocol (CHAEP).

N.3.2 Intensity-Severity-Discharge: Acute (ISD-A; InterQual)

'Intensity of service, Severity of illness, Discharge screens - Acute care' (ISD-A) is also widely known by its proprietary name 'InterQual'. The intensity of service and severity of illness sets of criteria were first published in the USA in 1978 (Jacobs and Lamprey, 1992) with the diagnostic screens added in 1982 at which stage it became known as 'ISD'. It is reviewed and updated annually (www.interqual.com) and, over the years, the range of the ISD has been expanded to include criteria focused on specific groups such as paediatrics, psychiatry and sub-acute care (see, for example, Goldman et al, 1997).

ISD criteria are a set of measurable clinical indicators, as well as diagnostic and therapeutic services, that reflect a patient's need for hospitalisation. They are used to determine the appropriateness of admission, continued care, and discharge and, because they are independent of diagnosis (considering instead the level of illness of the patient and the services required) they can serve as criteria for all acute hospital care, regardless of its size or location.

N.3.3 Other Assessment Tools

The 'Oxford Bed Study Instrument' (OBSI) was the first UK-developed set of explicit criteria (Anderson et al, 1988). Derived from the AEP, it has a smaller set of criteria and contains less detail. The list of criteria for an 'appropriate' admission to hospital is combined with a second set of 'reasons for not being at home'. However, unlike the AEP, it does not rely solely on data gathered from patient records but also involves interviewing local senior nursing staff. In this respect it is quicker to apply - and potentially provides a more complete picture of the patient's clinical and social circumstances - but may also pick up biases arising from interviewing staff who are directly connected with the patient's care.

Fenn et al (2000) report on using the OBSI in Oxfordshire and finding it quick to apply (although this is down to verbal communication between surveyor and the ward nursing

staff). In their view it was not a suitable instrument for designating appropriateness of admission (as used in their study).

The Managed Care Appropriateness Protocol (MCAP) is another commercially developed criteria-based assessment tool which was first established in 1987 to develop a 'more modern and more stringent set of managed care criteria' based upon the AEP (www.oakgroup.com), but there are few published reports of its application (see, for example, Kalant et al 2000) and no evidence in published studies to suggest that it has supplanted the AEP.

Mozes et al (1996) also report on their attempt to formulate an improved version of the AEP called the Medical Patients Assessment Protocol (MPAP). In comparing the two instruments they were aiming to prove the MPAP tool to have higher inter-observer reliability and to be more clinically orientated and comprehensive than the AEP (while taking about the same amount of time to employ). However, no subsequent publications of this approach have been identified.

N.4 Application of Tools

Two important dimensions in the application of assessment tools are the validity and reliability of the instrument: these are key tests of acceptability with clinicians and whether results from studies using the tools will be acceptable and potentially acted upon.

While not completely free from surveyor subjectivity in their application, acute bed utilisation reviews using explicit criteria (assessment tools) are generally regarded as providing a more valid, consistent and reliable methodology for assessing bed utilisation than local clinical opinion (Beech, 2005). In the studies reviewed by McDonagh et al (2000) it was noted that physician opinion was 'generally considered' to be the 'gold standard' for classifying patients as appropriately or inappropriately placed but that this depended on whose opinion was being asked with variability depending on physician seniority or make-up of a local physician panel. Several researchers use this method as a way of testing the validity of assessment instruments in this way (eg Gertman and Restuccia, 1981; Strumwasser et al., 1990; Inglis et al, 1995, Kalant et al 2000) and it is a recurring theme of many other studies.

This gold standard also underpins the 'clinical override' component in bed utilization studies. This is where a clinician - ideally with peer-group corroboration rather than operating singly - can designate a patient to be 'appropriately' admitted or continuing to occupy an acute bed where the AEP criteria alone would otherwise have classified them as inappropriate.

Beech (2005) describes this as a 'clinical review' phase which is often invoked in a utilization review where a patient is deemed by assessment criteria to be inappropriately in an acute bed. In these cases the case notes can be given a further, subjective clinical review on the grounds that it is 'not possible to have a list of criteria that cover all eventualities surrounding a patient's need for acute-based care'. However, particularly if this review is carried out in conjunction with the clinicians directly responsible for the patient's care, this may result in a more conservative view of where patients might receive care. For example, Coast et al, (1996) showed use of the clinical override reduced the number of otherwise 'inappropriate' admissions by half in a study in south-west England. This is especially the case if potential alternatives to the acute care do not currently exist, or identifying the potential for their development is not included as part of the study. This is noted by Vetter (2003) who argues that comparisons of studies are further complicated by a lack of definition of 'inappropriateness' and whether the studies have identified a range of alternative settings for the inappropriate care setting.

Campbell (2001), in a study of 88 emergency medical admissions, asked referring doctors and the patients whether they would have considered alternatives and were presented with a list of possible alternatives to admission. Of those responding, 60% of doctors and 70% of patients specified alternatives to care with a focus on same-day outpatient assessment or sub-acute care settings. This compares with only 28% of admissions identified as outside AEP admission criteria. A key conclusion is that assessment criteria err on the side of being 'clinically conservative' and that the scope for alternative settings to acute care might actually be greater.

Clinical review also relates to the variance issue in many studies of bed review methodologies; whether this is inter-observer variance on an individual study; between individual clinicians in setting 'gold standard' reference points; between different, objectively designed criteria systems and when to apply them; or between these systems and local clinical opinion. Issues of access to case notes, and their quality or completeness are also often raised. A variety of studies address these different aspects:

- Gertman and Restuccia (1981) found high inter-observer agreement in their initial work on developing the AEP. There was 92-94% agreement on those cases deemed appropriate and 73-79% agreement on 'inappropriate' cases. A parallel study using purely objective clinician judgement resulted in 90% inter-observer agreement for appropriate cases, but only 40% agreement for 'inappropriate' cases.
- Lorenzo, Lang, et al (1999) found good observed agreement between physician surveyors in six different European countries who examined the appropriateness of the same set of case notes (which, however, only included 19 admissions and 12 continuing days of care). This was taken as an encouraging indication of the reliability of the tool in a European setting.
- Santos-Eggiman et al (1997) found that studies undertaken retrospectively, rather than concurrently, yielded a higher level of agreement between surveyors but also higher numbers of admissions judged as being outside AEP criteria as notes provide less information than a 'real time', concurrent assessment.
- Ramos-Cuadra et al (1995) examined the quality of medical records and concluded that 'completeness' of the medical record did not significantly affect the number of patients outside 'day of care' criteria.
- Inglis et al (1995) found that the ISD-A instrument had 'high reliability' and validity in a UK study on acute admissions; although only when a full range of alternative forms of care was assumed to be available.
- Tsang and Severs (1995) report on a study of 146 acute geriatric admissions assessing how the AEP instrument compared with local geriatrician judgement and found 92% agreement between the individual clinical opinion on inappropriate admissions (13%) and the same patient judged by the AEP criteria (11%).
- Paldi et al (1995) reported significant variation in the percentage of inappropriate hospitalisation between two hospitals in Israel, but strong agreement between reviewers using the AEP instrument.
- Lang et al (1995) found the AEP to be highly reliable in four French studies with inappropriate admission ranging from 18-25%.

There was extensive subsequent testing for reliability and application in participating countries. Lorenzo et al (1999) provide a brief overview of the - mainly positive experiences - of several countries trialling the AEP at different stages of its local development. Many of these note various changes to the AEP to reflect the particular country's health culture.

- Moya-Ruiz C (2001) reported that providing feedback to physicians reduces inappropriate admissions attributable to physicians (from 35% to 28%) but the overall reduction on inappropriate stays was not significant.
- In Germany, research by Sangha et al (2002) confirmed for them the utility of an adapted AEP as a reliable review tool.

The Balance of Care Group (www.balanceofcare.com) have undertaken several major retrospective surveys using the AEP instrument in surveys across the UK (see, for example, Balance of Care Group, 2003). In these the AEP has been used to determine levels of acuity in patients (both on admission and on day of care) in the context of what 'ideal' alternative care options and settings and their specification might be.

N.5 Findings Reported in the Literature

Interpreting and comparing results of different utilisation review studies needs to be undertaken with care as there are usually different factors at work which combine to create variation in studies and their subsequent results. Coast (1996) points out that 'appropriate' care is not necessarily 'efficient' care and that 'inappropriate' care can be more cost-effective than a clinically appropriate alternative. This reinforces the need for the objectives behind undertaking any bed review exercise to be clearly set out and to ensure that the collection of any data and application of any review instrument (whether using implicit or explicit criteria) are tailored accordingly from the outset of the project.

Variation in results is always to be expected but can sometimes lead to claim and counter-claim over the validity of the assessment tool itself (eg Smeet et al 2000, countered by Panis et al 2002).

Important factors leading to different results in different environments appear to be:

- Which population is being studied such as: O'Neill and Pearson (1995); Santos-Eggiman et al, (1995); Apolone et al, (1999); Bristow et al (1997).
- The extent to which existing or putative alternatives to acute care are considered within the study framework such as: Fellin et al (1995); Campbell (2001); Bowen (2005).
- The basis for the numbers included for the survey: whether it is based on all inpatients or only on admissions (this is often not clearly differentiated); the range of specialties and patient ages included in the study and any exclusions; the sample size. Vetter (2003) comments on this and McDonagh et al (2000) cover many of these aspects in their systematic review of a large number of bed utilisation studies.
- The use of clinical override, such as: Smith et al (1997); Bristow et al (1997); Tsang and Severs (1995).

Various authors describe the percentages of their survey population that meet AEP or other criteria:

- O'Neill and Pearson (1995), reviewing appropriateness of hospital use in the UK report on several findings to that date including the original Oxford Bed Study Instrument application where acute medical, surgical and geriatric admissions to a teaching hospital were studied and, overall, 38% of patients were deemed 'inappropriately placed' on the day following admission (with highest rates for surgical and lowest rates for geriatric patients).

- In Switzerland, Santos-Eggiman et al, (1995) report on a study of four hospital utilization reviews based on an adapted AEP on all the hospital days from a sample of patients admitted over a six month period. The level of inappropriate use ranged between eight and 15% in terms of days and was consistently higher in medicine than in surgery.
- De Coster et al (1996) found in a study in Manitoba, that the proportion of a sample of adult medicine and paediatric medical records meeting acute admission criteria was 50%, with only 33% of subsequent days in hospital meeting acute criteria.
- Another Canadian study on Prince Edward Island study found the proportion of acute admissions outside AEP was 27% (Wright and Cardiff, 1998).
- Apolone et al, (1999) were enthusiastic about the potential of the European AEP for developmental changes in the Italian health service. They surveyed 1,082 in-patients in adult acute departments in a Milan teaching hospital. The results showed that, overall, 27% of the admissions and 40% of the hospital days were inappropriate with the rate of inappropriate admissions higher for patients admitted during week days and also significantly associated with the admitting ward and the age of the patient. Most (75%) of the hospital days rated as inappropriate did not require any further stay.
- Esmail et al (2000) report their findings of applying a paediatric version of the AEP with 8% of sampled admissions deemed inappropriate. This they considered 'low' but a reflection of well-developed primary care-based services for children.
- Fenn et al (2000) in a UK study using the OBSI found 37% of bed days were inappropriate (regarding that as similar for comparable patients in other studies using the AEP which illustrated a range of 13-35%). They also noted that Anderson et al, 1987, using the OBSI, had found this percentage to be 62% and, interestingly, they further noted that a follow-up survey two years later saw the inappropriate bed days down to 25%.
- A Manitoba study found the proportion of acute admissions was 71% acute with 34% of subsequent days in hospital meeting acute criteria. (Bruce et al., 2001).
- Attena et al (2001) in a retrospective study of 533 medical records found nearly that 16% of admissions were inappropriate with the most frequent cause of this being admission for diagnostic tests; and nearly 36% were inappropriate on the day of care due to clinical conservatism in when to discharge the patient. It was noted that these data had prompted changes to be made to operation of the hospital as a result.
- Bowen (2005) reports on five different UK studies using the AEP and compares the percentage of medical patients within AEP criteria: this showed a range of 15-20% of surveyed patients outside admission criteria, and 47-57% outside day of care criteria.
- Trerise et al (2001) in a study of six of 156 patients using the discharge screening element of the ISD tool to assess underutilisation of services in an acute setting. This excluded patients receiving palliative care. They identified a small (about 1%), but significant, number of patients who might have potentially benefited from having additional acute care rather than less.
- An Ontario study reported by Flintoft et al. (1998) used both acute and subacute ISD criteria as this was deemed appropriate in the context of local bed usage. The overall proportion of acute admissions was 82% (62% acute and 20% subacute) with the level of acuity highest for myocardial infarction and strokes and lowest for elective hip or knee replacement. For all diagnoses and procedures, 18% of subsequent days in hospital were assessed as acute and 37% as subacute.

The focus of most bed utilisation studies is on potential alternatives to acute hospital admission and continued stay:

- In Italy, Fellin et al (1995) reported on the general features of 11 studies using the AEP grouped into two categories. One of these categories featured studies focusing on medical and surgical admissions and showed a range of 25-38% inappropriate admissions and 28-49% inappropriate days of care. Despite the heterogeneity of the studies themselves common features for further investigation were shown to be difficulties of transferring patients into suitable non-acute long-term care facilities and, within the hospitals, delays in lab investigations. The authors point to the potential of the AEP for developing quality assurance and performance improvement.
- Houghton et al (1996) reported 31% of adult medical ward inpatients in an east London hospital were outside AEP admission criteria and 66% outside day of care criteria. They were clear that there was 'considerable room for improvement' in co-operation between service providers in order to maximise bed usage. Delays due to pharmacy and social service support were particularly highlighted in this respect.
- A UK version of the AEP tool was developed by Bristow et al (1997) who reported on a study of over 1,800 cases from four hospitals in south-east England. Inappropriate on admission ranged from 18-30% across the hospitals (and was higher in elderly care specialties compared with surgery and medicine). A larger proportion of days of care were 'inappropriate' ranging from 39-55%. Lack of acute facility alternatives was identified as the main reason for this.
- In a British Columbian study the proportion of inappropriate acute admissions was 25% and 50% of subsequent days in hospital met the acute criteria. The study data indicated that by approximately the 12th day in hospital, 30% of patients no longer required acute-care level of service and by the 20th day, this increased to 40%. The authors concluded there was identified capacity within the existing acute-care system to effectively manage the care of acute medical patients and the potential for further reduction of acute-care days could be achieved through increased systematic utilisation management coupled with increased efficiencies in discharge management (ACCRM, 1997).
- Smith et al (1997) report a UK study of over 800 acute medical emergency admissions in a UK hospital. They found 6% of patients outside admission criteria and 45% outside day of care criteria mainly due, they concluded, to internal hospital organisation issues including investigations and treatments which might have otherwise been undertaken on an outpatient basis, and also patients remaining in hospital after the acute phase of care had been completed. The study led directly to operational changes in the hospital processes.
- An Ontario study reported by Flintoft et al. (1998) used both acute and subacute ISD criteria as this was deemed appropriate in the context of local bed usage. The overall proportion of acute admissions was 82% (62% acute and 20% subacute) with the level of acuity highest for myocardial infarction and strokes and lowest for elective hip or knee replacement. For all diagnoses and procedures, 18% of subsequent days in hospital were assessed as acute and 37% as subacute.

Several studies touch on the wider benefits than can result from bed utilisation review:

- Wickizer et al (1989) found in a US study that utilization reviews had a significant negative effect on both utilisation and expenditure – reducing admissions by 13%, average lengths of stay by 1% and routine expenditure by 7%.

- O'Donnell et al (1990) put the price of the additional cost of an inappropriate admission to acute care as \$AUS 1,750 in their Australian application of the AEP to a teaching hospital.
- Lorenzo and Sunol (1995) concluded that utilization reviews using the AEP in Spain showed up 'overutilisation' of hospital beds and a conservative attitude of physicians.
- Bentes et al (1995) report the value of AEP studies in Portugal in terms of identifying and quantifying resource utilisation problems as well as targeted reviews of individual patients.
- Payne et al (1991) point out that the data gathered in undertaking an AEP review is a rich source of data in its own right with potential application for improving the efficiency of internal hospital operations.
- Lang et al (1995) in their report on four French AEP studies found that lack of social support was a particular reason for inappropriate admissions and noted the importance generally of identifying causes of inappropriate admission as systemic indicators of health care system delivery problems. The AEP was viewed as a tool that could support a start to addressing necessary changes.
- Lorenzo, Beech et al (1999), in connection with the multi-national BIOMED project which sought to adapt the AEP in a European context, emphasised the importance of the AEP as a validated tool for assessing resource needs for both inpatient and outpatient care, as well as the organisational changes that might stem from better understanding of resource usage.

As well as results from studies using individual assessment tools there are a number that attempt to compare results of using different assessment tools on the same data.

- Strumwasser et al (1990) comparing ISD and AEP on the same data set noted that both were 'moderately valid' based on a sample of 119 medical cases and having two reviewers apply each instrument to each case and those results, in turn, with the judgement of a physician panel.
- Hensher et al (1999) reviewed seven studies (which used the AEP, OBSI and ISD tools) and which took place between 1994 and 1997. They noted variations in the percentage of inappropriate admissions and in continuing acute care presence, but their commentary was focused on the lack of evidence for the cost-effectiveness of alternatives to hospital admission, rather than a critique of the assessment tools themselves. The variation they noted between the studies was due to different foci of the studies and sample population base. The ISD studies focused on general medicine and care of the elderly (22% and 24% inappropriate admissions), while the AEP studies they considered had 6% (focus on emergency medicine, all ages) and 27% (which included surgery and medicine).

N.6 Recent Bed Utilisation Reviews in Ireland

In Ireland, prior to the extensive exercise reported in the body of this document, the AEP had been used in a number of studies undertaken since 1990 in acute hospitals in Limerick, Dublin, Sligo, Letterkenny, Cork, Tralee, Waterford, Portlaoise and Kilkenny (see table 1). The studies focused principally on acute adult medical admissions although, within these, some focused on elderly patients or patients who had been in hospital for more than 21 days. All of the studies measured the appropriateness of hospital admissions and most also measured the appropriateness of subsequent days of hospital stay.

Excepting Kilkenny, whose exceptionally low values both on admission and on the day suggest a different approach, the percentage of inappropriate admissions ranges from 8-23%. Each study identified reasons for inappropriate admissions and the type of facilities that might have avoided them. These fell broadly under three headings:

- A lower, sub-acute level of care (eg in a community hospital setting)
- An observational/assessment unit,
- Rapid access to outpatient clinics (eg chest pains clinic).

The range of inappropriate 'day of care' findings in those studies which included them was 23 - 65%. Reasons for inappropriate days of hospital stay also fell under three main headings:

- Need for step-down bed or long-term care facility
- Delays identified within hospital treatment/ diagnosis/ consultation processes
- Delays in transfer to a tertiary centre

The most common alternative identified to a continued stay in hospital was access to step-down or long-term care beds.

Three recent Irish studies which incorporate reviews of hospitalisation (but which have not used the AEP or other explicit criteria instrument) are also useful to mention here because they point to similar general conclusions about the medical and other characteristics of patients who stay long periods of time in acute settings.

- Hayes et al (1995) examined the utilisation of hospital beds by elderly patients admitted to a Dublin teaching hospital. Objective, pre-determined criteria were used to determine appropriate days of stay; 29% were considered inappropriate. These were mostly single, female patients over 75 years of age who had already been receiving public health nursing support in the community or living with other people. Associated diagnoses and referral routes included cerebrovascular disease, self-referral, medical ward admissions for observation, social reasons (and some had multiple reasons). Inappropriate days of stay were attributed to physician and hospital factors (almost 50%); rehabilitative services (almost 25%); and lack of alternative care facilities (39.5%).
- Moloney et al. (2004) indirectly examined utilisation characteristics amongst medical emergency inpatients in a Dublin teaching hospital through a review of HIPE (hospital in-patient enquiry) discharge data. This described case-mix and utilisation resource patterns following emergency medical admission and aimed to explore the relationship between coded diseases at the time of discharge, patterns of investigation, and length of hospital stay. It was found that the median length of stay (6 days) was significantly shorter when the patient was admitted under a general medical service, and that there was a correlation between length of stay and age. Prolonged length of stay was associated with, amongst other things, heart failure, respiratory system, malignancy, stroke, diabetes, psychiatry, and anaemia. They concluded that clinical coding, using the HIPE database, was a strong predictor for hospital length of stay for acute general medical admissions and would, therefore, be of value as a tool to optimise efficient utilisation of acute bed capacity.
- John et al. (2004) examined bed utilisation in a Dublin teaching hospital by prospectively auditing the inpatient bed use during a three-month period. This showed that 70% of the patients who went home on the day that they were medically discharged had a mean age of 54 years; the 30% who remained in hospital awaiting

step-down facilities had a mean age 70 years. It was estimated that 54% additional patients might have otherwise been treated without an increase in the bed complement; the conclusion drawn was that more efficient use of beds coupled with suitable alternatives to them should be developed before the construction of any additional facilities.

Table N.1: Summary of recent AEP studies in Ireland

| Year | Acute Hospital | % inapprop. admiss. | Reasons for inappropriate admissions | | | % inapprop. days of stay | Reasons for inappropriate days of stay | | |
|------|---|---------------------|--------------------------------------|---------|-----|--------------------------|--|-------------------|-----------------|
| | | | Community hospital | Obs bed | OPD | | Step down | Tertiary transfer | Hospital delays |
| 1990 | Mid-Western Regional Hospital, Limerick | 23 | 11 | | 89 | 34 | 44 | | 56 |
| 1993 | Kerry General Hospital | 22 | 8 | | 79 | | | | |
| 1995 | DATHs (Dublin) Hospitals* and Connolly Memorial | 8 | 20 | | 65 | 30 | | | |
| 1996 | Sligo General Hospital | 16 | 56 | 27 | 17 | | | | |
| 1996 | Letterkenny General Hospital | 15 | 56 | 27 | 17 | | | | |
| 1998 | Cork University Hospital | 22 | 6 | | 78 | 35 | 10 | | 90 |
| 1998 | St Joseph's Hospital, Clonmel | 20 | 25 | 47 | 18 | 34 | 47 | 24 | 12 |
| 1999 | Waterford Regional Hospital | 11 | 31 | 35 | 31 | 23 | 55 | 0 | 45 |
| 1999 | Kerry General Hospital | 10 | 8 | | 67 | | | | |
| 1999 | Midland Regional Hospital, Portlaoise | 20 | | | | 65 | 51 | | 48 |
| 2002 | St Luke's Hospital, Kilkenny | 2 | 33 | 66 | | 6 | 69 | 12 | 19 |

* Connolly Memorial and the DATHs hospitals: St Vincent's University; Mater Misericordiae; Beaumont; St James's; Tallaght /AMNCH

PA/Balance of Care would like to thank Dr. Orlaith O'Reilly for provision of these data and analysis

N.7 Conclusions

This review has outlined three explicit assessment criteria two of which (AEP and ISD) are the most commonly used. Both have been well-tested and produce consistent results over the years, but the AEP seems to have had wider application in European studies largely as a result of the Biomed project in the early 1990s (Lang et al., 1999)

Results from a wide range of studies would appear to suggest that all instruments are capable of providing similar results for a given population; and more pragmatic considerations of applying an instrument are likely to play a part in which is chosen. The ISD instrument is commercially supported and provides a detailed assessment but there is a licence cost in its implementation and it can be quite time-consuming to complete.

The OBSI is a much simpler and speedier instrument to apply, but the inputs required from care staff responsible for looking after patients can lead to a loss of objectivity.

The AEP does not have a licensing cost, but neither does it have technical support as a result; relying on local capabilities to run a successful and meaningful study. It has an inherently more objective focus than the OBSI (relying exclusively on patient notes), although inter-observer subjectivity will still occur. It can also be rapidly applied; for many patients the criteria are relatively straightforward to identify and decide upon.

APPENDIX O: AEP Survey Form

| | | | |
|--|--|---|--|
| Acute Hospital Utilisation Review | | Feidhmeannacht na Seirbhíse Sláinte Health Service Executive | Survey number <input style="width: 100%;" type="text"/> Survey date <input style="width: 100%;" type="text"/> |
| Hospital <input style="width: 100%;" type="text"/> Ward <input style="width: 100%;" type="text"/> Bed type <input style="width: 100%;" type="text"/> | | | |
| <u>PATIENT DETAILS</u> | | | |
| Treatment Specialty <input style="width: 100%;" type="text"/> County of Residence <input style="width: 100%;" type="text"/> Health Care Insurance <input style="width: 100%;" type="text"/> GMS? Yes <input type="checkbox"/> No <input type="checkbox"/> | Hospital No (MRN) <input style="width: 100%; background-color: #cccccc;" type="text"/> Date of Birth <input style="width: 20%; background-color: #cccccc;" type="text"/> <input style="width: 20%; background-color: #cccccc;" type="text"/> <input style="width: 20%; background-color: #cccccc;" type="text"/> <input style="width: 20%; background-color: #cccccc;" type="text"/> | | |
| <u>CURRENT ADMISSION</u> | | | |
| Date of Arrival | <input style="width: 100%;" type="text"/> | Time | <input style="width: 100%;" type="text"/> |
| | Elective surgery? | | Yes <input type="checkbox"/> No <input type="checkbox"/> |
| Source of Referral | GP <input type="checkbox"/> Self <input type="checkbox"/> Outpatients <input type="checkbox"/> Private clinic <input type="checkbox"/> Other hospital <input style="width: 100%;" type="text"/> Other: <input style="width: 100%;" type="text"/> | | |
| Admitted From | Own Home <input type="checkbox"/> Private Nursing Home <input type="checkbox"/> HSE Residential Home <input type="checkbox"/> Other hospital <input style="width: 100%;" type="text"/> Other: <input style="width: 100%;" type="text"/> | | |
| Admission Reason & Diagnosis | <input style="width: 100%; height: 20px;" type="text"/> | | |
| Adm. Co-morbidities | CCF <input type="checkbox"/> IHD <input type="checkbox"/> COPD <input type="checkbox"/> Diabetes <input type="checkbox"/> Hypertension <input type="checkbox"/> PVD <input type="checkbox"/> Arthritis <input type="checkbox"/> Dementia <input type="checkbox"/> Cancer <input type="checkbox"/> Cerebrovascular <input type="checkbox"/> Alcohol/substance misuse <input type="checkbox"/> Other <input style="width: 100%;" type="text"/> | | |
| Risk Factors | Multiple Drugs 4+ <input type="checkbox"/> Incapacity of Carer <input type="checkbox"/> Lives Alone <input type="checkbox"/> Frail Elderly <input type="checkbox"/> | | |
| <u>For elective surgery patients only</u> | | | |
| Did the admission meet location of surgery criteria? | Yes <input type="checkbox"/> No <input type="checkbox"/> | | If yes, which criterion? <input style="width: 100%;" type="text"/> |
| Did the admission meet timeliness criteria? | Yes <input type="checkbox"/> No <input type="checkbox"/> | | If yes, which criterion? <input style="width: 100%;" type="text"/> |
| <u>For all patients</u> | | | |
| Did the admission meet AEP Criteria? | Yes <input type="checkbox"/> No <input type="checkbox"/> | | |
| If Yes, which AEP criterion? | <input style="width: 100%;" type="text"/> | | If B1, did the patient meet any other criterion? Yes <input type="checkbox"/> No <input type="checkbox"/> |
| If No, Could this admission have been avoided by provision of sufficient treatment in some other way? (Indicate and <u>rank</u> all you think are appropriate) | | | |
| Own Home only (+GP) | <input style="width: 100%;" type="text"/> | Non acute bed no therapy support | <input style="width: 100%;" type="text"/> |
| Home with social care | <input style="width: 100%;" type="text"/> | Non acute bed with therapy support | <input style="width: 100%;" type="text"/> |
| Home with home care package | <input style="width: 100%;" type="text"/> | Hospice/ palliative care | <input style="width: 100%;" type="text"/> |
| Home with community nursing | <input style="width: 100%;" type="text"/> | Mental Health Bed | <input style="width: 100%;" type="text"/> |
| Home with specialist nursing | <input style="width: 100%;" type="text"/> | Access to assessment/diagnostics | <input style="width: 100%;" type="text"/> |
| Home with therapy support | <input style="width: 100%;" type="text"/> | Other: | <input style="width: 100%;" type="text"/> |

ON THE DAY OF CARE

Is the patient currently receiving care which meets AEP criteria? Yes No

If Yes, which day of care criterion?

If D2, did the patient meet any other criterion? Yes No

If care on the day is outside AEP criteria,

- is the patient currently receiving rehabilitation? Yes No

- what are the discharge choices that would reduce the length of stay?
(Indicate and rank all you think are appropriate)

| | |
|------------------------------|----------------------|
| Own Home only (+GP) | <input type="text"/> |
| Home with social care | <input type="text"/> |
| Home with home care package | <input type="text"/> |
| Home with community nursing | <input type="text"/> |
| Home with specialist nursing | <input type="text"/> |
| Home with therapy support | <input type="text"/> |
| Other: _____ | |

| | |
|------------------------------------|----------------------|
| Non acute bed no therapy support | <input type="text"/> |
| Non acute bed with therapy support | <input type="text"/> |
| Hospice | <input type="text"/> |
| Mental Health Bed | <input type="text"/> |
| Young chronic sick facility | <input type="text"/> |
| Access to assessment/ diagnostics | <input type="text"/> |

DISCHARGE ARRANGEMENTS

Is there evidence of discharge planning? Yes No Predicted discharge date

Medically fit date

If care on the day is outside AEP criteria, what is the patient waiting for? (Tick all you think apply)

| <u>Review/ assessment by other care professional</u> | <u>Specialist facility</u> | <u>Investigations</u> |
|---|--|---|
| Consultant decision to discharge <input type="checkbox"/> | Mental health bed <input type="checkbox"/> | CT <input type="checkbox"/> |
| Other medical specialist <input type="checkbox"/> | Nursing home bed <input type="checkbox"/> | MRI <input type="checkbox"/> |
| Social worker <input type="checkbox"/> | Young chronic sick facility <input type="checkbox"/> | Ultrasound <input type="checkbox"/> |
| Physiotherapist <input type="checkbox"/> | Hospice/palliative care <input type="checkbox"/> | Xray <input type="checkbox"/> |
| Occupational therapist <input type="checkbox"/> | Rehab/Step down facility <input type="checkbox"/> | Blood/U&E <input type="checkbox"/> |
| Home care liaison <input type="checkbox"/> | Sheltered housing <input type="checkbox"/> | Histology <input type="checkbox"/> |
| Nursing home liaison <input type="checkbox"/> | Other acute facility <input type="checkbox"/> | Echo <input type="checkbox"/> |
| | | Cardiac catheter <input type="checkbox"/> |
| <u>Community health/social care</u> | <u>Carers/relatives</u> | |
| Home care nursing <input type="checkbox"/> | To agree actions <input type="checkbox"/> | |
| Home care with therapy <input type="checkbox"/> | To be organised <input type="checkbox"/> | |
| Adaptations/ equipment <input type="checkbox"/> | Power of attorney <input type="checkbox"/> | |
| <u>Other</u> : <input type="text"/> | | |

Form completed by: _____

Date _____

APPENDIX P: AEP Criteria**Admission Criteria****A. Severity of Illness**

- A1.** Sudden onset of unconsciousness or disorientation (coma or unresponsiveness).
- A2.** Pulse rate:
 - a) < 50 per minute
 - b) > 140 per minute
- A3.** Blood Pressure:
 - a) Systolic < 90 or > 200 mm Hg.
 - b) Diastolic < 60 or > 120 mm Hg.
- A4.** Acute loss of sight or hearing.
- A5.** Acute loss of ability to move body part.
- A6.** Persistent fever for >5 days:
 - a) 37.78 C (100 F) orally, or
 - b) 38.33 C (101 F) rectally.
- A7.** Acute bleeding.
- A8.** Severe electrolyte or blood gas abnormality (any of the following):
 - a) Na < 123 mmol/L
Na > 156 mmol/L
 - b) K < 2.5 mmol/L
K > 6.0 mmol/L
 - c) Venous bicarbonate (unless chronically abnormal) < 20 mmol/L
Venous bicarbonate (unless chronically abnormal) > 36 mmol/L
 - d) Arterial pH < 7.30
Arterial pH > 7.45
- A9.** Electrocardiogram evidence of acute ischaemia; must be suspicion of a new myocardial infarction.
- A10.** Wound dehiscence or evisceration.

B. Intensity of Service

- B1.** Intravenous medications and/or fluid replacement (does not include tube feedings).
- B2.** Surgery or procedure scheduled within 24 hours requiring:
 - a) General or regional anaesthesia, or
 - b) Use of equipment, facilities, or procedures available only in a hospital.
- B3.** Vital sign monitoring every 2 hours or more often (may include telemetry or bedside cardiac monitor).
- B4.** Chemotherapeutic agents that require continuous observation for life-threatening toxic reaction.
- B5.** Intramuscular antibiotics at least every 8 hours.
- B6.** Intermittent or continuous respirator use at least every 8 hours.

Day of Care Criteria

C. *Medical Services*

- C1.** Procedure in operating theatre that day.
- C2.** Scheduled for procedure in operating theatre the next day, requiring pre-operative consultation or evaluation.
- C3.** Cardiac catheterisation that day.
- C4.** Angiography that day.
- C5.** Biopsy of internal organ that day.
- C6.** Invasive central nervous system diagnostic procedure (eg lumbar puncture, cisternal tap, ventricular tap).
- C7.** Any test requiring strict dietary control for the duration of the diet.
- C8.** New or experimental treatment requiring frequent dose adjustments under direct medical supervision.
- C9.** Close medical monitoring by a doctor at least 3 times daily (observations must be documented in record).
- C10.** Operative day for any procedure covered in numbers 1, or 3-7 above.

D. *Nursing/ Life Support Services*

- D1.** Respiratory care – intermittent or continuous respirator use and/or inhalation therapy (with nebuliser, intermittent positive pressure breathing) at least three times daily.
- D2.** Parenteral therapy – intermittent or continuous intravenous fluid with any supplementation (electrolytes, protein, medications).
- D3.** Continuous vital signs monitoring, at least every 30 minutes, for at least 4 hours.
- D4.** Intramuscular and/or subcutaneous injections at least twice daily.
- D5.** Intake and output measurement.
- D6.** Major surgical wound and drainage care (eg chest tubes, T-tubes, haemovacs, penrose drains).
- D7.** Close medical monitoring by nurse at least 3 times daily, under doctor's orders.

E. *Patient's Condition*

WITHIN 24 HOURS ON OR BEFORE DAY OF REVIEW:

- E1.** INABILITY TO VOID OR MOVE BOWELS (PAST 24 HOURS) NOT ATTRIBUTABLE TO NEUROLOGICAL DISORDER.

Within 48 hours on or before day of review:

- E2.** TRANSFUSION DUE TO BLOOD LOSS.

- E3.** VENTRICULAR FIBRILLATION OR ELECTROCARDIOGRAM EVIDENCE OF ACUTE ISCHAEMIA, AS STATED IN PROGRESS NOTES OR IN ELECTROCARDIOGRAM REPORT.
- E4.** FEVER AT LEAST 37.78 C (100 F) ORALLY OR AT LEAST 38.22 C (101 F) RECTALLY, IF PATIENT WAS ADMITTED FOR REASON OTHER THAN FEVER.
- E5.** COMA – UNRESPONSIVE FOR AT LEAST ONE HOUR.
- E6.** ACUTE CONFUSIONAL STATE NOT DUE TO ALCOHOL WITHDRAWAL.
- E7.** ACUTE HAEMATOLOGICAL DISORDERS, SIGNIFICANT NEUTROPENIA, ANEMIA, THROMBOCYTOPENIA, LEUCOCYTOSIS, ERYTHROCYTOSIS, OR THROMBOCYTOSIS, YIELDING SIGNS OR SYMPTOMS.
- E8.** PROGRESSIVE ACUTE NEUROLOGICAL DIFFICULTIES.

APPENDIX Q: AEP Criteria – Elective Surgery Variation

AEP Admission Criteria: Elective Surgery Variation

Location of Surgery

Co-Morbidity

1. Respiratory Status: Significantly abnormal pulmonary function measurements:
 - a. Functional vital capacity (FVC) of <1 litres.
 - b. Forced expiratory volume in the first second (FEV₁) of < 50% x FVC.
 - c. Arterial pCO₂ > 50mmHg*.
 - d. Arterial pO₂ < 50mmHg*.
2. Sleep apnoea: documented as present regardless of how severe or frequent.
3. Blood disorders:
 - a. Sickle cell disease (SS) or sickle-c disease (SC). Documented diagnosis, not just the presence of the trait.
 - b. Haemophilia.
 - c. Idiopathic thrombocytopenic purpura.
4. Cardiac diseases:
 - a. Angina pectoris class III or IV.
 - b. Congestive heart failure class III or IV.
 - c. Myocardial infarction within 90 days of admission date.
5. Personal or family history of malignant hyperthermia.
6. Patients with documented difficulty regulating medications for:
 - a. Endocrine disease (diabetes, Addison's disease, thyrotoxicosis, and other rarer endocrine diagnoses).
 - b. Hypertension.
 - c. Bronchospastic lung disease.
 - d. Seizures.

Potential for Complications

7. Surgery on an internal organ, including procedures on head, neck, and back, as well as on thoracic, abdominal, and pelvic organs.
8. Blind biopsy of an internal organ.
9. General or regional anaesthesia lasting more than 90 minutes.
10. Social factors precluding prompt access to medical attention, in case of adverse post-procedure effect:
 - a. Lack of ability to communicate, because of living alone or telephone inaccessibility (eg a patient unable to dial a phone who is alone at home during the immediate post-op period).

- b. Lack of practical transportation availability, great distance from urgent medical care.
- c. Mental instability. This includes any mental conditions that might interfere with the patient's recognising a post-op adverse effect.

Need for Intensive Post-op Care:

11. Amputations, except digits.
12. Peripheral vascular surgery (eg peripheral arterial grafting, varicose vein resection).
13. Placement of orthopaedic hardware, except distal K-wires insertion for stabilisation (eg insertion of orthopaedic rods, plates or nails).
14. Placement of drainage tubes (eg nephrotomies, ureterostomies, chest tubes).

Timeliness of Admission Criteria

Special Pre-op Evaluation/Treatment:

1. Supervised diet.
2. Parenteral medications.
3. Extensive enemas (more than a Fleet enema).
4. Procedures such as angiography, endoscopy, myelography, to be done in advance of the planned surgery.
5. Dialysis or exchange transfusions.

Patient Condition:

6. Unacceptable cardiac status.
 - a. Suspicion of ongoing or recent myocardial infarction.
 - b. Uncontrolled or unstable angina pectoris.
 - c. New or complex arrhythmia.
 - d. Uncompensated congestive heart failure.
7. Unacceptable cerebrovascular status.
 - a. New stroke not completed.
 - b. Transient ischaemic attacks.
8. Unacceptable pulmonary status.
 - a. Unrelieved bronchospasm.
 - b. Documented deterioration of chronic obstructive pulmonary disease (COPD). Patients with emphysema whose measurements of pulmonary function (eg FEV₁/FVC, blood gases, etc) have worsened more than trivially from their usual readings also need to be “tuned up” before undergoing anaesthesia.
9. Unacceptable haematologic status.
 - a. Unexpected anaemia requiring transfusion or explanation pre-operatively.
 - b. New granulocytopenia (<1500/mm³) or thrombocytopenia (<100,000/mm³) requiring explanation pre-operatively.

- c. Severe thrombocytopenia or lack of other clotting factors (eg prothrombin) not correctable in time (<24 hours).
10. Unacceptable metabolic status.
- a. Uncontrolled diabetes mellitus.
 - b. Severe (Cr >5.0 mg/dl) or new azotemia.
 - c. Severe liver dysfunction, other than clotting (transaminase at least 5x upper limit of laboratory normal).
 - d. Uncontrolled hyperthyroidism or uncorrected hypothyroidism.
 - e. Uncontrolled electrolyte disturbances.
11. Unacceptable mental status.
- a. New confusion or coma.
 - b. Incompetence or inability to understand operative permit, etc.
12. Uncontrolled seizures.
13. Unexplained new rash.
14. Active infection, other than that for which surgery is planned.
15. Unexplained fever (temperature at least 100⁰F), if not related to need for surgery.

Administrative/Technical Circumstances:

Cancellation of surgery because of unforeseen administrative or technical circumstances (an example would be having been bumped from the operating theatre because of unplanned emergency surgery).

APPENDIX R: List of Surveyors

The following table lists the 129 surveyors that participated in this bed utilisation review.

Table R.1 List of surveyors used, their job title and location

| Name | Job Title | Location |
|--------------------|---|--|
| Physicians | | |
| Deirdre Murray | PHMS | Cork |
| Anne Sheahan | PHMS | Cork |
| Anne Dee | Specialist Registrar | Cork/Kerry |
| Emer Feely | PHMS | Dr. Steevens' |
| Carmel Mullaney | PHMS | Kilkenny |
| Mai Mannix | PHMS | Limerick |
| Declan McKeown | PHMS | Merlin Park |
| Emer O'Connell | PHMS | Merlin Park |
| Maura O'Shea | PHMS | Merlin Park |
| Geraldine Sayers | PHMS | Palmerstown |
| Aidan Ryan | Specialist Registrar | Sligo |
| Una Fallon | PHMS | Sligo |
| Marie Laffoy | Assistant National Director, Population Health | Strategic Health Planning |
| Patrick O'Sullivan | PHMS | Tullamore |
| Dr Declan Bedford | PHMS | Navan |
| Nurses | | |
| Fiona McMahon | Project Officer | NHO |
| Susanna Byrne | Project Officer | NMPDU-Dublin City & County North & South (Wicklow and Kildare) |
| Eilish Croke | Workforce Planner | NMPDU-Counties Laois, Longford, Offaly & Westmeath |
| Marian Wyre | Professional Development Co-ordinator | NMPDU- Counties Laois, Longford, Offaly & Westmeath |
| Breda Fallon | Project Officer | NMPDU-Counties Clare, Limerick & Tipperary NR |
| Cora Lunn | Project Officer | NMPDU- Counties Clare, Limerick & Tipperary NR |

| | | |
|--------------------|--|--|
| Gillian Conway | Workforce Planner | NMPDU- Counties Clare, Limerick & Tipperary NR |
| Mairead Cowan | Project Officer | NMPDU- Counties Clare, Limerick & Tipperary NR |
| Catherine Tunney | Practice Development Officer | NMPDU-Counties Cavan, Louth, Meath & Monaghan |
| Joan Donegan | Practice Development Officer (PHN) | NMPDU- Counties Cavan, Louth, Meath & Monaghan |
| Katherine McGinn | Orthopaedic Nurse/Clinical Audit Facilitator | NMPDU- Counties Cavan, Louth, Meath & Monaghan |
| Mary McCarthy | Acting Director | NMPDU- Counties Cavan, Louth, Meath & Monaghan |
| Nuala Rafferty | Workforce Planner | NMPDU- Counties Cavan, Louth, Meath & Monaghan |
| Rose Lorenz | Co-ordinator of Continuing N&M Education | NMPDU- Counties Cavan, Louth, Meath & Monaghan |
| Ruth Taylor | Nursing Practice Development Co-ordinator | NMPDU- Counties Cavan, Louth, Meath & Monaghan |
| Seamus McCaul | Nursing Practice Development Co-ordinator | NMPDU- Counties Cavan, Louth, Meath & Monaghan |
| Elizabeth Breslin | Development Officer | NMPDU-Counties Donegal, Sligo & Leitrim |
| Paula Kavanagh | Workforce Planner | NMPDU- Counties Donegal, Sligo & Leitrim |
| Kate Kennedy | Workforce Planner | NMPDU-Counties Cork & Kerry |
| Ciara Burke | Project Officer | NMPDU-Counties Carlow, Kilkenny & Tipperary SR, Waterford & Wexford |
| Ciara Rochford | Continuing Education Officer | NMPDU- Counties Carlow, Kilkenny & Tipperary SR, Waterford & Wexford |
| Mark While | Workforce Planner | NMPDU- Counties Carlow, Kilkenny & Tipperary SR, Waterford & Wexford |
| Patricia McQuillan | Professional Development Officer | NMPDU- Counties Carlow, Kilkenny & Tipperary SR, Waterford & Wexford |
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| Theresa Leahy | Staff Nurse | Bantry General Hospital |
| Margaret Carroll | | Beaumont Hospital |
| Siobhan Toner | | Beaumont Hospital |

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| Geraldine Igoe | Overseas Nurse Facilitator | Cavan General Hospital |
| Anne Murphy | Site Nurse Manager | Connolly Memorial Hospital |
| Mairead Lyons | Nursing Practice Development Co-ordinator | Connolly Memorial Hospital |
| Catherine O'Mahony | GP Liaison Nurse | Cork University Hospital |
| Georgina Murphy | CNMIII | Cork University Hospital |
| Helen Cahalane | A/ADoN | Cork University Hospital |
| Margaret Clancy-Noonan | | Cork University Hospital |
| Miriam Rignet | Clinical Facilitator | Cork University Hospital |
| Orla Goulding | CPC | Cork University Hospital |
| Karen Clarke | Overseas Nurse Facilitator | Our Lady of Lourdes Hospital |
| Anita Griffin | CNMII | Ennis MWRH |
| Brigid McCormack | Acting/ADoN | Ennis MWRH |
| Marian Burke | CNMI | Galway University Hospital (Merlin Park) |
| Mary Naughton | Acting CNMIII | Galway University Hospital (Merlin Park) |
| Maura Mannion | CNMIII | Galway University Hospital (Merlin Park) |
| Connie Gavin | Acting CNMII | Galway University Hospital (UCHG) |
| Grainne O'Shea | Acting CNMIII | Galway University Hospital (UCHG) |
| Helen Moran | CNMII | Galway University Hospital (UCHG) |
| Kathleen Boyle | Acting CNM III | Galway University Hospital (UCHG) |
| Marian Cahill Collins | Staff Nurse | Galway University Hospital (UCHG) |
| Mary Molloy | CNMII | Galway University Hospital (UCHG) |
| Terry McMahon | CNMII | Galway University Hospital (UCHG) |
| Eileen Walsh | CNMIII | Kerry General Hospital |
| Emer Hunter | CNMII | Letterkenny General Hospital |
| Maura Hickey | Inpatient Co-ordinator | Letterkenny General Hospital |
| Michelle Donnelly | CNMIII | Letterkenny General Hospital |
| Noreen Harley | ADoN | Letterkenny General Hospital |

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| Ber Hogan | CNMI | Limerick MWRH |
| Margaret Cassidy | CNMI | Limerick MWRH |
| Rosaleen Earlie | Assistant Bed Manager | Limerick MWRH |
| Mary Kelleher | Inpatient Co-ordinator | Mallow General Hospital |
| Chris Cox | Acting CNMII | Mayo General Hospital |
| Colette Murray | CNMI | Mayo General Hospital |
| Damien Ansboro | Staff Nurse | Mayo General Hospital |
| Geraldine Flannery | Staff Nurse | Mayo General Hospital |
| Paula McGreal | In-patient Co-ordinator | Mayo General Hospital |
| Claire Coleman | CNMII | Mercy University Hospital |
| Elaine O'Riordan | Staff Nurse | Mercy University Hospital |
| Evelyn O'Byrne | CNMII | Mercy University Hospital |
| Kate O'Herlihy | Staff Nurse | Mercy University Hospital |
| Catherine Clarke | Bed Manager | Mater Misericordiae University Hospital |
| Karen McDonald | Discharge Co-ordinator | Mater Misericordiae University Hospital |
| Colette Quinn | CNMII | Mullingar MRH |
| Yvonne Gray | CNMII | Mullingar MRH |
| Catherine Kearney | CNS | Nenagh MWRH |
| Patricia McKeown | A/CNM | Nenagh MWRH |
| Mary McHugh | Nursing Practice Development Co-ordinator | Portiuncula Hospital |
| Mary Barrett | CNMII | Portiuncula Hospital |
| Catherine Rogan Foy | CNMII | Portlaoise MRH |
| Eileen Kennedy | Nursing Administration Site Manager | Portlaoise MRH |
| Mairead O'Sullivan | Facilitator for InterNational Nurses | Portlaoise MRH |
| Jenny O'Hagan | CNMII | Roscommon General Hospital |
| Ursula Morgan | Staff Nurse | Roscommon General Hospital |
| Alma Spillane | CNMII | S Infirmary University Hospital |
| Fiona McGuinley | CNMIII | S Infirmary University Hospital |

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| Phil McKenna | ADoN | S Infirmery University Hospital |
| Una Cashman | CNMII | S Infirmery University Hospital |
| Mairead Hourihan | CNMII | Sligo General Hospital |
| Pat McLoughlin | CNMII | Sligo General Hospital |
| Shirley O'Brien | Bed Manager | Sligo General Hospital |
| Elizabeth Laffan | Inpt Co-ordinator/ Discharge Planner | St Columcille's Hospital |
| Olive McCusker | Assist. DoN | St Columcille's Hospital |
| Bernie Lyons | Site Nurse Manager CNMIII | St James's Hospital |
| Sharon O'Hare | CNMII | St James's Hospital |
| Antoinette English | Haemovigilance Officer | St John's Hospital, Limerick |
| Fiona Kelly | CNMII | St John's Hospital, Limerick |
| Anne Gladney | CNMI | St Luke's Hospital, Kilkenny |
| Mary Norton | CNMII | St Luke's Hospital, Kilkenny |
| Mary B Brennan | CNMI | St Luke's Hospital, Kilkenny |
| Shevaun O'Sullivan | CNMI | St Luke's Hospital, Kilkenny |
| Adrian Connor | CNMI | St Michaels Hospital |
| Michael Naughton | CNM II | St Michaels Hospital |
| Ann Brennan | CNMII | St. Vincent's University Hospital |
| Mark Jeffrey | CNMIII | St. Vincent's University Hospital |
| Clare Broderick | Discharge Planner | AMNCH |
| Mary O'Connor | CNMII | AMNCH |
| Alice Cockram | CNMII | Tullamore MRH |
| Rosemary Bracken | Bed Manager | Tullamore MRH |
| Sinead Boyd | CNMII | Tullamore MRH |
| Emma Mulligan | CNMII | Waterford Regional Hospital |
| Karen Jackman | Act CNMI | Waterford Regional Hospital |
| Martina McCarthy | Acting CNMI | Waterford Regional Hospital |
| Olive Lynch | Acting Night Superintendent | Waterford Regional Hospital |
| Paula Cooke | Senior Staff Nurse | Waterford Regional Hospital |

R: List of Surveyors



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|------------------|-----------------------------------|--------------------------|
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| Margaret Curran | Assistant DoN | Wexford General Hospital |
| Norma Sheehan | CNMII | Wexford General Hospital |
| Rebecca Pierce | Assistant DoN | Wexford General Hospital |

APPENDIX S: Summary of Surveyor Feedback

The following points reflect the main points that were made by the surveyors. These should be given careful consideration in the event that another bed utilisation review is undertaken.

1. The more groundwork that can be done to alert local hospital staff to facilitate and support surveyors the better the survey experience. Support from ward clerks in supplying notes and explaining local set-up is particularly valuable; quiet space to undertake the survey work is also important. Experience of this varied from hospital to hospital.
2. Having accurate patient listings with the sample organised by ward for the surveyors saves time and confusion. There is definite value in having a lead surveyor/ HSE liaison locally to support the surveyors, especially in getting started and also maintaining overview of progress throughout the day – although this can reduce their capacity to undertake survey work.
3. An understanding of the surveyor clinical background and experience is useful in order to set up most efficient pairings during the planning stage. Specifically there is a need to consider how experienced surveyors can support 'new' surveyors in the survey.
4. It is desirable to undertake 'dry runs' of patient listings well in advance of survey samples to iron out issues about beds to be included, data available from the listings, etc, as there is significant variation between hospitals.
5. Whilst the exercise is challenging, the surveyors in general find it to be a positive and rewarding experience.
6. There is a large variation between hospitals and wards as to the nature and quality of patient records, and this needs to be considered during the planning and execution of any bed utilisation survey.
7. Still some clarification is required around the application of the AEP tool, as a surveyors' professional instinct is to have someone in a hospital environment in circumstances where symptoms/ diagnosis on admission is unclear (especially around 'pain'), but in accordance with AEP guidelines they should in many instances be excluded.

APPENDIX T: Location and Dates of Consultation Sessions

The following table contains the dates and locations of the network consultation sessions that were undertaken as part of this bed utilisation review.

Table T.1 Consultation dates and locations

| Network | Location | Date |
|---------------------|-----------|------------|
| 1 – North Eastern | Dublin | 06/02/2007 |
| 2 – Dublin Midlands | Tullamore | 06/02/2007 |
| 3 – Mid West | Limerick | 07/02/2007 |
| 4 – Southern | Cork | 07/02/2007 |
| 5 – West/North West | Galway | 20/02/2007 |
| 6 – South Eastern | Kilkenny | 15/02/2007 |
| 7 – Dublin North | Dublin | 08/03/2007 |
| 8 – Dublin South | Dublin | 08/03/2007 |

APPENDIX U: Definition of Terms Used In AEP Form

The following tables define what the terms used in the AEP form, and referred to in the main report address.

U.1 Source of Referral

| Term | Definition |
|----------------|--|
| GP | The patient was either seen by their GP (and there is a GP referral letter, or some other clear indication in the notes, such as a documented phone call); or they were referred by the GP by phone. |
| Self | The patient self-referred themselves to the hospital or called an ambulance (without any GP involvement). |
| Outpatients | The patient was referred from outpatients as a planned admission (usually the case in orthopaedics); or was admitted directly from outpatients as an emergency. |
| Private Clinic | The patient was referred from a private clinic. |
| Other Hospital | The patient was transferred from another hospital. |

U.2 Admission Comorbidities

| Term | Definition |
|-------------------------|---|
| CCF | Congestive Cardiac <u>Failure</u> |
| IHD | Ischaemic Heart Disease (all other chronic heart disease eg atrial fibrillation, angina, previous history of myocardial infarction) |
| COPD | Chronic Obstructive Pulmonary Disease |
| PVD | Peripheral Vascular Disease (eg amputation, ischaemic ulcers) |
| Cancer | any type |
| Cerebrovascular Disease | eg Stroke, TIA |

U.3 Alternative Care Settings

| Term | Definition |
|-------------------------------------|--|
| Own home only (+ GP) | At home (alone, or with a carer/ family) but with no additional supporting services other than normal access to their GP |
| Home with social care | At home with home help/ care assistant support and/or other services such as meals, telecare, day centre etc |
| Home with home care package | At home with a multidisciplinary tailored package of services |
| Home with community nursing | At home with general community nursing support (and with or without any necessary social care support) |
| Home with specialist nursing | Specialist nurse skills – eg diabetes, stroke, CPN - (and with or without social care and/or community nursing support) |
| Home with therapy support | Support at home from therapy services (with or without any necessary social care and/or nursing support) |
| Non-acute bed, no therapy support | Placement in community hospital, residential or nursing care home (excluding mental health facility); no direct input from therapy services |
| Non-acute bed, with therapy support | Placement in community hospital, residential or nursing care home (excluding mental health facility) with direct input from therapy services |
| Hospice | End of life/ palliative care location |
| Mental Health Bed | Bed in an institutional location specialising in continuing mental health care |
| Young Chronic Sick Facility | Care setting for young (<65) chronically sick people |
| Access to assessment/ diagnostics | At home (with appropriate social and nursing care support as required) and with access to assessment/diagnostics services |

APPENDIX V: Glossary

| | |
|-------------------|--|
| CCF | Congestive Cardiac Failure |
| CHD | Coronary Heart Disease |
| COPD | Chronic Obstructive Pulmonary Disease |
| CVD | Cerebrovascular Disease |
| CVS | Cardiovascular Disease |
| Group 1 Hospitals | The major academic training hospitals (AMNCH, Beaumont, Cork, Connolly, MMUH, St. James's, St. Vincent's and UCHG). |
| Group 2 Hospitals | Other casemix hospitals (Cavan, Drogheda, Louth, Navan, Tullamore, Mullingar, Portlaoise, Dooradoyle, Mercy, SIVU, Mallow, Kerry, Letterkenny, Sligo, Portiuncula, Mayo, Merlin, Waterford, St. Luke's, Wexford and St. Columcille's). |
| HT | Hypertension |
| IHD | Ischaemic Heart Disease (all other chronic heart disease eg atrial fibrillation, angina, previous history of myocardial infarction) |
| MAU | Medical Admission Unit |
| OT | Occupational Therapy |
| PCCC | Primary, Community and Continuing Care |
| PET | Positron emission tomography, also called PET imaging or a PET scan |
| PVD | Peripheral Vascular Disease (eg amputation, ischaemic ulcers) |

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