Leicester, Leicestershire and Rutland (LLR) Joint Primary and Secondary Care Mortality Review

1. Executive Summary

The Summary Hospital-Level Mortality Indicator (SHMI) of University Hospitals of Leicester (UHL) NHS Trust has been at or slightly above 1.05 since 2010/11. Although it has always been within the SHMI Control Limits, and so would not normally trigger a concern, its persistence for more than two years led local NHS provider and commissioning organisations to undertake a joint primary and secondary care case records review of deaths that occurred during the year of 2012/13.

In order to maximise the likelihood of establishing whether there is a significant level or pattern of systematic clinical issues in the care received by patients in Leicester, Leicestershire and Rutland, the review took a focused sample of in-patient and community deaths following an emergency admission to Leicester Royal Infirmary. The sample did not include those who died with a Do Not Attempt Resuscitation (DNAR) order.

Local doctors and nurses reviewing a sample of 381 cases found that:

- 23.4% (89/381) of cases had an aspect of their care below acceptable standard (95% confidence interval[1] from 19.4% to 27.9%).
- 54.6% (208/381) of cases had significant lessons to learn (95% confidence interval[1] from 49.6% to 59.5%).

The 'Top Twelve' themes identified in the 208 cases deemed to have significant lessons to learn were:

System Theme	Number of cases with the theme
DNAR orders	45
Clinical reasoning	41
Palliative care	30
Clinical management	24
Discharge summary	19
Fluid management	18
Unexpected deterioration	16
Discharge	14
Severity of illness	13
Early Warning Score	11
Antibiotics	11
Medication	11

[1] The 95% confidence interval indicates the degree of uncertainty due to statistical or random variation inherent in any sample. The confidence interval can be interpreted as indicating the likely values of the true proportion given the value of the proportion found in the sample. The 95% indicates the degree of likelihood.

2. Case Records Review Panel Members

The review was undertaken by experienced doctors and nurses who are working or have worked in the health service in Leicester, Leicestershire or Rutland for many years. The analyses in this report are based on their review of case records.

2.1. Doctors' Sub-Panel

Title	Name	Job Title	Location	Practice	No. of cases reviewed
Dr	Dan O'Keeffe	General Practitioner	Retired	-	57
Dr	Pam Bowyer	General Practitioner	Coalville	Dr NR Pulman & Partners	36
Dr	Orest Mulka	General Practitioner	Retired	-	35
Dr	Sue Cullis	General Practitioner	Portfolio	-	34
Dr	Kath Packham	Specialty Registrar	Public Health	-	28
Dr	Simeon Rayner	General Practitioner	Billesdon	Dr MWE Austin & Partners	28
Dr	Ian Robinson	General Practitioner	Portfolio	-	28
Dr	Carol Furlong	General Practitioner	Coalville	Dr NR Pulman & Partners	26
Dr	Elizabeth Alun-Jones	General Practitioner	Hinckley	Dr ID Cracknell & Partners	26
Dr	**Chris Williams – also on Thematic Analysis Panel**	**General Practitioner**	**Coalville**	**Dr NR Pulman & Partners**	**26**
Dr	Chris Prideaux	General Practitioner	Portfolio	-	21
Dr	Hilary Fox	General Practitioner	Uppingham	Dr JP Jones & Partners	18
Dr	Geth Jenkins	General Practitioner	Earl Shilton	Dr G Jenkins & Partners	13
Dr	Karl Shergill	General Practitioner	Birstall	Dr KS Shergill & Partners	5
Dr	***Ronald Hsu – Doctors' Co-ordinator***	***Teaching Fellow***	***Public Health***	***University of Leicester***	***0***

Title	Name	Job Title	Specialty	Hospital	No. of cases reviewed
Mr	Martin Dennis	Hospital Consultant	Vascular Surgery	Leicester Royal Infirmary	64
Dr	James Reid	Hospital Consultant	Geriatric Medicine	Leicester Royal Infirmary	43
Dr	Doug Skehan	Hospital Consultant	Cardiology	Glenfield Hospital	33
Dr	Fiona Miall	Hospital Consultant	Haematology	Leicester Royal Infirmary	31
Dr	**Azri Nache – also on Thematic Analysis Panel**	**Specialty Registrar**	**General Medicine**	**Leicester Royal Infirmary**	**31**
Dr	Mark Ardron	Hospital Consultant	Stroke Medicine	Leicester Royal Infirmary	30
Dr	Penny Eames	Hospital Consultant	Neurology	Leicester General Hospital	21
Dr	Alison Gallagher	Hospital Consultant	Endocrinology	Leicester Royal Infirmary	21
Dr	Lisa Turner	Specialty Registrar	General Medicine	Leicester Royal Infirmary	21
Dr	Ruth Denton-Beaumont	Hospital Consultant	Acute Medicine	Leicester Royal Infirmary	18
Dr	John Parker	Hospital Consultant	Anaesthetics	Leicester Royal Infirmary	18
Dr	Lee Walker	Hospital Consultant	Acute Medicine	Leicester Royal Infirmary	15
Dr	Barrie Rathbone	Hospital Consultant	Gastroenterology	Leicester Royal Infirmary	13
Dr	Patricia Hooper	Specialty Registrar	General Medicine	Leicester Royal Infirmary	12
Dr	Dilesh Lakhani	Hospital Consultant	Geriatric Medicine	Leicester Royal Infirmary	10
Dr	**Miles Levy – also on Thematic Analysis Panel**	**Hospital Consultant**	**Endocrinology**	**Leicester Royal Infirmary**	**0**

2.2. Nurses' Sub-Panel

Title	Name	Job Title	NHS Organisation	Division	No. of cases reviewed
Mrs	Debra Clarke	Deputy Sister for District Nursing Service	LPT NHS Trust	Merlyn Vaz Health and Social Care Centre	85
Ms	Sara Lowe	Releasing Time to Care Nurse Facilitator	LPT NHS Trust	Charnwood Mill	49
Mr	Jonathan Dexter	Advanced Nurse Practitioner	LPT NHS Trust	Charnwood Mill	27
Ms	Zoe Harris	Specialist Nurse Team Manager for Long Term Conditions	LPT NHS Trust	Riverside House	25
Mrs	Debbie Leafe	Clinical Education Lead for Adult Services	LPT NHS Trust	Charnwood Mill	13
Mrs	Louise Clayton	Specialist Nurse for Heart Failure	LPT NHS Trust	Westcotes Health Centre	13
Ms	Shelley Jacques	Registered Nurse in Nursing Bank	LPT NHS Trust	St Matthews Health and Community Centre	12
Ms	Lesley Tooley	Clinical Training and Development Manager	LPT NHS Trust	Charnwood Mill	12

Title	Name	Job Title	NHS Organisation	Hospital	No. of cases reviewed
Ms	Julia Ball	Divisional Head of Nursing for Planned Care	UHL NHS Trust	Leicester Royal Infirmary	29
Miss	Amy Brown	Registered Nurse in Emergency Department	UHL NHS Trust	Leicester Royal Infirmary	29
Ms	Yvonne Kenmuir-Hogg	Matron for Elective Orthopaedic Surgery	UHL NHS Trust	Leicester General Hospital	27
Mrs	Helen Smalley	Ward Sister for Specialist and Vascular Surgery	UHL NHS Trust	Leicester Royal Infirmary	26
Mrs	Christine Bufton	Lead Specialist Nurse for Vascular Studies Unit	UHL NHS Trust	Leicester Royal Infirmary	22
Ms	Alison Hessey	Matron for Planned Care	UHL NHS Trust	Glenfield Hospital	19
Mrs	Natalie Nelson	Ward Sister for Orthopaedic Surgery	UHL NHS Trust	Leicester Royal Infirmary	19
Ms	Elizabeth Aryeetey	Lead Specialist Nurse for Congenital Heart Disease	UHL NHS Trust	Glenfield Hospital	16
Mr	Dominick Tompkins	Releasing Time to Care Nurse Facilitator	UHL NHS Trust	Leicester Royal Infirmary	16
Ms	Linda Zeleny	Ward Sister for Brain Injury Unit	UHL NHS Trust	Leicester General Hospital	12
Mrs	***Lucy Douglas-Pannett – Nurses' Co-ordinator***	***Specialty Registrar in Public Health***	*-*	*-*	***10***
Ms	Margaret Kelly	Deputy Sister for Acute Medical Unit	UHL NHS Trust	Leicester Royal Infirmary	9

3. Thematic Analysis Panel Members

The reviewers' analyses were analysed for themes by the five clinicians in bold.

4. Report Authors

Dr R Hsu and Mrs L Douglas-Pannett compiled this report based on the analyses.

5. Acknowledgements

All members of the LLR Mortality Case Records Review Panel and Thematic Analysis Panel would like to express our indebtedness to the patients whose case records we reviewed and analysed. Regardless of our years of clinical experience, each of us was personally touched by the experiences, both good and bad, of the patients as described in the case records. It is incumbent upon all of us to use the legacy that these patients left us to identify where and how care can be improved.

The doctors and nurses would not have been able to undertake the review without the support of the directors and managers of local NHS Trusts and Clinical Commissioning Groups:

University Hospitals of Leicester (UHL) NHS Trust	– Dr Kevin Harris – Ms Carole Ribbins – Ms Rebecca Broughton
Leicestershire Partnership (LPT) NHS Trust	– Ms Rachel Bilsborough – Ms Jude Smith
East Leicestershire and Rutland (ELR) CCG	– Dr Dave Briggs – Ms Carmel O'Brien
Leicester City (LC) CCG	– Dr Simon Freeman – Ms Dawn Leese
West Leicestershire (WL) CCG	– Dr Nick Pulman – Ms Caroline Trevithick

Equally importantly was the work of the managerial, administrative and clerical staff who brought together primary care, community (SystmOne) and hospital records for the reviewers to review:

University Hospitals of Leicester (UHL) NHS Trust	– Ms Linda Hutchinson – Ms Jo Lowry – Ms Enady Mussa – Ms Claire Willday
Greater East Midlands Commissioning Support Unit	– Mr Phil Demmer

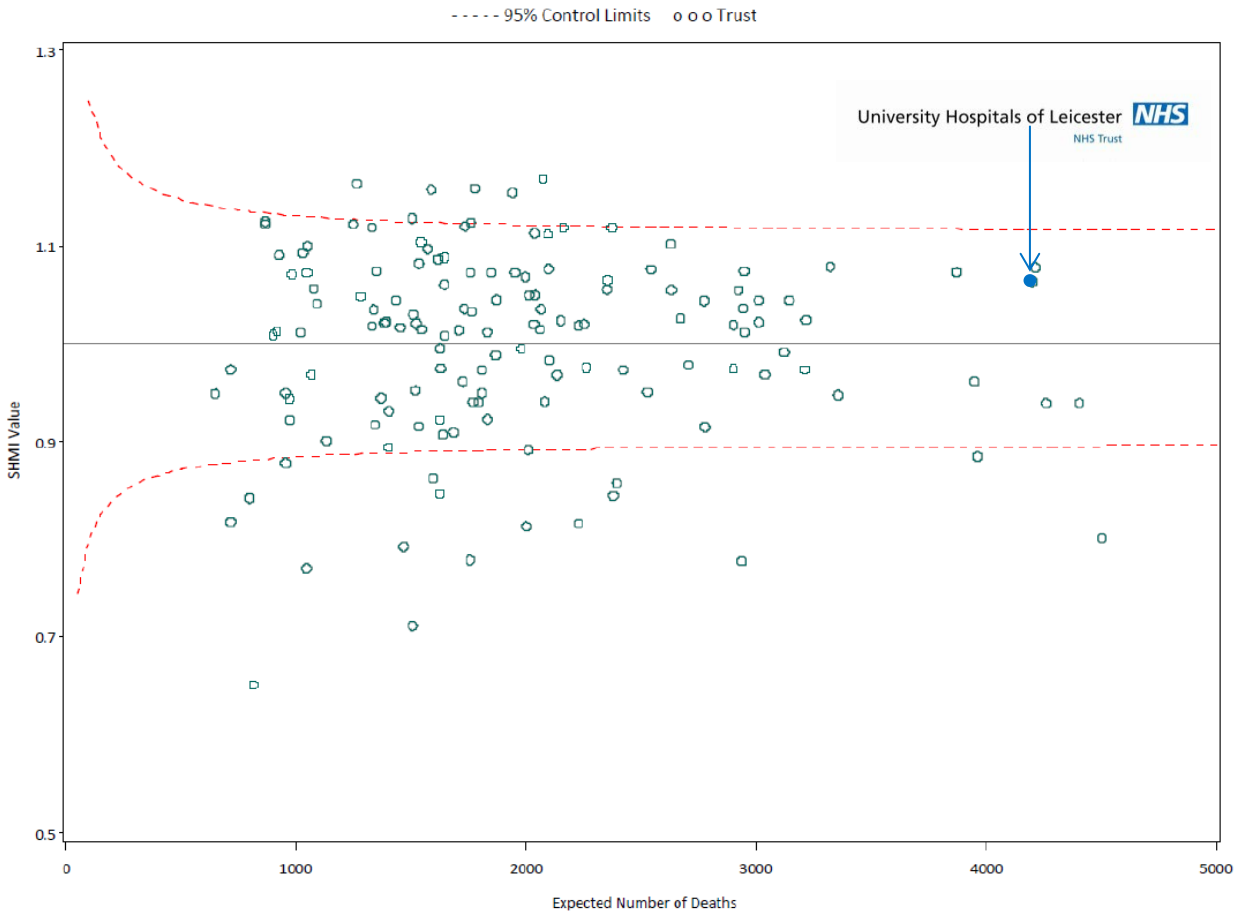
Finally, we would like to thank the following data analyst and clerks for collating the information necessary to identify those patients who were admitted to LRI and either seen by the LRI Resuscitation Team or treated in LRI Intensive Therapy Unit for adults:

UHL Business Intelligence	– Mr Gareth Greaves
LRI Resuscitation Team	– Ms Nicola McKay
LRI Intensive Therapy Unit for Adults	– Ms Kim Clarkson – Ms Alexandra Smith

6. Background for the Review

Since the publication of the Summary Hospital-Level Mortality Indicator (SHMI)[2] for NHS Trusts in England for the year ending March 2011, University Hospitals of Leicester (UHL) NHS Trust's SHMI has been at or slightly above 1.05. Although it has always been within the Control Limits[3] of 0.89 and 1.13, the persistence of UHL's SHMI at 1.05 suggests that there may be a systematic reason, rather than random variation, for it being at that value.

Figure 1: Summary Hospital-Level Mortality Indicator (SHMI) – Deaths associated with Hospitalisation for England, April 2012 to March 2013, with Over-Dispersion Control Limits[4]



[2] SHMI value for all NHS Trusts for England is 1.00. Values more than 1.00 indicate an excess in the number of deaths after adjusting for relevant differences in the patients. Values less than 1.00 indicate fewer deaths than expected.

[3] The variation of those values within the Control Limits around the central value of 1.00 is most likely to be explained by a set of common causes, whereas those values outside the Control Limits are most likely to have some special causes in addition to the common causes to explain their variation from the central value of 1.00.

[4] Summary Hospital-Level Mortality Indicator (SHMI) – Deaths associated with Hospitalisation for England, April 2012 to March 2013. Experimental Statistics: Executive Summary (available at www.hscic.gov.uk/shmi).

Local NHS organisations commissioned a retrospective case record review to ascertain whether there are systematic clinical issues in the care received by patients in Leicester, Leicestershire and Rutland. If such a retrospective case record review fails to find a significant level or pattern of systematic clinical issues, it would be reasonable to assume that systematic non-clinical issues, such as differences in clinical coding or unadjusted confounding, could explain the persistence of UHL's SHMI at 1.05.

The commissioning of the retrospective case record review does not imply, and is not intended to imply, that there really is an excess in the adjusted number of deaths attributable to the care provided by University Hospitals of Leicester (UHL) NHS Trust or any other organisation providing health or social care services in Leicester, Leicestershire and Rutland.

7. Context for the Review

From the outset, it was agreed that the persistently high SHMI is an issue for all those providing NHS healthcare in Leicester, Leicestershire and Rutland, and not just for University Hospitals of Leicester (UHL) NHS Trust.

So, it was agreed that a joint primary and secondary care case records review would be undertaken in which doctors and nurses from primary care, community health services and hospitals review primary care, community health (SystmOne) and hospital records together.

Such a comprehensive joint review of NHS healthcare records has never been attempted before, and so it is not possible to make direct comparisons with other reviews. However, there are two published reviews that give an indication of the results that could reasonably be expected in this review:

1. In a NCEPOD review of the care of patients who died in hospital between 1 October 2006 and 31 March 2007 within four days of admission[5] on page 17: *"However, in 34.2% (750/2195) of patients there was room for improvement and in 4.9% (108/2195) of cases care was judged to have been less than satisfactory by the advisors. In 107 cases there was insufficient data to assess the case."* Although not calculated by NCEPOD, the 95% confidence intervals for 34.2% would be 32.2% to 36.2% and for 4.9% they would be 4.09% to 5.91%.

2. In a retrospective case record review by Hogan H et al of 1,000 adults who died in 2009 in 10 acute hospitals in England[6] on page 739: *"131 (13.1%; 95% CI: 10.9% to 15.1%) patients were identified as having a problem in care that contributed to their death."* This is analogous to significant lessons to learn. Although not calculated by Hogan H et al, Table 3 in their article has 60 cases considered to have received poor quality of care and 10 very

[5] National Confidential Enquiry into Patient Outcome and Death. *Caring to the End? A review of the care of patients who died in hospital within four days of admission.* London: NCEPOD; 2009 Nov.
[6] Hogan H, Healey F, Neale G, Thomson R, Vincent C, Black N. Preventable deaths due to problems in care in English acute hospitals: a retrospective case record review study. *BMJ Quality and Safety* 2012 Sep; **21(9)**: 737-45.

poor care, giving a total of 70 cases of the 1,000 records reviewed (7%; 95% CI: 5.57% to 8.76%). This is analogous to unacceptable care.

8. Sample Size Required for the Review

If the headline category is considered to be unacceptable care, and one considers the expected percentage in 1,000 eligible cases in a year to be 5%, the following sample sizes would give the following degrees of uncertainty as exemplified by the 95% confidence interval[7]:

Expected percentage	Sample size	95% confidence interval
5%	440	from 3.48% to 6.52%
5%	240	from 2.60% to 7.40%
5%	144	from 1.70% to 8.30%

It was decided to sample 440 cases in order to minimise the degree of uncertainty to an expected percentage of 5% ± 1.5%. If the measured proportion turns out to be less than 5%, there will be a smaller degree of uncertainty, and if more than 5% (up to 50%), there will be a larger degree of uncertainty.

9. Sampling Strategy for the Review

The sampling strategy was to focus on admissions most likely to demonstrate any systematic clinical issues that may exist. That way, if no systematic clinical issues are found, then there is no need for any further comprehensive reviews as other samples are also unlikely to find systematic clinical issues.

A focused sample was undertaken of those patients from Leicester, Leicestershire or Rutland who either died in or were discharged from Leicester Royal Infirmary on or between 1 April 2012 and 31 March 2013 following an emergency admission to a hospital.

For those who died in Leicester Royal Infirmary, only those who died after involvement of the Resuscitation Team or in the Intensive Therapy Unit for adults were selected on the basis that they were not expected to die. If a patient was expected to die, one would expect a Do Not Attempt Resuscitation (DNAR) order to be in place and so the Resuscitation Team would not be called and the patient would not be treated in the Intensive Therapy Unit for adults.

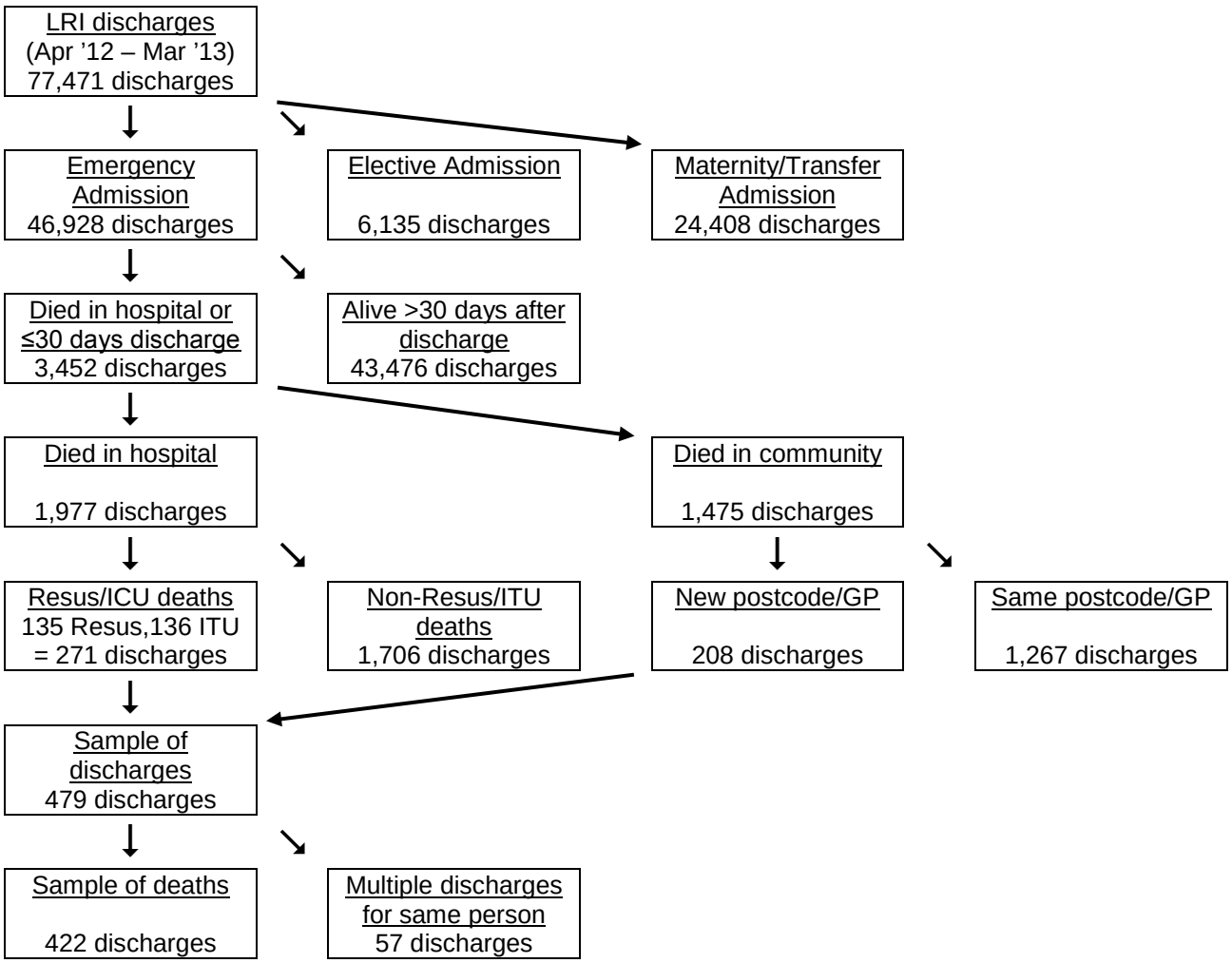
For those who were discharged from Leicester Royal Infirmary, only those who died within 30 days of discharge and changed either their postcode or registered GP, indicating a change in residence, were selected on the basis that such changes increase the likelihood of systematic clinical issues arising.

Since the sample is not a random sample of either admissions or deaths, it is not possible to extrapolate the findings of this review to all admissions or all deaths in University Hospitals of Leicester (NHS) Trust or Leicester, Leicestershire and Rutland.

[7] The 95% confidence interval indicates the degree of uncertainty due to statistical or random variation inherent in any sample. The confidence interval can be interpreted as indicating the likely values of the true proportion given the value of the proportion found in the sample. The 95% indicates the degree of likelihood.

10. Sample Taken for the Review

Figure 2: Flowchart showing identification of cases to be sampled



There were 77,471 deaths or discharges of Leicester, Leicestershire or Rutland patients from Leicester Royal Infirmary from 1 April 2012 to 31 March 2013 inclusive. 46,928 (60.6%) were following an Emergency Admission which resulted in 3,452 (7.4% of Emergency Admissions) dying either in hospital (n = 1,977) or within 30 days of discharge from hospital (n = 1,475).

Amongst the 1,977 hospital deaths, only 271 (13.7%) involved the Resuscitation Team or Intensive Therapy Unit and 1,706 (86.3%) died with a Do Not Attempt Resuscitation (DNAR) order in place.

For the 1,475 deaths within 30 days of discharge from hospital, only 208 (14.1%) were recorded as having changed their postcode or GP before death and 1,267 (85.9%) remained in the same residence and presumably continued being cared for by the same primary care and community health teams.

479 discharges (i.e. 271 hospital deaths + 208 community deaths) were therefore sampled. However, 57 were multiple discharges in the month before death, leaving 422 cases to be sampled for the review.

11. Questions to be Answered by the Review

The primary question was the proportion of cases in the sample that had clinical care of at least an acceptable standard.

The secondary question was whether there were significant lessons that could be learnt from the clinical care reviewed.

11.1. Primary Question: Was the Clinical Care of at Least an Acceptable Standard?

Clinical care was considered to be the processes of healthcare or social care services that impact on a patient's experience and/or the probability of outcomes for a patient. When deciding whether care was of an acceptable standard or not, the reviewers considered the implications for the patient's experience or the probability of outcomes for the patient rather than whether the care would be considered as customary or usual practice of care.

The acceptable standard of care was considered as the absence of error. So, for care to be considered as not acceptable, an error had to be identified. The reviewers used the definition of error described by the Institute of Medicine's Committee on Quality of Health Care in America in its report *To err is human – building a safer health system*[8] (page 54):

> *"Error is defined as the failure of a [correctly] planned action to be completed as intended (i.e. error of execution) or the use of a wrong plan to achieve an aim (i.e. error of planning)."*

Note that an action or inaction does not have to be linked with an adverse event for it to be considered an error. So, the reviewers were not looking for adverse events or serious untoward incidents, nor were they looking to attribute adverse events or serious untoward incidents to an error. However, they were looking for errors of commission or omission. The assumption is that a pattern of repeated errors reflects deficiencies in the systems of care even if a patient was not harmed in a particular case.

Since no plan is perfect or implemented as intended, it is unrealistic to consider the presence of any error as defining care as not acceptable. Care was considered as not of an acceptable standard only if an error was serious. In order to achieve a reasonable degree of validity and reliability in the assessment of seriousness of errors, an error was considered sufficiently serious if it demonstrably impacted on the patient's experience (such as a delay in diagnosing pneumonia prolonging the presence of symptoms), or there was widely accepted evidence that the error was likely to have significantly increased the probability of an adverse event (such as lack of thromboembolism prophylaxis) or significantly decreased the probability of a beneficial event (such as failure to administer aspirin after a myocardial infarction).

[8] Kohn LT, Corrigan JM, Donaldson MS (eds) on behalf of the Committee on Quality of Health Care in America, Institute of Medicine. *To err is human – building a safer health system.* Washington DC: National Academy Press; 2000.

11.2. Secondary Question: What Significant Lessons can be Learnt from the Care?

Any significant lessons that could be learnt from a case were described by the reviewers under one or more of the following headings:

- **"Failure to Interpret"** refers to the initial assessment of the patient and the failure to realise that an adverse event had happened or could happen based on what would reasonably be expected to be ascertained in the situation.

- **"Failure to Investigate"** refers to the follow-up of the patient after the initial assessment. This includes observations to monitor the patient, as well as laboratory tests, imaging or referral.

- **"Failure in Instruction"** refers to the conveying of information for others to take action once it is realised that such actions are necessary. The features of good communication are accuracy, completeness, relevance, clarity and timeliness.

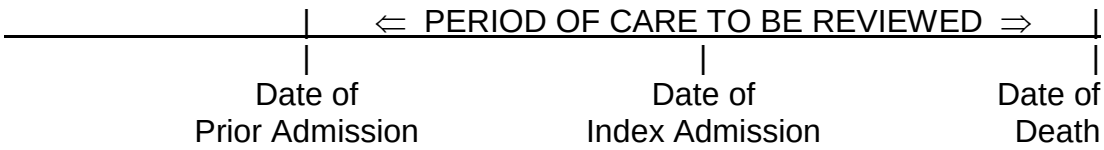
- **"Failure in Information"** refers to the conveying of information for others to take note rather than for action. The features of good communication are accuracy, completeness, relevance, clarity and timeliness.

- **"Failure to Implement"** refers to the actions that should take place based on appropriate instructions conveyed correctly.

11.3. Index Admission and Period of Care Reviewed

The Index Admission was defined as the emergency admission involving an in-patient stay in Leicester Royal Infirmary (LRI) whose date of admission was the last one prior to the date of death.

The Period of Care reviewed was from the date of the last in-patient admission to University Hospitals of Leicester NHS Trust (UHL) prior to the Index Admission up to and including the date of death:



11.4. Clinical Uncertainty

Whenever there was clinical uncertainty, the reviewers erred towards giving the benefit of doubt to the clinicians involved in the care of the patient. So, the default stance was always that the care received by a patient was of an acceptable standard and that there were no significant lessons to learn. There had to be evidence to the contrary for care to be considered otherwise.

12. Case Records Review Panel

The Doctors' Sub-Panel consisted of:

- 13 General Practitioners (2 of whom retired recently) and 1 Specialty Registrar in Public Health who was formerly a General Practitioner
- 12 Hospital Consultants and 3 Specialty Registrars in their final year.

The Nurses' Sub-Panel consisted of:

- 8 nurses from City and County bases in the Community Health Services Division of Leicestershire Partnership NHS Trust
- 11 nurses from the three hospital sites of University Hospitals of Leicester (UHL) NHS Trust and 1 Specialty Registrar in Public Health who was formerly a nurse.

The Doctors' and Nurses' Sub-Panels worked independently in adjacent rooms. Each Sub-Panel had reviewers from primary care or community health services paired with reviewers from the acute hospital. All reviewers received a written protocol and attended a 30 minute training session on the protocol and data entry requirements before they started reviewing cases. After the first day, new reviewers were paired with experienced reviewers. Reviewers were rotated between pairs so that no reviewer reviewed with someone they worked with on a previous day.[9]

Each case was first reviewed by a pair in the Doctors' Sub-Panel. If they decided that there were no significant lessons to learn, the case was reviewed by a pair in the Nurses' Sub-Panel. This arrangement was necessary because there were fewer nurses than doctors reviewing cases. Since it is unlikely that a pair in the Nurses' Sub-Panel would overrule a Doctors' Sub-Panel's finding of significant lessons to learn, this sub-group review by the Nurses' Sub-Panel is unlikely to affect the number of cases with significant lessons to learn but is likely to lead to an underestimate of the number of significant lessons to learn.

All pairs reviewed the primary care and hospital records, and had access to the community health services records on SystmOne as well as hospital computerised laboratory results and imaging. Both reviewers in a pair had to agree whether care was of an acceptable standard and whether there were any significant lessons to learn. Then the pair had to justify their decision about the standard of care and significant lessons to a Sub-Panel Co-ordinator who was a public health specialist with either a medical or nursing background. The pair's review of a case was accepted only if the Sub-Panel Co-ordinator agreed with their decision about the standard of care and description of significant lessons to learn. Whenever there was uncertainty within a pair or between a pair and the Sub-Panel Co-ordinator, the case was discussed with all the pairs from the same Sub-Panel until a consensus was reached.[10] The pairs in each Sub-Panel were encouraged to discuss their cases with other pairs in the same Sub-Panel or other Sub-Panel, depending on the expertise required, as well as contact colleagues with specific areas of expertise. It took each pair an average of 45 minutes to review a case with the doctors' pairs spending 43 minutes per case and the nurses' pairs spending 47 minutes per case.

[9] On two occasions it was necessary to allow two nurses to work together twice.

[10] There were only 4 cases in which other pairs in the Sub-Panel changed the original pair's decision: 2 cases from acceptable care to unacceptable care, 1 case from unacceptable care to acceptable care, 1 case with acceptable care from significant lessons to learn to no significant lessons to learn.

13. Thematic Analysis of Significant Lessons

The reviewers' descriptions of significant lessons to learn were analysed to ascertain the following:

1. **Care:** whether the type of care[11] the patient should have received was received

2. **Decision Making:** whether the correct plan was made at the correct time

3. **Communication:** whether the right message reached the right people

4. **Delivery:** whether the required care was delivered and was timely

5. **Monitoring:** whether the patient's clinical condition was monitored appropriately

6. **Responsiveness:** whether there was an appropriate response to any unexpected deterioration in the patient's clinical condition

7. **System Themes:** the themes raised by the reviewers' in their descriptions.

14. Thematic Analysis Panel

The LLR Mortality Case Records Thematic Analysis Panel consisted of:

- one doctor with general practice expertise who had reviewed cases (Dr Chris Williams)
- one doctor with hospital medicine expertise who had reviewed cases (Dr Azri Nache)
- one doctor with hospital medicine expertise who had not reviewed cases (Dr Miles Levy)
- one doctor with public health expertise who had heard the reviewed cases as the Doctors' Sub-Panel Co-ordinator (Dr Ronald Hsu)
- one nurse with public health expertise who had heard the reviewed cases as the Nurses' Sub-Panel Co-ordinator (Mrs Lucy Douglas-Pannett).

The doctors on the Thematic Analysis Panel independently analysed the reviewers' descriptions of significant lessons to learn. Then they discussed their individual analyses and themes with each other. The collective analysis and themes for a case was agreed only when there was unanimity between the doctors on the Panel.

The Nurses' Sub-Panel Co-ordinator, Mrs Lucy Douglas-Pannett, reviewed the analysis and themes agreed by the doctors and revised the analysis and themes in 38 cases after discussion with the Doctors' Sub-Panel Co-ordinator, Dr Ronald Hsu.

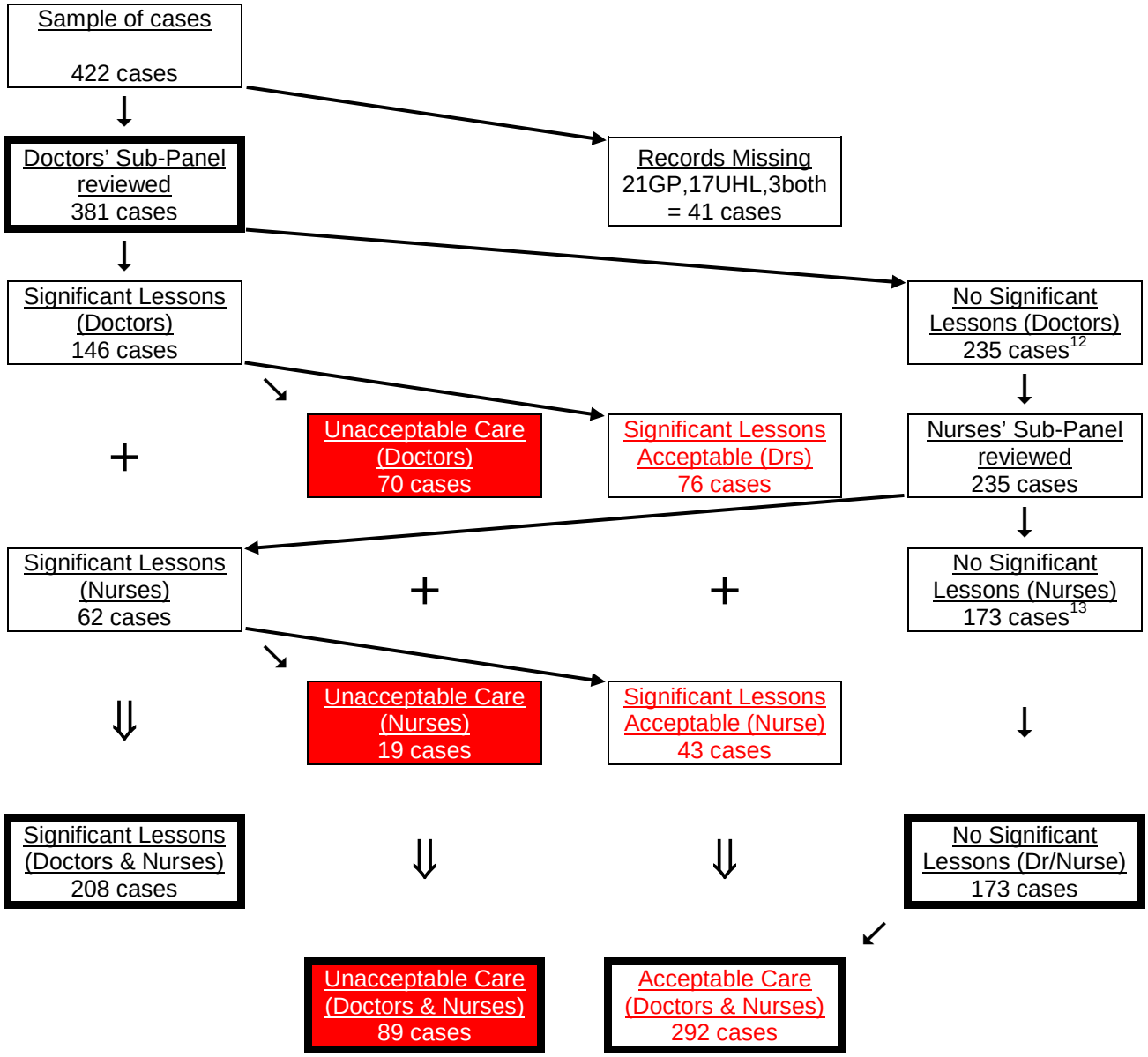
Each doctor on the Thematic Analysis Panel took an average of 20 hours to analyse 208 cases and another 20 hours to agree the collective analysis and themes.

[11] Care was categorised into:

- "Acute Care" where the intention of care was to improve the patient's health state
- "Continuing Care" where the intention of care was to maintain or prevent decline in patient's health state
- "Palliative Care" where the intention of care was to reduce the rate of decline in the patient's health state
- "End of Life Care" where the intention of care was to support the patient during the declining health state

15. Summary of the Quantitative Results of the Review

Figure 3: Flowchart showing classification of the cases reviewed



89 of the 381 reviewed cases were deemed by either doctors or nurses to have had an aspect of their care below acceptable standard. This represents 23.4% of the cases reviewed (95% confidence interval[14] from 19.4% to 27.9%). This may be an

[12] This includes 1 case considered unclassifiable by doctors but classifiable by nurses.
[13] This includes 5 cases considered unclassifiable by nurses but classifiable by doctors.
[14] The 95% confidence interval indicates the degree of uncertainty due to statistical or random variation inherent in any sample. The confidence interval can be interpreted as indicating the likely values of the true proportion given the value of the proportion found in the sample. The 95% indicates the degree of likelihood.

underestimate as the nurses reviewed only 235 out of the 381 cases reviewed by the doctors, and some of the 76 cases considered by doctors to have significant lessons with an acceptable standard of care may be considered by nurses as being below acceptable standard if they had reviewed them.

208 of the 381 reviewed cases were deemed by either doctors or nurses to have significant lessons to learn. This represents 54.6% of the cases reviewed (95% confidence interval from 49.6% to 59.5%). The rigour of the review means that one can be reasonably certain that the 173 cases deemed by both doctors and nurses to have no significant lessons to learn represented good care. In fact, the doctors commented on how exemplary the care was in 8 of the cases they reviewed and the nurses did so in 6 other cases with 1 case in which doctors and nurses independently commented on the exemplary nature of the care.

For the 89 cases with below acceptable standard of care and all 208 cases with significant lessons to learn, the vast majority of lessons were in the acute hospital:

Figure 4: Venn diagram showing healthcare setting for significant lessons to learn in the 89 cases with below acceptable standard of care

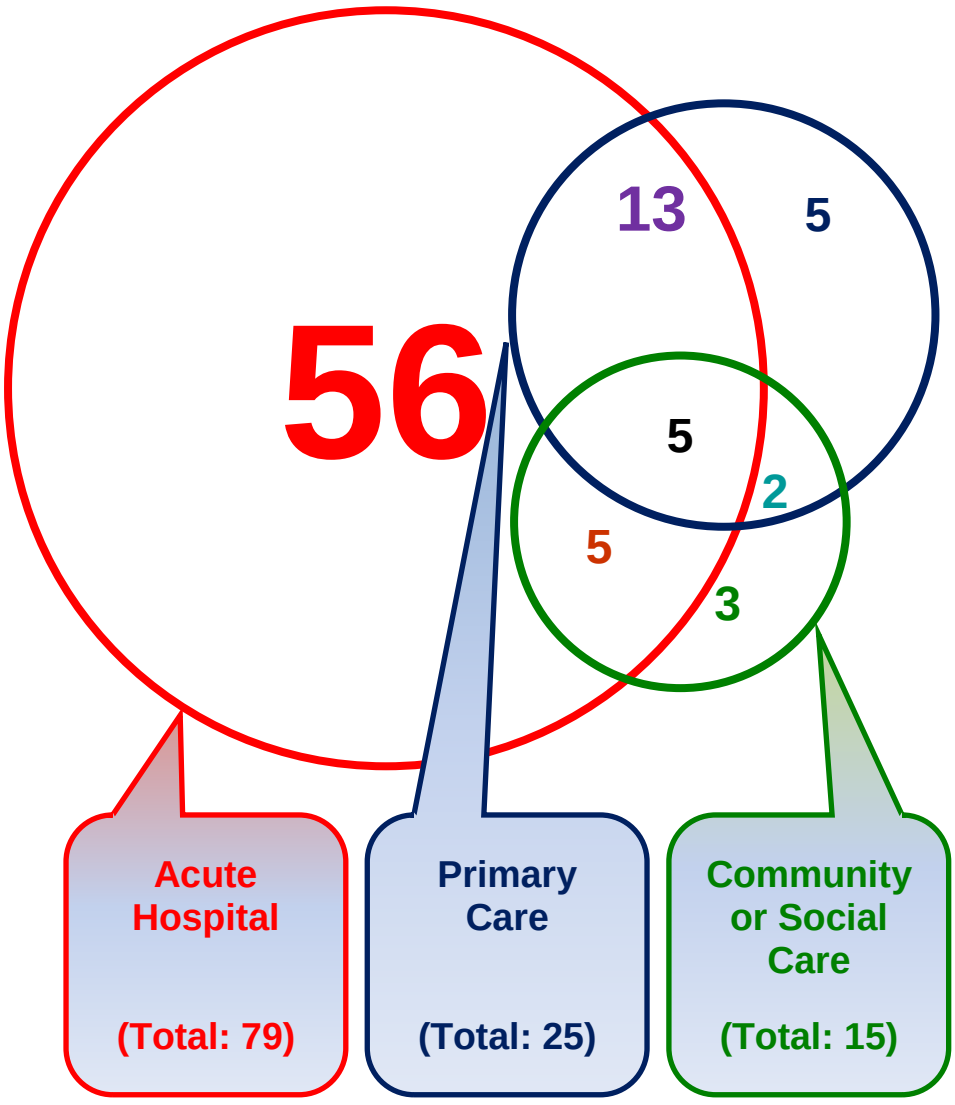
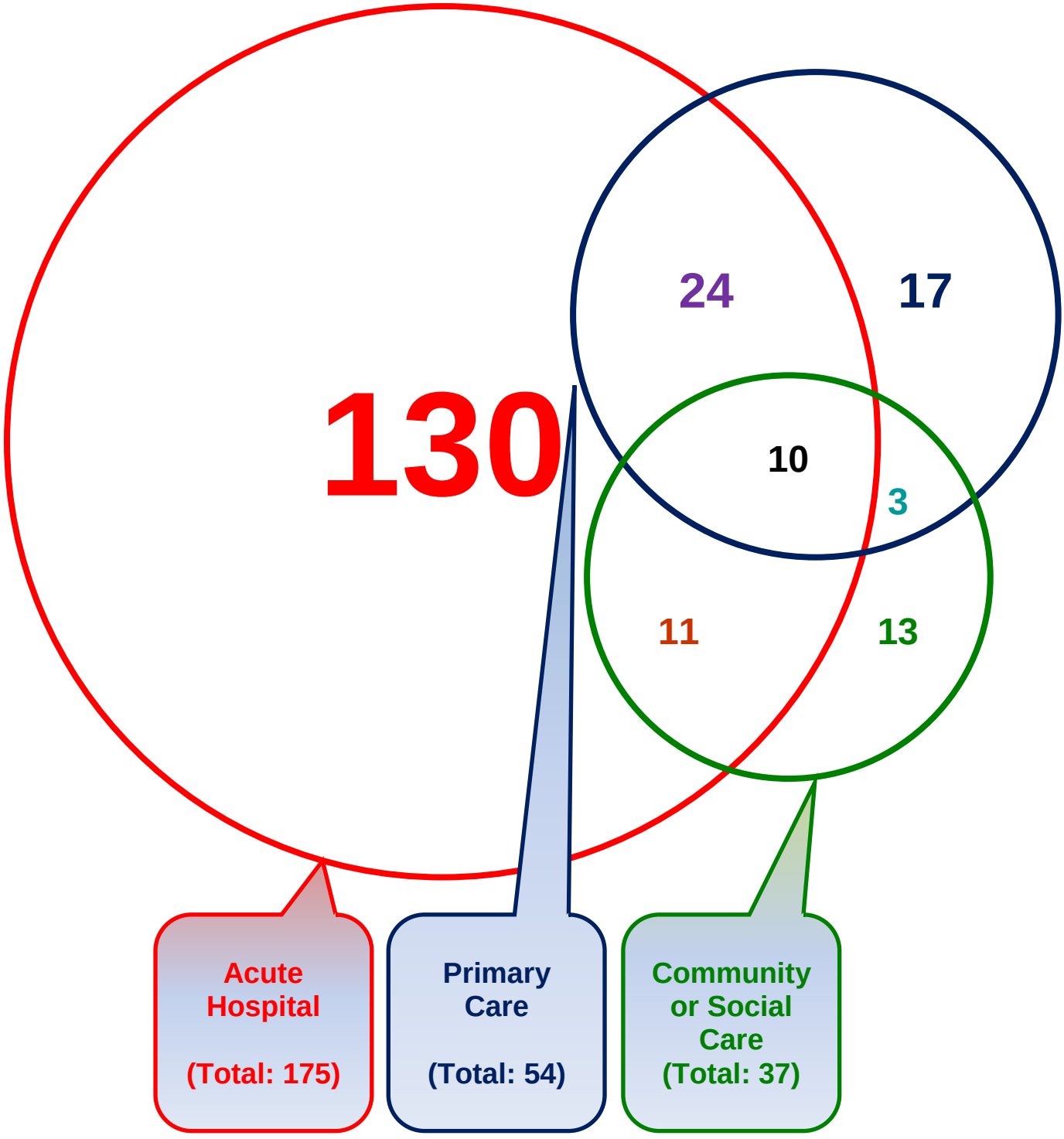


Figure 5: Venn diagram showing healthcare setting for significant lessons to learn in the 208 cases with significant lessons to learn



The doctors and nurses placed their descriptions of the significant lessons in all the headings although the doctors placed more under "Failure to Interpret" and the nurses placed more under "Failure to Investigate" than the other headings. This indicates that "*the initial assessment of the patient and the failure to realise that an adverse event had happened or could happen based on what would reasonably be expected to be ascertained in the situation*" (definition of "Failure to Interpret") and "*the follow-up of the patient after the initial assessment. This includes observations to monitor the patient, as well as laboratory tests, imaging or referral*" (definition of "Failure to Investigate") are important but not unique categories to consider:

For the 89 cases with below standard care:			
Heading	**Doctors' Sub-Panel**	**Nurses' Sub-Panel**	**Both Sub-Panels**
"Failure to Interpret"	45 entries	9 entries	54 entries
"Failure to Investigate"	22 entries	12 entries	34 entries
"Failure in Instruction"	25 entries	7 entries	32 entries
"Failure in Information"	20 entries	4 entries	24 entries
"Failure to Implement"	26 entries	5 entries	31 entries
For the 208 cases with significant lessons to learn (including the 89 cases above):			
Heading	**Doctors' Sub-Panel**	**Nurses' Sub-Panel**	**Both Sub-Panels**
"Failure to Interpret"	72 entries	14 entries	86 entries
"Failure to Investigate"	30 entries	28 entries	58 entries
"Failure in Instruction"	52 entries	17 entries	69 entries
"Failure in Information"	42 entries	12 entries	54 entries
"Failure to Implement"	38 entries	17 entries	55 entries

A similar but not identical pattern emerged when the Thematic Analysis Panel analysed the descriptions of the significant lessons to learn:

For the 89 cases with below standard care:			
Category	**Doctors' Sub-Panel**	**Nurses' Sub-Panel**	**Both Sub-Panels**
Decision Making	52 entries	9 entries	61 entries
Communication	30 entries	6 entries	36 entries
Delivery of Care	37 entries	12 entries	49 entries
Monitoring Patient	17 entries	12 entries	29 entries
Responsiveness	22 entries	7 entries	29 entries
For the 208 cases with significant lessons to learn (including the 89 cases above):			
Heading	**Doctors' Sub-Panel**	**Nurses' Sub-Panel**	**Both Sub-Panels**
Decision Making	86 entries	21 entries	107 entries
Communication	69 entries	22 entries	91 entries
Delivery of Care	63 entries	28 entries	91 entries
Monitoring Patient	27 entries	28 entries	55 entries
Responsiveness	25 entries	9 entries	34 entries

The pattern of system themes that emerged from the Thematic Analysis Panel's analysis of the descriptions of the significant lessons to learn implies that there are no single item solutions that would have a significant impact on their own:

For the 208 cases with significant lessons to learn:

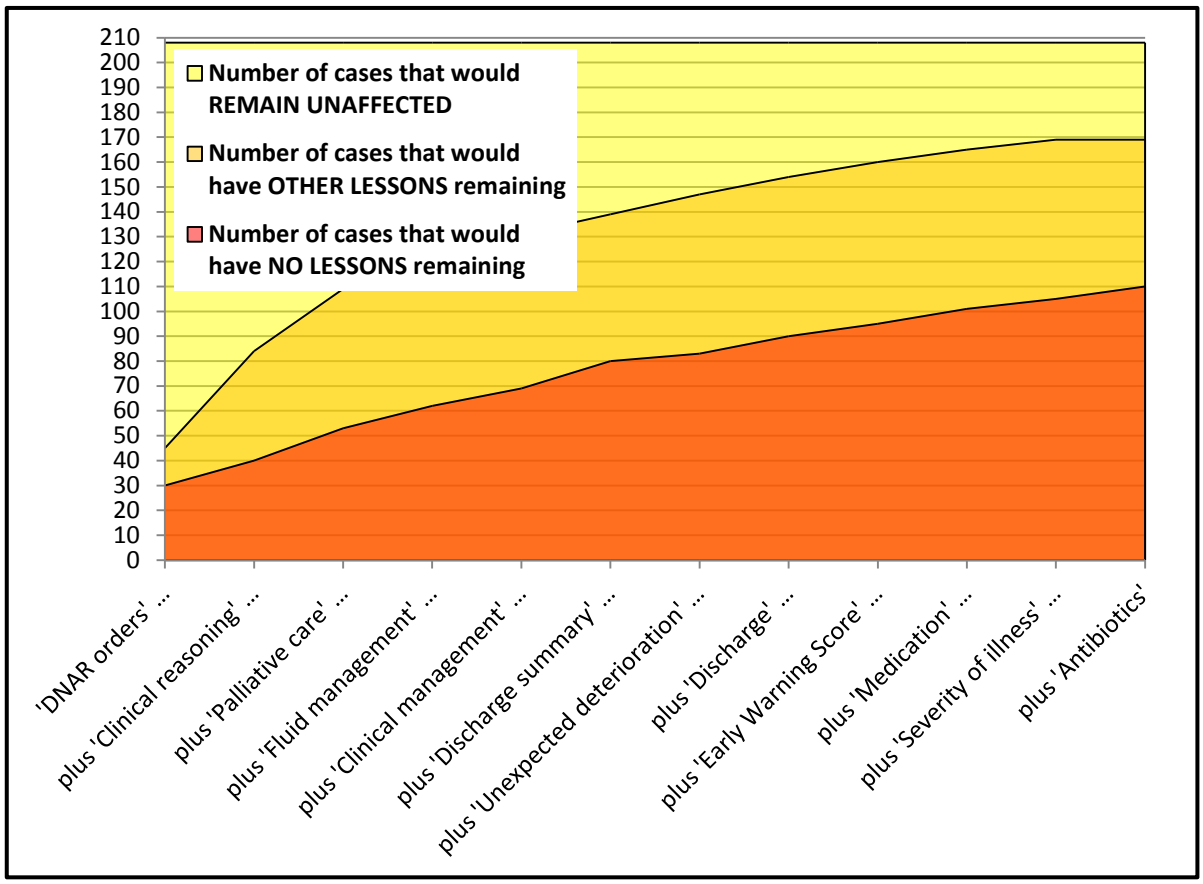
System Theme	Number of cases with the theme	Number of times as communication	Number of times as delivery issue
DNAR orders	45	25	11
Clinical reasoning	41	0	0
Palliative care	30	13	17
Clinical management	24	0	2
Discharge summary	19	17	0
Fluid management	18	5	6
Unexpected deterioration	16	0	0
Discharge	14	5	0
Severity of illness	13	14	0
Early Warning Score	11	1	0
Antibiotics	11	0	8
Medication	11	3	4
Specialty referral	10	5	2
Anticoagulation	10	2	1
Social care	10	1	8
Test result	8	6	0
Out of hours	7	2	0
Procedure delay	7	0	4
Care home placement	6	1	6
ITU referral	5	1	1
GP review	5	0	3
Feeding	5	1	1
Surgical care	4	0	3
Mental capacity	4	2	2
Diabetes care	4	1	1
Falls prevention	4	0	2
Handover	3	0	0
Retrospective entry	3	0	0
Oxygen	3	0	1
Pressure care	3	0	2
MDT outcome	2	0	1
Illegible notes	2	2	0
Reason for death	2	2	0
Medical equipment	2	0	1
Safeguarding	2	0	0

N.B. – the Thematic Analysis Panel identified the following themes only once: Aids and adaptations, Analgesia, Ascitic tap, Blood transfusion, Consent, GP monitoring, GP registration, Hospice care, Pre-hospital care, Reason for treatment, Resuscitation, Stoma care.

The above table highlights the 'Top Twelve' system themes with a grey background. The "Summary of the Qualitative Themes in the Review" section has examples illustrating the issues in those themes.

The 'Top Twelve' were identified on the basis of the number of cases affected until a plateau was reached where additional themes affected only a small number of additional cases. This can be seen when plotting the cumulative effect of combinations of system themes as in the graph below:

Figure 6: Graph showing the cumulative effect of combinations of system themes on the 208 cases with significant lessons to learn



As system themes are added cumulatively, there is an increase in the number of cases affected. In the graph above, the lower dark area shows the number of cases that would have no lessons remaining if the various combinations of system themes were addressed completely. The middle area shows the additional number of cases that would have some of their lessons addressed but would have issues from other themes yet to be remedied. The upper light area shows the number of cases left unaffected if the combinations of system themes were addressed.

If all 'Top Twelve' system themes were resolved, 169 of the 208 cases (81.3%) with significant lessons to learn would have their care improved but only 110 (52.9%) would have all their significant lessons resolved. For the 89 cases with below acceptable standard of care, 77 (86.5%) would have their care affected and 37 (41.6%) would have all their significant lessons resolved.

A comparison of the type of care[15] received with what should have been received by patients, whose care was below an acceptable standard of care or had significant lessons to learn, shows low agreement as indicated by kappa coefficients of agreement[16] calculated to be 0.27 and 0.32 respectively:

For the 89 cases with below standard care:

Care Received	Should have had Acute Care	Should have had Continuing Care	Should have had Palliative Care	Should have had End of Life Care
Actually had Acute Care	59	0	7	16
Actually had Continuing Care	0	2	2	0
Actually had Palliative Care	0	0	3	0
Actually had End of Life Care	0	0	0	0

For the 208 cases with significant lessons to learn (including the 89 cases above):

Care Received	Should have had Acute Care	Should have had Continuing Care	Should have had Palliative Care	Should have had End of Life Care
Actually had Acute Care	105	2	12	58
Actually had Continuing Care	1	9	2	1
Actually had Palliative Care	0	0	6	0
Actually had End of Life Care	0	0	0	12

It can be seen that 26% (23/89) and 34% (70/208) of patients, whose care was below an acceptable standard of care or had significant lessons to learn respectively, received Acute Care when they should have received Palliative Care or End of Life Care. The issue of palliative care and 'End of Life' care provision requires Primary Care and Community Health Services to work with the University Hospitals of Leicester (UHL) NHS Trust as it is not in a position to address these issues on its own.

[15] Care was categorised into:
- "Acute Care" where the intention of care was to improve the patient's health state
- "Continuing Care" where the intention of care was to maintain or prevent decline in patient's health state
- "Palliative Care" where the intention of care was to reduce the rate of decline in the patient's health state
- "End of Life Care" where the intention of care was to support the patient during the declining health state

[16] The kappa coefficient gives a measure of agreement where 1 = perfect agreement and 0 = no agreement. A kappa coefficient of more than 0.4 is regarded as reflecting moderate agreement. Any table that is imbalanced between above and below the diagonal line of agreement (represented by the grey cells) exaggerates the kappa coefficient.

16. Summary of the Qualitative Themes in the Review

Excerpts from the reviewers' descriptions of 10 cases are used to illustrate the issues raised by the 12 most common themes described by the Case Records Review Panel and identified by the Thematic Analysis Panel.

16.1. Do Not Attempt Resuscitation (DNAR) Orders

45 of the cases were found to have issues relating to Do Not Attempt Resuscitation (DNAR) orders. Frequently there was a lack of recognition for the need to broach the subject of DNAR with the patient and/or their next-of-kin resulting, at times, in inappropriate hospital admissions and treatment.

> *"No evidence of an 'End of Life' care plan, although the patient obviously fitted the criteria."*
>
> *"… the patient would have been better managed with palliative care."*
>
> *"… since no DNAR form had been completed, the patient received resuscitation which was unsuccessful."*

There are many reasons why DNAR orders may not be raised at the appropriate time but they need to be overcome to prevent inappropriate responses to clinical deterioration.

> *"If this was broached by doctors on the ward with the patient and family, it is very likely the patient would have had a hospital DNAR form and a good death."*

The role of Primary Care in initiating discussion of advance care directives, encompassing DNAR orders, needs to be reconsidered if inappropriate admission and treatment in hospital are to be prevented. The responsibility of hospital staff to check whether a community DNAR orders exists, and to carry a patient's last wishes as set out in the order, needs to be re-emphasised.

A recurring issue identified by the reviewers was the communication of DNAR orders so that they could be acted upon.

> *"Preceding extensive discussion between GP and family about future care and a community DNAR form was agreed. Nurses and doctors on ward were unaware of this and, when patient had a cardiac arrest, resuscitation was unsuccessfully initiated."*

16.2. Clinical Reasoning

There were 41 cases where the reviewers felt that there were significant lessons to learn from poor clinical reasoning. Certain cases highlighted problems with the clinical assessment of patients by doctors and/or slow recognition of the need for clinical reassessment.

> *"… the issue of [investigative procedure] dominated discussions between doctors rather than the treatment of severe pneumonia in ITU."*

> *"The patient was known to have metastatic [type of] cancer. The patient was bed bound in own home for [a number of] weeks due to pain. GP assessments did not diagnose pathological fracture neck of femur as the reason for being bed bound and in pain. …"*

In some cases the significance of clinical findings were not considered and translated into an appropriate management plan.

> *"Blood results (sodium 155 mmol/L, potassium 3.3 mmol/L) indicating significant dehydration do not appear to have been acted upon."*

> *"As the patient was asymptomatic with no evidence that it would become symptomatic, we feel this could have been managed in the community hospital."*

In other cases the validity and timeliness of certain clinical decisions was questionable.

> *"GP did not arrange appropriately timed INR check after starting [antibiotics] for [condition] (checked 4 days after starting [antibiotics] but then not scheduled for 8 weeks) and patient subsequently admitted with INR > 10 and upper GI bleed."*

Several of the reviewed cases demonstrated a need in the hospital for routine procedures to be carefully monitored and for timely recognition and action when the clinical condition of a patient deviates from the norm or standard care pathway.

16.3. Palliative Care

Palliative care was cited as an issue in 30 reviewed cases. A number of cases alluded to patients being investigated and treated when it was no longer appropriate given the patient's diagnosis/prognosis.

> *"… The patient was transferred from LRI to GGH but unfit to have [investigative procedure] and admitted to GGH ITU shortly afterwards. [Investigative procedure] then done, with little benefit to patient."*

Lack of familiarity with the patient in 'Out of Hours' care was found to interrupt palliative care plans. Coupled with poor documentation, this resulted in unnecessary hospital admissions.

> *"We feel that the decision to readmit the patient for the Index Admission may not have been in the patient's best interests. It is possible that this was due to either a failure of the information in the Discharge Summary for the Prior Admission to be conveyed or a failure of the relevance of the information to be recognised when a problem arose regarding the patient's medication. This decision was probably taken by an 'Out of Hours' GP and the hospital notes suggest that admission was advised without a face-to-face assessment."*

> *"The information from the Prior Admission, which would have informed a decision not to readmit, appears to have not been available to key decision makers."*

> *"Therefore, an 'Out of Hours' GP was called, who recommended readmission as the Index Admission. This may not have been in the patient's best interests and may have resulted from inadequate information sharing."*

> *"Failure to implement an 'End of Life' care plan in the community."*

A number of these cases ultimately resulted in death away from the home environment. This could be avoided if palliative care was considered to be an active, rather than a passive, package of care and communicated as such to all involved in a clear and timely manner.

16.4. Clinical Management

There was a lack of clinical oversight in 24 cases which affected the ability to plan and implement appropriate clinical management of patients, especially those with multiple complex diseases. These cases highlighted the necessity of holistic care and the problems caused by managing clinical issues and physiological anomalies in isolation. Some aspects related specifically to a lack of co-ordination within and between specialties.

> *"Eventual diagnosis unclear but failure of physicians, surgeons and ITU to escalate treatment. We wonder if this was in part due to him having known mental health issues. Patient does not appear to have had a carer with him after his initial assessment."*

> *"The doctors in GGH concentrated on diagnosing the cause of the asymptomatic [arrhythmia] and ignored the delirium and functional decline of the patient for about 10 days."*

16.5. Discharge Summary

19 of the reviewed cases illustrated how an inadequate, or inadequately communicated, discharge summary contributed to inappropriate decisions by staff.

> *"The Discharge Summary for the Prior Admission did not fully convey the plan for a non-interventional, palliative approach although strongly implied."*

> *"The Discharge Summary did not convey the renal failure or the possible transient ischaemic attack (for which aspirin had been started) and stated that the ramipril had been stopped because the patient's blood pressure was controlled, rather than the patient's renal failure."*

Without comprehensive discharge summaries, GPs and other community care services were often having to reassess patients, frequently resulting in errors/omissions and the fragmentation of care; all of which could have been avoided with clear and timely discharge documentation.

This was exacerbated when the patient changed their address and/or GP. The discharge summary would still be sent to the patient's previous GP as the patient had not registered with a new GP. Thus the information required by the new GP would not be available to them. So discussions and decisions in the hospital regarding circumstances requiring readmission and 'End of Life' planning would not be known to the new GP or the community health team, let alone the 'Out of Hours' GP service.

16.6. Fluid Management

Fluid management was identified as an issue in 18 cases. Fluids were prescribed in a haphazard manner and records showed an inadequate level of monitoring which resulted in patients becoming dehydrated or overloaded.

> *"… Intravenous fluids appear to have been inadequately prescribed. There were no recorded instructions to nurses to record fluid balance."*

> *"After ITU discharge to ward, it seemed as though the patient's renal function was not measured. There were no fluid balance charts in the notes. The patient was readmitted as the Index Admission with a creatinine of 530 umol/L indicating renal failure which was the cause of death."*

The reviewed cases suggested an overall lack of understanding of the importance of fluid management, especially the recording and monitoring of patient fluid intake and output on the ward.

16.7. Unexpected Deterioration

In 16 cases, there was a failure to recognise an unexpected significant deterioration in a patient. At times, this occurred in the presence of a precipitous drop in oxygen saturation or an increased Early Warning Score (EWS). Thus clinicians missed the last window of opportunity to treat a patient proactively.

> *"Failure to act on ITU plan to immediately inform ITU if patient deteriorates. Patient suddenly had oxygen saturation of 74% on air but ITU was not informed. Patient had a cardiac arrest 2 hours later and died despite resuscitation attempt."*

Poor communication was deemed to be a significant issue in relation to the escalation of patient care when deterioration was identified.

> *"Observations taken during the 24 hours before death showed hypoxia with oxygen saturation of 80% on 2 separate occasions associated with systolic BP dropping from 130 mmHg to 96 mmHg, and rose only to 90%. No record in hospital notes of doctor being informed for subsequent assessment."*

> *"High EWS score should have been communicated and acted upon."*

> *"Nurses' requests for medical advice were not adequately responded to by on-call [specialty] doctors."*

These cases illustrate the importance of having a culture, structure and procedures in place that facilitate recognition and responsiveness to deviations from the norm or standard care pathways.

16.8. Discharge

Reviewers found a lack of clinical overview and co-ordination within the hospital in relation to discharge preparation, and between secondary and primary care post-discharge. Issues such as a lack of information regarding follow up requirements were often compounded by GPs not reviewing

patients post-discharge and/or correctly identifying their post-discharge needs.

> *"The Discharge Summary included the stopping of [drug] but the information was not highlighted or obvious. There was no request for the GP to monitor renal function after discharge and there was no hospital follow-up plan."*

> *"This could have been due to either a failure of the information in the Discharge Summary for the Prior Admission to be conveyed or a failure of the relevance of the information to be recognised when a problem arose regarding the patient's medication."*

Discharges were delayed due to a lack of appropriate placements and/or funding.

> *"Fast Track forms may not have been completed."*

In some cases poor discharge planning and implementation prevented the patient from being discharged to and die in the place of their choice. This was considered to be below an acceptable standard of care by the reviewers.

16.9. Severity of Illness

Reviewers felt that there were 13 cases in which the severity of the patient's illness was not recognised in a timely manner. By the time referral to an appropriate specialist was made, the delay in transfer of care compounded the situation for the patient.

> *"Failure to seek further specialist opinion despite multiple clinical signs of seriousness of illness."*

> *"Failure by both consultant and junior doctors to appreciate the seriousness of illness on several occasions despite multiple clinical signs."*

On some occasions it was found that protocols, pathways and procedures were followed but without assessment of the appropriateness and/or benefit of such for the patient when considering their long term prognosis.

> *"In the hospital, there was no record of any discussion with patient or family about suitability of operation and risk/benefit of operation given underlying disease [of known metastatic [type of] cancer]."*

It was clear to the reviewers that a lack of appreciation of the severity of a patient's illness often contributed to the delivery of inappropriate or excessive care and/or a missed opportunity to discuss patient's wishes in relation to their long term treatment or palliative care.

16.10. Early Warning Score (EWS)

11 cases were found to have issues relating to the Early Warning Score (EWS) used to record and score patient observations made in hospitals. Inconsistent use of the EWS tool and errors in the calculation of the scores were noted. A lack of communication of increased scores was also an area of concern for the reviewers.

> *"Nursing observations prior to actual discharge from ITU showed EWS of 5 (incorrectly calculated as 4). No evidence of communication by nurse to doctors about deterioration."*

Cases were identified where clinicians recorded the EWS but did not fully assess or appropriately respond to the patient's presenting condition or symptoms. Thus resulting, again, in clinicians missing the last window of opportunity to treat a patient proactively.

> *"In hospital, a window of opportunity was lost for early identification of deterioration prior to death as oxygen saturation dropped to 80% but this does not seem to have been noticed as EWS only scored 1 on the basis of BP."*

There was evidence of nurses responding appropriately to a patient's condition or Early Warning Score (EWS), but being reassured inappropriately by junior doctors.

> *"… junior doctor did not act on high post-operative EWS on return from ward. No entries in medical notes until Resuscitation Team called, although EWS entry in nursing notes suggests patient was seen by a junior doctor and no action was deemed necessary a few hours prior to death."*

16.11. Antibiotics

Antibiotics featured in 11 of the cases reviewed. The issues relating to antibiotics included delayed administration and ineffectual prescribing.

> *"Delay in antibiotic administration of 9 hours despite blood white cell count being 0.3 x 10^9/L."*

> *"Failure to recognise infection can be from other non-bacterial sources … [and] Microbiologist not involved until Day 5."*

16.12. Medication

Reviewers identified 11 cases in which medication was an area of concern. Although the reviewers appreciated that clinicians can differ in their assessment and treatment of a patient, poor prescribing practice was evident in a number of cases and decisions for changes to medication were often poorly documented.

> *"Seen by another consultant 3 days later on [date] who stated to restart warfarin. This did not affect the outcome in this patient as he never received the warfarin but odd contradiction in management plan that is not explained. ?plan by previous consultant not noticed."*

The reviewers felt that clear clinical leadership was key to avoiding these issues in the future.

17. Conclusions of the Review

This joint primary and secondary care case records review was undertaken to establish whether there is a significant level or pattern of systematic clinical issues in the care received by patients in Leicester, Leicestershire and Rutland.

In this review, 23.4% of reviewed cases (95% CI: 19.4% to 27.9%) were found to be below acceptable standard. These were amongst the 54.6% of reviewed cases (95% CI: 49.6% to 59.5%) identified as having significant lessons to learn.

Although one should be wary of making direct comparisons between reviews with different methodologies and sampling strategies, it is likely that this joint case records review has established that there is a significant level or pattern of systematic clinical issues in the care received by patients in Leicester, Leicestershire and Rutland. In the 'Critique of the Protocol and Comparison with Published Reviews' document, the "Summary of Comparing with Comparable Studies" on page 29 is "*In summary, the proportion of cases with unsatisfactory care ranged from 3% to 7% in studies of deaths in hospital. A sub-group analysis of the LLR Joint Mortality Review, based on the findings of doctors only and counting only cases with significant lessons for the hospital with/without other services, gave a range from 17% to 19% for 'below an acceptable standard' of care.*"

Thematic analysis of the reviewers' descriptions of cases with significant lessons to learn identified 47 system themes. The 12 most common system themes were found in 86.5% of cases with below acceptable standard of care and 81.3% of cases with significant lessons to learn. However, even if all 12 of the most common system themes were resolved, only 41.6% of cases with below acceptable standard of care and 52.9% of cases with significant lessons to learn, would have all their issues resolved. This illustrates why addressing single issues, even when done cumulatively, has limited impact on resolving all the issues for cases with concern.

Reviewing cases can only identify issues and themes. A system-wide approach through co-operation and collaboration is required to identify solutions and make improvements. Solutions need to take into account the intangible and intrinsic aspects of healthcare delivery such as organisational culture. Learning from this review, and any subsequent work, requires partnership with input from a cross-section of clinical and managerial staff and, most importantly, patients.

Dr Ronald Hsu
Senior Teaching Fellow in Epidemiology and Public Health
Department of Medical and Social Care Education
University of Leicester

Mrs Lucy Douglas-Pannett
Specialty Registrar in Public Health