

The Rural General Hospital Model: A rapid needs appraisal to inform its development and implementation in Scotland

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BACKGROUND

A Rural General Hospital model described by a report of the national remote and rural workstream as:

"The RGH undertakes the management of acute medical, surgical emergencies and is the centre for the community, including the place of safety for mental health emergencies. It is characterised by more advanced level of diagnostic services than a Community Hospital and will provide a range of outpatient, daycase, inpatient and rehabilitation services."

Six hospitals in Scotland were identified as Rural General Hospitals:

The model was described using hospital-based activity non-standardised for age and not informed by external evidence-base which doesn't ask or assess whether current activity is proportionate to healthcare need.

The North of Scotland Public Health Network was approached to assess what the model would mean in terms of meeting the populations healthcare needs i.e. Could/should one model fulfil the healthcare needs of the rural populations around the six hospitals?

Time and resource constraints meant that a full health needs assessment could not be carried out.



OBJECTIVES

A rapid needs assessment was undertaken to establish:

- the evidence base for healthcare services in Rural General Hospital
- how quality and safety can be assured in RGH
- the sustainability issues and how they can be addressed
- to what degree are the needs of the catchment populations around RGHs currently being met

METHODOLOGY

Methods used were:

- A literature review [to address (1) to (3) above]
- Analysis of population-based hospital activity data that was routinely available [to address (4) above]

LITERATURE REVIEW

Method

- Systematically retrieved from both electronic databases and from the grey literature.
- Search was limited to English language, and studies carried out in the UK, Australia, New Zealand, Canada, the United States and Western Europe.
- Two reviewers with an iterative approach.
- Thematic content analysis used i.e. recording the aspect of remote and rural health addressed in the paper.
- Evidence was graded according to hierarchy as per SIGN.

Results

- Intrapartum care should be provided only for low risk women with no identified risk markers at the time of birth and who have normal weight babies. (Level 2-)
- RGHs should have a defined level of diagnostic capability. (Level 3)
- Better outcomes for many of the cancers are associated with specialised care and if cancer care is to be delivered locally, it should involve shared care with outreach clinics and deliver the same outcomes. (Level 2+)
- Recruitment should take account of both nature and nurture factors i.e. rural backgrounds not necessarily Scottish-based and involvement in training programmes designed to promote rural healthcare. Although multiple barriers to retention exist, access to flexible continuous medical education including maintenance of advanced procedural skills is an important requirement. (Levels 2++ to 3)

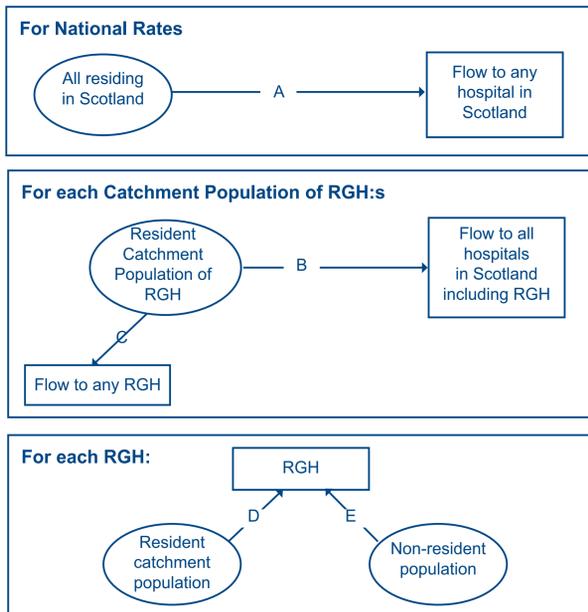
- 2++ High quality systematic reviews of case control/cohort studies or high quality case or cohort studies with very low risk of confounding, bias or chance;
- 2+ Well conducted case control or cohort studies with low risk of confounding, bias or chance;
- 2- Case control or cohort studies with high risk of confounding, bias or chance;
- 3 Non-analytic studies e.g. case reports, case series

ANALYSIS OF ROUTINELY AVAILABLE HOSPITAL DATA

Specifications

- SMR01 data (inpatients, with or without procedure and daycases, with only a primary procedure) covering the resident population in Scotland FYE 2004 to 2006 (3 years).
- Relative uptake based on expected as per the national age/sex specific rates and the observed for each catchment population.
- Specialties inclusive of all acute medical and acute surgical. GP other than obstetrics care provided in hospitals was included in the acute medical activity but also described separately.
- Catchment populations estimated from general medical uptake by data zone for mainland RGHs.

METHODOLOGY



3 TYPES OF ANALYSIS

- Compare the hospitalisation rates of the catchment population (B) with the national average (A) by indirect standardisation method
- Proportion of catchment populations hospitalisation rate taken up at local RGH (C as a % of B)
- Profile of uptake within each RGH from local or non-local flow (D + E) by main diagnosis and procedure

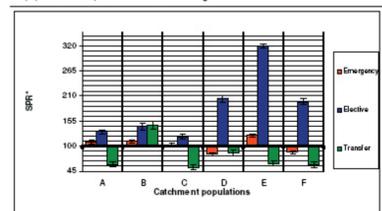
Results

For each hospital for consultant episodes or by patients:
Standardised hospitalisation ratio¹ for catchment populations¹ and proportion of activity taken up at RGH

	Consultant episodes-based			Acute Surgical Admission type			Acute Medical ² Admission type			GP Other than Obstetrics Admission type		
	SHR ³ ± confidence interval	Emergency	Elective	Emergency	Elective	Transfers	Emergency	Elective	Transfers	Emergency	Elective	Transfers
All ages	128.4 ± 4.4	134.2 ± 4.6	118.0 ± 6.8	115.3 ± 3.0	158.2 ± 9.7	152.0 ± 6.4	155.8 ± 16.3	319.0 ± 55.9	176.2 ± 30.4			
Nos. of admissions	3312	3300	1118	5487	1026	2175	350	125	129			
Proportion of activity at RGH	57.7%	29.0%	33.6%	76.7%	28.0%	71.8%	0.0%	0.0%	0.0%			
0-14 years old	94.2 ± 12.6	138.0 ± 19.9	75.1 ± 25.6	94.9 ± 7.6	67.0 ± 24.6	126.3 ± 38.7	213.8 ± 187.4					
Nos. of admissions	214	185	33	605	48	41	5					
Proportion of activity at RGH	61.7%	-	-	7.8%	2.1%	9.8%	0.0%	0.0%	0.0%			
Aged 65 & over	135.4 ± 7.7	133.3 ± 7.2	109.8 ± 9.2	116.4 ± 4.5	166.0 ± 15.3	163.4 ± 8.6	149.6 ± 18.8	318.6 ± 62.4	179.3 ± 32.8			
Nos. of admissions	1176	1331	545	2567	453	1398	243	100	115			
Proportion of activity at RGH	74.3%	24.8%	24.4%	84.7%	36.0%	77.1%	0.0%	0.0%	0.0%			
All ages with cancer diagnosis ⁴	115.1 ± 20.5	211.1 ± 12.8	113.2 ± 14.6	90.8 ± 12.8	36.6 ± 3.8	104.3 ± 19.1	199.5 ± 69.1	13.7 ± 25.8	282.5 ± 99.4			
Nos. of admissions	121	1037	230	194	359	115	32	1	31			
Proportion of activity at RGH	48.8%	68.4%	28.7%	61.3%	42.9%	33.0%	0.0%	0.0%	0.0%			
Daycases with a procedure ⁵ (all ages)	n/a	125.7 ± 4.1	n/a	10.1 ± 10.7	95.0 ± 4.4	4.0 ± 3.9	n/a	n/a	n/a			
Nos. of admissions	-	3606	-	1	1828	4	-	-	-			
Proportion of activity at RGH	-	73.3%	-	-	78.3%	-	-	-	-			

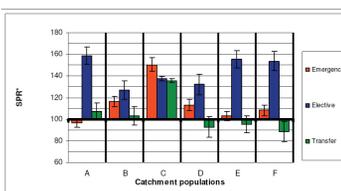
¹ Catchment populations are based on Postcode Area
² Includes activity within GP Other than Obstetrics
³ SMR01 has provision for recording up to 6 diagnoses (1 main and up to 5 secondary diagnoses). Only the main diagnosis has been used to select cancer patient episodes
⁴ Cancer diagnosis was identified using the International Classification of Diseases (10th revision) codes C00 - C97 (malignant neoplasms).
⁵ SMR01 has provision for recording up to 4 procedures (1 main and up to 3 secondary procedures). Only those day case records *SHR = 100, = equivalent with, >100 = higher, < 100 = lower than national average;
 Source: ISD SMR01 Ref: ISD/HIG/IR2007-00484 Date: 16th March 2007

Standardised patient ratios (SPRs)¹: Inpatient all ages admitted to medical specialties (incl. GP Other) by catchment populations: comparison with national average



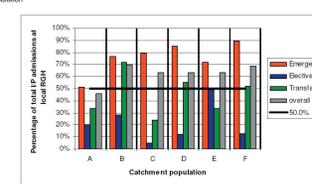
¹ SPRs >100 means that the actual patient-based episode rates are those expected on the basis of the national average taking account of population structure.
 Data Source: SMR01 linked activity FYI 2004-06

Standardised patient ratios (SPRs)¹: Inpatient all ages admitted to surgical specialties by catchment populations: Comparison with national average



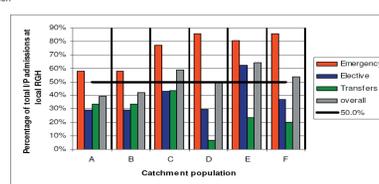
¹ SPRs >100 means that the actual patient-based episode rates are those expected on the basis of the national average taking account of population structure.
 Data Source: SMR01 linked activity FYI 2004-06

Percentage of all inpatient admissions to medical specialties taken up at the local RGH for each catchment population



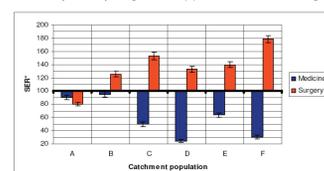
Data Source: SMR01 linked activity FYI 2004-06

Percentage of all inpatient admissions to surgical specialties taken up at the local RGH for each catchment population



Data Source: SMR01 linked activity FYI 2004-06

Surgical and Medical Daycase activity relating to catchment populations: relative to national average



* SPRs >100 means that the actual consultant episode rates are those expected on the basis of the national average taking account of population structure.
 Data Source: SMR01 linked activity FYI 2004-06

Top 10 Diagnosis of admissions to medical specialties in RGHs: Patient vs Consultant Episode-Based

Primary Diagnosis	Rank	
	CE-based	Patient-based
Pain in throat & chest	1	1
Mental & behav. disorders due to alcohol	2	3
Other COPD	3	10
Angina pectoris	4	5
Heart failure	5	6
Acute MI	6	7
Unsp. acute lower resp. infection	7	2
Atrial fibrillation and flutter	8	8
Syncope and collapse	9	4
Pneumonia, organism unspecified	10	9

Data Source: SMR01 linked activity FYI 2004-06

Top 10 Primary procedures over all specialties in RGHs

Primary Procedure	All hosp	RANK					
		A	B	C	D	E	F
Fiberoptic Endo. Exam. Upper G.I. Tract & Biopsy Lesion Upper G.I. Tract	1	1	4	3	2	1	1
Intravenous Chemotherapy	2	8	1	2	10	3	17
Other Specified Continuous Infusion Of Therapeutic Substance	3	2	2	5	1	12	3
Unspecified Diagnostic Endoscopic Examination Of Colon	4	6	9	7	4	7	2
Unspecified Continuous Infusion Of Therapeutic Substance	5	3	5	5	1	46	5
Other Specified Operations On Unspecified Organ	6	4	7	6	16	11	4
Unspec. Diagnostic Fiberoptic Endo. Exam. Of Upper G.I. Tract	7	13	3	4	5	13	11
Unspecified Diagnostic Endoscopic Examination Of Bladder	8	9	45	1	7	8	7
Unspecified Excision Of Lesion Of Skin	9	13	10	9	9	6	5
Insertion Of Prosthetic Replacement For Lens	10	ND	ND*	ND	3	2	10

Data Source: SMR01 linked activity FYI 2004-06
 ND = not done; ND* this service is now available in this hospital

Average ratios of Consultant Episodes per patient admitted to medical specialties

Hospital	CEs:Pats	
	Elective	Emergency
A	2.8	1.5
B	2.1	1.6
C	1.1	1.6
D	4.0	1.6
E	1.5	1.7
F	3.4	1.6
Overall	2.2	1.6

Data Source: SMR01 linked activity FYI 2004-06

Admissions to medical specialties: Proportion of total (Consultant Episode-based) by type of admission

Hospital	Elective	Emergency	Transfers	All
				All
A	35.2%	59.1%	5.7%	6,776
B	23.4%	55.9%	20.7%	7,713
C	11.6%	84.4%	4.0%	3,425
D	15.5%	71.7%	12.9%	3,730
E	23.3%	72.5%	4.2%	6,686
F	13.6%	78.3%	8.0%	3,904
Overall	22.5%	67.6%	9.9%	32,234

Data Source: SMR01 linked activity FYI 2004-06

SUMMARY OF CONCLUSIONS

From the literature review

- Very little high grade evidence other than around obstetric care, recruitment of medical staff and cancer care

From the analysis of routinely available data

Catchment population based activity:

Relative to the Scottish average hospital rate:

	Medical Specialities	Surgical Specialities
Elective Uptake	1.2 – 3.2 higher	1.3 – 1.7 higher
Emergency Uptake	Significantly higher in 3 hospitals	Significantly higher in 4 hospitals
Transfers	All lower except 1 hospital	All lower except for 2 hospitals

Contribution of local RGH to the populations overall hospitalisation rate:

	Medical Specialities	Surgical Specialities
Elective Uptake	3 – 48%	30 – 65%
Emergency Uptake	50 – 90%	55 – 90%

RGH-based activity:

- Little commonality in daycase procedures between hospitals
- Some major procedures are carried out in very small volumes (e.g. mastectomies) in certain RGHs
- In the medical specialties, the average consultant episodes per patient varied between RGHs from 1.1 to 4.0
- The percentage of acute medical activity by admission type varied between RGHs e.g. 56-85% emergency and 4-21% transfers

LESSONS LEARNED WITH USING THE RAPID NEEDS APPRAISAL

There were some key advantages in adopting it:

- Could be carried out remotely i.e. no need to visit each hospital, just need a computer and access to the internet.
- Data was routinely available and standardised.
- Results can be presented in a standard way to all stakeholders.
- Using catchment-based population activity demonstrated large discrepancies from the national average and in all cases, the minority of elective need being met locally.

But the following would have improved its effectiveness:

- Making it clear that this was not an end product in itself - consultation of the results with clinicians was to be an equally important part of the needs assessment e.g. the discrepancies with the national average and the variations between hospitals still need to be explained by mapping patient pathways - a process that can only be adequately done by RGH-based clinicians.
- Highlighting that the results do not provide the full activity profile of RGHs-outpatient activity was not captured basically because nationally this is inadequately coded for procedure or diagnosis.
- Flagging up that coding practices by the hospitals will have contributed to some of the variations found between hospitals.
- Appreciating that perceptions of hospital activity by clinicians do not necessarily match the definitions used to collect activity data e.g. definition of emergency admissions.

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