A Surgeons Response - Who When and Where

Michael Horrocks The Vascular Society

Sample Cases

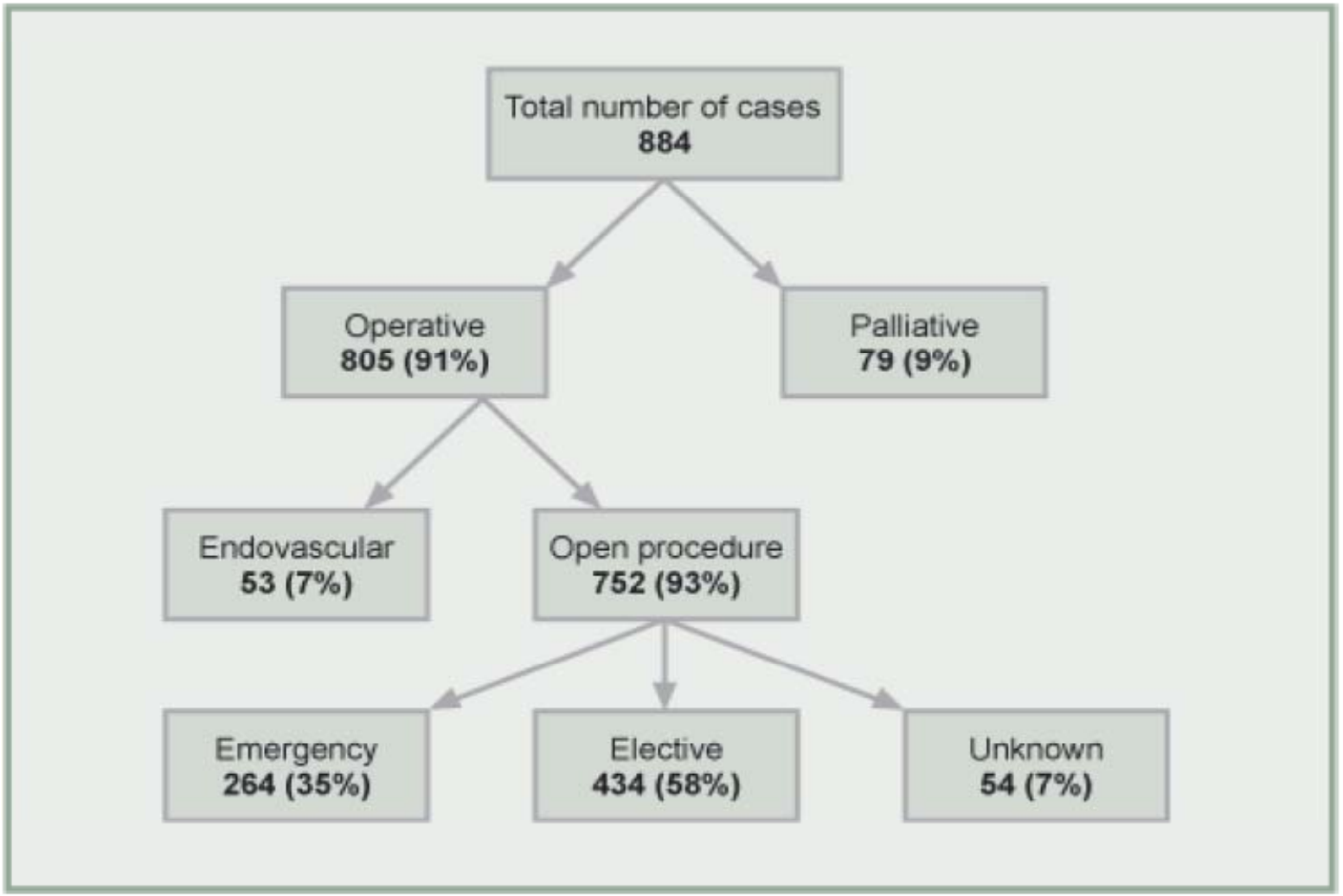

Figure 1. An overview of the study sample cases

Age Distribution

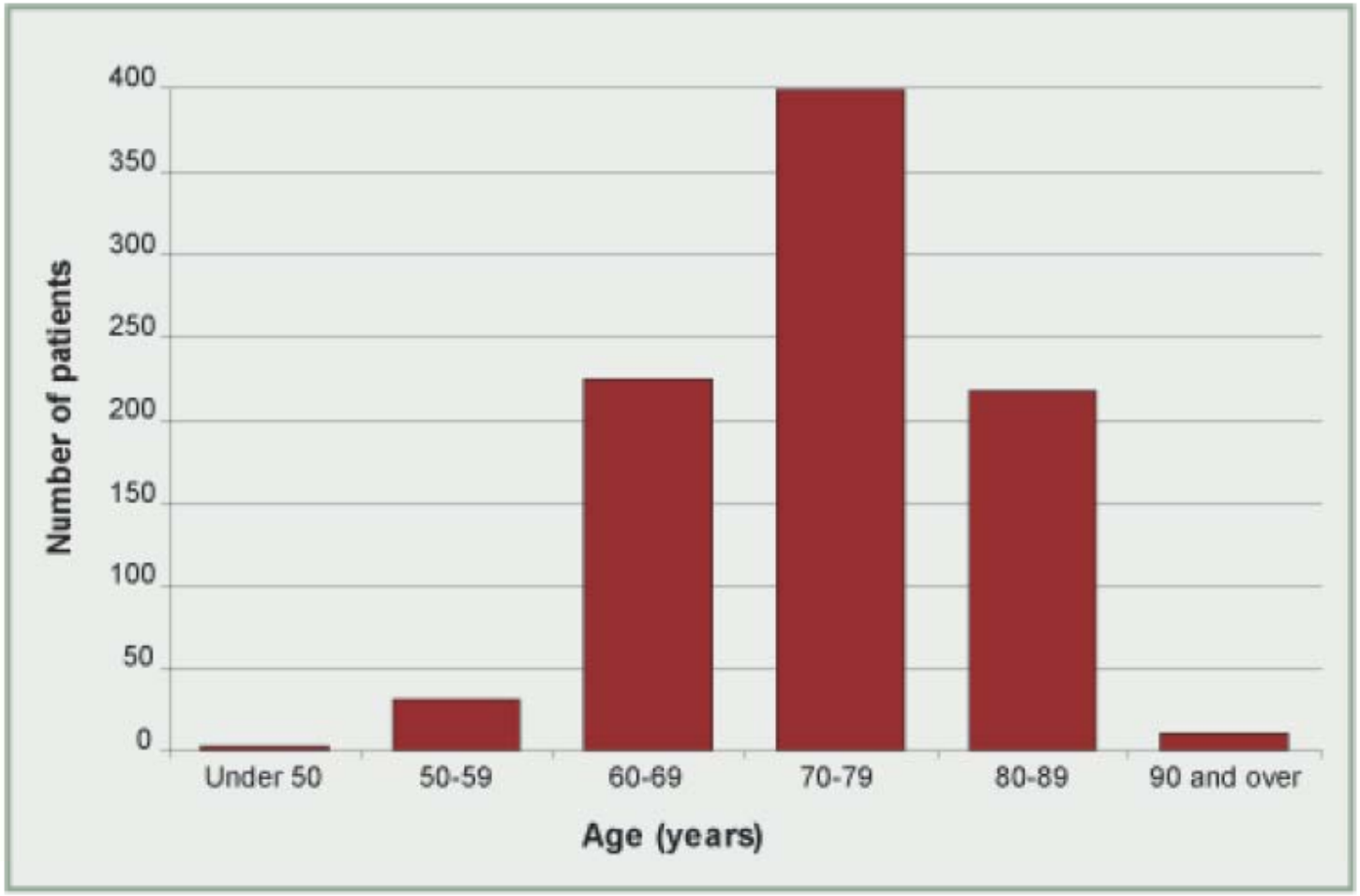

Figure 3. Distribution of age of study population

Age and Gender

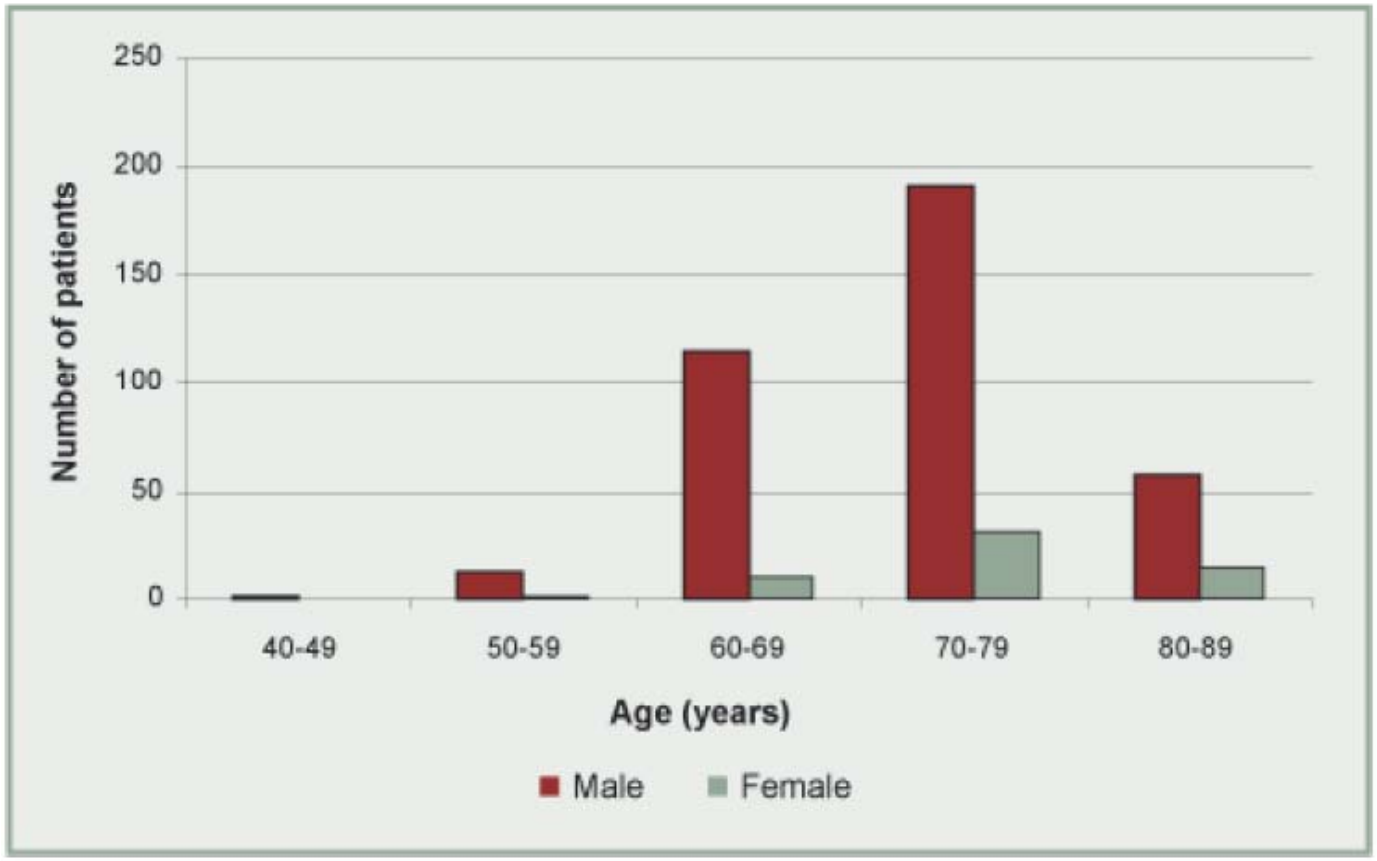

Figure 2. The distribution of age and sex *n* =434

Imaging Facilities

Table 1. General availability of different imaging facilities according to size of vascular unit

	Angiography	%	CT scanner	%	Interventional radiology	%	MRI scanner	%	Ultrasound	%
Large	45	100	46	100	44	98	44	96	47	100
Intermediate	100	96	104	99	98	94	95	91	106	100
Remote	13	81	16	100	12	75	14	88	16	100
Total	**158**	**96**	**166**	**99**	**154**	**93**	**153**	**92**	**169**	**100**

?Facilities in Remote Units

Out of Hours Imaging

Table 2. Out of hours availability of different imaging facilities according to size of vascular unit

	Angiography	%	CT scanner	%	Interventional radiology	%	MRI scanner	%	Ultrasound	%
Large	29	64	36	78	27	61	15	34	29	62
Intermediate	46	46	85	82	41	42	25	26	74	70
Remote	5	38	11	69	6	50	5	36	11	69
Total	**80**	**51**	**132**	**80**	**74**	**48**	**45**	**29**	**114**	**67**

Lack of all Facilities in All Units

On-call Inerventional Rota by Unit Size

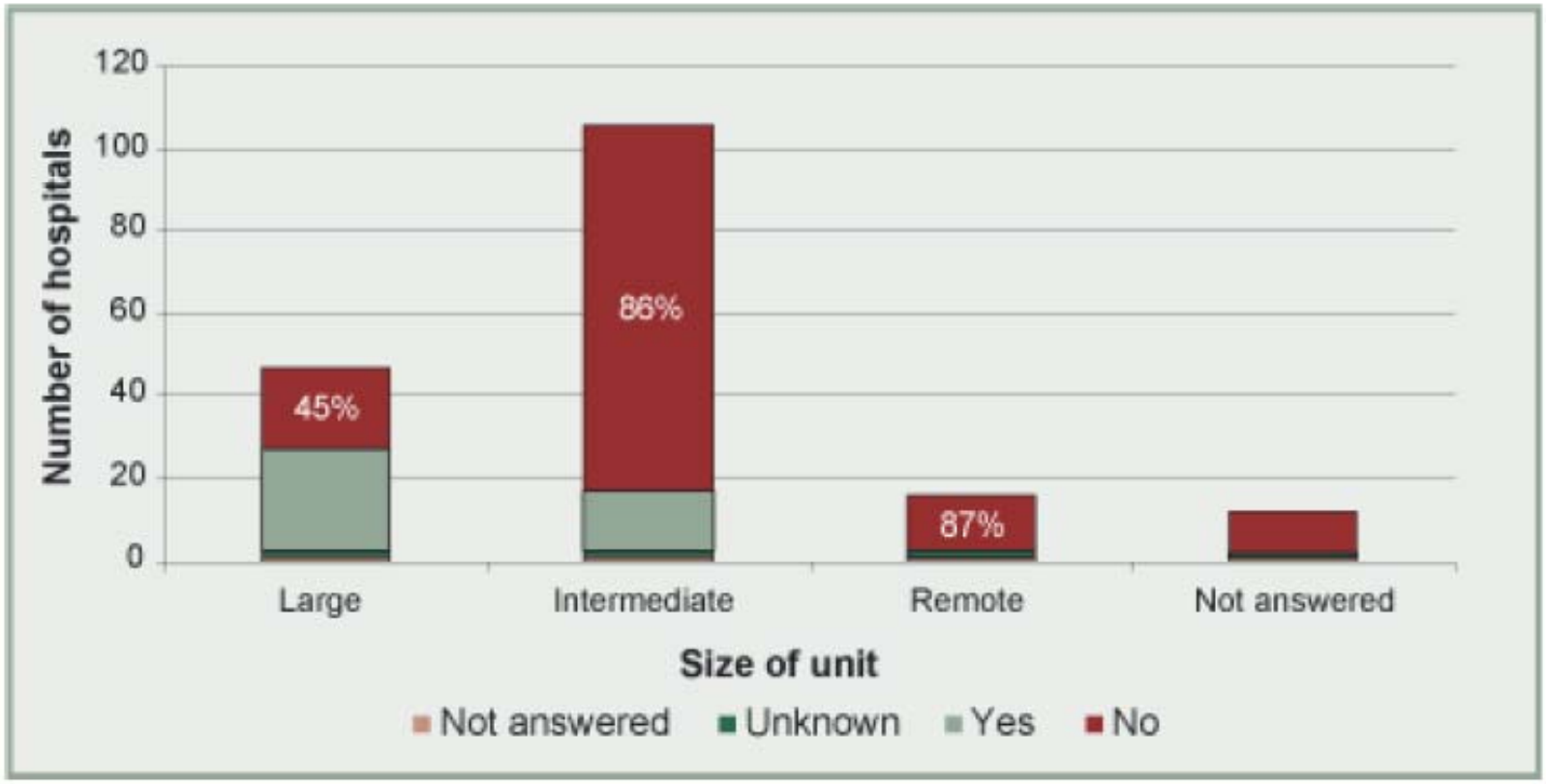

Figure 8. Separate on-call interventional rota in hospitals by size of vascular unit *n=181.*

Percentages refer to hospitals without a separate on-call rota.

Organisation of VascularServices-1

3. Organisation of vascular services

Trusts should ensure the availability outside normal working hours of radiology services including CT scanners.

Clinicians, purchasers, Trusts and Strategic Health Authorities should review whether elective aortic aneurysm surgery should be concentrated in fewer hospitals.

Major elective surgery should not take place unless all essential elements of the care package are available.

Types of Unit ? Definitions

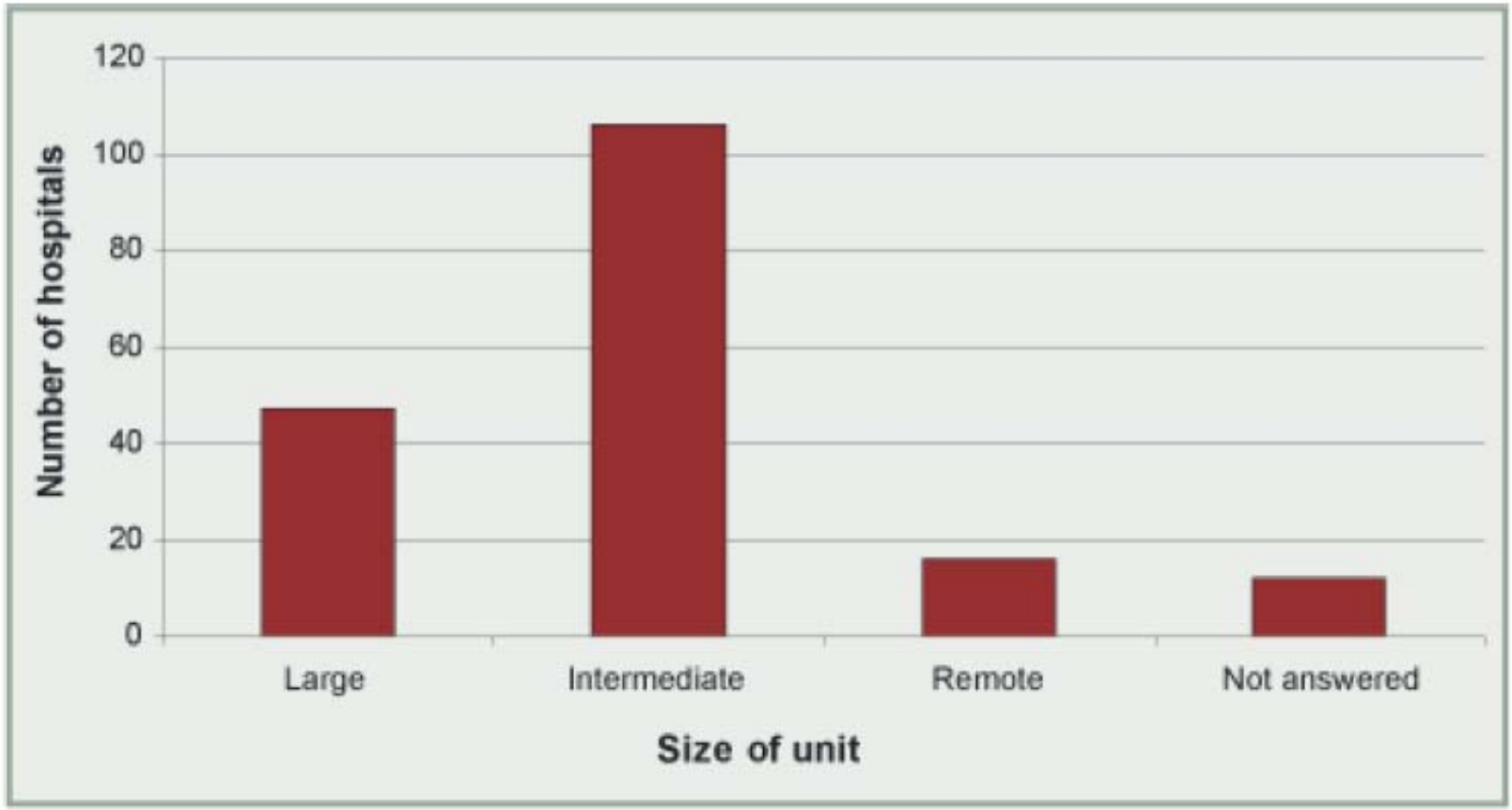

Figure 1 . Size of vascular unit *n=181*

Elective and Emergency Repairs

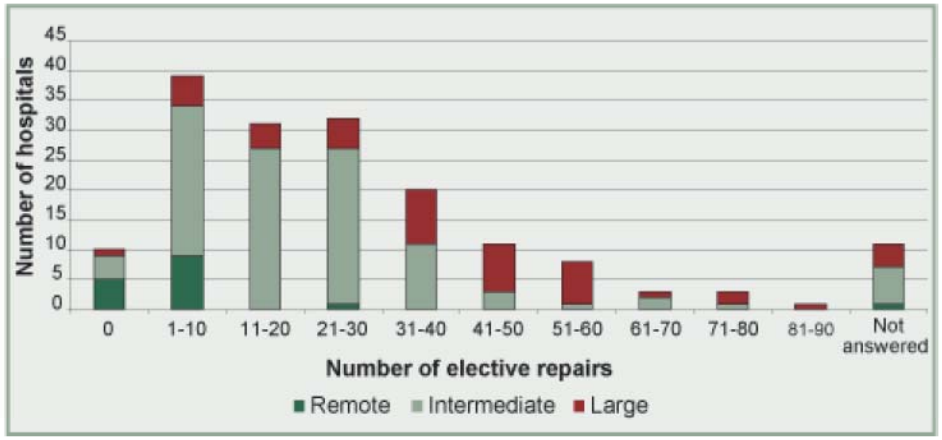

Figure 2. Number of elective open repairs performed in year 2002/03 by size of unit *n=181*

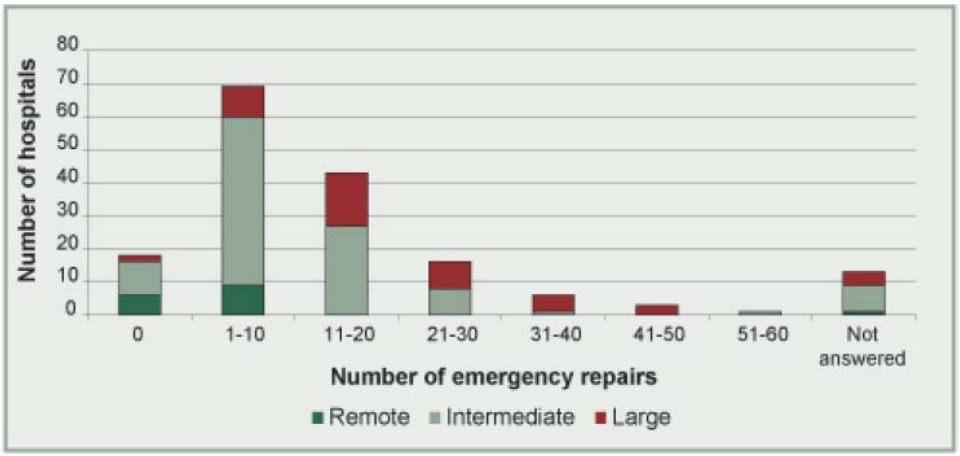

Figure 3. Number of emergency open repairs performed in year 2002/03 by size of unit *n=181*

?Large Units with Small Numbers

Ratio of Elective to Emergency Surgery

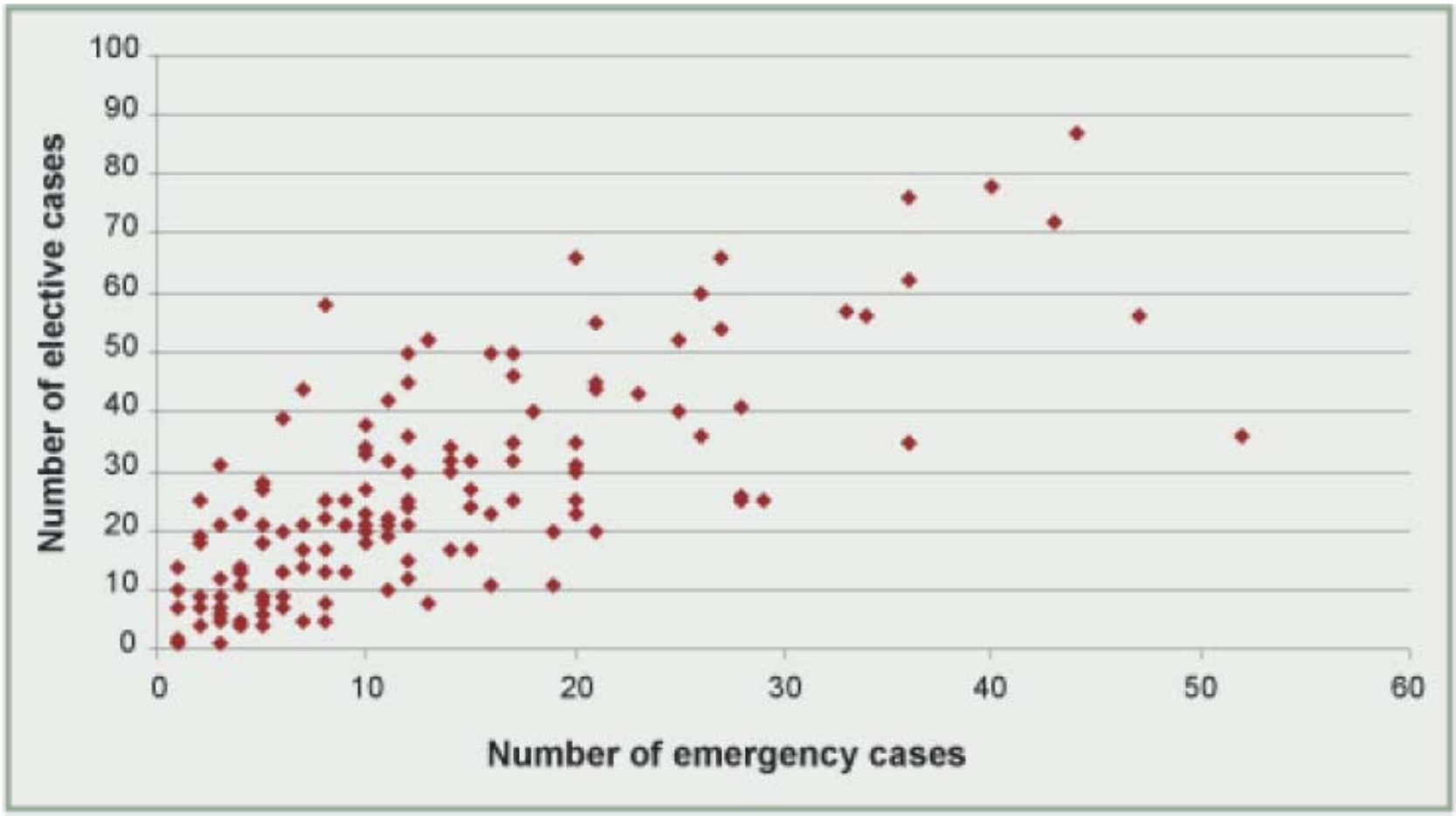

Figure 4. Number of emergency open repairs by number of elective open repairs *n=137/181*

Relationship between Hospital Volume and Elective Outcome

Table 3. Outcome of elective cases by number of elective open procedures performed in hospital in the previous year

Outcome	Volume of cases						
	Low	%	High	%	Sub-total	Not answered	Total
Died within 30 days	11	6	14	7	25	2	27
Alive at 30 days	185	94	173	93	358	47	405
Sub-total	**196**		**187**		**383**	**49**	**432**
Not answered	1		1		2	0	2
Total	**197**		**188**		**385**	**49**	**434**

On-call Vascular Rota

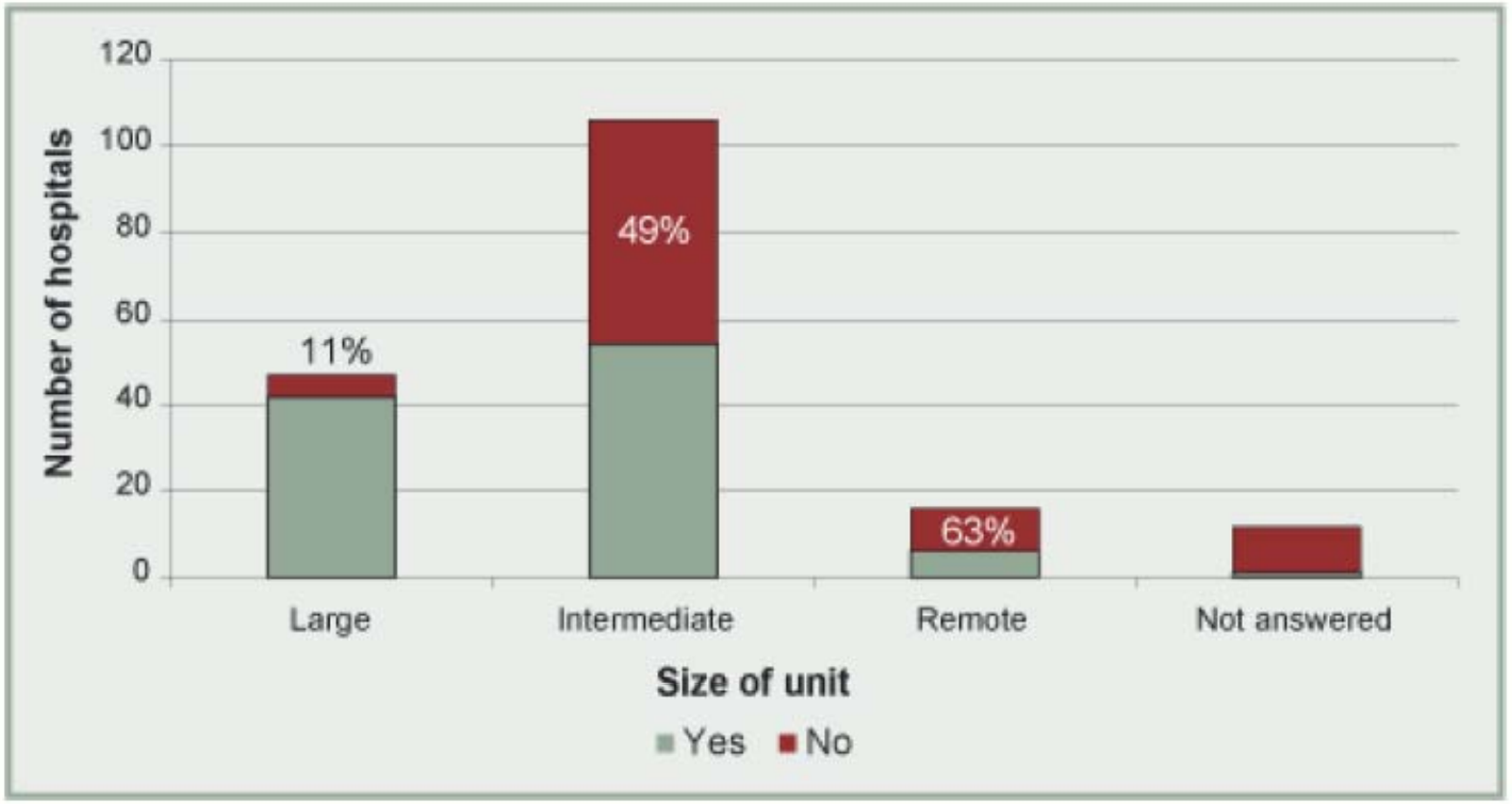

Figure 5. Separate surgical on-call rota for vascular surgery by size of vascular unit *n=181.*

Percentages refer to hospitals without a separate rota.

Outcome of Ruptures by Rota

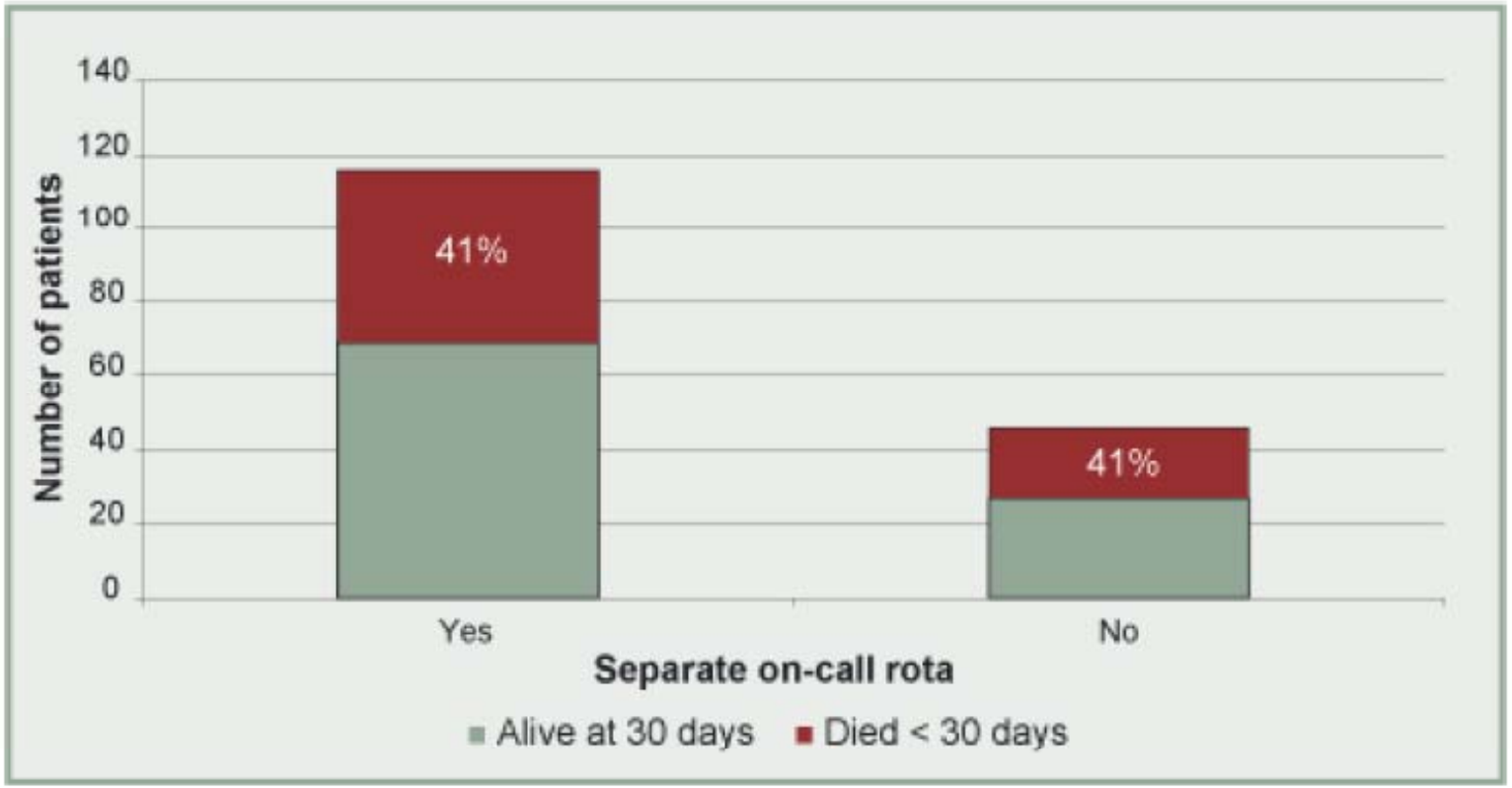

Figure 6. Outcome in ruptured emergency open procedure cases by whether or not there is a separate on-call rota for vascular surgery *n=162/168. Percentages refer to patients who died in hospital within 30 days.*

Outcome of Emergencies by Hospital Volume

Table 4. Outcome of emergency cases by number of elective open procedures performed in hospital in the previous year

Outcome	Volume of cases						
	Low	%	High	%	Sub-total	Not answered	Total
Died within 30 days	45	40	32	29	77	17	94
Alive at 30 days	68	60	77	71	145	25	170
Total	113		109		222	42	264

Outcome of Elective Repair by Unit Size

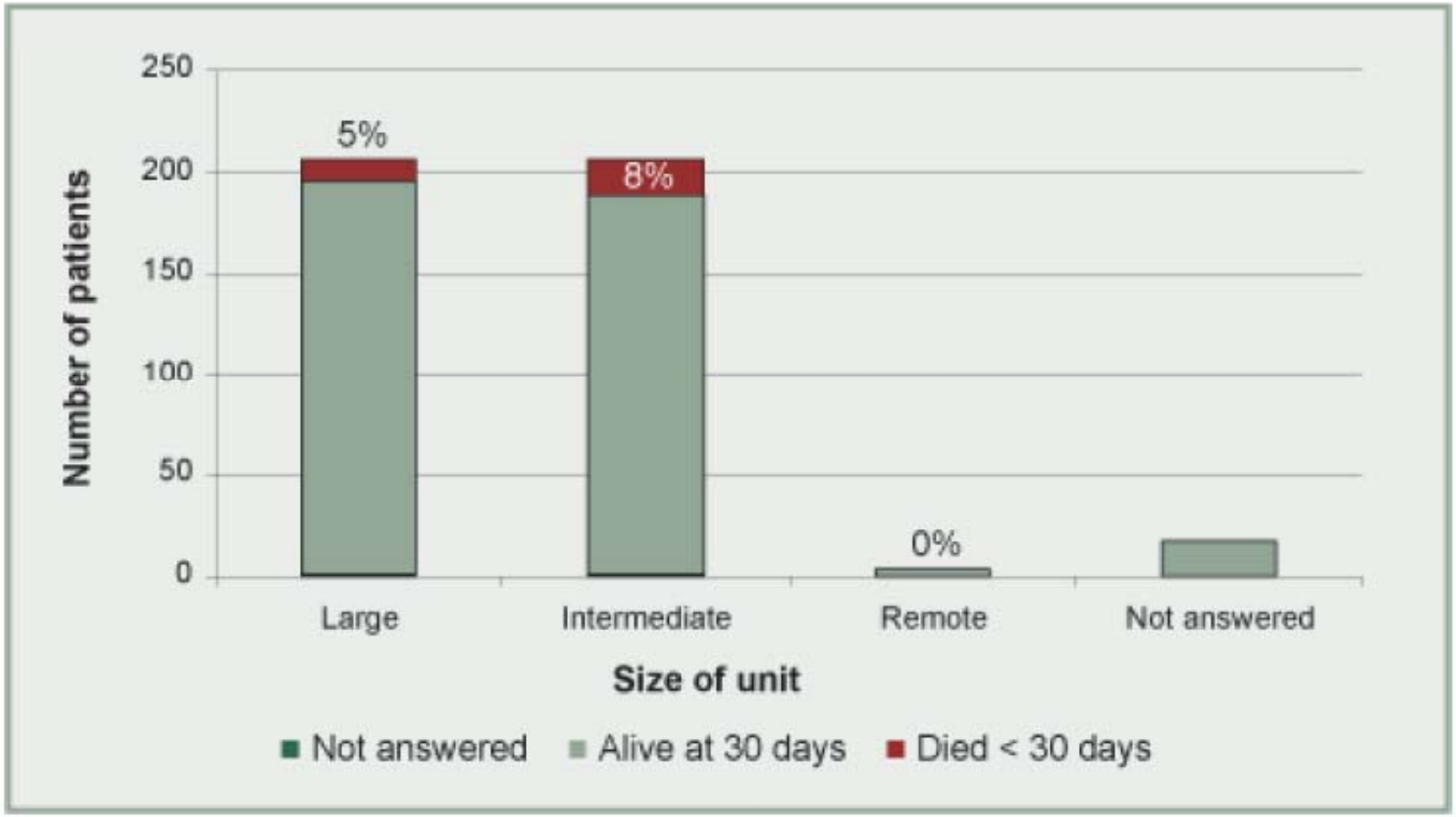

Figure 12. Outcome in elective open repairs by size of vascular unit *n=434. Percentages refer to patients who died in hospital within 30 days.*

Outcome of Emergency Repair by Unit Size

Table 6. Outcome after emergency open repair by size of vascular unit

	Large unit	%	Intermediate unit	%	Remote unit	%	Not answered	Total
Died within 30 days	35	29	44	35	6	75	9	**94**
Alive at 30 days	86		80		2		2	**170**
Total	**121**		**124**		**8**		**11**	**264**

Outcome of AAA Repair by Experience of Anaesthetist

Table 14. Outcome of open AAA repair by number of anaesthetics for emergency AAA repair given in 200203

	Low volume	%	High volume	%	Unknown	Total
Died within 30 days	32	40	23	27	39	94
Alive at 30 days	48		62		60	170
Sub-total	**80**		**85**		**99**	**264**
Unknown	0		0		0	0
Total	**80**		**85**		**99**	**264**

Decision NOT to Operate by Unit

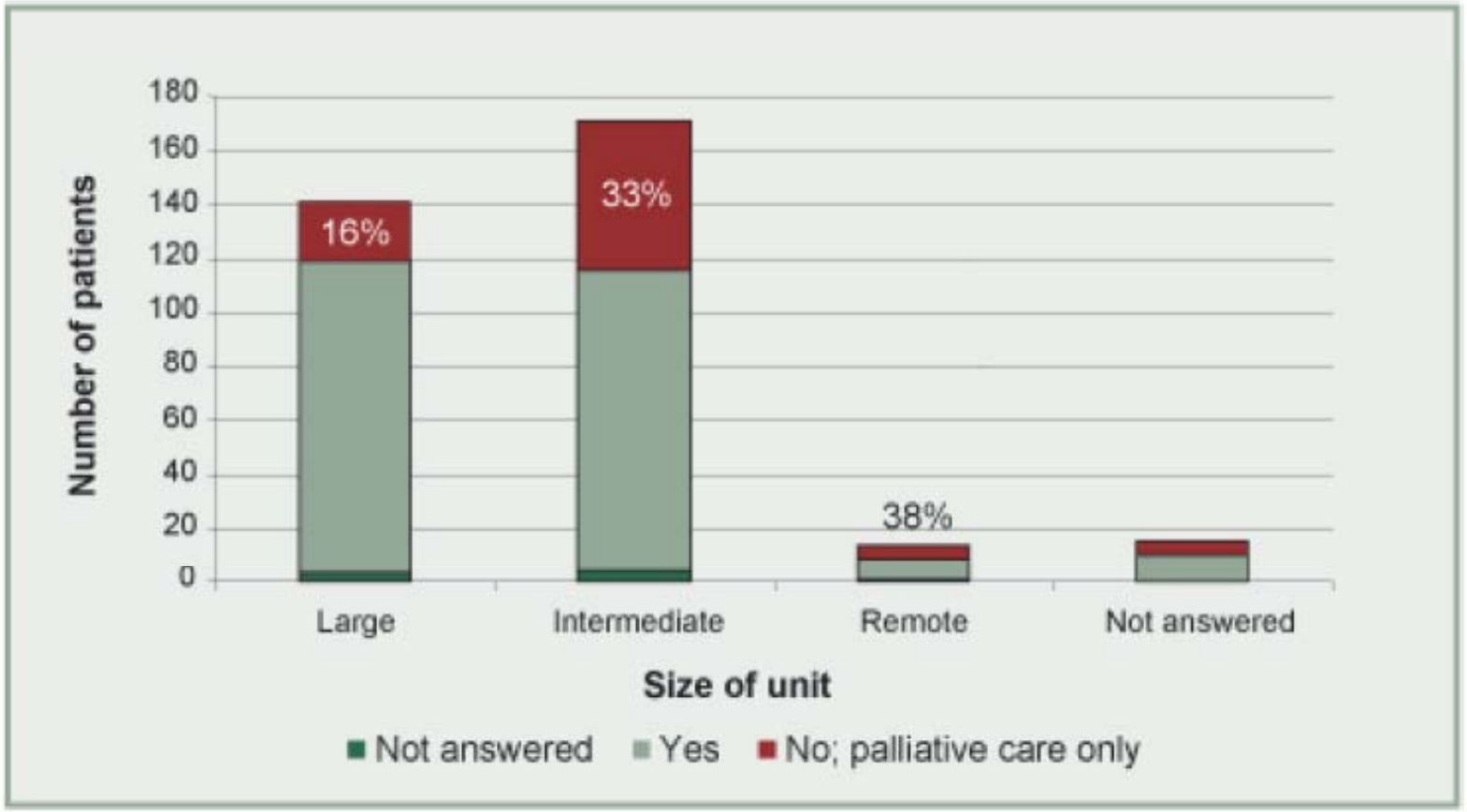

Figure 14. Decision to operate on emergency cases (including palliative patients) by size of vascular unit *n=342. Percentages refer to patients who received palliative care only.*

Influenceof Transfer

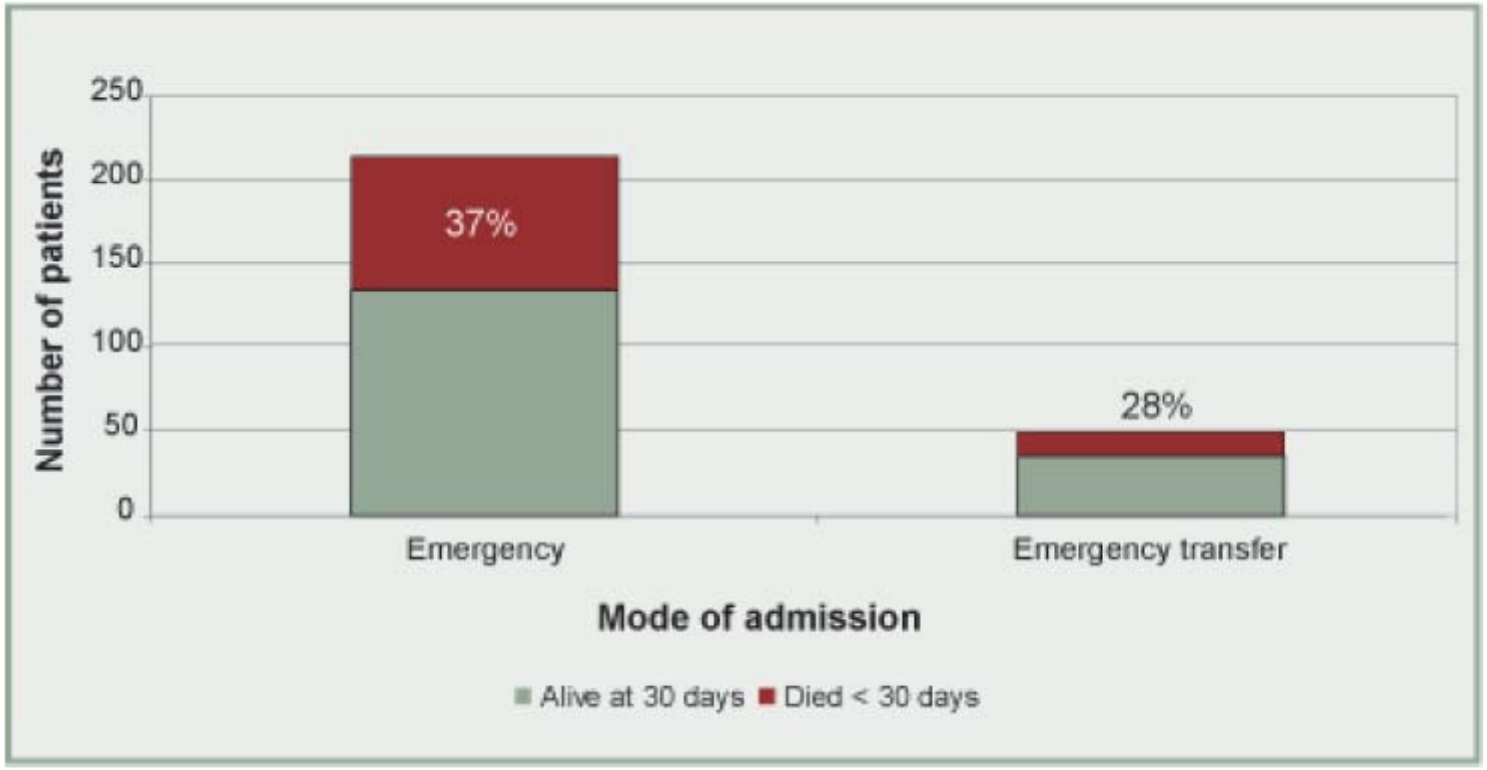

Figure 16. Outcome in emergency open repairs by whether patients were transferred *n=264.*

Percentages refer to patients who died in hospital within 30 days.

Age and Mortality

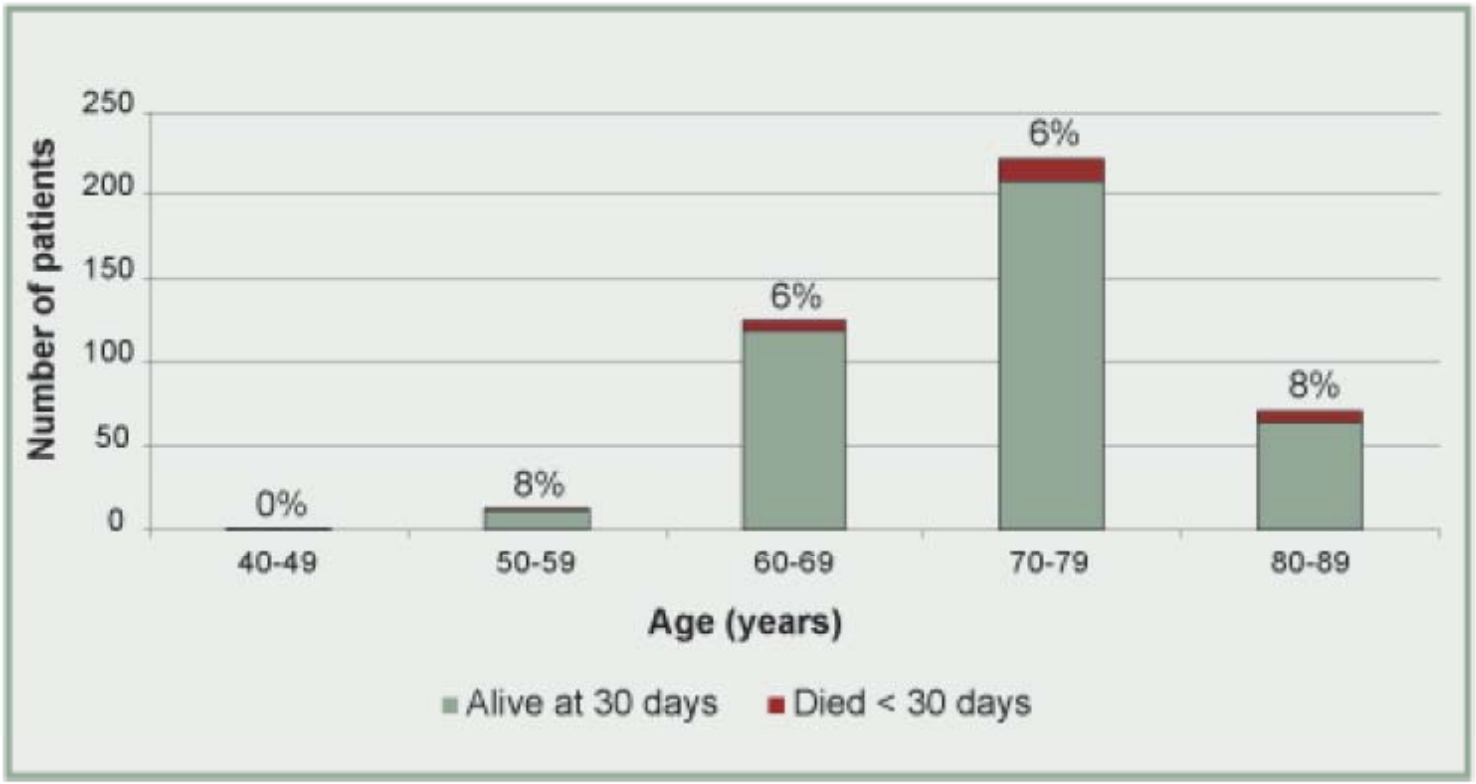

Figure 3. Age by mortality *n* =432/434. *Percentages refer to patients who died in hospital within 30 days.*

Surgical Delay

Figure 4. Time between patients being placed on the surgical waiting list and the date of their surgery *n=382/434*

Length of Operation

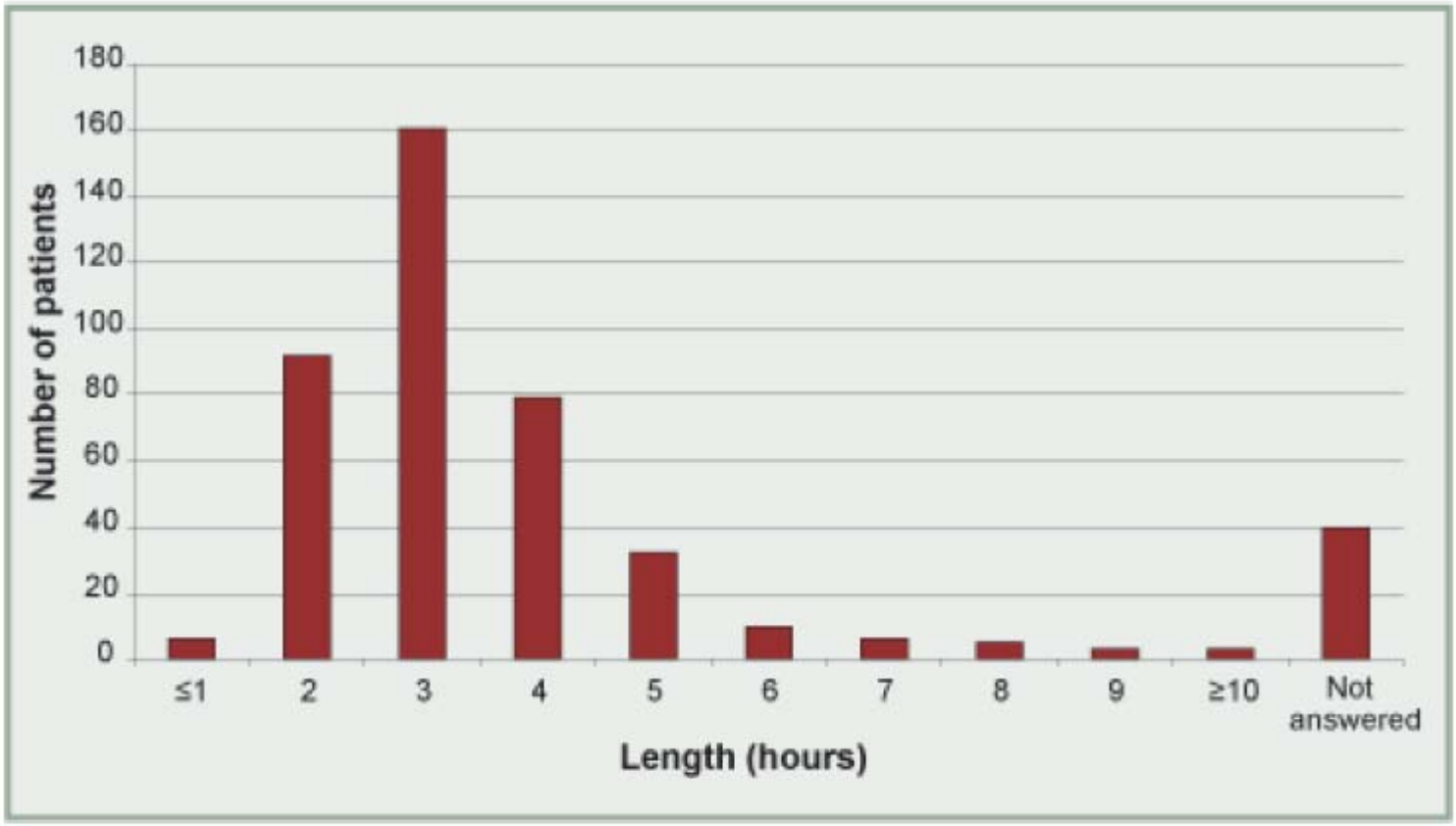

Figure 6. Length of operation *n=434*

Other Procedures

Table 7. Other procedures completed during the same theatre visit *n=434. Answers may be multiple.*

Procedure	Total	% died within 30 days
Peripheral artery bypass	9	33
Thrombectomy /embolectomy	19	32
Other vascular procedures	21	29
Other non-vascular procedures	17	12
None	327	5
Not answered	47	

Grade of Most Senior Operating Surgeon

Table 8. Grade of the most senior operating surgeon		
Grade of surgeon	**Total**	%
Consultant	403	97
Staff grade	3	≤
SpR year 3+	4	≤
Other	7	2
Sub-total	**417**	
Not answered	17	
Total	**434**	

Number of Elective AAA Repair by Most Senior Surgeon

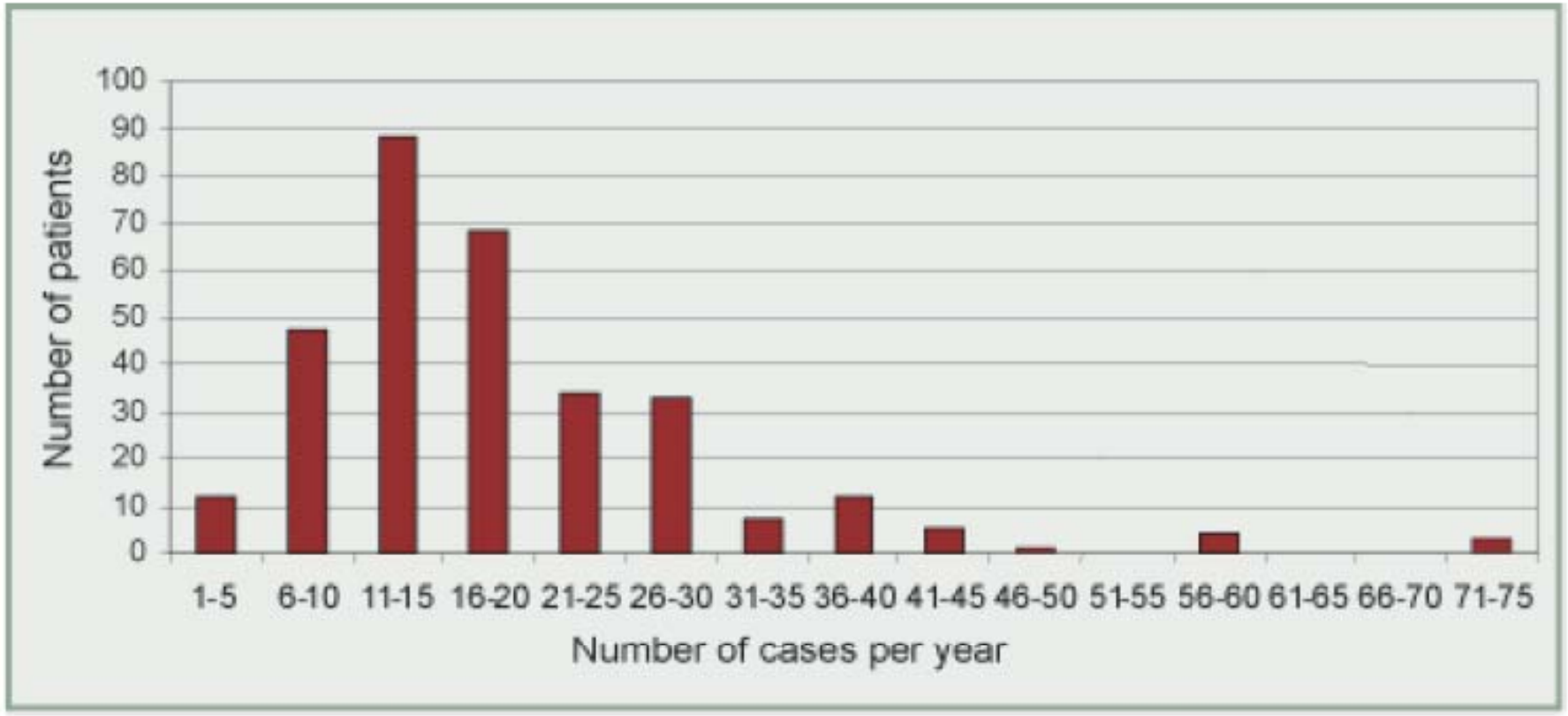

Figure 8. Number of elective repairs performed by the most senior surgeon *n=312/434*

Time of Operaton and Outcome

Figure 11. Time of day when operation started by outcome *n=264. Percentages refer to patients who died within 30 days.*

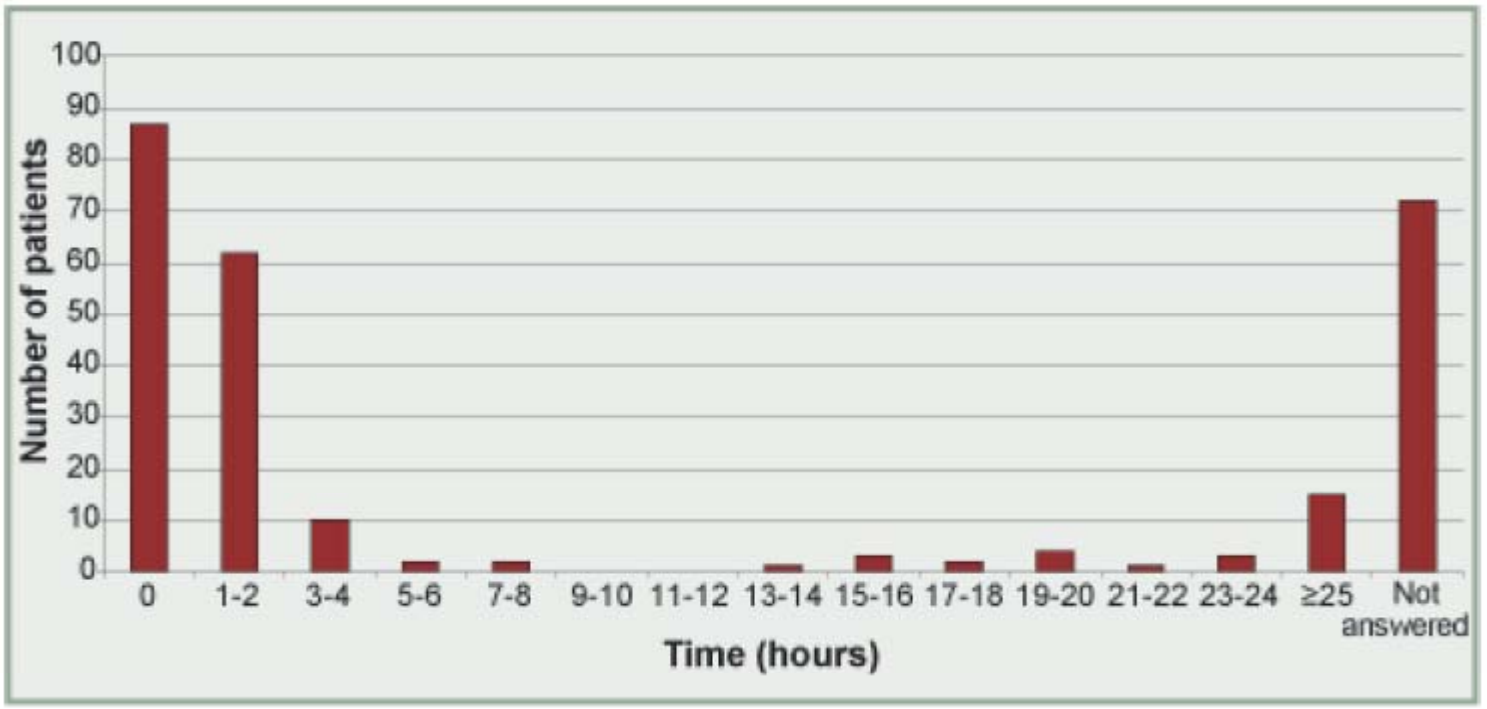

Figure 12. Time to operation from time decision was made to operate *n=264*

Duration of Operation and Outcome

Figure 13. Length of operation *n=264. Percentages refer to patients who died in hospital within 30 days.*

Organisation of VascularServices-1

3. Organisation of vascular services

Trusts should ensure the availability outside normal working hours of radiology services including CT scanners.

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Organisation of VascularServices-2

4. Surgery

Patients with an aortic aneurysm requiring surgery must have equal priority with all other patients with serious clinical conditions for diagnosis, investigation and treatment.

Trusts should take action to improve access to Level 2 beds for patients undergoing elective aortic aneurysm repair so as to reduce the number of operations cancelled and inappropriate use of Level 3 beds.

Trusts should ensure that clinicians of the appropriate grade are available to staff preoperative assessment clinics for aortic surgery patients.

Strategic Health Authorities and Trusts should co-operate to ensure that only surgeons with vascular expertise operate on emergency aortic aneurysm patients, apart from exceptional geographical circumstances.

Organisation of VascularServices-3

5. Anaesthesia

Trusts should ensure that anaesthetists can identify the major cases that they have managed in order to support audit and appraisal.

Anaesthetic departments should review the allocation of vascular cases so as to reduce the number of anaesthetists caring for very small volumes of elective and emergency aortic surgery cases.

Trusts should ensure they that they have robust systems for the postoperative care of epidural catheters with accompanying appropriate documentation.

Anaesthetic departments and critical care units should review together whether vascular surgery patients who routinely receive postoperative mechanical ventilation could be managed in a Level 2 High Dependency Unit breathing spontaneously.

Recommendation - 1

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Further Proposals

- All vascular patients should be cared for only by appropriately trained vascular specialists in an appropriate setting
- All vascular patients requiring surgery should be looked after by an experienced vascular anaesthetist
- All this may require centralisation of Vascular Services with reshaping of the service
- We should consider adopting *Vascular Centres* as proposed by the UEMS working party