

BCIS Audit Returns Adult Interventional Procedures

Jan 2008 to Dec 2008



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BCIS National Audit Lead

On behalf of

British Cardiovascular Intervention Society

Bournemouth October 2009

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2008 data: Ludman

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 - Delays to treatment Primary PCI
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 - CTB times by unit
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 - HOCM septal ablation
 - Mitral valuloplasty
 - Other adult structural intervention
 - Transcatheter Aortic Valves
- **Outcome**
 - MACCE
 - Outcome by syndrome
 - Outcome by lesion subset
 - Risk adjusted outcomes

Structure



2007 data: Ludman



Angiography Centres 2008



2008 data: Ludman

New Centres

Maidstone (restarts)

Peterborough District Hospital

West Suffolk Hospital

Ipswich Hospital

Centres ceasing activity

St James's University Hospital

Western General (Bristol)

Bristol Spire

Droitwich Spa

PCI Centres 2008



2008 data: Ludman

PCI becomes Angio only

Southend

PCI Centres 2008



2008 data: Ludman

New PCI Centres

Frenchay Hospital (Bristol)

Kettering General Hospital

PCI centres from existing angiography units

Kent and Sussex Hospital

Darrent Valley

Kings Mill Hospital (Mansfield)

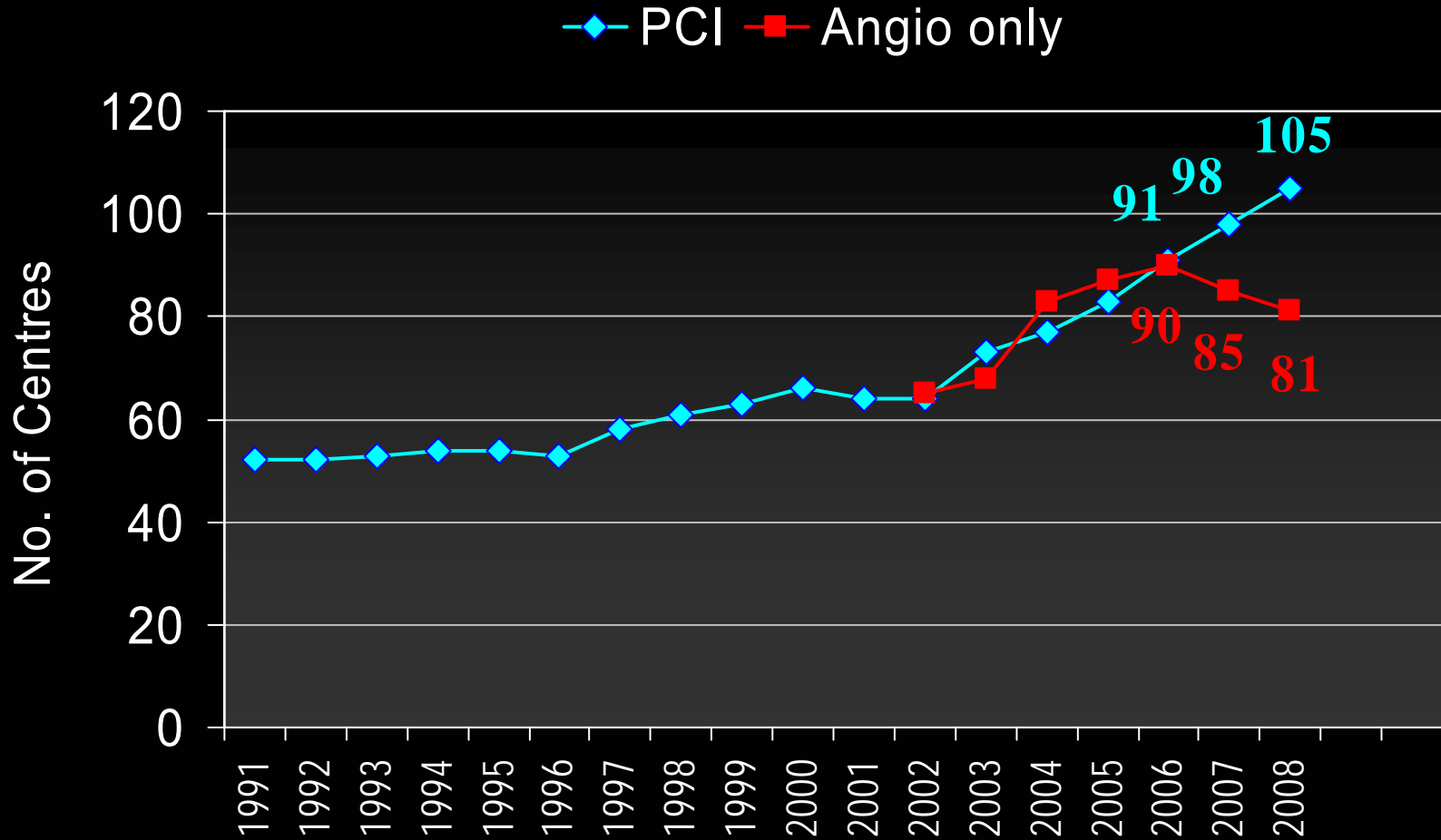
Lincoln County Hospital

Worcester Royal Hospital

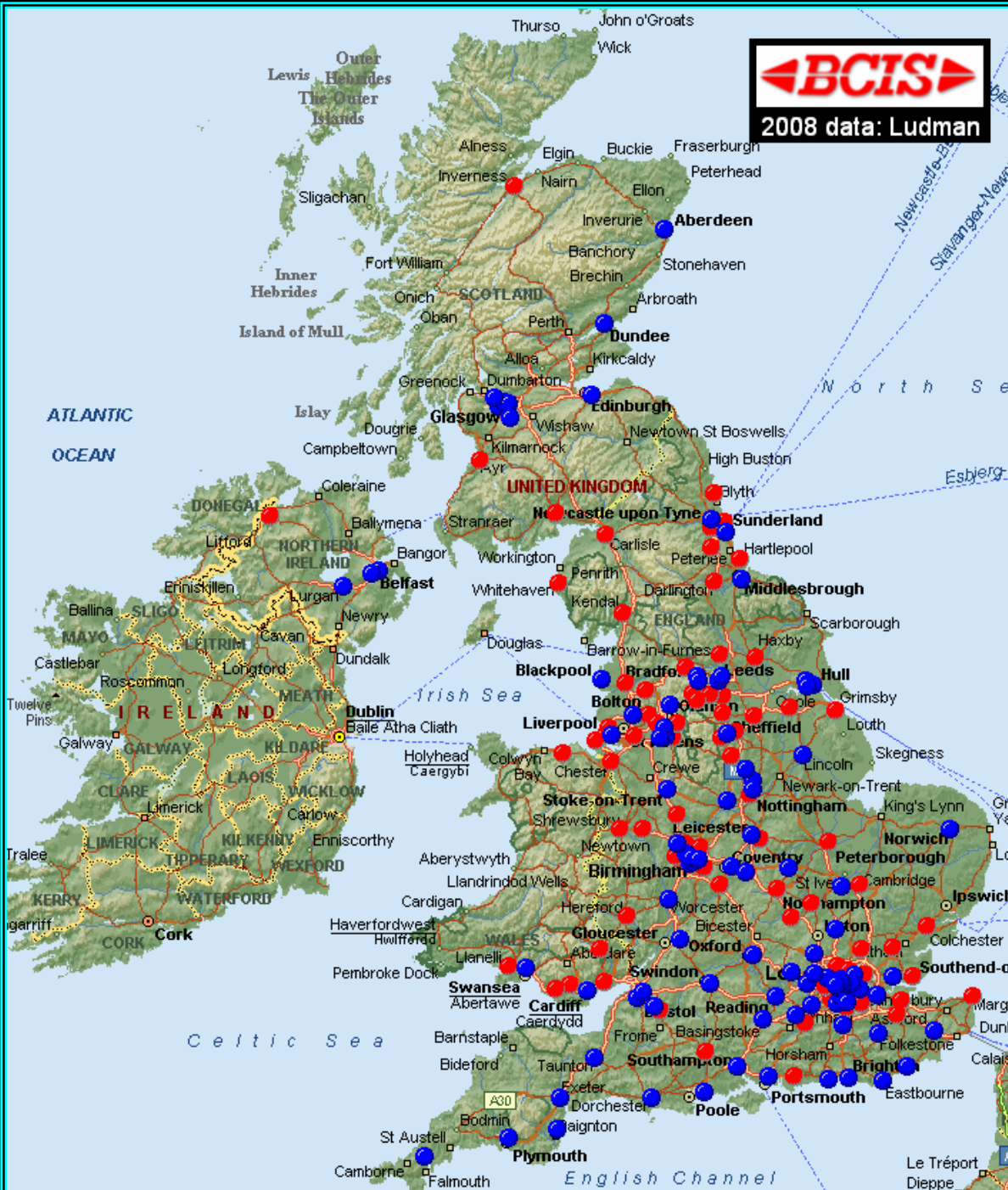
UK Centres 2008



2008 data: Ludman



2008



● Angiography (81)

● PCI (105)

PCI Centres in 2008

UK Countries



2008 data: Ludman



Scotland	NHS	7 → 5
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England	NHS	76
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N Ireland		3
Wales		2

Total		105
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UK Interventional and Diagnostic centres 2008



2008 data: Ludman

	No.	No cath data	No PCI data	Caths (% of total)	PCIs (% of total)
NHS Interventional	88	0	0		
Private Interventional	17	1	1		
Diagnostic only	81	2	na		
TOTAL	186				

UK Interventional and Diagnostic centres 2008



2008 data: Ludman

No PCI data:
London Independent Hospital

NHS Interventional	88	0	0	
Private Interventional	17	1	1	
Diagnostic only	81	2	na	
TOTAL	186			

UK Interventional and Diagnostic centres 2008



2008 data: Ludman

No angiography data:
University Hospital of Hartlepool
Princess of Wales Hospital, Bridgend

NHS Interventional	88	0	0		
Private Interventional	17	1	1		
Diagnostic only	81	2	na		
TOTAL	186				

UK Interventional and Diagnostic centres 2008



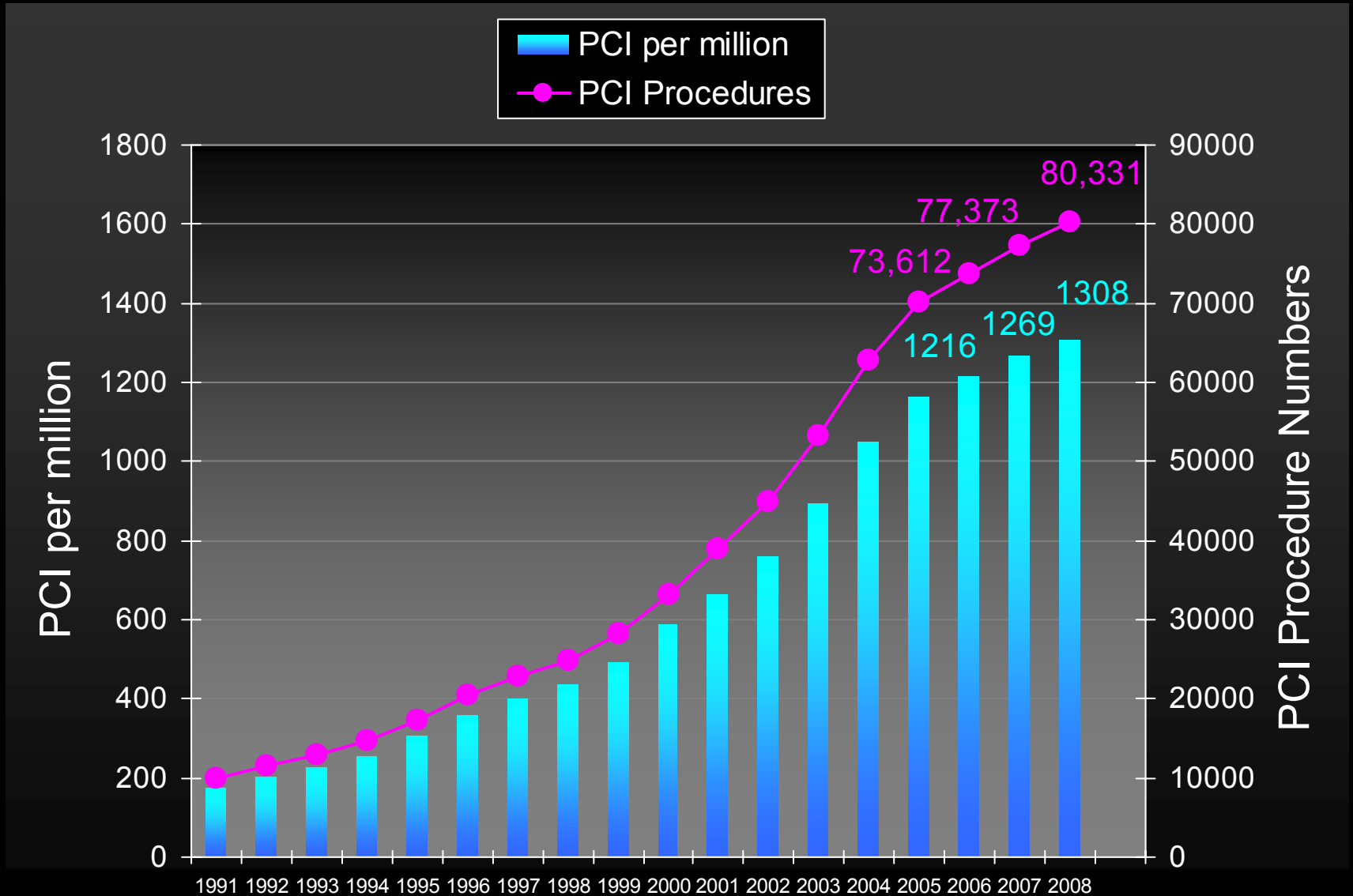
2008 data: Ludman

	No.	No cath data	No PCI data	Caths (% of total)	PCIs (% of total)
NHS Interventional	88	0	0	166,454	78,077
Private Interventional	17	1	1	7,026	2,254
Diagnostic only	81	2	na	56,548	na
TOTAL	186			230,028	80,331

PCI activity to 2008 (UK)



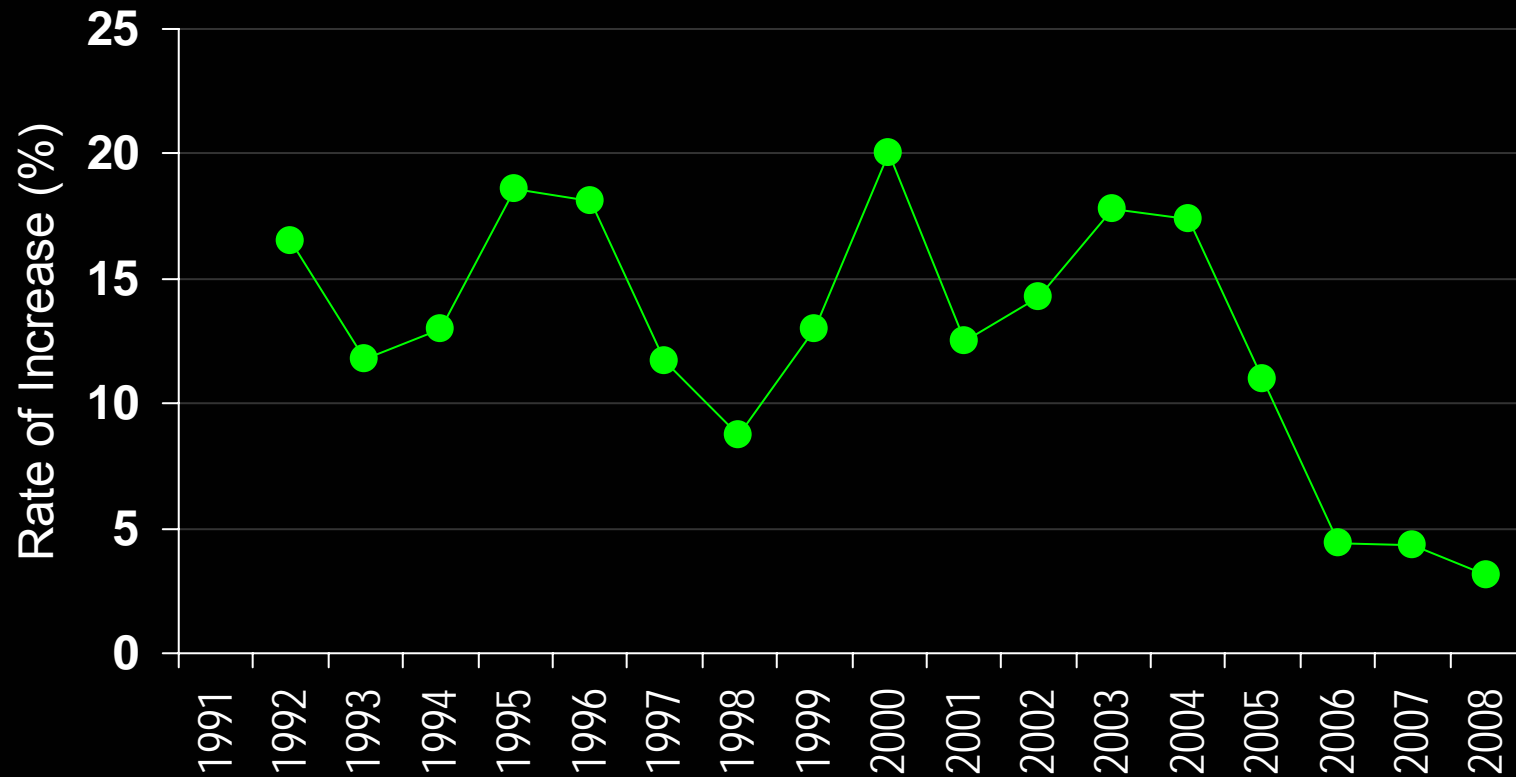
2008 data: Ludman



Rate of increase in PCI numbers pmp



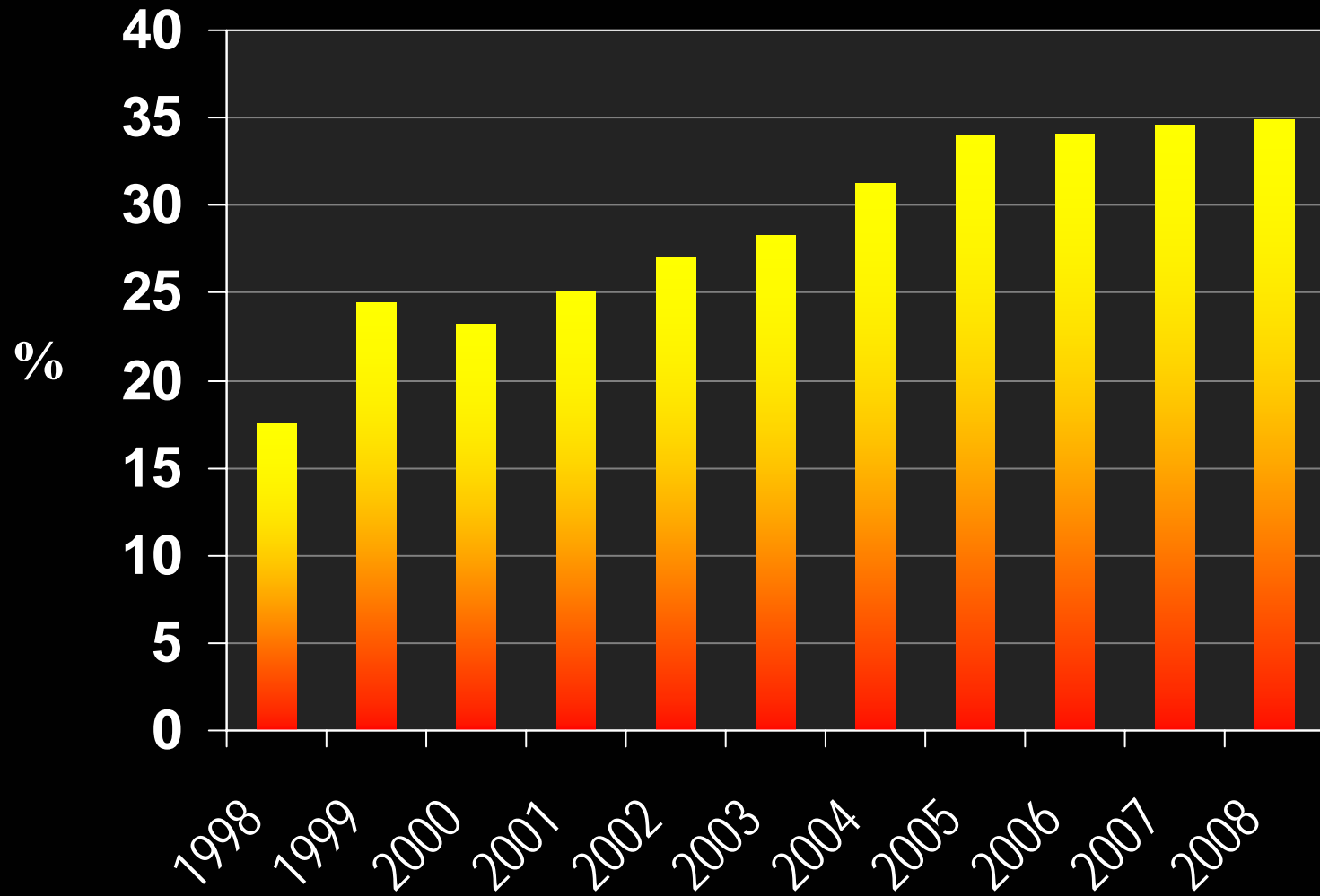
2008 data: Ludman



PCI per Angiogram ratio



2008 data: Ludman

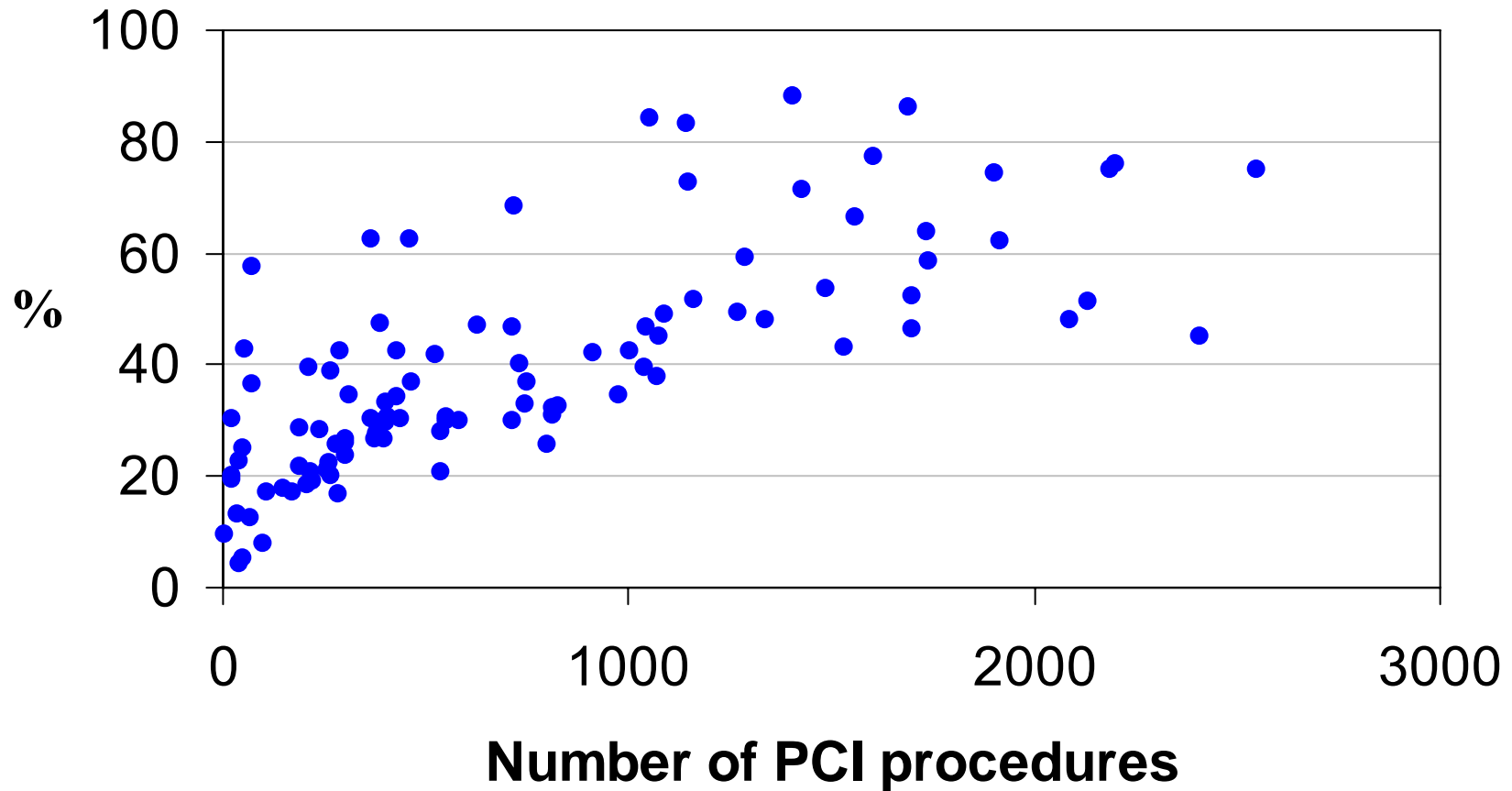


PCI per Angiogram ratio

By Individual PCI Units



2008 data: Ludman



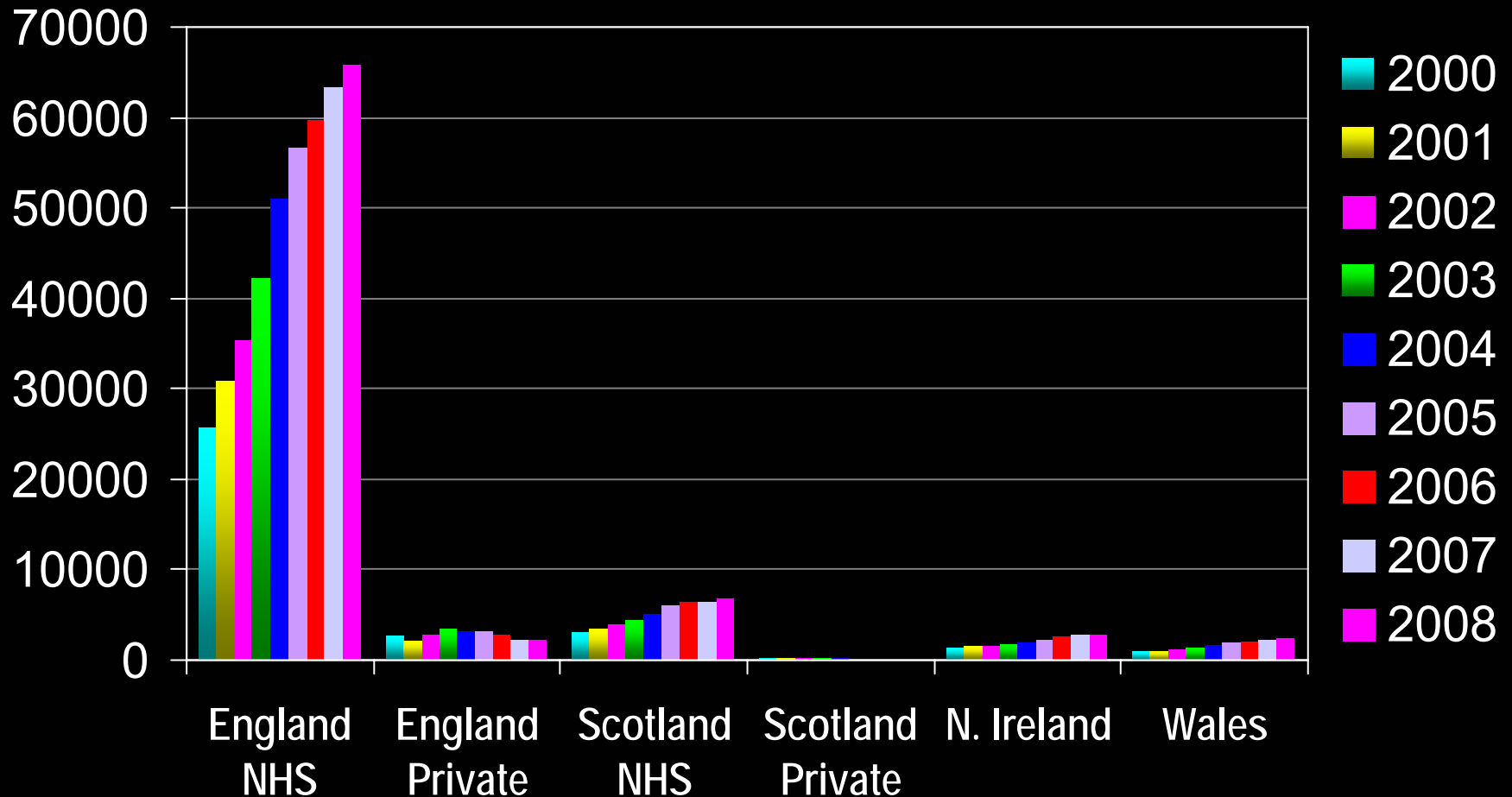
Total PCIs in the UK Countries

by Type of Institution



2008 data: Ludman

Total No.s of PCI



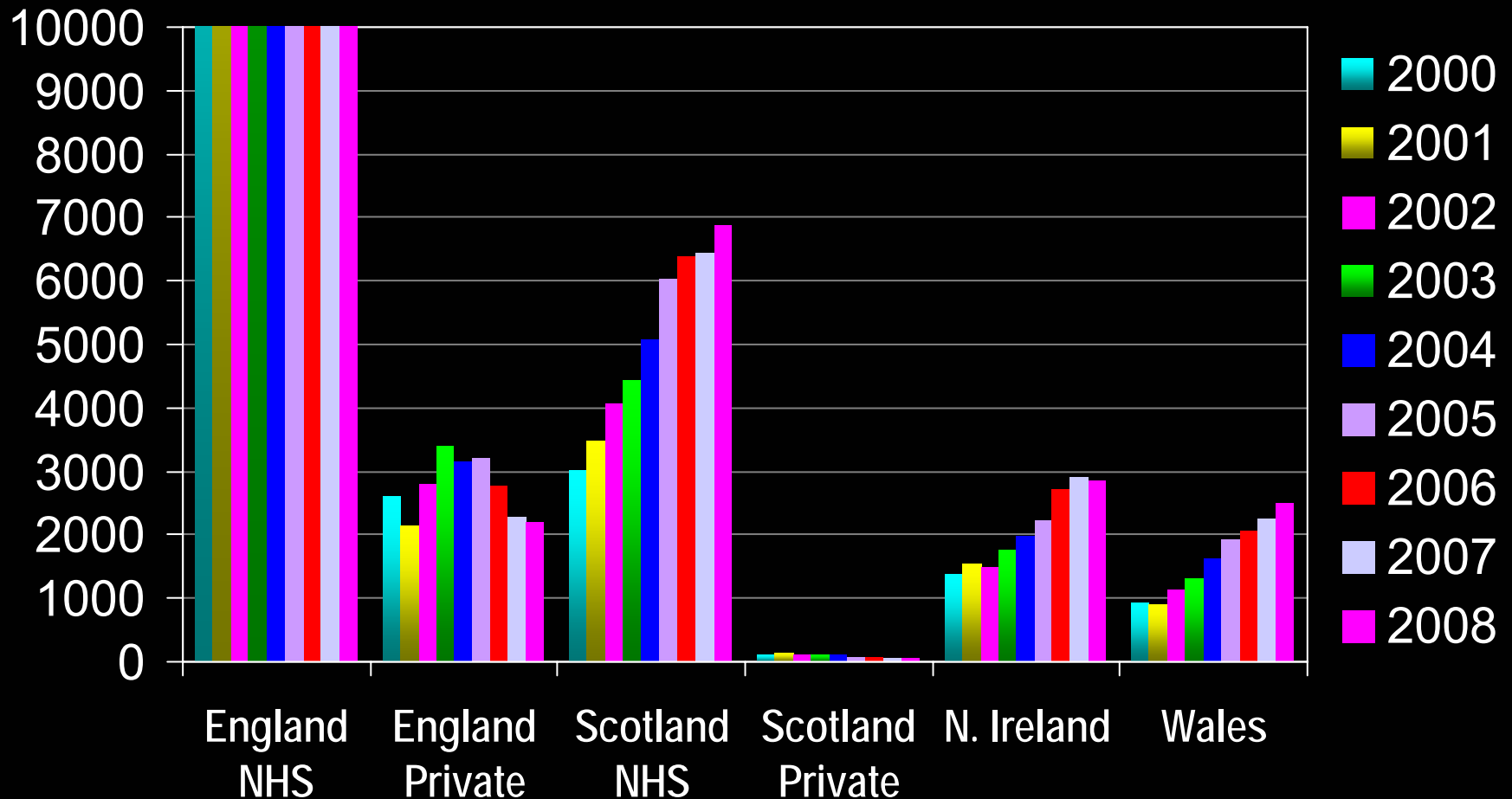
Total PCIs in the UK Countries

by Type of Institution



2008 data: Ludman

Total No.s of PCI



Population estimates

Mid 2008



2008 data: Ludman



Total UK: 61.4 m

Scotland 5.169 m

Northern Ireland 1.775 m

England 51.446 m

est: Welsh Rx in England 0.8 m

Total Rx in England 52.3 m

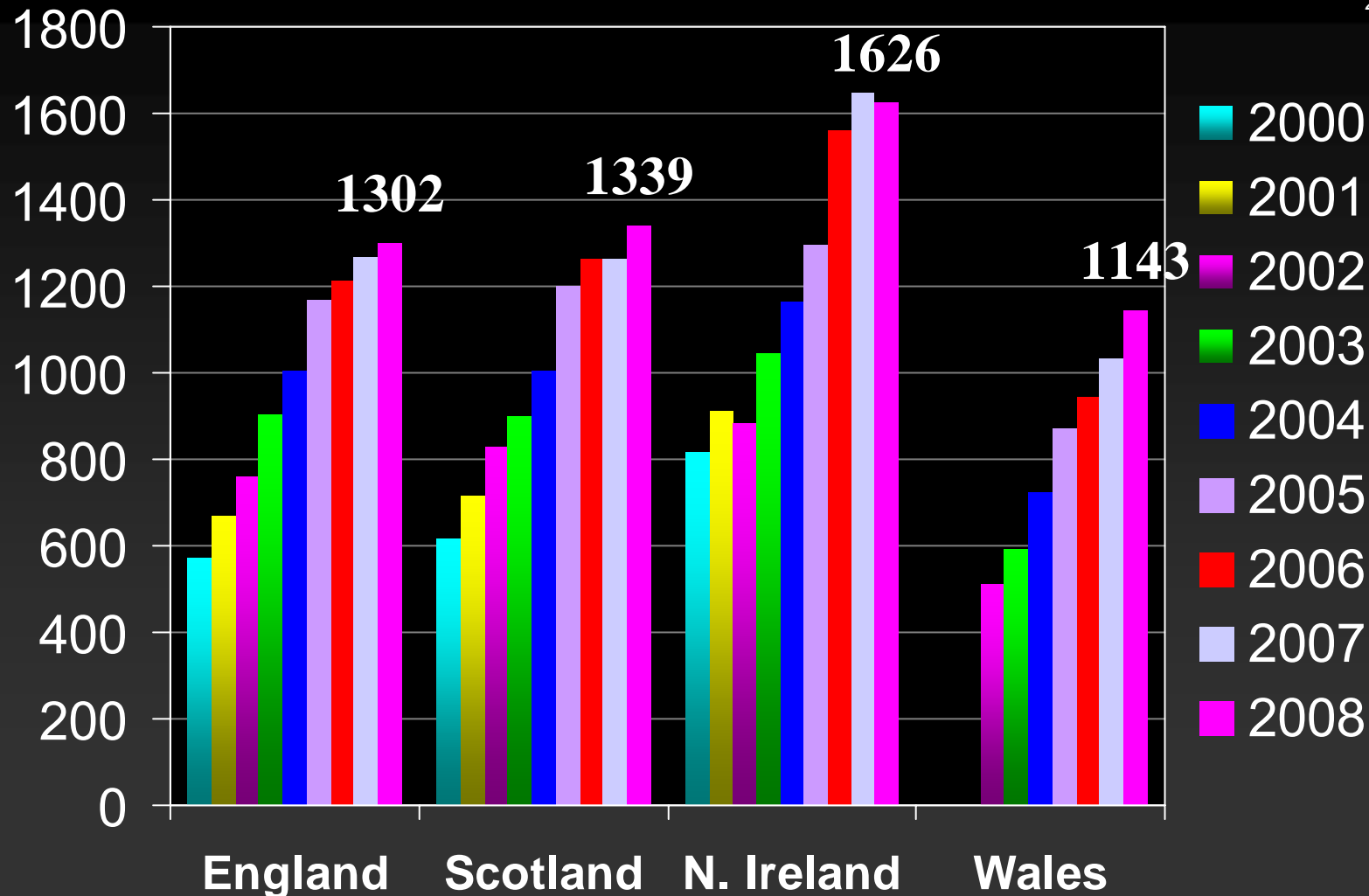
Wales 2.99 m

est: Rx in Wales: 2.2 m

PCIs/million UK Countries



2008 data: Ludman

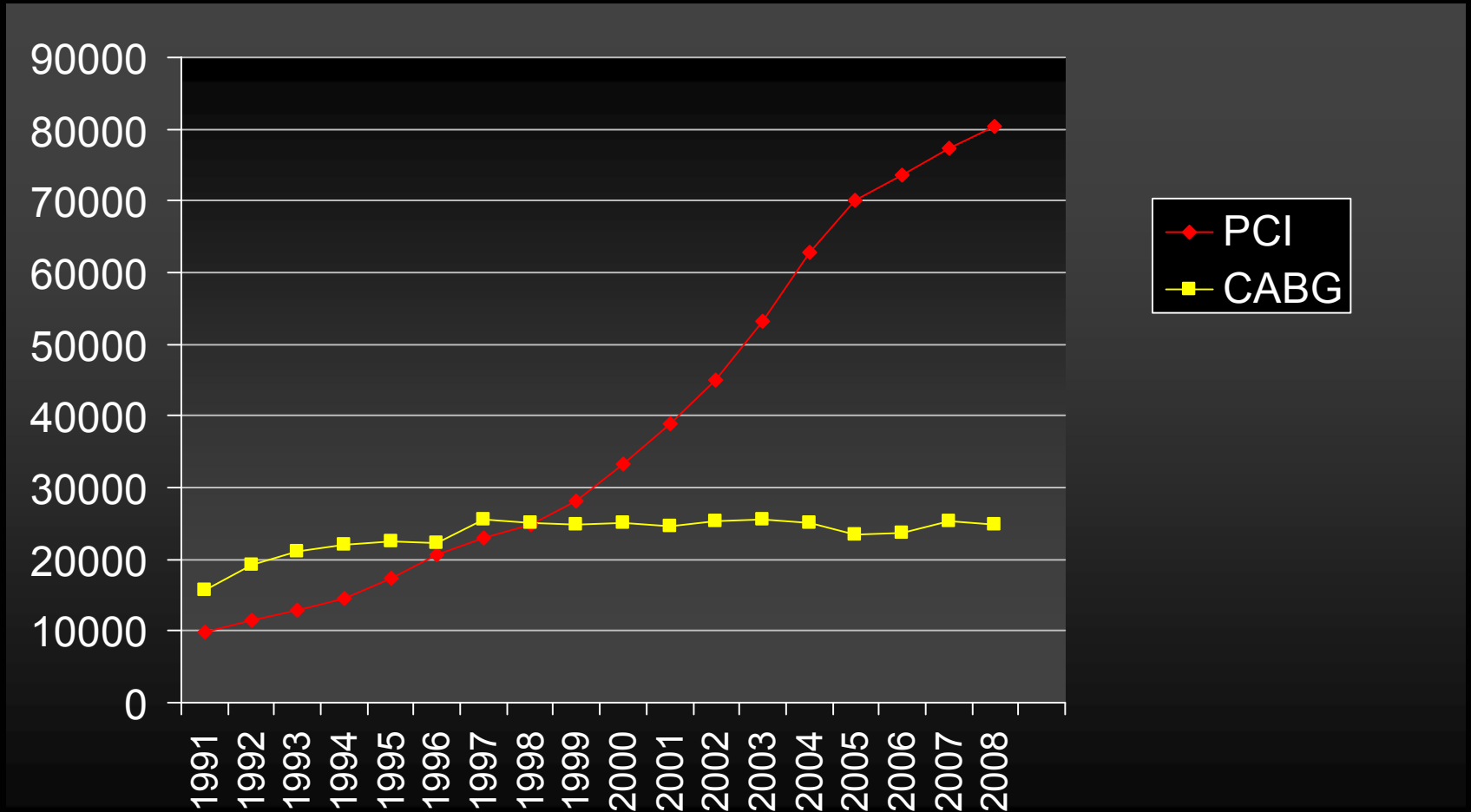


PCI vs Isolated CABG Numbers (UK)

1991 to 2008



2008 data: Ludman

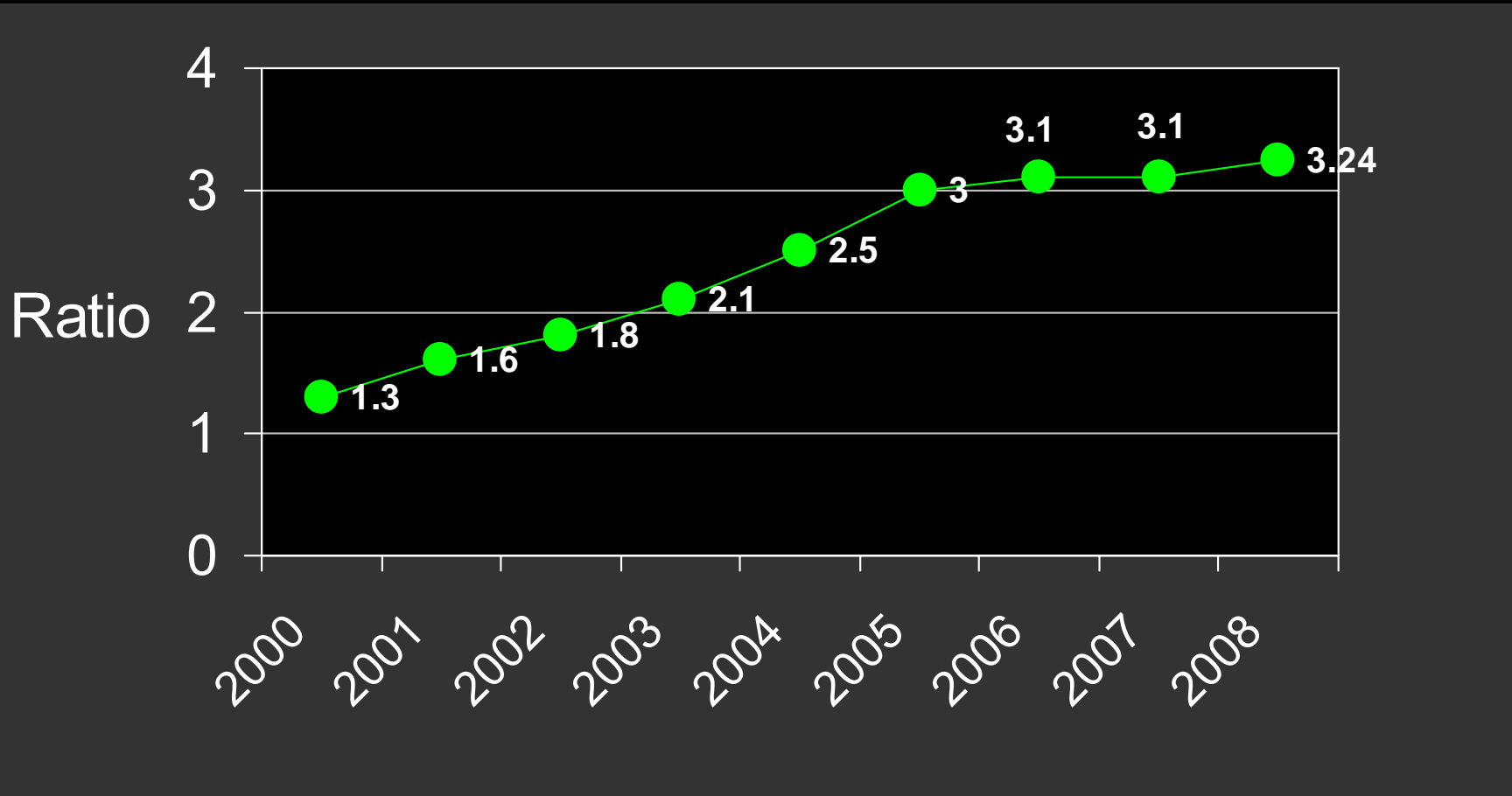


PCI vs Isolated CABG Ratio (UK)

2000 to 2008



2008 data: Ludman



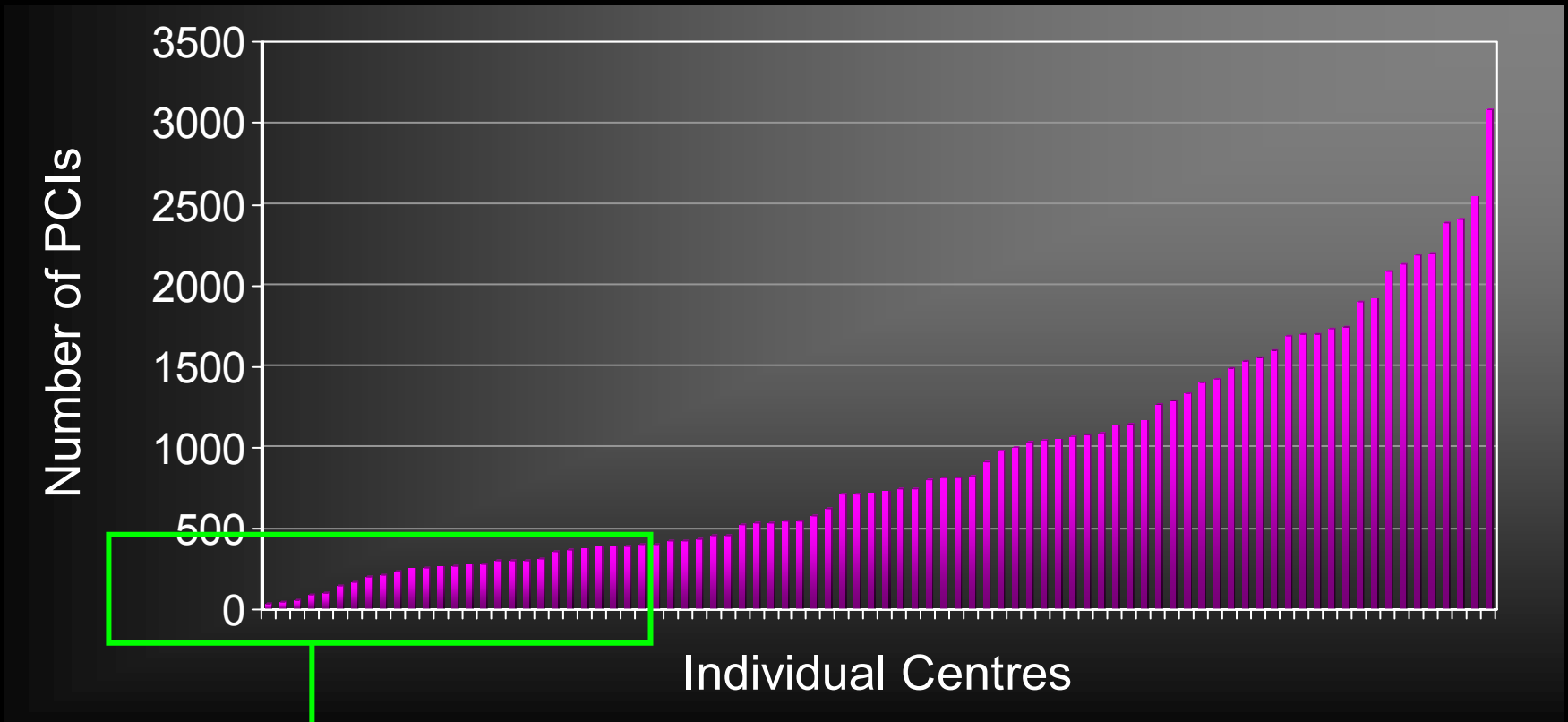
Number of PCIs performed in 2008

(per NHS Centre)



2008 data: Ludman

Mean = 908



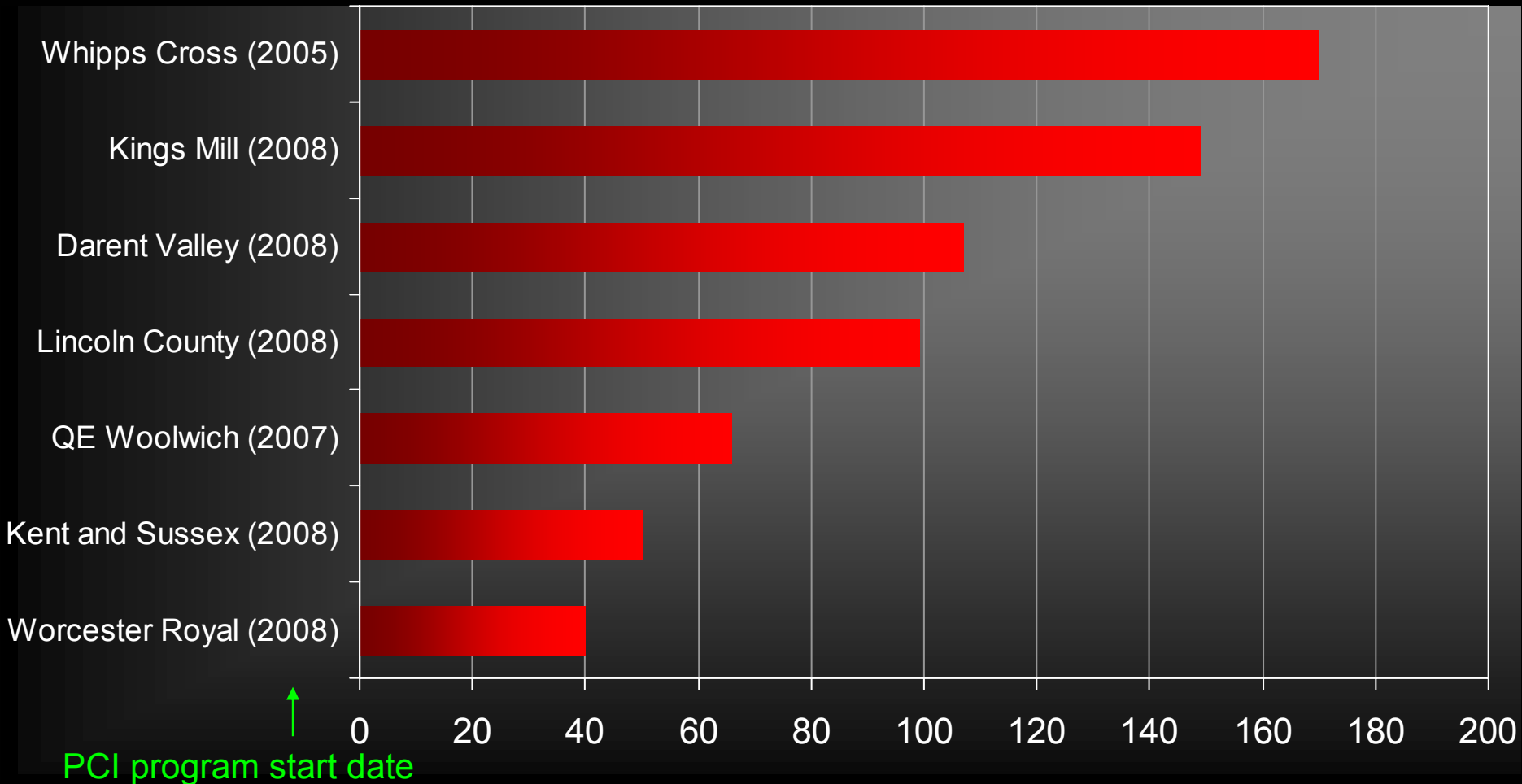
26 Centres performing < 400 cases (25%)

Number of PCIs performed in 2008



2008 data: Ludman

7 Centres performing < 200 procedures

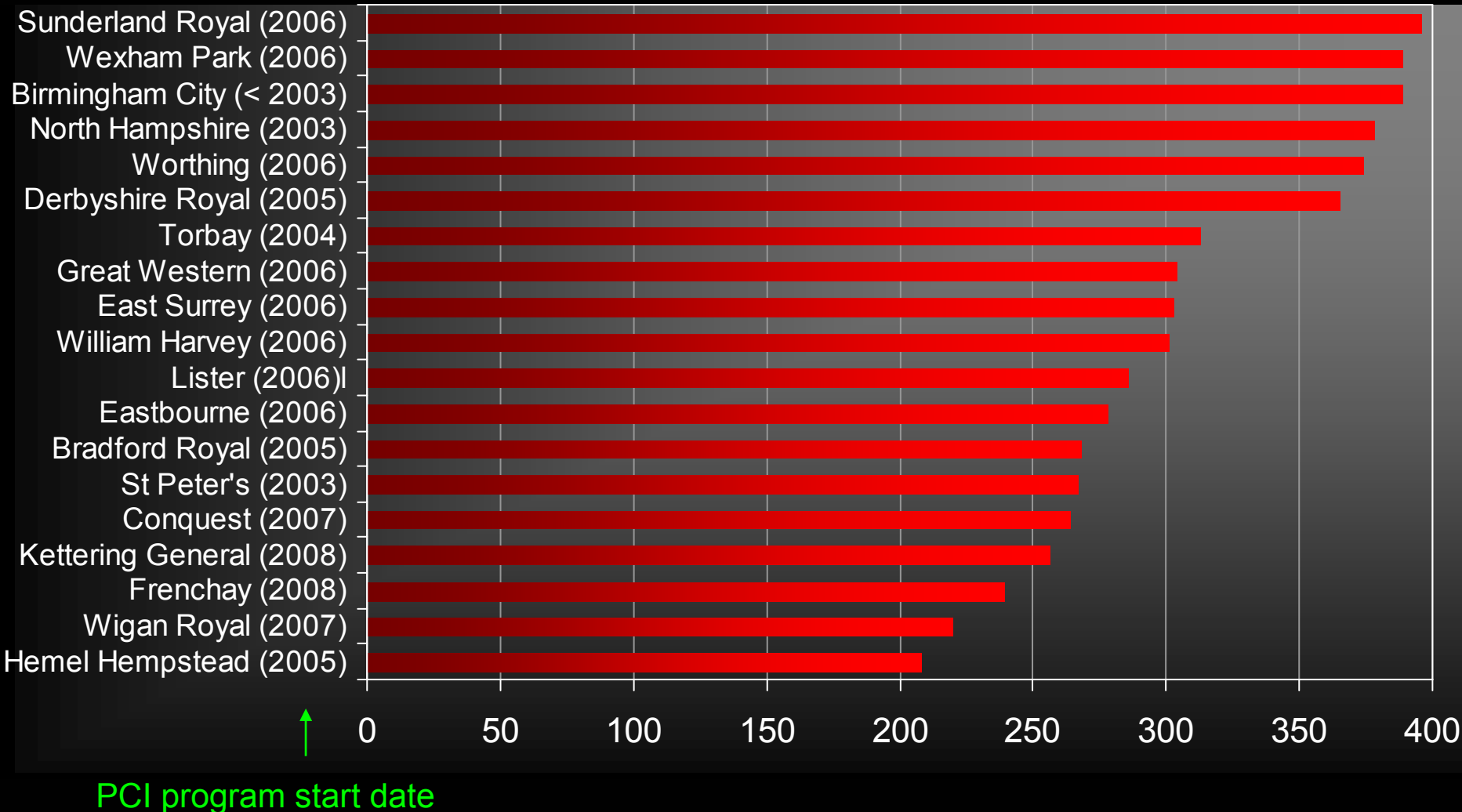


Number of PCIs performed in 2008



2008 data: Ludman

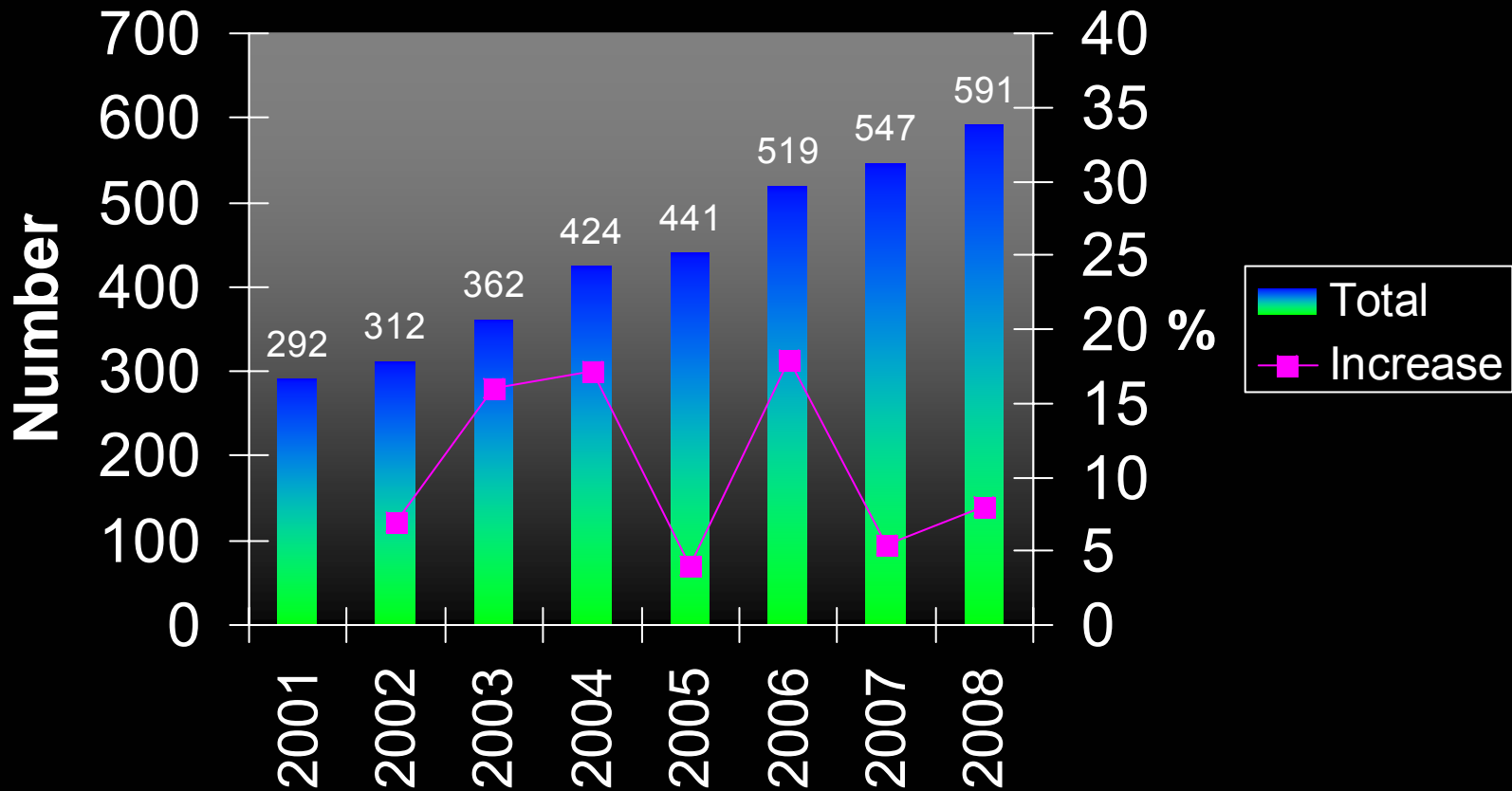
19 Centres performing 200 to 400 procedures



No. of Interventional Consultants (NHS centres)



2008 data: Ludman

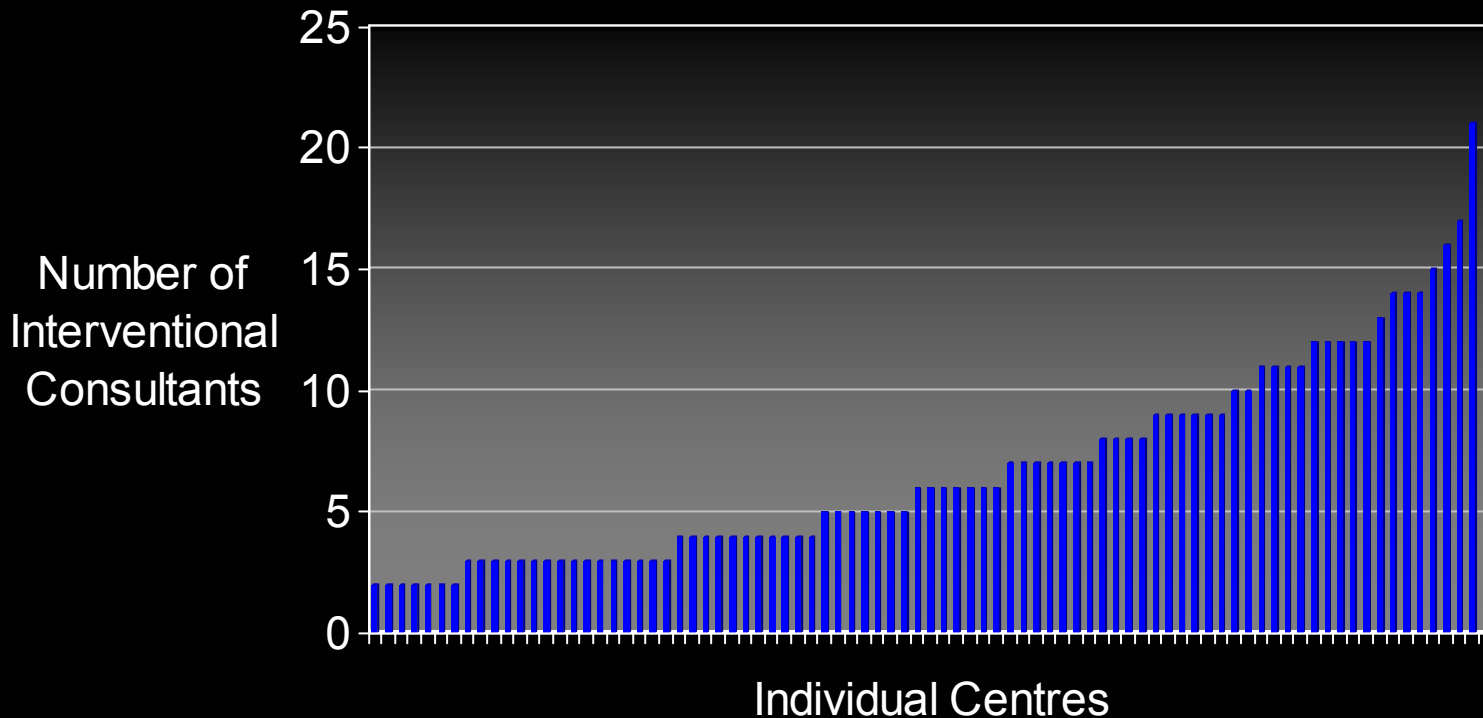


Note: if work at two NHS centres will be counted twice
Includes cardiologists and radiologists

No. of Interventional Consultants (NHS centres 2008)



2008 data: Ludman



Mean	
2000	5.5
2001	6.1
2002	6.5
2003	6.7
2004	7.4
2005	7.0
2006	6.9
2007	6.9
2008	6.8

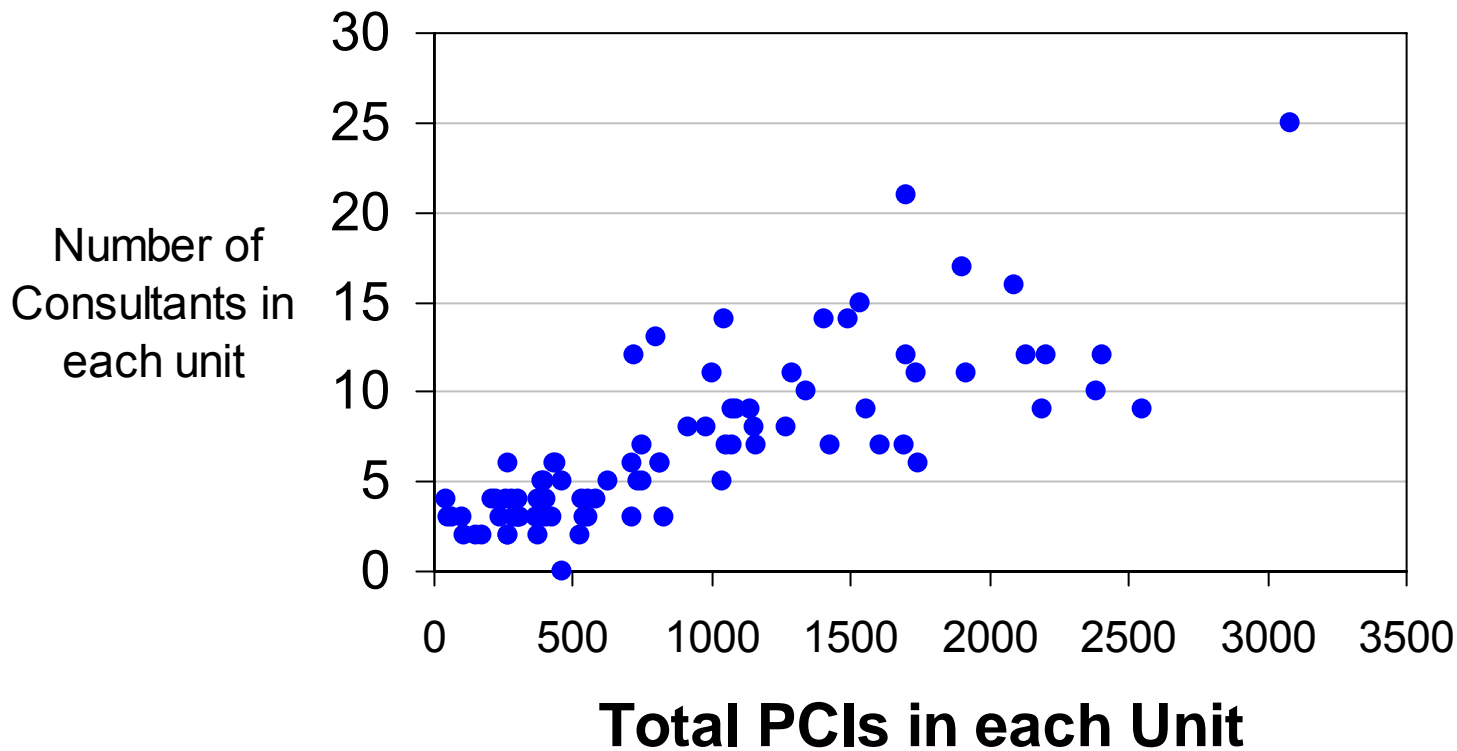
Note: if work at two NHS centres will be counted twice

No. of Consultant in each unit

(NHS Centres 2008)



2008 data: Ludman



Mean	
2000	5.5
2001	6.1
2002	6.5
2003	6.7
2004	7.4
2005	7.0
2006	6.9
2007	6.9
2008	6.8

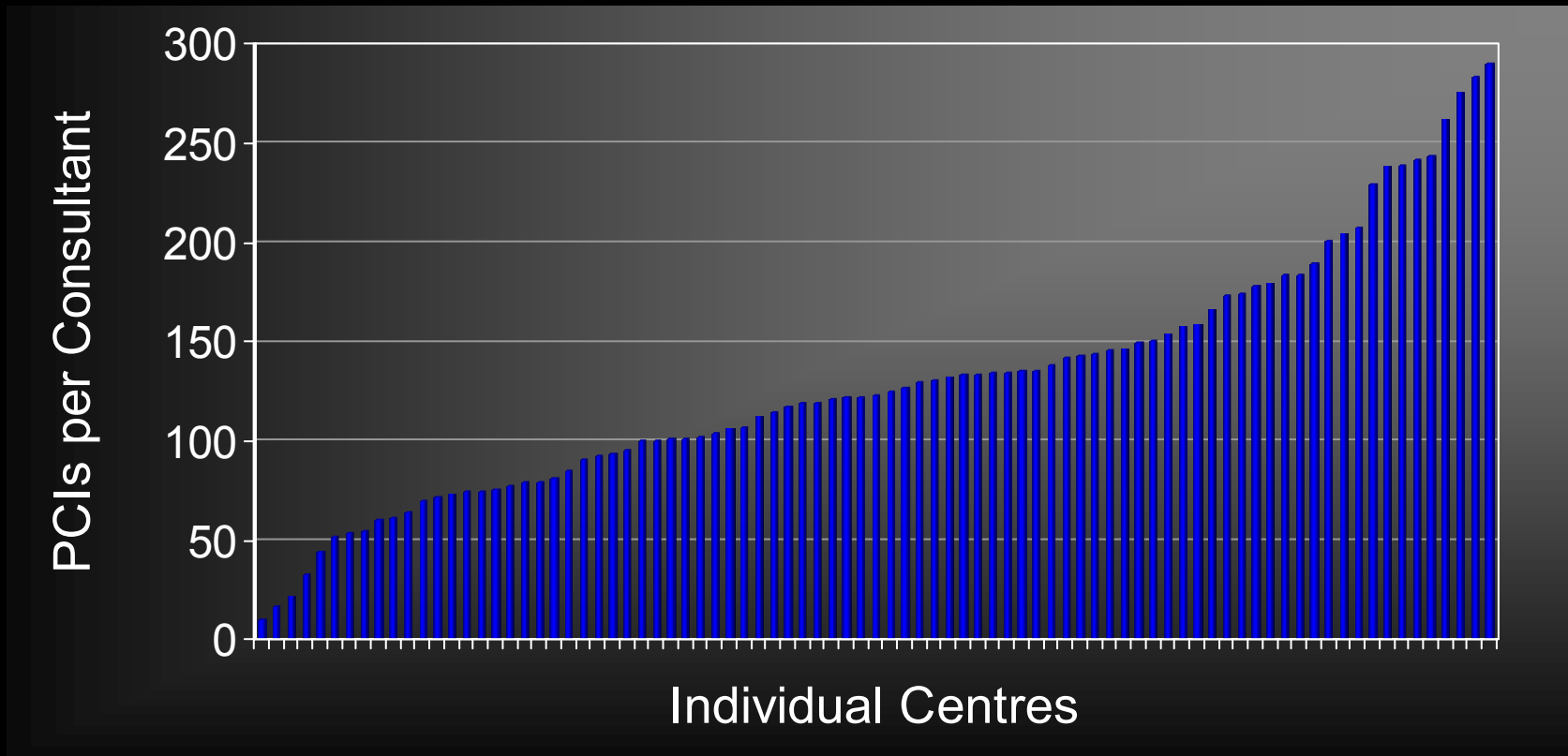
Note: if work at two NHS centres will be counted twice

No. of PCIs per Consultant

(NHS Centres 2008)



2008 data: Ludman



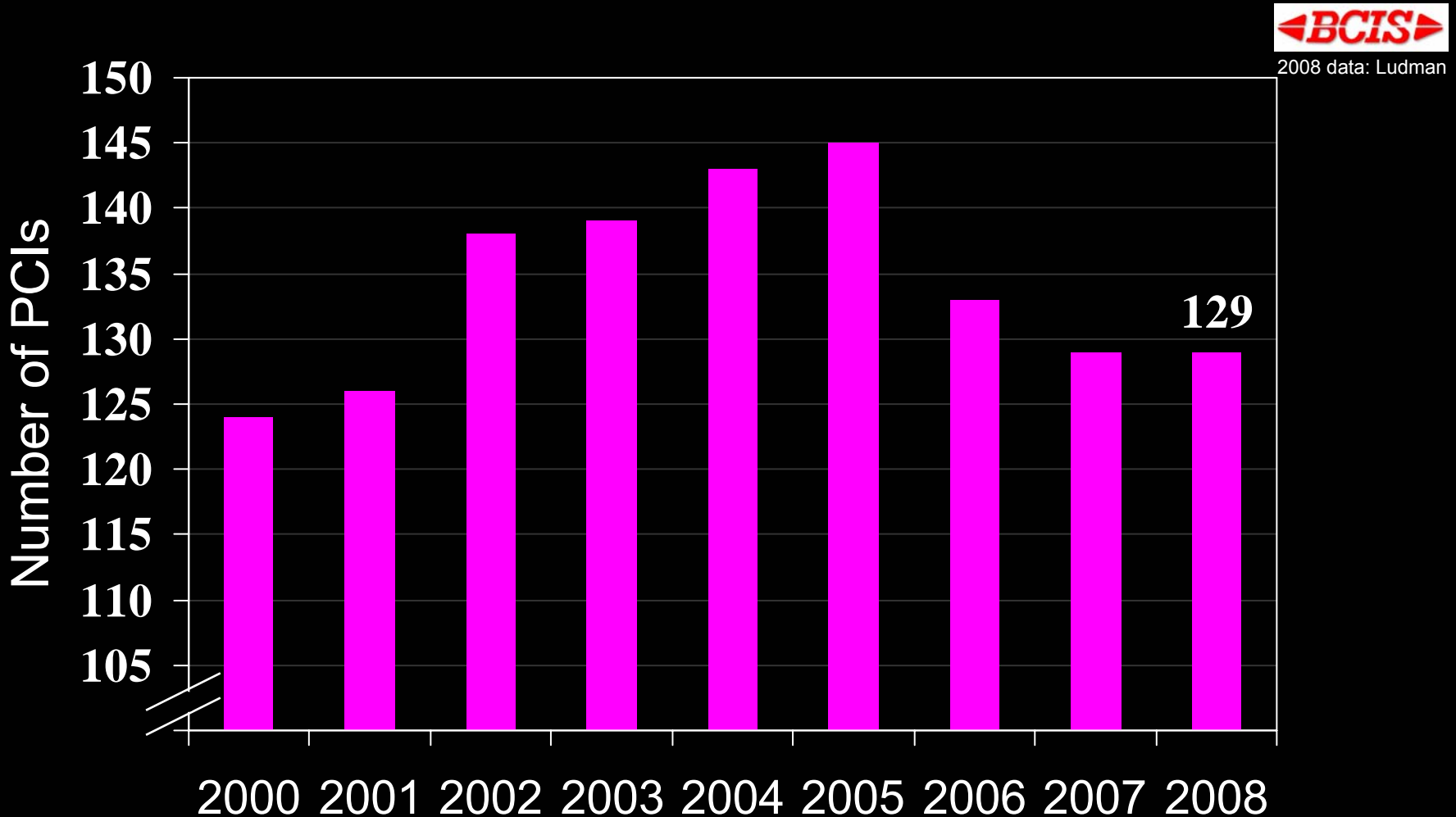
Note:

Data from institutional volume divided by No operators per institution

Some consultants work in multiple institutions

PCI per Consultant

Unit case number / Number of operators

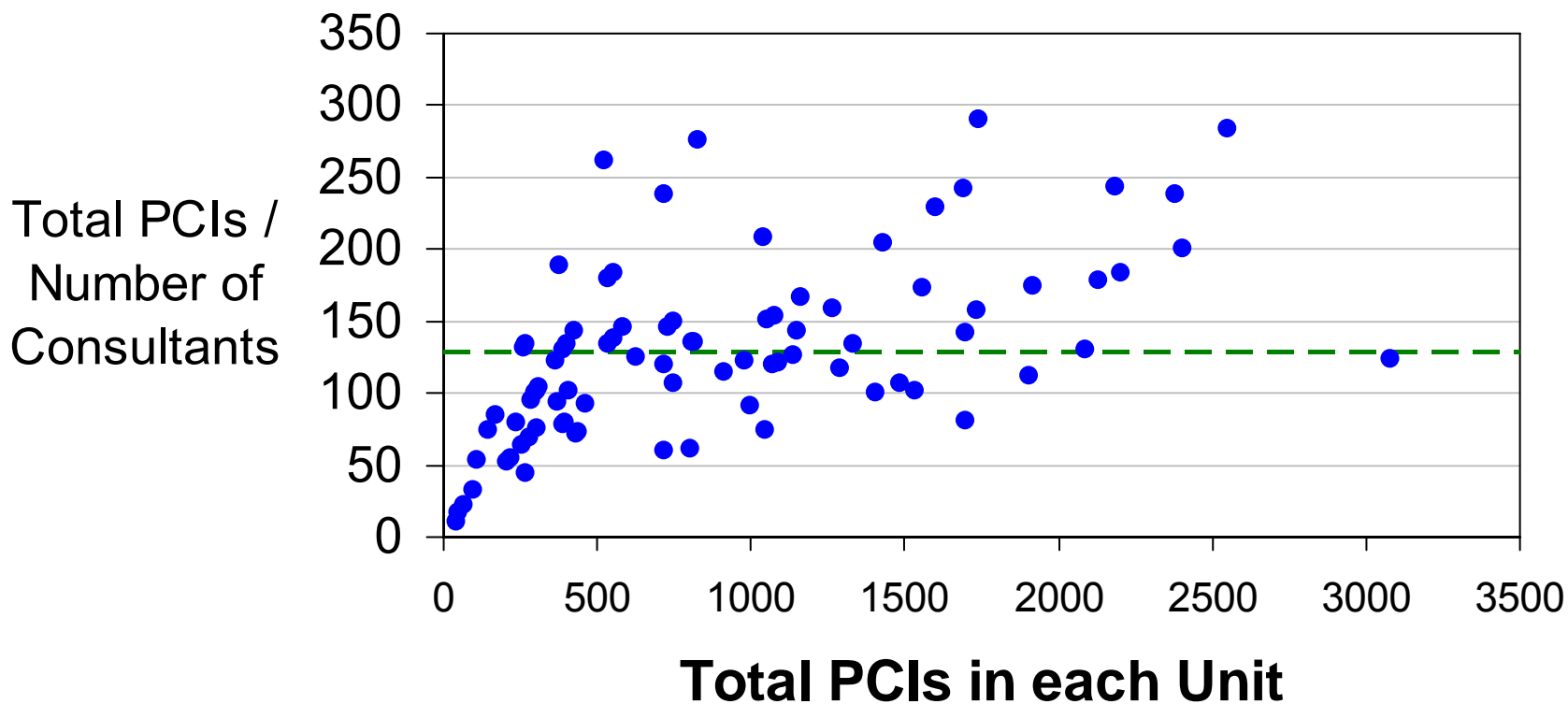


No. of PCIs per Consultant

(NHS Centres 2008)



2008 data: Ludman



Note:

Data from institutional volume divided by No operators per institution

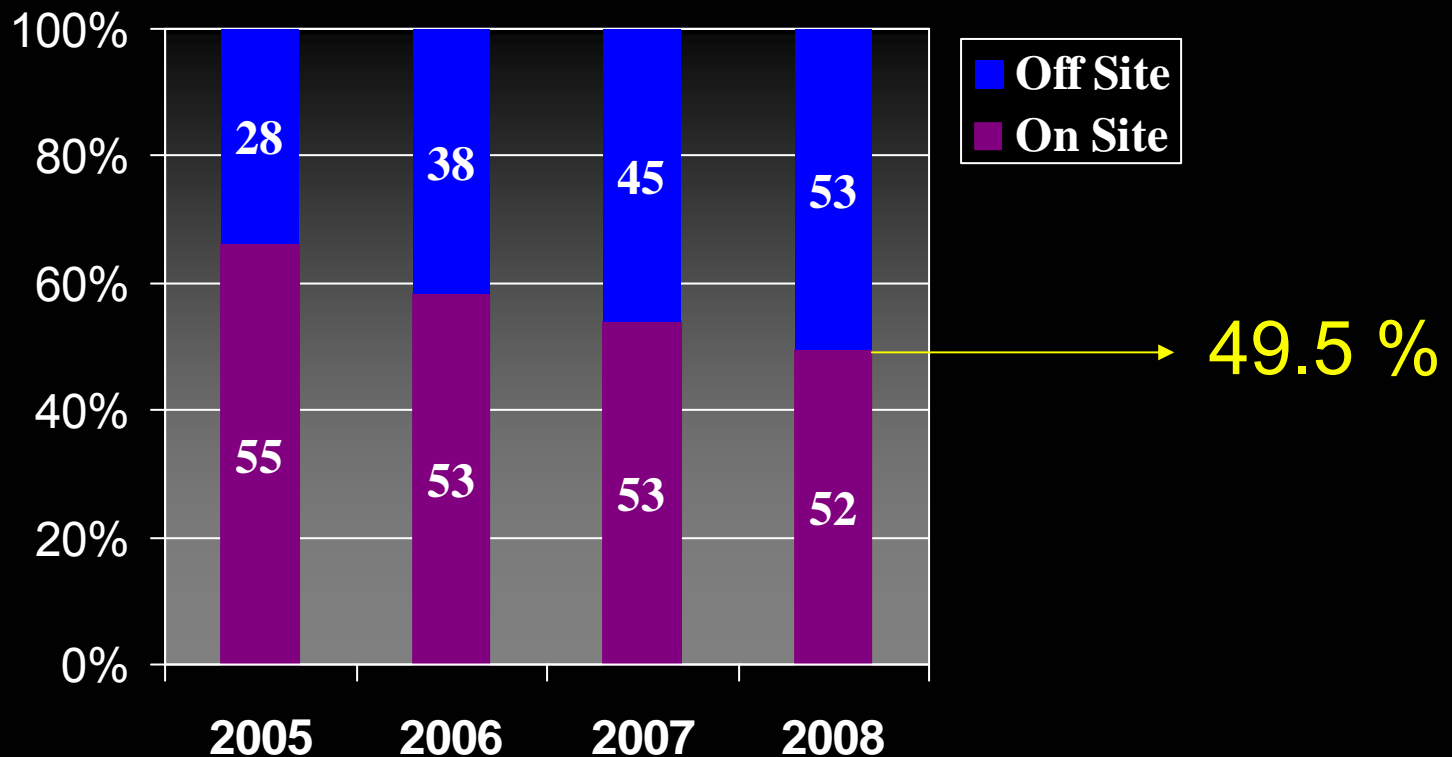
Some consultants work in multiple institutions

On v Off Site Surgery

All Centres (NHS and private)



2008 data: Ludman

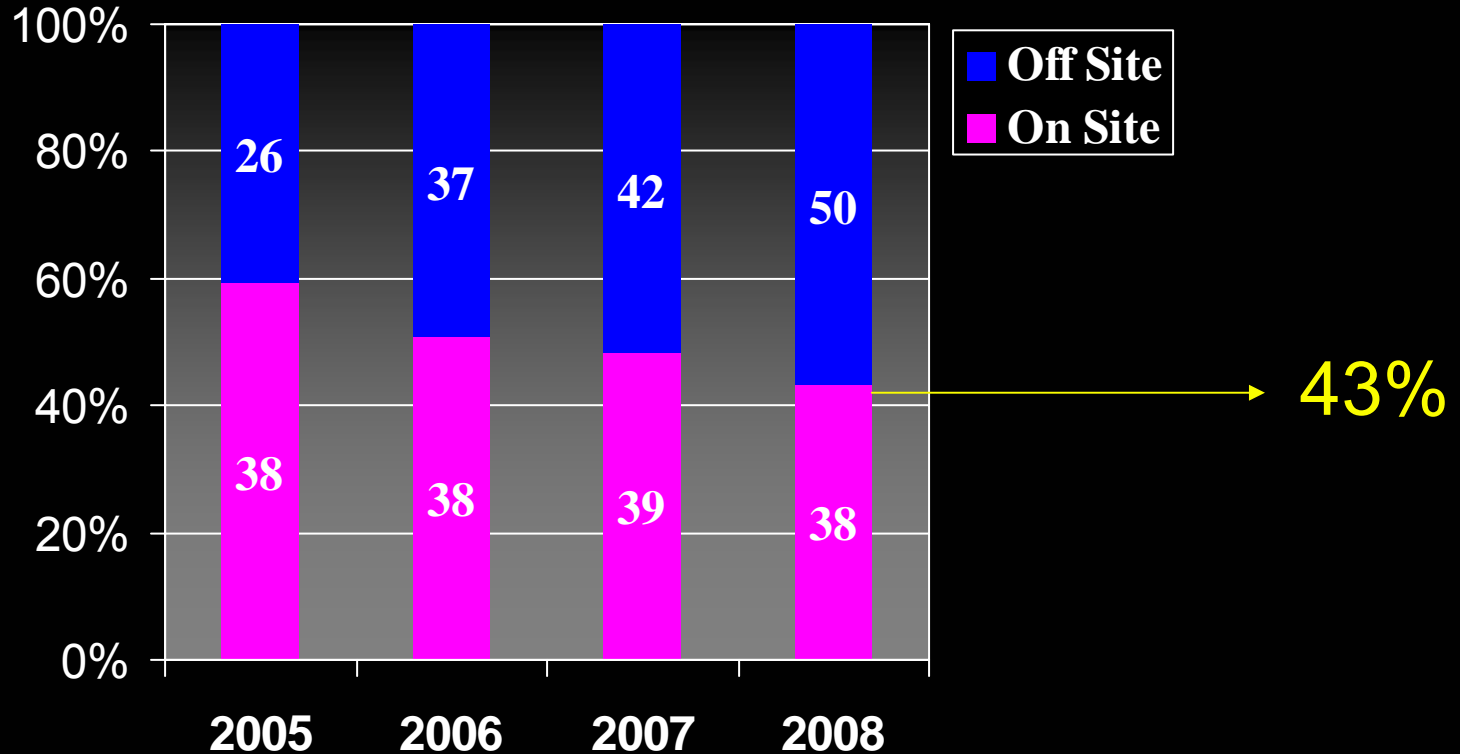


On v Off Site Surgery

NHS Centres only



2008 data: Ludman



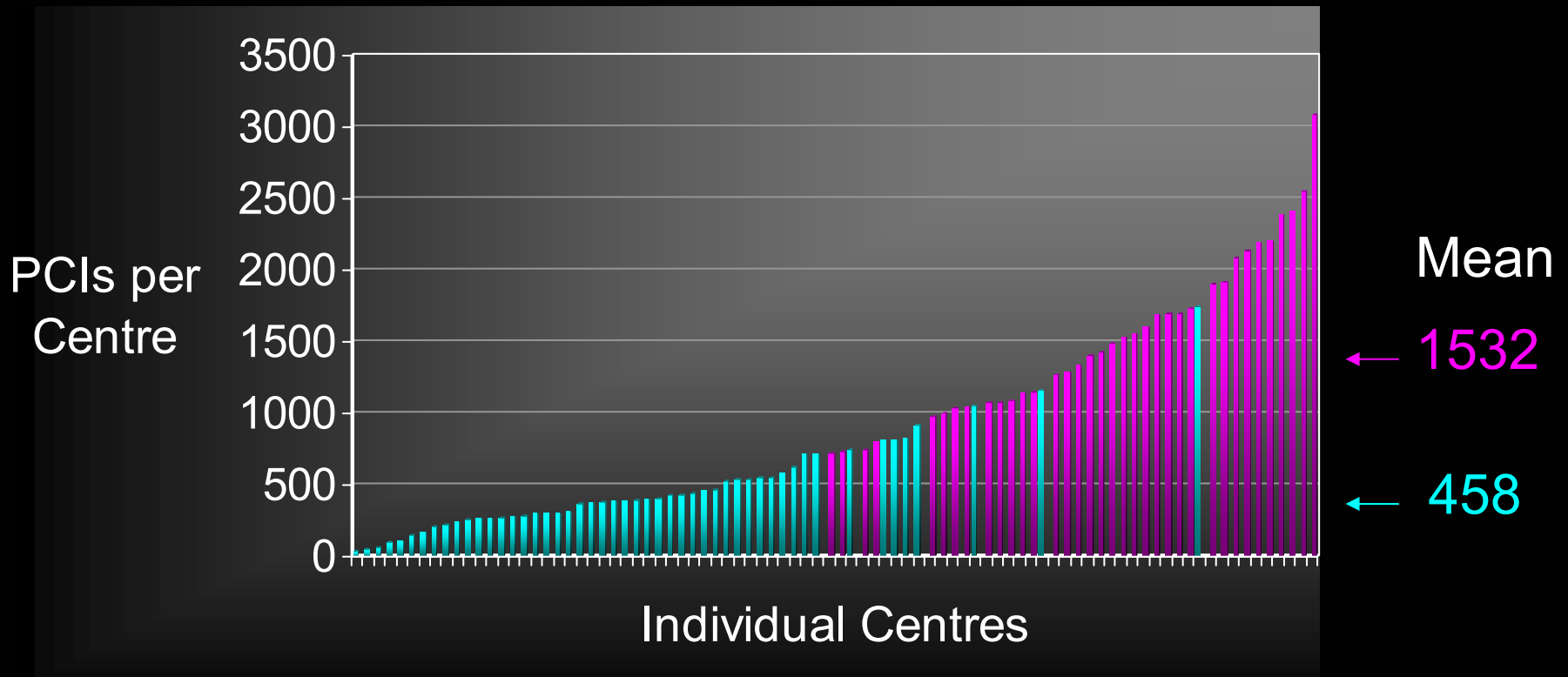
Surgical Cover

(2008 - all 88 NHS centres)



2008 data: Ludman

Off site On Site



Surgical Cover

(all 105 NHS and Private Centres)



2008 data: Ludman

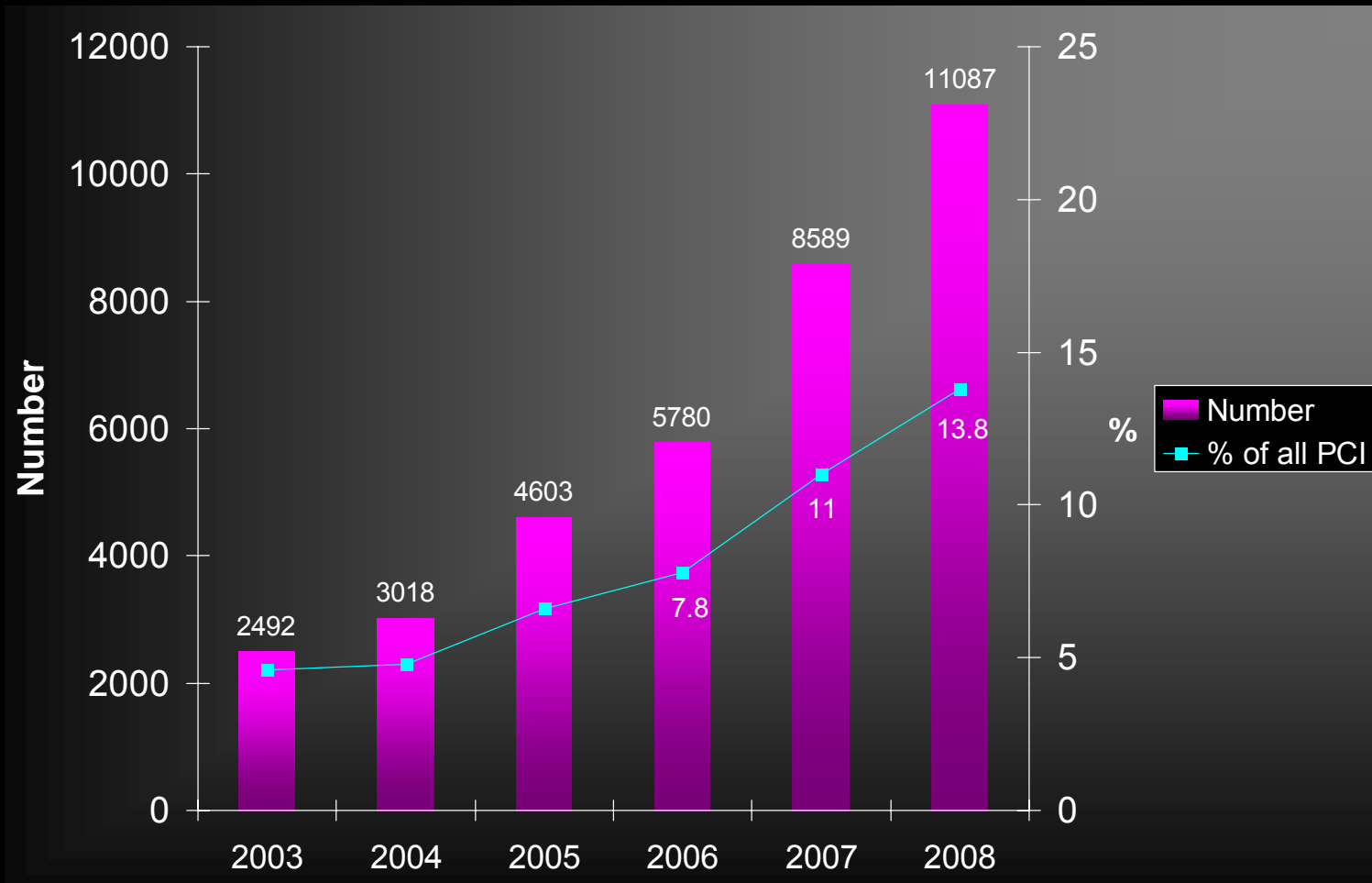
	On site	Off site
No of centres	52 (49.5%)	53 (50.5%)
No. of PCI (% of total)	57,127 (71%)	23,204 (29%)
Mean No. PCI per centre (all)	1143	438
Mean No. PCI per centre (NHS)	1532	458

Day Case PCI



2008 data: Ludman

- 54 of 87 Units performing day case PCI

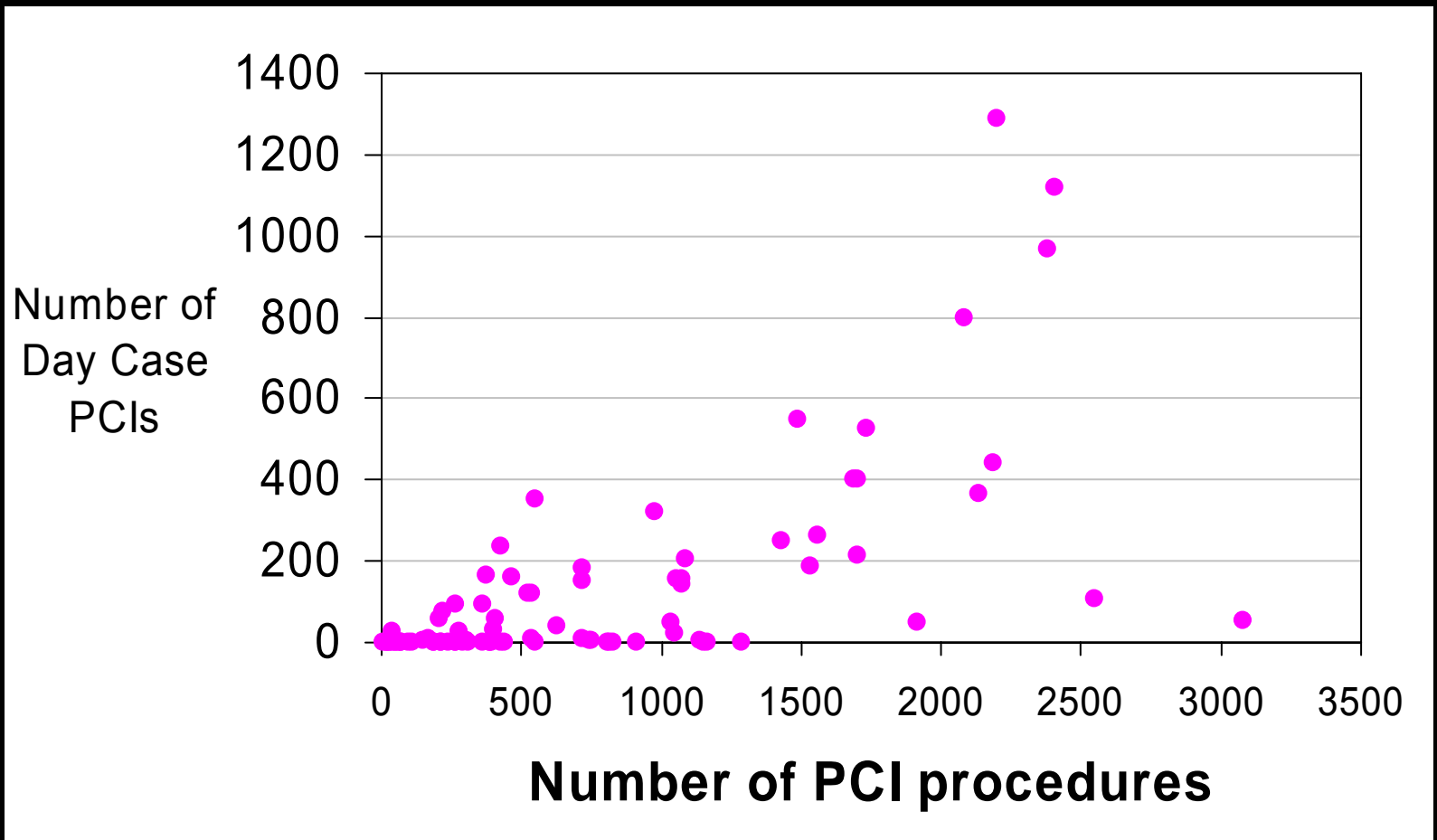


Data from: 87 of 105 centres

Day Case PCI

Total DC PCI against all PCI activity

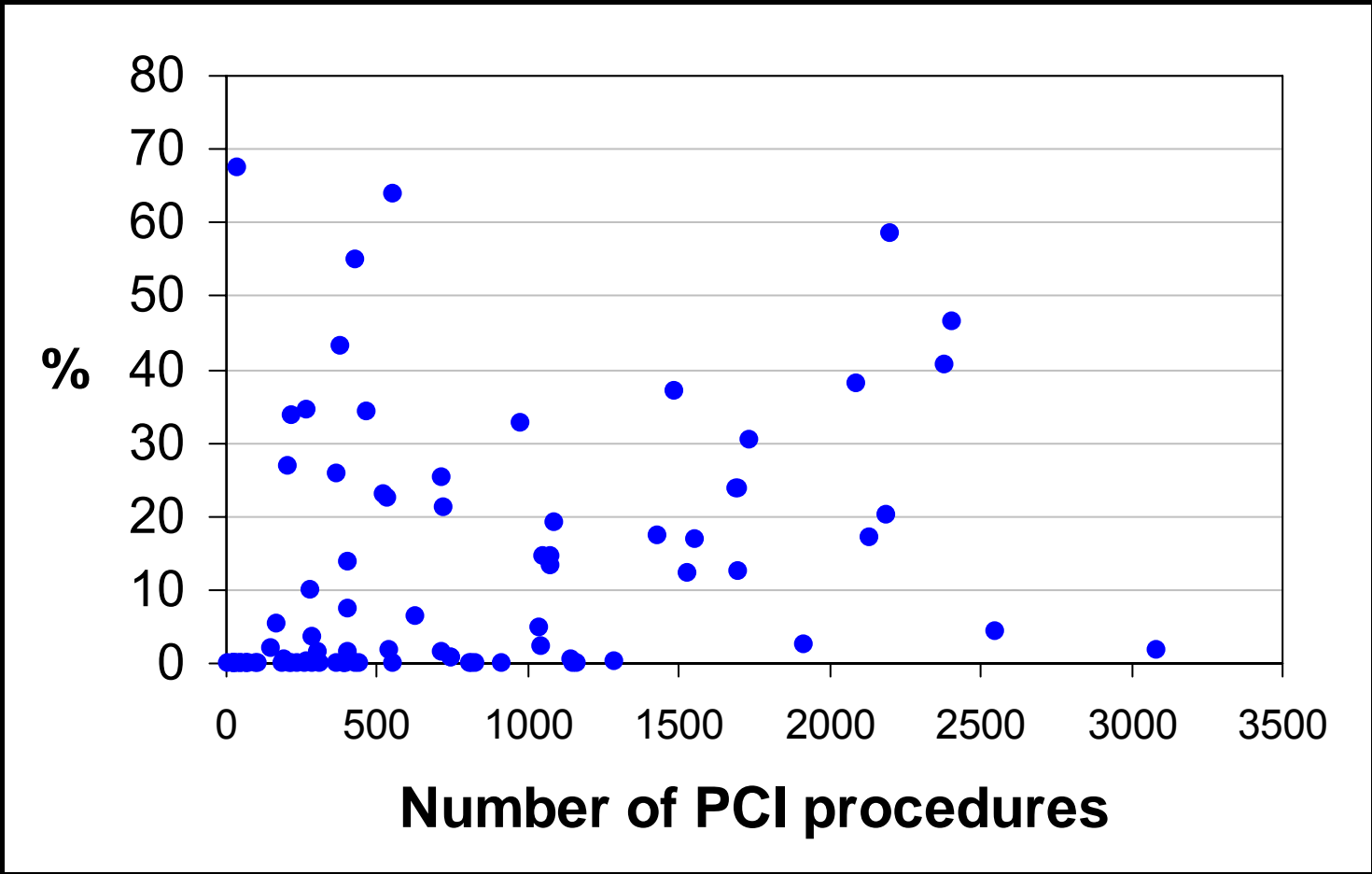
2008 Data from 87 of 105 centres



Day Case PCI

As Percentage of all PCI activity

2008 Data from 87 of 105 centres

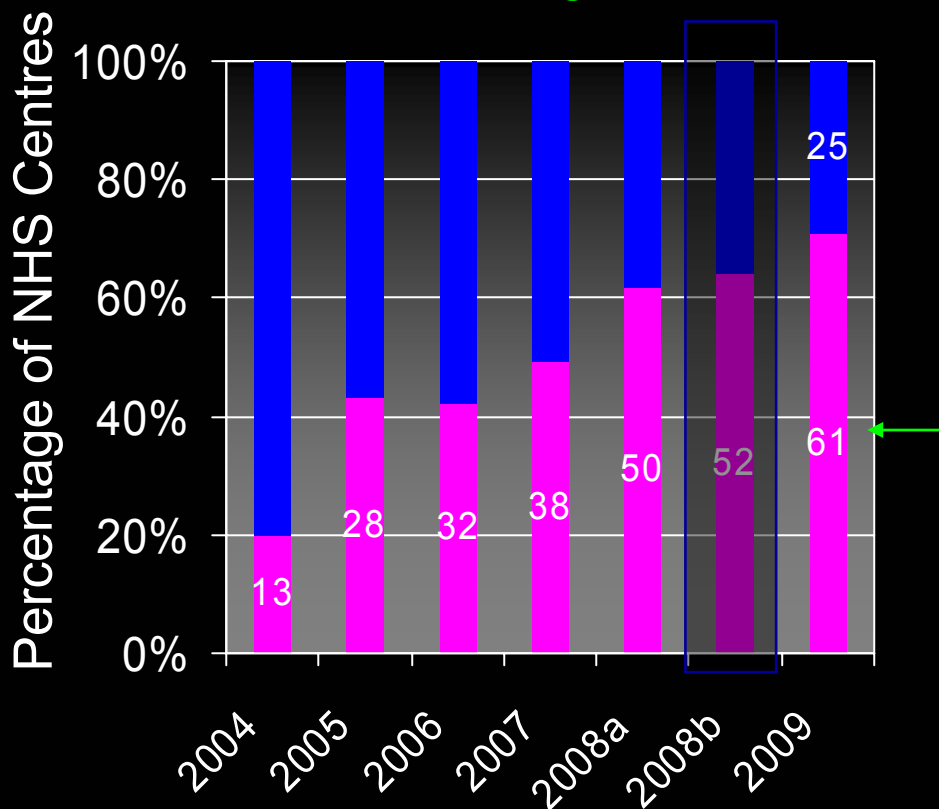


Primary PCI Routine Rx for STEMI

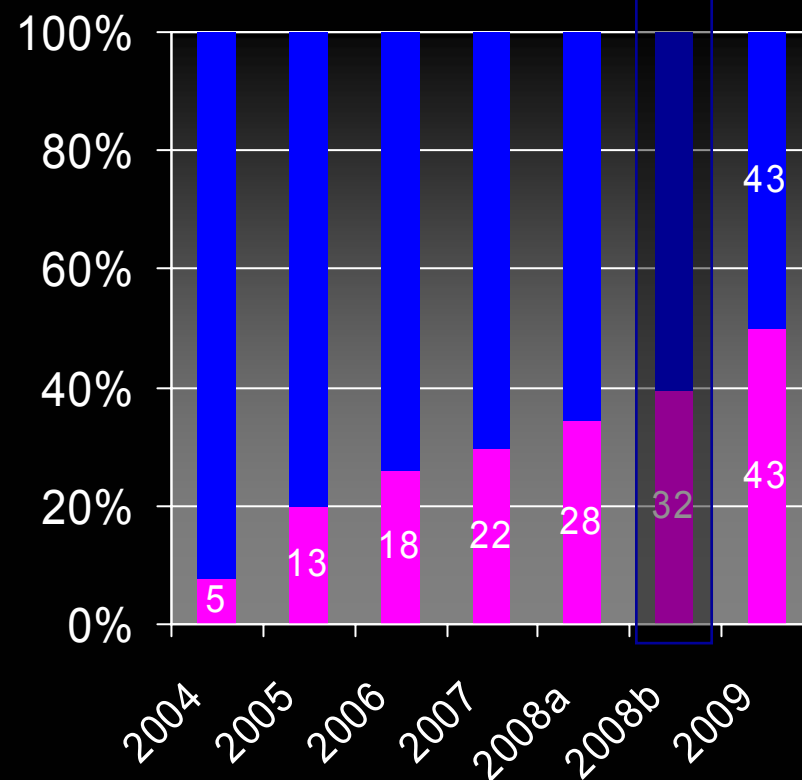


2008 data: Ludman

Working Hours



24/7



Number of centres

86 NHS Centres only

(Glasgow Royal and Western no PPCI after March 08)

Working Hrs includes all 24/7 sites

Primary PCI

Routine Rx for STEMI



2008 data: Ludman

- Discrepancies in 2008 information about centres
 - Glasgow Royal and Western moved activity to Golden Jubilee in March 2008
 - these 2 units not counted in No of centres in 2008 slide
 - CCAD includes such activity as occurred before switch (so data from all 3 hospitals)
 - Daytime only (in describing activity in 2008)
 - Belfast:
in 2007 return said y, in 2008 return said n
 - City Stoke, Mayday, Freeman:
in 2007 return said n, in 2008 return said y
 - 24/7 (in describing activity in 2008)
 - Walsgrave :
in 2007 return said n, in 2008 return said y
 - Torbay, Sunderland, Torbay, Freeman:
in 2007 return said y, in 2008 return said n

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 - Risk adjusted outcomes

Procedure Specific Analysis

Participation in CCAD



2008 data: Ludman

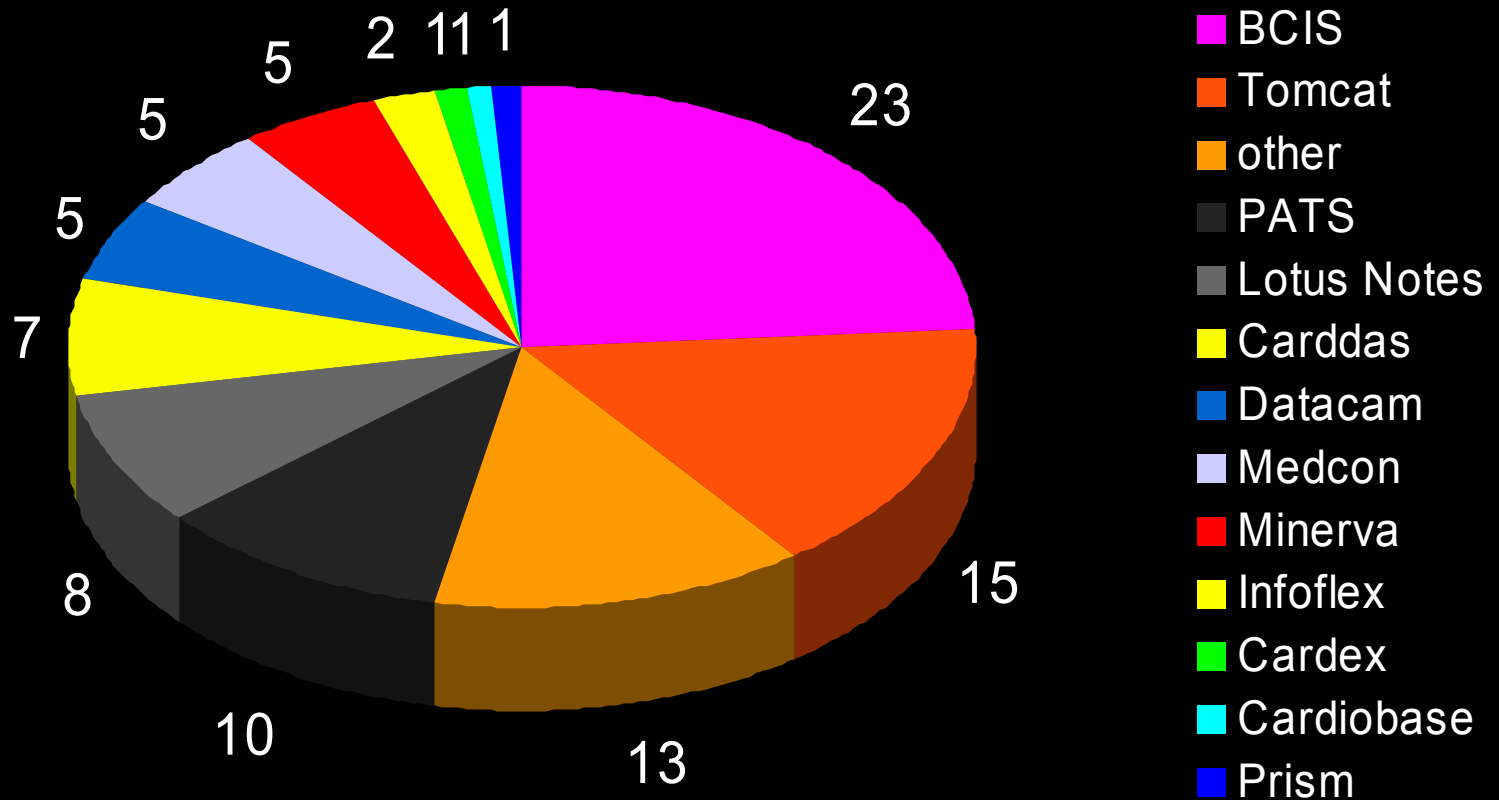
		Total No. of Centres	Data to CCAD	Participation
England	NHS	75	76*	99%
	Private	16	5	31%
Wales		2	2	100%
N Ireland		3	1	33%
Scotland	NHS	7	7 via link	100%
	Private	1	0	0%

*QE Woolwich not yet linked

'Front end' Database used

2008


2008 data: Ludman



Data Quantity

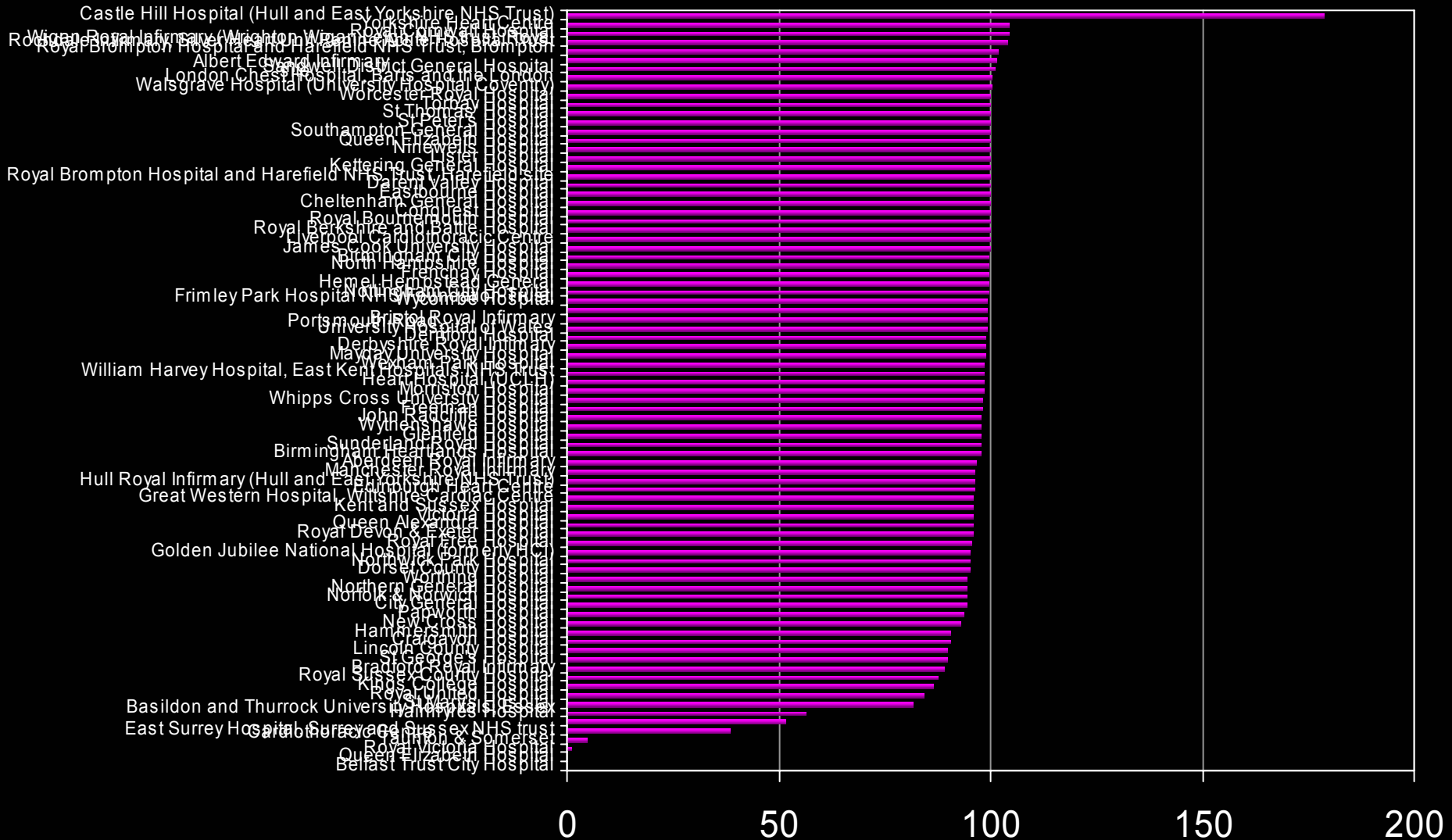


CCAD data



2008 data: Ludman

UK PCI data in CCAD as % of Reported Totals



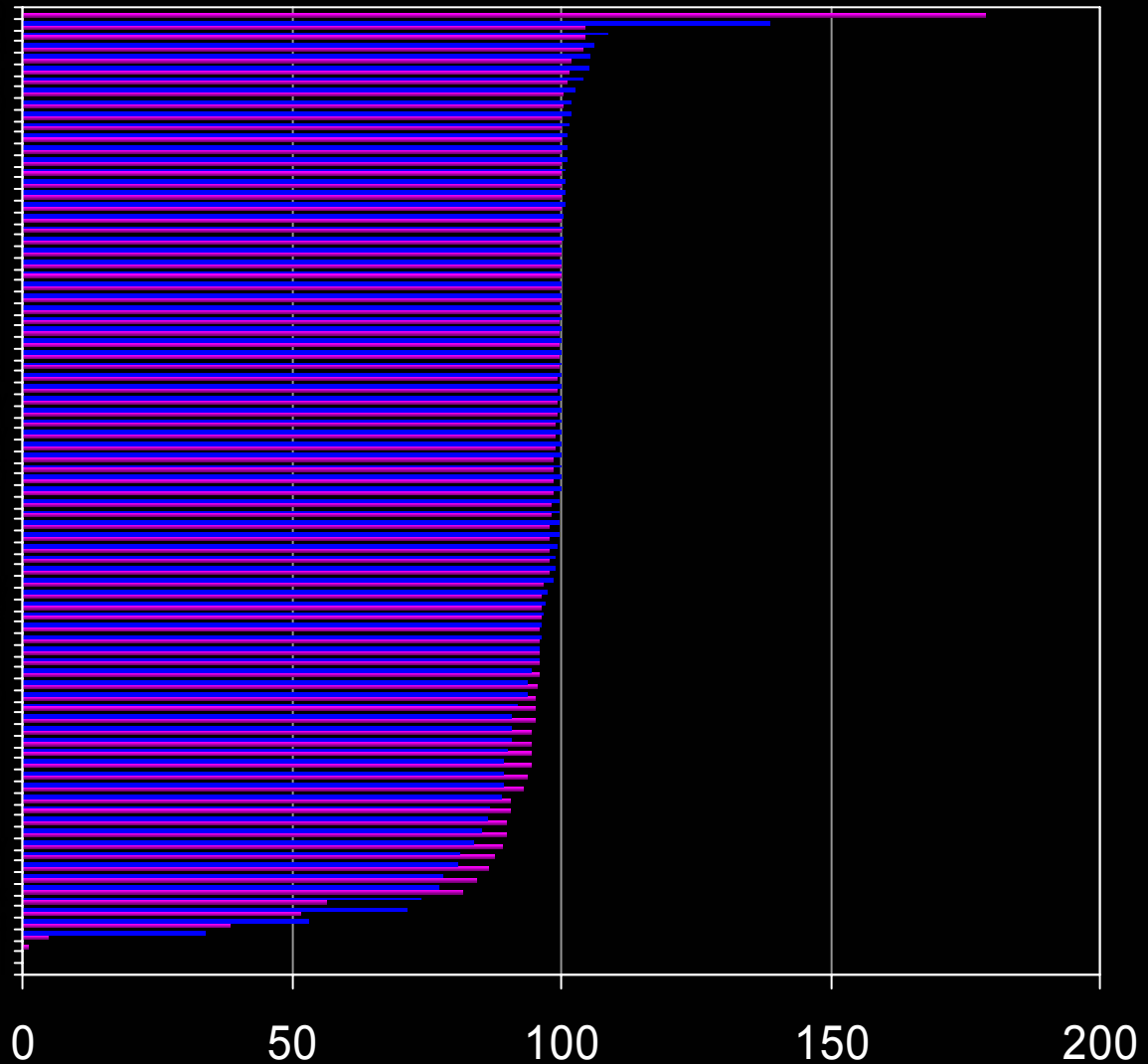
As July 09

CCAD data



2008 data: Ludman

UK PCI data in CCAD as % of Reported Totals



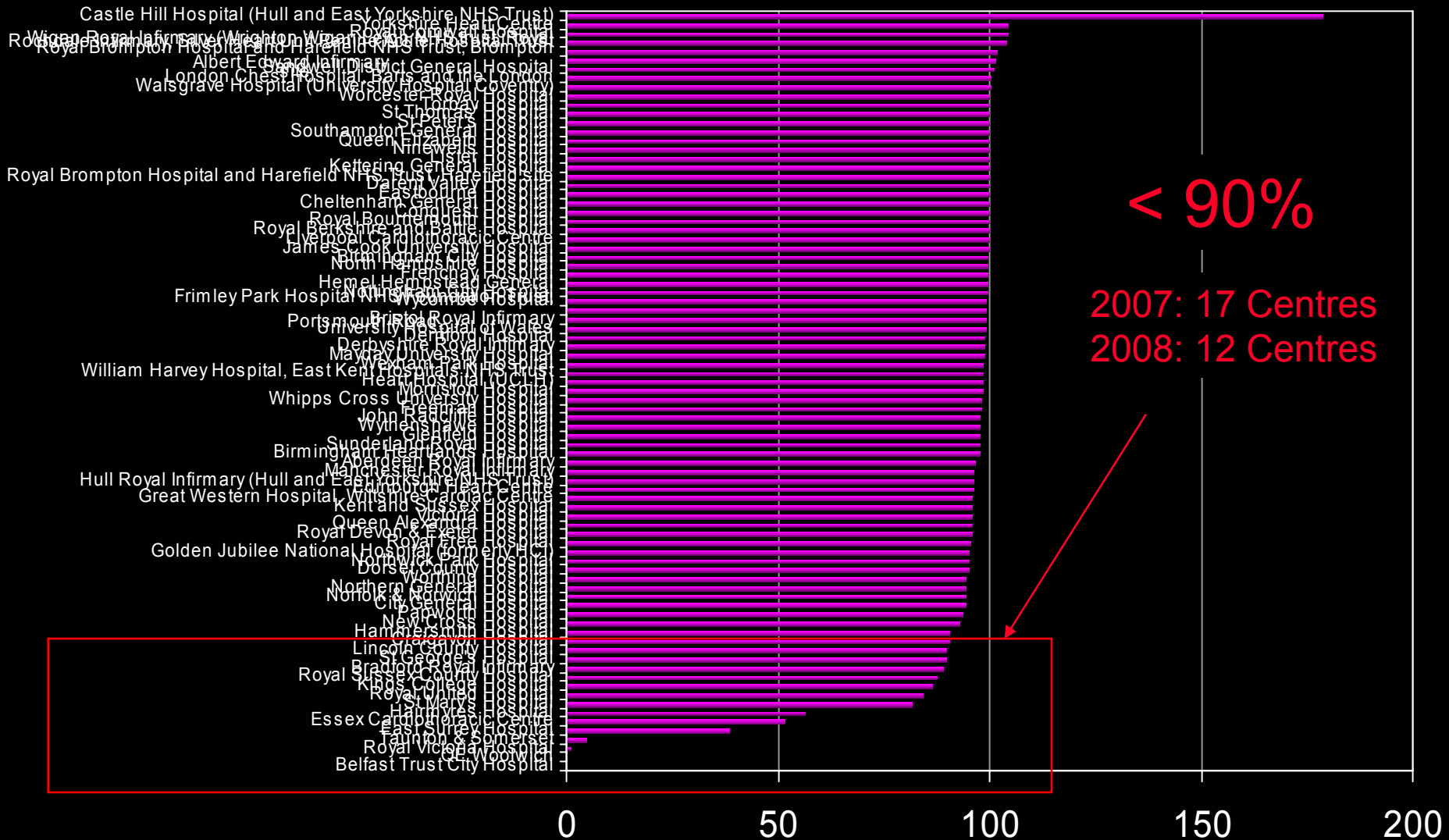
As July 09

CCAD data



2008 data: Ludman

UK PCI data in CCAD as % of Reported Totals



As July 09

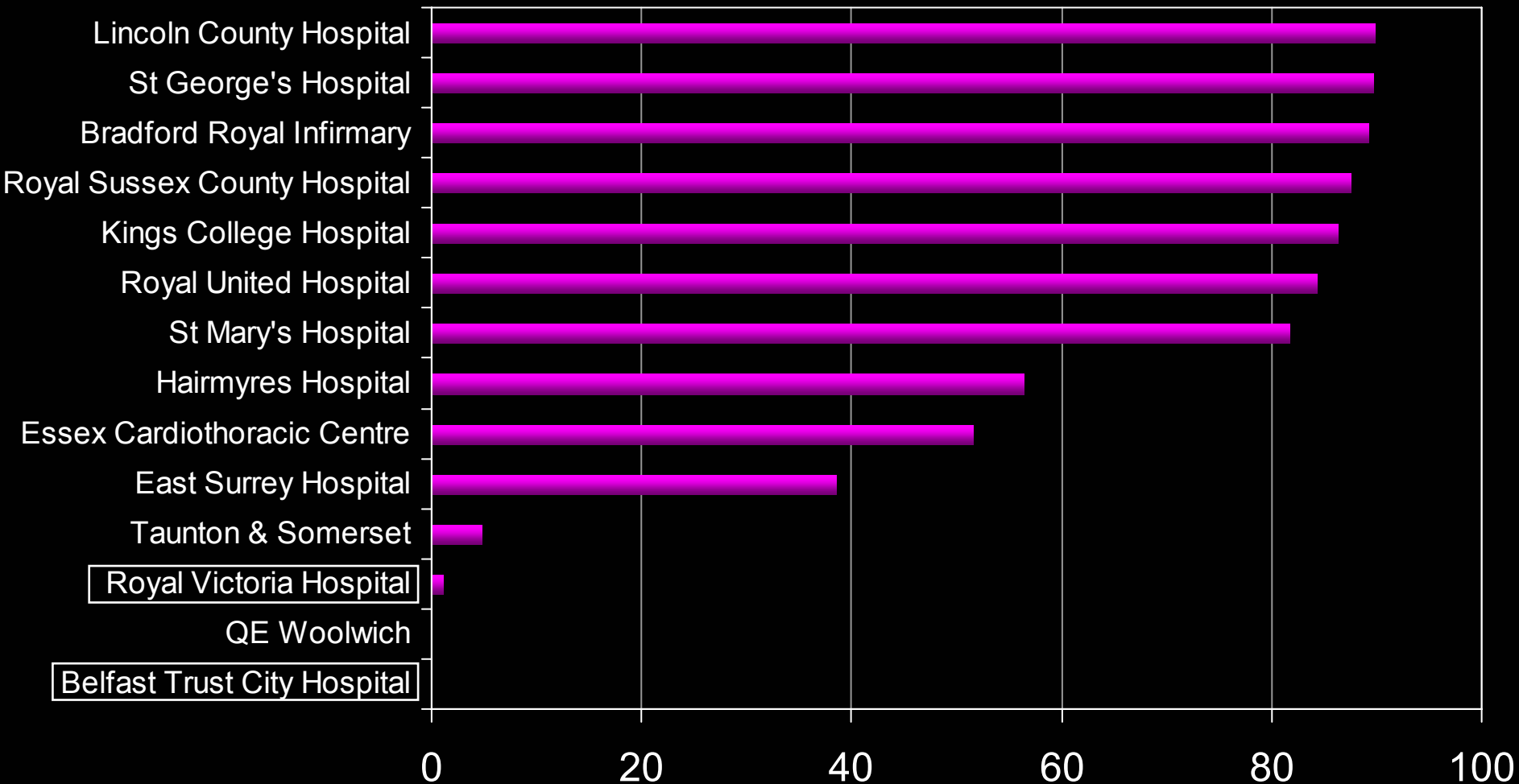
CCAD data



2008 data: Ludman

PCI data in CCAD as % of Reported Totals

Centres with < 90% of their activity in CCAD



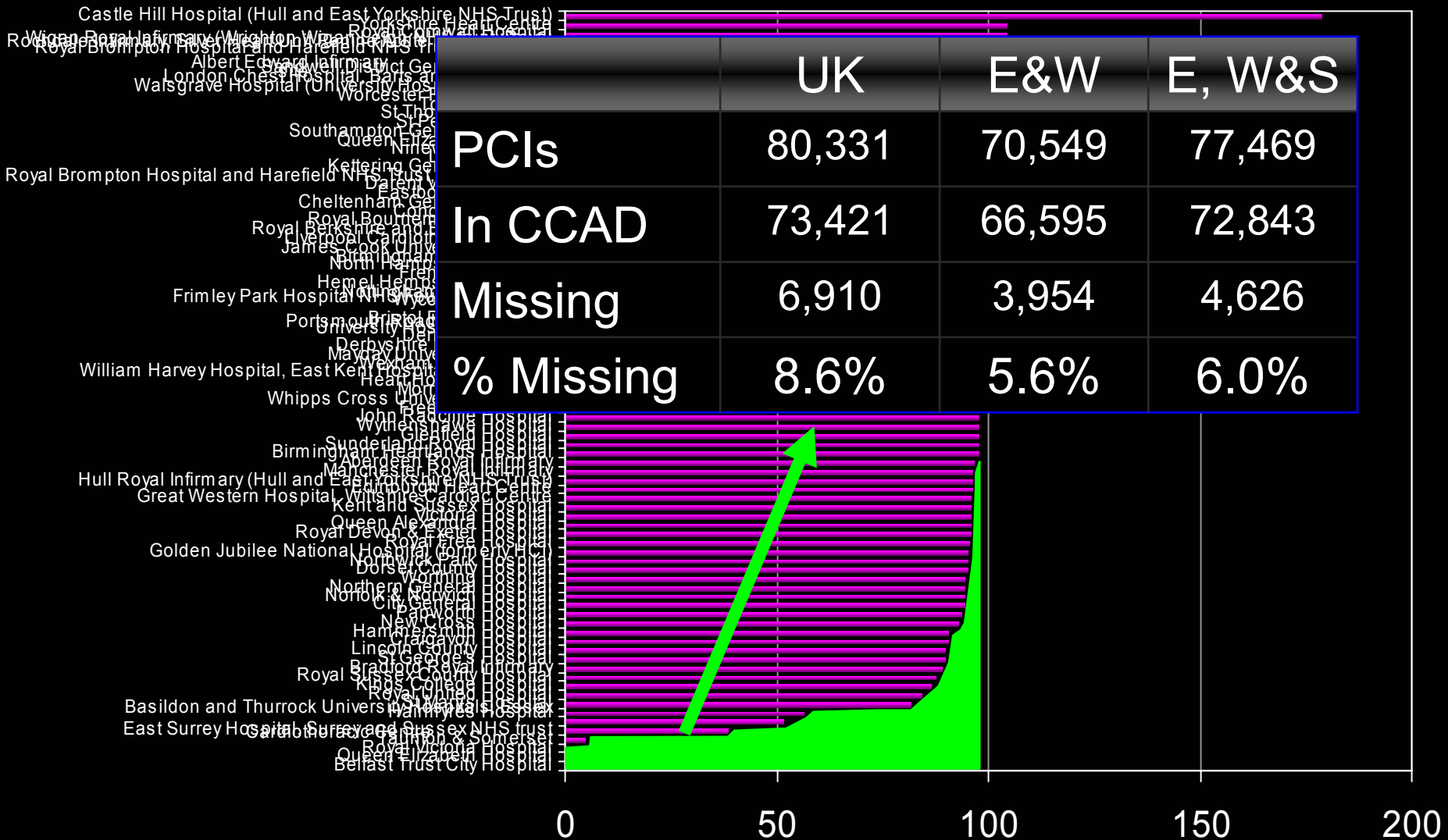
As Sept 08

CCAD data



2008 data: Ludman

UK PCI data in CCAD as % of Reported Totals



Data Quality



Risk Stratified Outcome

A D Grayson et al Heart 2006;92:658–663

- NWQIP risk adjustment model

Age 70–79 years
Age \geq 80 years
Female sex
Cerebrovascular disease
Cardiogenic shock
Urgent PCI
Emergent PCI
LMS lesion treated
Graft lesion treated

% Completeness

12 fields required for risk adjusted outcome NWQIP

Hospital	DOB	Sex	Medical History	Shock	Urgency	Vessels treated	Renal disease	Diabetes	Discharge date	Discharge status	PCI hospital outcome	NHS number	TOTAL
a	98.9	99.6	94.7	100	100	83.9	92.4	98.5	99.6	99.6	94.6	99.6	1161.4
b	100	100	63.6	100	100	100	99.1	98	94	94	100	99.8	1148.5
c	100	100	75.4	0	100	100	91.3	97.1	99.3	99.3	99.3	89.9	1051.6
d	100	99.9	93.7	97.1	99.9	99.3	90.7	98	93.7	92.8	91.4	76.1	1132.6
e	100	100	84.1	98.9	99.9	100	97.2	95.5	72.2	92.5	100	93.6	1133.9
f	100	100	36.4	100	100	100	87.9	75.1	45.6	45.9	100	59	949.9



Top score potential = 1200

Demographics



2008 data: Ludman

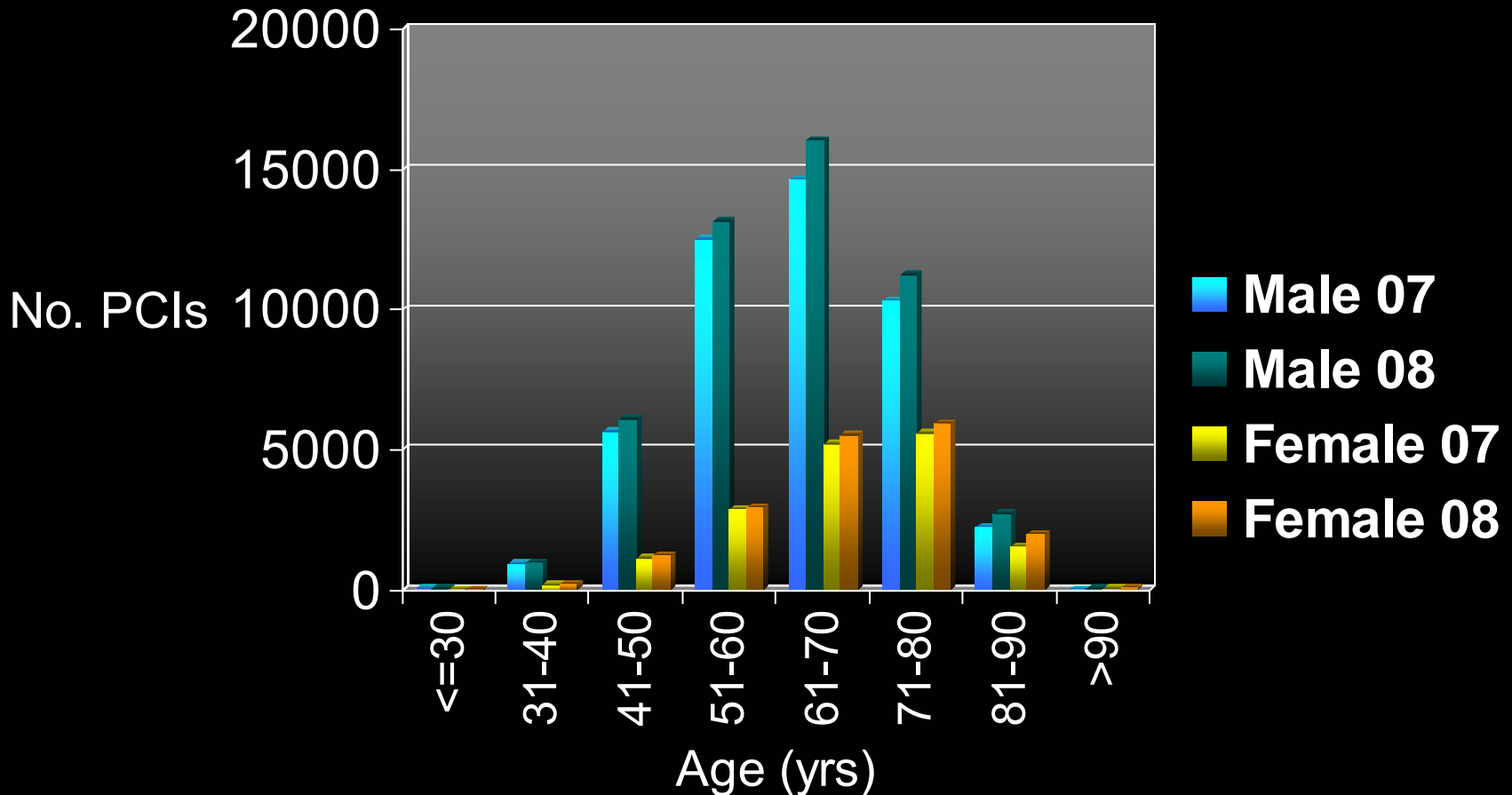
	2007	2008
Age (mean)	64.3 yrs	64.4 yrs
Sex (male)	73.6%	73.8%
Diabetic	17.5%	18.0%
Previous CABG	8.5%	9.1%
Previous PCI	18.6%	21.1%
Previous MI	29.5%	30.2%

Demographics - Age

Male: mean = 63.2
Female: mean = 67.9



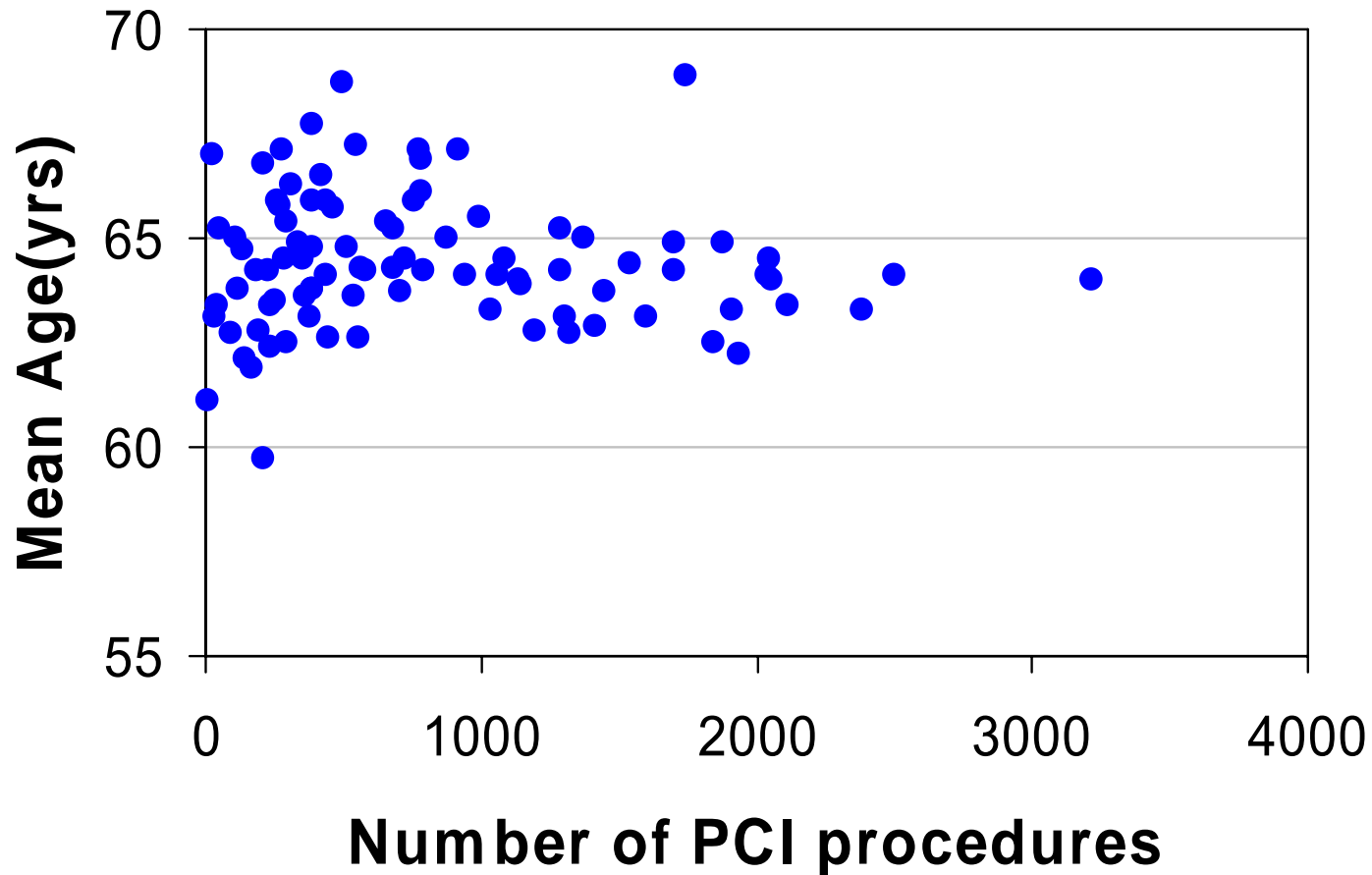
2008 data: Ludman



Demographics - Age



2008 data: Ludman



Demographics



2008 data: Ludman

Ethnic Origin			
Year	2007	2008	
n	43,929	48,581	
Caucasian	92.3%	92.0%	
Asian	6.7%	7.1%	
Black	0.83%	0.72%	
Oriental	0.2%	0.17%	

Demographics



2008 data: Ludman

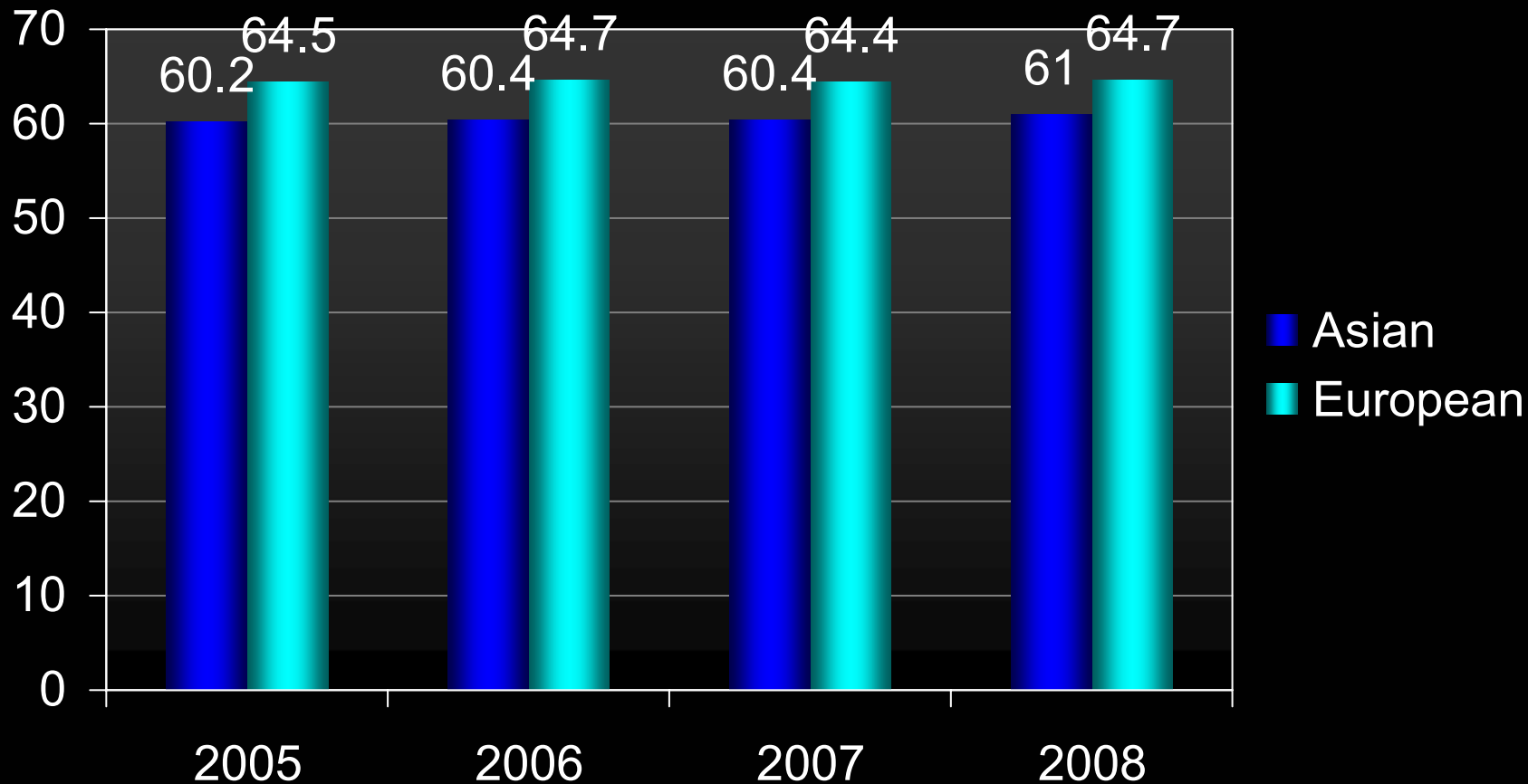
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Age at PCI by Ethnicity



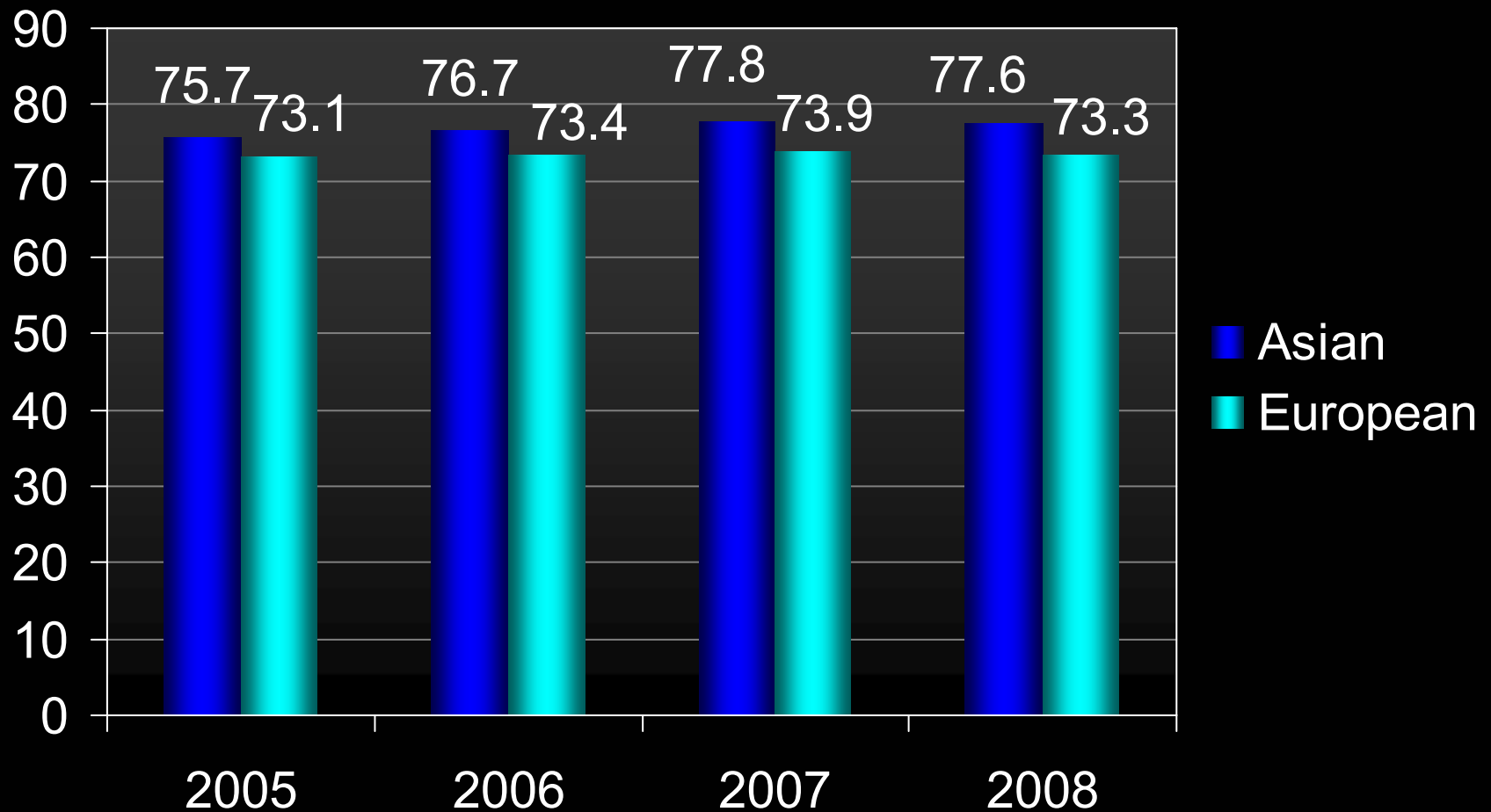
2008 data: Ludman

- Age (mean)



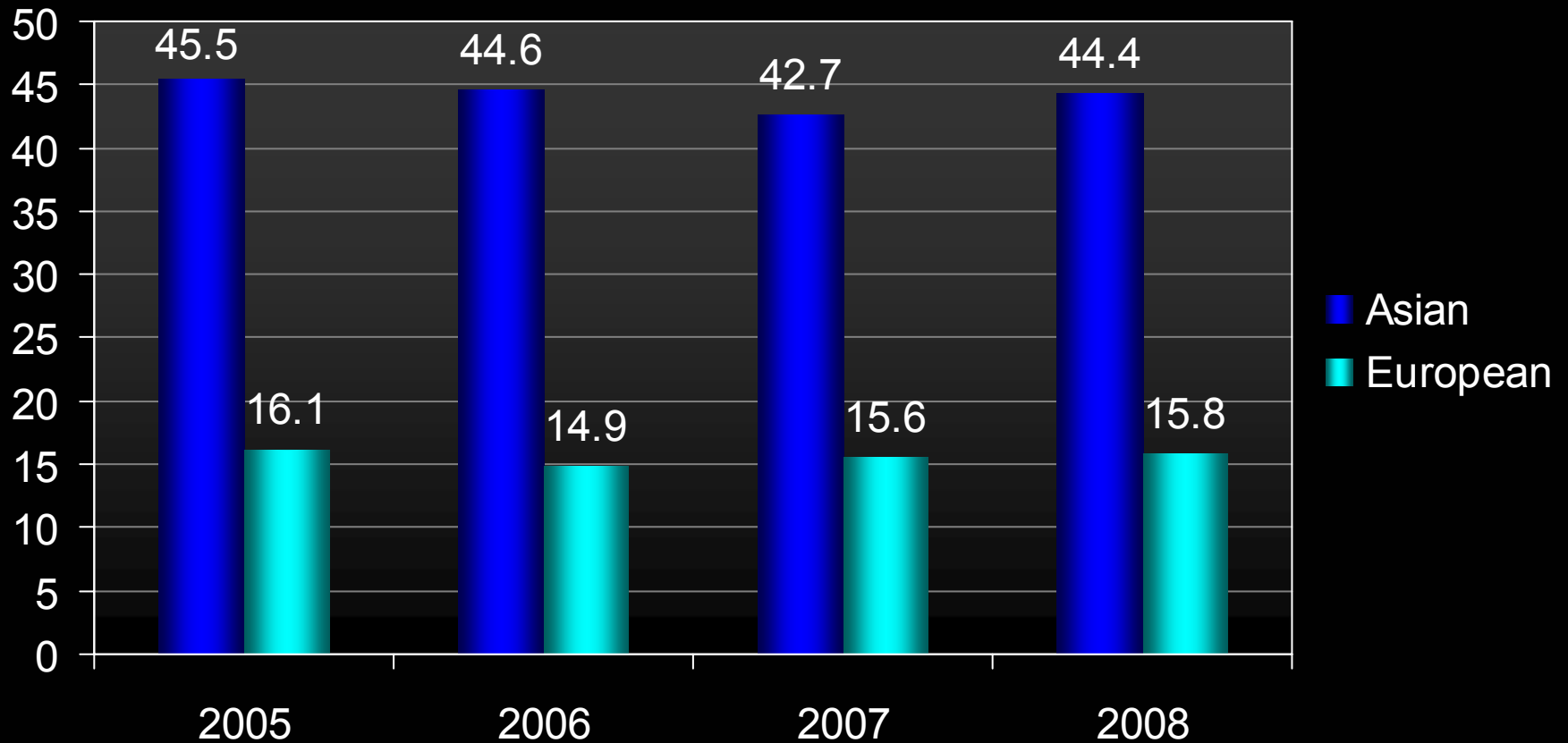
Sex by Ethnicity

- Sex (male %)



Diabetes by Ethnicity

- Diabetes



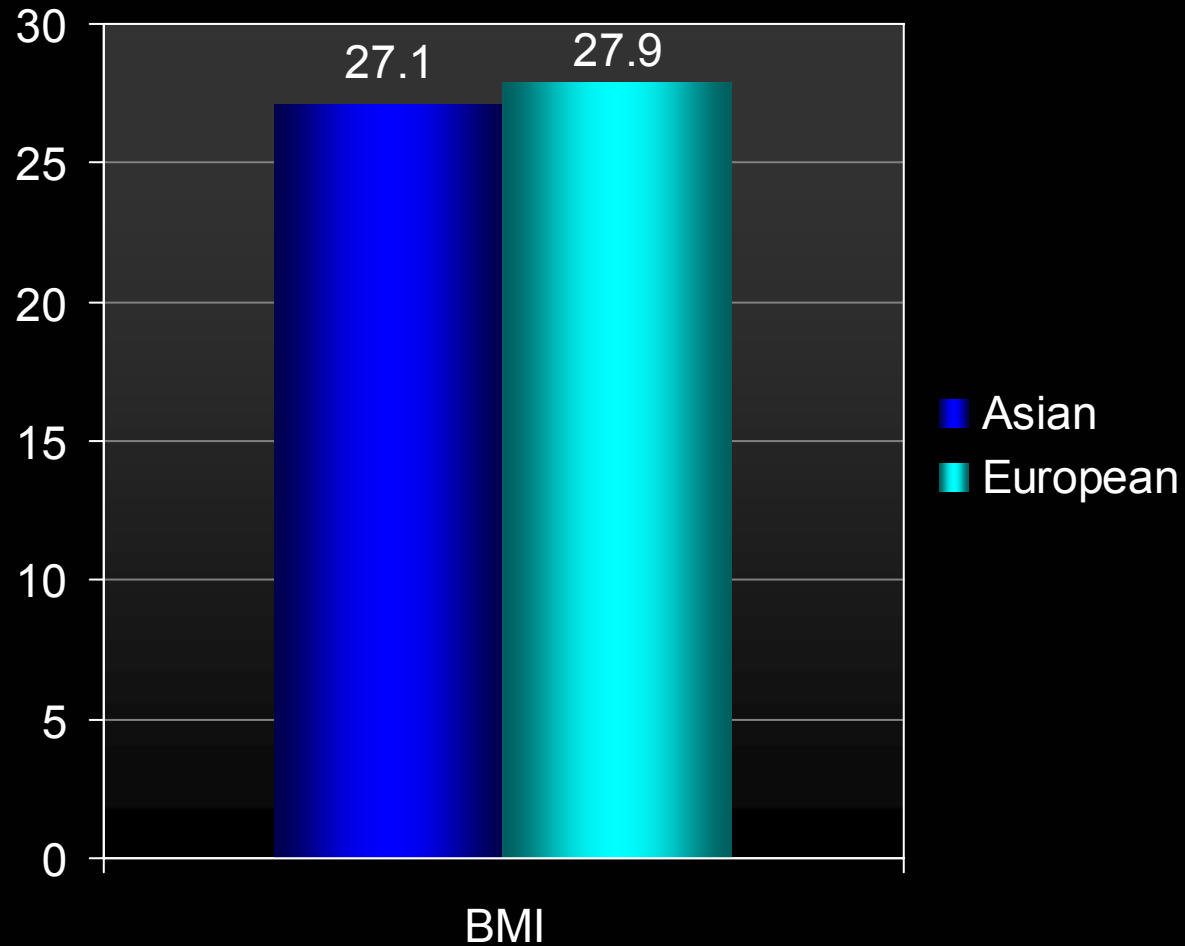
BMI by Ethnicity

2008

- BMI



2008 data: Ludman

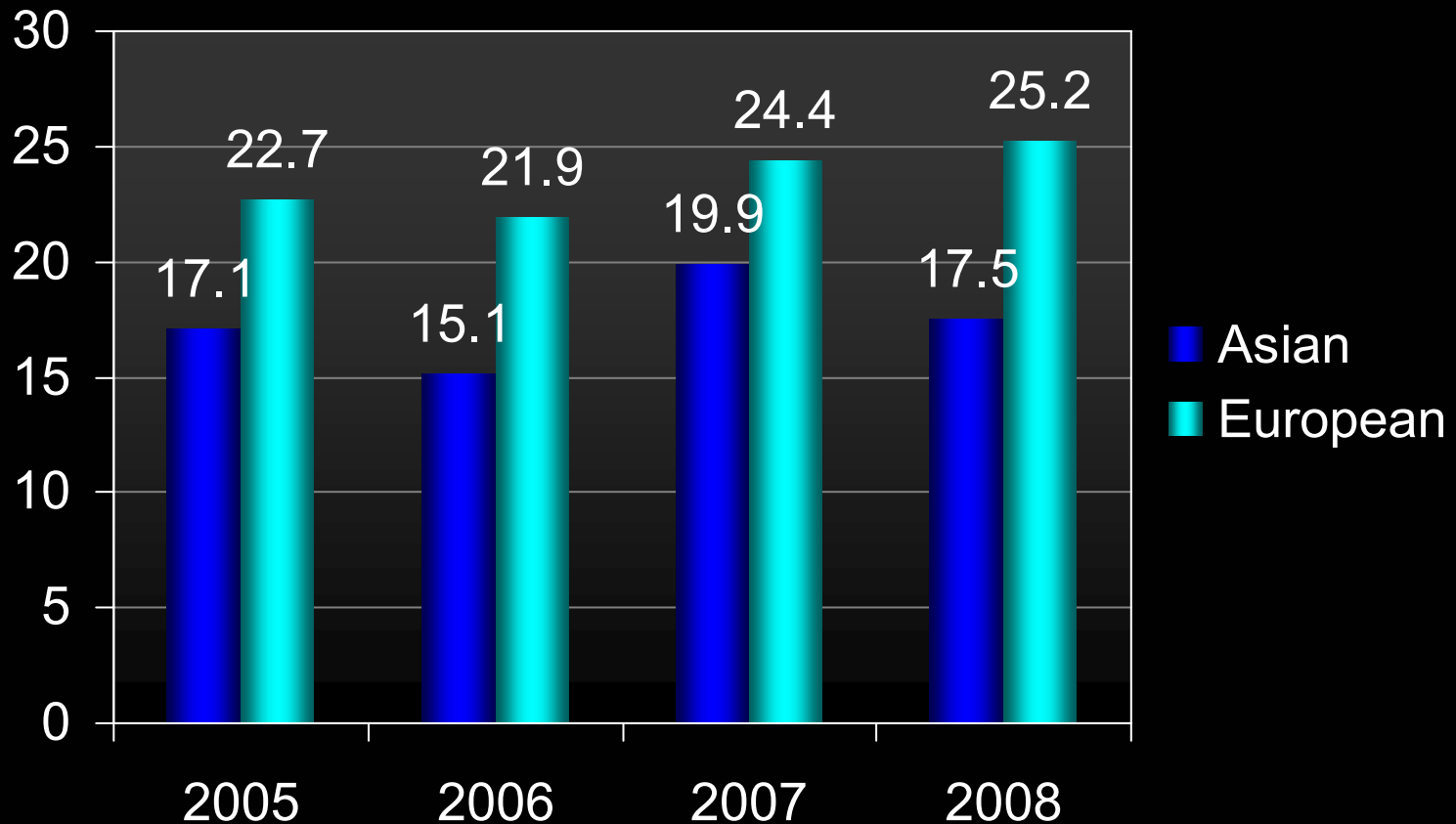


Smoking by Ethnicity



2008 data: Ludman

- Smoking - current

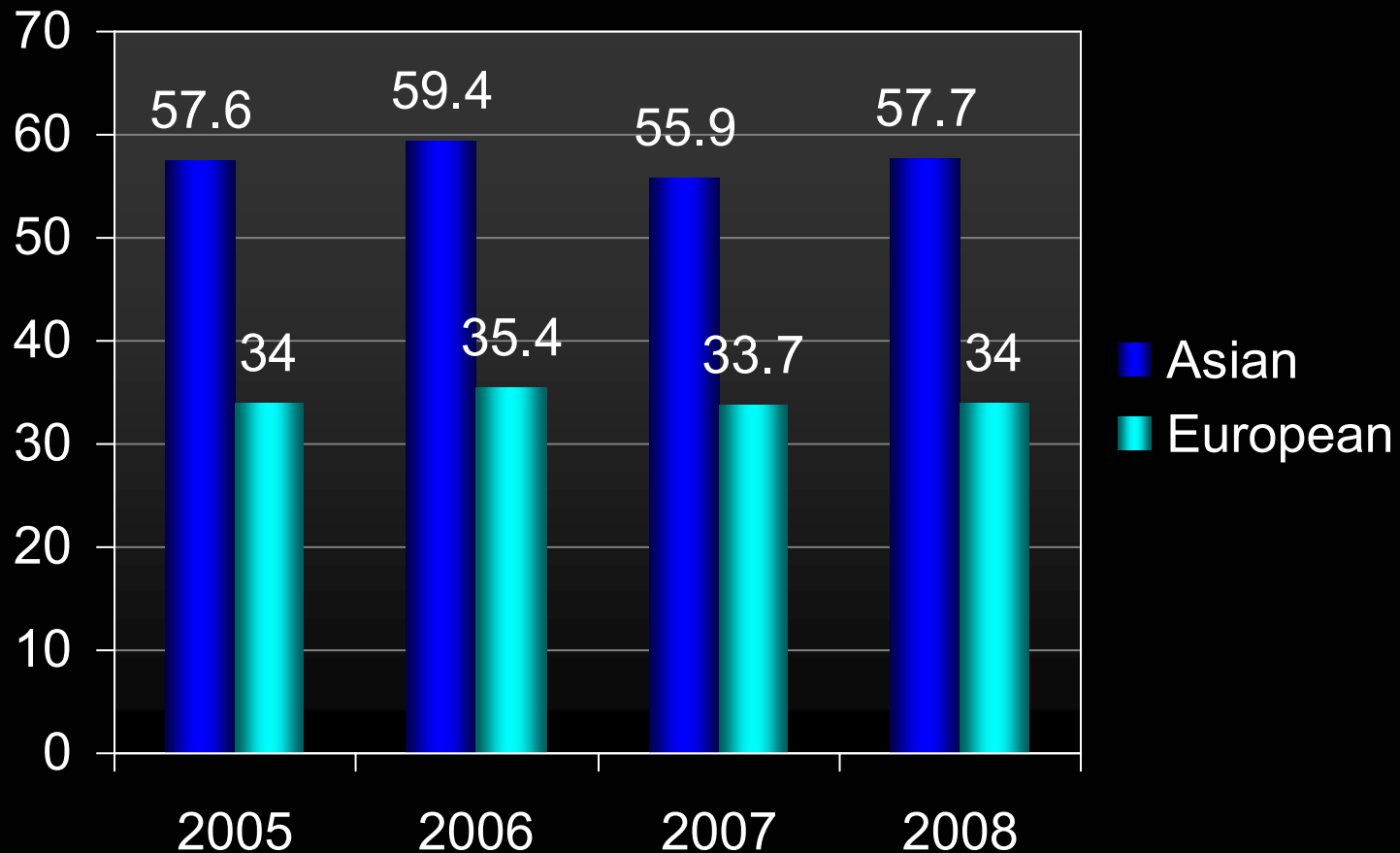


Smoking by Ethnicity



2008 data: Ludman

- Smoking - never

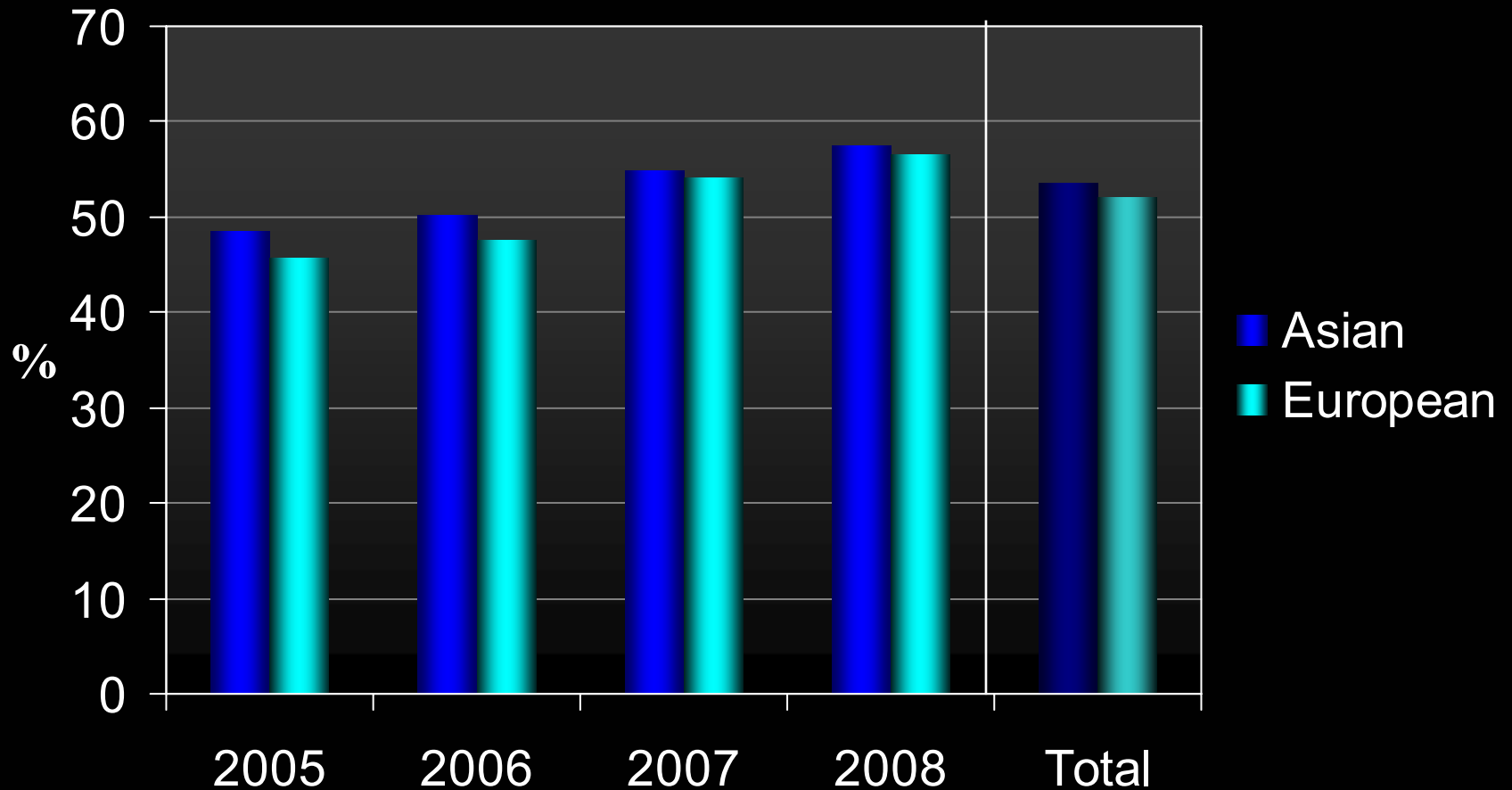


Presentation by Ethnicity



2008 data: Ludman

- % Acute



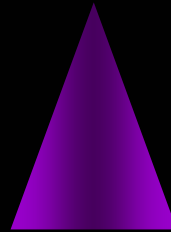
Adverse Markers for outcome

S. Asian

European

Diabetes
Acute

Older
Smokers
More females



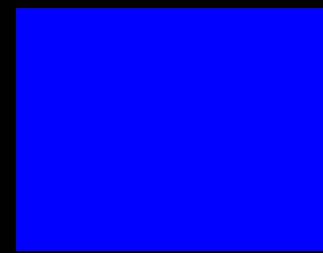
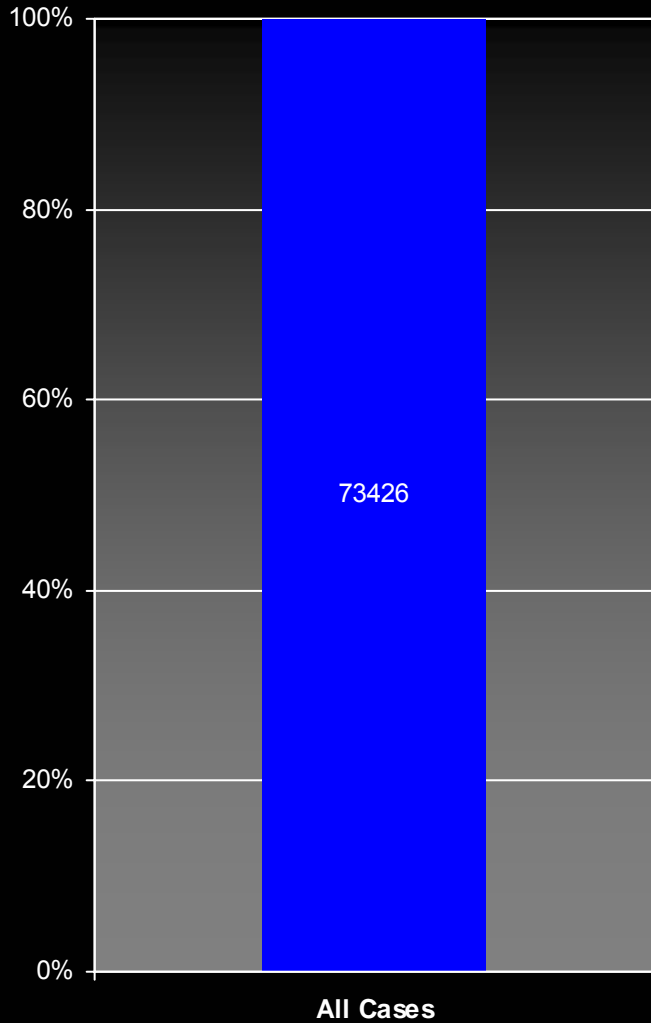
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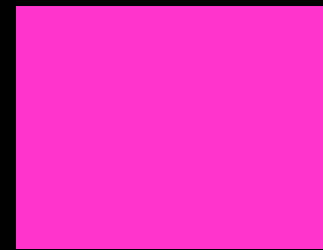
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 - Risk adjusted outcomes

Appropriateness

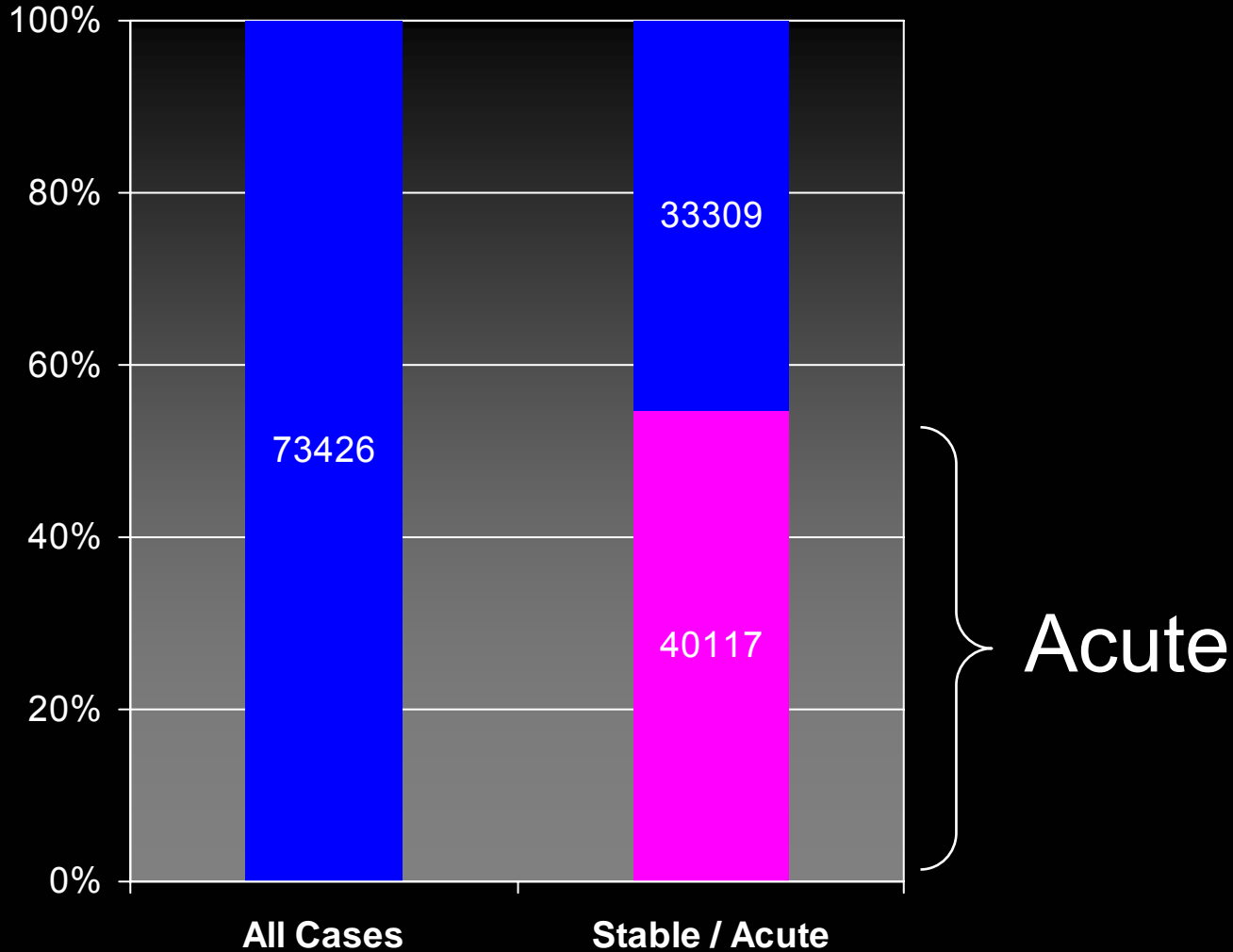


Under analysis



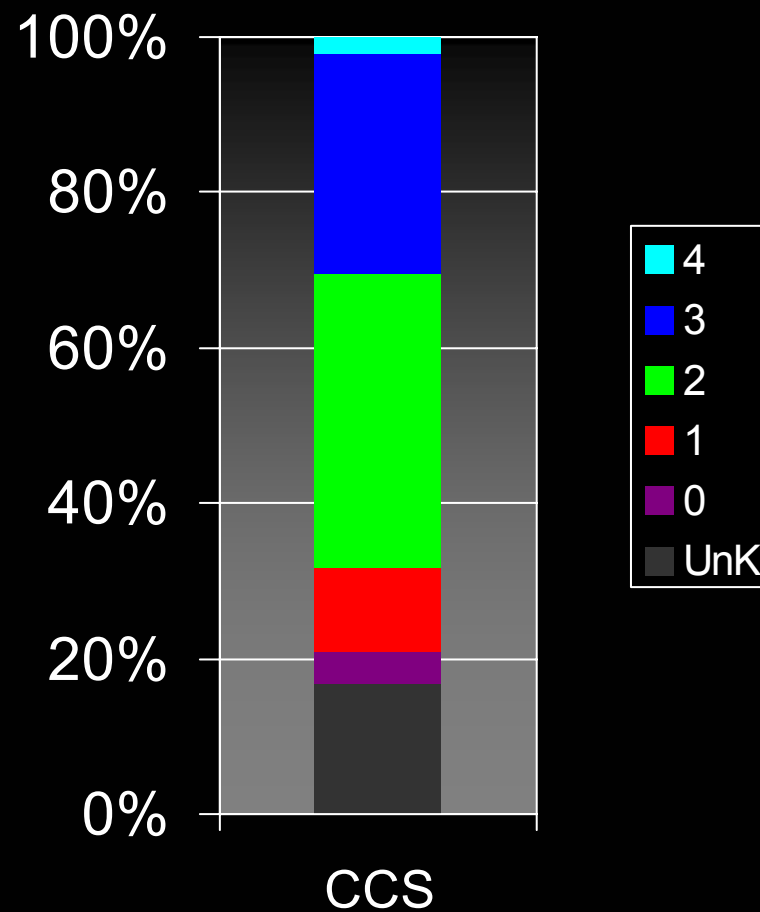
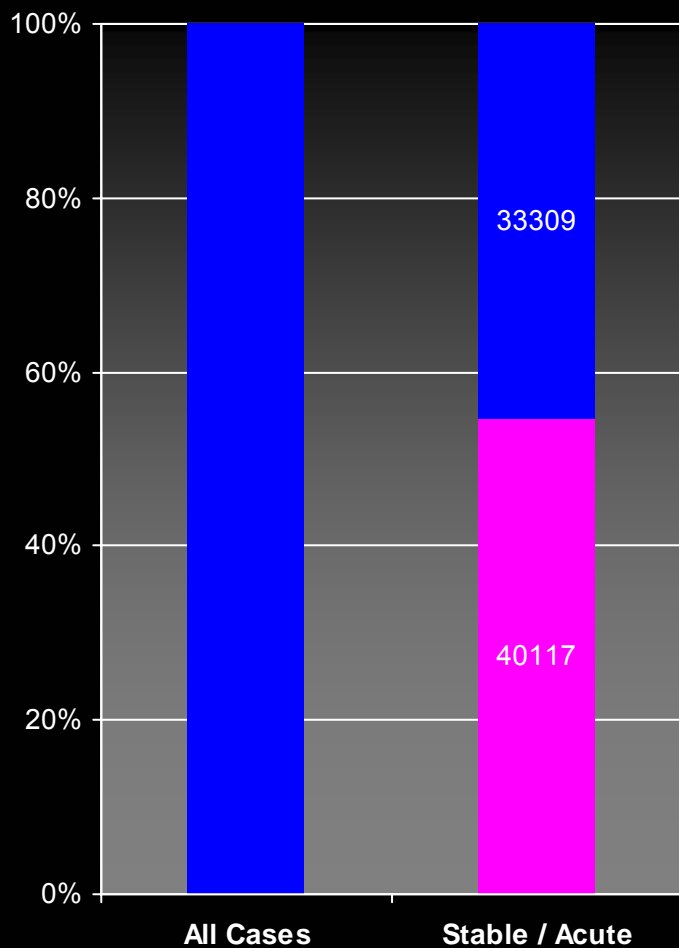
Accepted as appropriate

Appropriateness



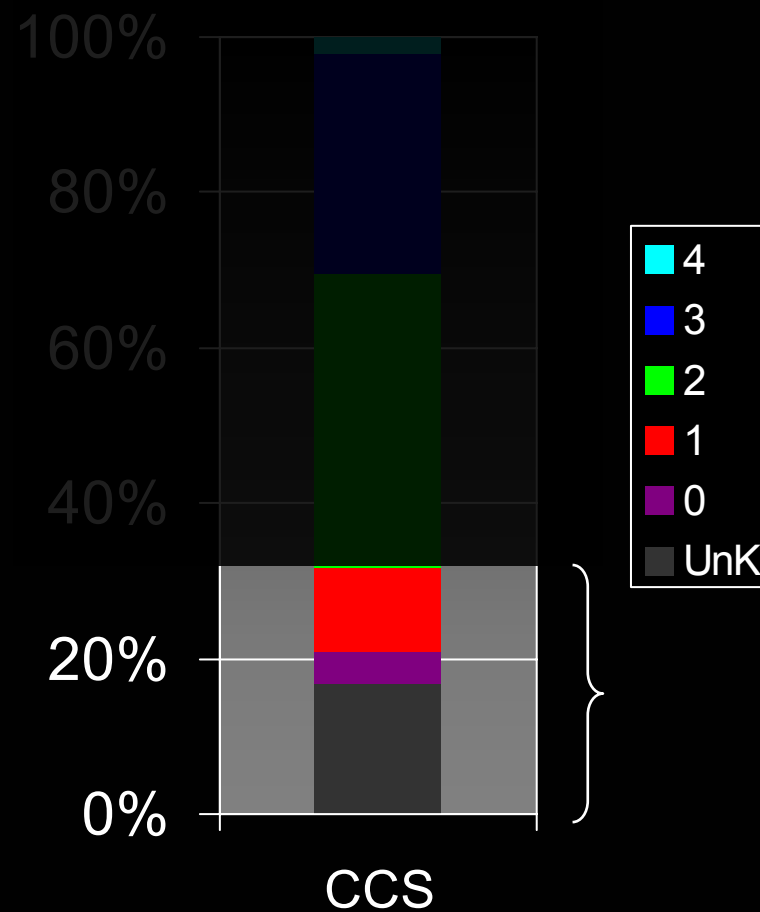
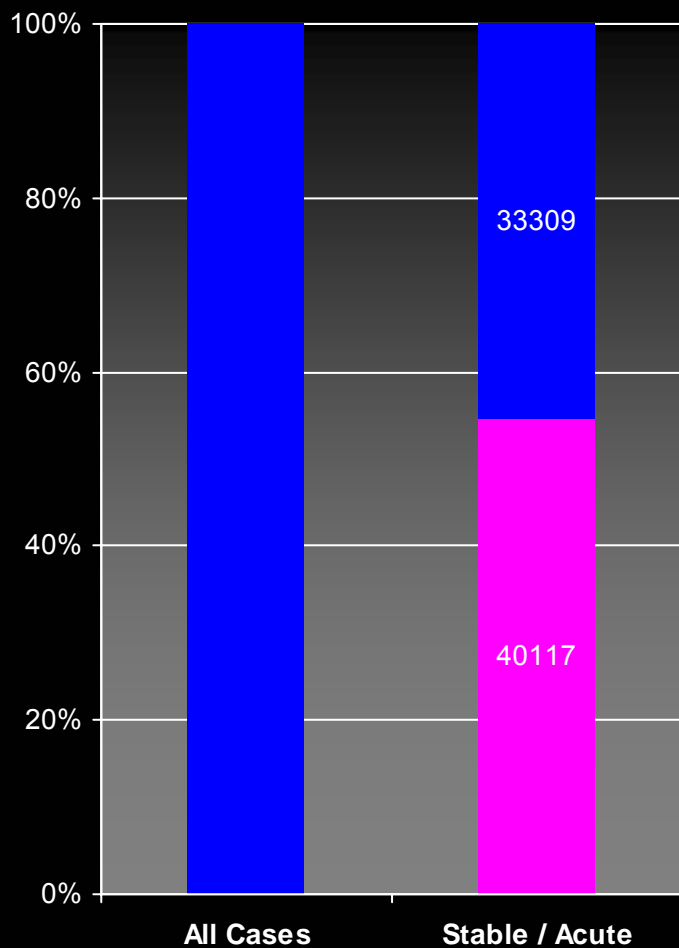
Appropriateness

Of Stable Cases



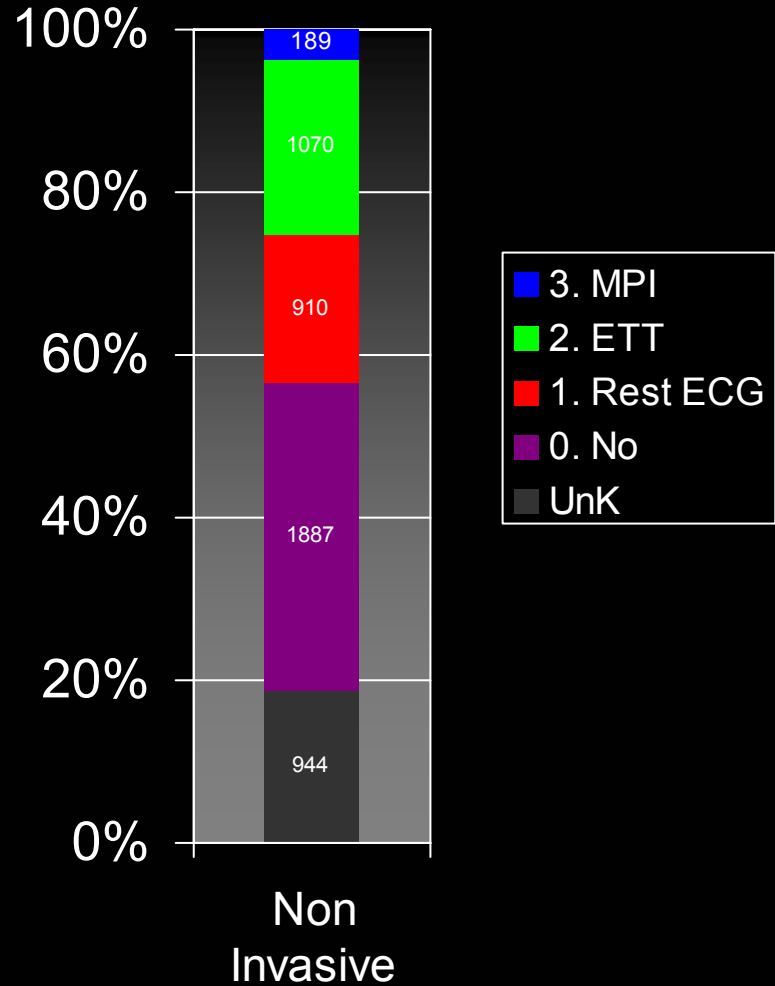
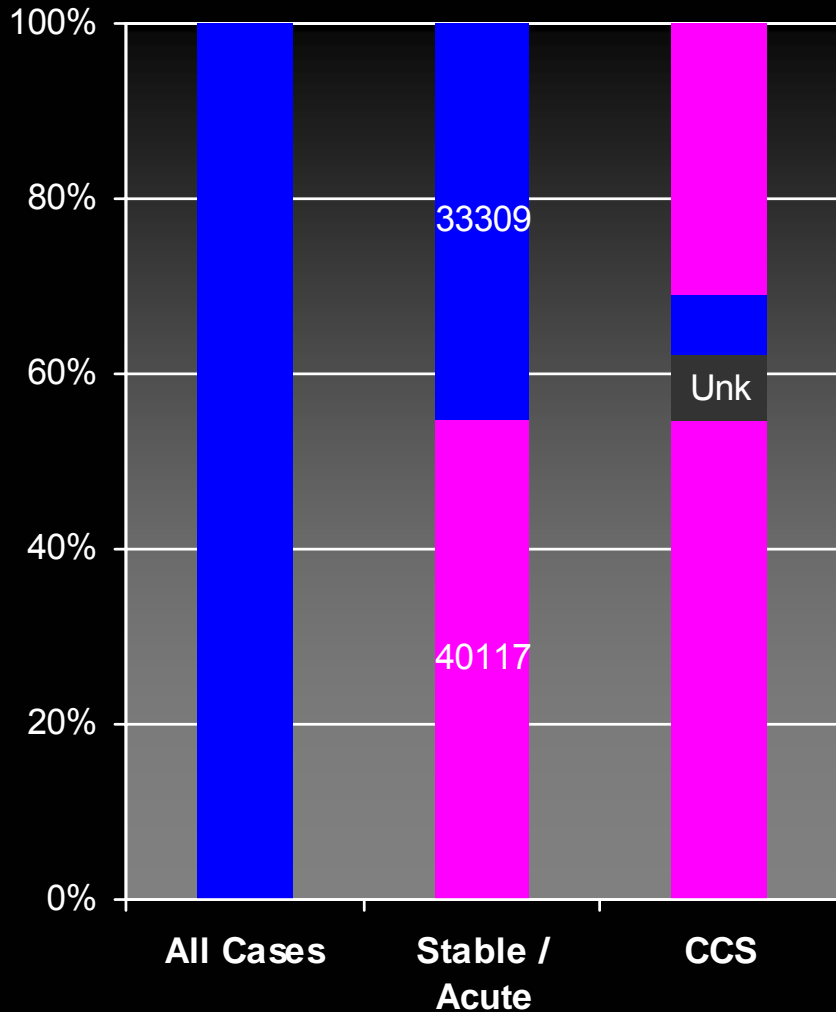
Appropriateness

Of Stable Cases



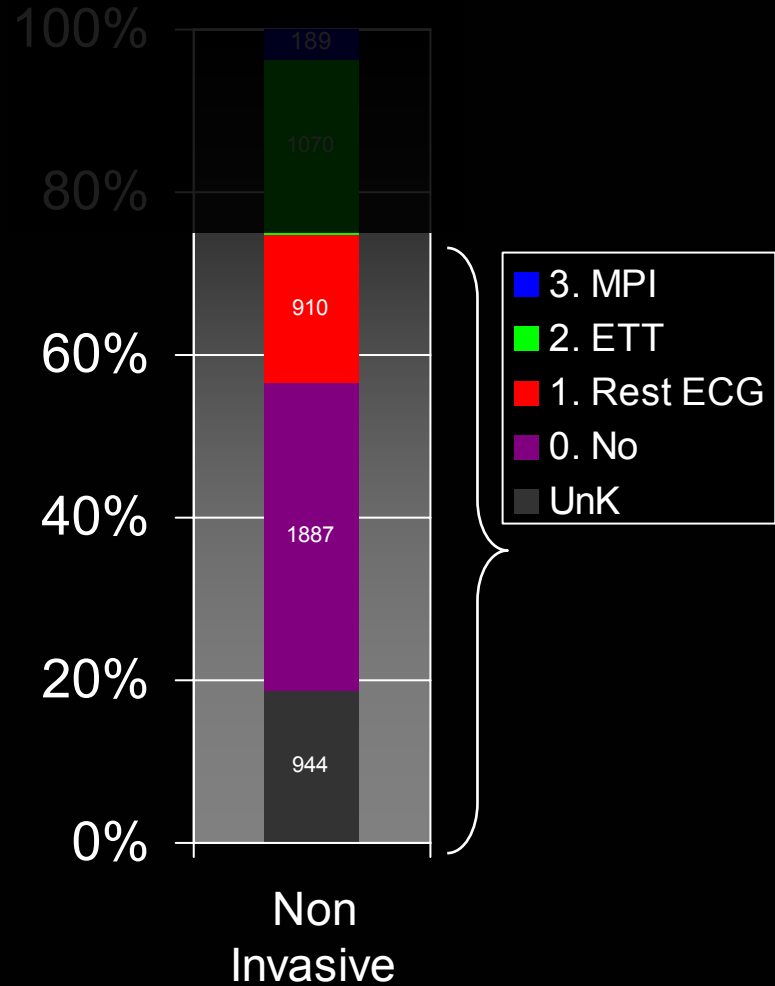
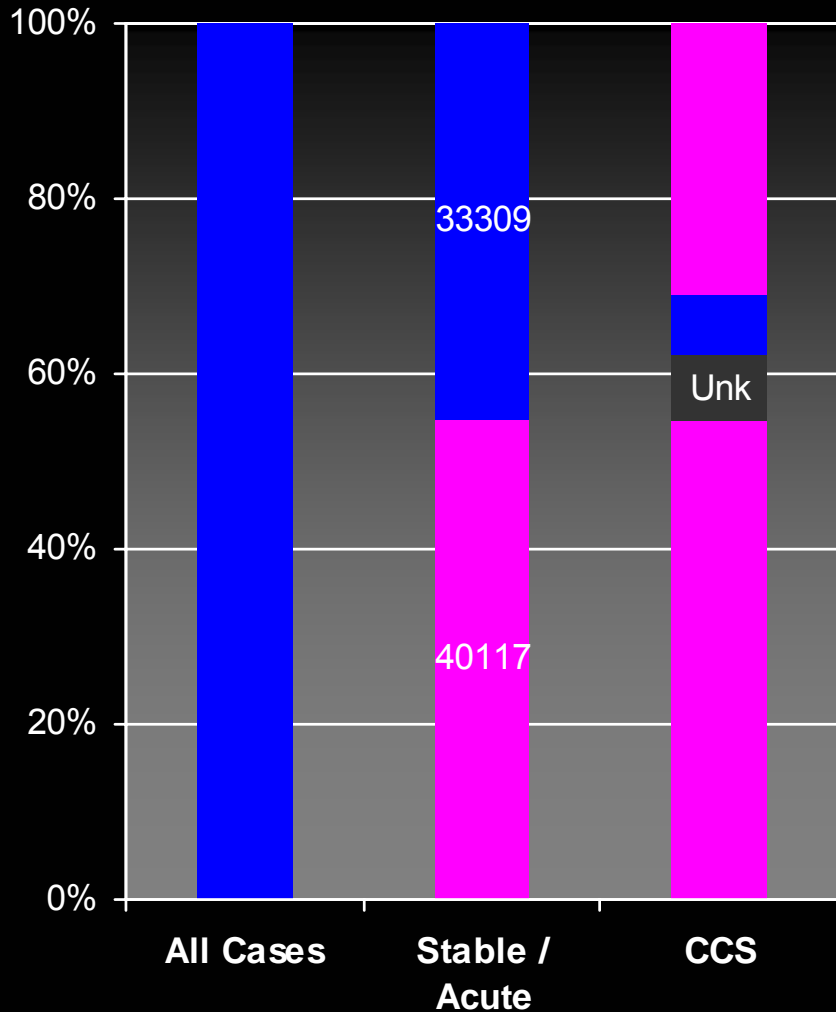
Appropriateness

Of Stable of CCS 0 or 1



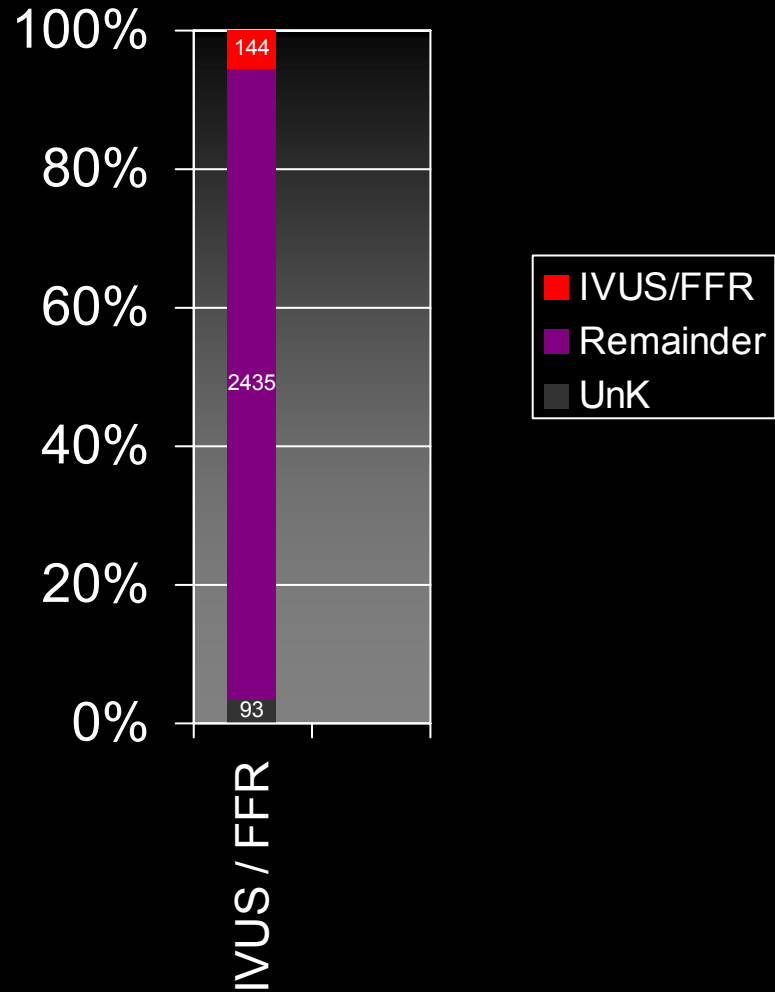
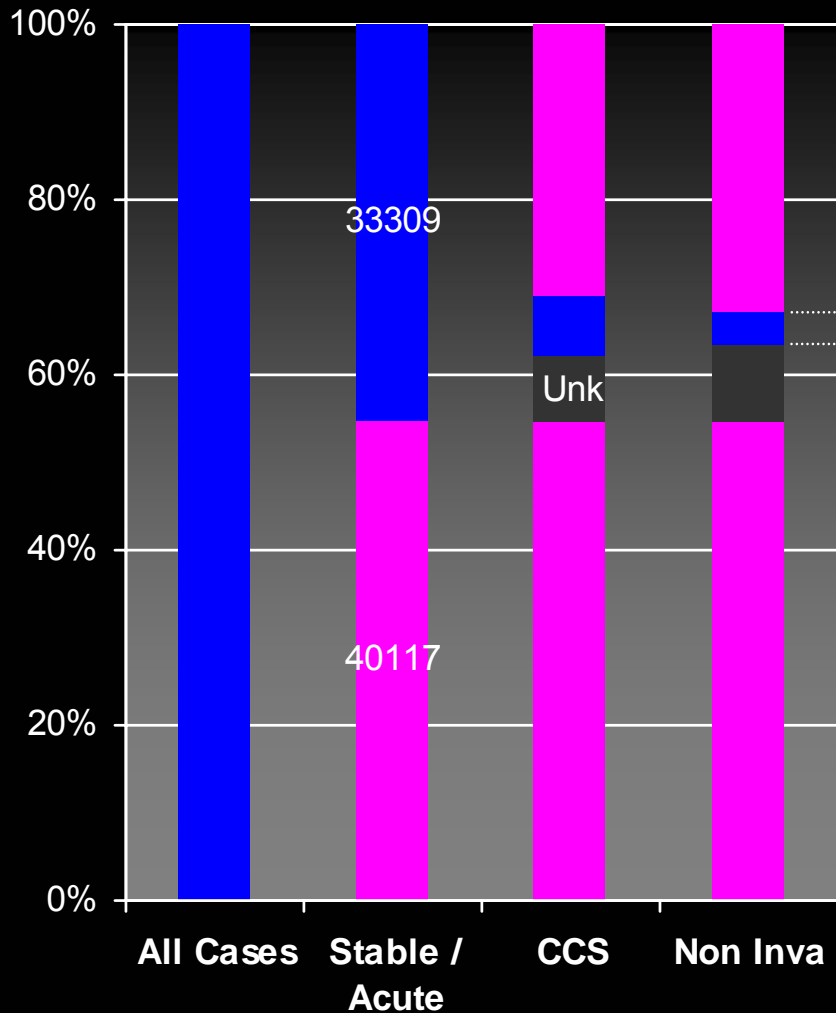
Appropriateness

Of Stable of CCS 0 or 1



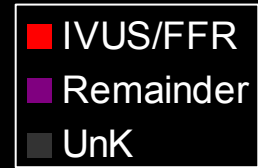
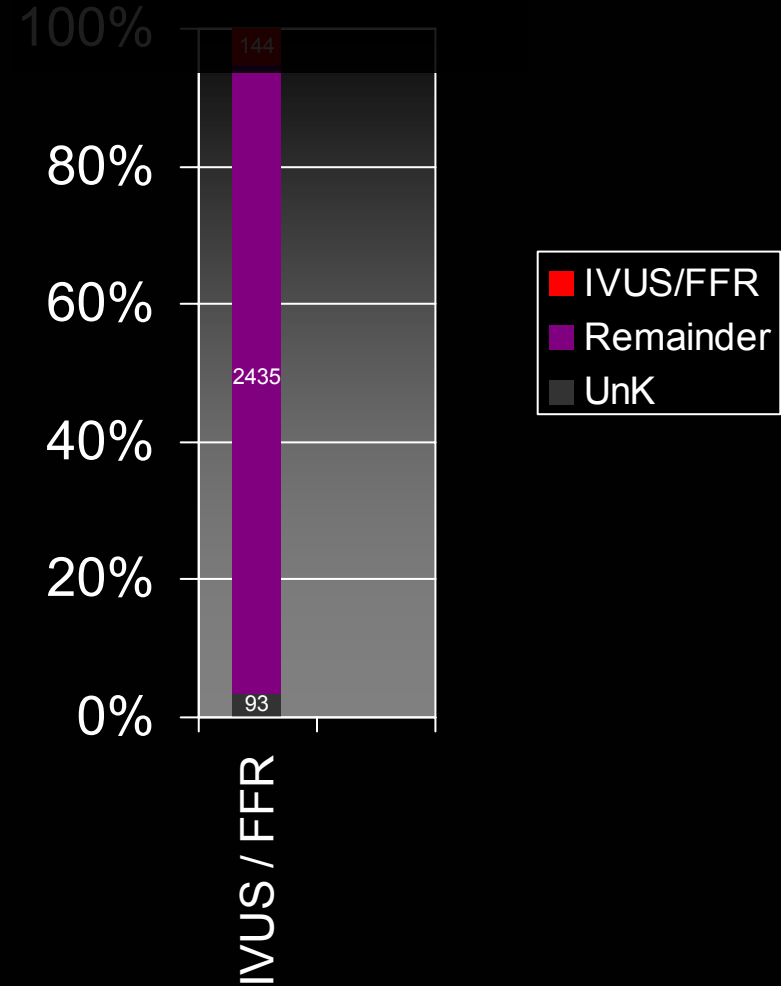
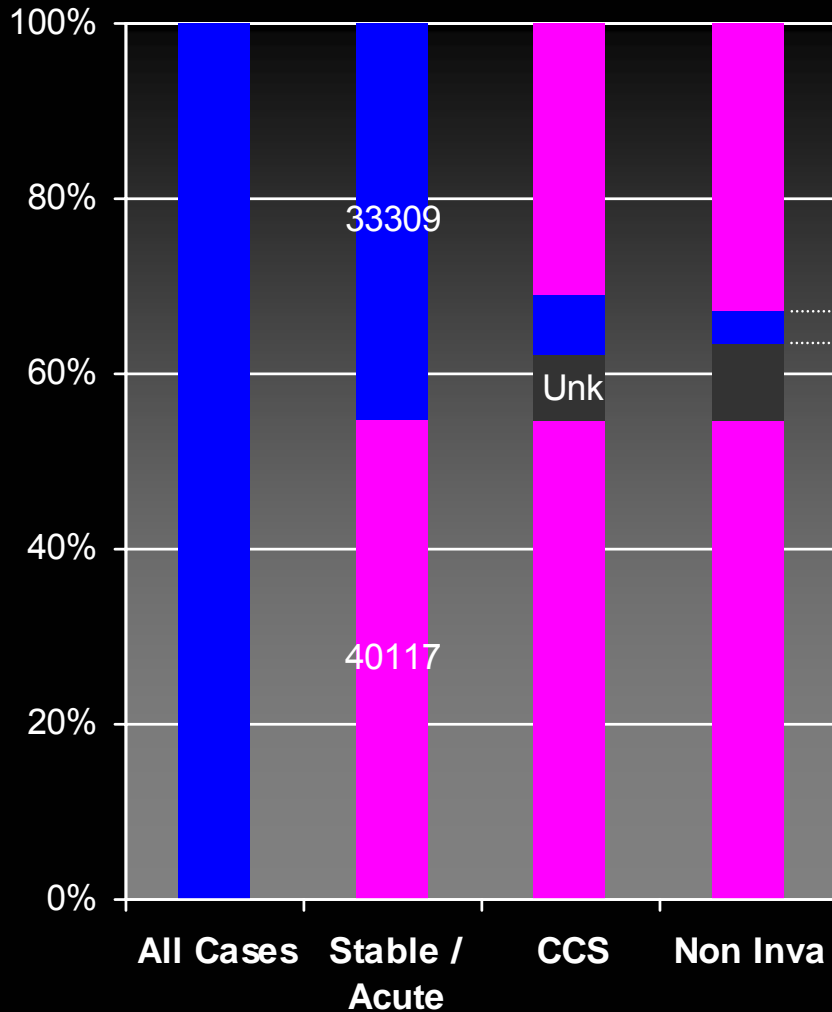
Appropriateness

Of Stable, CCS 0/1, no non
invasive testing

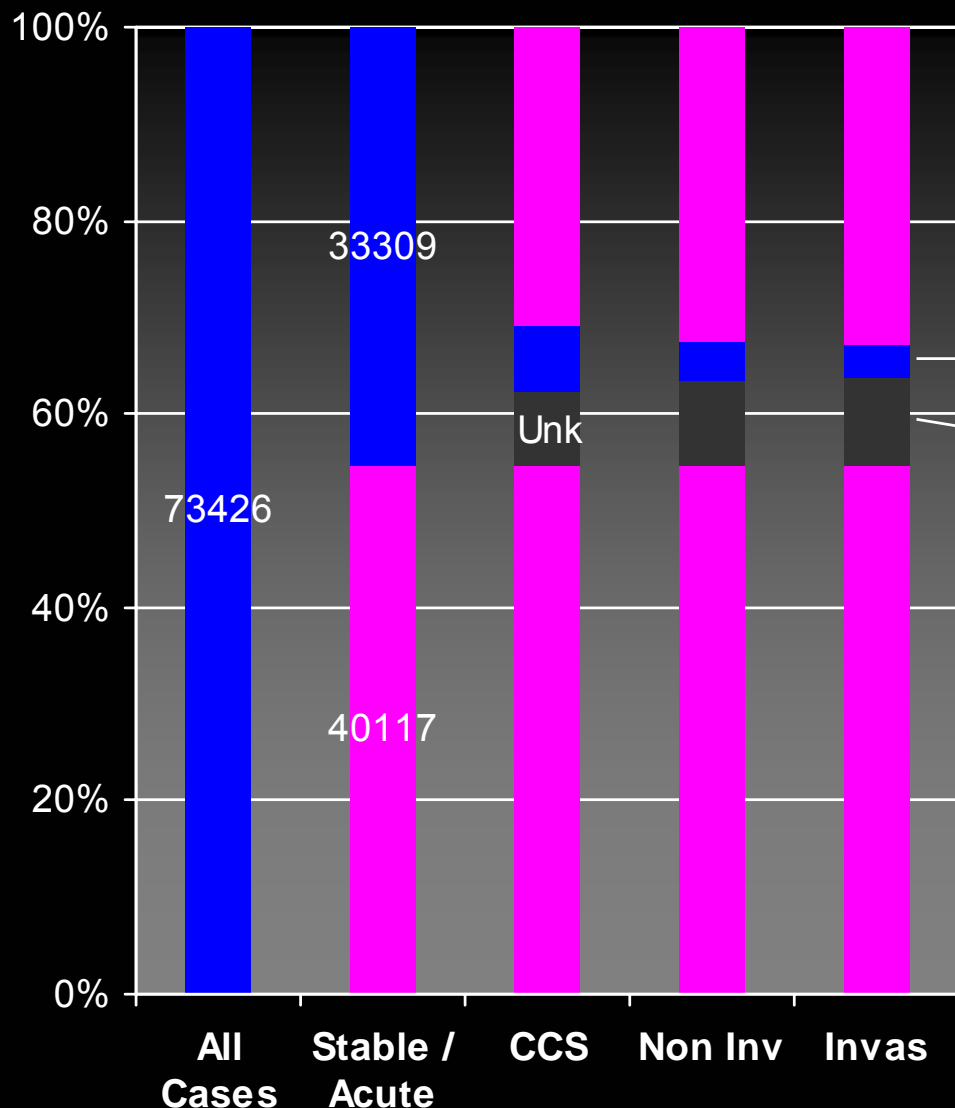


Appropriateness

Of Stable, CCS 0/1, no non
invasive testing



Appropriateness



- Stable
- CCS 0/1
- no non invasive testing
- no invasive testing for ischaemia

	Number	%
? Inappropriate	2435	3.3 %
Unknown	6587	8.8 %

Clinical Syndrome



2008 data: Ludman

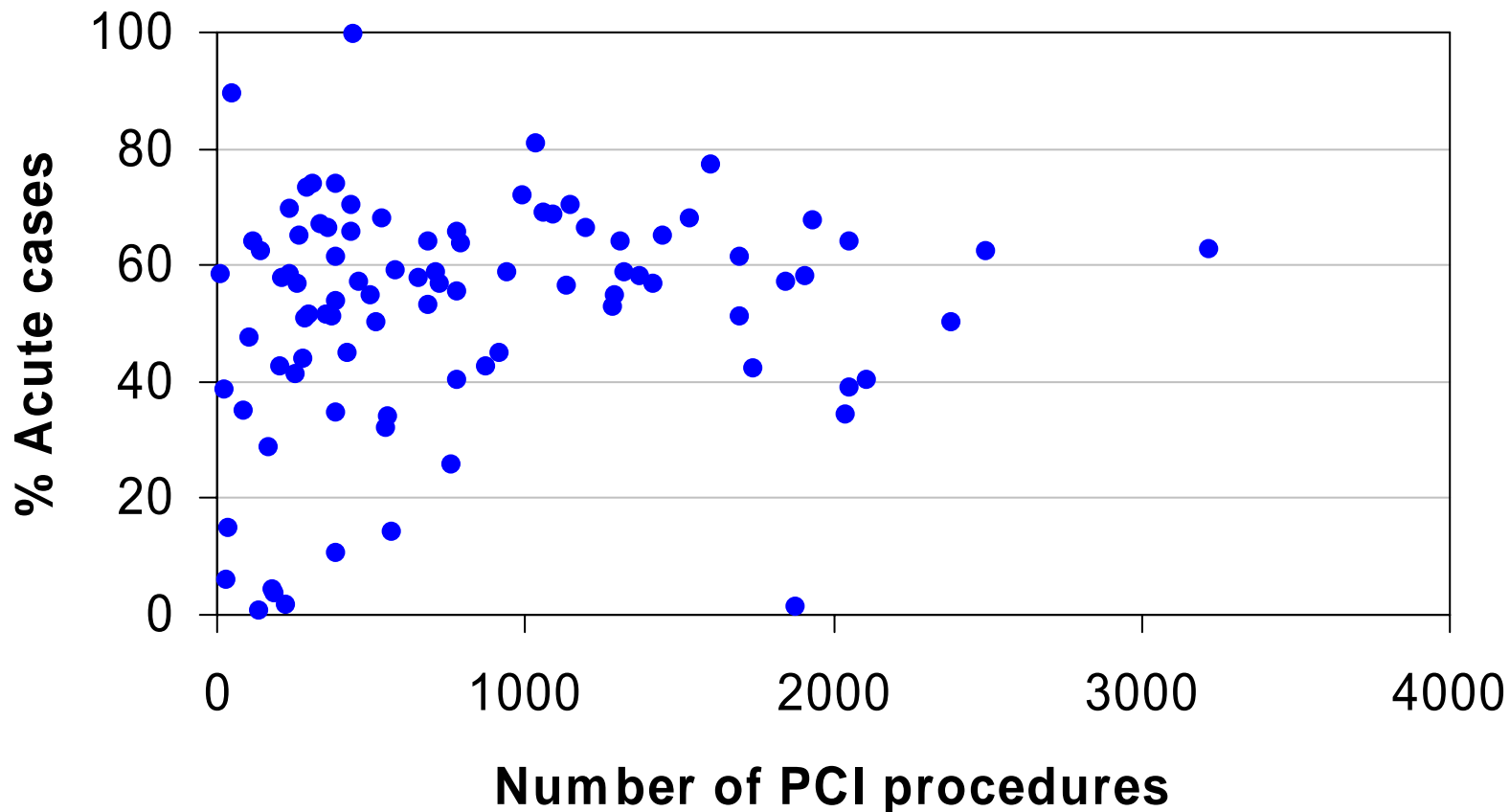


Clinical Syndrome

- % PCI in patients with Acute syndromes by unit volume



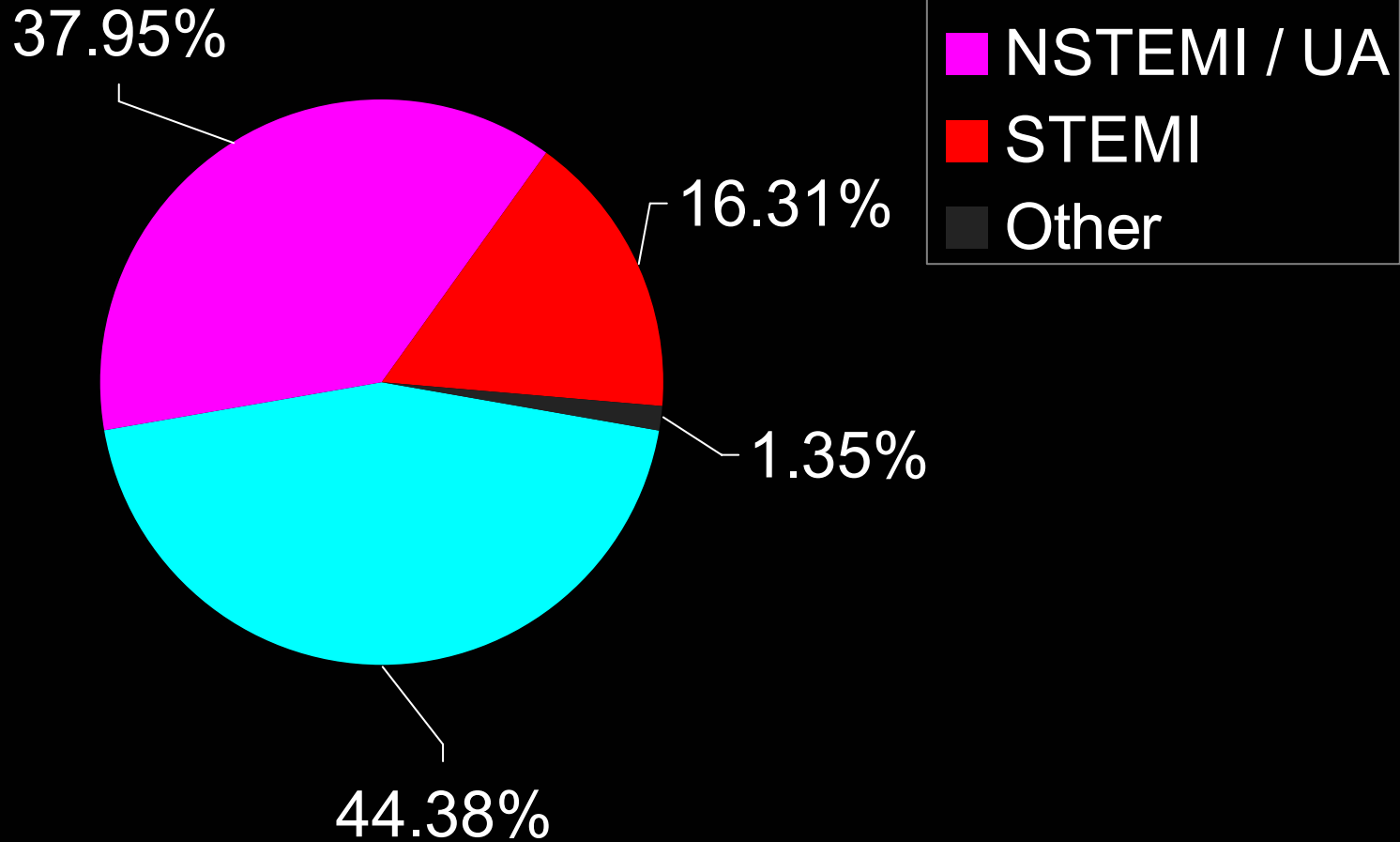
2008 data: Ludman



Indication for PCI



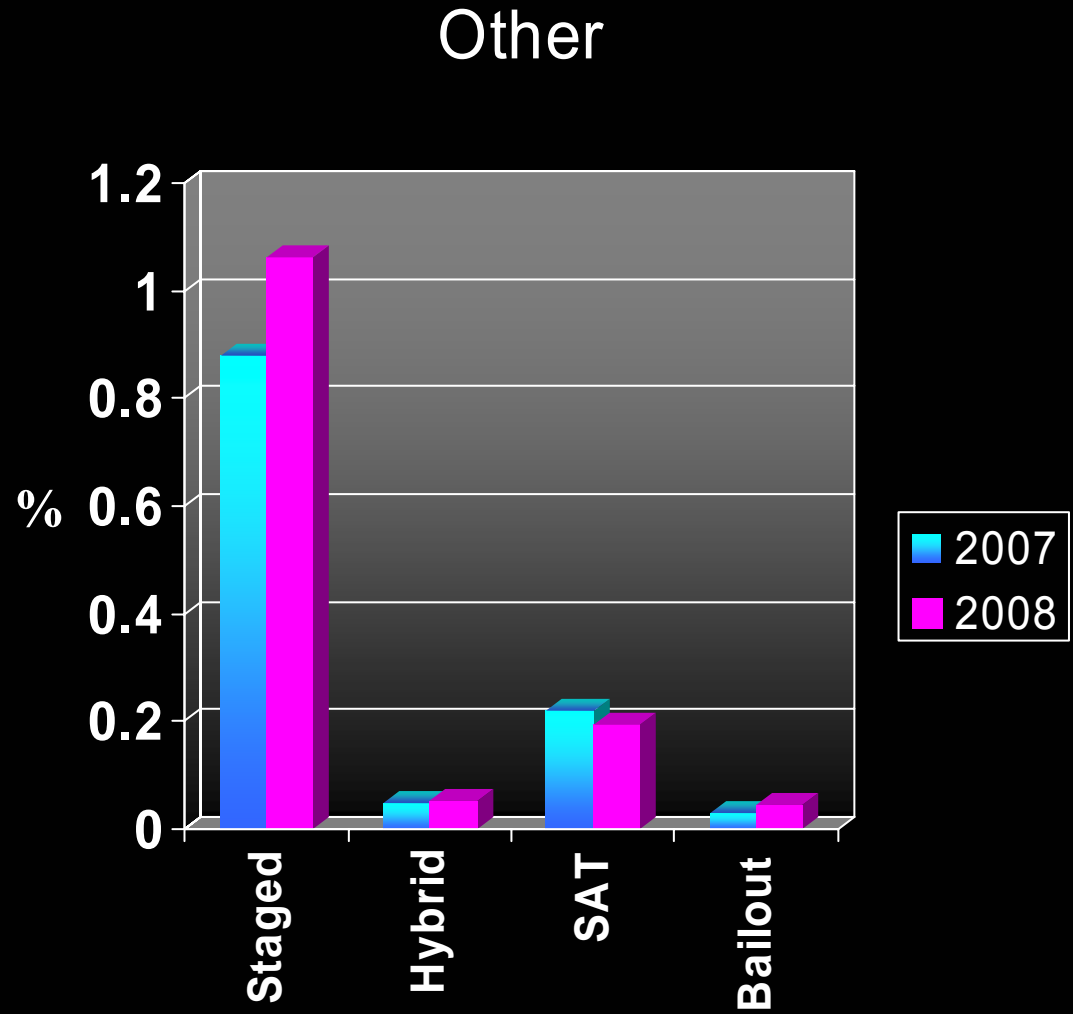
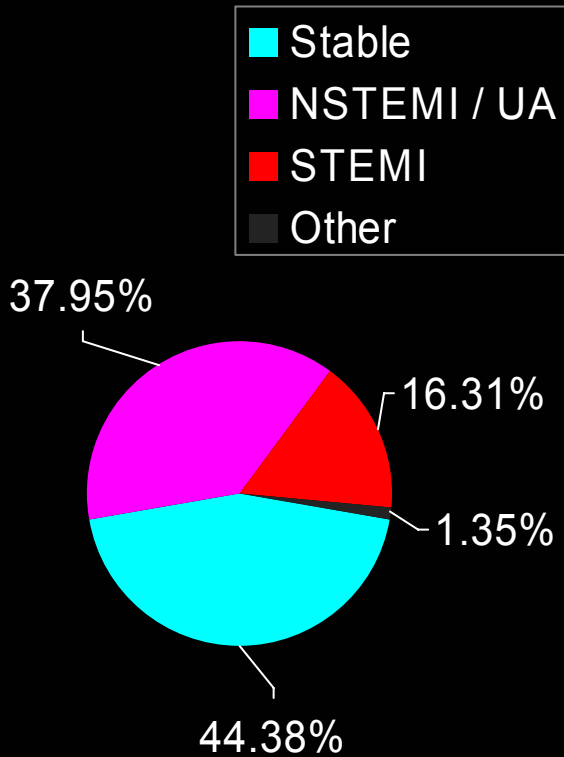
2008 data: Ludman



Indication for PCI



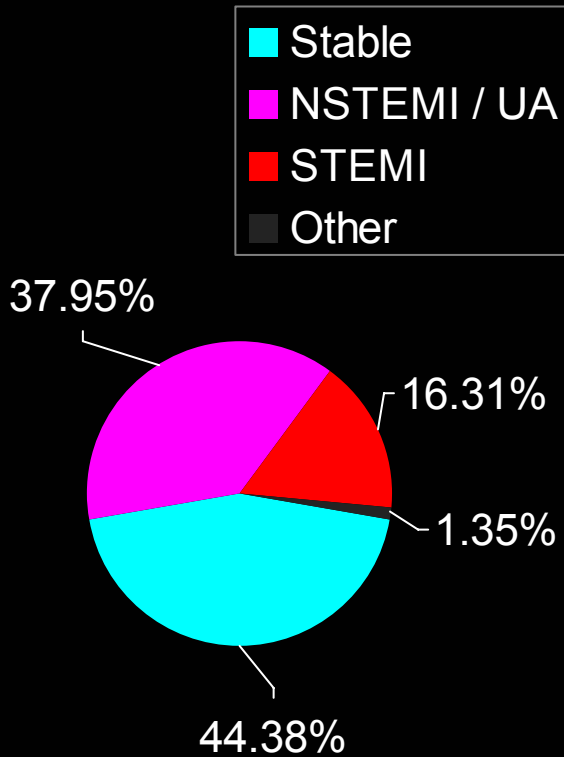
2008 data: Ludman



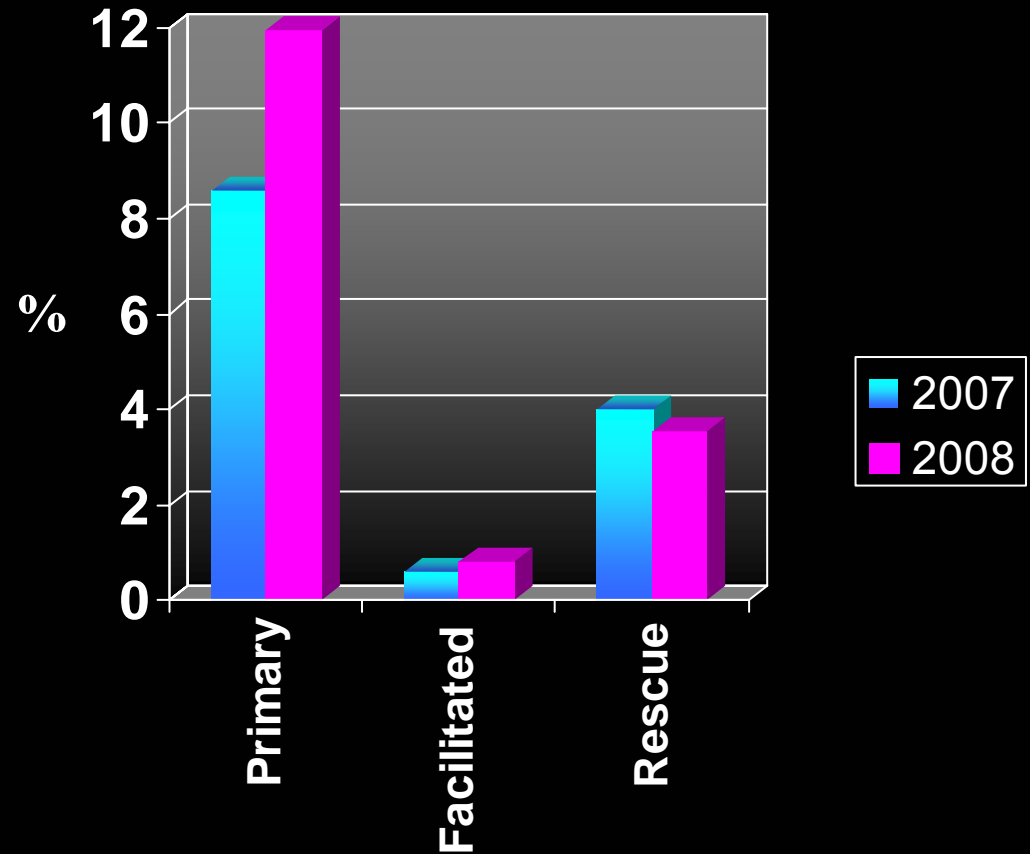
Indication for PCI



2008 data: Ludman



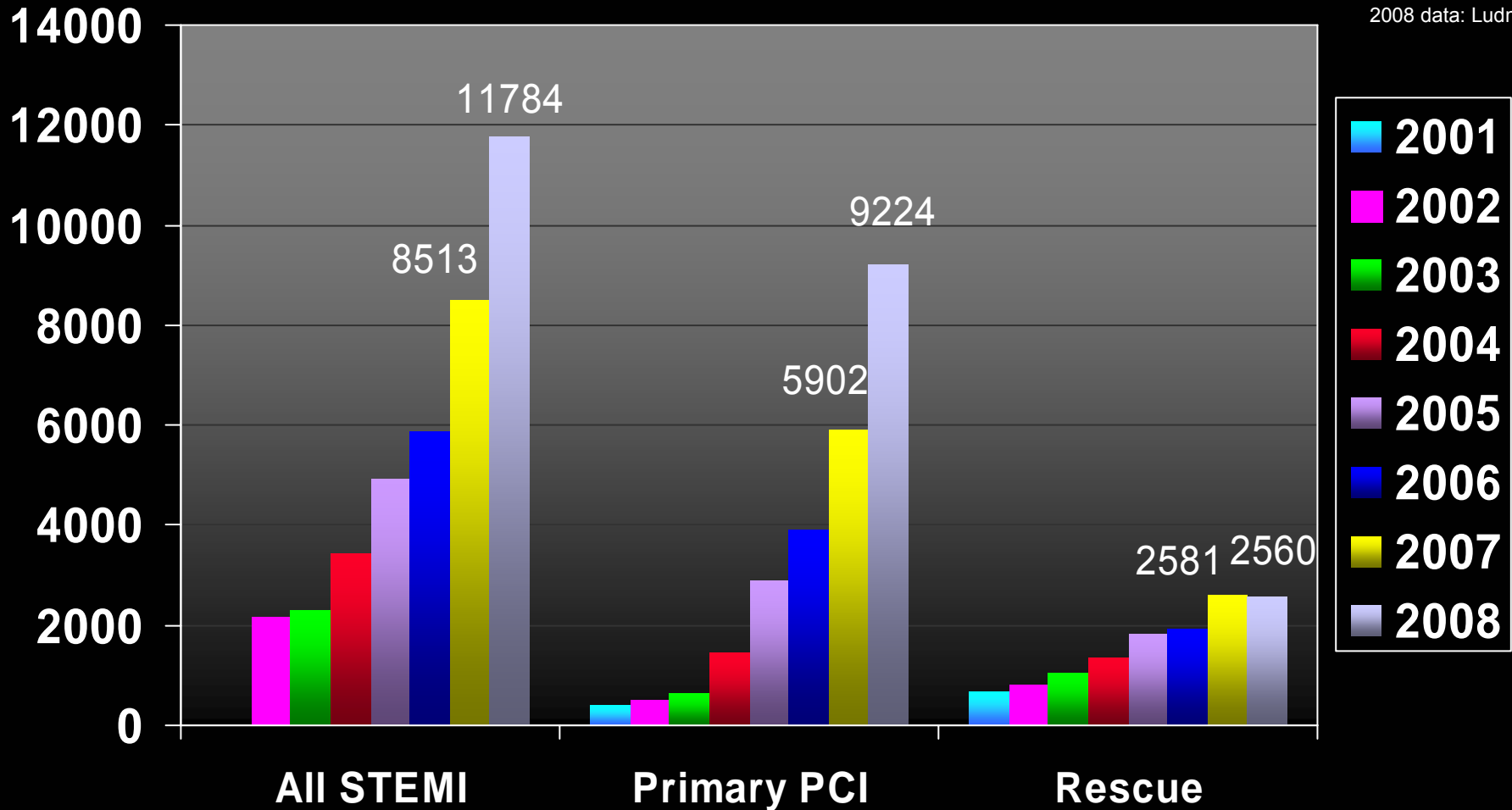
STEMI



PCI for STEMI



2008 data: Ludman



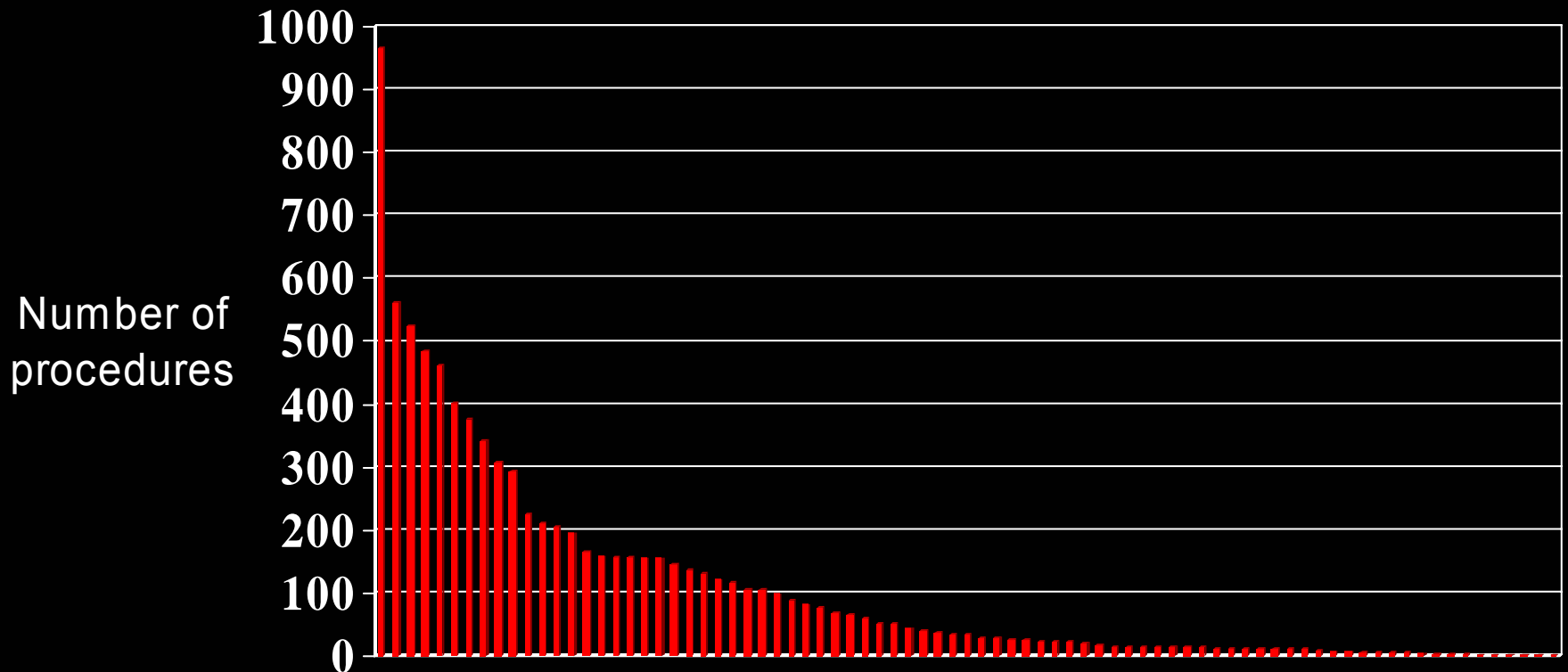
Primary PCI for STEMI

2008 data from NHS Centres

Total 9224 procedures 2008



2008 data: Ludman

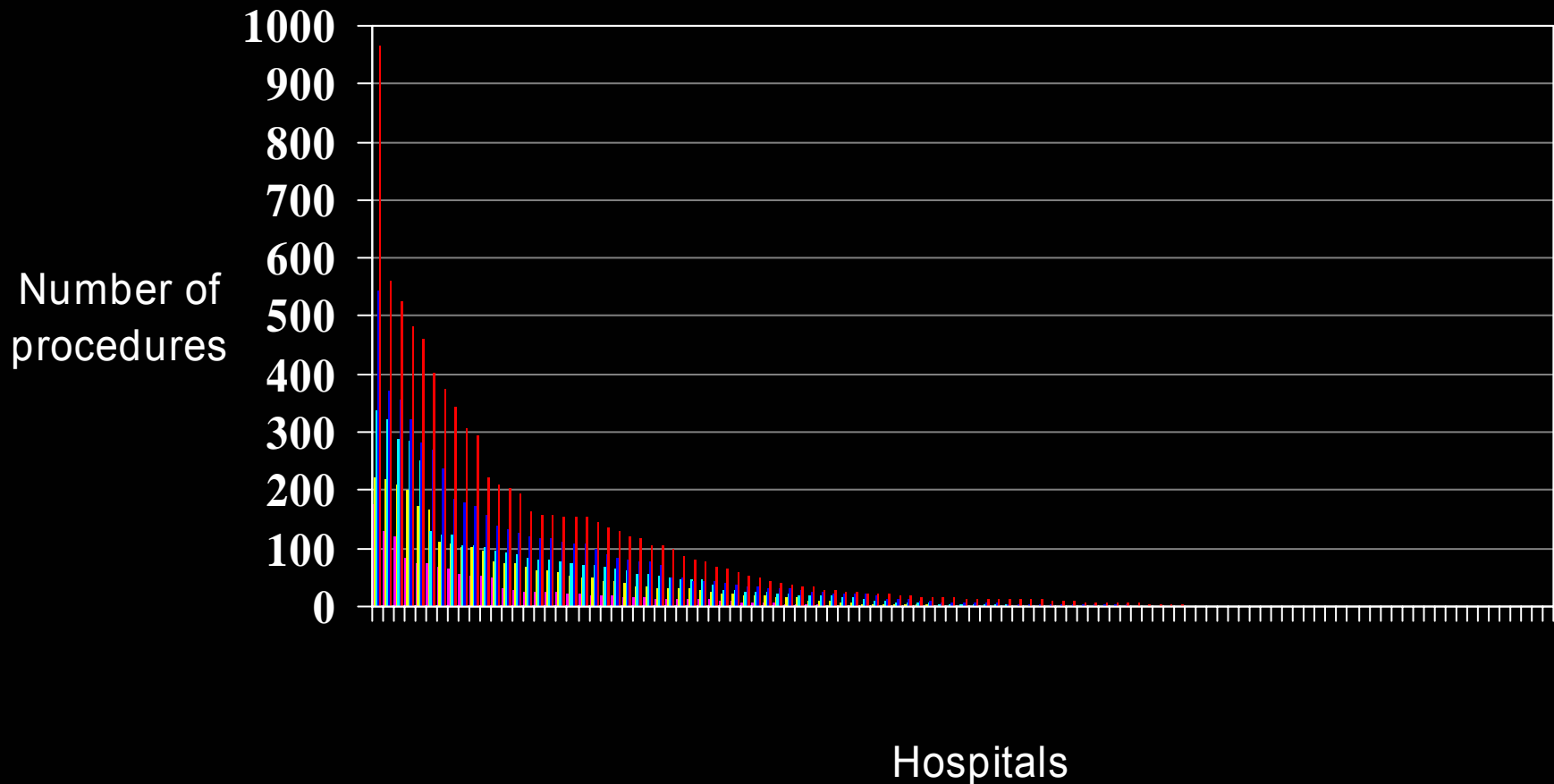


Primary PCI for STEMI



2008 data: Ludman

2004 2005 2006 2007 2008

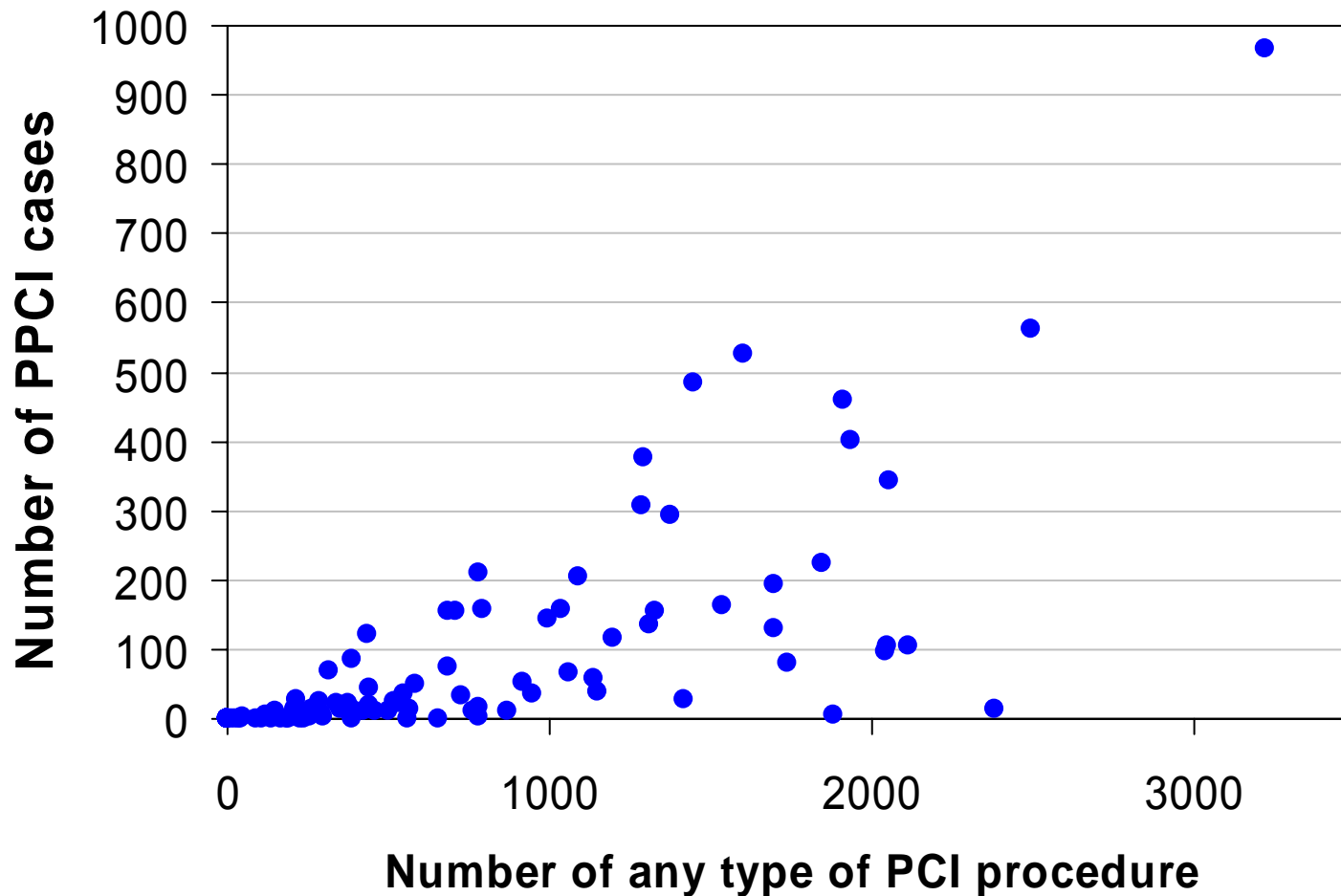


Primary PCI for STEMI

Absolute number PPCI



2008 data: Ludman

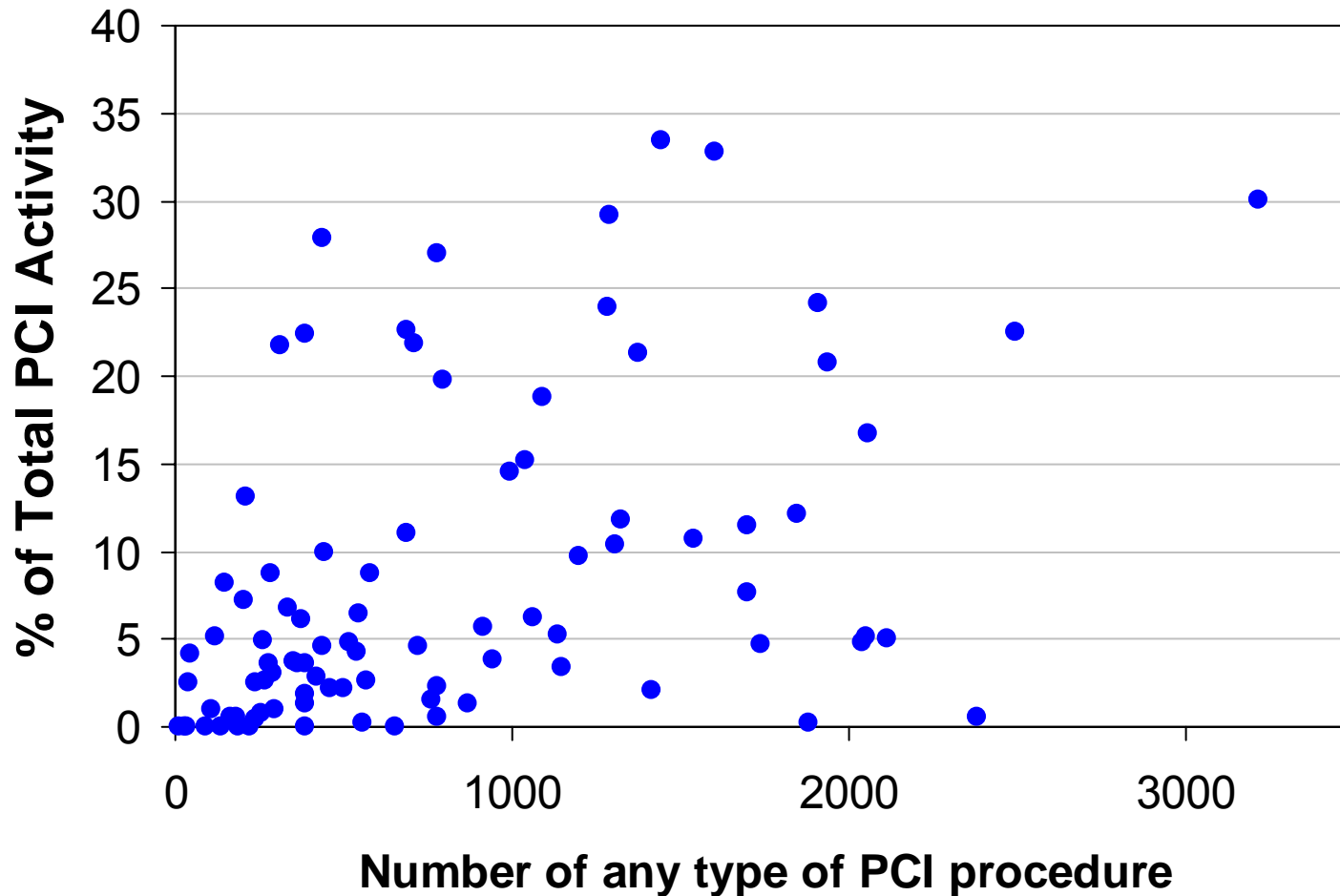


Primary PCI for STEMI

% PPCI of total activity



2008 data: Ludman



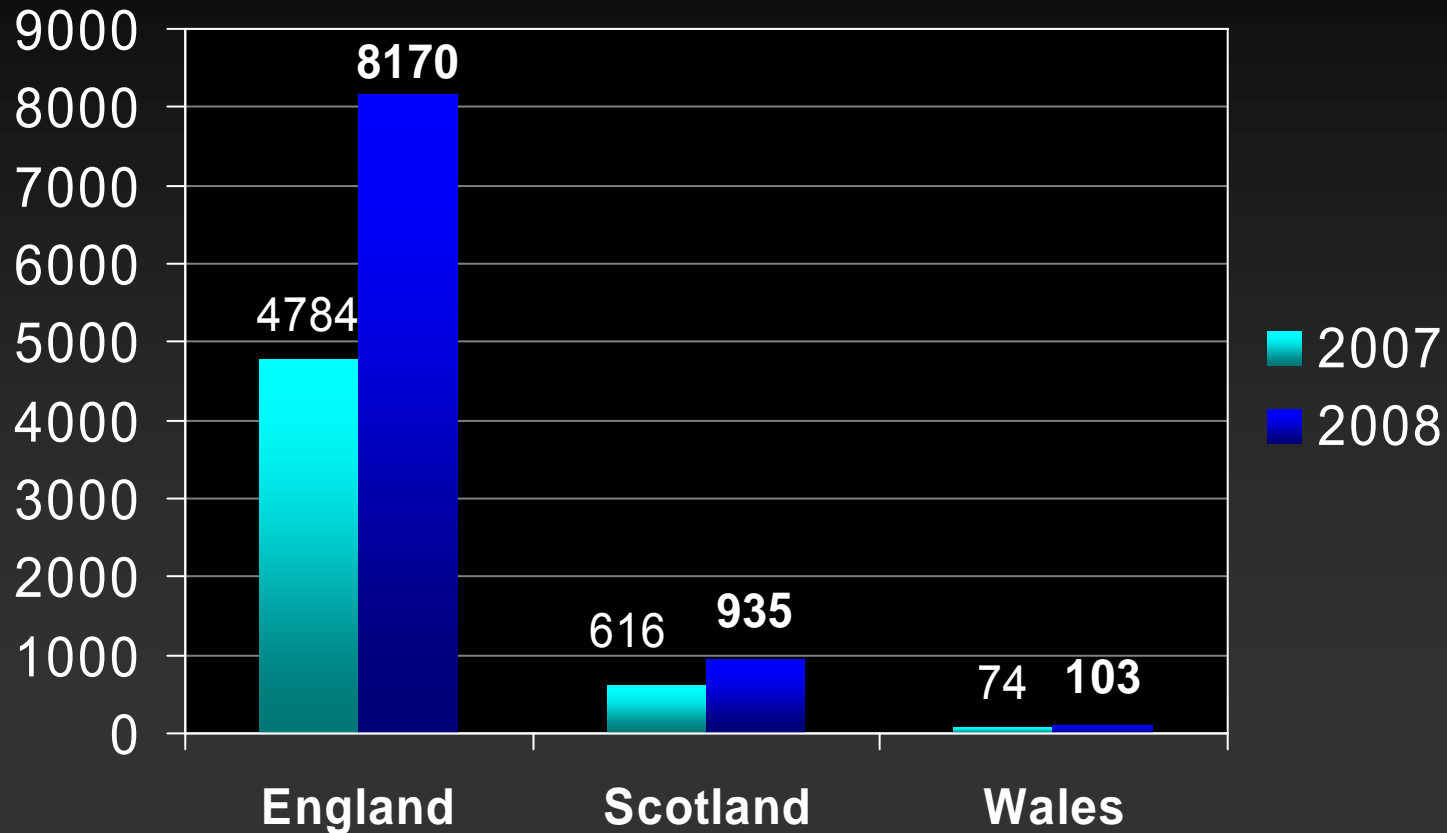
Primary PCI

UK Countries



2008 data: Ludman

Total Number of PPCI



MINAP records 8099 E&W calendar yr 2008 (98%)

Primary PCI

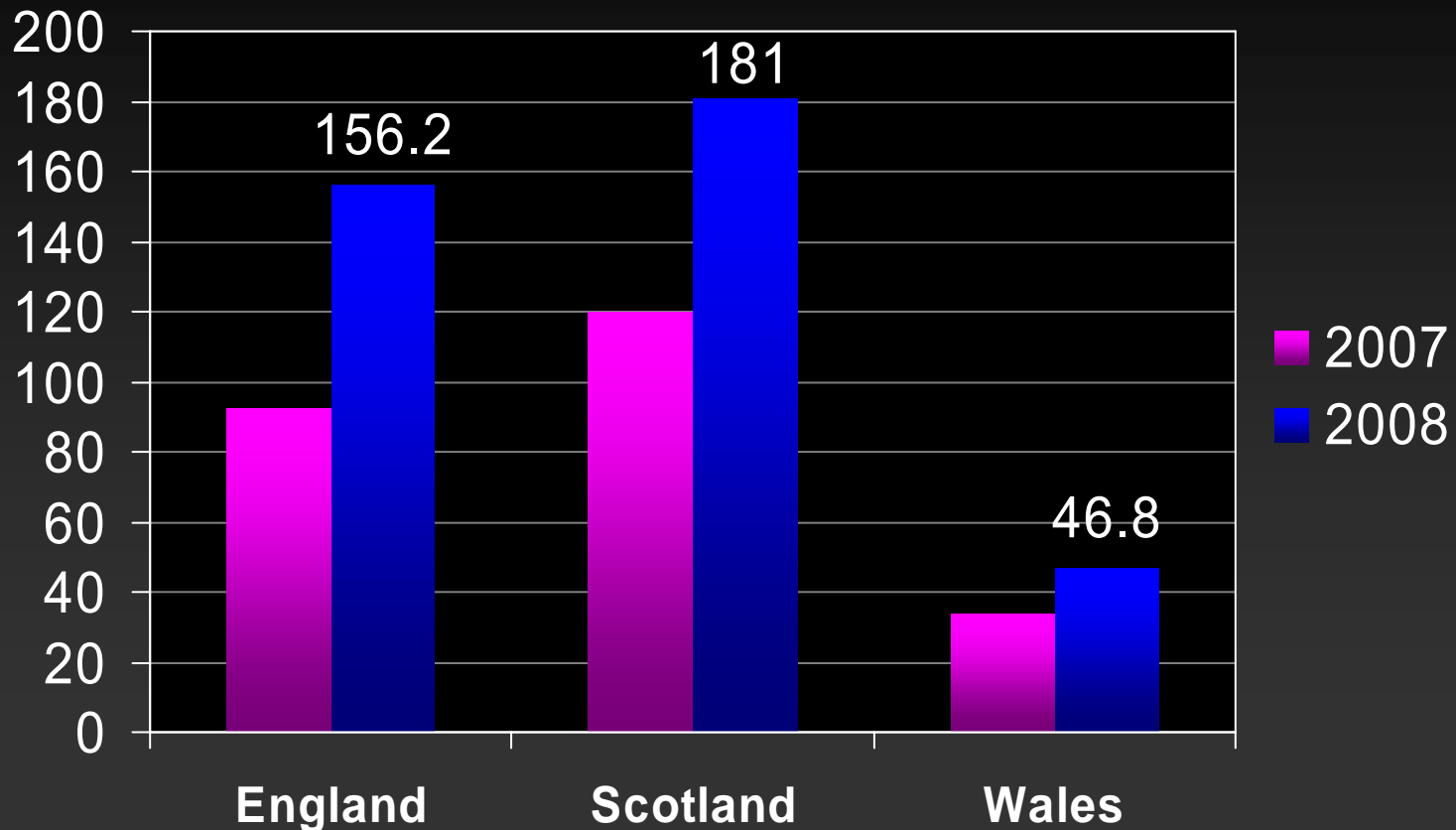
UK Countries

Overall UK = 150 pmp



2008 data: Ludman

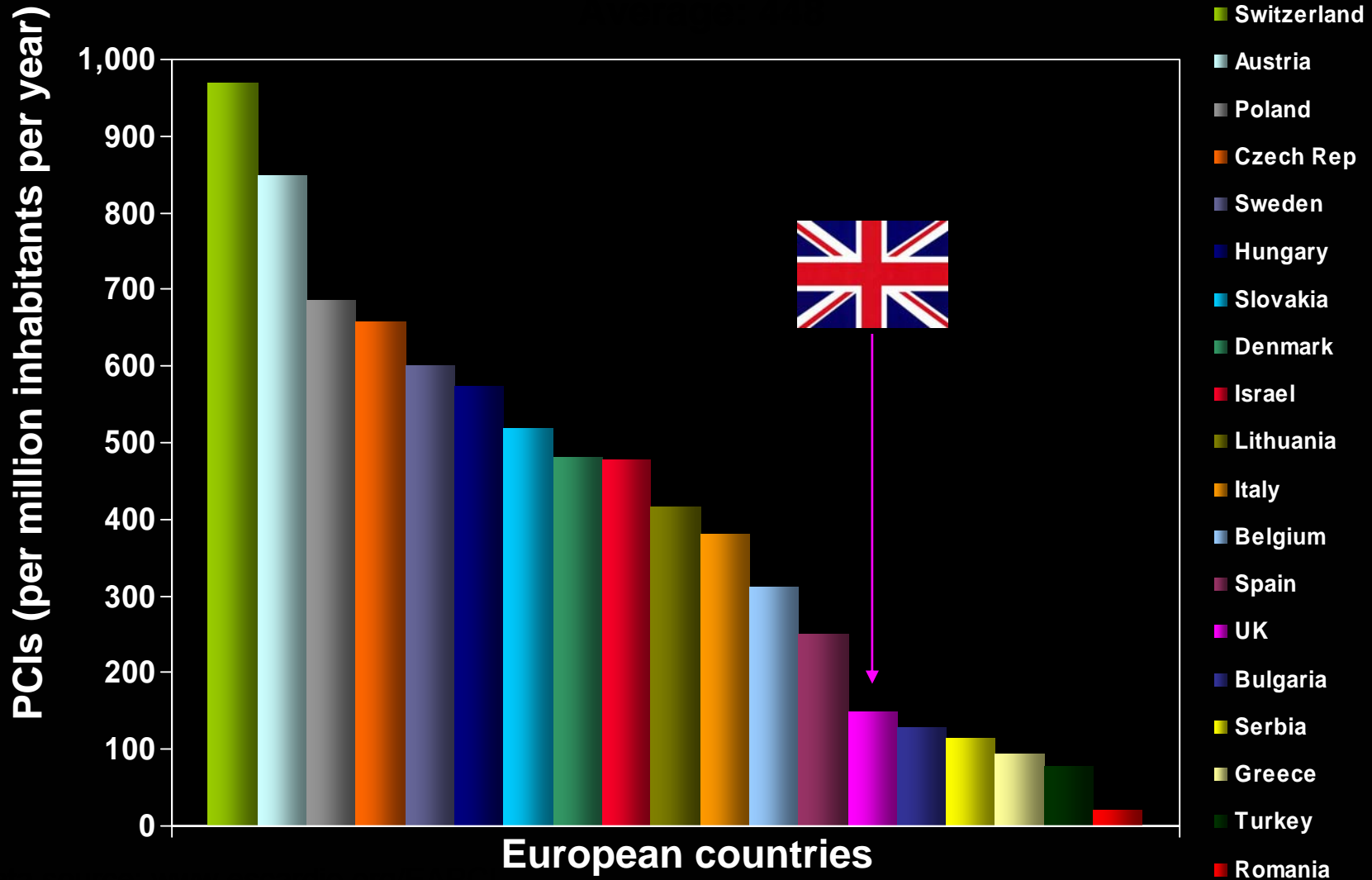
PPCI pmp



Primary PCIs pmp

Europe

Data source: www.escardio.org/EAPCI





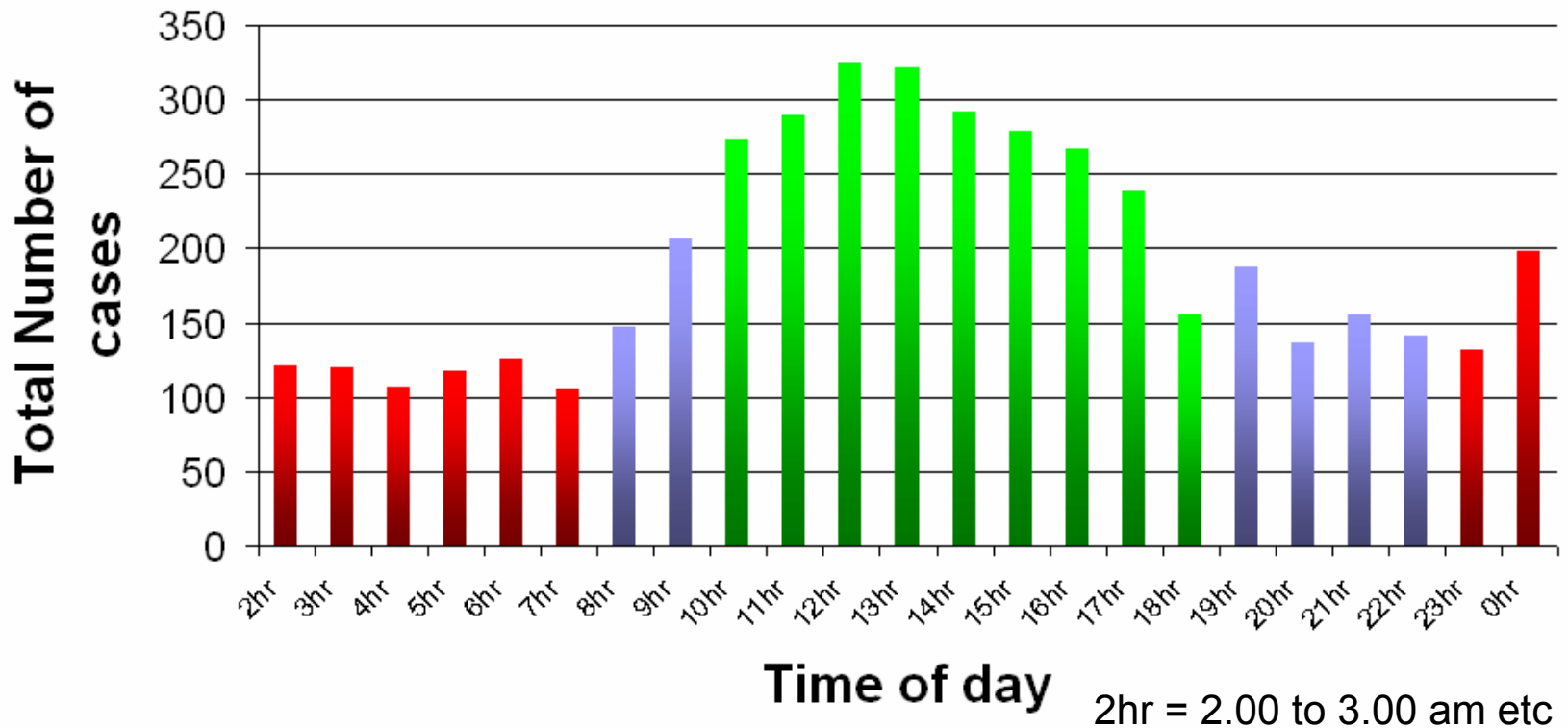
Primary PCI for STEMI

'Balloon' time in 24/7 units



2008 data: Ludman

PPCI circadian distribution



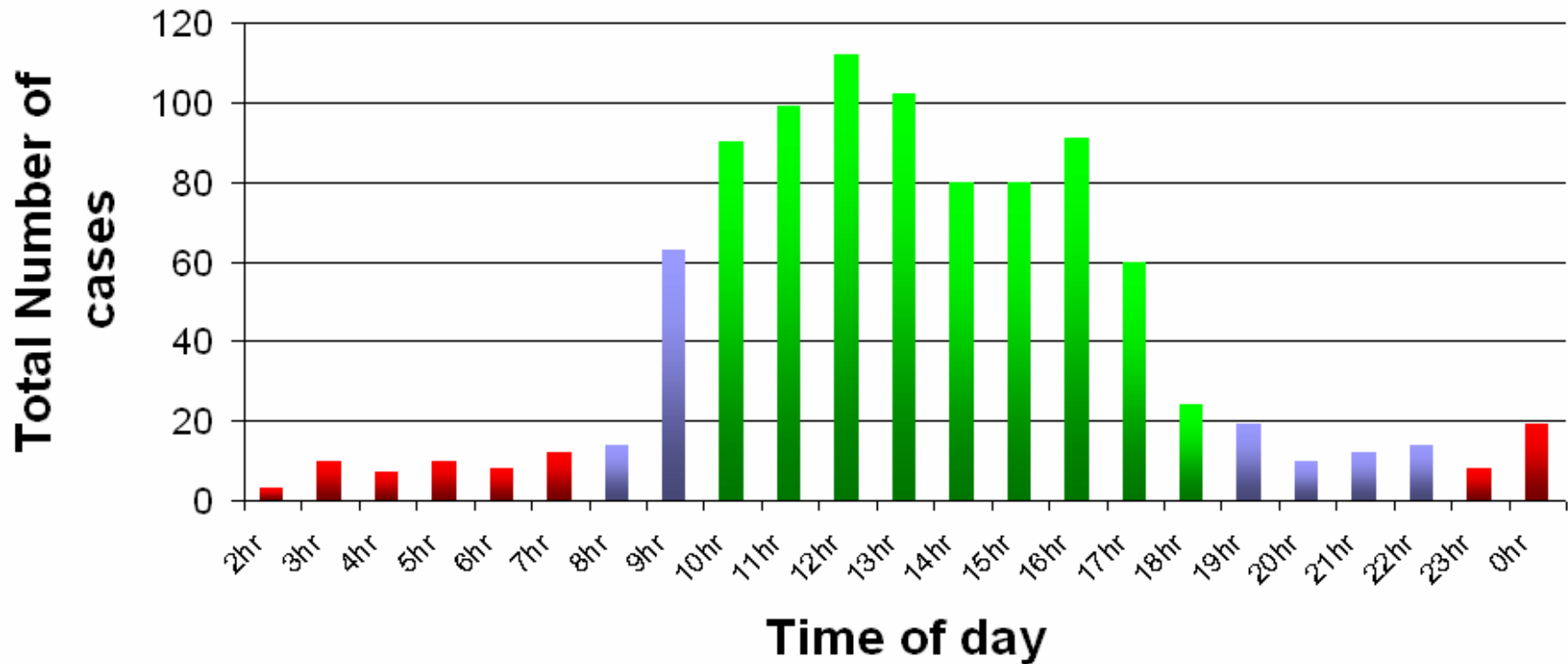
Primary PCI for STEMI

'Balloon' time in day time only units

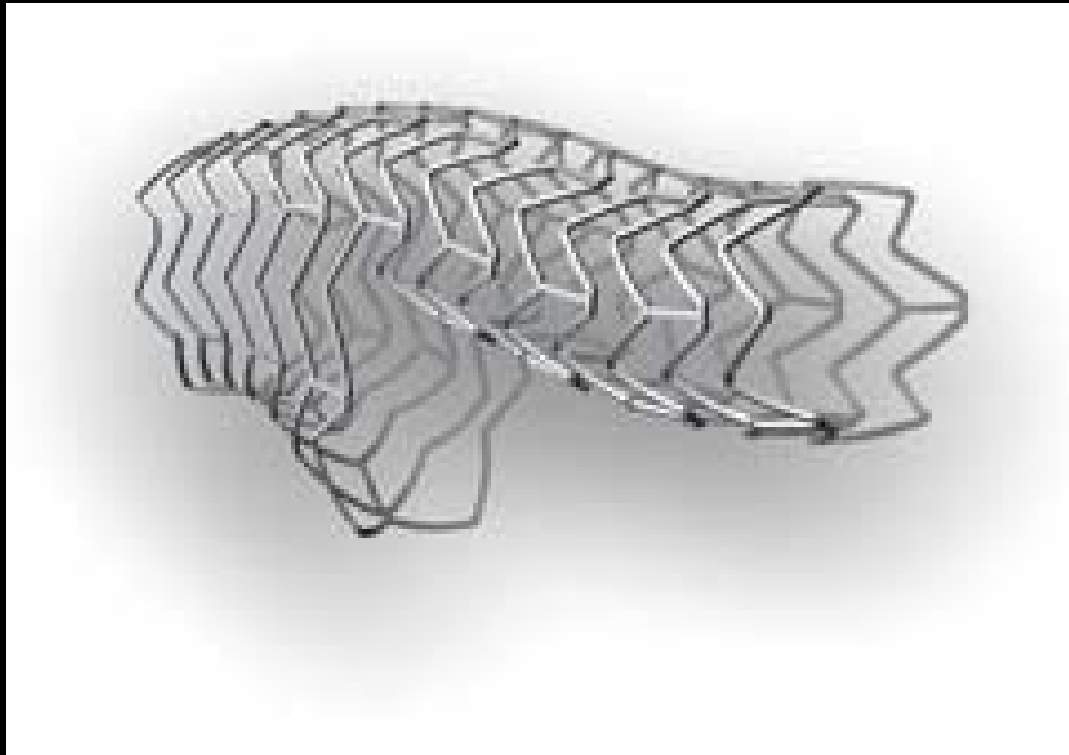


2008 data: Ludman

PPCI circadian distribution



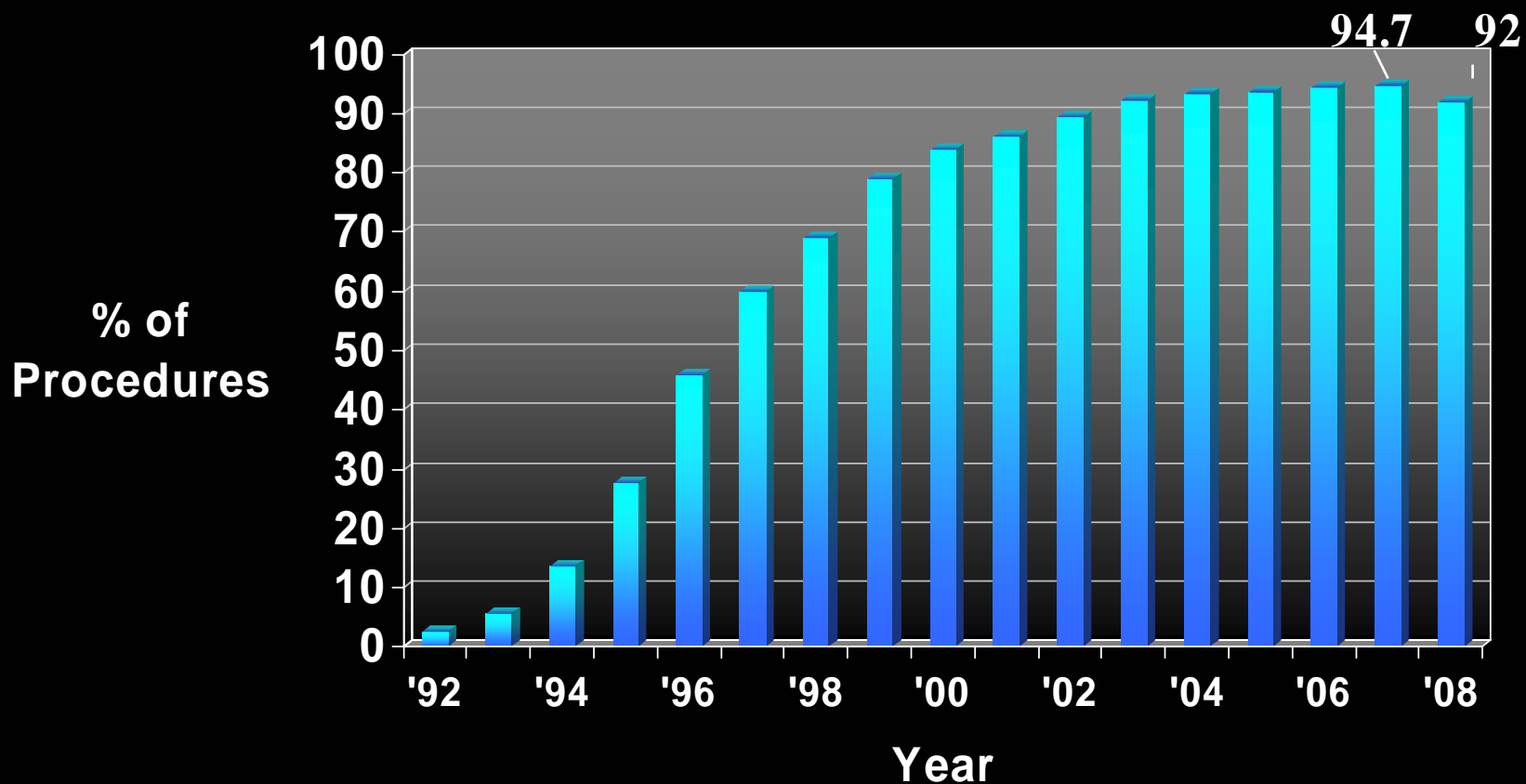
Stents



Procedures using Stents



2008 data: Ludman



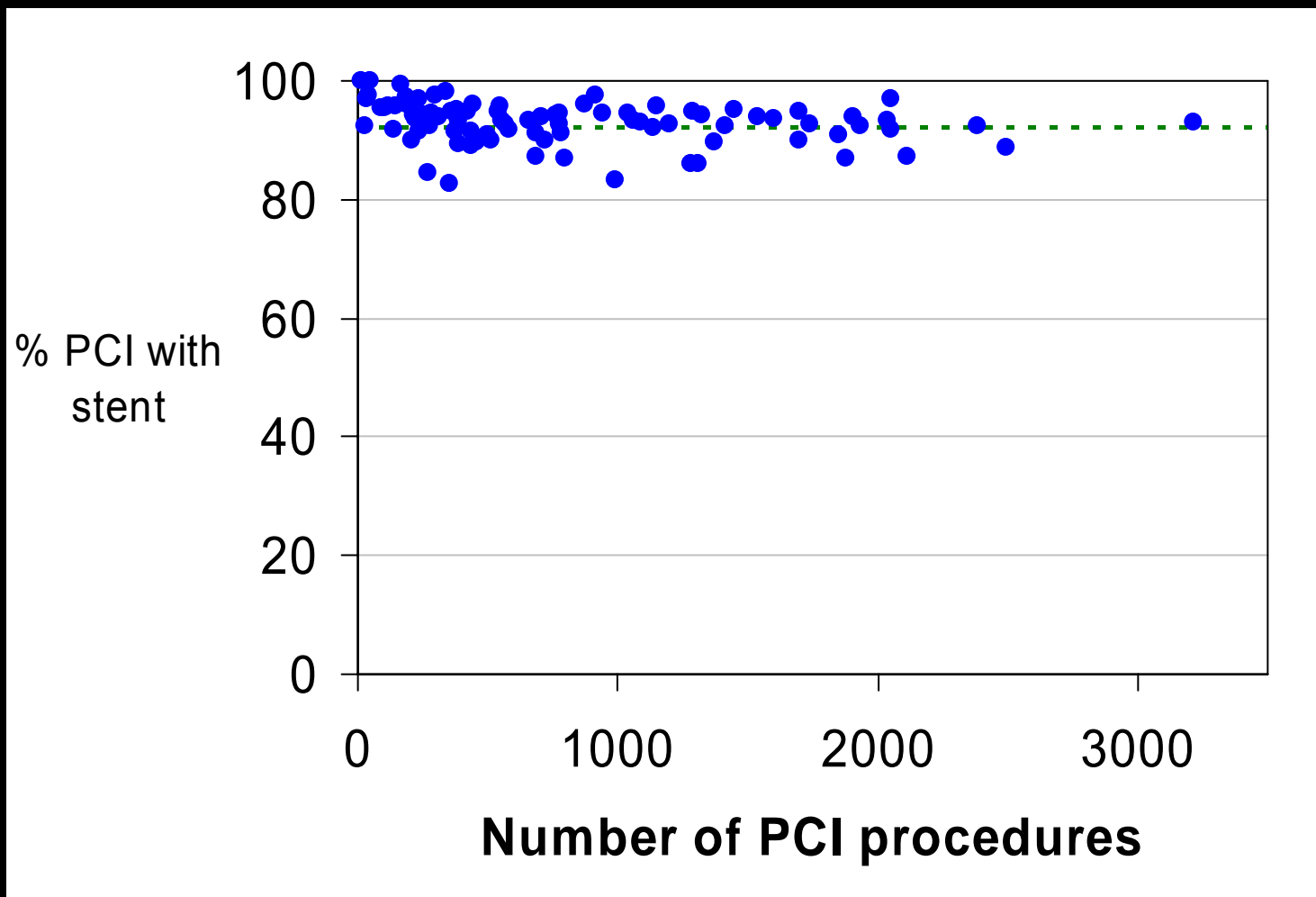
aggregate data up to 2007, CCAD for 2008

Procedures using Stents



2008 data: Ludman

Mean = 92%

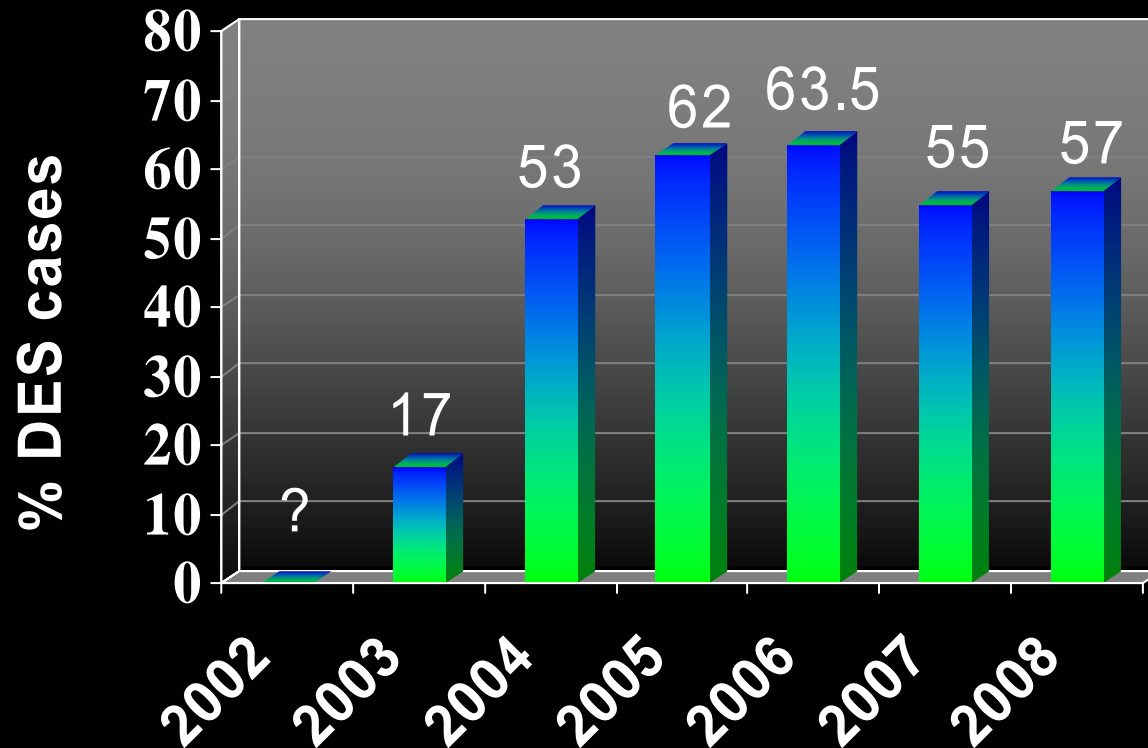


Drug Eluting Stent cases



2008 data: Ludman

Mean of % use by Centres



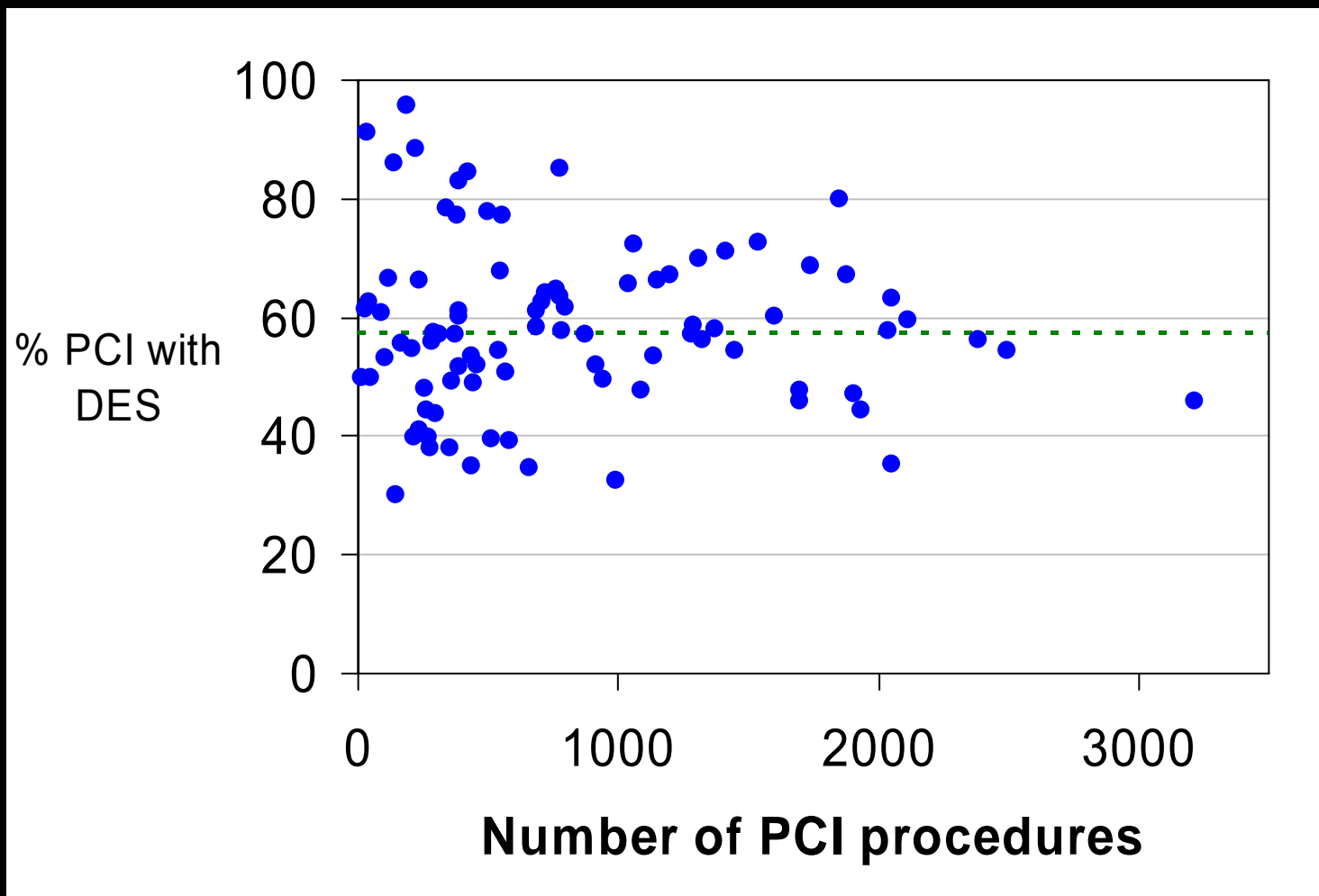
NHS and private

Procedures using DES



2008 data: Ludman

Mean = 57%

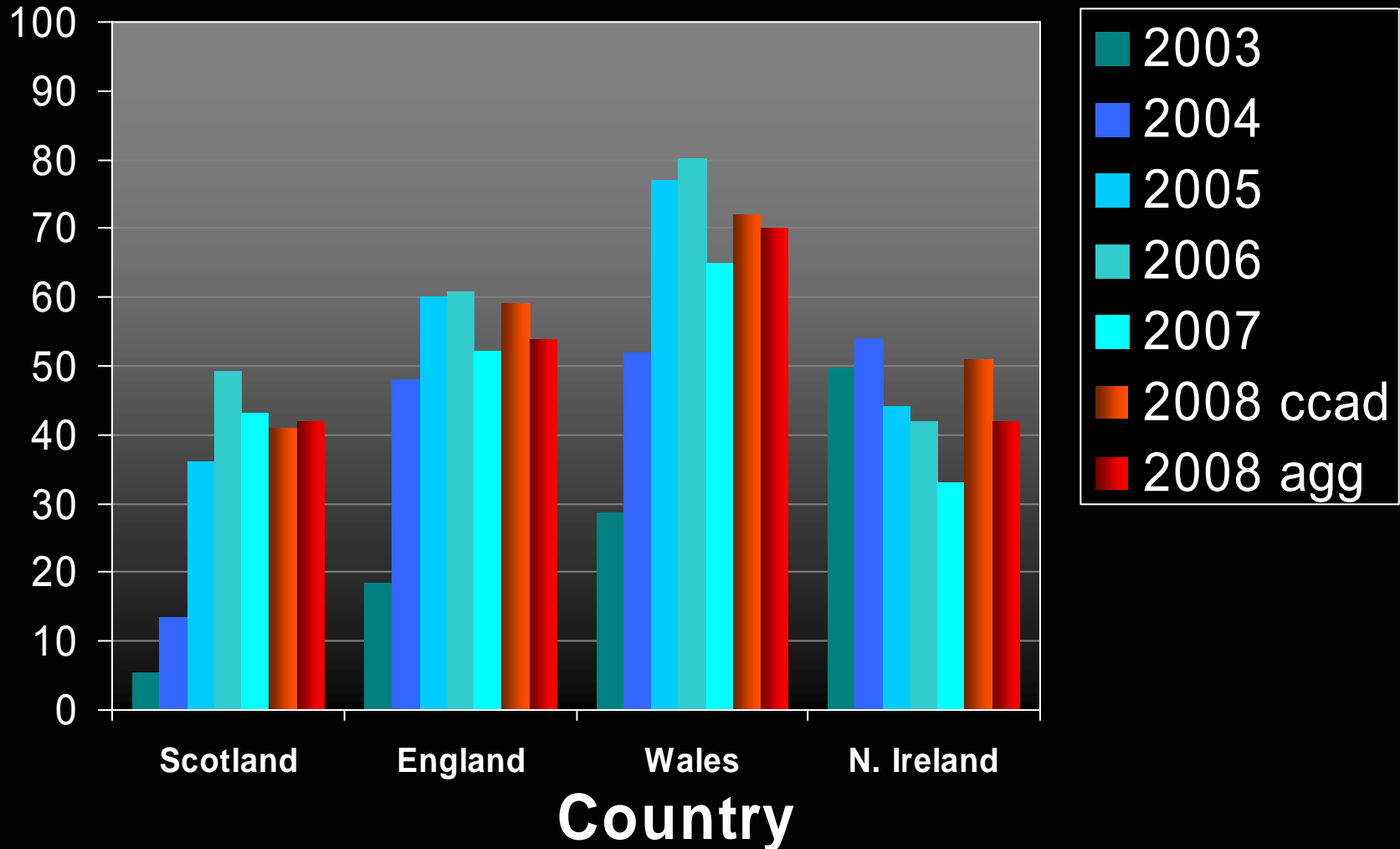


Drug Eluting Stent cases NHS

% PCI with DES



2008 data: Ludman

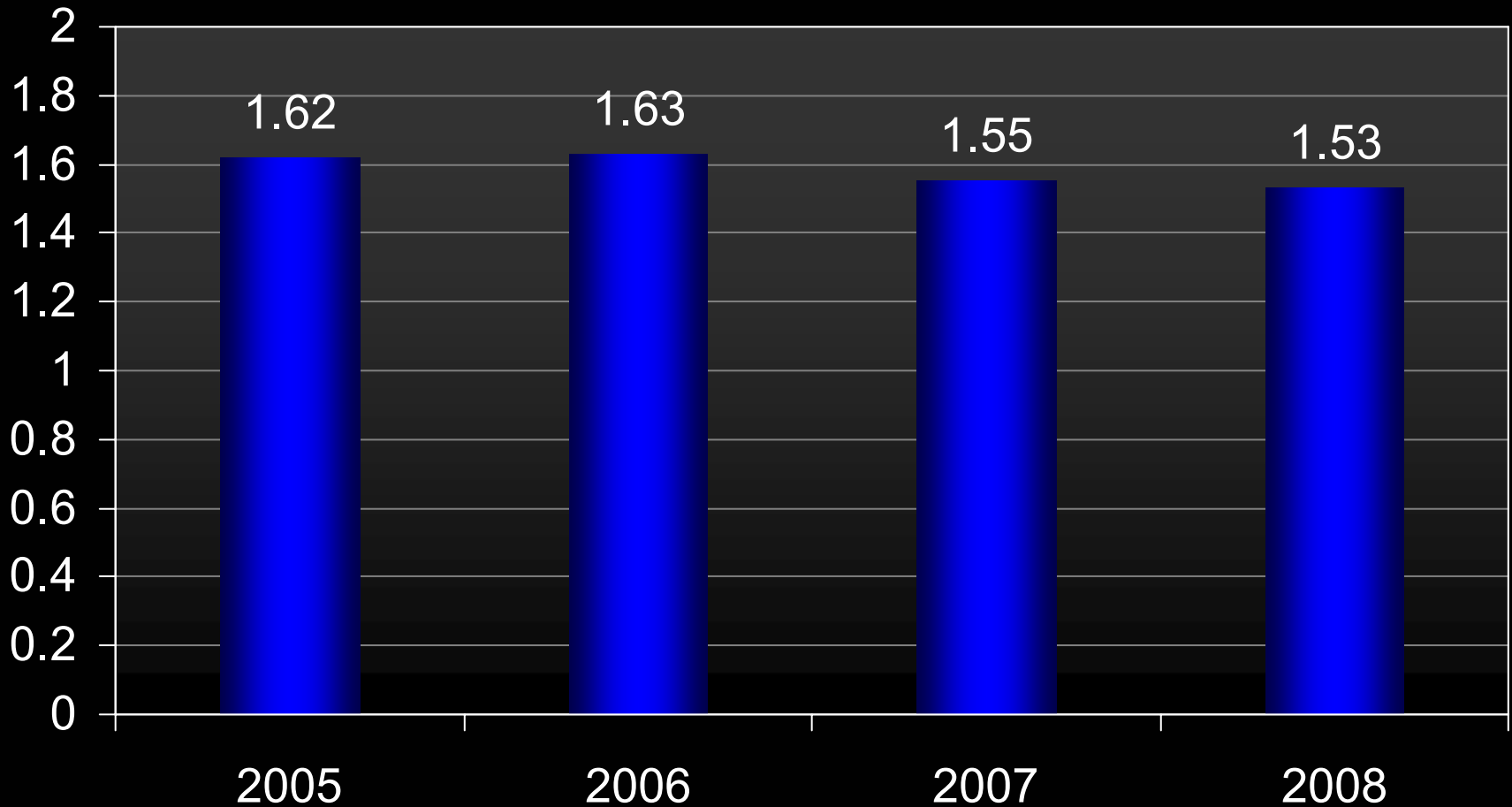


Stents per Case

- Mean number of stents per case



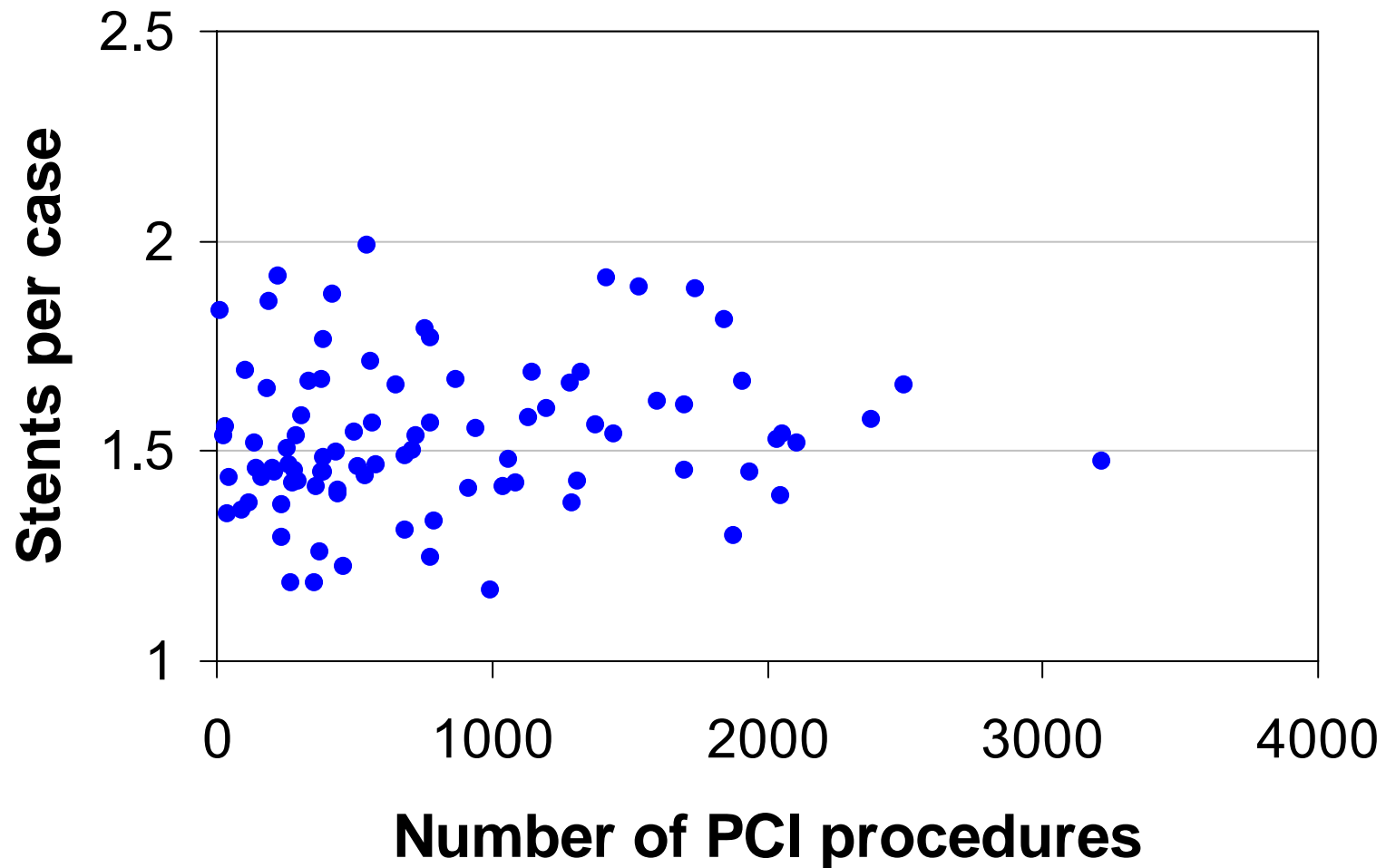
2008 data: Ludman



Mean Stents per Case (by PCI unit)



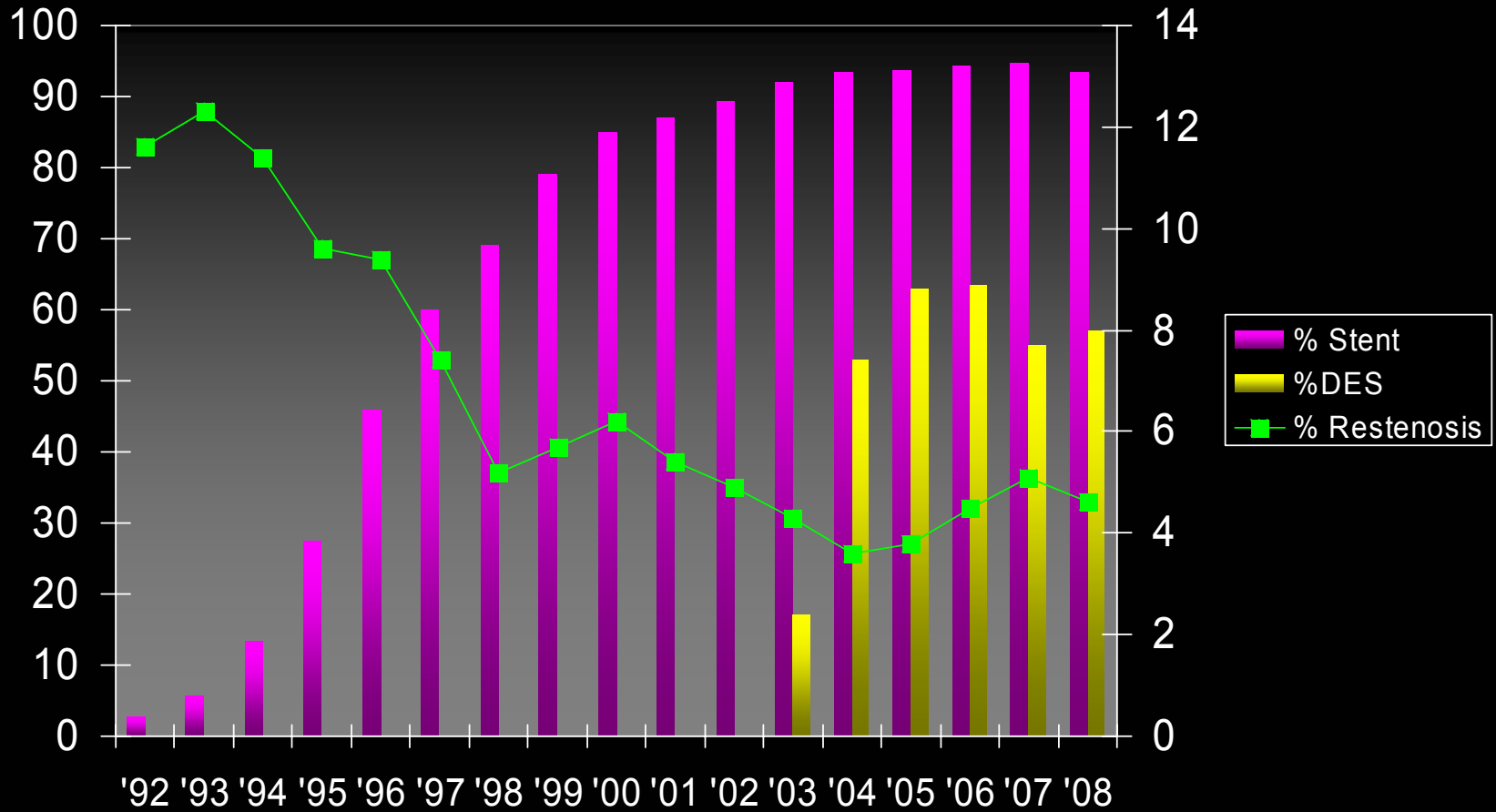
2008 data: Ludman



BMS and DES use v PCI for Restenosis



2008 data: Ludman



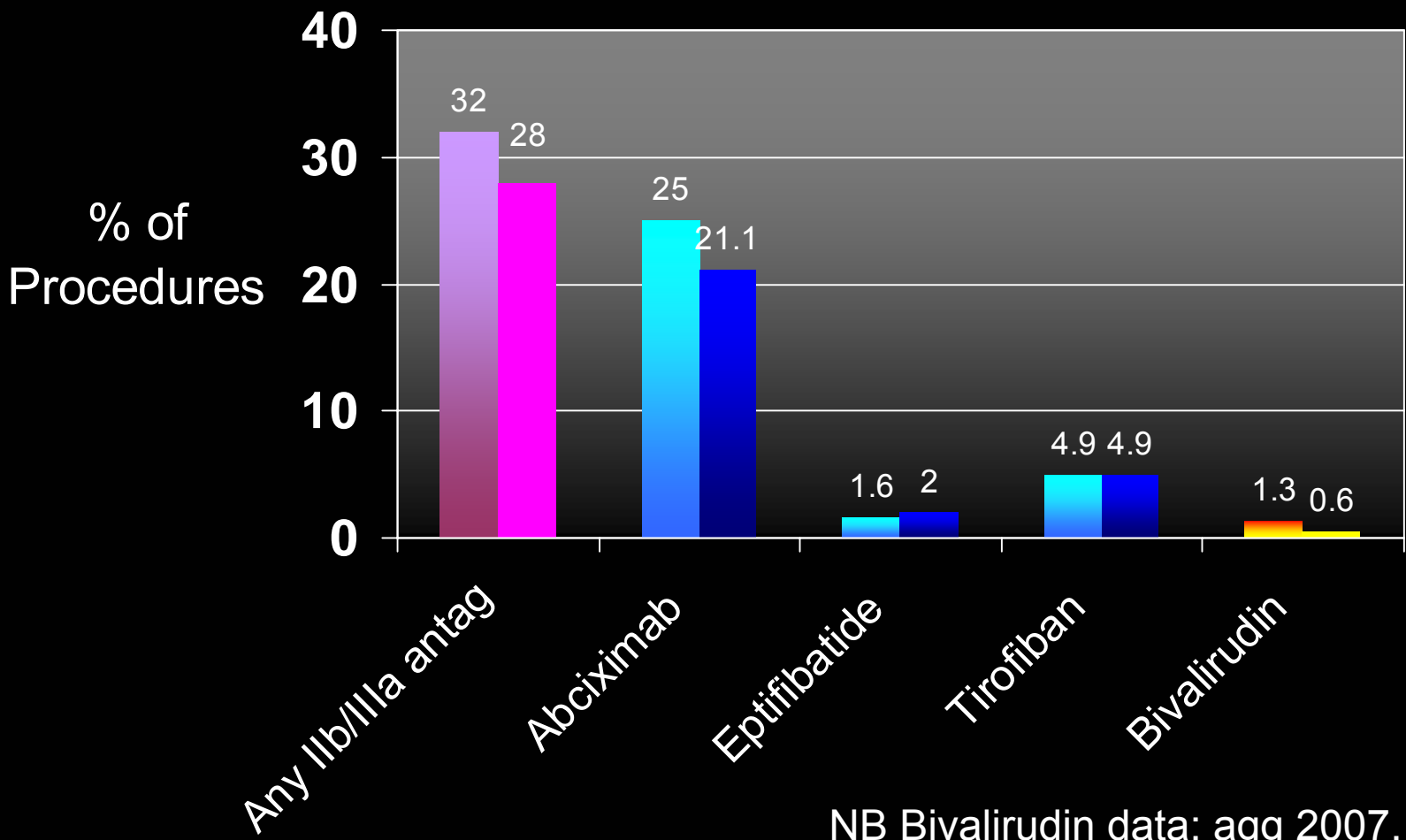
Adjunctive therapy

Use by Type



2008 data: Ludman

■ 2007 ■ 2008



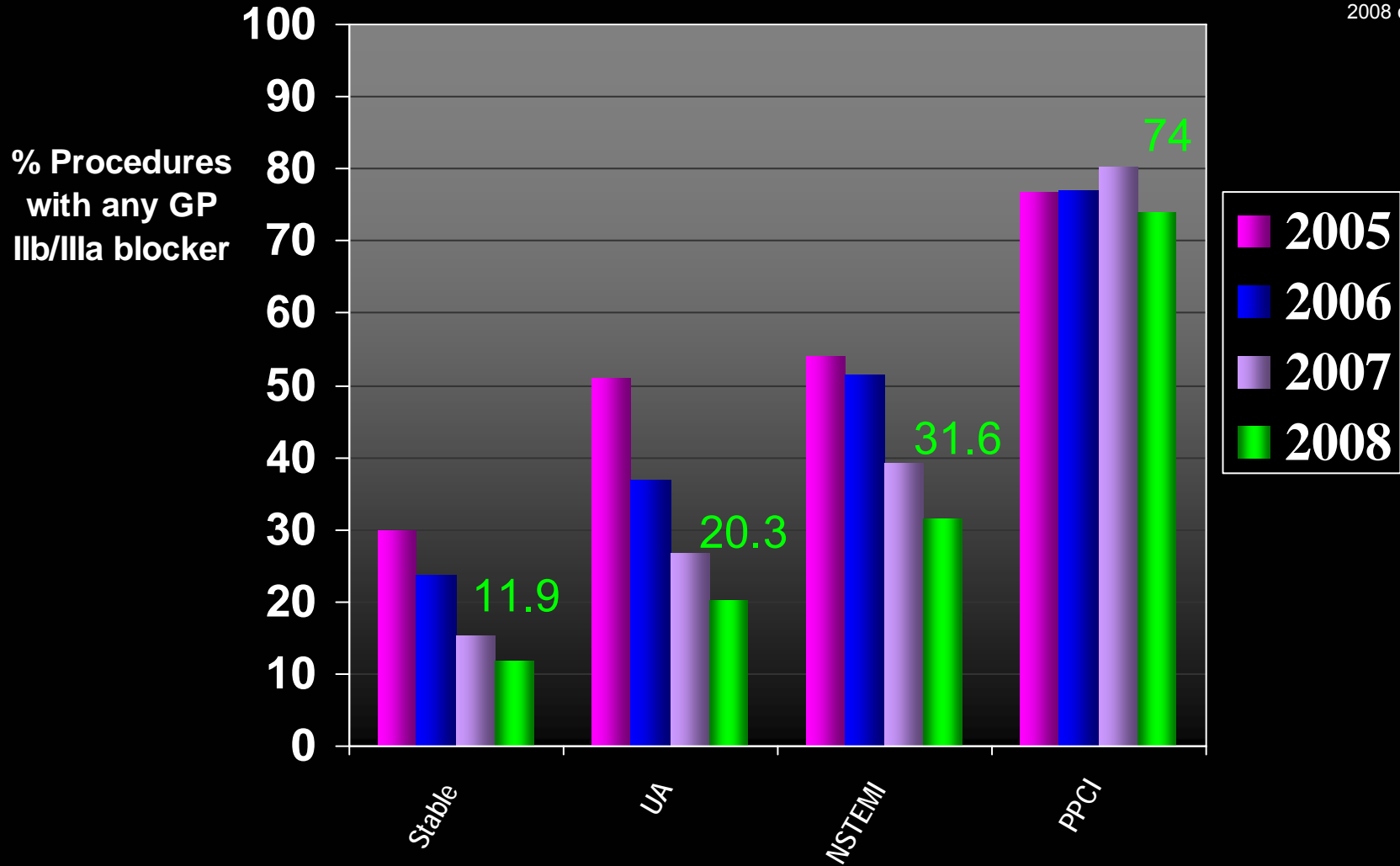
NB Bivalirudin data: agg 2007, CCAD 2008

GP IIb/IIIa Antagonists

Use by Presentation



2008 data: Ludman



LV Support



2008 data: Ludman

Data for circulatory support available for 66,910 procedures

LV Support	Number	%
Inotropes	359	0.54 %
IABP	1085	1.62 %



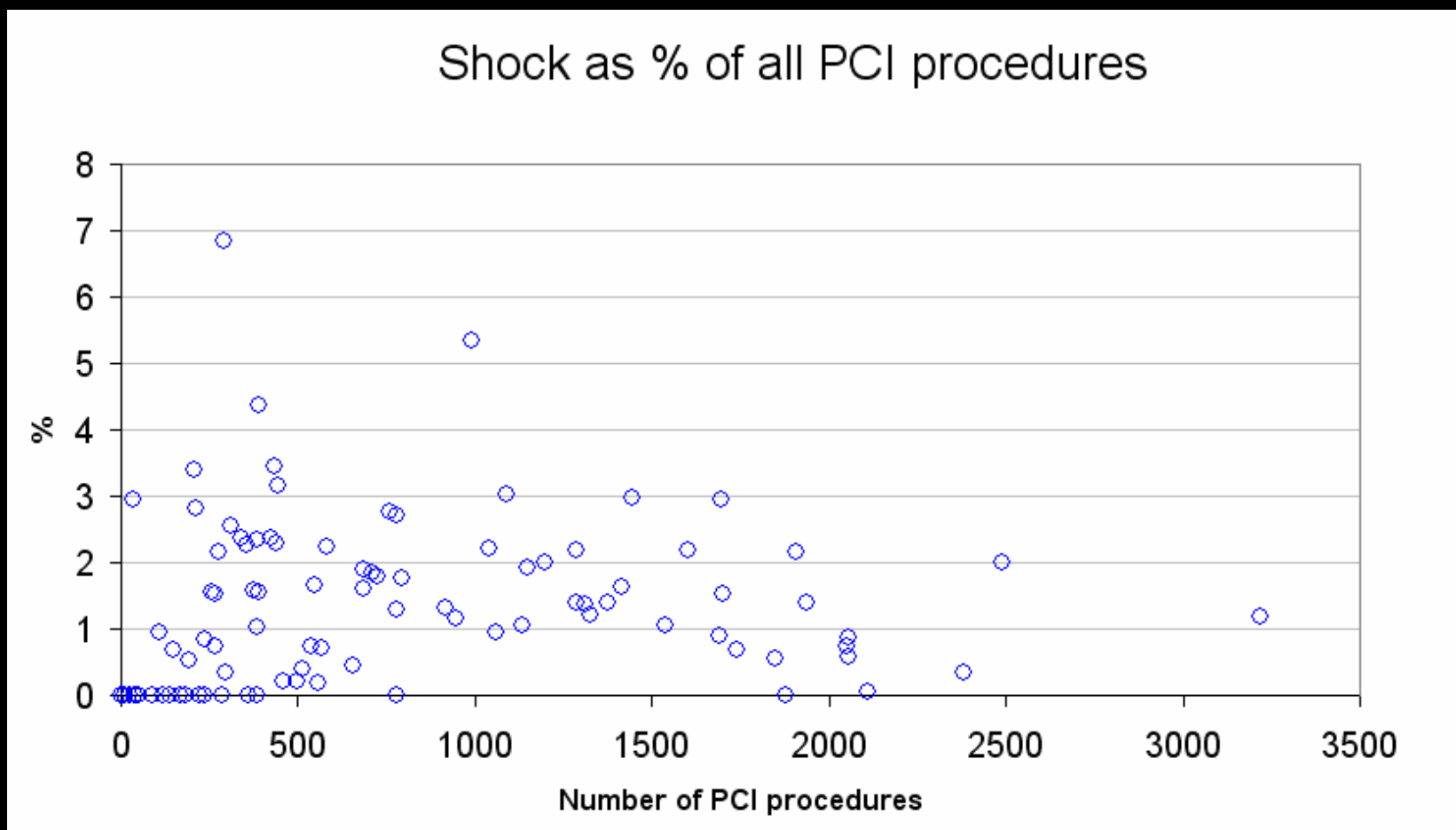
Cardiogenic Shock

% Cases with shock by PCI unit



2008 data: Ludman

Shock in 1.4% of cases (1064 of 74,250)

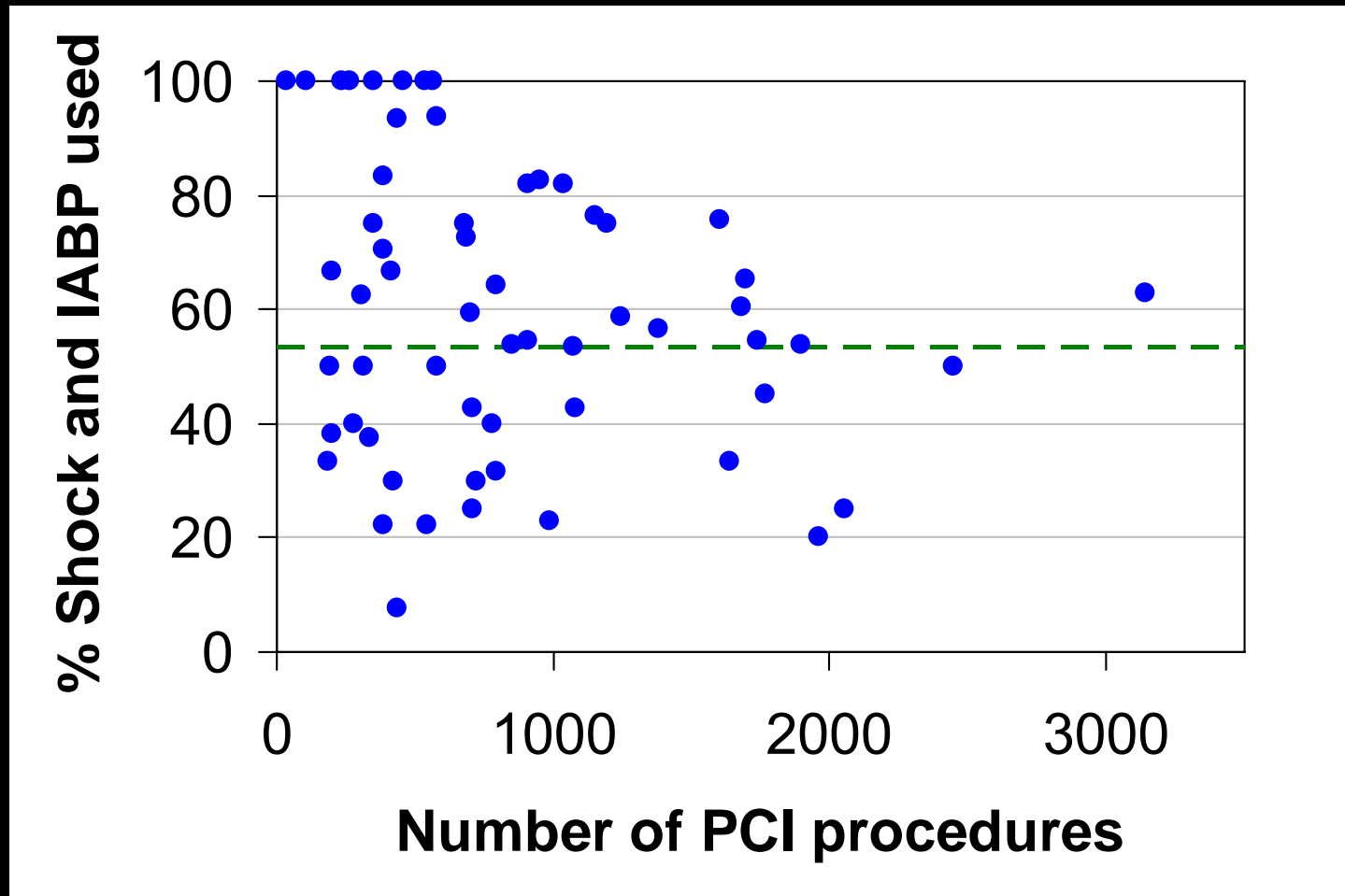


% Shock Cases Treated with IABP support by total PCI unit activity

Mean = 53.6%



2008 data: Ludman

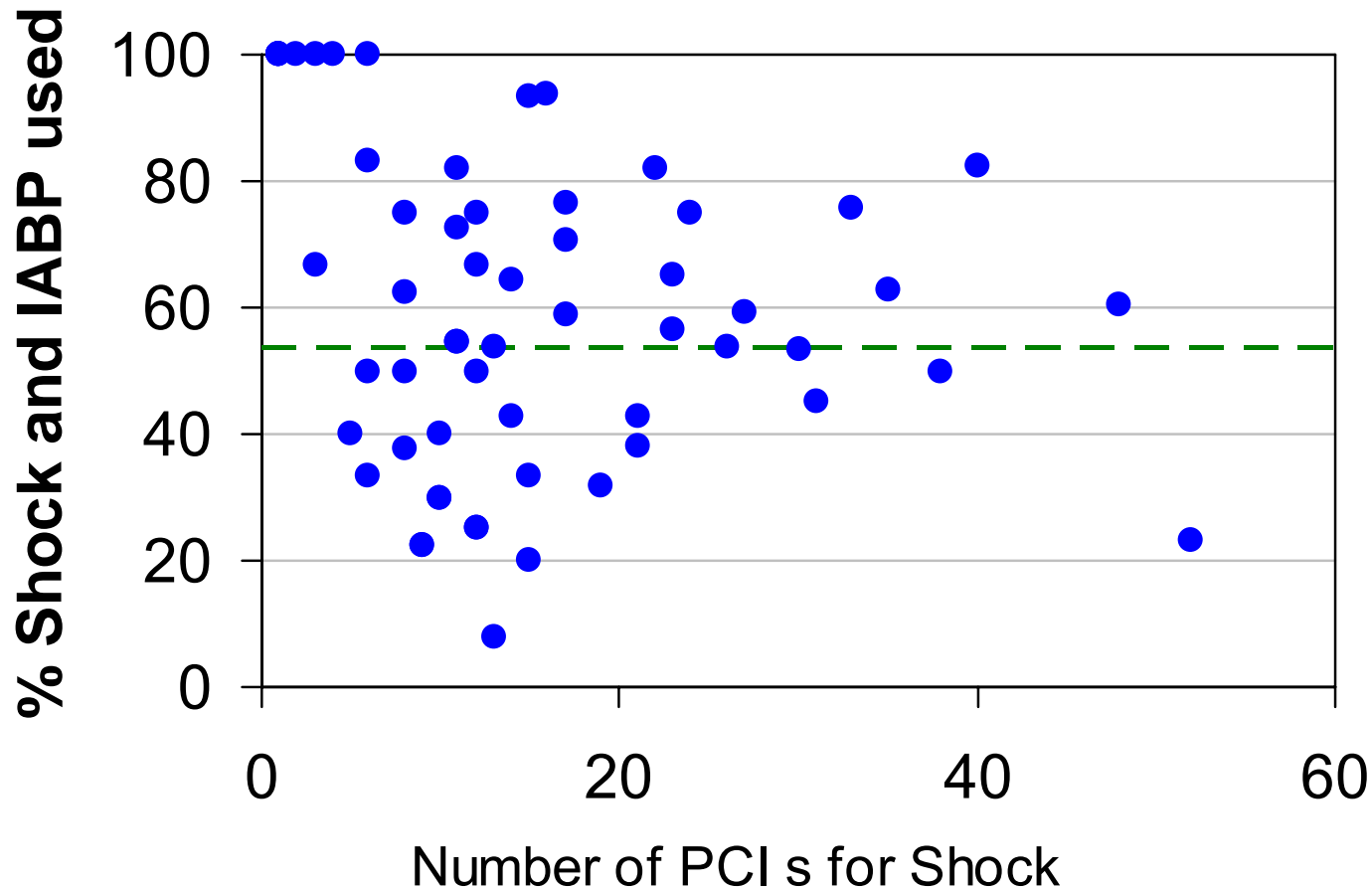


% Shock Cases Treated with IABP support by total PCI unit activity for shock

Mean = 53.6%

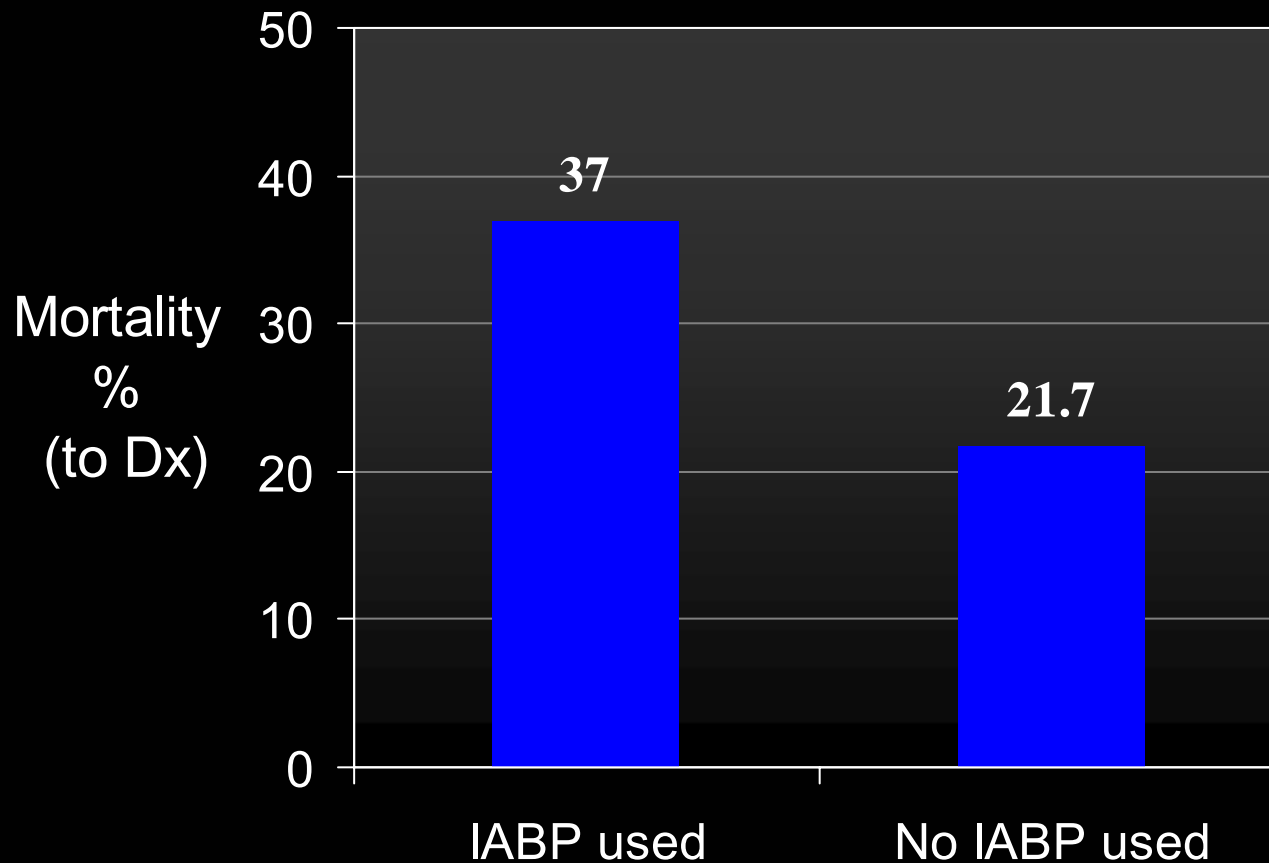


2008 data: Ludman



LV Support

- Mortality (in hosp) v IABP use in shock
 - Classification of shock is subjective



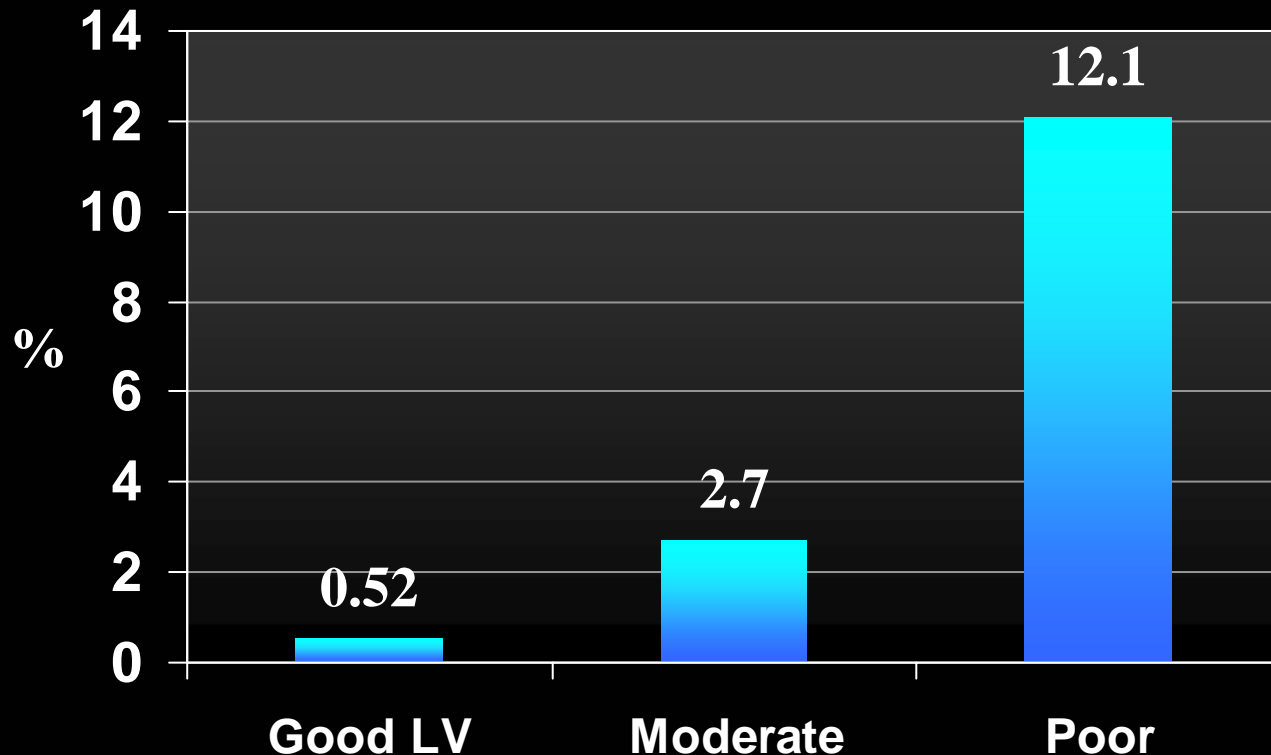
LV Support

% cases using IABP v LV function

- Total cases 74,250
- Data from 33,915 cases



2008 data: Ludman



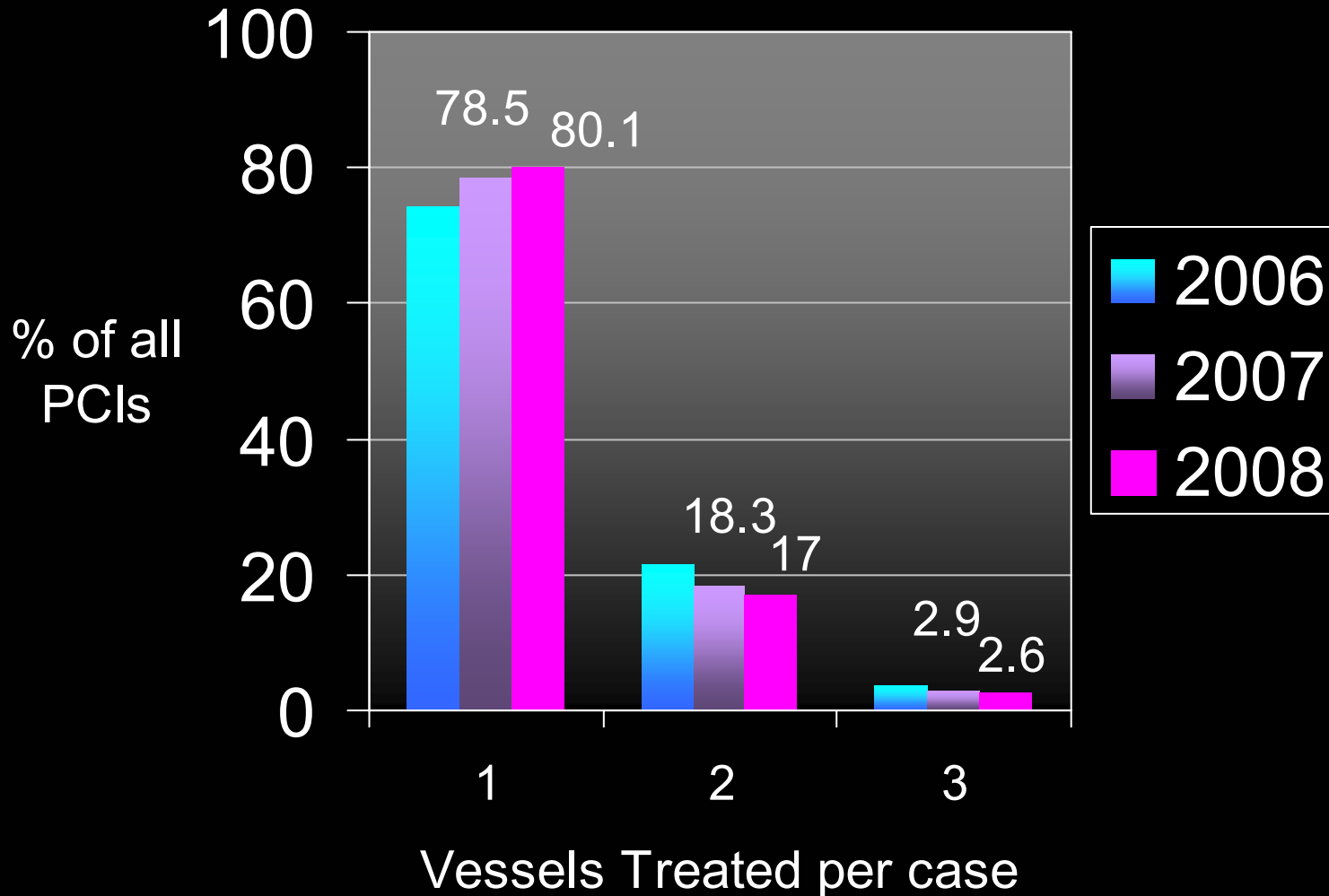
Multi-vessel Disease



Multi-vessel Treatment



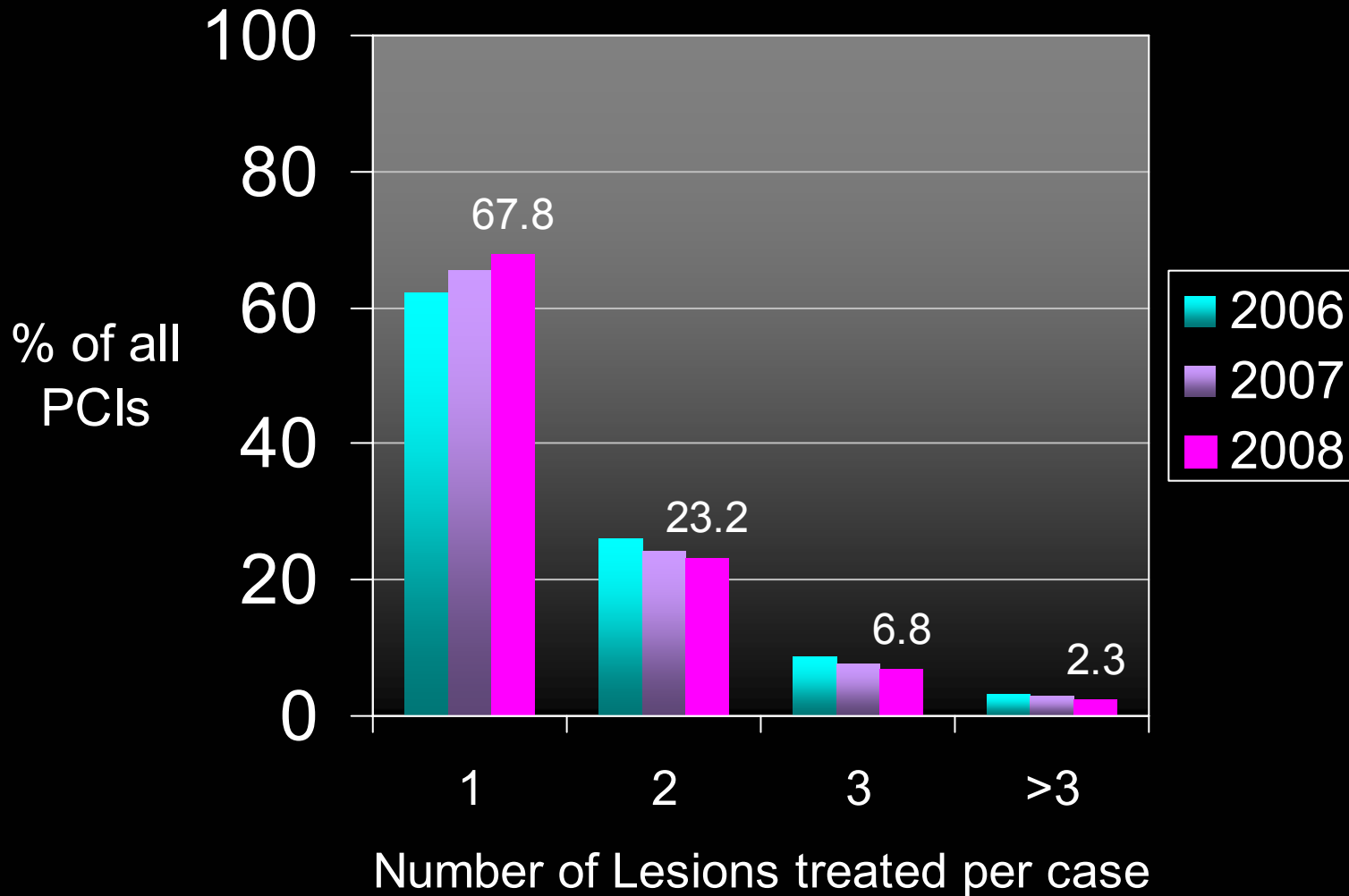
2008 data: Ludman



Multi-Lesion Treatment



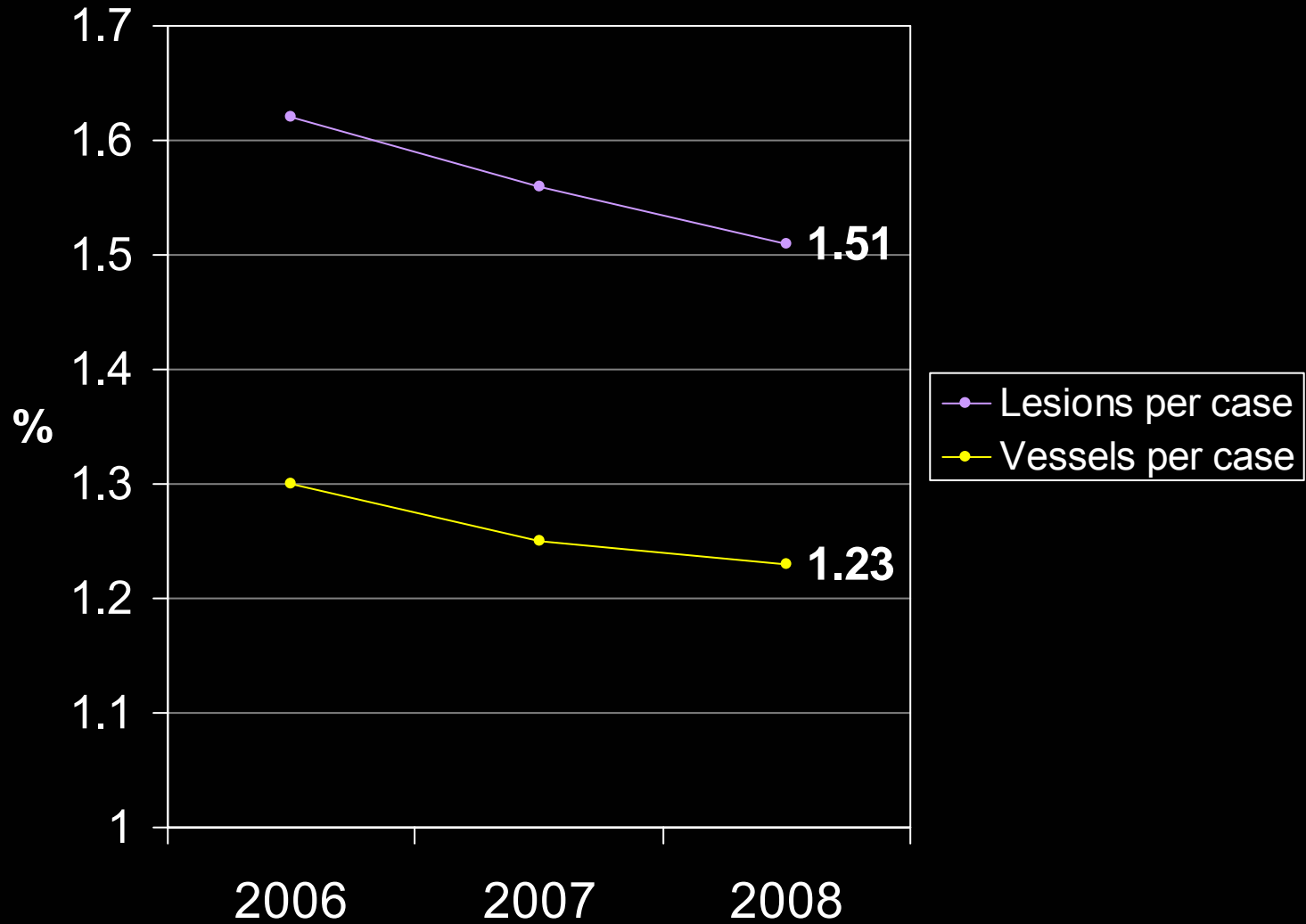
2008 data: Ludman



Multi-Lesion Treatment



2008 data: Ludman

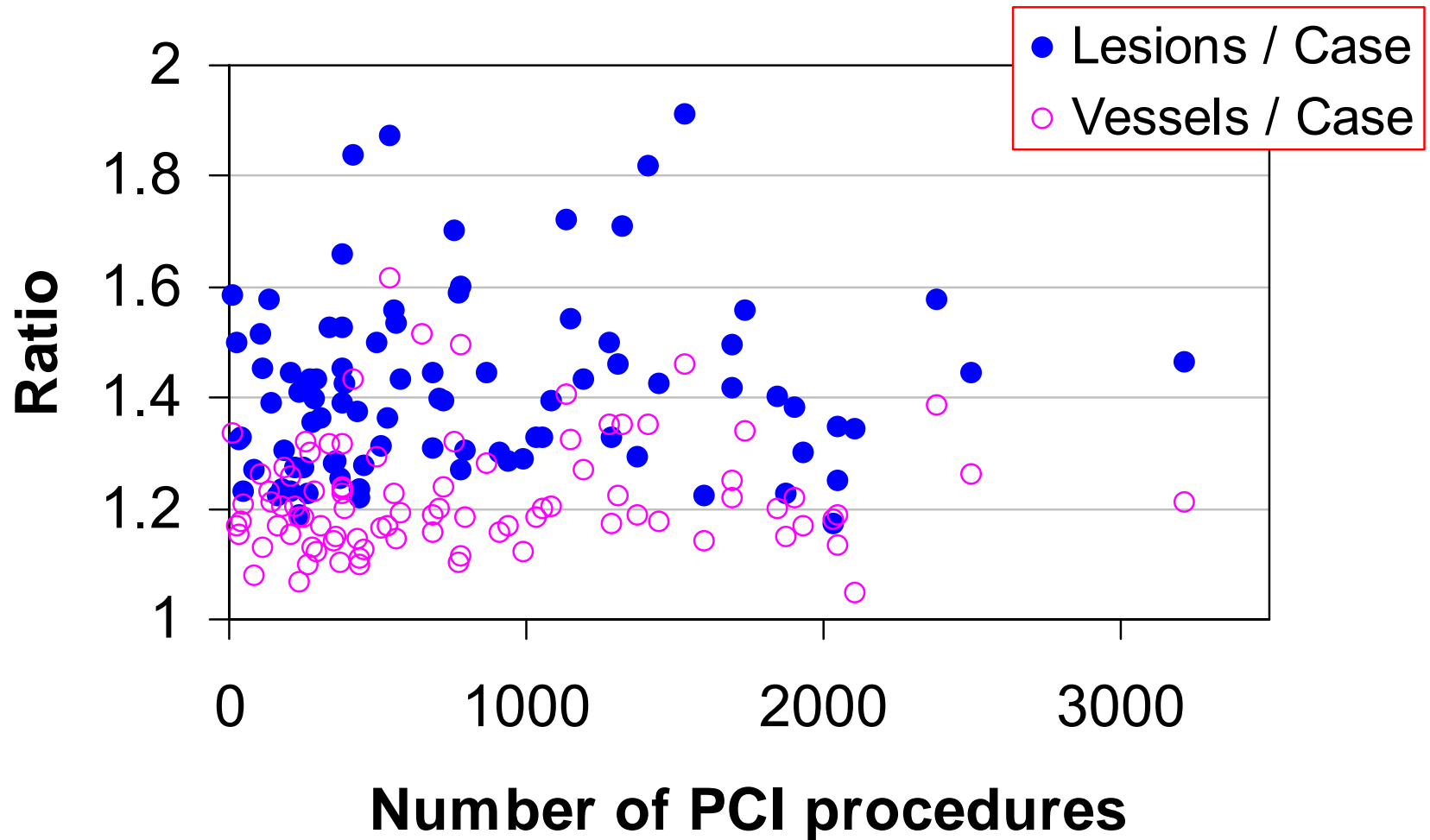


Multi-vessel Treatment

By centre - 2008



2008 data: Ludman



Additional Interventional Coronary Techniques



2008 data: Ludman

	Units	No	Δ % cf 2007	Mean*	Max Cases
Rotablation	45	1118	+32%	25	81
Laser	11	145	+77%	13	49
Cutting balloon	66	986	-6%	15	137
Thrombectomy	64	3749	+153 %	59	385
Distal protection	63	650	-12%	10	60

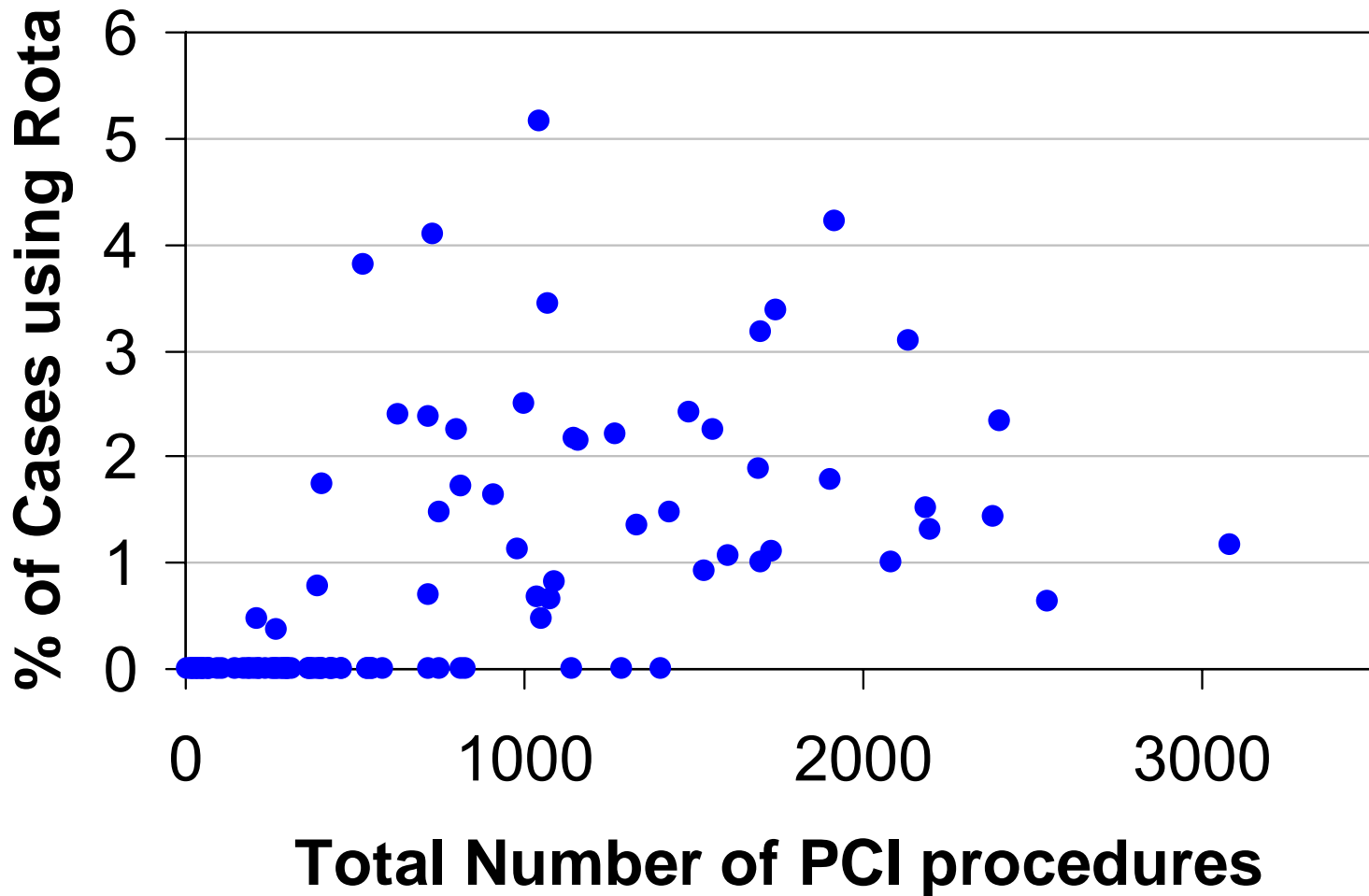
*Mean number in units using the technique

Aggregate data

Rotational Atherectomy



2008 data: Ludman



Other Diagnostic Techniques



2008 data: Ludman

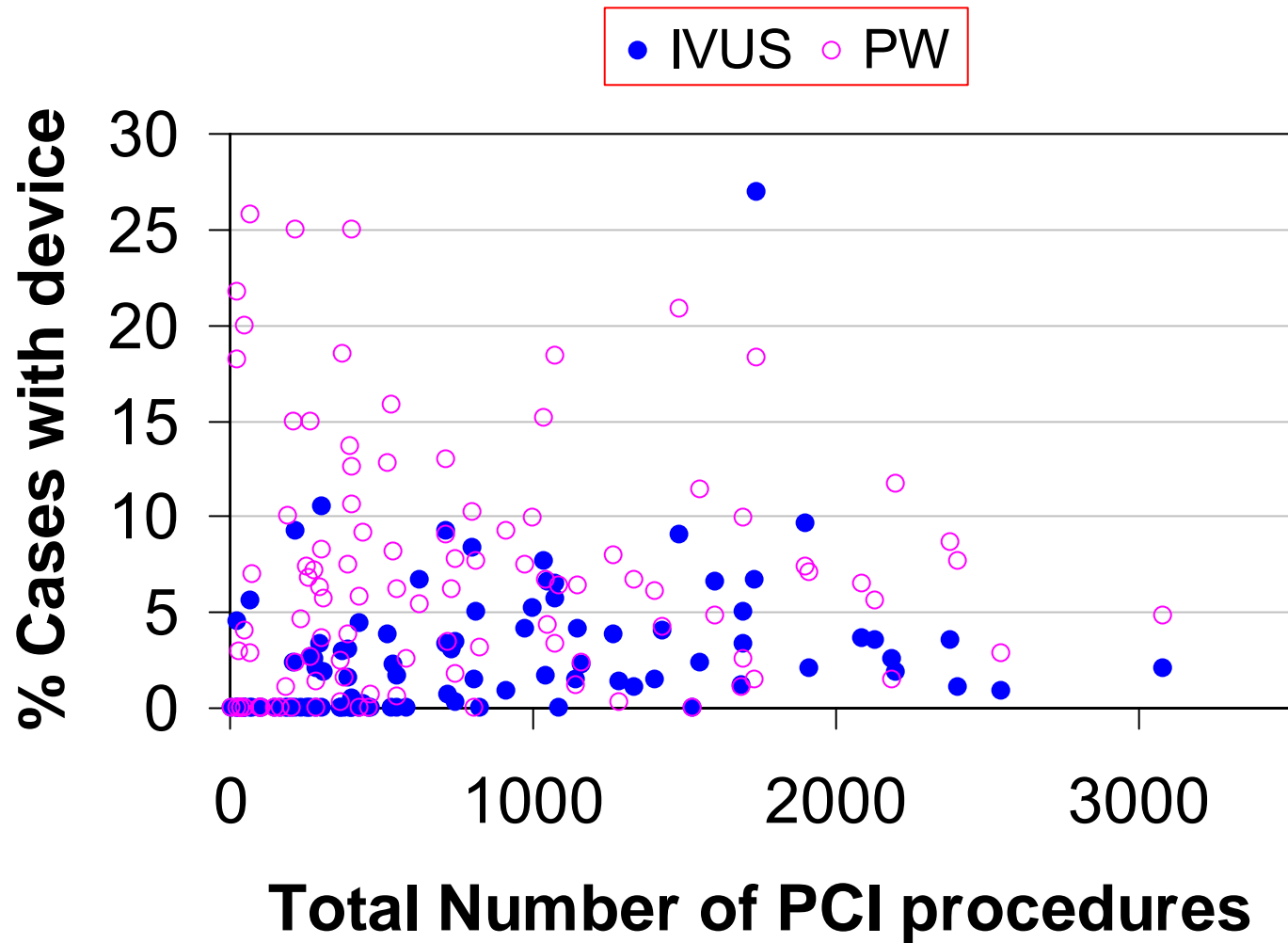
	Units	No	Δ cf 2007	Mean	Max Cases
IVUS	63	2836	+37%	45	469

Press wire	88	5406	+39%	61	318
------------	----	------	------	----	-----

IVUS and Pressure Wire



2008 data: Ludman



Radial Artery Access



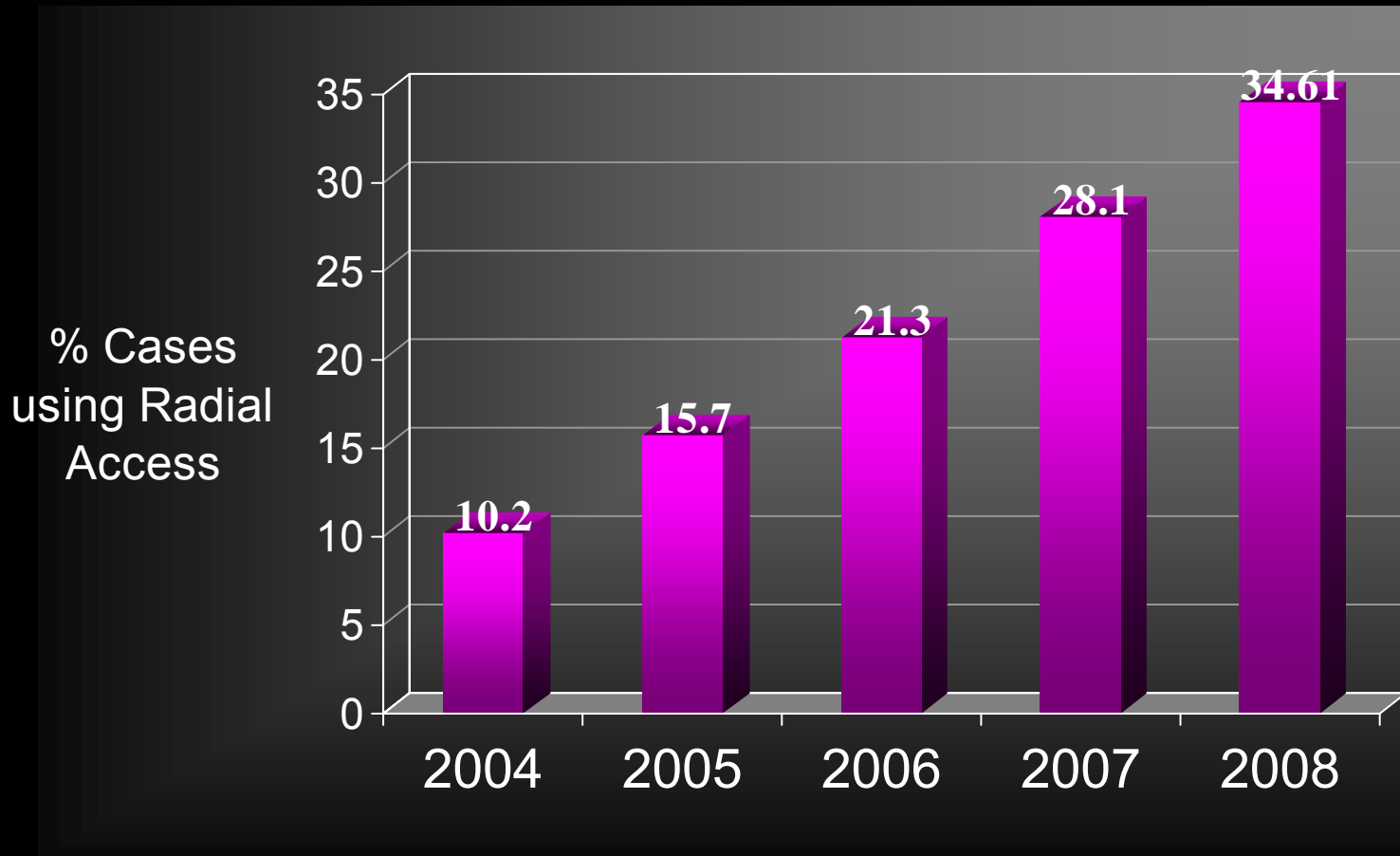
2008 data: Ludman

- Overall use
- Use in different presenting syndromes
- Complications
 - Bleeding
 - Stroke
- Door to Balloon times

Radial Artery Access



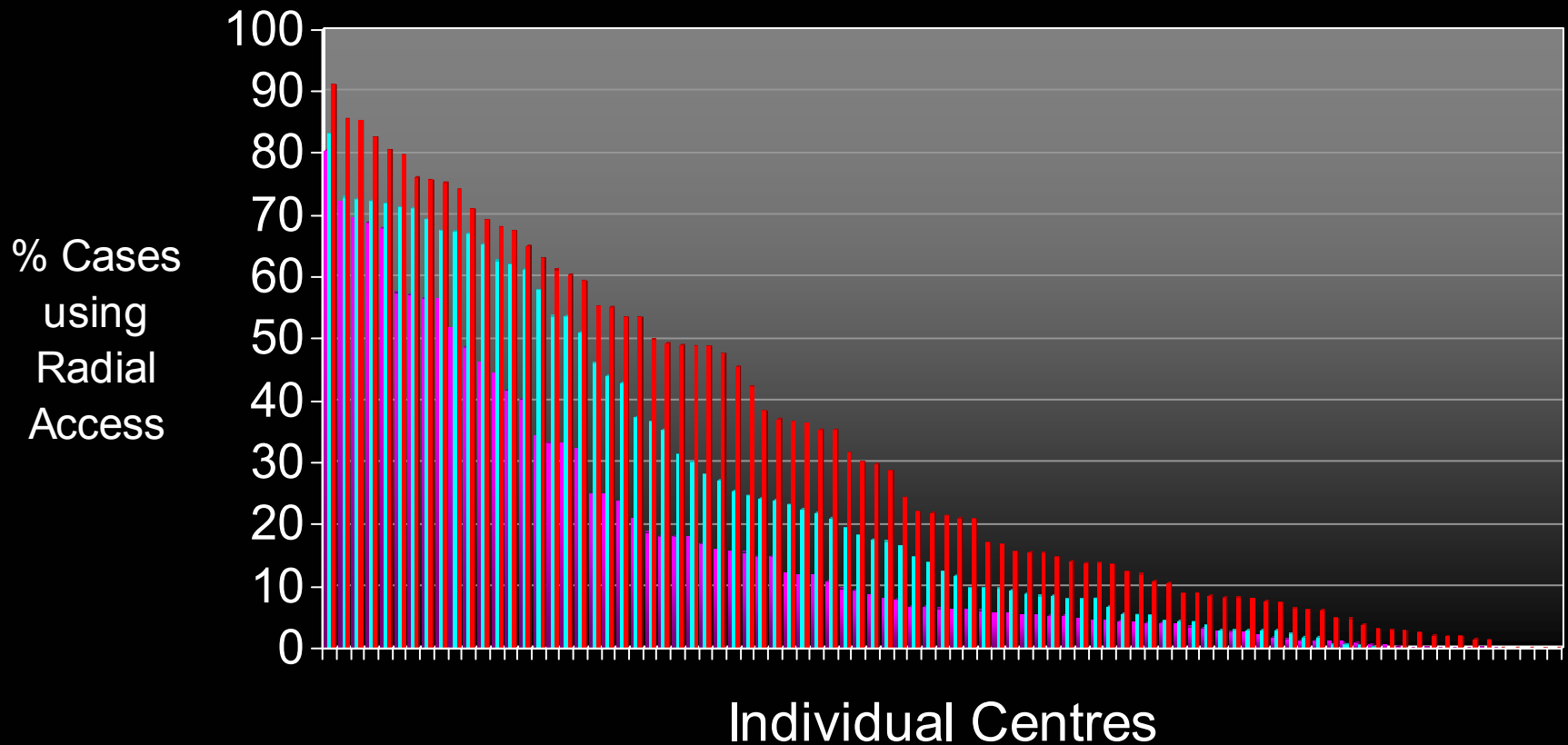
2008 data: Ludman



Radial Artery Access



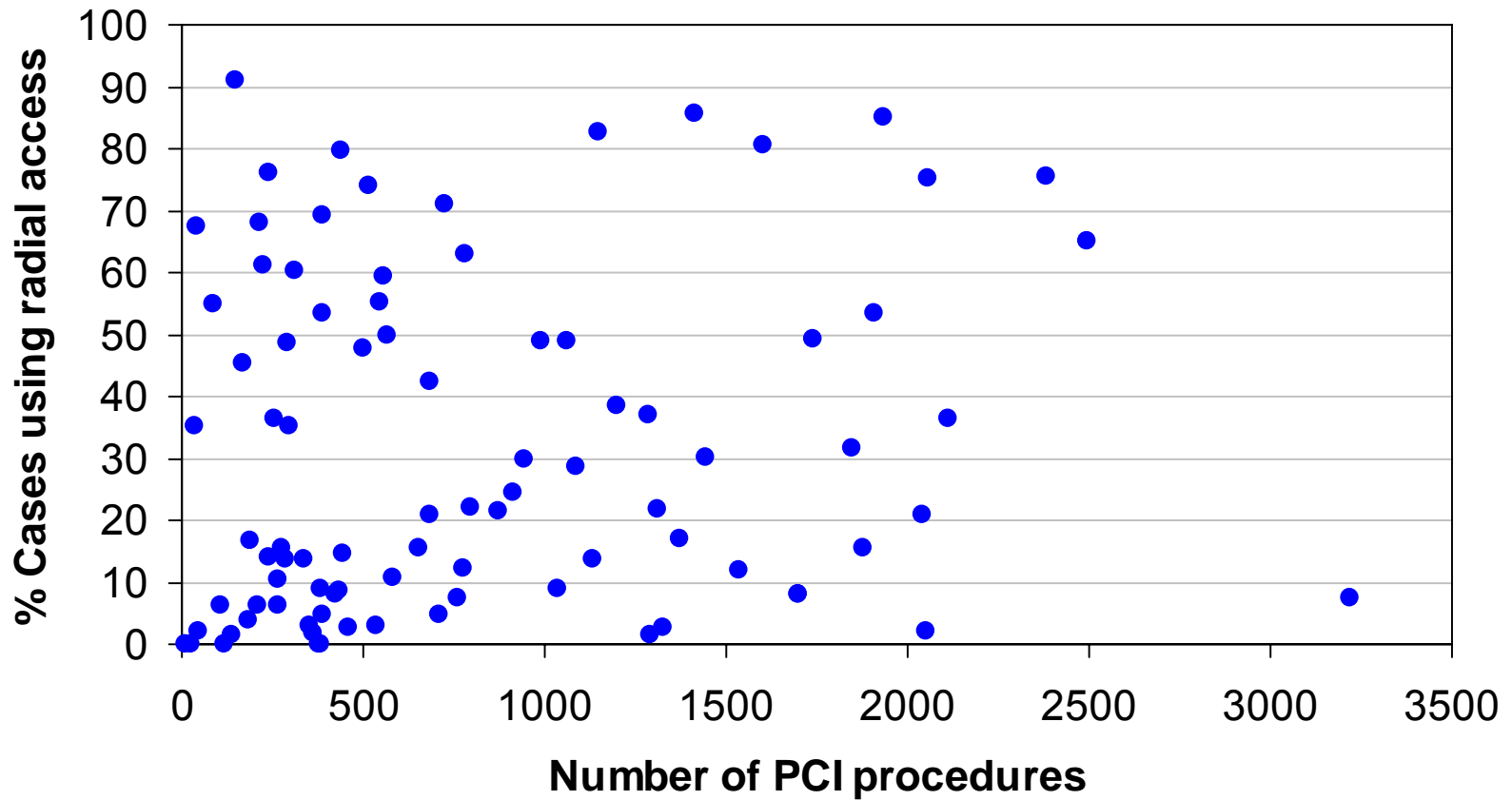
2008 data: Ludman



Radial Artery Access



2008 data: Ludman

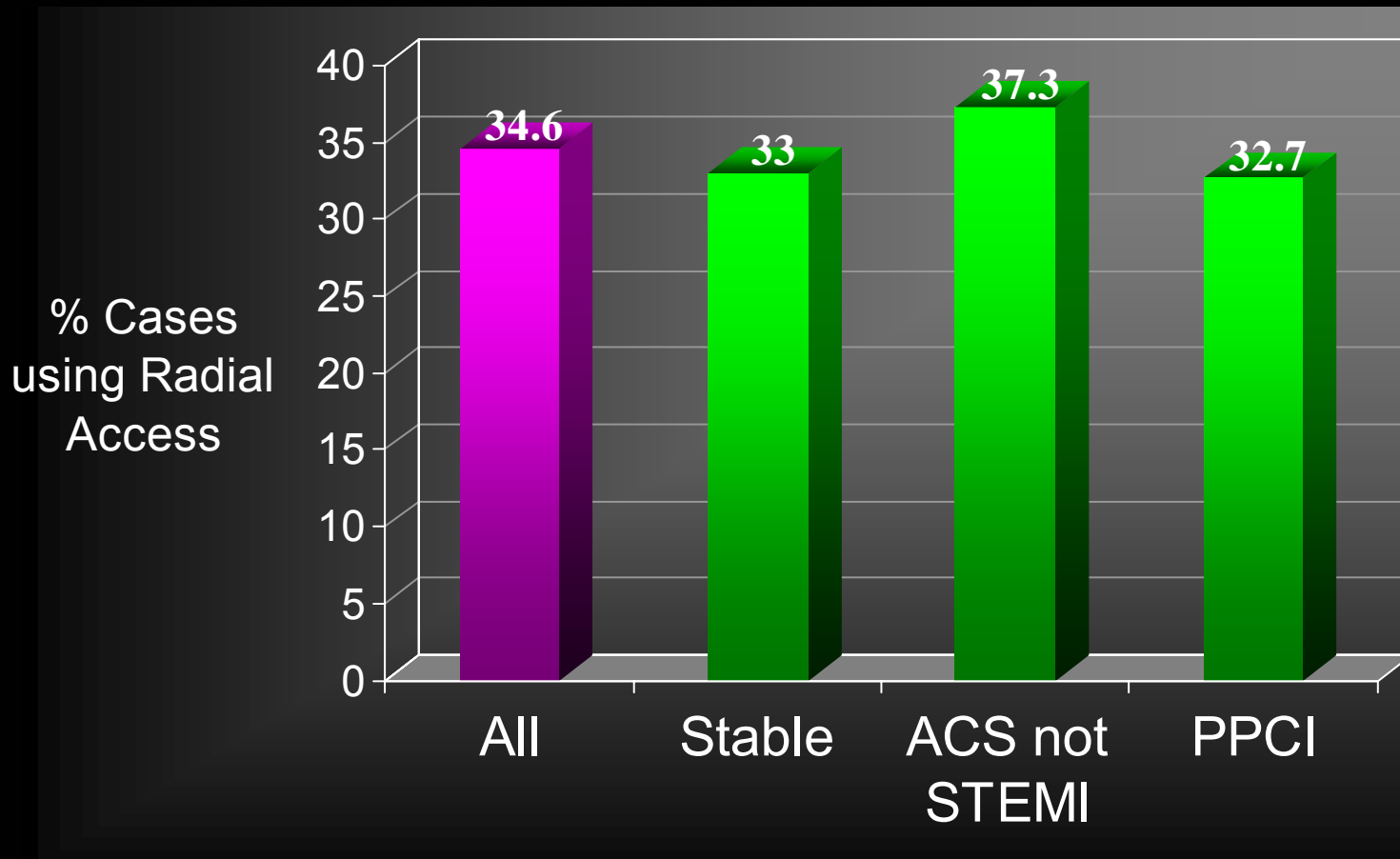


Radial Artery Access

Clinical Syndrome



2008 data: Ludman



Complication by Access route

Complications to hospital Dx:

False aneurysm

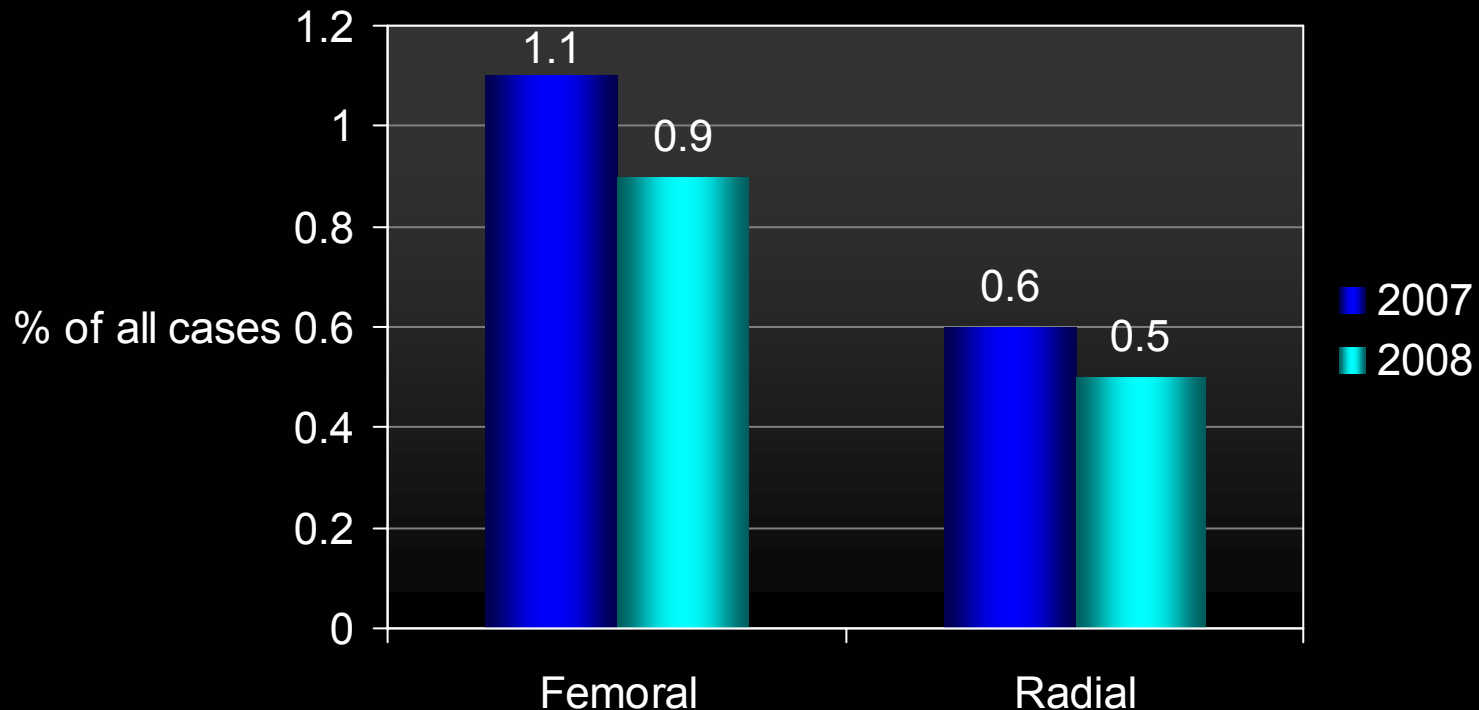
Haemorrhage (retroperitoneal, delay Dx, surgery)

Art occlusion / dissection

Any need for surgery



2008 data: Ludman



Complication by Access route (including bleeding)



2008 data: Ludman

Complications to hospital Dx:

Arterial complications 1 to 11 inclusive:

- False aneurysm

- Haemorrhage (retroperitoneal, delay Dx, surgery)

- Art occlusion / dissection

- Any need for surgery

PCI hospital outcomes:

- 5. arterial complication

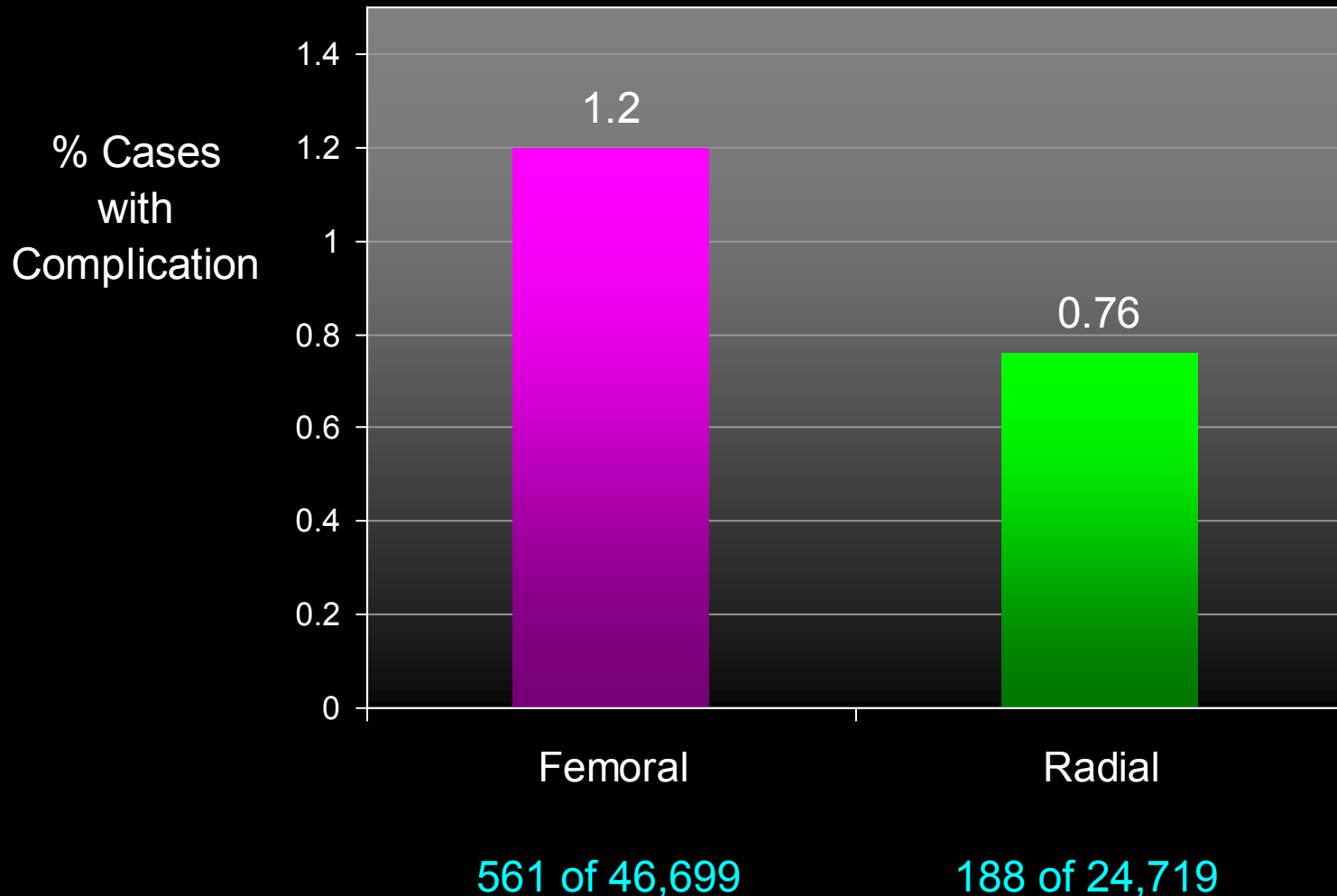
- 13. Blood Tx

- 17. Platelet Tx

Complication by Access route (including bleeding)



2008 data: Ludman

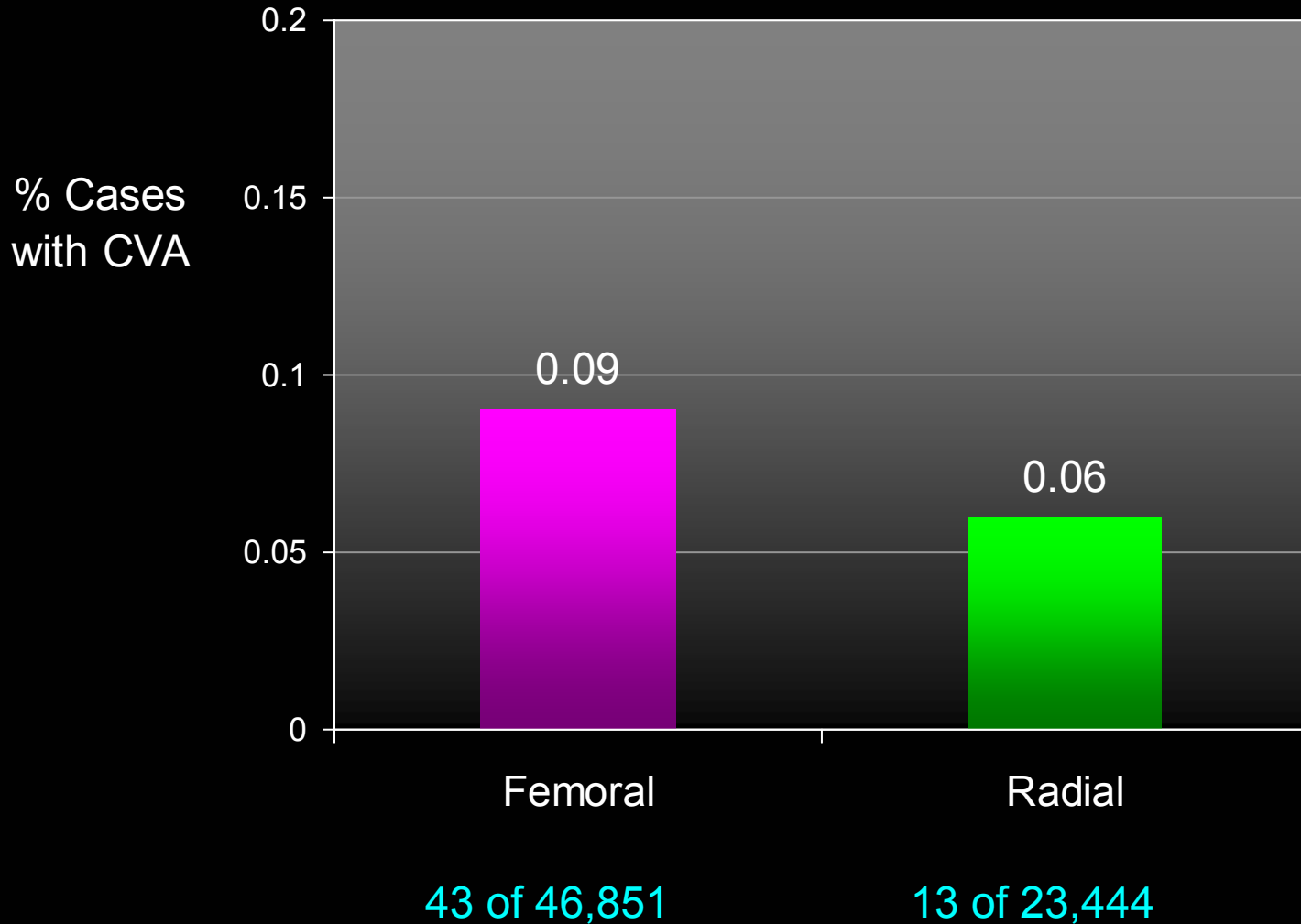


Complication by Access route

CVA



2008 data: Ludman



Door to Balloon time

Femoral v Radial



2008 data: Ludman

- Methodology
 - 2008 data
 - all centres with default STEMI Rx PPCI
 - 24/7 and day time only
 - direct admission only
 - (to avoid problems with D1 or D2)
 - Primary, no shock
 - radial v femoral
 - data cleaning
 - ignored times > 240 min and negative

DTB time

Femoral v Radial



2008 data: Ludman

Results

	FA	RA	p
Cases	2,511	976	
Mean	66.02	63.16	0.08
Median	57	54	

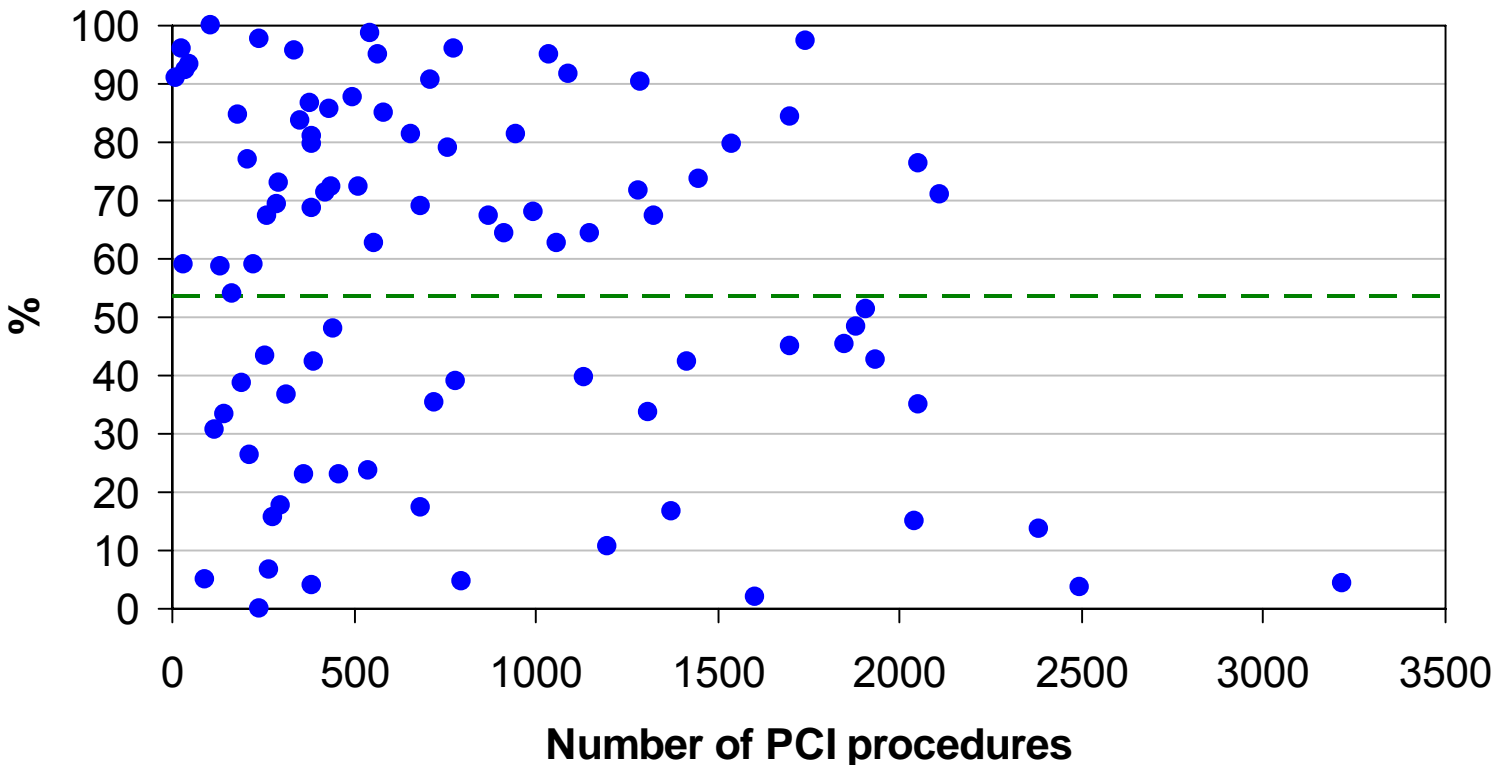
Femoral closure devices

- % PCI via FA using closure device



2008 data: Ludman

FA closure (PCI from FA) 2006 = 39.6%
2007 = 50.7%
2008 = 53.6%



Contents



2008 data: Ludman

- Structure
 - New centres
 - Total PCI numbers
 - No of procedures per unit
 - PCI pmp and by country
 - PCI Operators
 - Surgical cover
 - Day case activity
 - Primary PCI units
- PCI Procedure specific data
 - CCAD data completeness
 - Demographics
 - Ethnicity
- Appropriateness
 - indication for PCI / Clinical syndrome
 - Circadian activity for PPCI
 - Stents (BMS and DES)
 - Adjunctive therapy
 - LV support
 - Shock
 - Multi-vessel treatment
 - Additional interventional techniques
 - Arterial access
 - complications
 - DTB times
- **Process of care**
 - Delays to treatment NSTEMI
 - Delays to treatment Primary PCI
 - DTB times by unit
 - CTB times by unit
- Non coronary intervention
 - HOCM septal ablation
 - Mitral valuloplasty
 - Other adult structural intervention
 - Transcutaneous Aortic Valves
- Outcome
 - MACCE
 - Outcome by syndrome
 - Outcome by lesion subset
 - Risk adjusted outcomes

Dataset Updates to 5.4.4



2008 data: Ludman

Data point added
Jan 09

Data point added
June 08



Door 1

Door 2



Door 1



Balloon



Home

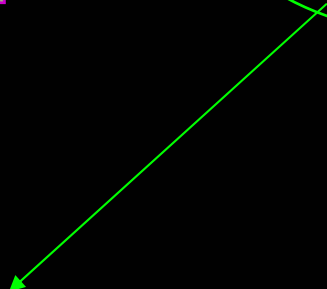
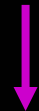
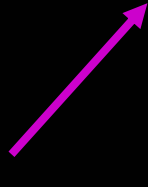
Symptom

Call

Door 1

Balloon

Home



Time fields

Data completeness

For Healthcheck 08/09

BCIS Field No.	Patients treated for STEMI by	MINAP Field No.
	Primary PCI	
2.07	Date/time of symptom onset	3.01
2.08	Date/time of arrival at first hospital	3.06
5.26	Date/time of arrival at PCI hospital	
3.26	Date/time of first balloon inflation	3.09
4.04	Discharge date	4.01

 > 90% completeness in each

Time fields

Data completeness



2008 data: Ludman

2.07 symptom onset	2.08 arrival at 1st hosp	5.26 arrival at PCI unit	3.26 Balloon	4.04 Discharge date	
100	100	100	100	100	QEB. Queen Elizabeth Hospital Edgbaston
100	100	100	100	100	RSC. Royal Sussex County Hospital
99.8	99.6	100	100	100	SCM. James Cook University Hospital
97.6	99.6	99.6	98	99.2	KCH. King's College Hospital
97.3	97.3	99.1	99.1	100	RFH. Royal Free Hospital
98.9	98.9	98.9	95.4	100	GRL. Glenfield Hospital
100	100	100	96.7	100	TOR. Torbay Hospital
98.8	100	100	98.8	100	WYT. Wythenshawe Hospital
96.3	99.3	99.3	99.3	100	RAD. John Radcliffe Hospital
94.6	95.7	98.9	97.8	100	STO. North Staffordshire Hospital
93.9	97	97	98.5	95.5	QAP. Queen Alexandra Hospital
98.5	99.3	99.3	100	100	SGH. Southampton General Hospital

Time fields

Data completeness



2008 data: Ludman



QEB. Queen Elizabeth Hospital Edgbaston
RSC. Royal Sussex County Hospital
SCM. James Cook University Hospital
KCH. King's College Hospital
RFH. Royal Free Hospital
GRL. Glenfield Hospital
TOR. Torbay Hospital
WYT. Wythenshawe Hospital
RAD. John Radcliffe Hospital
STO. North Staffordshire Hospital
QAP. Queen Alexandra Hospital
SGH. Southampton General Hospital

Time fields

Data completeness



2008 data: Ludman

2.07 symptom onset	2.08 arrival at 1st hosp	5.28 arrival at PCI unit	3.28 Balloon	4.04 Discharge date	
100	100	100	75	91.7	CRG. Craigavon Area Hospital
100	100	100	50	100	NHB. Royal Brompton Hospital
95.5	93.6	94.5	59.1	100	BRI. Bristol Royal Infirmary
97.4	97.4	85.6	97.7	100	HH. Harefield Hospital
100	100	100	97.2	100	DUD. City Hospital
99	97.9	97.9	93.8	100	SAN. Sandwell District General Hospital
100	50	50	100	100	VIC. Victoria Hospital
92.3	95.3	82.4	93.9	93.9	NCR. New Cross Hospital
98.6	99.3	97.1	100	98.6	UCL. University College Hospital
99.1	97.2	98.1	97.2	100	STH. St Thomas' Hospital
100	95.7	95.7	100	100	BHR. Royal Berkshire and Battle Hospital
100	85.7	85.7	57.1	100	SUN. Sunderland Royal Hospital
94.4	90.1	92.5	94.4	97.5	LGI. Yorkshire Heart Centre
100	92.6	92.6	96.3	96.3	AMG. Wycombe General Hospital
98.6	95.7	95.7	100	92.9	BOU. Royal Bournemouth General Hospital
100	94.8	94.8	87.9	100	MOR. Morriston Hospital
100	69.6	69.6	87	91.3	LIS. Lister Hospital
100	91.7	91.7	91.7	83.3	HHH. Hemel Hempstead General Hospital
89.9	90.5	93.5	84.6	100	WAL. Walsgrave Hospital
85.6	88.3	53.6	76.3	93.1	BAL. Barts and the London
85.7	92.1	81.7	90.5	100	EBH. Birmingham Heartlands Hospital

Time fields

Data completeness



2008 data: Ludman

2.07 symptom onset	2.08 arrival at 1st hosp	5.28 arrival at PCI unit	3.28 Balloon	4.04 Discharge date	
0	100	100	100	100	NHH. North Hampshire Hospital
74.6	65.8	67.5	98.2	100	MRI. Manchester Royal Infirmary
100	89.5	89.5	100	47.4	BAT. Royal United Hospital Bath
0	69.3	100	94.7	100	HAM. Hammersmith Hospital
5	55	55	75	100	RDE. Royal Devon & Exeter Hospital
0	100	100	0	100	ESU. East Surrey Hospital
60	52	52	16	72	UHW. University Hospital of Wales
2.2	0.4	0.7	88.7	100	GEO. St George's Hospital
0	25	25	0	50	NPH. Northwick Park Hospital
n/a	n/a	n/a	n/a	n/a	BRD. Bradford Royal Infirmary
n/a	n/a	n/a	n/a	n/a	CHN. Nottingham City Hospital
n/a	n/a	n/a	n/a	n/a	DGE. Eastbourne DGH
n/a	n/a	n/a	n/a	n/a	MHO. Manor Hospital
n/a	n/a	n/a	n/a	n/a	NGS. Northern General Hospital
n/a	n/a	n/a	n/a	n/a	STM. St Mary's Hospital

Time fields

Data completeness



target date	
10	NHH. North Hampshire Hospital
10	MRI. Manchester Royal Infirmary
.4	BAT. Royal United Hospital Bath
10	HAM. Hammersmith Hospital
10	RDE. Royal Devon & Exeter Hospital
10	ESU. East Surrey Hospital
2	UHW. University Hospital of Wales
10	GEO. St George's Hospital
0	NPH. Northwick Park Hospital
a	BRD. Bradford Royal Infirmary
a	CHN. Nottingham City Hospital
a	DGE. Eastbourne DGH
a	MHO. Manor Hospital
a	NGS. Northern General Hospital
a	STM. St Mary's Hospital

PCI for Acute Sx

Four admission scenarios



2008 data: Ludman

Admitted from
the community

Already
in hospital

Admission to
Non-PCI centre

Direct admission
to PCI centre

Transfer
to PCI centre

Hospital is a
PCI centre

Hospital is a
Non-PCI centre



PCI for Acute Sx

Four admission scenarios



2008 data: Ludman

Admitted from
the community

Already
in hospital

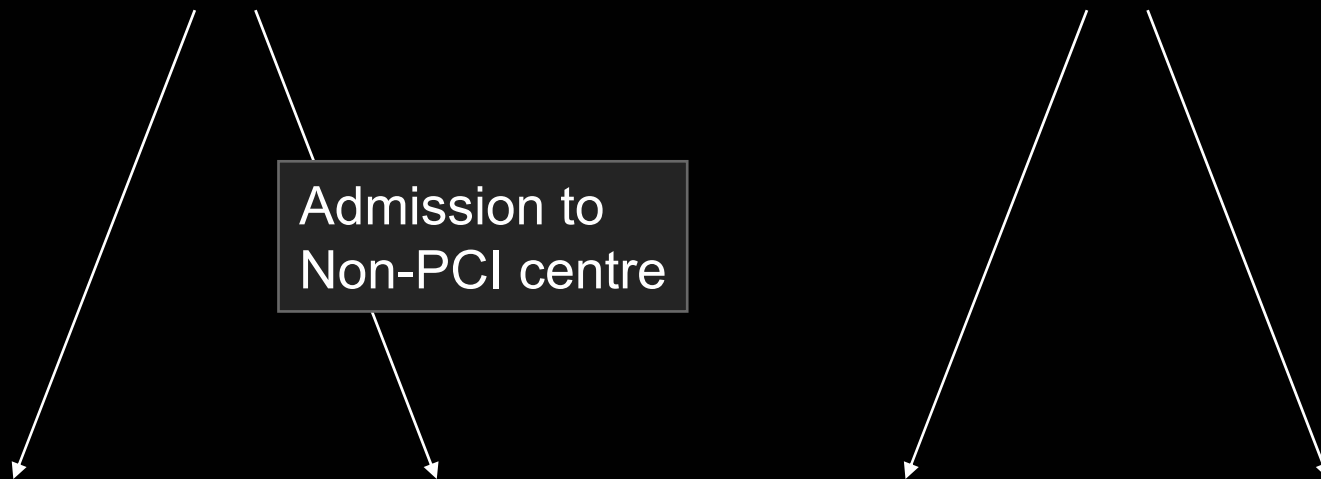
Admission to
Non-PCI centre

Direct admission
to PCI centre

Transfer
to PCI centre

Hospital is a
PCI centre

Hospital is a
Non-PCI centre



Scheduled reporting



2008 data: Ludman

BCIS Delays Report 01/01/2009 to present QEB - Message (Plain Text)

File Edit View Insert Format Tools Actions Help

Reply Reply to All Forward Print Copy Paste Undo Redo Bold Italic Underline Text Color Background Color

Extra line breaks in this message were removed. To restore, click here.

From: CCAD_Template_Development@ccad.org.uk

Subject: FW: BCIS Delays Report 01/01/2009 to present QEB

Attach... BCIS Delays Report-19-Sep-09 12-07 PM.xls (315 KB)

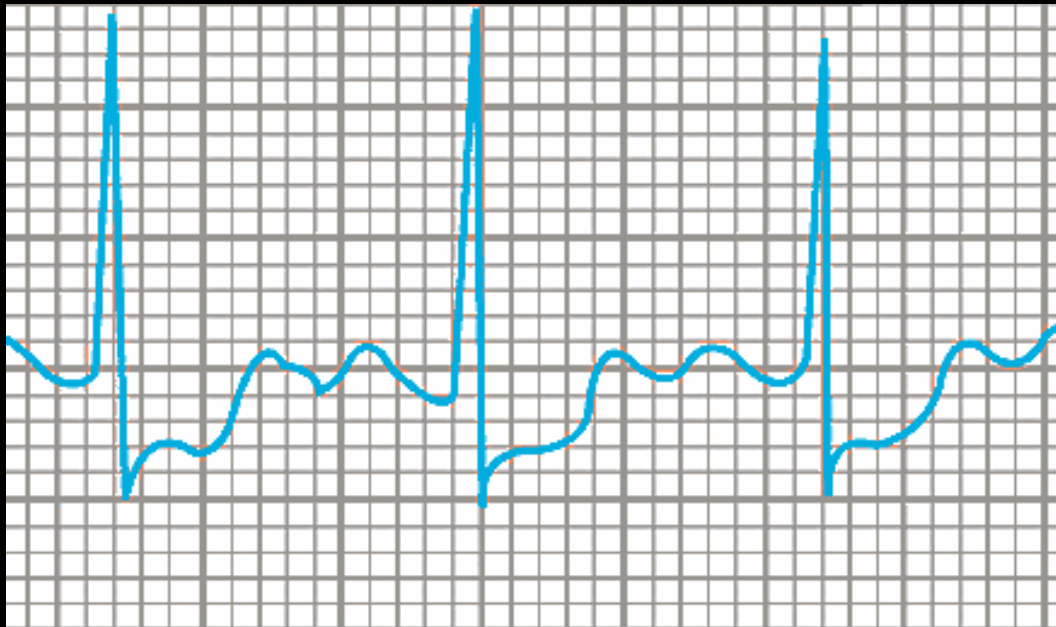
Dear Colleague,

Attached is an analysis of time delays to treatment for patients with acute coronary syndrome at our centre. The spreadsheet has been generated automatically (with a default data range) from the data submitted to BCIS-CCAD.

The spreadsheet is split into several worksheets:

1. Summary data: headline door to balloon times for primary PCI, and data completeness
2. Summary data help: an explanation of the method of calculation of data above. Attached are further explanations
3. "Unit code": Statistical process control charts of door to balloon times
4. Delays data: a detailed breakdown of the delays according to presenting syndrome and

NSTEMI



NSTEMI / UA / Convalescent STEMI

Direct admission v IHT - 2008



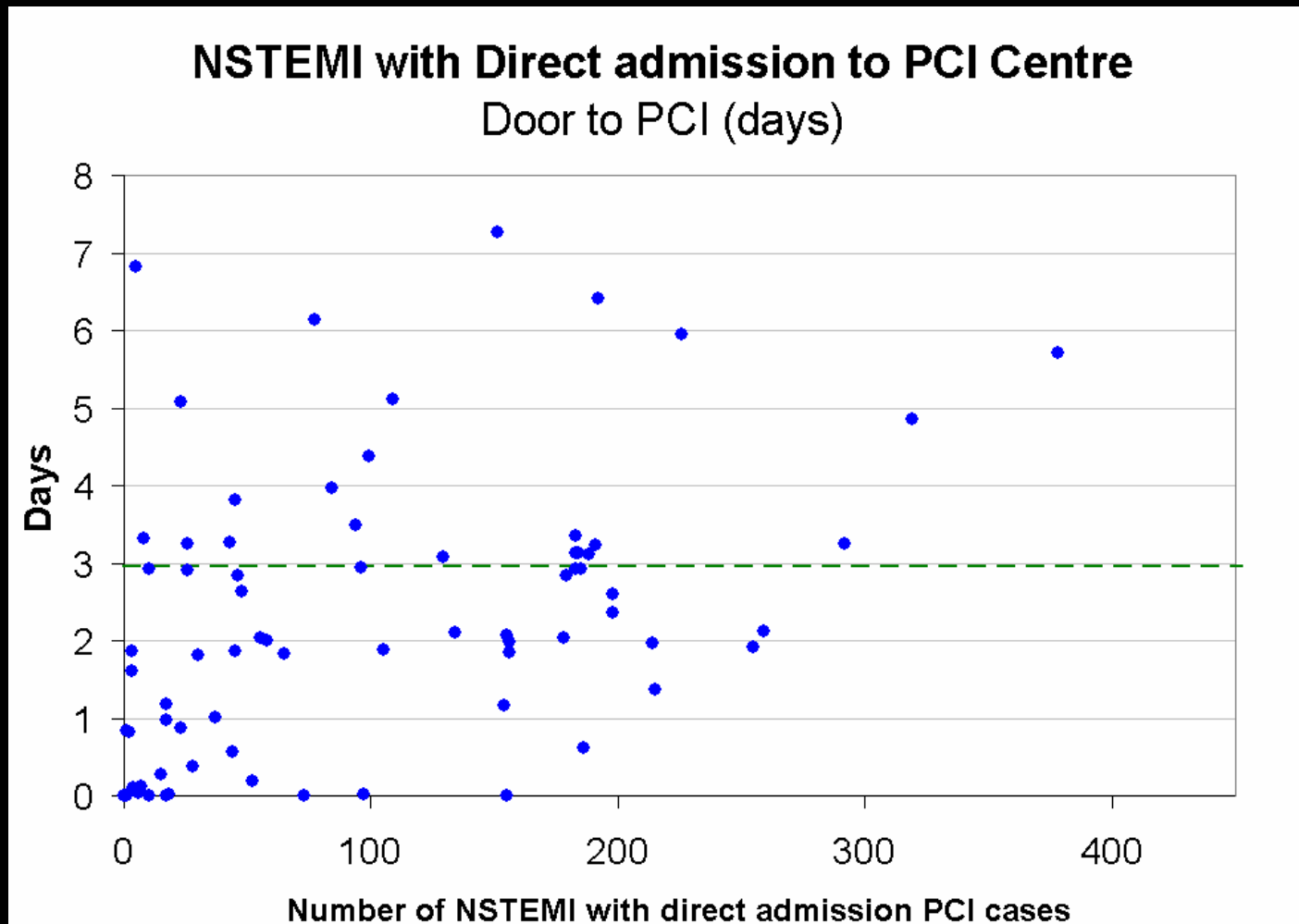
2008 data: Ludman

	Time Wtd mean of units' median times	Units
Direct: Door to PCI	2.96	Days
IHT: Door 1 to Door 2	3.2	Days
Door 2 to PCI	1.0	Days

NSTEMI / UA / Convalescent STEMI

Direct admission - 2008

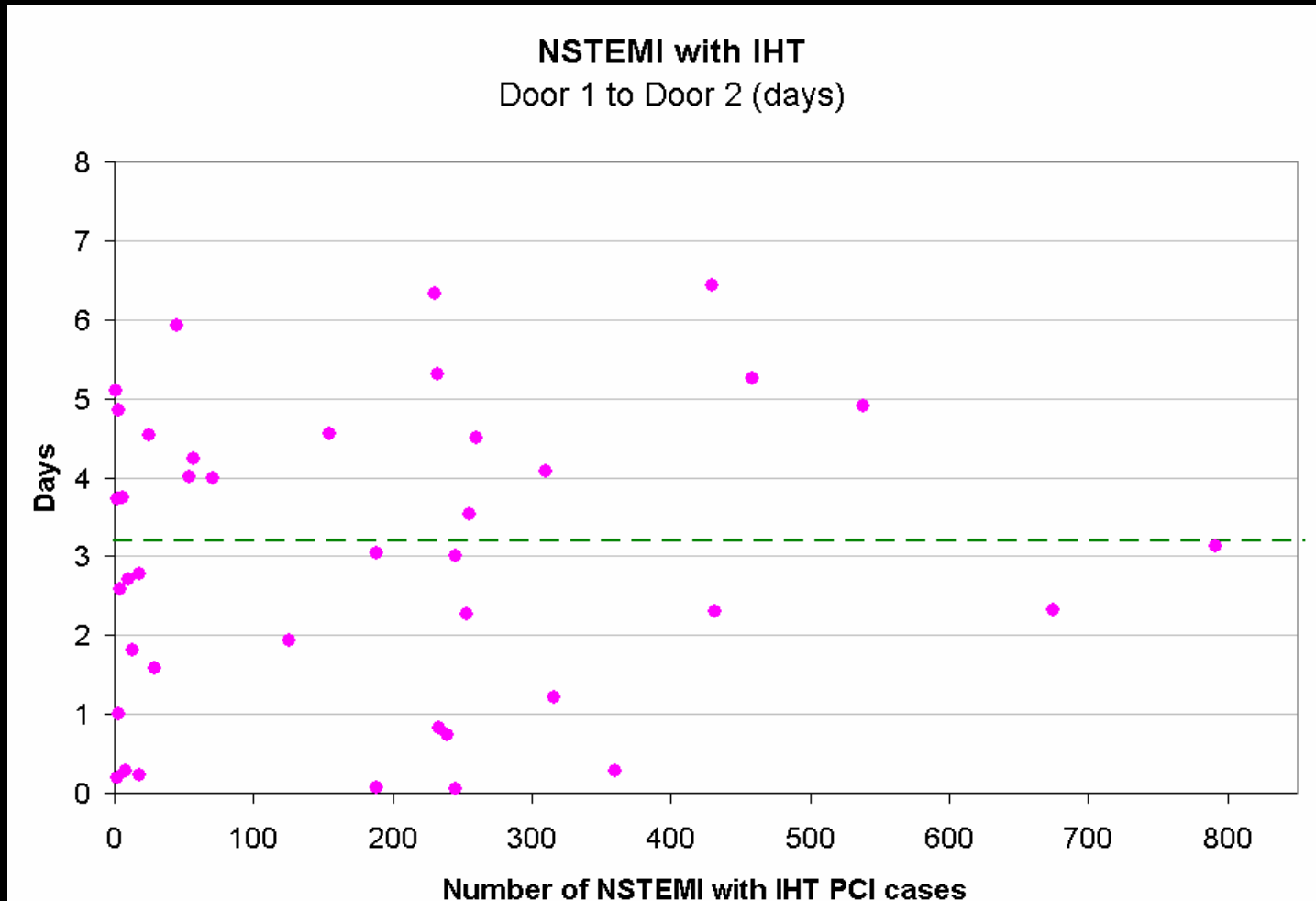
Mean Door to PCI = 2.96 days



NSTEMI / UA / Convalescent STEMI

IHT - 2008

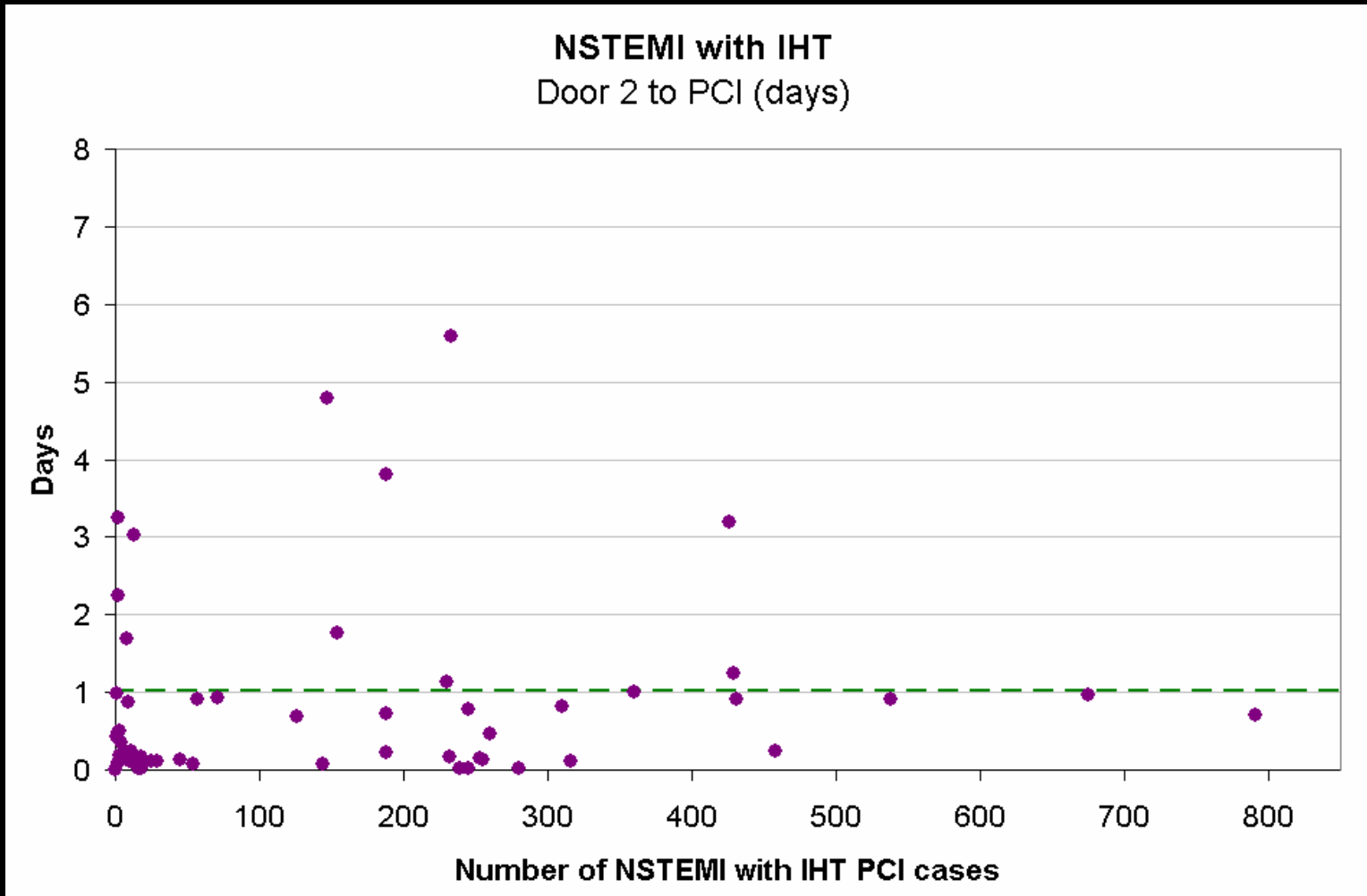
Mean D1 to D2 = 3.2 days



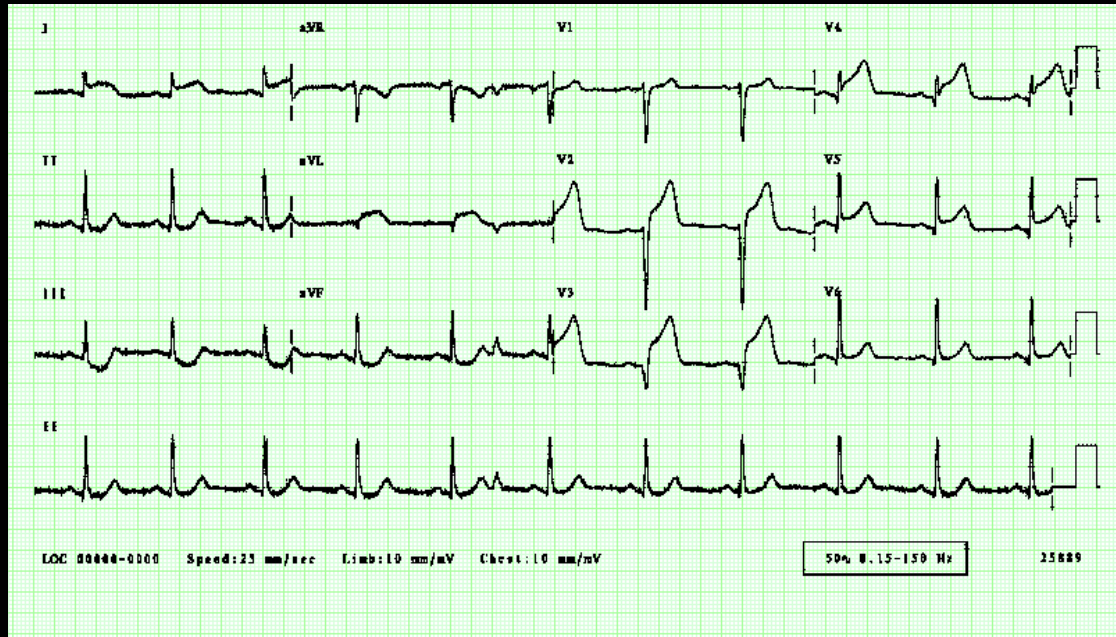
NSTEMI / UA / Convalescent STEMI

IHT - 2008

Mean D2 to PCI = 1.01 days



Primary PCI



Primary PCI

2008: Routine Rx for STEMI (NHS centres)

Day only or 24/7: 50 centres



2008 data: Ludman

AMG. Wycombe General Hospital

BAL. Barts and the London

BAT. Royal United Hospital Bath

BHR. Royal Berkshire and Battle Hospital

BOU. Royal Bournemouth General Hospital

BRD. Bradford Royal Infirmary

BRI. Bristol Royal Infirmary

CHN. Nottingham City Hospital

CRG. Craigavon Area Hospital

DGE. Eastbourne DGH

DUD. City Hospital

EBH. Birmingham Heartlands Hospital

ERI. Royal infirmary of Edinburgh

ESU. East Surrey Hospital

GEO. St George's Hospital

GRI. Glasgow Royal Infirmary

GRL. Glenfield Hospital

HAM. Hammersmith Hospital

HH. Harefield Hospital

HHH. Hemel Hempstead General Hospital

KCH. King's College Hospital

LGI. Yorkshire Heart Centre

LIS. Lister Hospital

MOR. Morriston Hospital

MRI. Manchester Royal Infirmary

NCR. New Cross Hospital

NGS. Northern General Hospital

NHB. Royal Brompton Hospital

NHH. North Hampshire Hospital

NPH. Northwick Park Hospital

QAP. Queen Alexandra Hospital

QEB. Queen Elizabeth Hospital Edgbaston

RAD. John Radcliffe Hospital

RDE. Royal Devon & Exeter Hospital

RFH. Royal Free Hospital

RSC. Royal Sussex County Hospital

SAN. Sandwell District General Hospital

SCM. James Cook University Hospital

SGH. Southampton General Hospital

STH. St Thomas' Hospital

STM. St Mary's Hospital

STO. North Staffordshire Hospital

SUN. Sunderland Royal Hospital

TOR. Torbay Hospital

UCL. University College Hospital

UHW. University Hospital of Wales

VIC. Victoria Hospital

WAL. Walsgrave Hospital

WIG. Glasgow Western Infirmary

WYT. Wythenshawe Hospital

Primary PCI

2008: Routine Rx for STEMI (NHS centres)

24/7: 28 centres



2008 data: Ludman

BAL. Barts and the London

BRD. Bradford Royal Infirmary

BRI. Bristol Royal Infirmary

DUD. City Hospital

EBH. Birmingham Heartlands Hospital

ERI. Royal infirmary of Edinburgh

GEO. St George's Hospital

GRI. Glasgow Royal Infirmary

HAM. Hammersmith Hospital

HH. Harefield Hospital

HHH. Hemel Hempstead General Hospital

KCH. King's College Hospital

LGI. Yorkshire Heart Centre

MRI. Manchester Royal Infirmary

NCR. New Cross Hospital

NGS. Northern General Hospital

NHB. Royal Brompton Hospital

RAD. John Radcliffe Hospital

RDE. Royal Devon & Exeter Hospital

RFH. Royal Free Hospital

SAN. Sandwell District General Hospital

SCM. James Cook University Hospital

STH. St Thomas' Hospital

STM. St Mary's Hospital

UCL. University College Hospital

WAL. Walsgrave Hospital

WIG. Glasgow Western Infirmary

WYT. Wythenshawe Hospital

Primary PCI

2008: Routine Rx for STEMI (NHS centres)



2008 data: Ludman

Anomalies

- > 20 cases but “not” PPCI centre
 - Fre. Freeman

- Doing PPCI but < 5 cases in CCAD

BRD. Bradford Royal Infirmary	no cases in ccad
CHN. Nottingham City Hospital	no cases in ccad
DGE. Eastbourne DGH	no cases in ccad
ESU. East Surrey Hospital	1 case
NGS. Northern General Hospital	no cases in ccad
NHB. Royal Brompton Hospital	1 case
NPH. Northwick Park Hospital	3 cases
STM. St Mary's Hospital	no cases in ccad
VIC. Victoria Hospital	2 cases

ERI. Royal infirmary of Edinburgh	no cases in ccad
GRI. Glasgow Royal Infirmary	no cases in ccad
WIG. Glasgow Western Infirmary	no cases in ccad

Primary PCI

2008: Routine Rx for STEMI (NHS centres)



2008 data: Ludman

- Final Funnel analysis
 - all units that described as using PPCI as default Rx for STEMI and have cases in CCAD
 - plus:
 - FRE. Freeman
- No time data from
 - GEO. St George's Hospital
 - NPH. Northwick Park Hospital

Note:

- Call time only mandatory from Jan 2009
- Door 1 and Door 2 times mandatory from Aug 2008

Primary PCI

2008: Routine Rx for STEMI (NHS centres)



2008 data: Ludman

Direct admission to PCI unit only

Exclusions: cardiogenic shock and pre-procedure ventilation

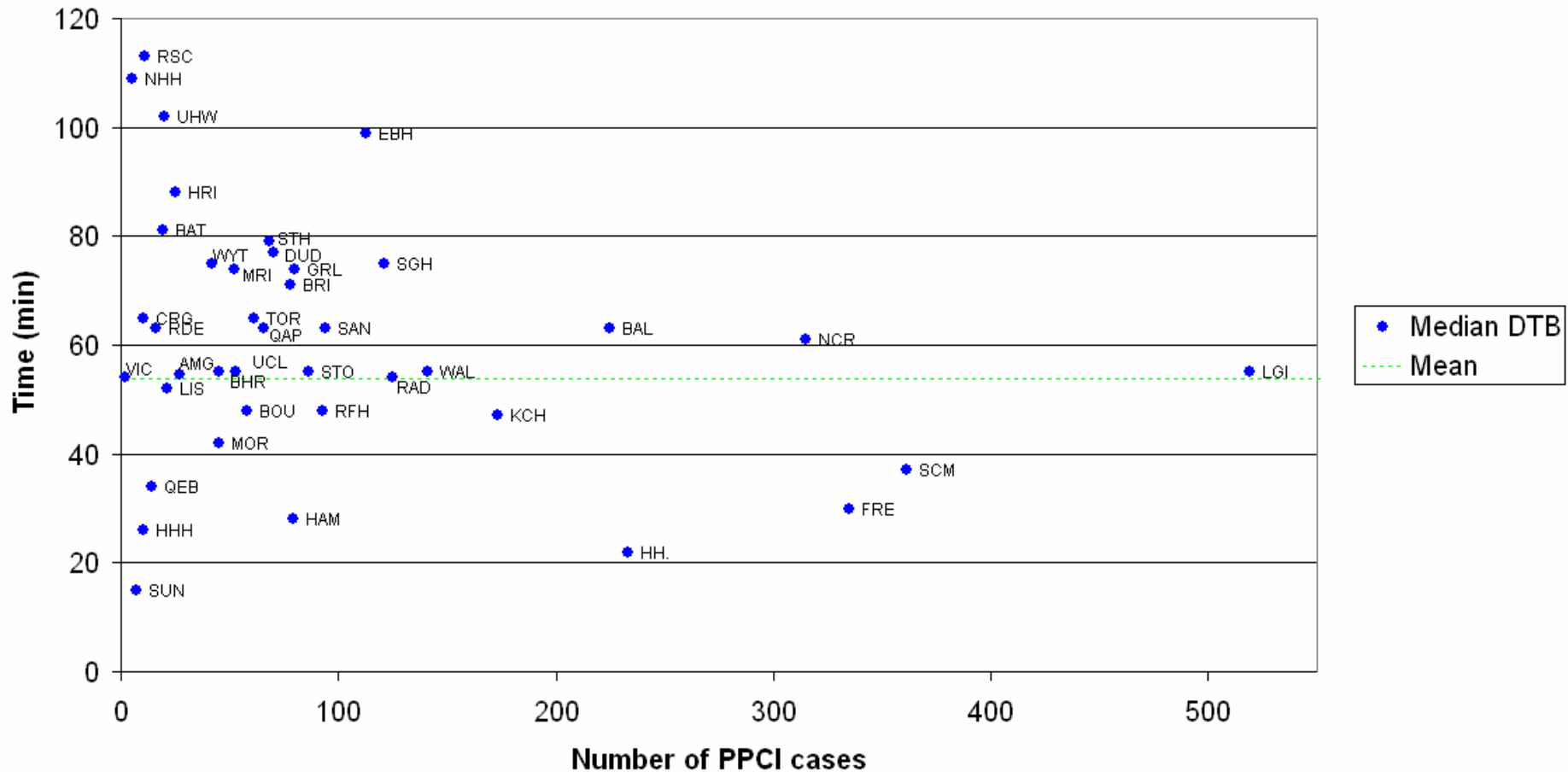
- Door to Balloon
 - Mean 53.8 min
 - 81.3% of all patients < 90 min
- Call to Balloon
 - Mean 116.6 min
 - 78.8 % of all patients < 150 min

Primary PCI

Door to Balloon time (min)

Door to Balloon times (min)
Direct admission only

Mean = 53.8

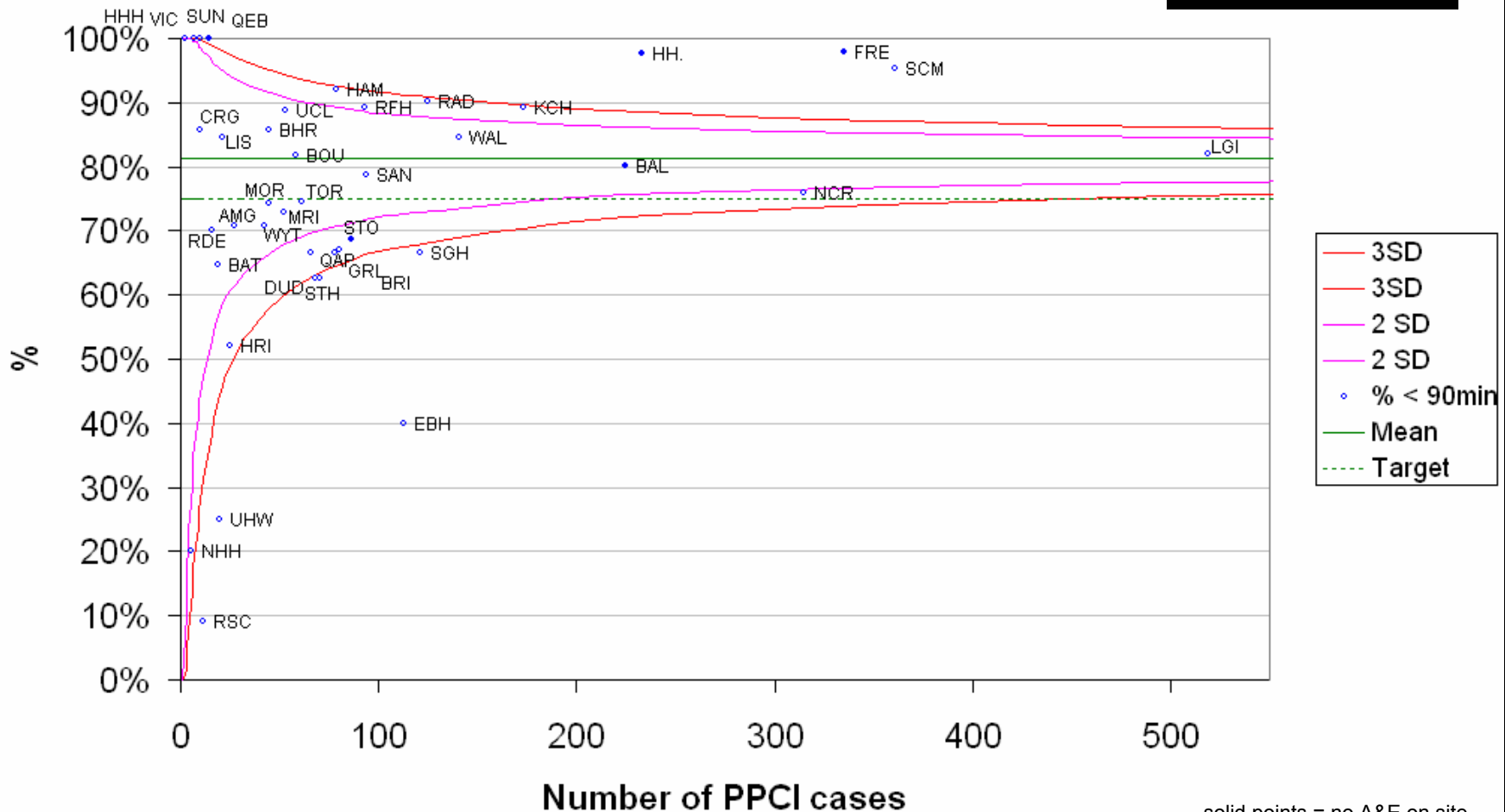


Primary PCI

Door to Balloon Time (% < 90 min)

Door to Balloon time (% < 90 min)
Direct admission only

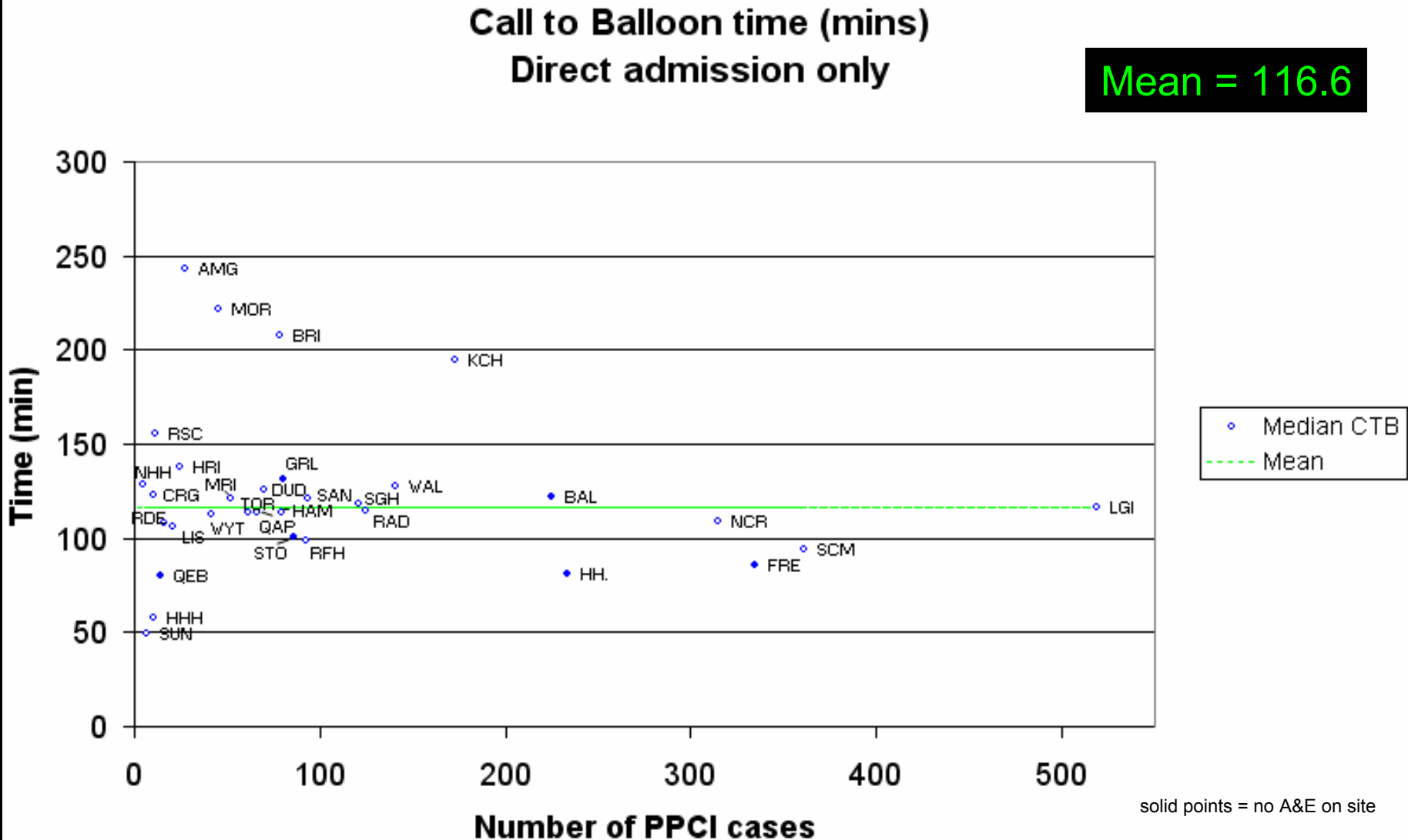
Mean 81.3%



Data not mandatory in 2008

Primary PCI

Call to Balloon time (min)



Data not mandatory in 2008

Primary PCI

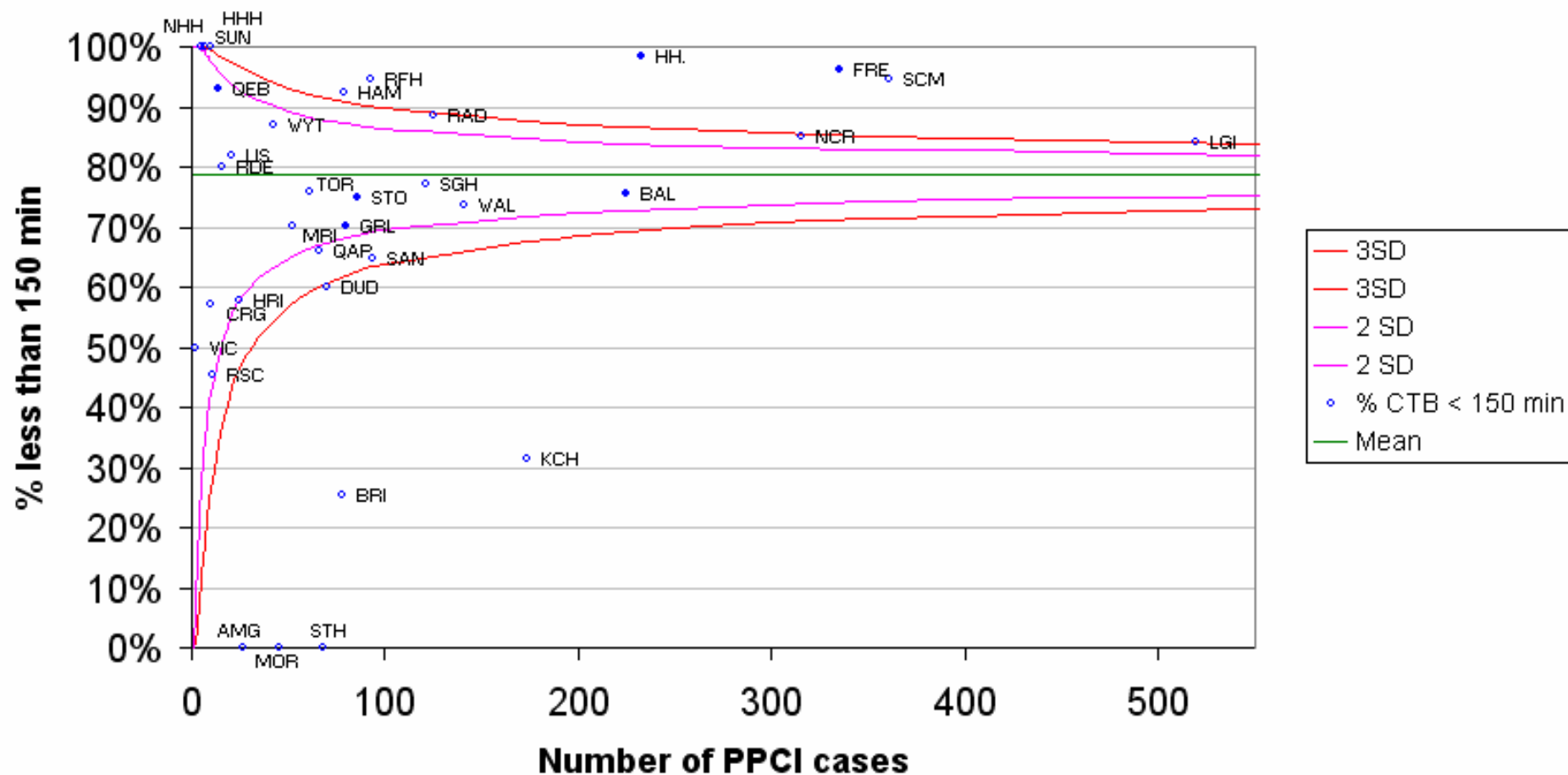
Call to Balloon time (<math>\%<150\text{ min}</math>)



2008 data: Ludman

Call to Balloon time (<math>\%<150\text{ min}</math>)
Direct admissions only

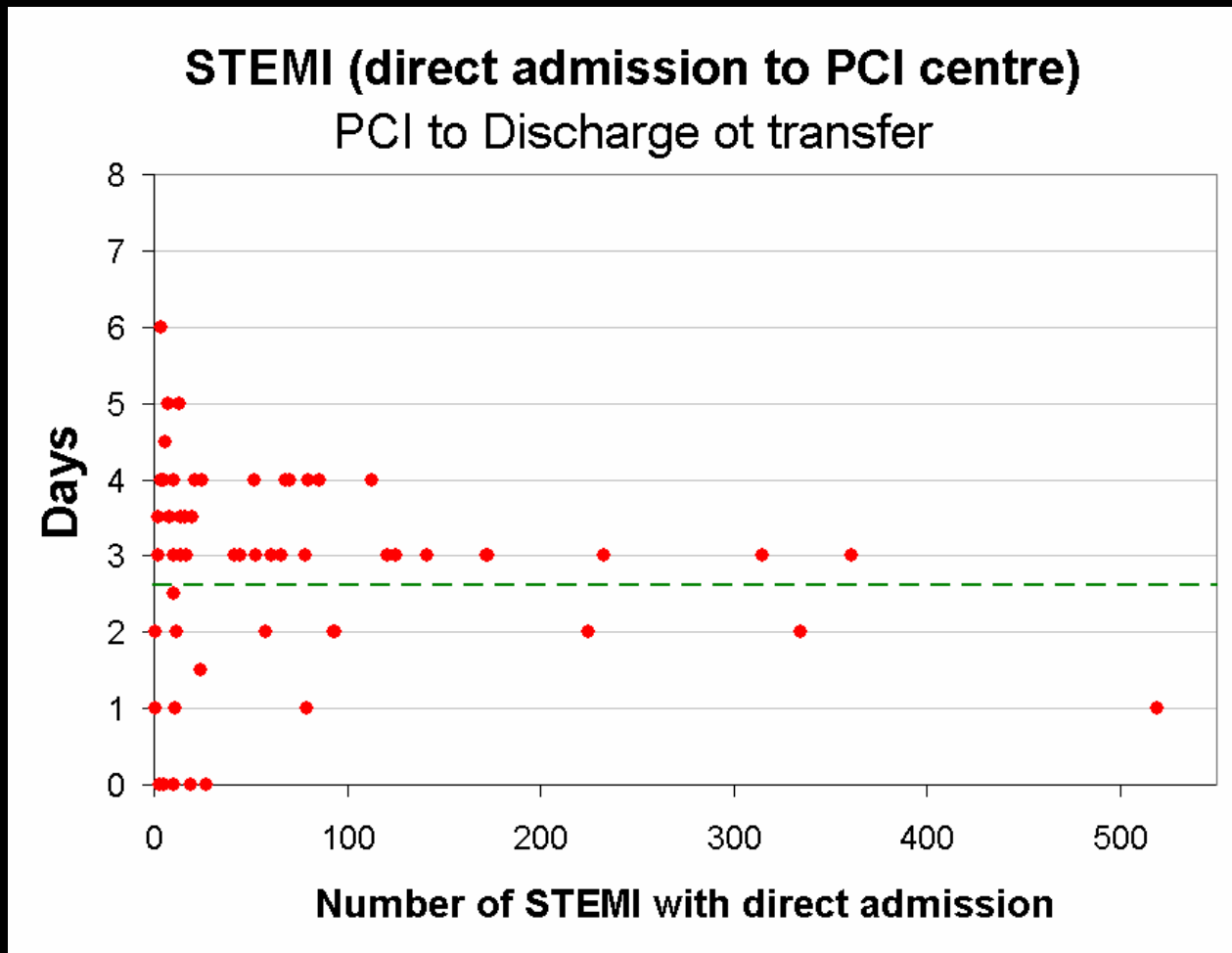
Mean = 78.8%



PPCI for STEMI

Direct admission - 2008

Mean PCI to Discharge or transfer = 2.6 days



PPCI for STEMI

Direct admission to PCI centre - 2008

All units treating > 5 cases by PPCI
(not just those with default PPCI strategy)



2008 data: Ludman

	Time Wtd mean of units' median times	Units	
Symptom to arrival	1.9	Hours	n=3631
Door to Balloon	53.8	Min	n=3662
Call to Balloon	111.3	Min	n=2159
PCI to discharge	2.59	Days	n=4229

Contents



2008 data: Ludman

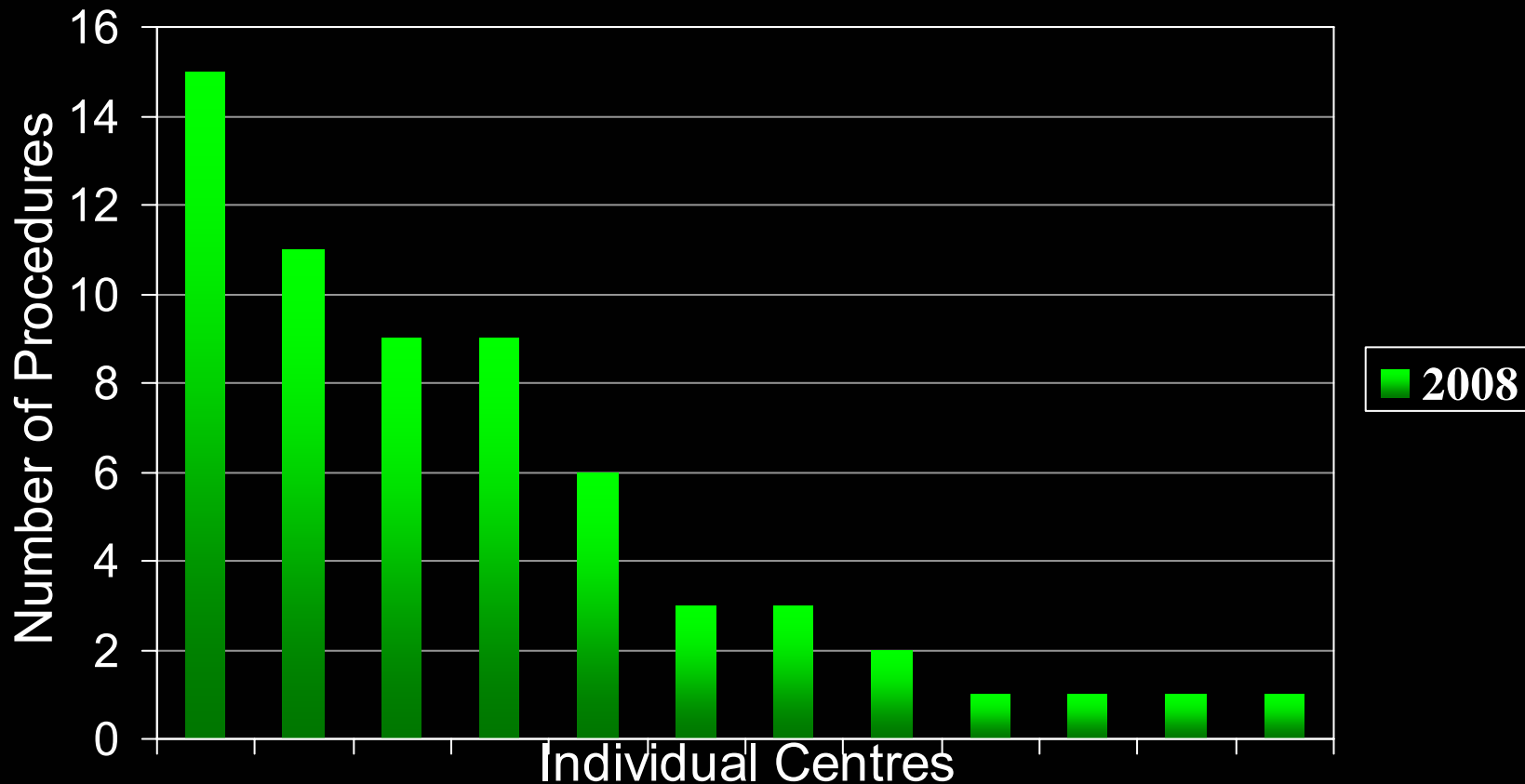
- Structure
 - New centres
 - Total PCI numbers
 - No of procedures per unit
 - PCI pmp and by country
 - PCI Operators
 - Surgical cover
 - Day case activity
 - Primary PCI units
- PCI Procedure specific data
 - CCAD data completeness
 - Demographics
 - Ethnicity
- Appropriateness
 - indication for PCI / Clinical syndrome
 - Circadian activity for PPCI
 - Stents (BMS and DES)
 - Adjunctive therapy
 - LV support
 - Shock
 - Multi-vessel treatment
 - Additional interventional techniques
 - Arterial access
 - complications
 - DTB times
- Process of care
 - Delays to treatment NSTEMI
 - Delays to treatment Primary PCI
 - DTB times by unit
 - CTB times by unit
- **Non coronary intervention**
 - HOCM septal ablation
 - Mitral valuloplasty
 - Other adult structural intervention
 - Transcatheter Aortic Valves
- Outcome
 - MACCE
 - Outcome by syndrome
 - Outcome by lesion subset
 - Risk adjusted outcomes

Alcohol Mediated Septal Ablation



2008 data: Ludman

	Units	No	Δ cf 2007	Mean	Max
Septal ablation	12	62	+27%	5	15



Adult non coronary intervention



2008 data: Ludman

	Units	No.	Δ cf 2007	Mean	Max Cases
MV plasty	24	97	-37%	5	12
AV plasty	17	177	+581%	10	33
PV plasty	12	38	+41%	3.2	10
TV plasty	1	1	0%	1	1
PDA	15	72	-27%	4.8	21
ASD	33	615	+7%	19	58
PFO	37	874	+10%	24	87

Adult non coronary intervention



2008 data: Ludman

	Units	No	Δ cf 2007	Mean	Max
VSD congen	8	18	-14%	2	6
VSD post MI	6	17	-10%	3	9
LAA occlusion	0	0		0	0
Paravalvular leak closure	8	17		2	5

Adult great vessel intervention



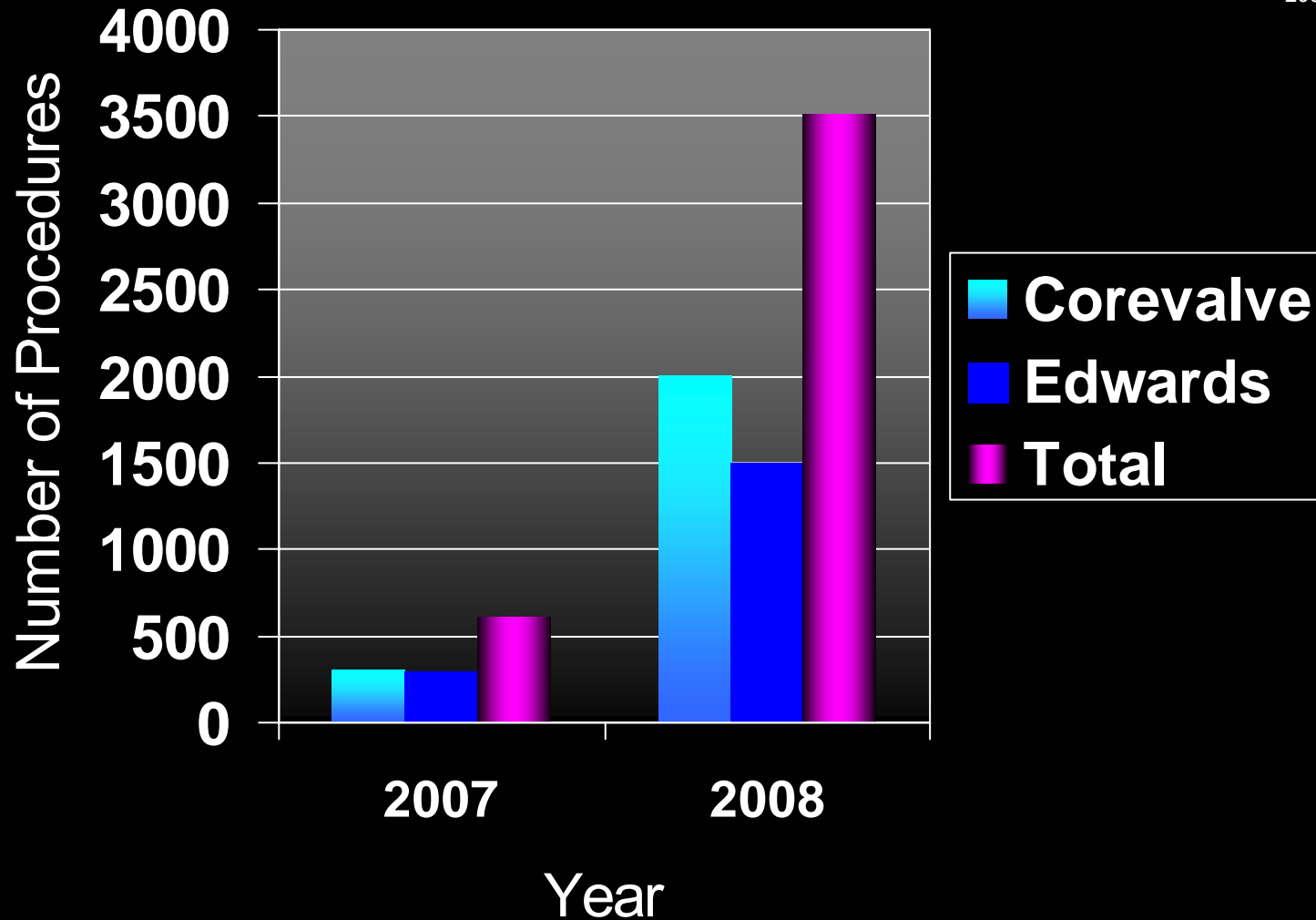
2008 data: Ludman

	Units	No	Δ cf 2007	Mean	Max
Coarct / Re-coart	12	73	-11%	6	15
Carotid	5	119	+95%	24	98
Aorta	3	106	+71%	35	82
Pulm art	5	16	-45%	3.6	7

World wide TAVI



2008 data: Ludman



Transcatheter Valves



2008 data: Ludman

	Units	No	Mean	Max Cases
Transcatheter Aortic Valve Implantation (TAVI)				
CoreValve: Femoral	10	165	17	24
CoreValve: Subclavian	5	10	2	4
Edwards: Femoral	8	51	6.4	16
Edwards: Apical	9	66	7.3	23
Total = 292				

UK TAVI



2008 data: Ludman

- TAVI Dataset agreed
 - Collection via CCAD
 - Web browser interface
 - Version: 3.7 (Sept 2009)

Transcatheter Aortic Valve Implantation (TAVI)

Home

- Home Page

Patient Data

- View / Edit Records
- Create New Record
- Logout

Support

- 0845 300 6016 Opt 2
- Helpdesk

Edit Close

Empty Incomplete Complete

Patient	MDT	PMH/RF	Past Rx	Pre Status	Ix	Procedure	Outcome (Procedural)	Outcome (to Disch)	Disch	FU 1 yr	FU 3 yr
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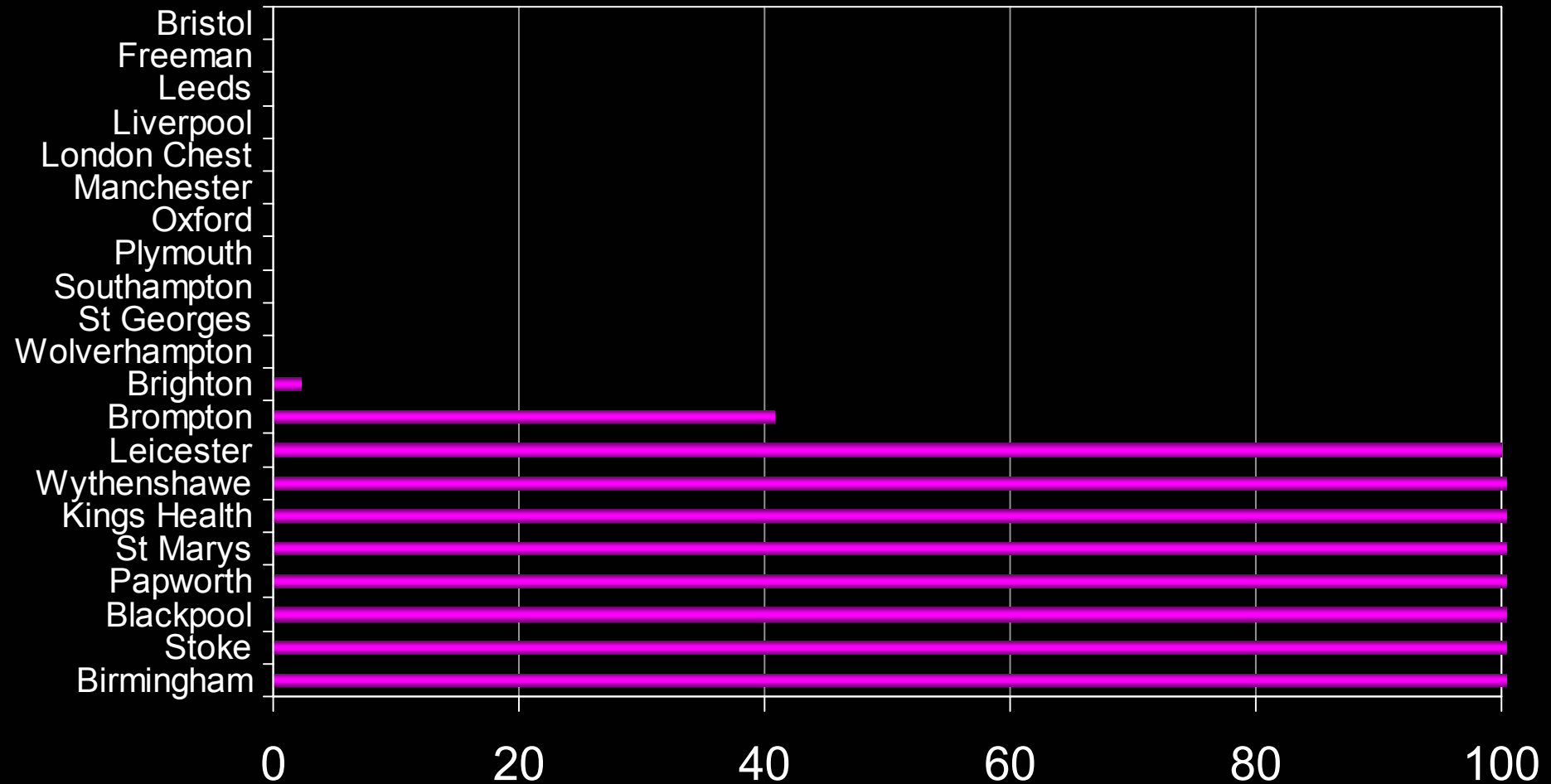
Results of Cardiac Investigations

PA systolic > 60mmHg	0. No	Aortic valve aetiology	1. Degenerative
Aortic valve peak gradient (mmHg)	41	LV function	2. Fair (LVEF = 30-49%)
Aortic valve area (cm ²)	0.8	Extent of coronary vessel disease	3. Three vessels with >50% diameter stenosis
Aortic annular diameter (mm)	21	Left main stem disease	0. No LMS disease or <= 50% diameter stenosis
Aortic annular measurement method	1. TOE		
Aortic valve pathology	0. Stenosis		

[https:// www.ncasp.org.uk](https://www.ncasp.org.uk)

UK TAVI

Implanted devices in CCAD as % of activity



UK TAVI



2008 data: Ludman

Implanted c

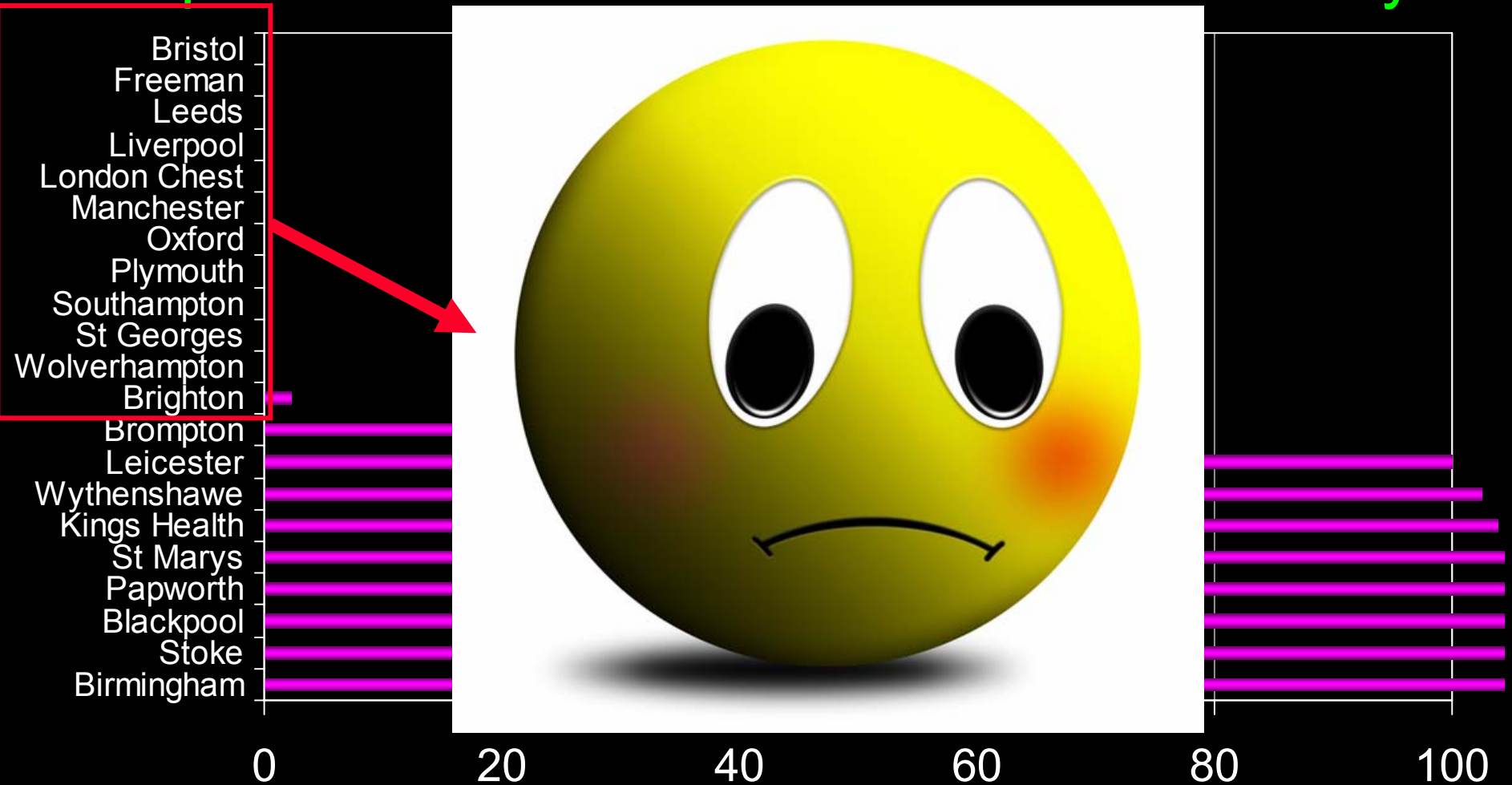


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As Sept 09

UK TAVI

Implanted devices in CCAD as % of activity



Percutaneous Valves



2008 data: Ludman

	Units	No	Δ % cf 2007	Mean	Max
Pulmonary Valve	5	62	+107%	12	23

Percutaneous Valves



2008 data: Ludman

	Units	No	Δ % cf 2007	Mean	Max Cases
Mitral Valve Repair					
Mitra-clip	2	3		1.5	2
Viacor	0				
Carillon	0				
Monarch	0				
Total = 3					

Contents



2008 data: Ludman

- Structure
 - New centres
 - Total PCI numbers
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 - Mitral valuloplasty
 - Other adult structural intervention
 - Transcutaneous Aortic Valves
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 - MACCE
 - Outcome by syndrome
 - Outcome by lesion subset
 - Risk adjusted outcomes

Outcome



Data sources



2008 data: Ludman

- Success, Mortality CVA and Emergency CABG
 - CCAD
 - No data from aggregate forms (Some England pp, some NI)
- QMI
 - CCAD
 - Denominator: Total PCI procedures except PCI for STEMI
(only tiny numbers of STEMI treated in units not submitting to CCAD)
- NQMI
 - CCAD
 - Denominator: Total PCIs for stable symptoms

MACE - All PCIs

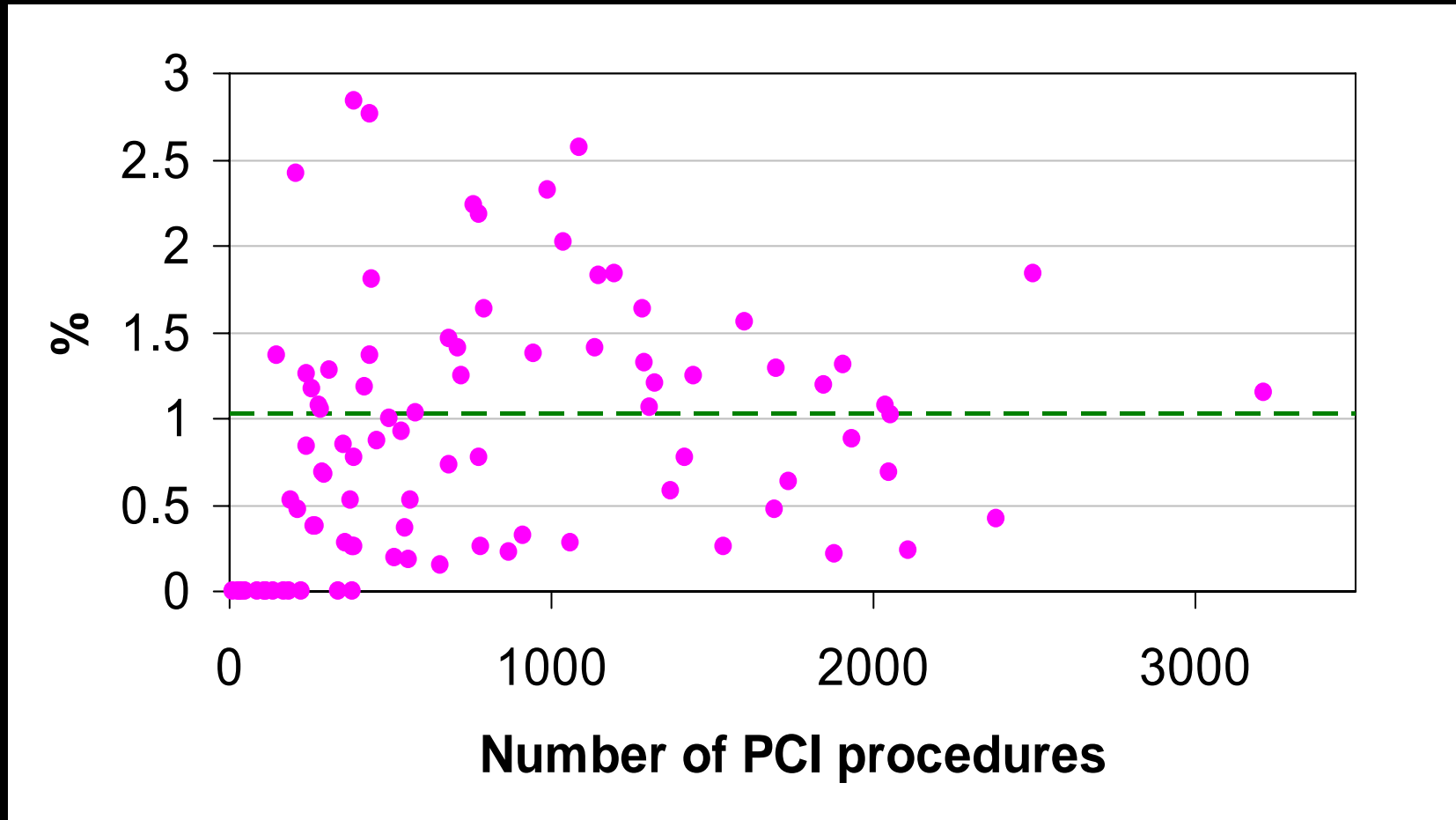


2008 data: Ludman

Year	Procedure Success (%)	QMI %	NQMI (stable) (%)	Em CABG (%)	CVA (%)	Mortality (%)
1997	92	1.2		1.1		0.89
1998	92	0.8		0.7		0.80
1999	90	0.57		0.48		0.61
2000	92	0.6		0.4		0.64
2001	94	0.5		0.4		0.75
2002	92 (51 of 64)	0.57 (49 of 64)		0.28 (53 of 64)		0.54 (53 of 64)
2003	92 (62 of 73)	0.36 (56 of 73)		0.29 (64 of 73)		0.53 (64 of 73)
2004	93.5 (63 of 78)	0.30 (57 of 78)		0.21 (64 of 78)		0.56 (66 of 78)
2005	90.2	0.24		0.12		0.59
2006	95.5	0.15	0.74	0.09		0.74
2007	92.1	0.14	0.62	0.08		0.89
2008	91.8	0.25	0.51	0.07	0.08	1.03

Adverse Outcomes - Death

- % of all cases with in-hospital death
 - Overall mean = 1.03

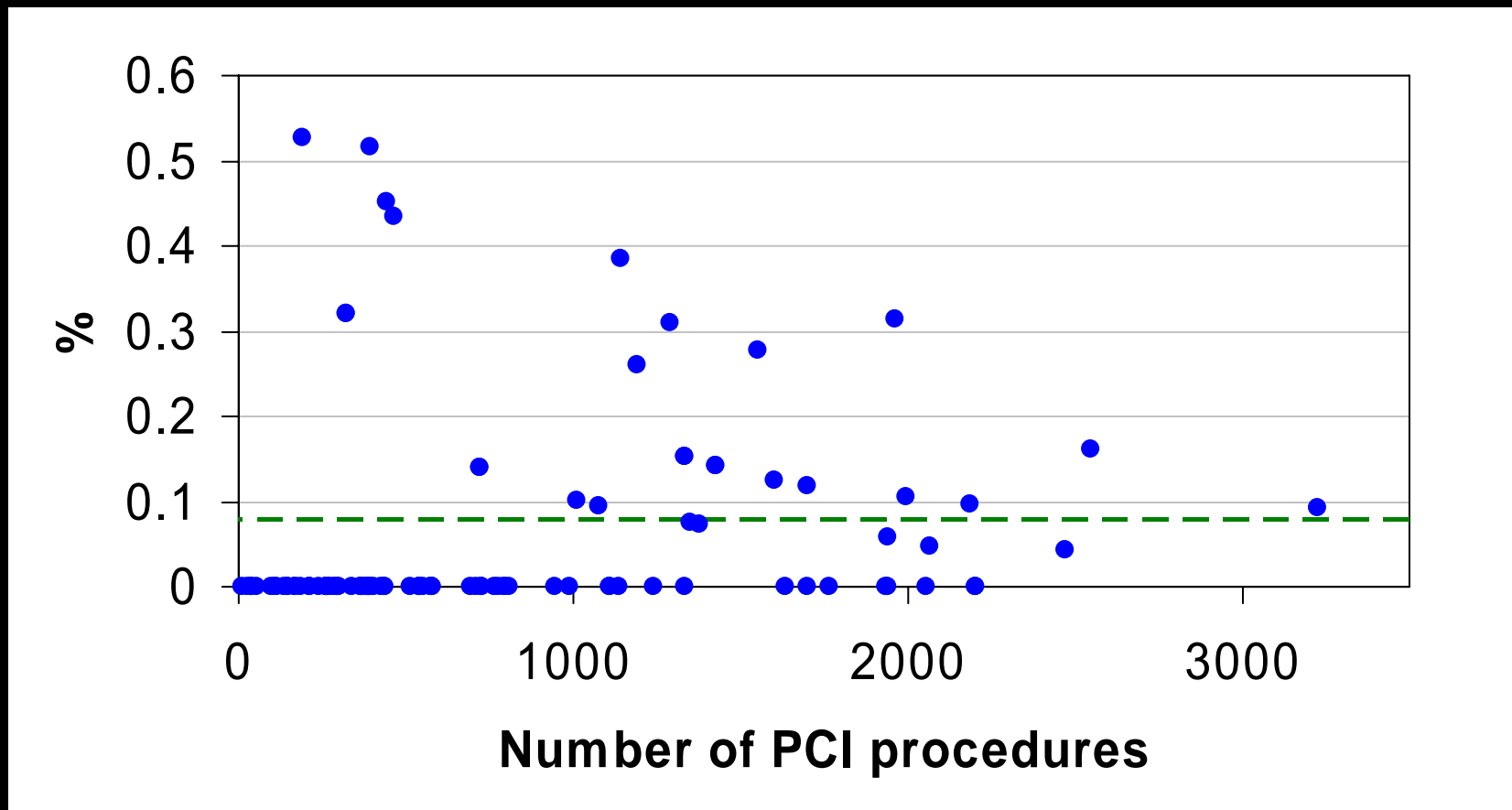


Adverse Outcomes - CVA



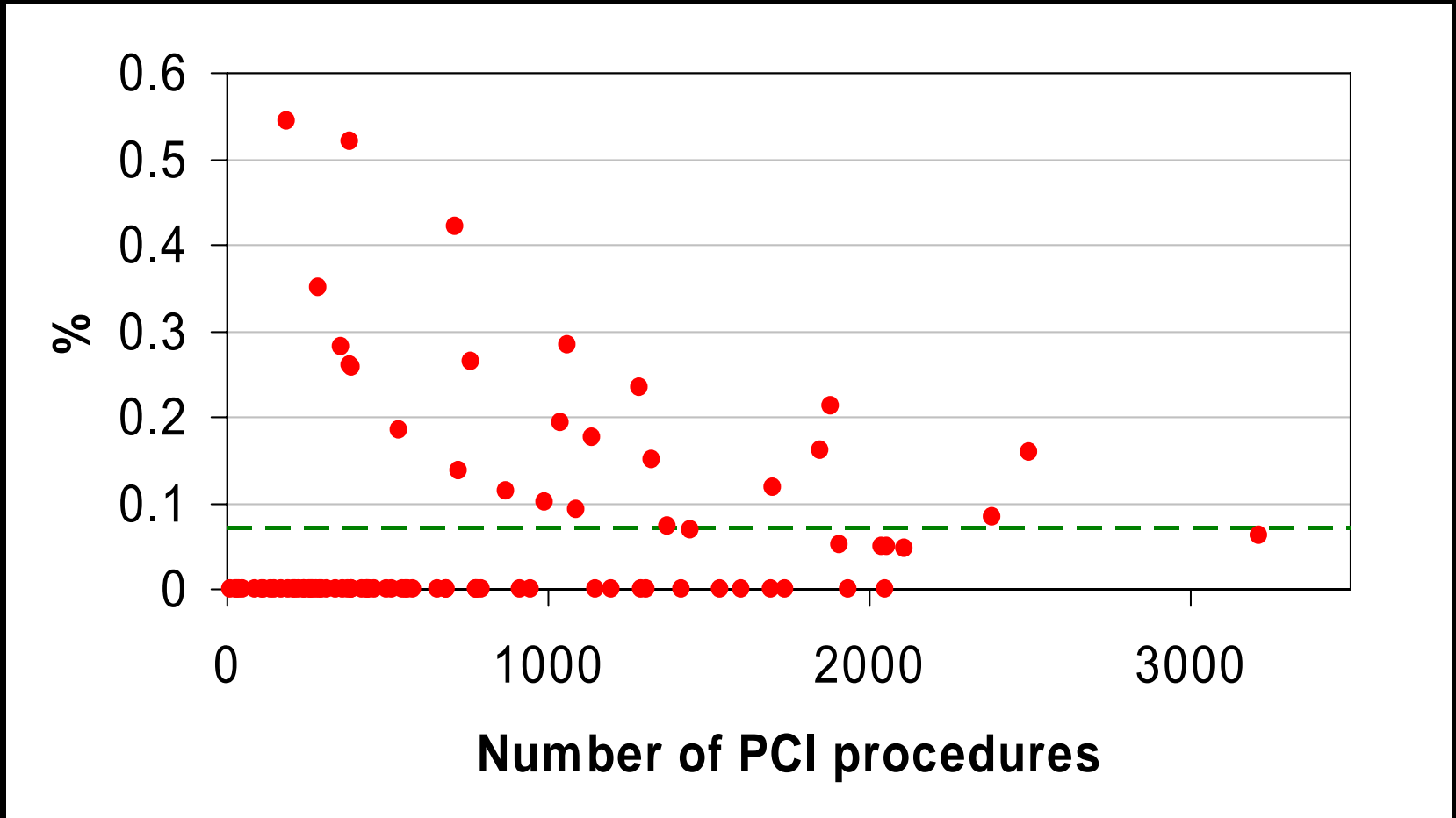
2008 data: Ludman

- % of all cases with CVA (not TIA)
 - Overall mean = 0.08



Adverse Outcomes – CABG

- % of all cases needing emergency CABG
 - Overall mean = 0.07

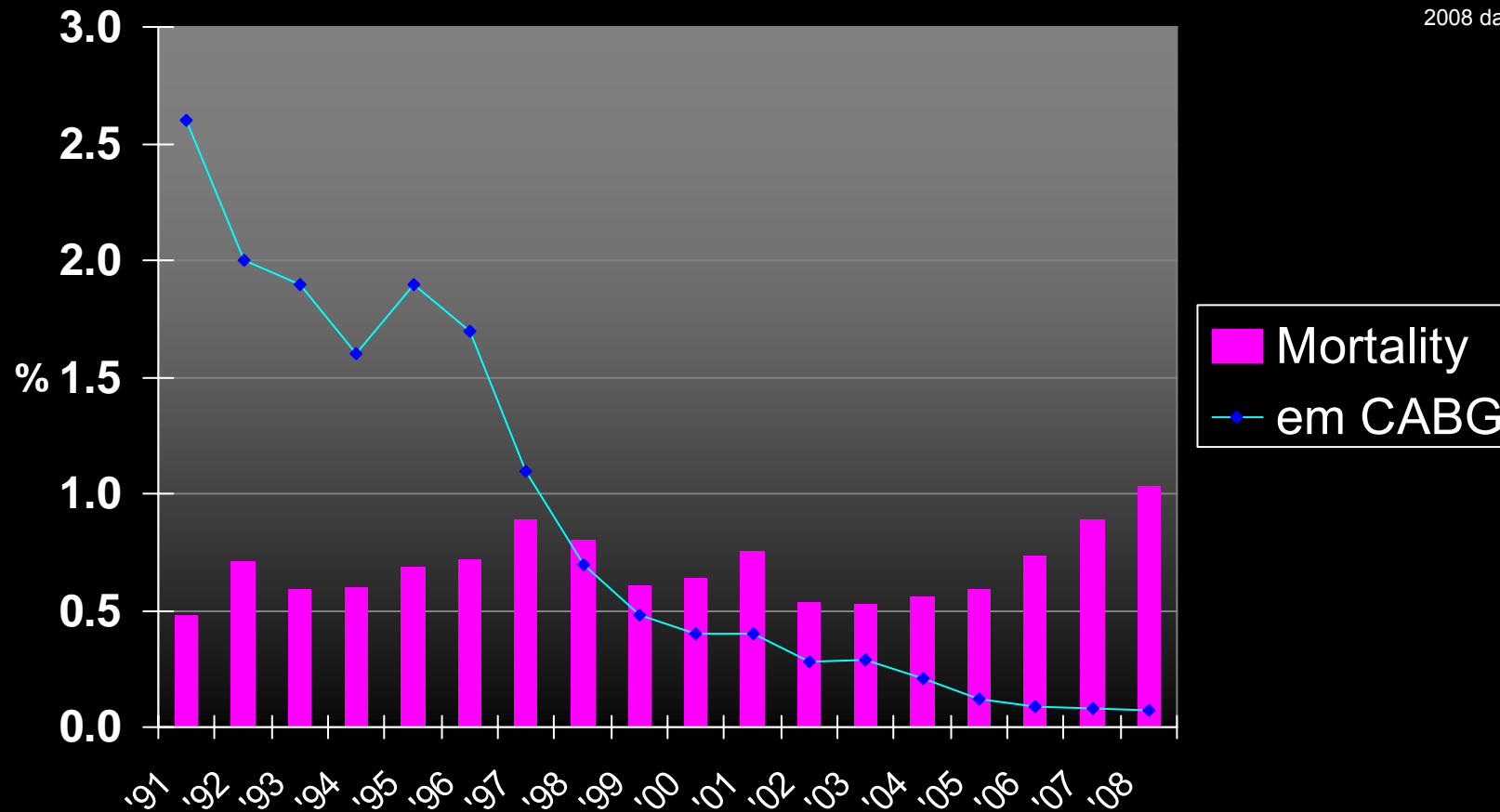


Adverse Outcome

Death and emergency CABG



2008 data: Ludman



Outcome 2008



2008 data: Ludman

Elective Patients

All as %	No. cases	Success	Partial success	Fail no comp	Re-PCI	QMI	Em CABG	Death
Stable SV (no CTO)	19,128	95.3		3.3	0.11	0.13	0.07	0.1
MV (no CTO)	5179	92.8	5.8	0.90	0.23	0.30	0.05	0.25
SV CTO	2942	68.5		28.9	0.20	0.07	0.14	0.14
MV CTO	778	72.4	23.8	3.5	0.13	0.26	0	0

Overall Stable

ALL	29,372	91.5%			0.14	0.16	0.07	0.13
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Outcome 2008



2008 data: Ludman

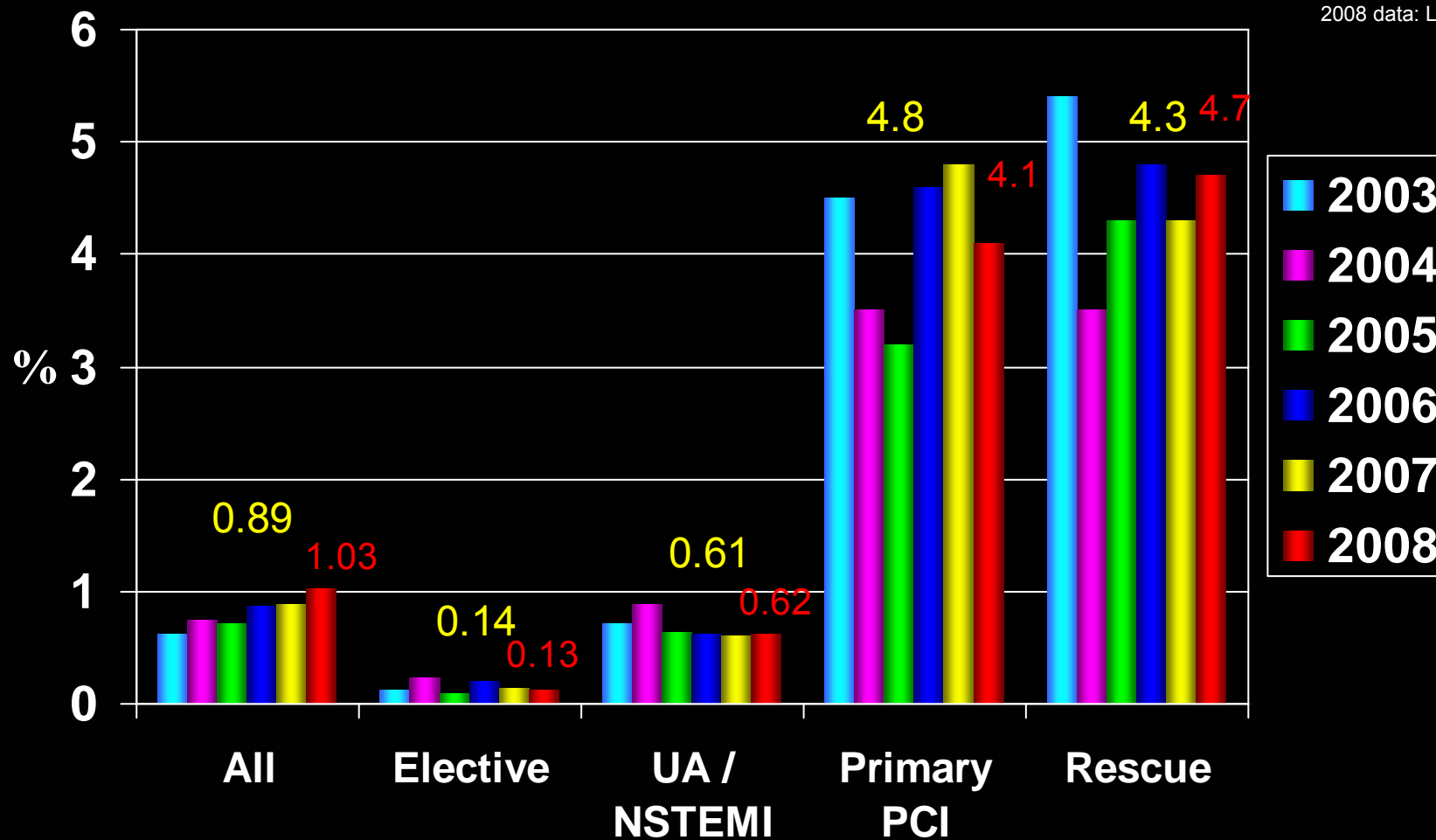
All as %	No.	Success	Partial success	Fail no comp	Re-PCI	QMI	Em CABG	Death
NSTEMI / UA no shock	26,264	93.4	2.5	3.3	0.3	0.4	0.07	0.62
All STEMI no shock	10,766	93.6	1.9	2.4	0.6		0.07	2.0
Primary PCI	8513	91.2	2.1	2.6	0.7		0.08	4.1
Rescue PCI	2129	91.0	2.2	2.2	0.6		0.05	4.7
Shock	1040	62.7	3.9	3.2	1.4		0	29.7

Summary: Mortality

Risk Stratified by Syndrome



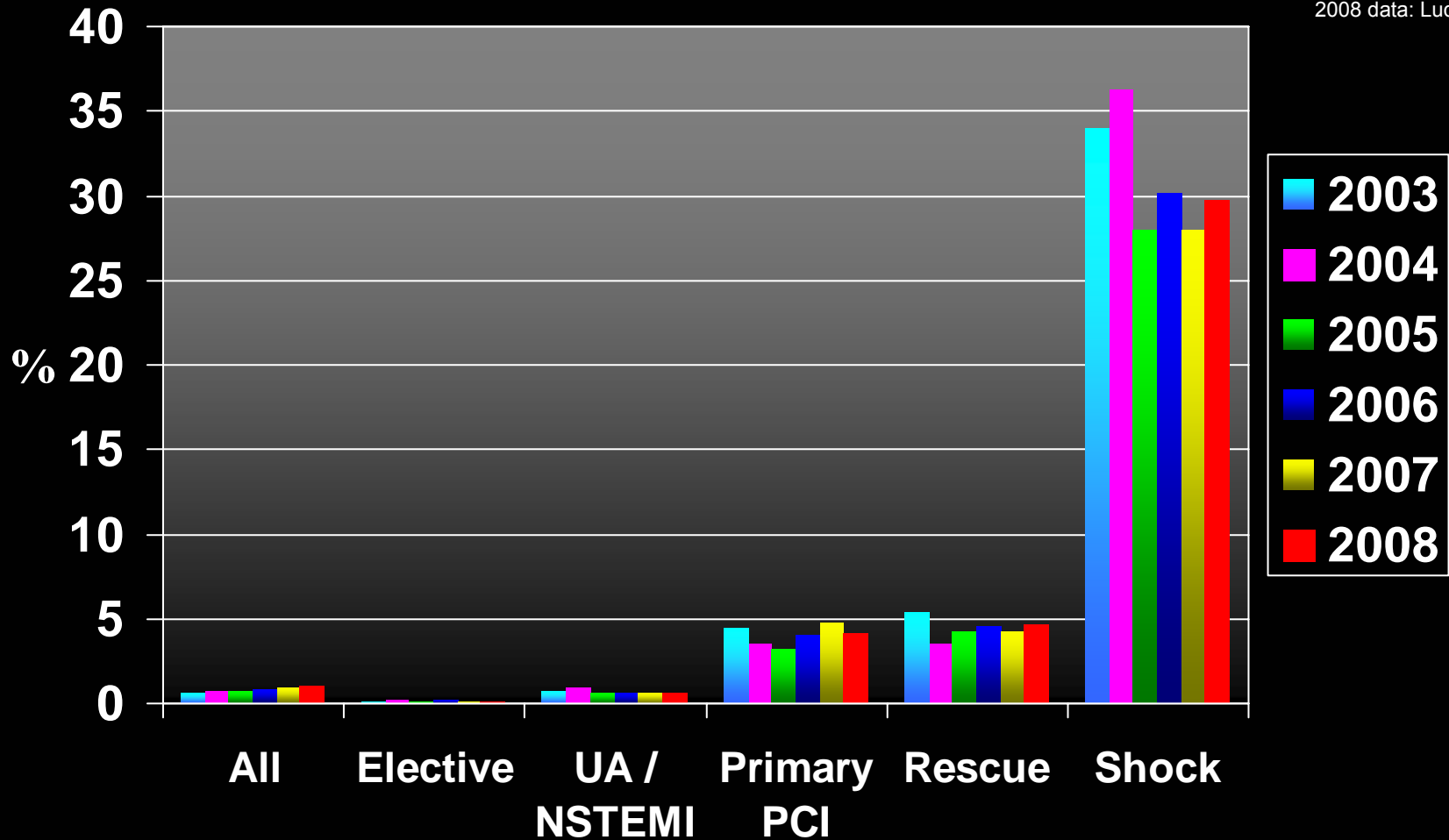
2008 data: Ludman



Mortality by Syndrome



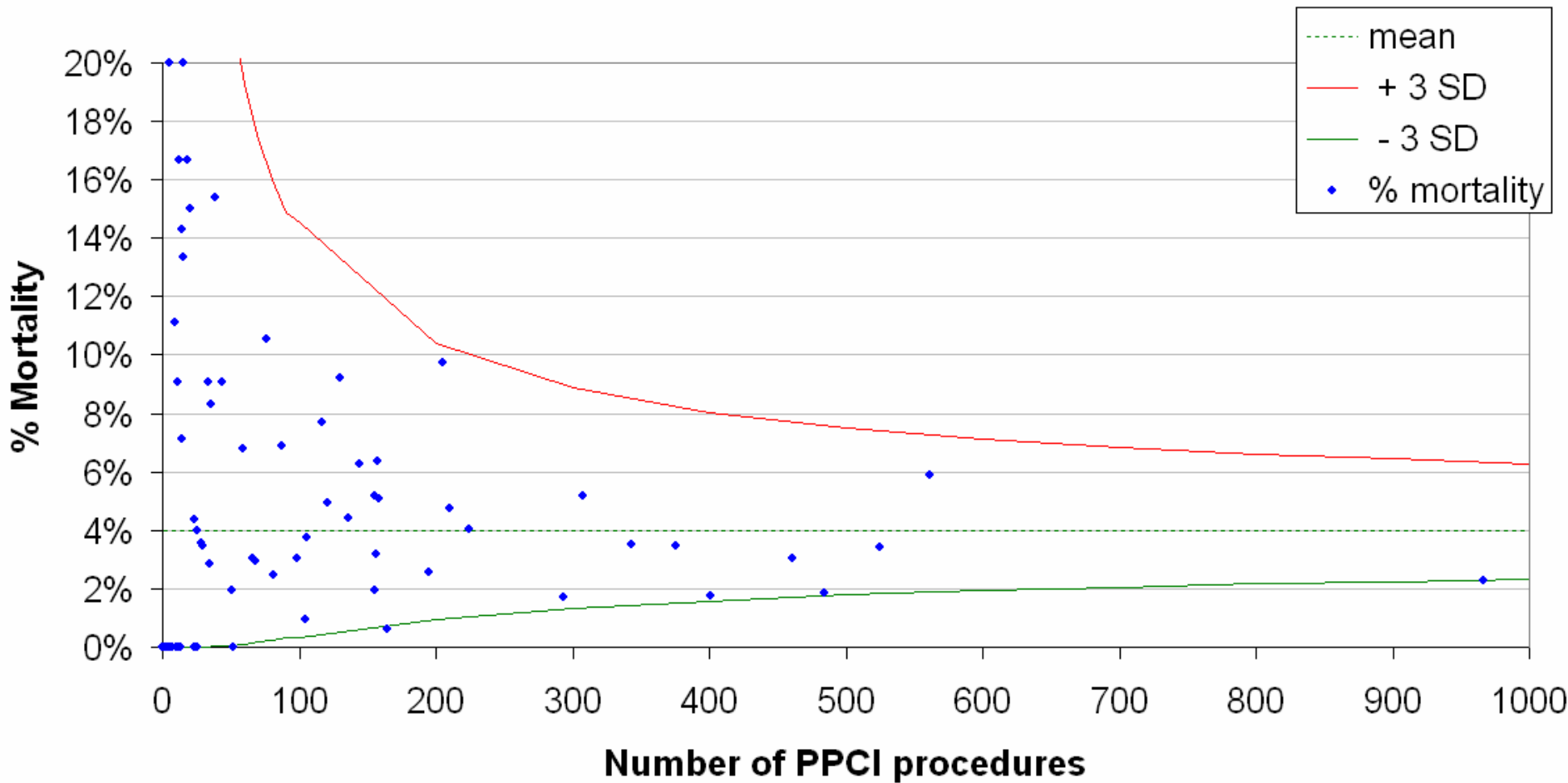
2008 data: Ludman



Primary PCI

Mortality v Volume Funnel

Mortality (%) primary PCI (all cases with indication 4)



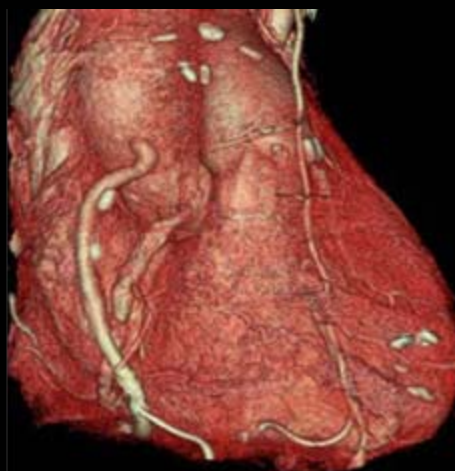
Bypass grafts

PCI of SVG and Arterial 2008



2008 data: Ludman

All as %	No.	Success	Partial success	Fail no comp	Re-PCI	QMI	Em CABG	Death
Bypass Grafts	4308	91.0	3.2	5.2	0.3	0.16	0.02	0.56



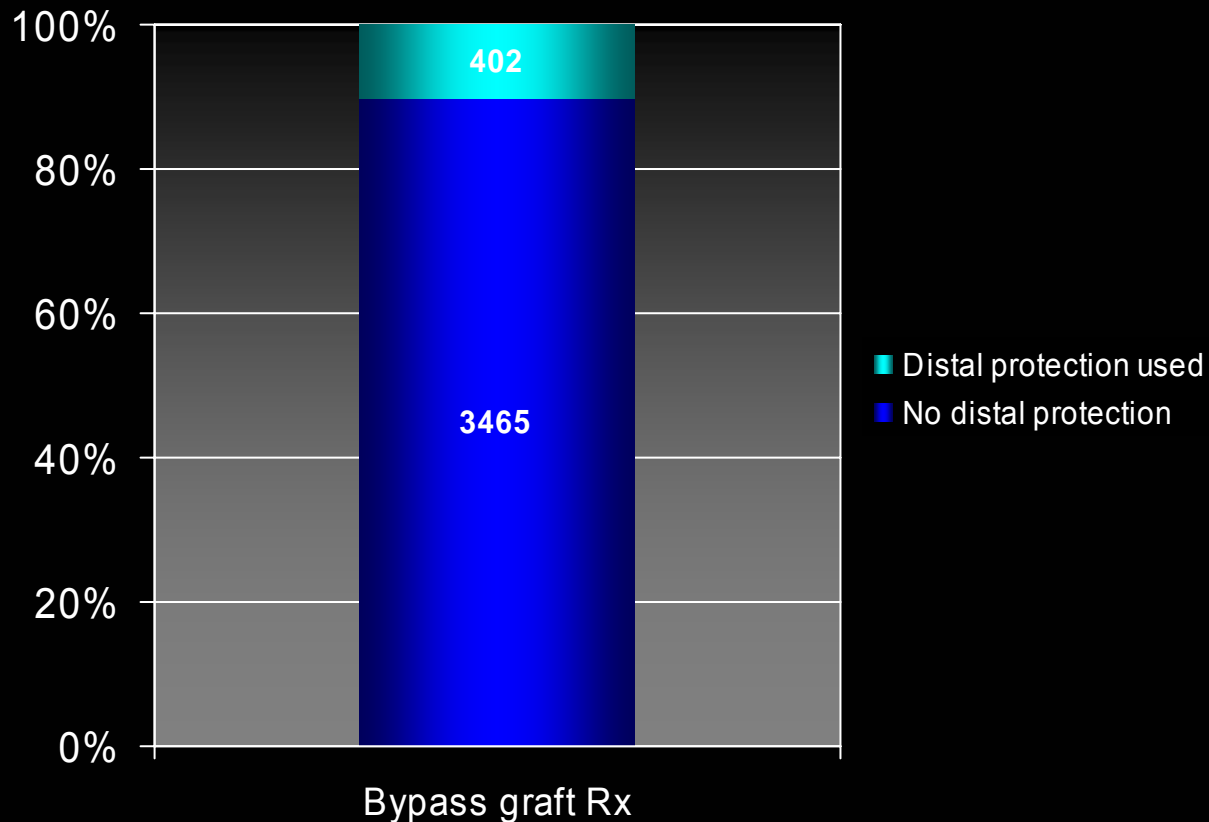
Bypass Grafts

(all types - SVG and IMA etc)



2008 data: Ludman

- Distal protection in 10.4%



Chronic Total Occlusions

2008



2008 data: Ludman

All as %	No.	Success	Partial success	Fail no comp	Re-PCI	QMI	Em CABG	Death
Chronic Total Occlusion	5949	67.6	8.0	21.7	0.3	0.4	0.13	1.1



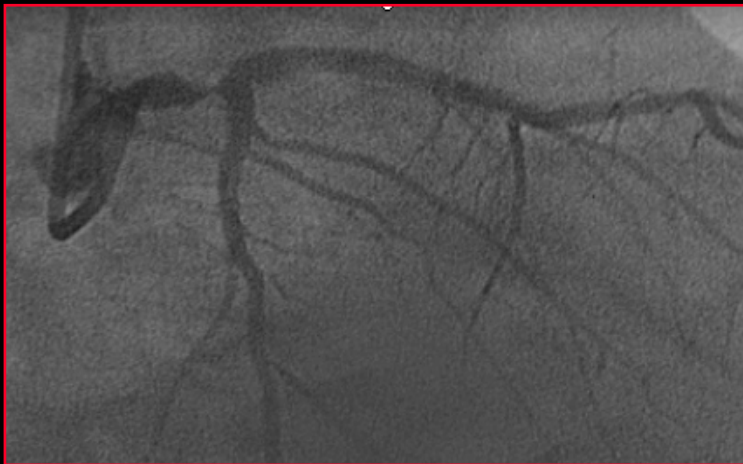
Unprotected LMS

2008



2008 data: Ludman

All as %	No.	Success	Partial success	Fail no comp	Re-PCI	QMI	Em CABG	Death
Unprotected LMS	1084	83.9	5.3	2.6	0.6	0.46	0.5	8.0



N.B.

Includes all clinical presentations (including shock)
In hospital outcome

Models



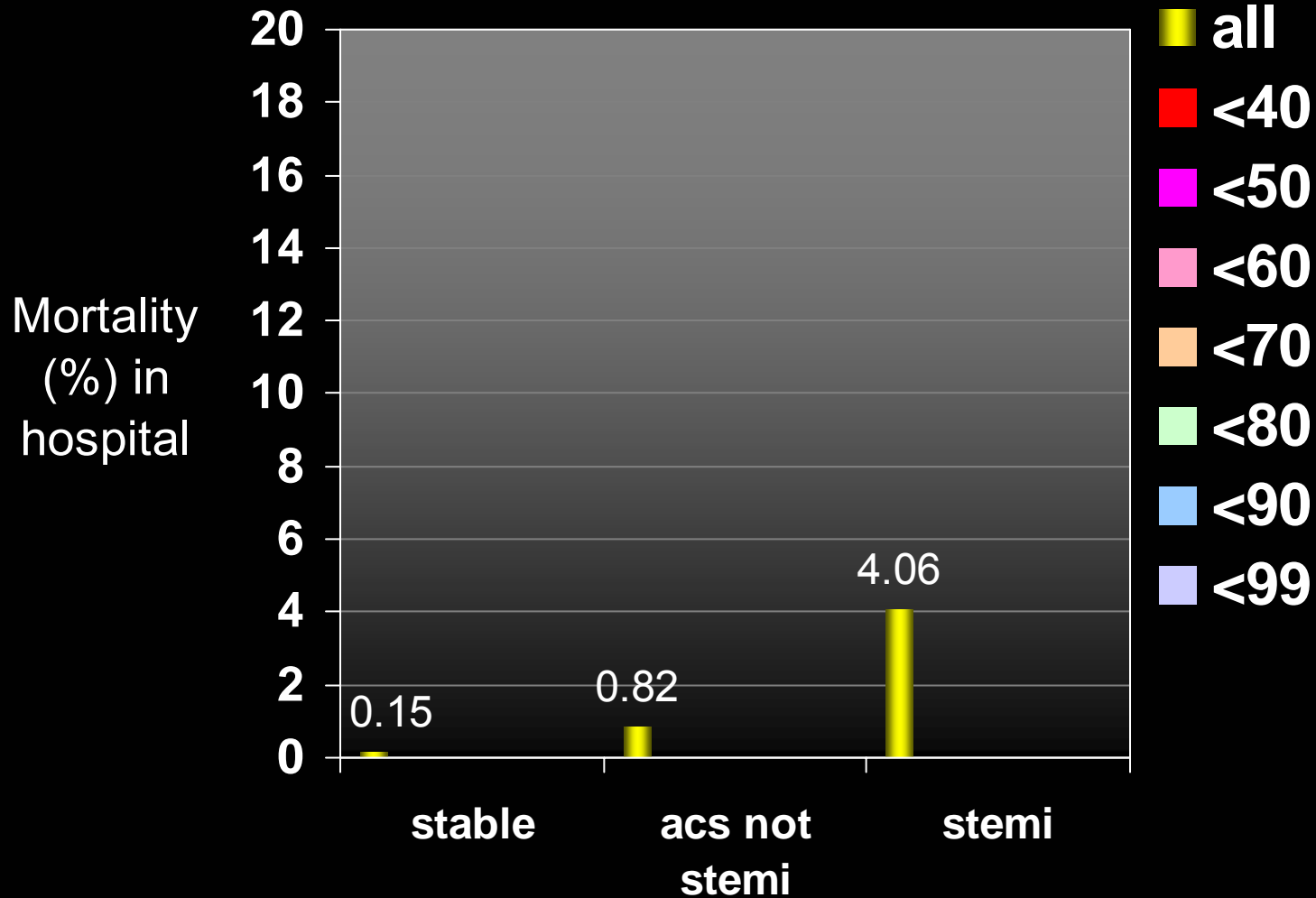
2008 data: Ludman

- Shared risk factors
 - Age
 - Gender
 - Urgency
 - Shock
 - LMS treatment

Age and Syndrome v Mortality



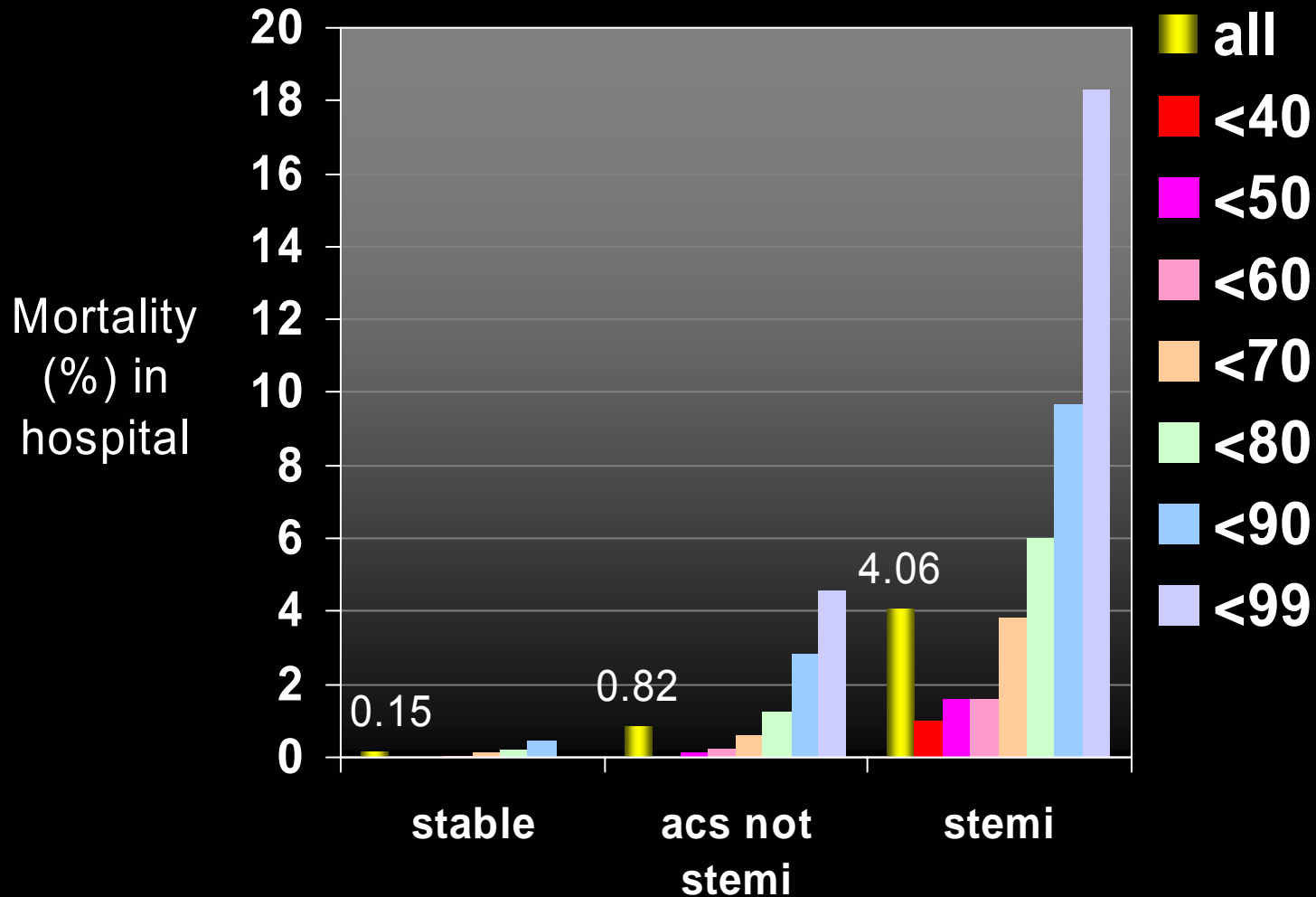
2008 data: Ludman



Age and Syndrome v Mortality



2008 data: Ludman



Gender v Mortality



2008 data: Ludman

In Hospital Mortality

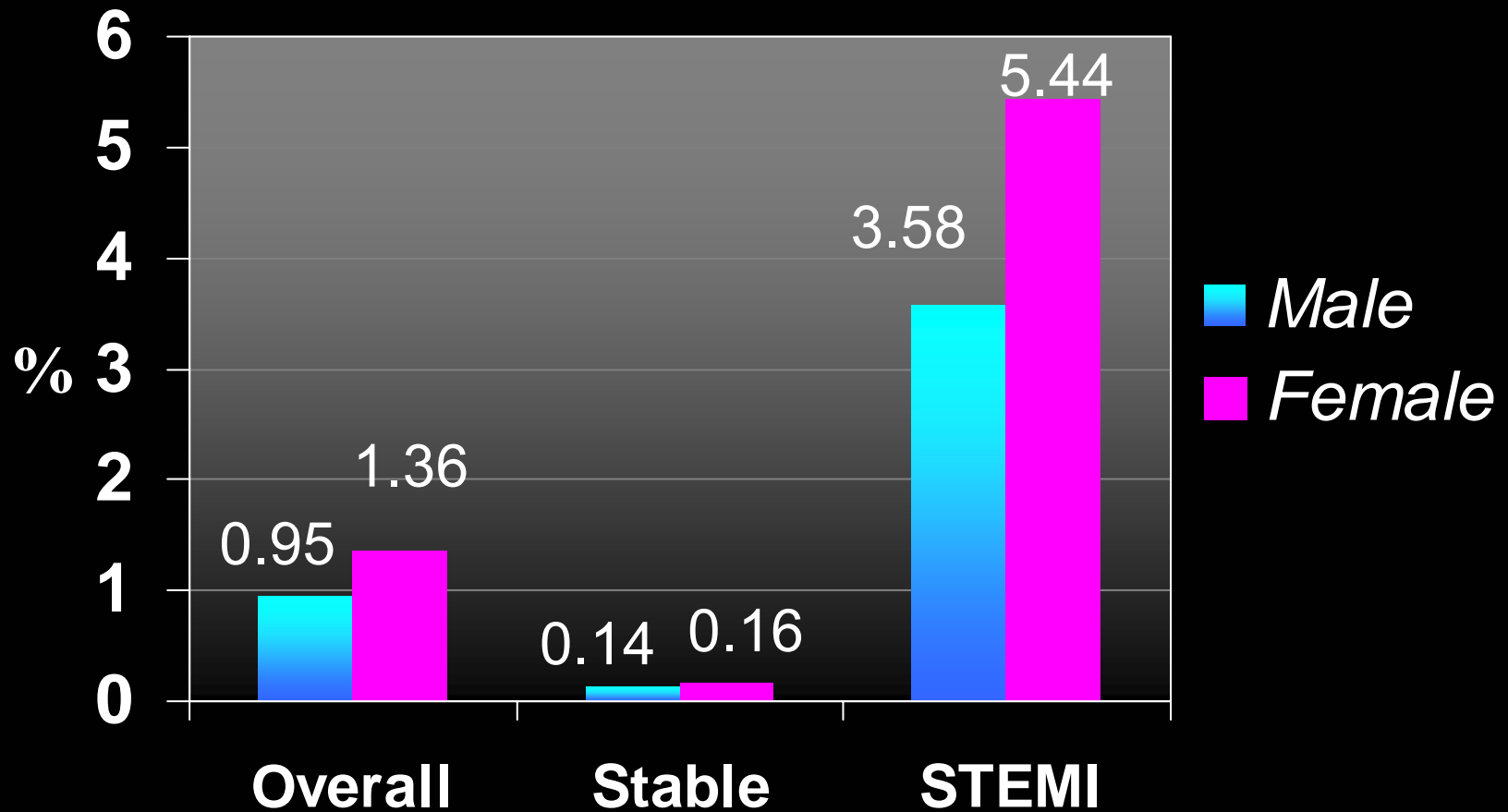


Gender v Mortality



2008 data: Ludman

In Hospital Mortality



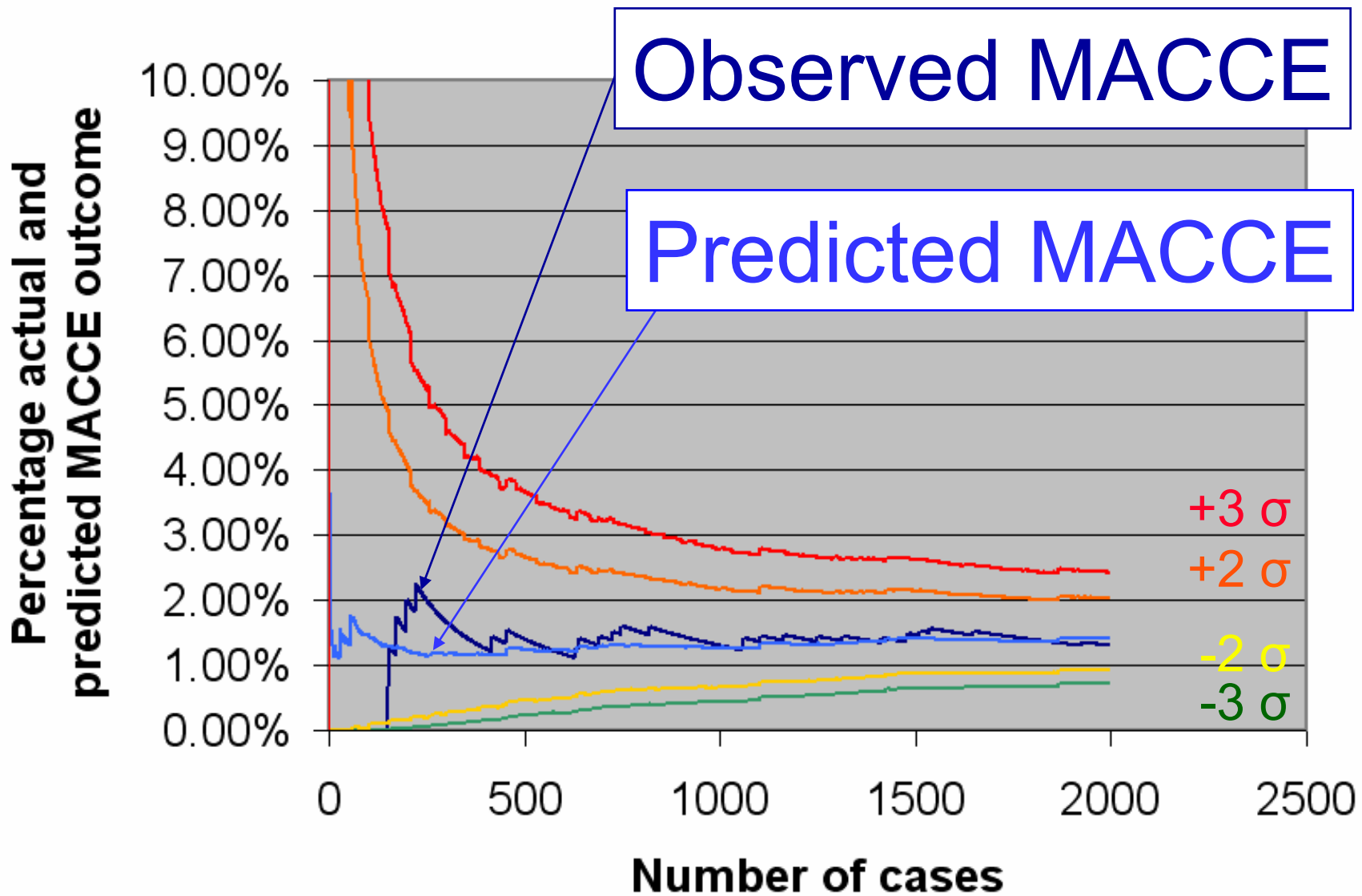
Risk adjusted outcome

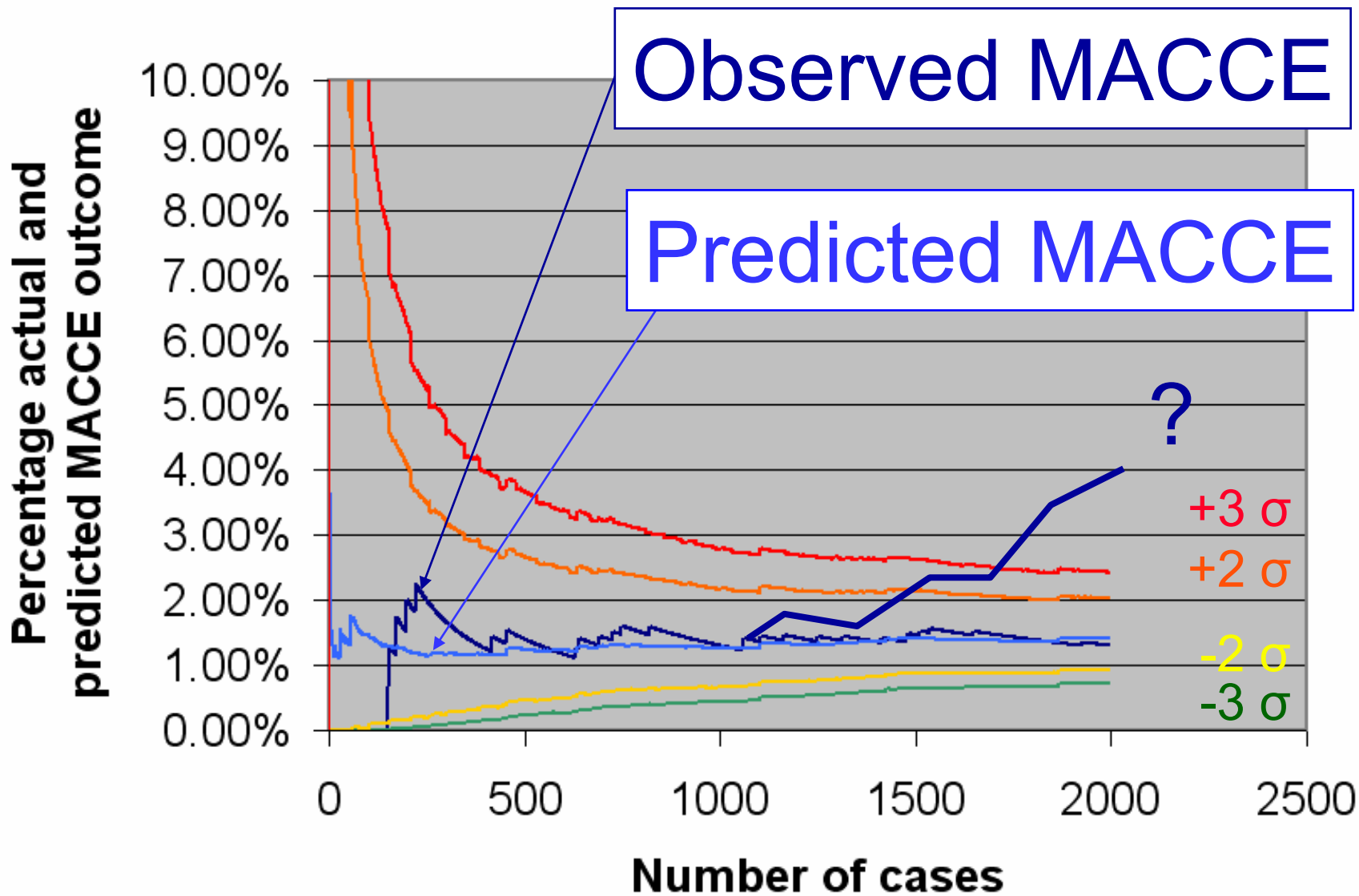


Assessment of unit specific performance

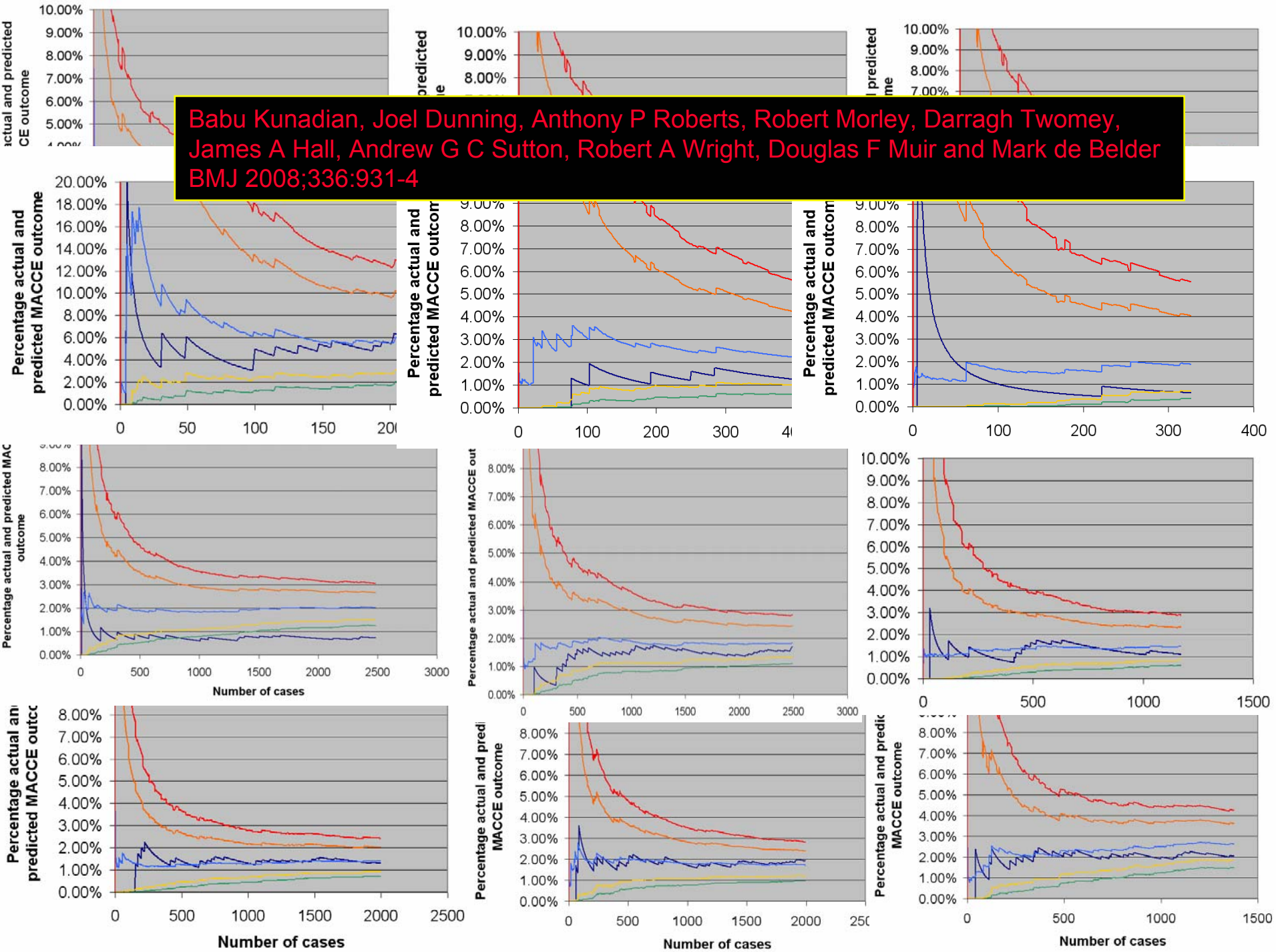


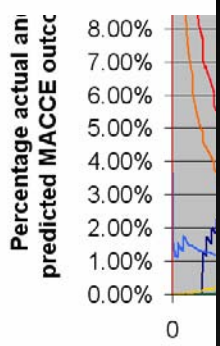
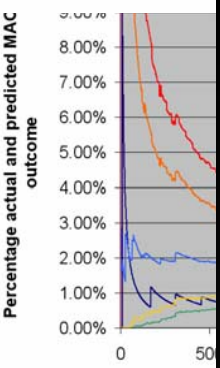
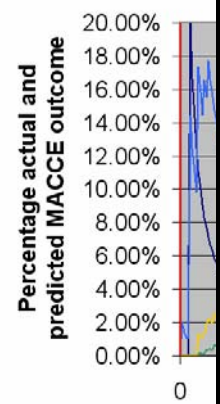
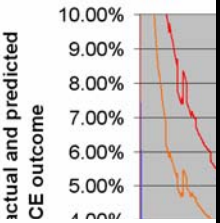
- 2007 + 2008 data
- Data monitoring committee
 - assessed Cumulative funnels for each unit
- Plots of each unit's overall risk adjusted outcome





Babu Kunadian, Joel Dunning, Anthony P Roberts, Robert Morley, Darragh Twomey, James A Hall, Andrew G C Sutton, Robert A Wright, Douglas F Muir and Mark de Belder
BMJ 2008;336:931-4

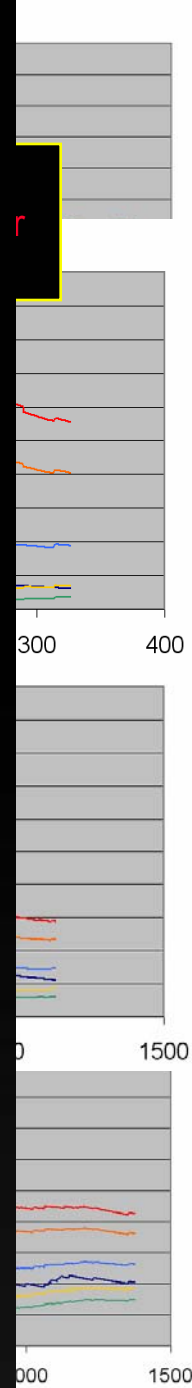




Number of cases

Number of cases

Number of cases



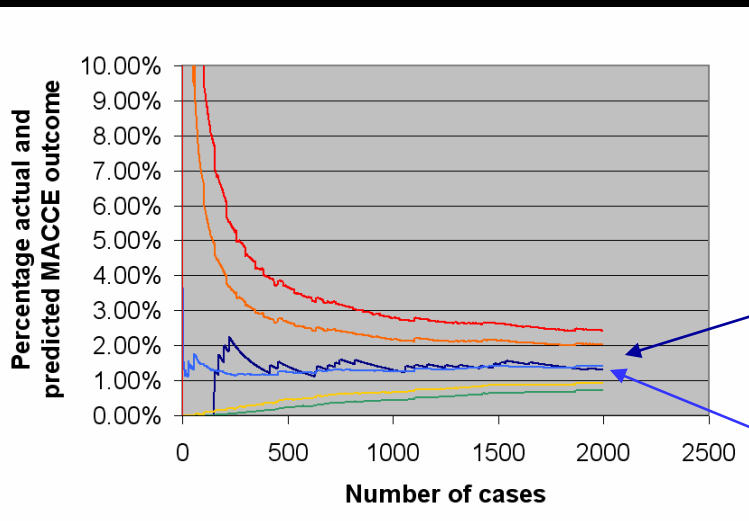
Outcome

MACCE for 2007 and 2008



2008 data: Ludman

After all PCIs for 2007 and 2008



Observed MACCE

Predicted MACCE

Outcome

MACCE for 2007 and 2008

After all PCIs for 2007 and 2008



2008 data: Ludman

Risk Adjusted MACCE (for unit x) =

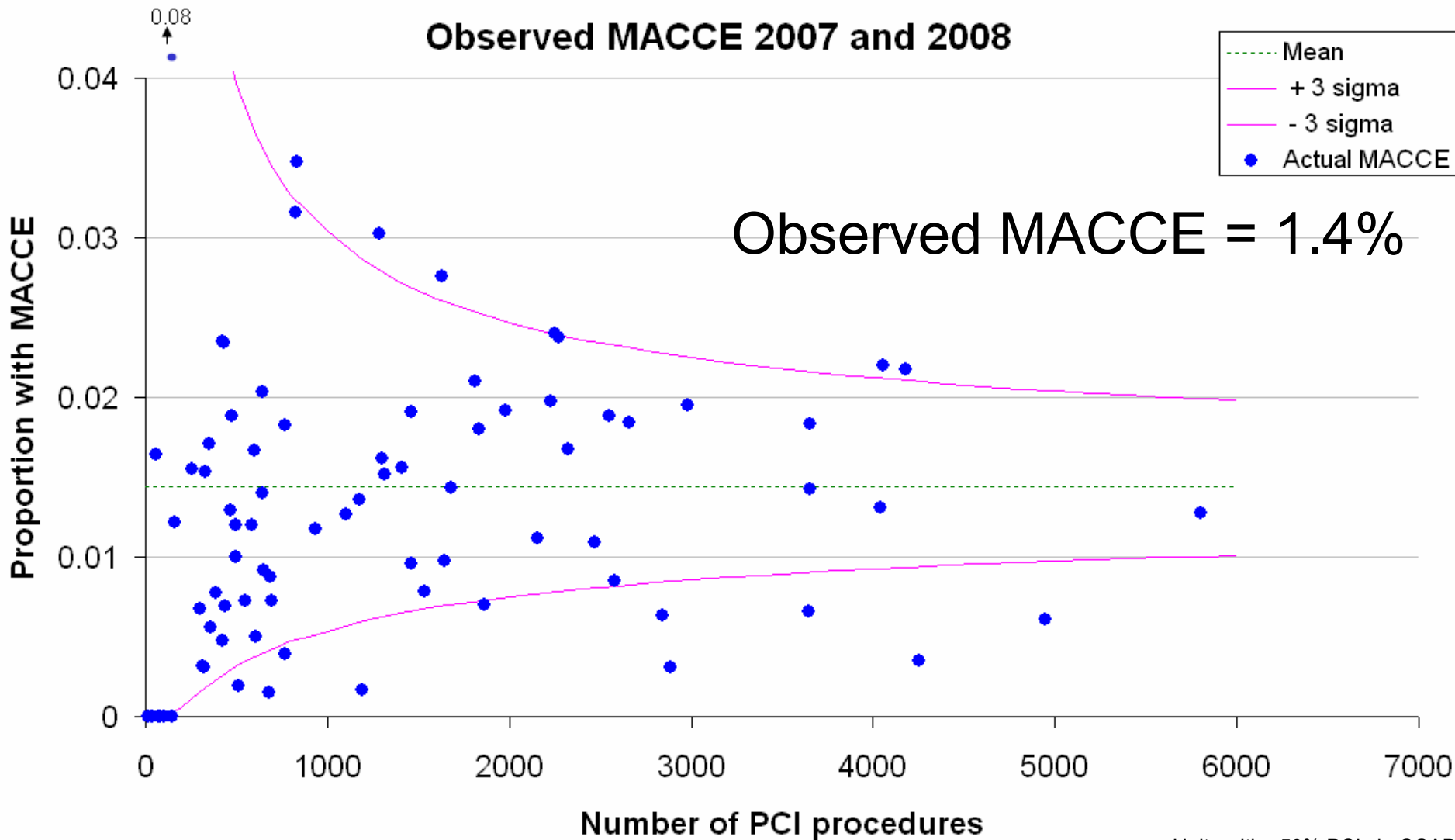
$$\text{Observed MACCE (all cases)} \times \frac{\text{Observed MACCE (for unit x)}}{\text{Predicted MACCE}}$$

Outcome

Data for 2007 and 2008



2008 data: Ludman

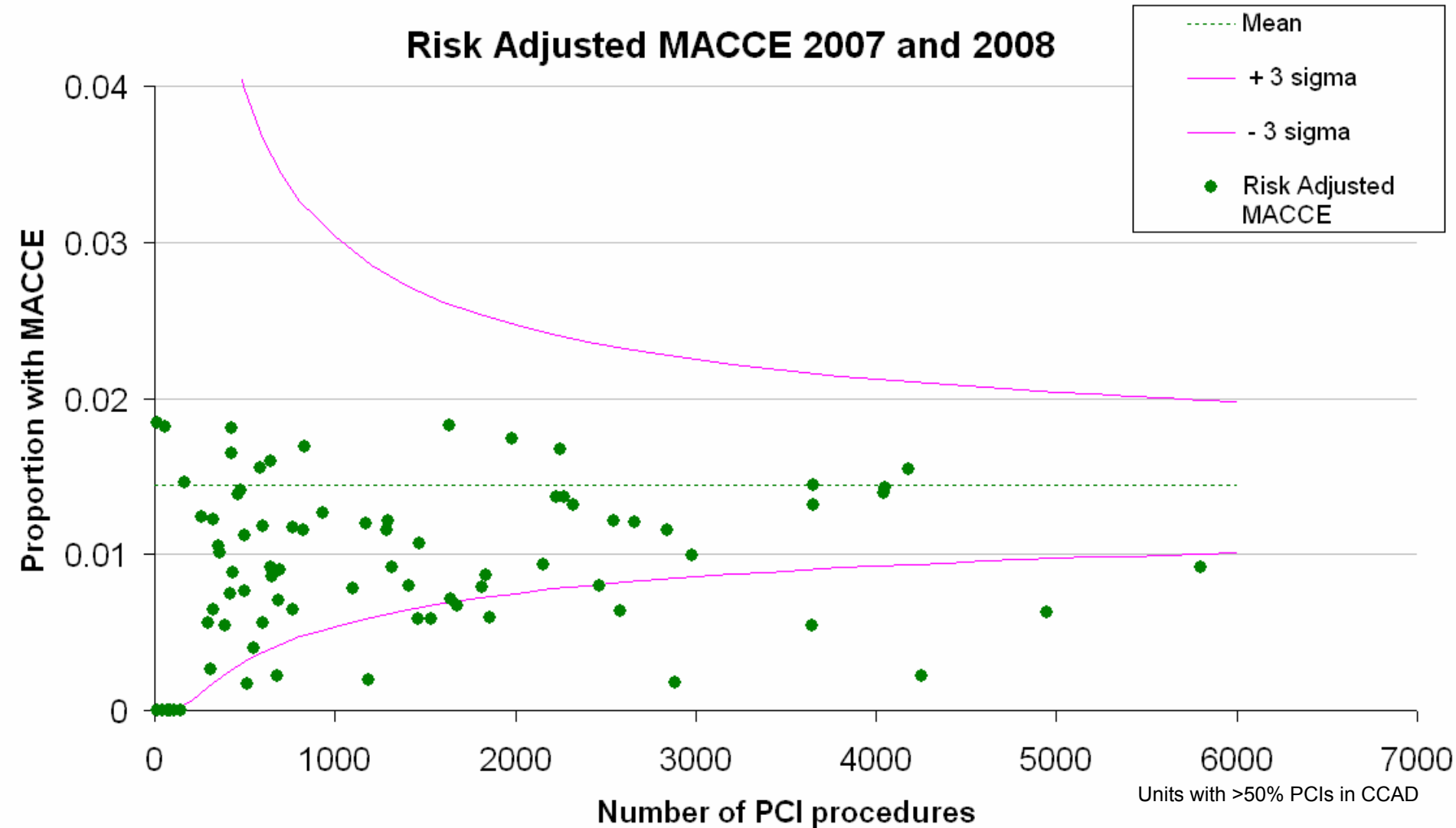


Outcome

Data for 2007 and 2008



2008 data: Ludman

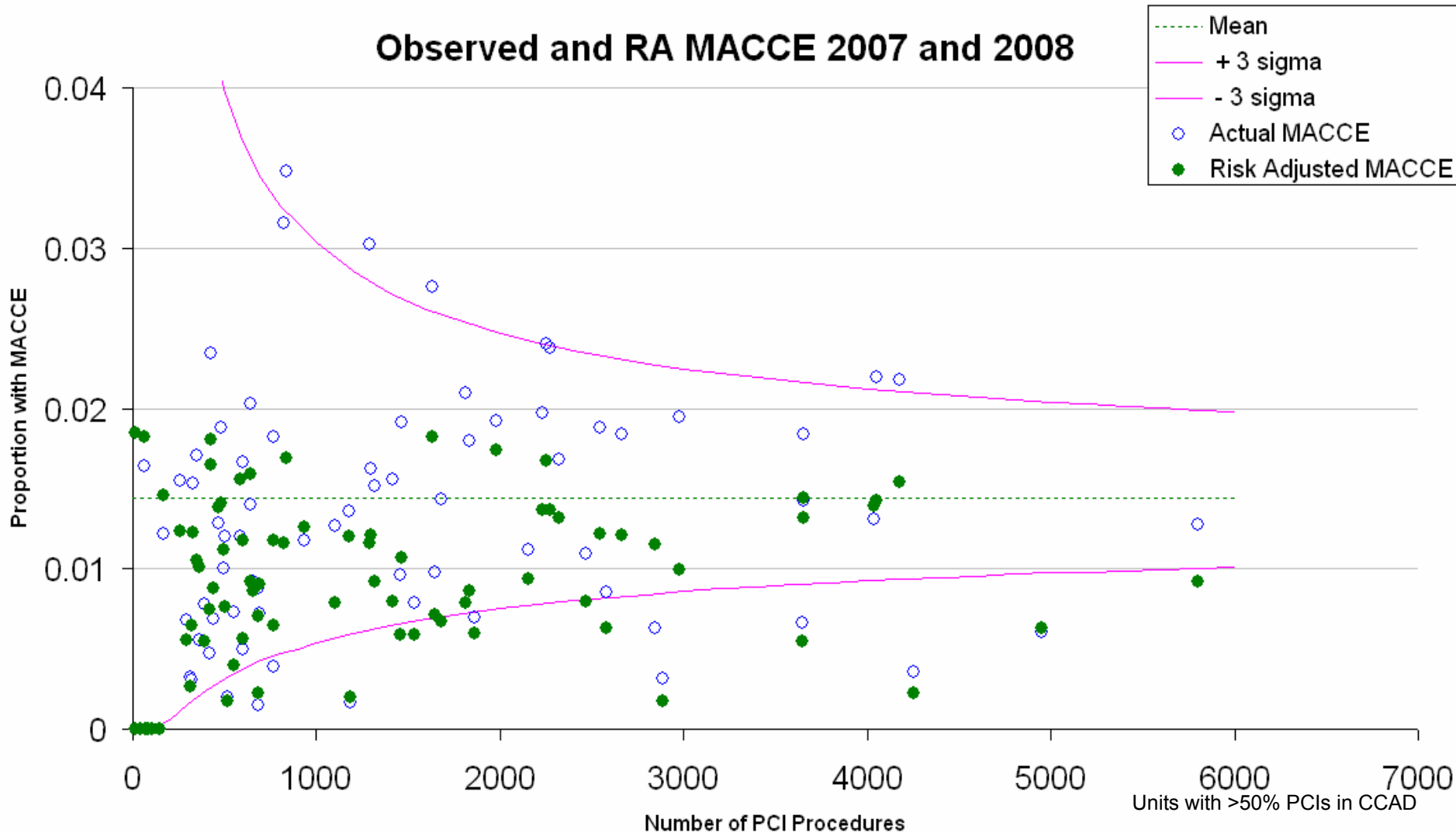


Outcome

Data for 2007 and 2008



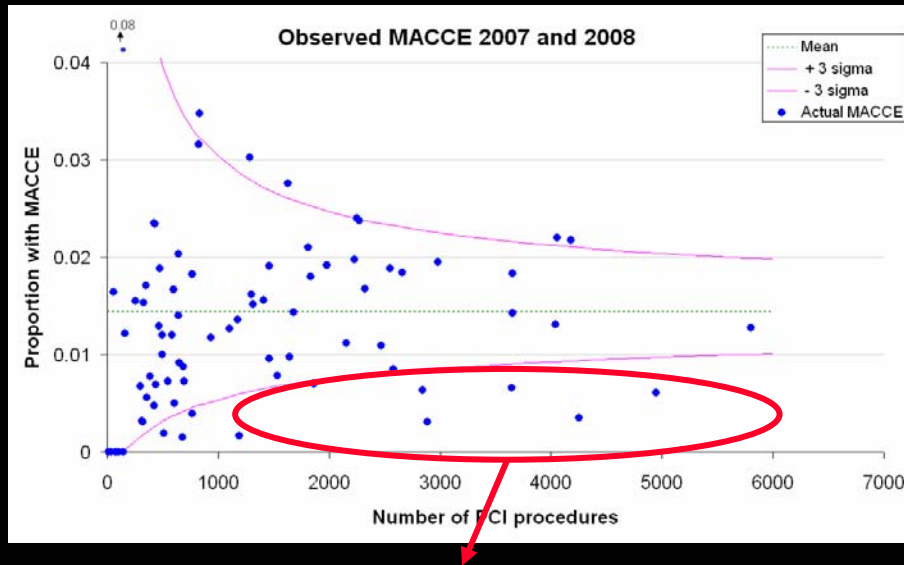
2008 data: Ludman



Potential Problems



2008 data: Ludman

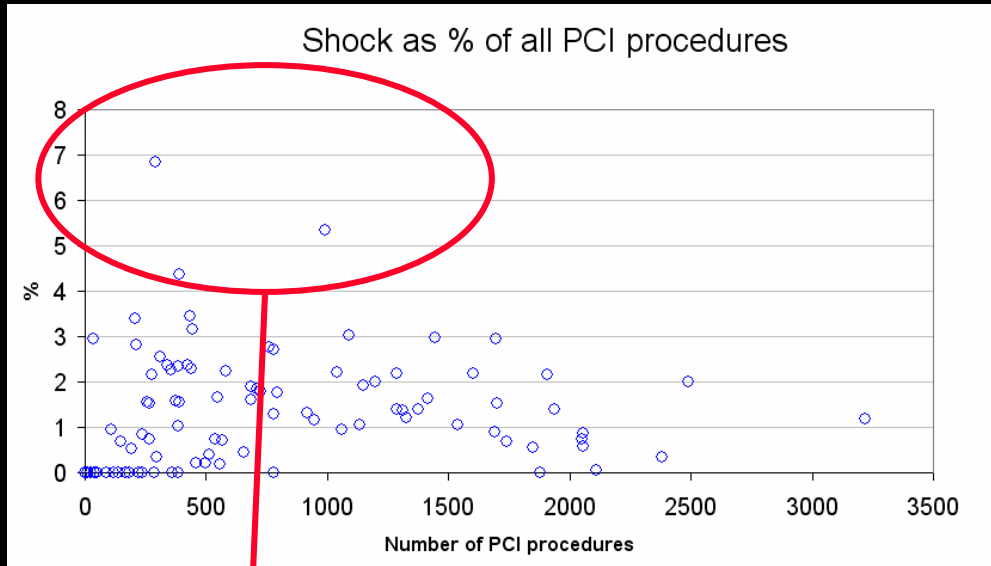


- Possible under reporting of MACCE
 - what happens after patient leaves lab
 - Rx and transfer
 - Data collection issues
 - Outperforming the model

Potential Problems



2008 data: Ludman



- Risk Models
 - Shock
 - Heavy weighting
 - Subjective assessment

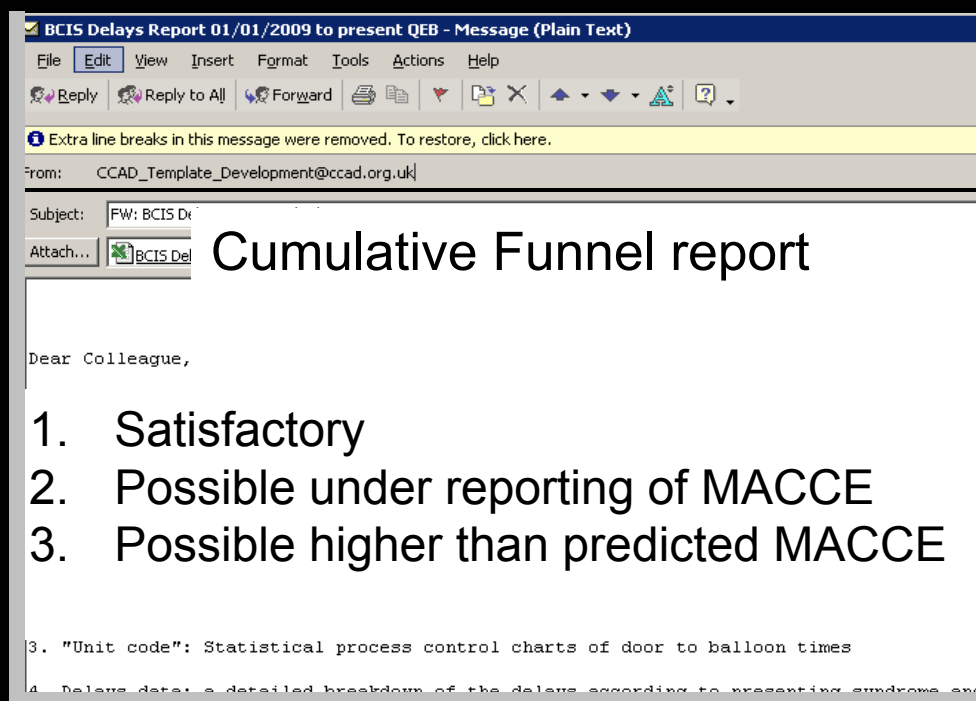
Predictors	NWQIP model	
	Odds ratio	Coefficient
Age, number of decades after 30 years		
Age 70–79 years	2.02	0.7048
Age ≥80 years	2.75	1.0106
Female sex	1.58	0.4586
Cardiogenic shock	26.14	3.2636
Cerebrovascular disease	2.37	0.8618
Urgent PCI	1.61	0.4788
Emergency PCI	3.91	1.3625
Urgent or emergency PCI		
LMS lesion treated	5.21	1.6502
Graft lesion treated	2.48	0.9101

Developments



2008 data: Ludman

- Regular reports



- Development of a mortality only model
- Peer assessment of outlying case mix?

Developments

- Revalidation
 - Unit specific data
 - Operator specific data
 - GMC number to be added to dataset
 - Private units - CCAD



2008 data: Ludman

General
Medical
Council

Principal List of the register of medical practitioners

General
Medical
Council
Regulating doctors
Ensuring good medical practice

Certificate of Full Registration as a Medical Practitioner

Description of certificate: Fully registered medical practitioner

GMC reference number: 1234567

Date of issue: 01/08/2007

Practitioner's name: Example, Name **Gender:** Woman

Date of full registration: 01/08/2007

Date of current entry from: 01/08/2007

Practitioner's address: Example Street, Example Town, Example Postcode

Registered qualifications: MB ChB 2006 University of Manchester

Annual retention fee due date: 17/05/2010

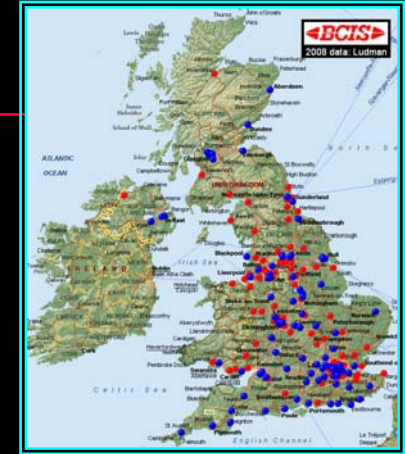
Description of employments

Grade: This certificate does not guarantee that this doctor's status on the Register has not changed. You can check this doctor's status on the Register, and find up to date details of this doctor's eligibility to practise medicine in the UK, on our website or by calling 0161 923 6602 (+44 161 923 6602 from outside the UK). This certificate is not proof of identity.

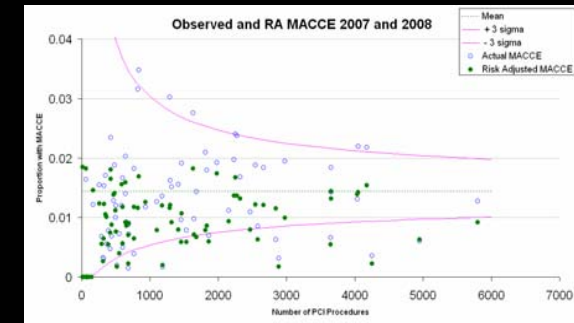
Chief Executive *Sirley McLeod*

Page 1 of 1

Summary 2008



- 105 PCI centres in UK
- 1,308 PCI pmp in UK
- Smaller increase in PCI continues
- Radial access related to less complications
- Early analysis of PPCI timings encouraging
- Risk adjusted outcomes appear good
- Plans
 - Improve reporting of syndromes and outcomes
 - Develop mortality model (ONS validation)
 - Potential role in revalidation
 - Call to balloon times mandatory from Jan 2009



- Additional data on the web site

The End

Acknowledgments

- Andrew Donald
 - Programmer at CCAD
- Peter Nightingale
 - Statistician University Hospital Birmingham
- Tony Roberts and Robert Morley
 - Statistical process control chart development
- Owen Nicholas
 - Statistician at NICOR