

Who and When to Refer for a Heart Transplant

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Presentation title: Who and when to refer for a heart transplant

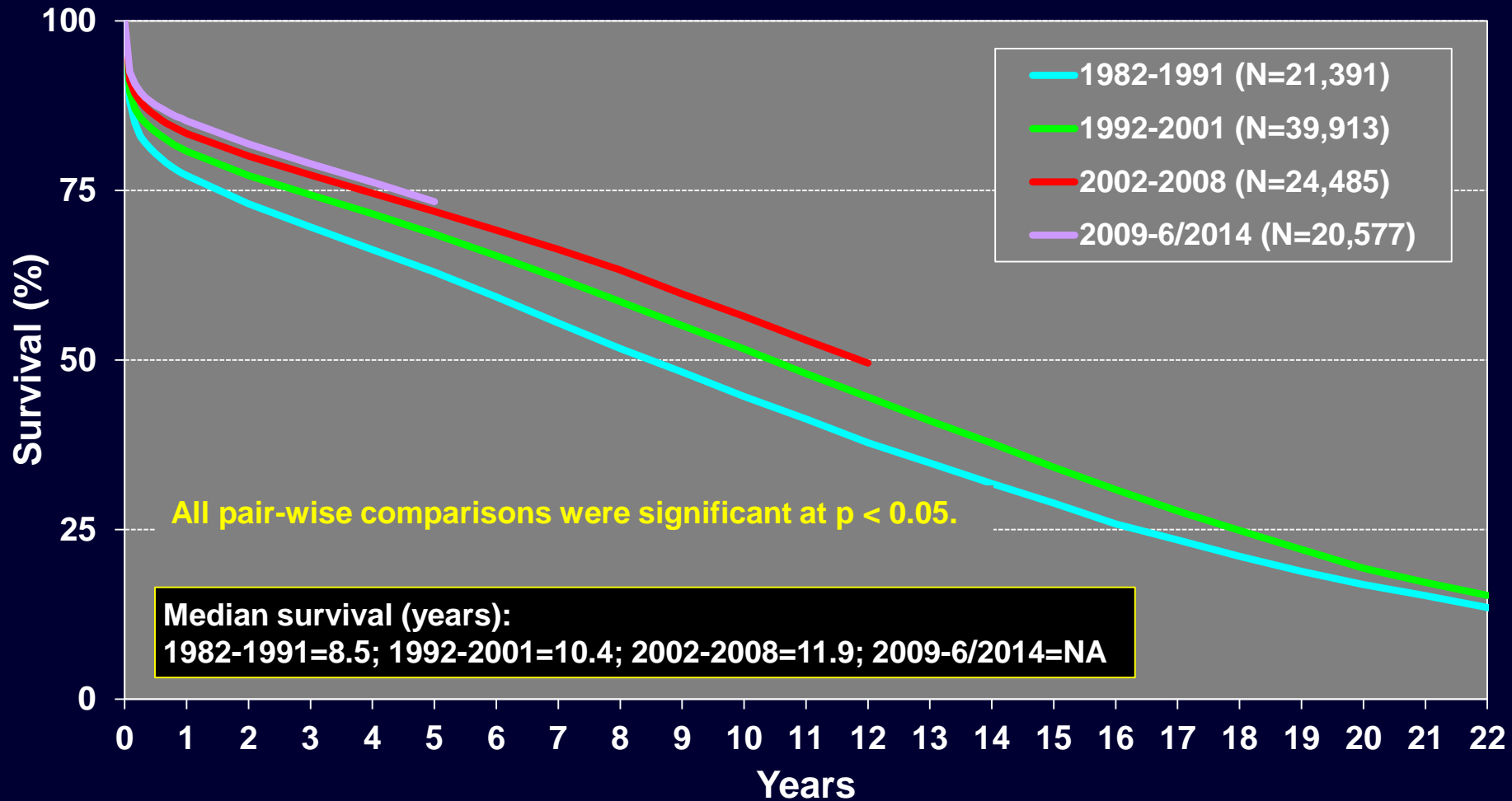
Speaker: Jayan Parameshwar

Conflicts of interest: NIL

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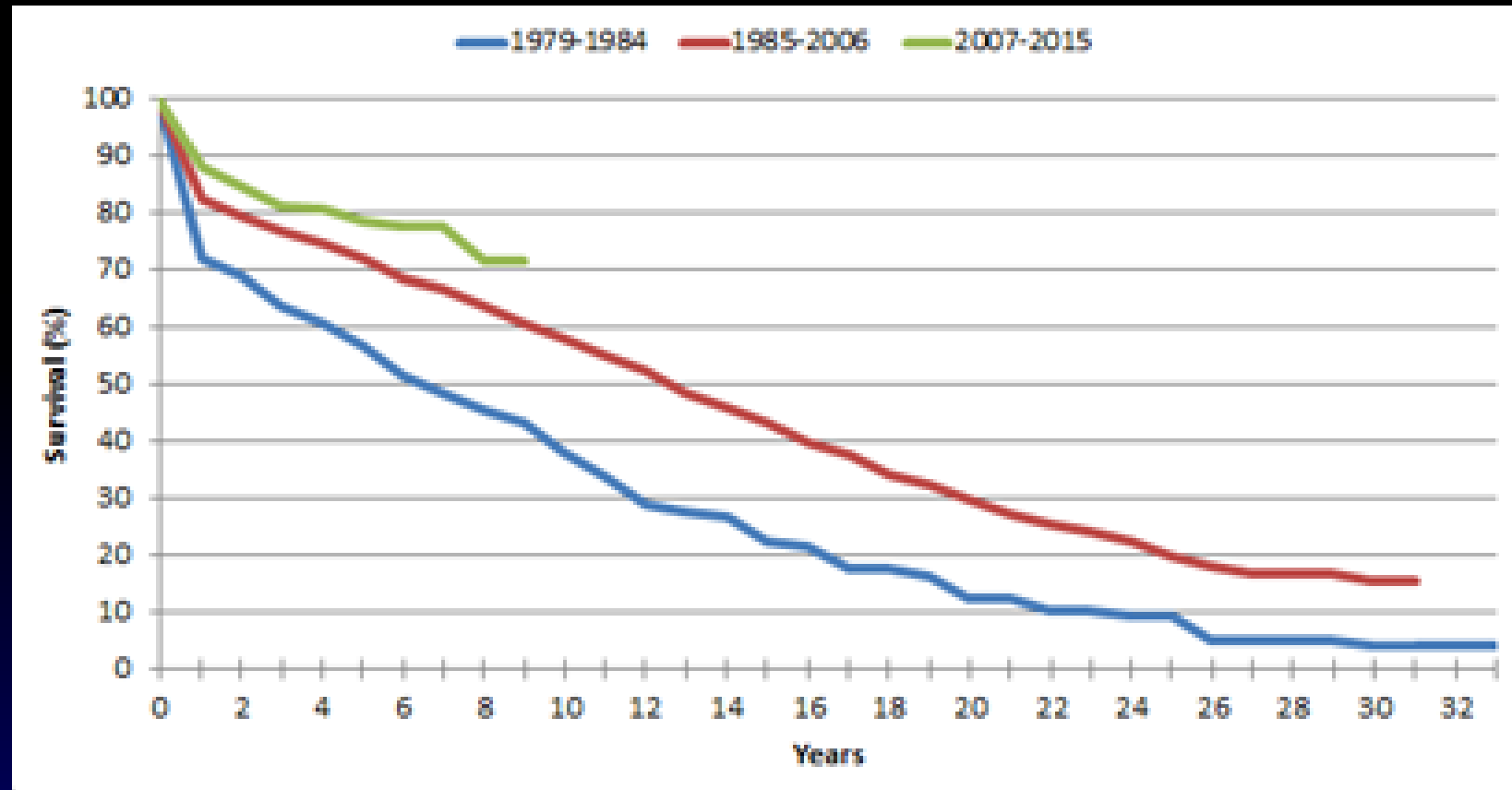
These presentation slides will be added to www.bsh.org.uk after the meeting

Adult Heart Transplants Kaplan-Meier Survival by Era (Transplants: January 1982 – June 2014)



Papworth Heart Transplant Survival

(1979-84 N=97; 1985-2006 N=979; 2007-15 N=253)



Adult Heart Transplants

Rehospitalization Post Transplant of Surviving Recipients (Follow-ups: January 2004 – June 2015)

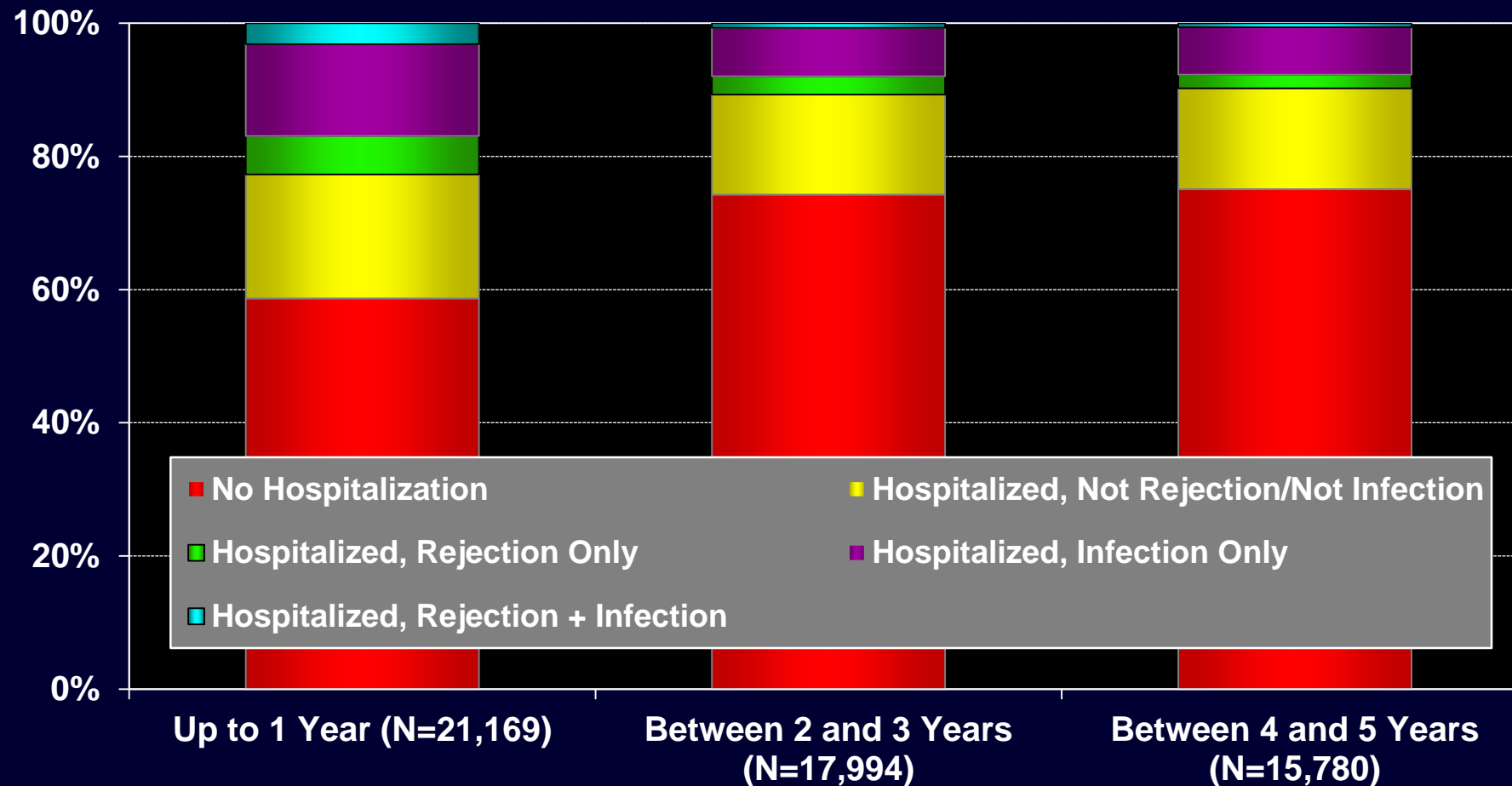
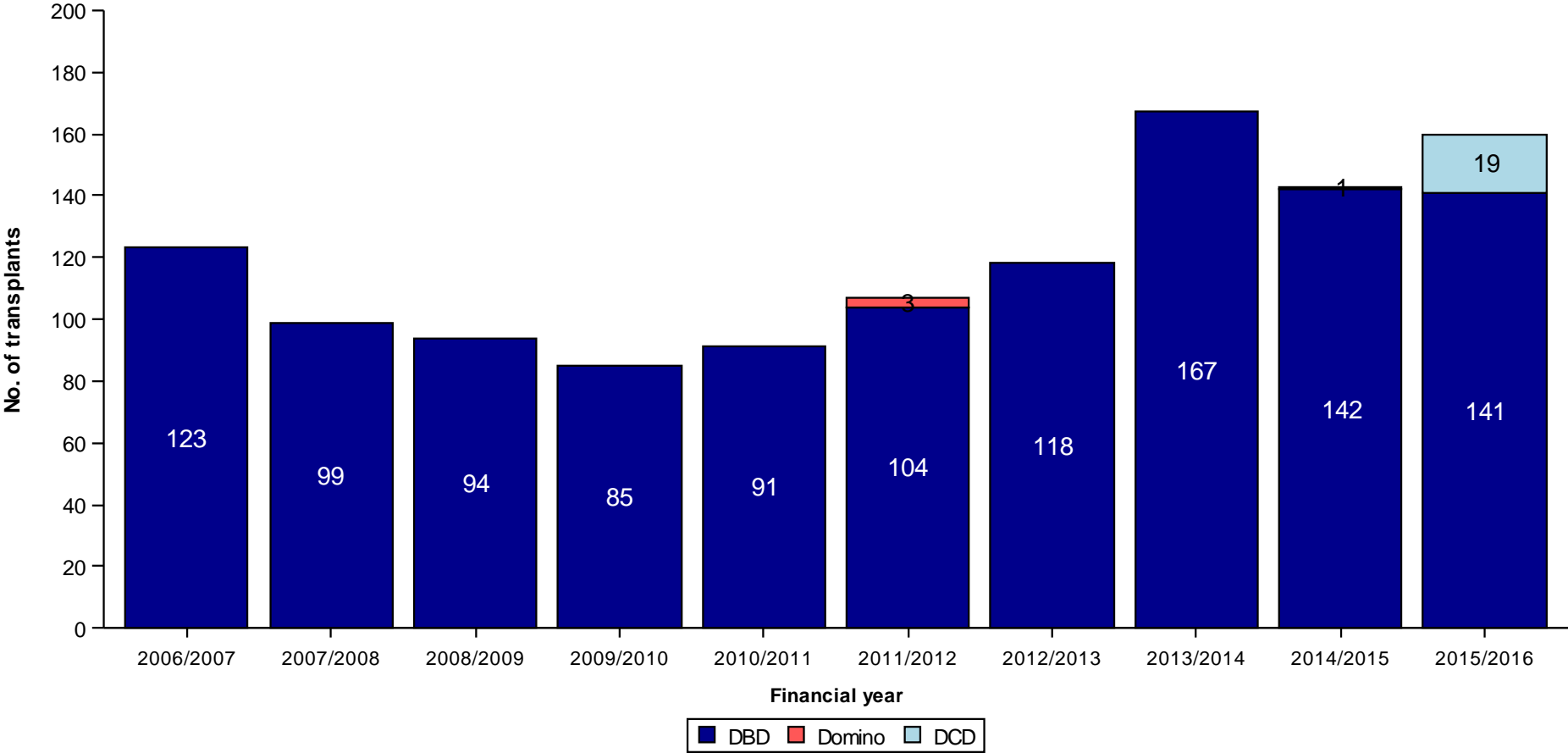


Figure 5.1 Number of adult heart transplants in the UK, 1 April 2006 to 31 March 2016, by financial year



**Deceased donor heart programme in the UK, 1 April 2007 - 31 March 2017,
Number of donors, transplants and patients on the active transplant list at 31 March**

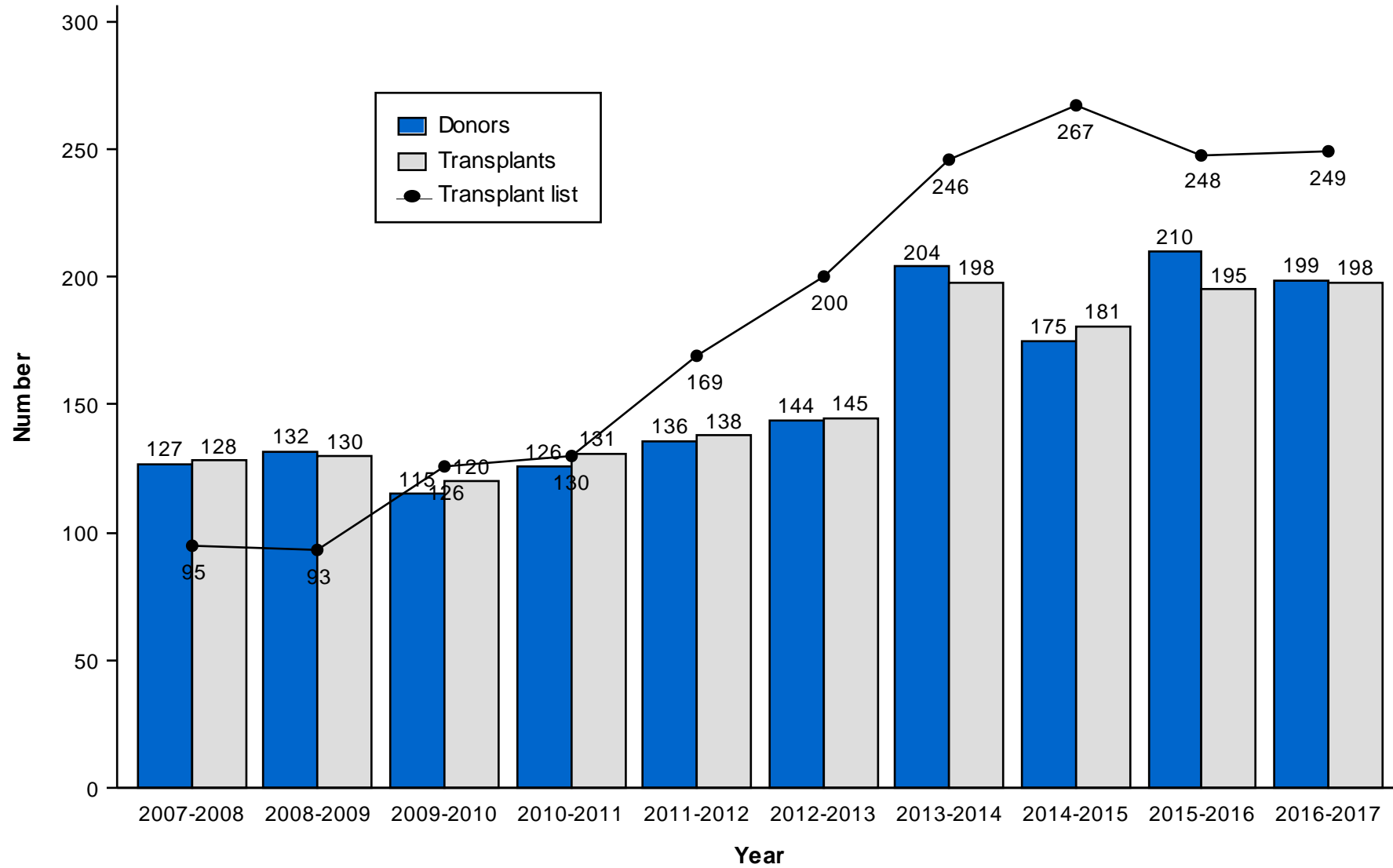
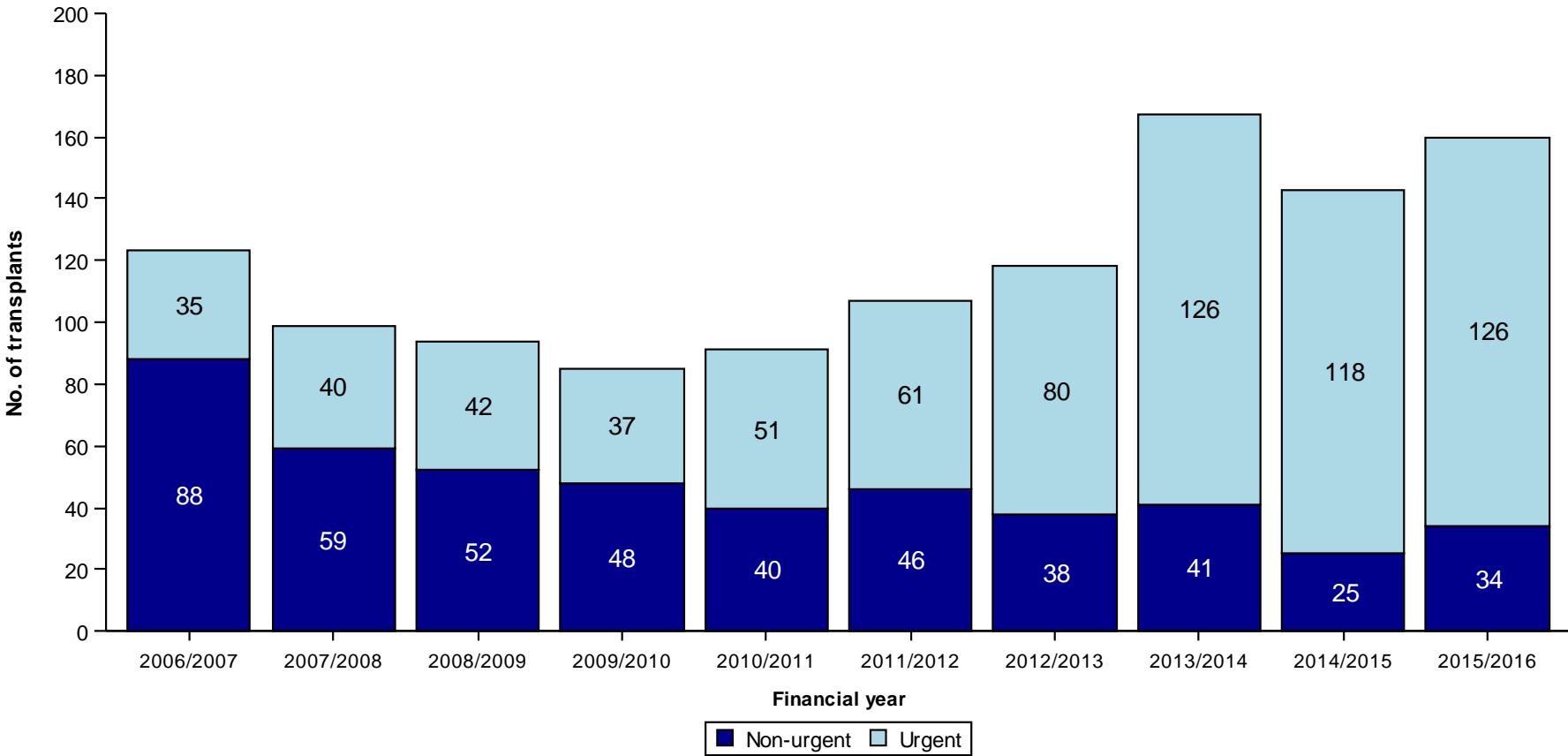


Figure 5.4 Number of adult heart transplants in the UK, 1 April 2006 to 31 March 2016, by financial year and urgency status



UK DATA

- www.odt.nhs.uk/statistics-and-reports

Patient Selection

- Relative risk and benefit for patient
- Benefit relative to the population of potential heart transplant candidates (i.e. patients capacity to benefit)
- Likelihood of receiving a transplant

Patients listing done in a MDT and as transparent as possible but is not an exact science. Second opinion is always available.

GUIDELINES

- UK Guidelines for referral and assessment of adults for heart transplantation
Heart 2011;97:1520-1527
- Listing Criteria for Heart Transplantation
J Heart Lung Transplantation 20016;35:1-23

INDICATIONS

- History
 - Recurrent admissions to hospital despite adequate medical therapy (2 in 12 months)
 - Persistent symptoms attributable to heart failure despite optimal medical therapy
 - Recurrent ventricular arrhythmia in the presence of severe ventricular dysfunction

PATIENT SELECTION CPEX

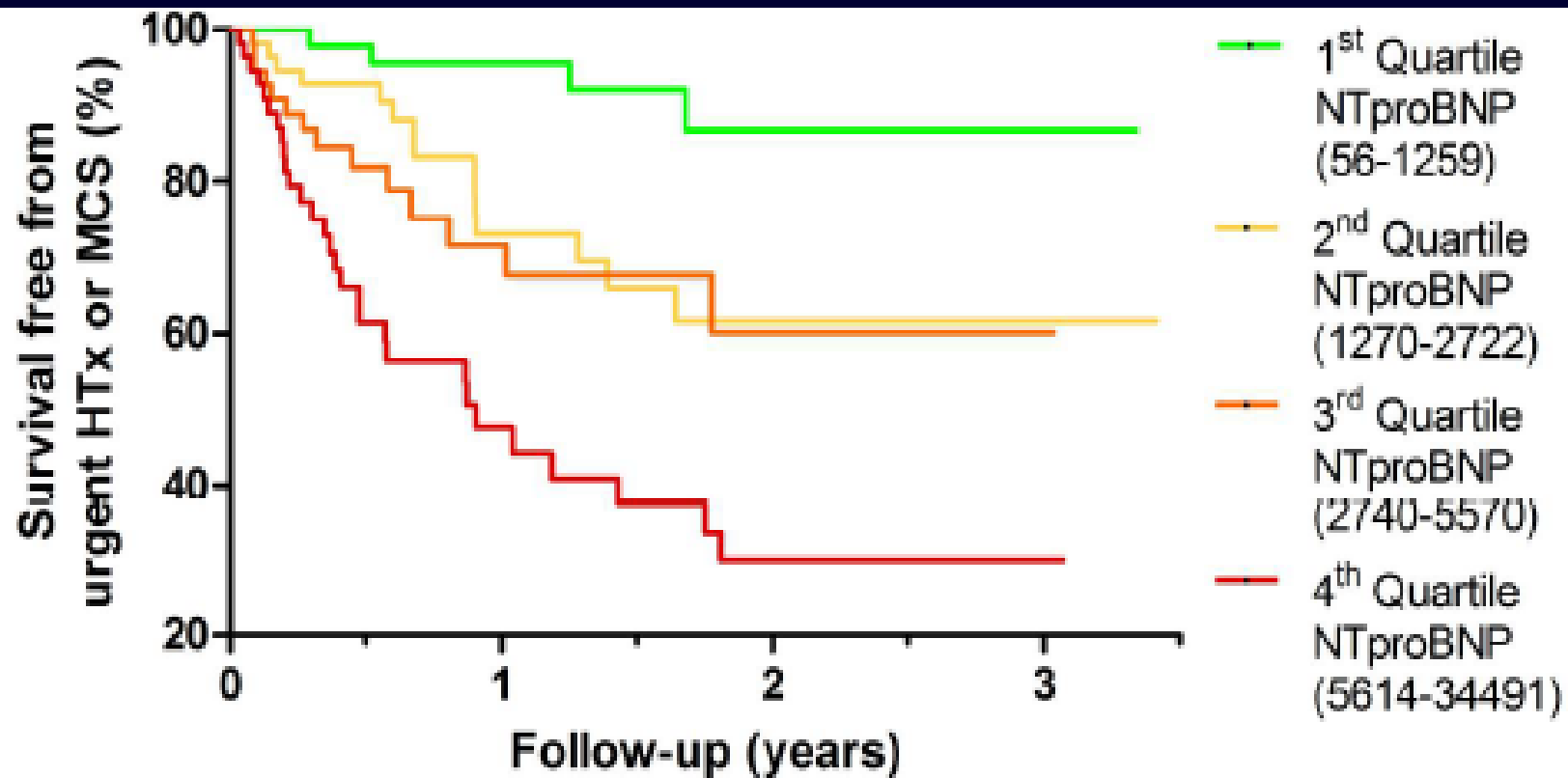
Peak $\text{VO}_2 < 14 \text{ ml/kg/min}$ or 50% predicted.

If on beta blockers $<12 \text{ ml/kg/min}$

Peak VO_2 is affected by age, pre-morbid fitness

INDICATIONS

- Laboratory
 - Deteriorating renal function (eGFR<50), inability to tolerate diuretic dose sufficient to clear congestion, need to decrease or discontinue prognostic medication
 - Hyponatraemia
 - Rising or persistent elevation of natriuretic peptide
 - ECHO: worsening RV function or rise in PASP (>50 mm Hg)



Patients at risk

NTproBNP Q1:	56	30	13	1
NTproBNP Q2:	56	26	8	2
NTproBNP Q3:	56	18	6	1
NTproBNP Q4:	57	15	8	1

*** $P < 0.0001$

Figure 1. Event-free survival by NTproBNP quartiles.

Urgent inpatient referral

- Inotrope or iv diuretic dependent
- Need for IABP to prevent secondary organ failure
- Intractable ventricular arrhythmia with severe ventricular dysfunction.
- Ventilation for pulmonary oedema

(Absence of Contraindication to Transplantation)

Urgent In-Patient Referral

- 65 year old man in ICU BP 80/60 on 2/3 inotropes
- 3 week h/o dyspnoea and fluid retention
- Ventilated for pulmonary oedema
- CTPA: multiple bilateral PE
- ECHO: poor LV and RV, clot in both
- Lactate 10, anuric, creatinine 400
- ALT 5000, INR 2.8 (auto anticoagulated)

Re-Testing

- Serial testing important for pts on waiting list and those deemed too well on initial listing
- Interval: 3-6 monthly recommended
- Pts with borderline PVR may need RHC more frequently

Relative Contraindications

- Active acute infection
- Symptomatic peripheral or cerebrovascular disease
- Diabetes mellitus with end-organ damage (nephropathy, neuropathy, proliferative retinopathy), poor diabetic control

Relative Contraindications

- Severe lung disease (FEV1 and FVC less than 50% predicted, CT lung disease)
- Recent pulmonary thromboembolism (6 weeks)
- Pulmonary hypertension: pulmonary artery systolic pressure > 65 mm Hg, transpulmonary gradient ≥ 15 mmHg and/or pulmonary vascular resistance > 5 Wood units.

Patient Selection-RHC

- RA pressure (volume status)
- TPG: PA mean – PCWP
- PVR: TPG \div Cardiac Output
- (Low filling pressure with CI $>$ 2 l/min/m²: good prognosis)

RHC

DATE	18/10/2011	15/02/2012	12/07/2012
RA	19	14	9
RV	78/27	81/15	43/12
PA	84/36 53 53%	82/32 49 55.4%	39/23 29 65.3%
PCWP	36 v=43	32 v=41	20 v=27
CO	2.0	2.8	4.0
CI	1.1	1.5	2.1
TPG	17	17	9
PVR	8.5	6.1	2.3

Relative Contraindications

- Age: not absolute bar to transplant evaluation
- Pts over 60 probably have a worse long-term outcome (most patients < 65)
- Higher risk of malignancy and renal dysfunction, (but less rejection)
- Careful attention to co-morbidity in older patients

Relative Contraindications

- Malignancy: recent history ? < 5 years, less for haematological malignancy
- Depends on the prognosis of the individual malignancy (consult oncologist)
- Possible effect of immunosuppression on tumour recurrence

Relative Contraindications

- Renal Dysfunction: common in patients with advanced heart failure
- Impacts on outcome after TP
 - Normal renal size & no proteinuria and eGFR > 40 ml/min/1.73 m²
- Response to trial of inotropic therapy may help in *some* patients
- Duration of abnormal function

Relative Contraindications

- Obesity: BMI \geq 35 affects outcome; advise weight loss first (consider body habitus). BMI 30-35, may help to lose weight before listing
- Chronic Viral infection:
 - HIV: if CD4 count $>$ 200 for 3 months, RNA –ve and no opportunistic infection or malignancy
 - Hep B and Hep C: if negative PCR and no cirrhosis/liver dysfunction, Hep C genotype

Relative Contraindications

- Smoking: affects medium term outcome; recommend 3-6 month smoking free
- Active/recent drug abuse
- Alcohol abuse (at least 6 months abstinence)
- Inability to give informed consent
- History of non-adherence

TIMING

- Probable duration on waiting list
 - Size
 - Blood group
 - Allo-sensitization (presence of anti-HLA antibodies)

CONCLUSION

- Refer “too early” rather than “too late”
- If in doubt discuss with transplant cardiologist
- **MINIMUM INFORMATION:**
 - History (operations, transfusion, co-morbidities), symptoms
 - Diabetes: complications, PVD
 - Medication
 - Height, weight, FBC, U+E, LFT, other
 - Imaging: Coronary angiogram, CT, MRI ,