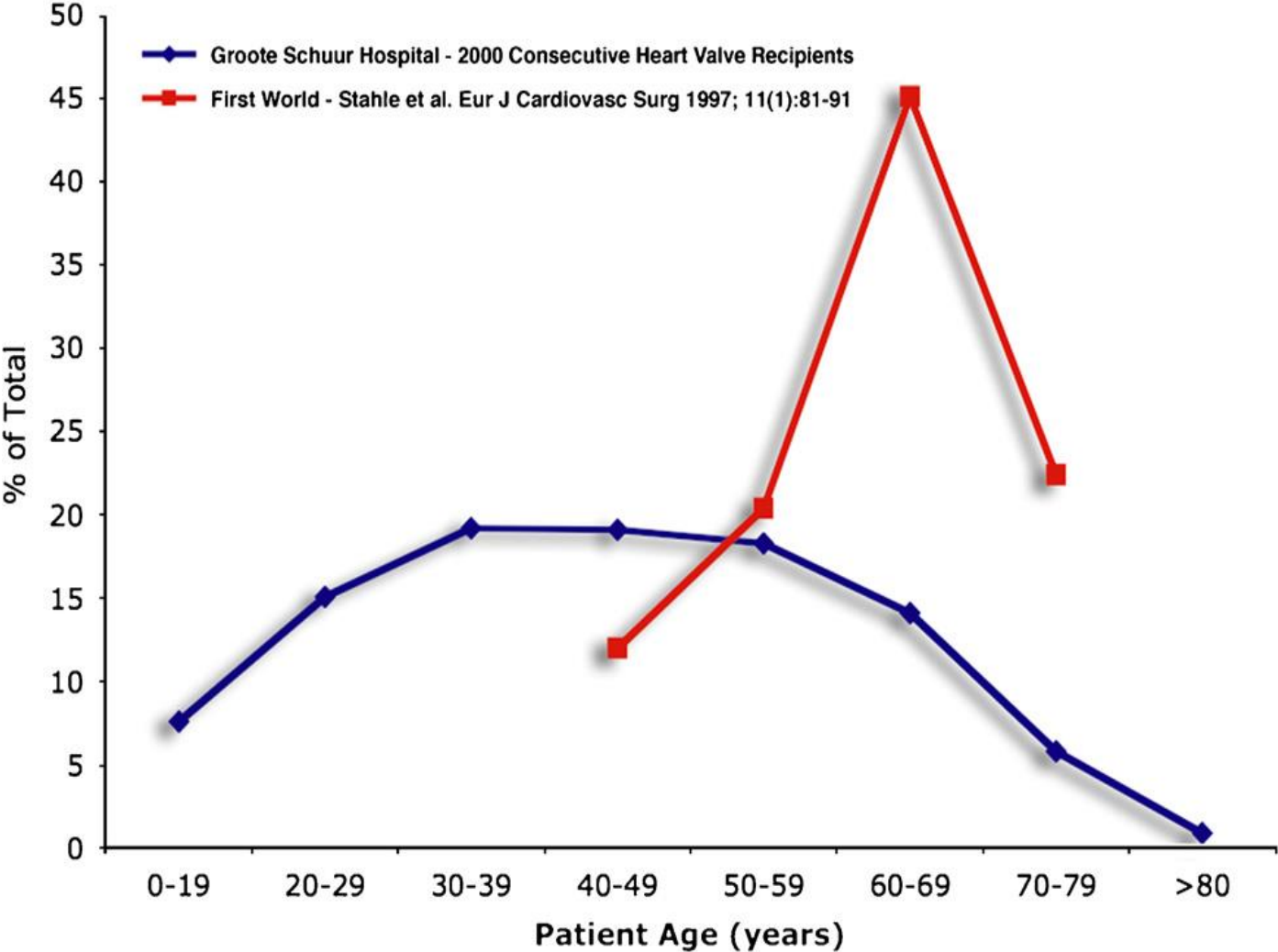


# Heart valve surgery in Central South Africa



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# Prosthetic heart valves: Catering for the few



**Figure** Typical age-distribution of patients undergoing heart valve replacement in the First World and in a Developing Country. While prosthetic valve recipients in a First World population are predominantly in the age group of 60–69 years (red line) they are broadly disseminated over an age spectrum from 20 to 70 years in a Developing Country such as South Africa (blue line). As the age distribution of 2000 consecutive heart valve recipients at the Groote Schuur Hospital (University of Cape Town) shows, a significant proportion of patients is even younger than 20 years. Zilla P, Brink J, Human P, Bezuidenhout D. 2008. Prosthetic heart valves: Catering for the few. *Biomaterials* 29: 385–406.

# Survival after heart valve replacement reduced vs. expected survival in the general population

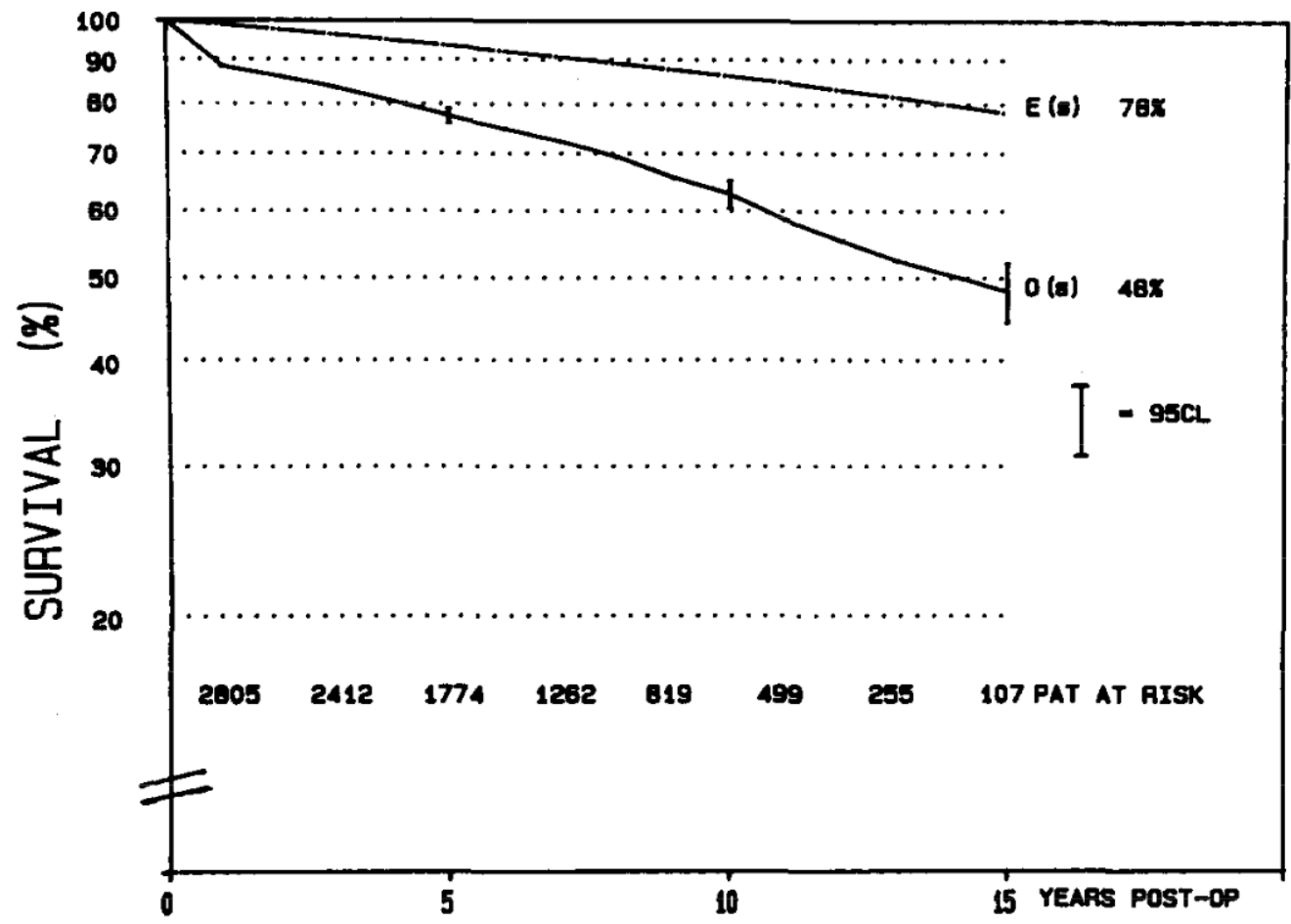


Figure 2. Observed survival (O[s]) among 2,805 patients undergoing aortic or mitral valve replacement, or both. The expected survival rate (E[s]) line represents the experienced survival in a gender- age- and year of operation-matched control group. The vertical bar indicates the 95% confidence limits (95CL). PAT = patient; POST-OP = postoperatively.

# Pre-operative heart failure reduces long-term survival

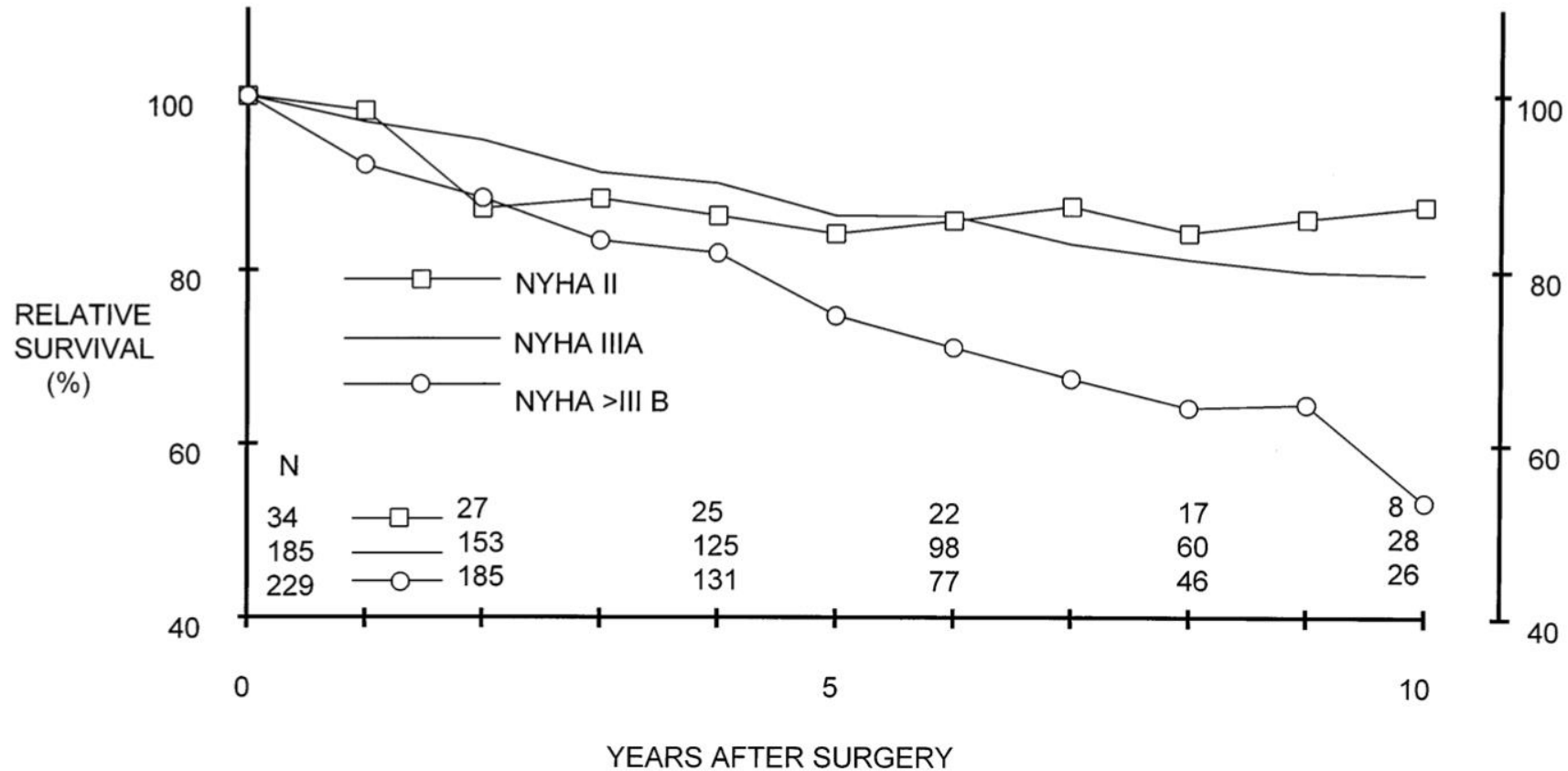


Fig. 8. Relative survival after primary mitral valve replacement by preoperative NYHA functional class in patients who survived the first postoperative month. NYHA II (—□—), IIIA (—)  $\geq$  IIIB (—○—). 95% confidence intervals at 5 and 10 years and the number (N) of patients at risk after one month, 2, 4, 6, 8 and 10 years are given.

# Risk Scores- Criteria

1. Derived from a **representative sample of a population recognizably similar to those to whom it will be applied** (age, sex, social class, ethnicity etc)- or appropriately re-calibrated
2. **Sufficiently powered** (big enough sample)
3. Tested internally and externally in terms of **discrimination** and **calibration**.
4. If new factors are added, does **performance improve** and is the **re-classification index** known?
5. Has its application been shown to result in **measurable health gains**?

# Rheumatic Heart Disease Patients 358 (75.7%) of the 473 Adult Patients for Valve Surgery 2008-2012

Demographics		
Race	Black	246 (68.7%)
	Other	112 (31.3%)
Gender	Male	155 (43.3%)
	Female	203 (56.7%)
Age (mean)		<b>44 (14 – 76)</b>
Mortality		24 (6.7%)
HIV n = 150	Positive	16 (10.7%) <b>0 % mortality</b>
	Negative	134 (89.3%)

# Comparison of present data to published SA data in the 1980's

	1980's (Antunes,1984,1989,1990)	2008 -2010 (UFS) (n = 259 consecutive RHD cases)
Age at presentation		43 years (Sliwa)
Mean Age at Operation	21 years	46 years
Percentage Mitral Valve Repair	43.8%	21%
Presenting for surgery with Acute RHF (MR)	29%	0%
Emergency surgery for RHD	Up to 30%	0%
Infective Endocarditis	Up to 12%	4.7%
Redo Surgery	12-22%	12%

# The prevalence of rheumatic heart disease among Grade 10 - 12 learners in the Free State and Northern Cape – Preliminary results of the Wheels-of-Hope Outreach Programme

F E Smit, L Botes S Rossouw S C Brown SAHeart 2015;12:146-151

## Abstract:

An outreach programme was initiated to echocardiographically screen Grade 10 - 12 learners, in Central South Africa, for rheumatic heart disease (RHD). Preliminary results, after the screening of 1 015 learners, identified 102 abnormal echocardiograms. The abnormal echocardiograms were reviewed by an echocardiographer and paediatric cardiologist team and 14 pathological conditions were confirmed in 13 patients. The abnormalities included RHD (n=5), pericardial effusion (n=2), left ventricular hypertrophy (n=2), mitral valve prolapse (n=3), ventricle septal defect (VSD) (n=1) and sub-aorta stenosis (n=1). The benchmark study by McClaren, et al. conducted in Soweto in 1972 (n=12 050, age 2 - 18 years) showed an overall RHD prevalence of 6.9 per 1 000 and **12.2 per 1 000 in the 15 - 18 year old bracket**. The highest incidence (19.2/100) was found in Grade 7 learners (age not defined). **The preliminary result of this study is 4.9 RHD cases per 1 000 in Grade 10 - 12 learners. This finding may indicate an actual decline in the prevalence of RHD in Central South Africa.**





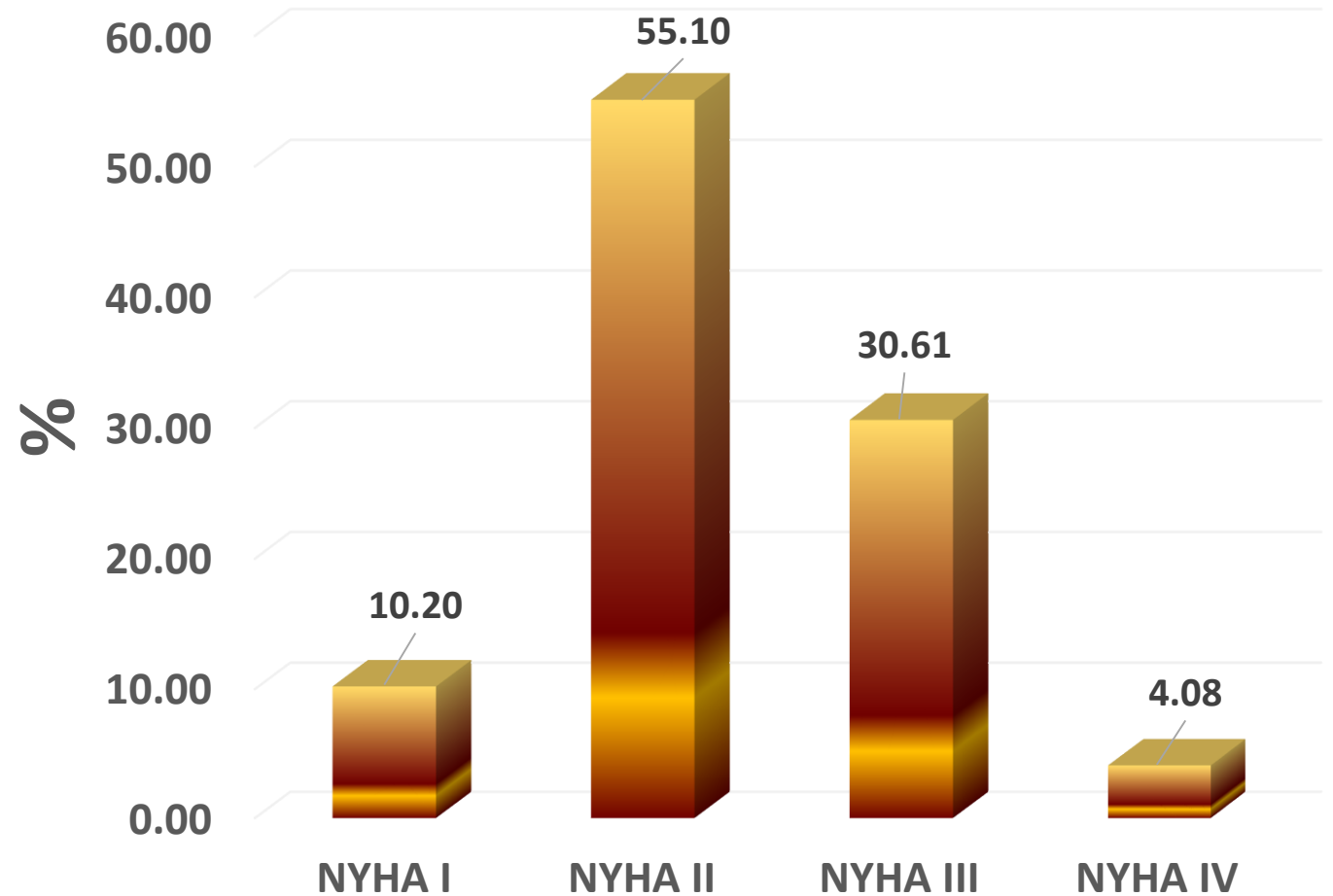
# Demographic Data, Length of Stay, Mortality (2015-2017)

	Variable	n (%)	Median	Range
Gender (M/F)	All Patients	292 (100%)		
	Female	164 (56,16%)		
	Male	128 (43,84%)		
Age (Years)	Female	164 (56,16%)	50,0	15-80
	Male	128 (43,84%)	49,5	15-80
Race (B/W/C/I/U)	Black	208 (71,23)		
	White	57 (19,52)		
	Coloured	13 (4,45)		
	Indian	2 (0,68)		
	Unknown	12 (4,11)		
Length of stay (Days)			12	0-68
Mortality (in hospital)	Yes	7 (2,24%)		
	No	292 (97,76%)		



# NEW YORK HEART ASSOCIATION (NYHA)

NYHA Classification (n=245)	n
NYHA I	25
NYHA II	135
NYHA III	75
NYHA IV	10





# RISK FACTORS

Parameter	Yes		No		Unknown		Median	Range
	n	%	n	%	n	%		
Rheumatic Heart disease ( n = 111)	82	73,8	29	26,1				
Endocarditis (n=111)	8	7,21	95	85,59	8	7,21		
Immunosuppressed (n=111)	7	6,73	96	92,31	8	7,69		
EF (n=122)							55	16-85
>55%	42	34,43	80	65,57				
EuroSCORE (n=82)							2,01	0,01-21,46
Diabetes (n=111)	8	7,21	96	86,49	7	6,31		
CVA (n=110)	4	3,64						
Rhythm	N 113	%						
AF	10	8,85						
AF/Flutter	15	13,27						
Sinus	85	75,22						
Complete heart block/paced	1	0,88						
N/A	2	1,77						



# SURGICAL PROCEDURES

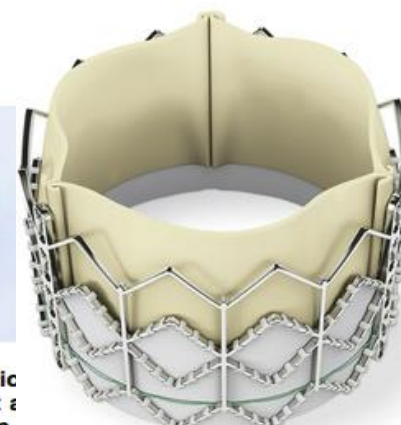
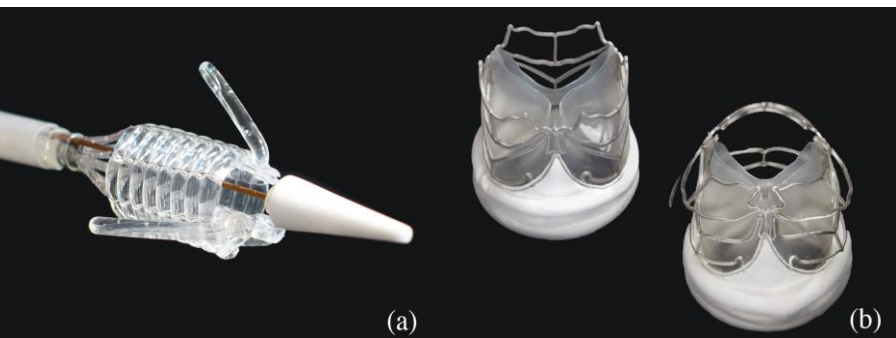
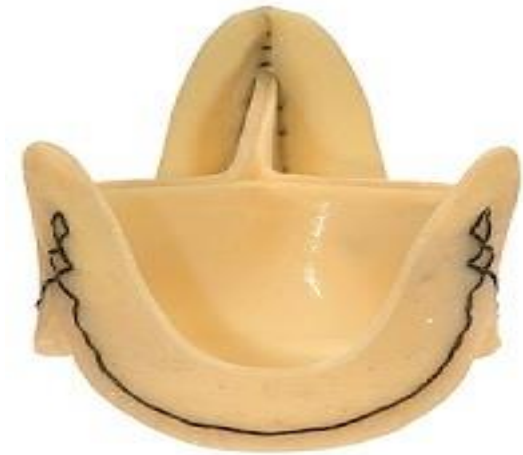
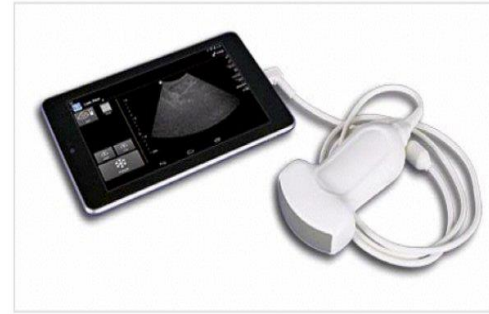
Mitral Valve procedures	Total	Mechanical	Tissue	Homograft
Mitral Valve Replacement	71	62	9	
Mitral Valve Replacement and Tricuspid Ring	44	36	8	
Mitral Valve Repair	12			
Mitral Valve repair and Tricuspid Ring	13			
Mitral Valve repair and CABG	7			
Repair Rate	18%			
Aorta Valve procedures				
AVR	57	44	11	2
AVR and CABG	9	1	8	
AVR and Mitral Repair	1	1		
AVR and tricuspid ring	3	3		
Aorta and Mitral Valve Procedures				
AVR,MVR	16	13	3	
AVR,MVR and Da Vegas	16	15	1	
AVR,MVR and CABG	1		1	
AVR,MVR and Tricuspid Ring		15	3	
AVR and Mitral repair	1	1		
Bentall				
and CABG	2	2		
and TVR	1	1		
Tricuspid Replacement	1			
Rings	9			
<b>TOTAL</b>	<b>292</b>	<b>204 (82%)</b>	<b>44 (18%)</b>	<b>2</b>

# The Future

- RHD prevention and early diagnosis

## RISK in SA population:

- Compare valve replacement/repair with normal SA population life expectancy
- Identify risk factors/procedures relating to long-term reduced survival
- Surveillance modification – e.g. BNP monitoring
- Alternative products – reduced degeneration, optimized design and no/little anti-coagulation



provides flow characteristics that more closely mimic native aortic valve-like leaflets to close before flow reverses, a phenomenon that is not seen in the current generation of prosthetic valves. (a) Valve from above in fully open position. (b) Elevated isometric view of the valve in a fully open position. (c) Valve with three pyrolytic carbon leaflets and ring. Images are courtesy of Ulrich Steinseifer, Helmholtz Institute, Aachen University.

