Enhanced care between services leading to improved outcomes in diabetes patients with ESRD.

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Declaration

- No conflicts of interest to declare

Introduction

- Services enhancements can lead to improved outcomes.
- ESRD + Diabetes patients
- 10 year incident cohort in the Midlands

Historical outcomes – UKRR reports
UKRR 8th Annual Report.

Diabetes and co-morbidity

Of the 8,044 patients starting RRT in 1999–2004 for whom co-morbidity returns and a primary diagnosis were available, 1,612 (20%) had a diagnosis of diabetes mellitus as the cause of ERF. Table 15.6 outlines the incidence of co-morbidity for patients with and without diabetes and documents the expected higher prevalence of vascular disease amongst diabetic

Table 15.6: Percentage of patients with or without diabetes (either as primary diagnosis or as co-morbidity) who have co-morbid conditions other than diabetes

Co-morbidity	Non-diabetics	Diabetics
Cardiovascular disease	22.0	30.8
Cerebrovascular disease	9.9	14.8
Peripheral vascular disease	10.4	25.7
Smoking	17.3	18.1
COPD	7.7	5.9
Malignancy	13.2	4.7
Liver disease	2.3	2.0

Table 15.15: Univariate analysis, co-morbidity hazards of death by 1 year after 90 days

Co-morbidity	Age <65		Age 65+	
	Hazard ratio	p value	Hazard ratio	p value
Angina	1.8	0.0003	1.2	0.043
Cardiovascular disease*	2.0	<0.0001	1.3	0.003
Vascular disease**	2.6	<0.0001	1.4	0.001
Diabetes (not as cause of ERF)	2.2	0.0004	1.4	0.008
Diabetes as primary disease	2.5	<0.0001	1.1	0.651
Diabetes of either category	2.8	<0.0001	1.2	0.03
COPD	1.8	0.0227	1.4	0.011
Liver disease	2.8	0.0002	1.5	0.152
Malignancy	4.6	<0.0001	1.3	0.05
Claudication	2.3	<0.0001	1.2	0.089
Ischaemic/neuropathic ulcers	3.6	<0.0001	2.2	<0.0001
Smoking	1.3	0.0621	1.3	0.04

*At least one of angina, myocardial infarction at any time, angioplasty/vascular graft
**At least one of cerebrovascular disease, claudication, ischaemic/neuropathic ulcer, angioplasty/vascular graft, amputation

Diabetic patients had a higher co-morbidity burden and faced an increased mortality risk following RRT commencement.

Survival from RRT of the 1994 to 2004 cohort of patients
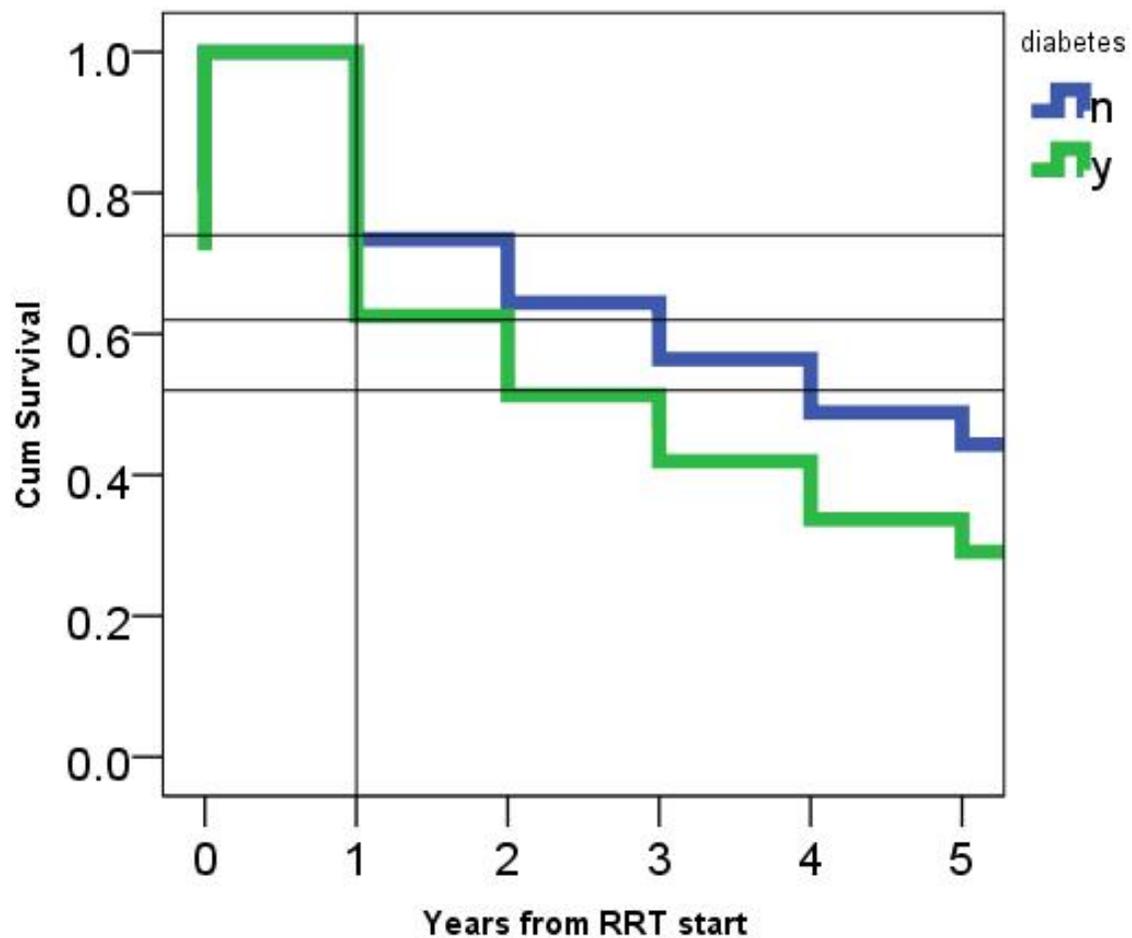
- **DM V Non DM – increased HR**
- **Average of 2 years extended survival of non DM patients**

Serviced involved.

- Renal Services
- Diabetes Services
  - Shared information
  - MDTs
  - Clinics
  - Dialysis unit links
  - Reduced complications

Demographic

	Non DM	DM	p
n	629	389	
Age	61.6 ± 17.5	63.0 ± 13.3	0.162
Male	64.70%	62.20%	0.23
Asian	13.70%	24.90%	<0.01
European	77.70%	67.70%	
HD	63.40%	70.70%	<0.01
PD	32.40%	28.30%	
Optimal access	57%	51.40%	0.08

Comorbidity

	non DM n=629	DM n=389 (38%)	p
Cancer	13.9	9	0.013
Ischaemic Heart disease	14.3	24.7	0.001
Vascular disease	17	28	0.001
Heart failure	7.3	19.5	0.001
Systemic Collagen	11.4	8.5	0.139
Other	10	8	0.316
Stoke High Risk score	11.9%	49.6%	0.001

Comorbidity presented as % of the cohorts
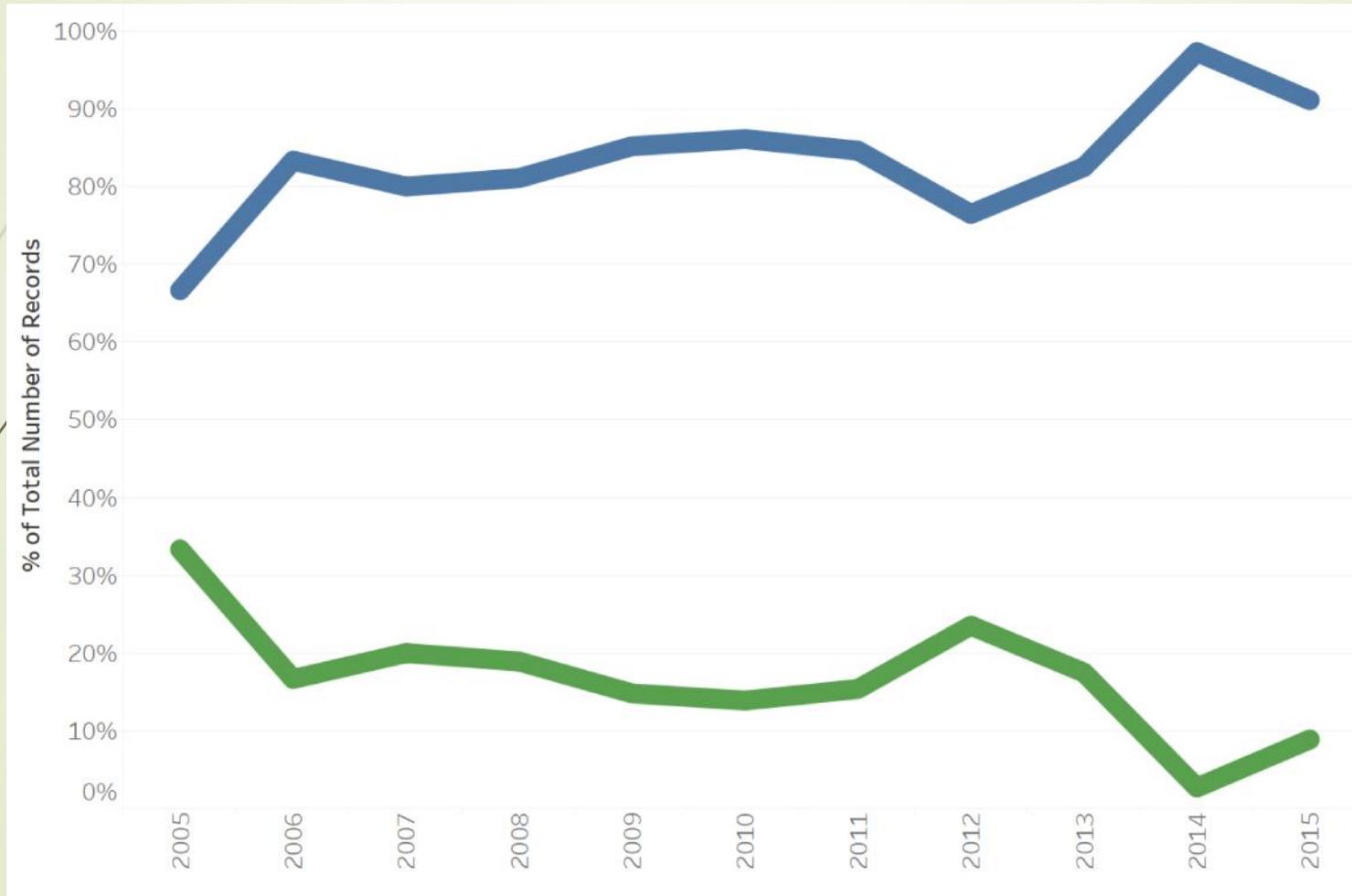
Referral

Duration of pre dialysis follow up (months)

Median follow_up: Non DM cases 21.00, DM cases 24.00
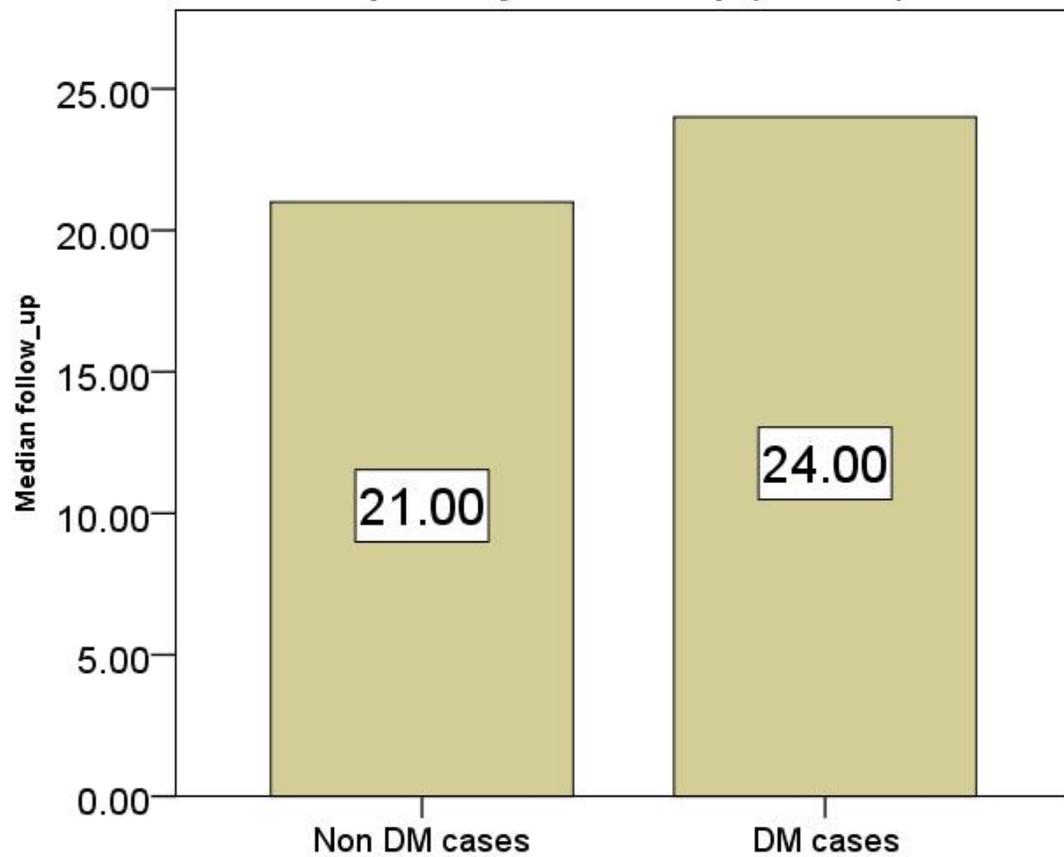
Presentation to Renal Service at RRT commencement

Non DM cases: 71 (blue), 29 (green)
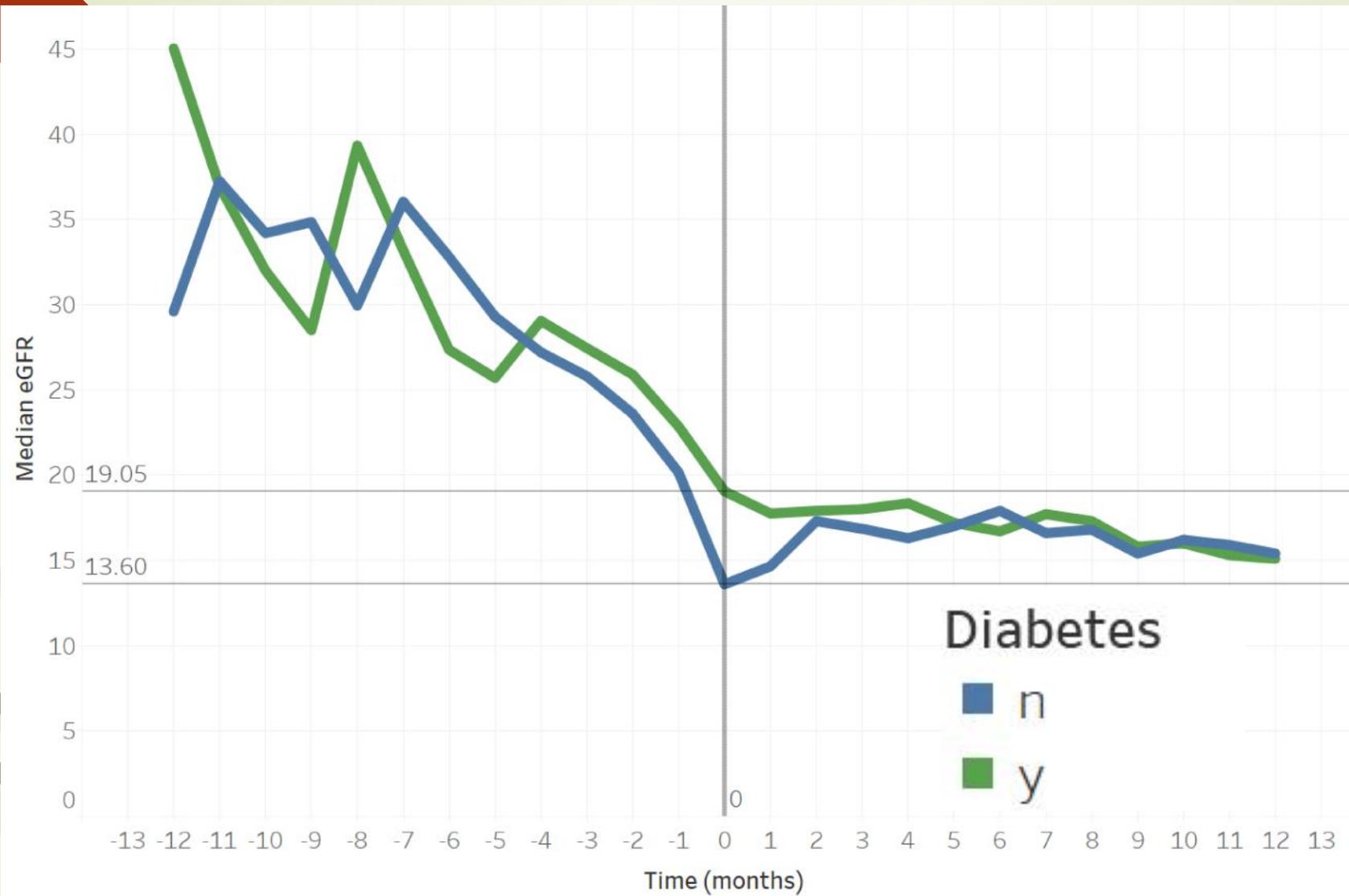DM cases: 83 (blue), 17 (green)
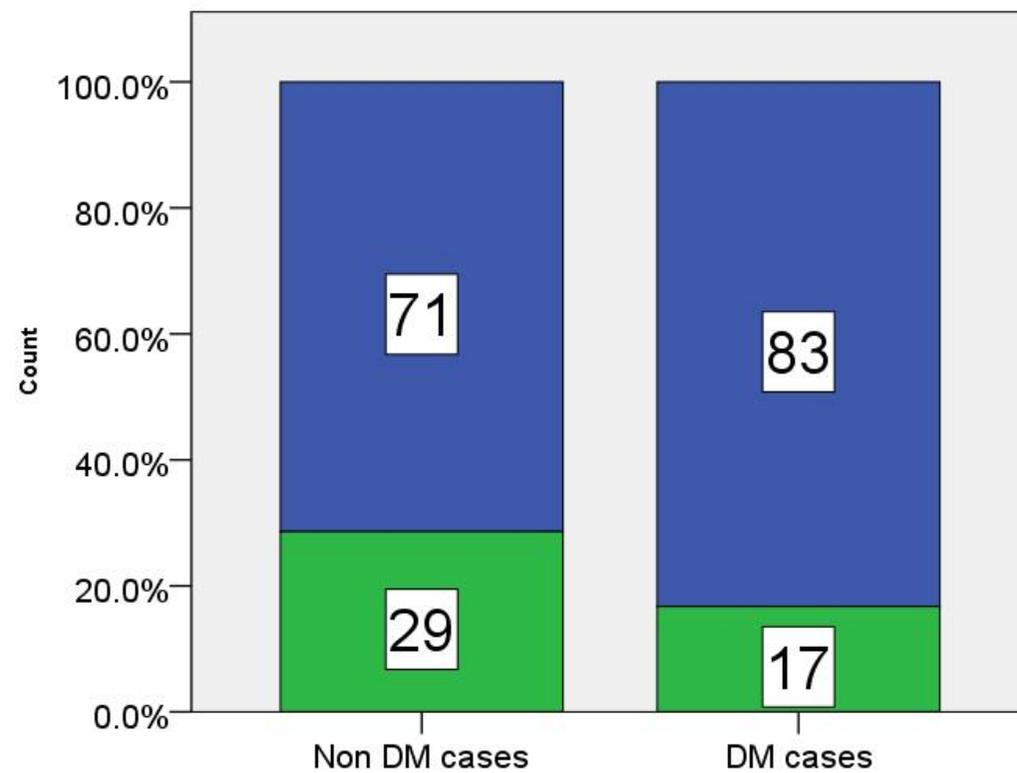
Key. Green – Late presenting cases

Longitudinal trends in referral patterns of DM patients.

Green: Late referrals

GFR levels around nephrology contact

Unadjusted survival results.

Survival Function for patterns 1 - 2
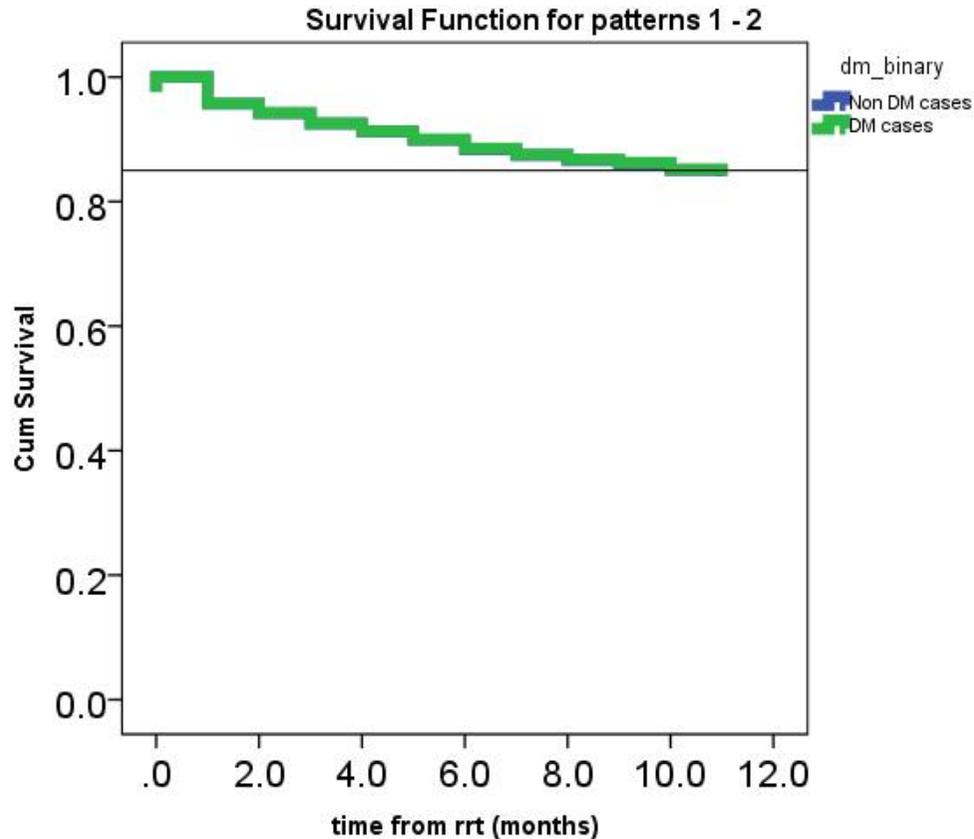
	Exp(B)	95.0% CI for Exp(B)		Sig.
		Lower	Upper	
Age	1.039	1.026	1.052	.000
Caucasian V Others	1.634	1.103	2.420	.014
Late referral	1.449	1.061	1.978	.020
Lines V Optimal access	1.983	1.313	2.994	.001
LVF	2.188	1.480	3.234	.000
Diabetes	1.127	.810	1.570	.478
Cancer	1.448	.999	2.100	.051
IHD	1.365	.957	1.947	.086
PVD	1.141	.812	1.604	.446
PD V HD	.948	.587	1.530	.827

Diabetes at the start of RRT is no longer discriminatory
Referral, Vascular access – possible for change

AVF use in HD patients with Diabetes
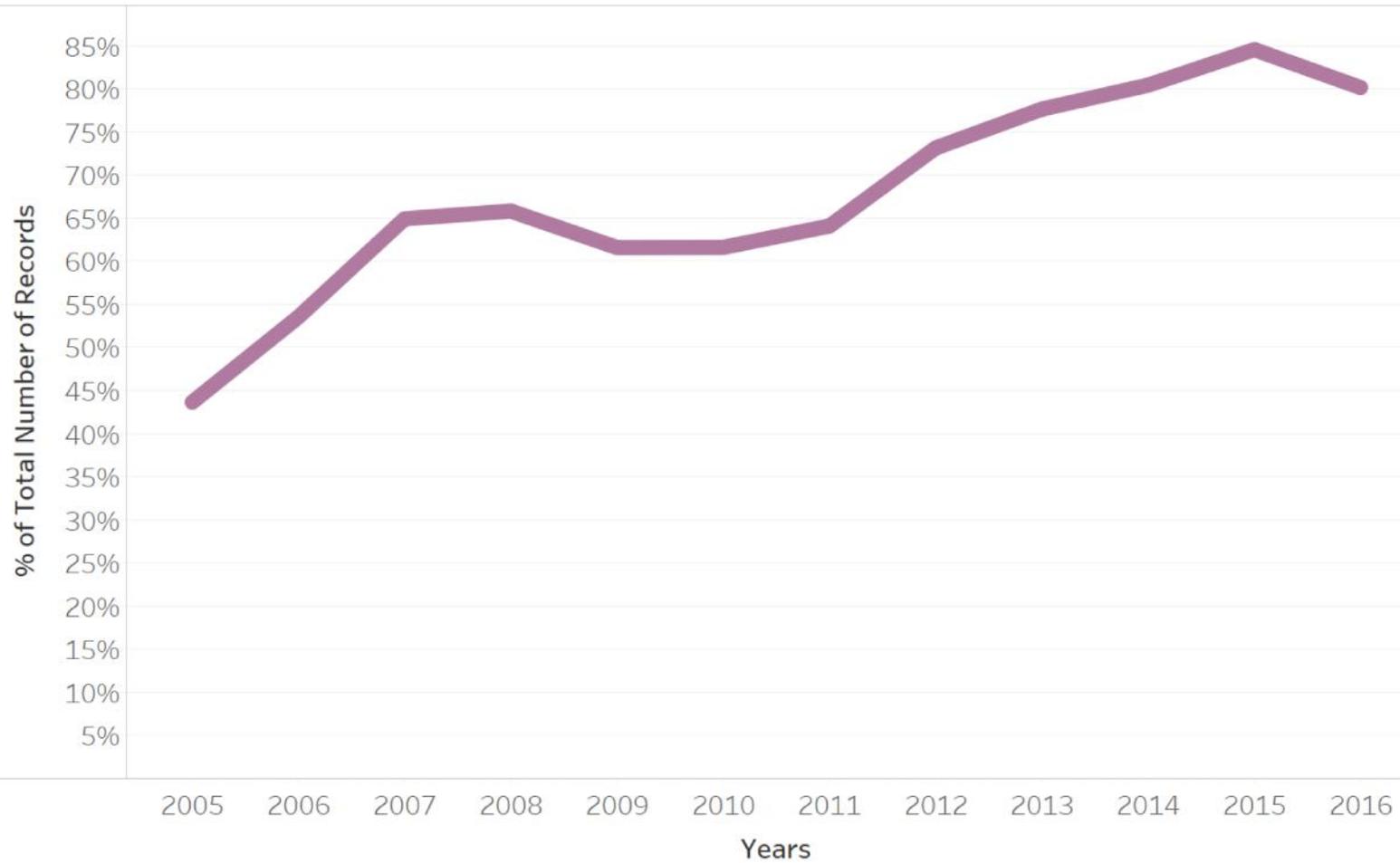
Summary

- Close working between Diabetes and Renal Services has been successful.

- Despite comorbid burden, DM patient survival is now similar to non DM cases

- Referral processes and dialysis access are important factors.
  - Both issues have been improved in all patients.

- Observations can be universally applied.

All referral patterns
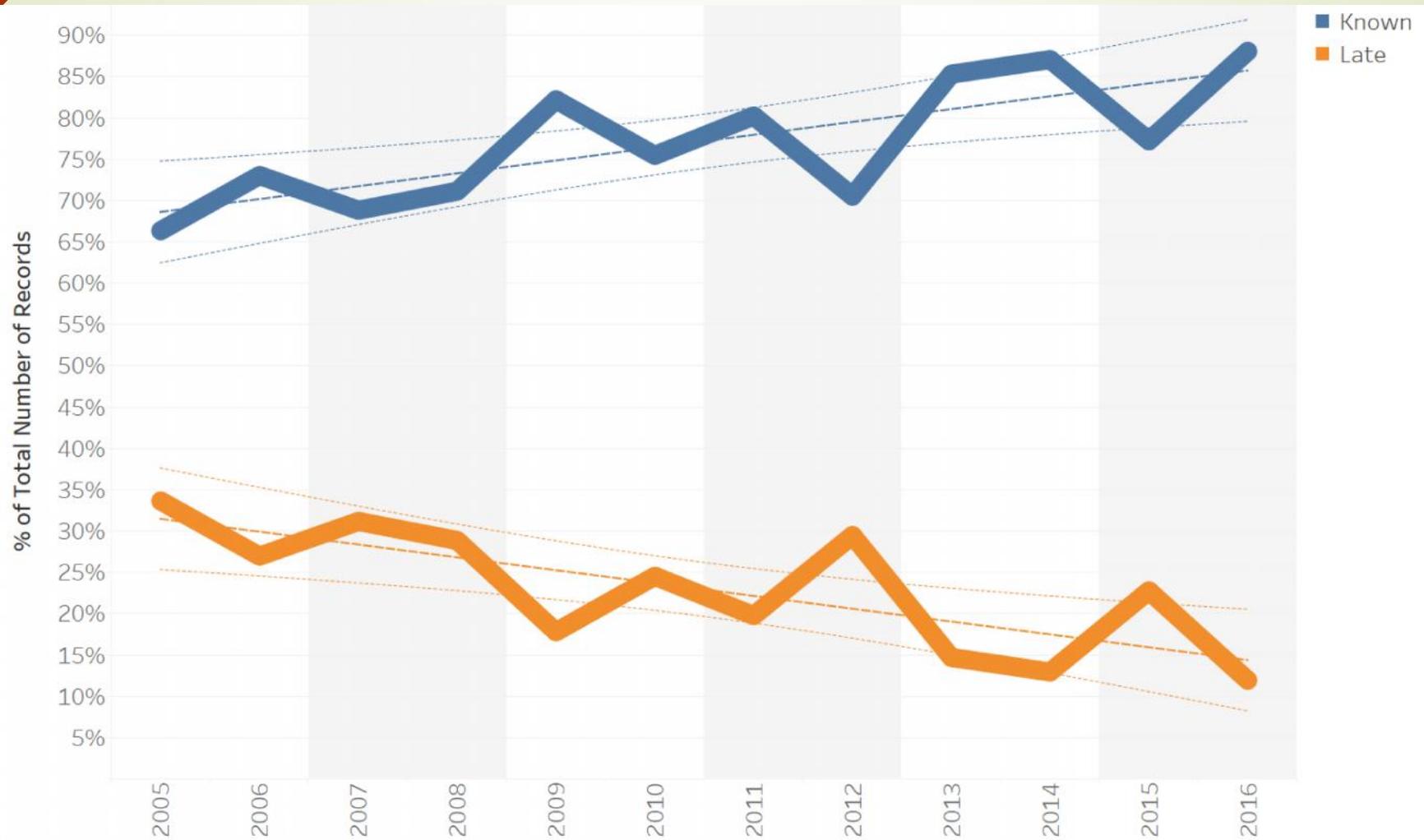
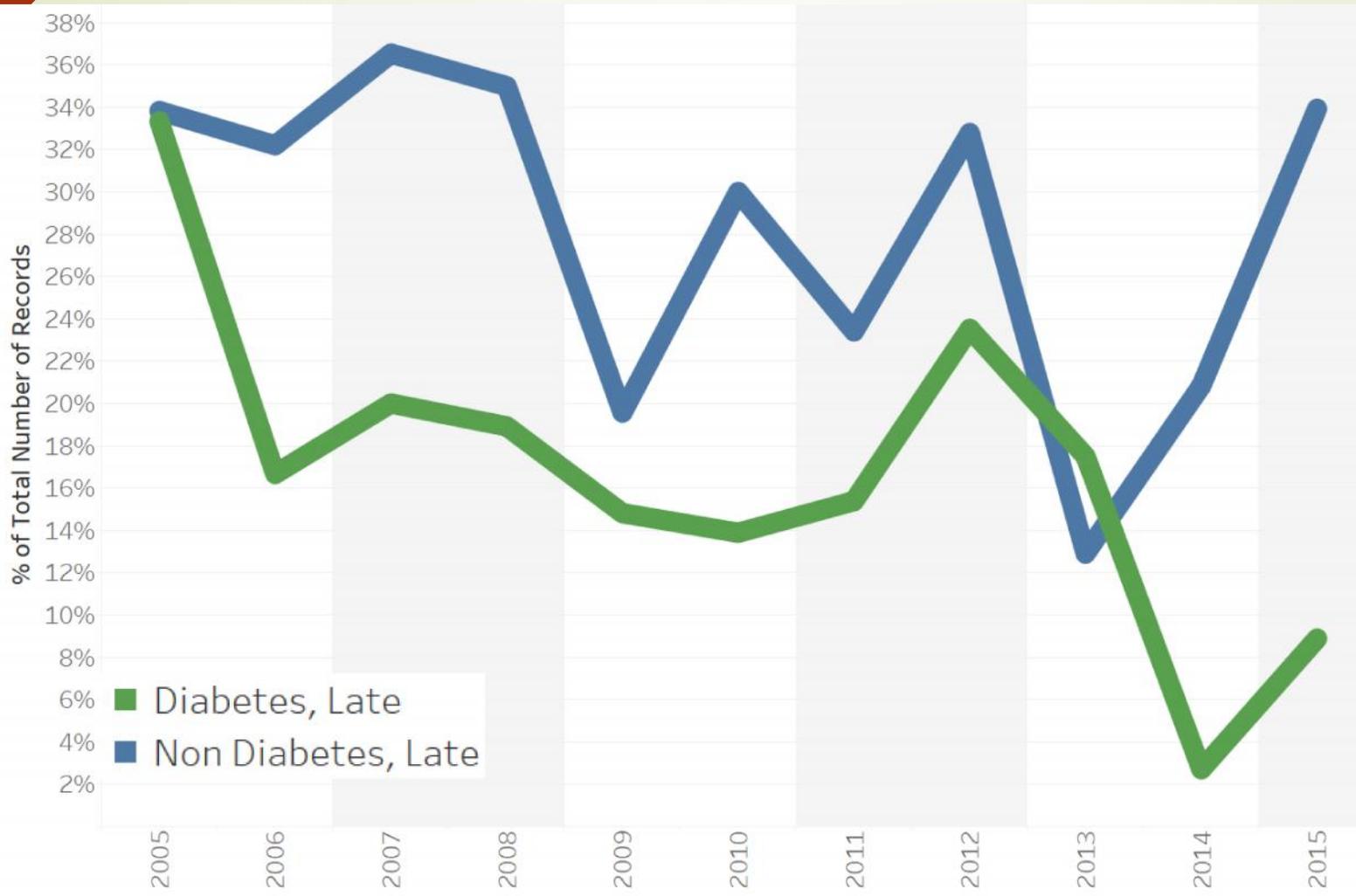# Glycaemic control agents in CAPD patients
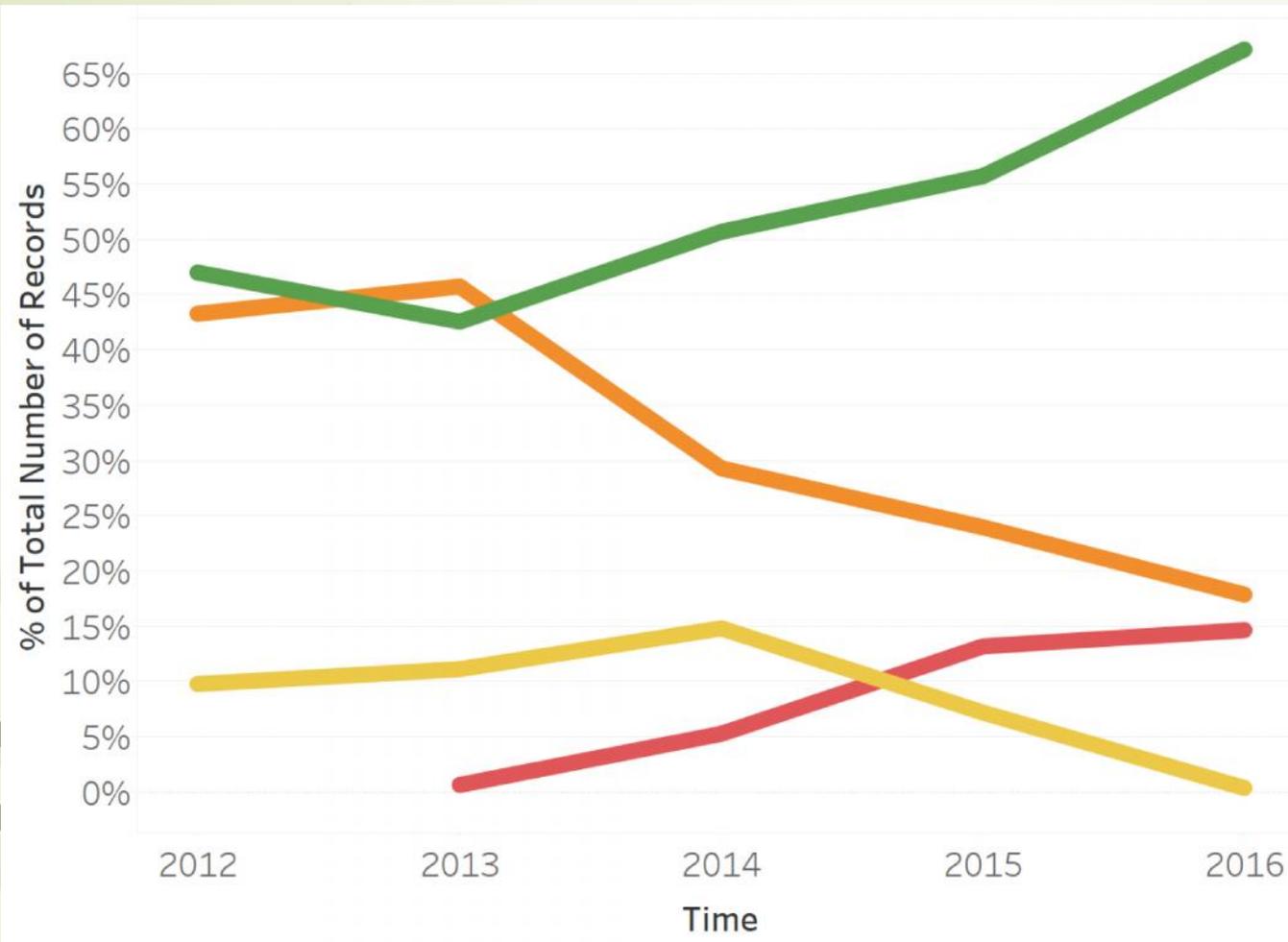
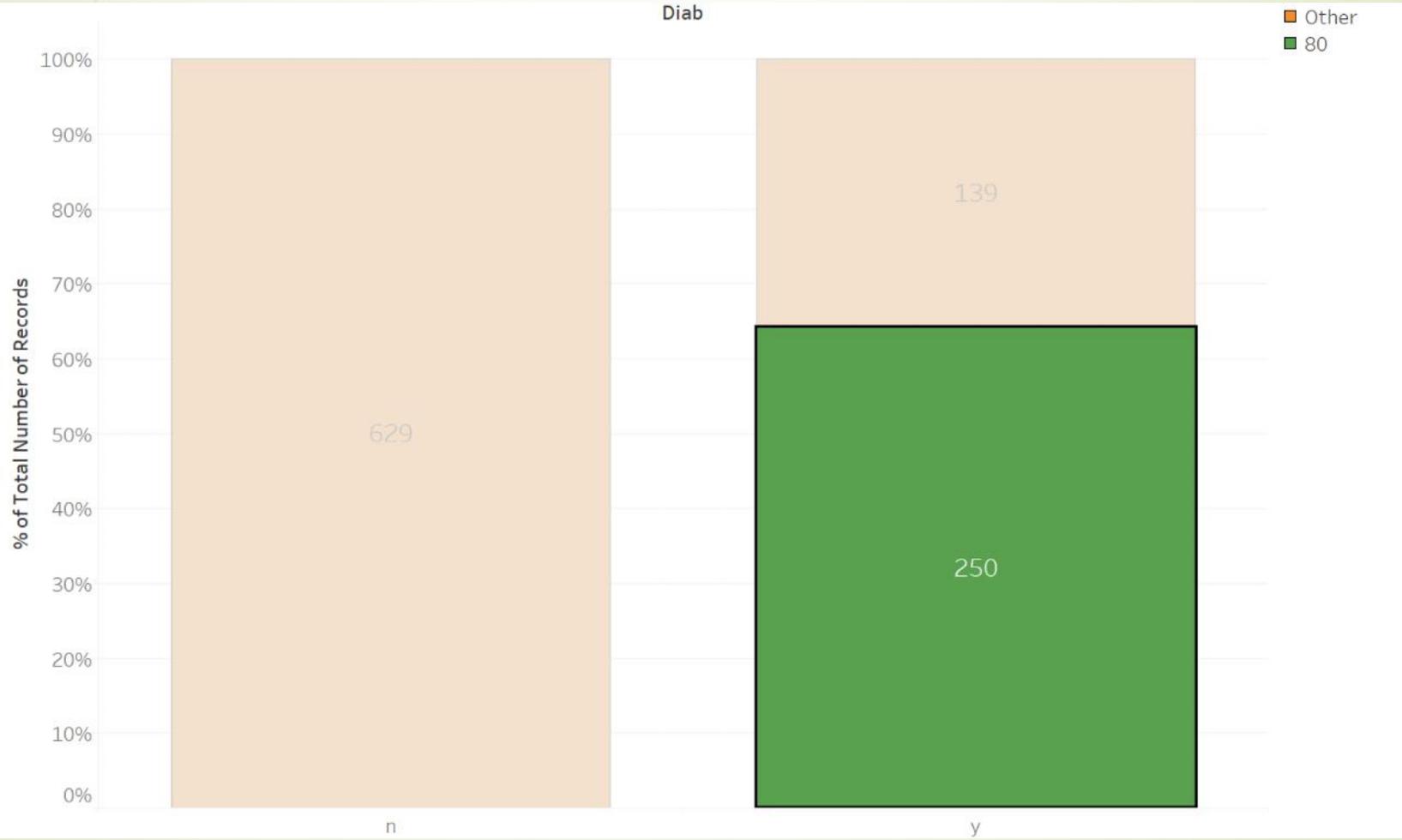Efforts to reduce glucose exposure in PD patients

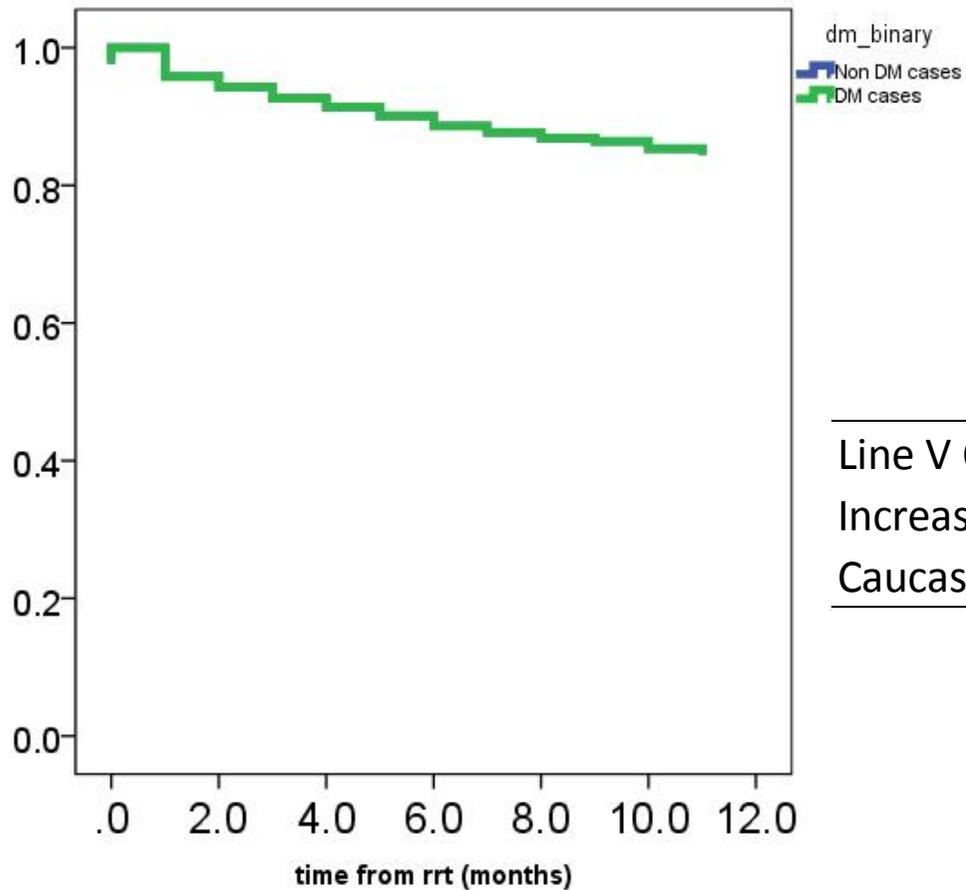Joint PD/ DM clinics

Medication adjustments made

Late presenting patients, stratified by Diabetes status.

PRD and Diabetes groups

Adjusted survival outcomes

	Exp(B)	95.0% CI for Exp(B)	
		Lower	Upper
Line V Optimal access	2.41	1.809	3.211
Increasing age (years)	1.044	1.033	1.056
Caucasian V Non	1.84	1.258	2.69

	0	1	2	3	4	5	6	7	8	9	10	11	12
Non DM	629	606	588	578	564	554	541	531	524	516	510	501	495
DM cases	389	377	368	357	348	341	337	328	323	321	321	317	312

Unadjusted survival results.

Survival Function for patterns 1 - 2
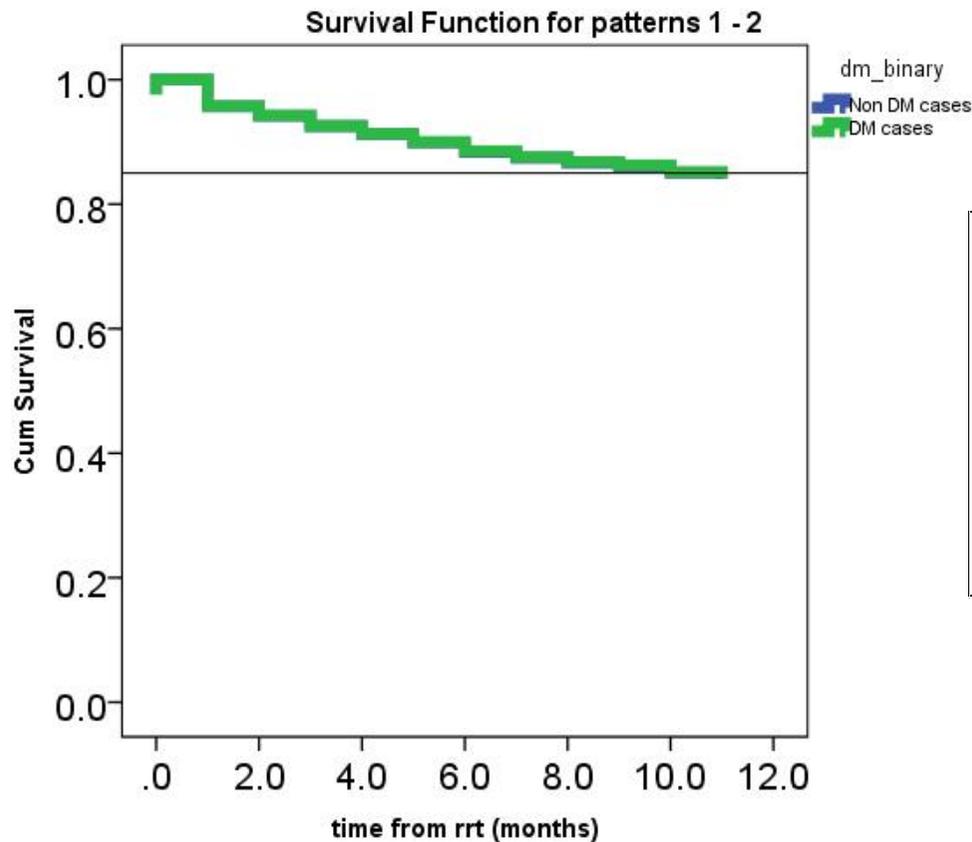
	Exp(B)	95.0% CI for Exp(B)		Sig.
		Lower	Upper	
Diabetes V Non Diabetes	1.01	0.737	1.384	0.95
Late referral V Early	1.489	1.096	2.023	0.011
Mid Risk V High	0.904	0.322	2.54	0.848
Low Risk V High	0.84	0.608	1.16	0.29
Age (years)	1.044	1.032	1.056	<0.001
Caucasian V Others	1.738	1.179	2.563	0.005
Lines V Optimal Access	2.105	1.547	2.865	<0.001

Diabetes at the start of RRT is no longer discriminatory
Age
Referral
Vascular access