



# V Convegno Nazionale

Centro Studi e Ricerche Fondazione AMD - onlus

La ricerca di AMD e l'innovazione in diabetologia

▶▶▶ FIRENZE 18-20 novembre 2010

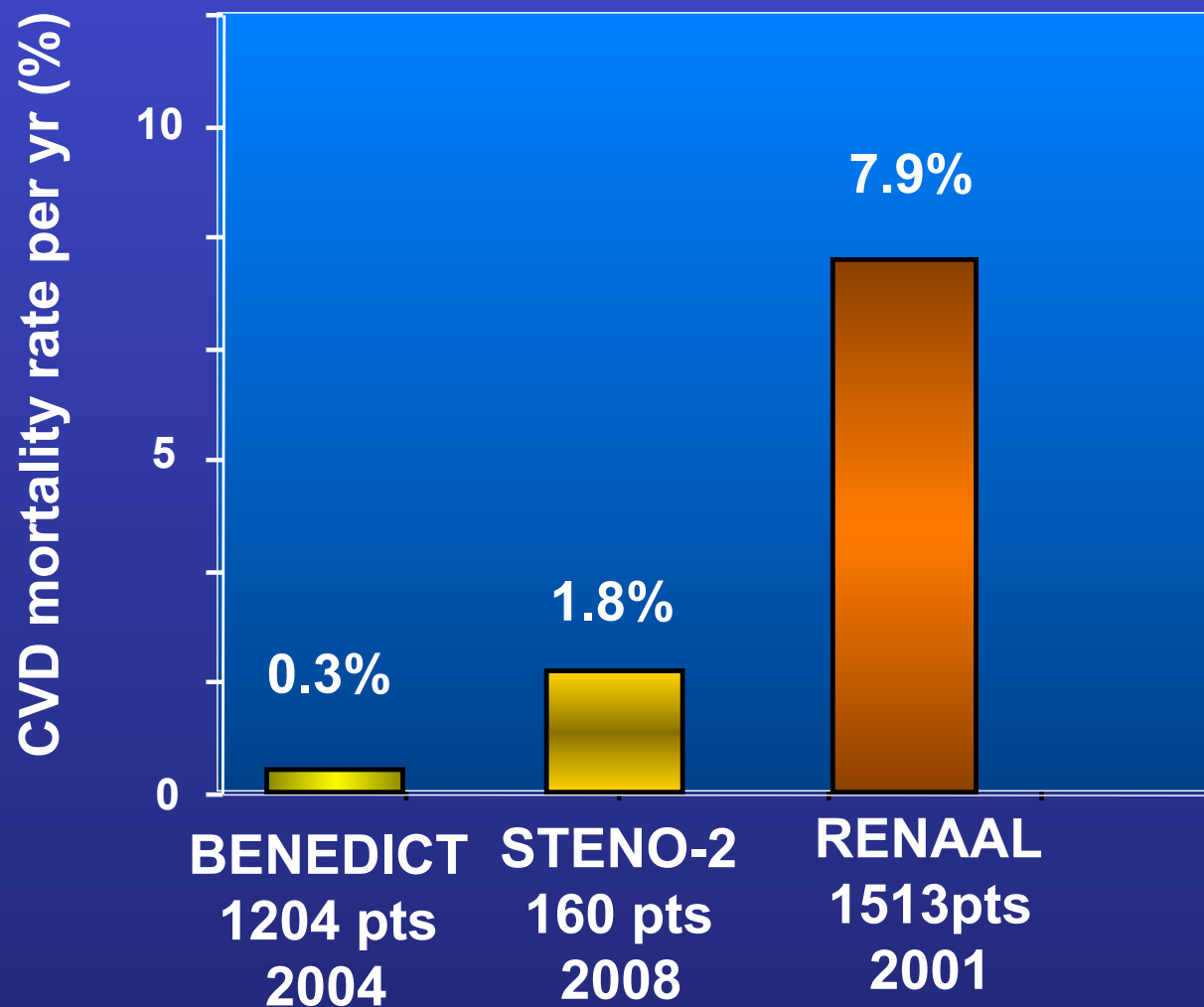
***RENE E DIABETE:***

***EPIDEMIOLOGIA***

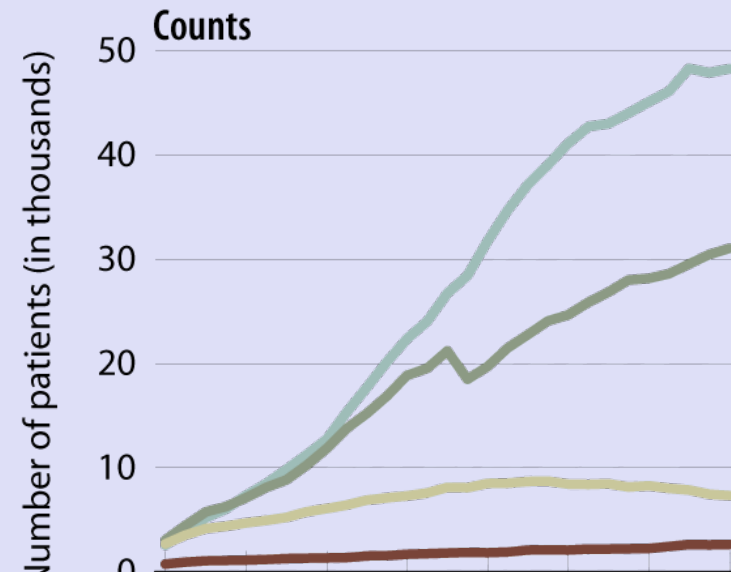
Roberto Trevisan

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# BENEDICT; Mortality for cardiovascular disease is low in Type 2 Diabetes with normoalbuminuria

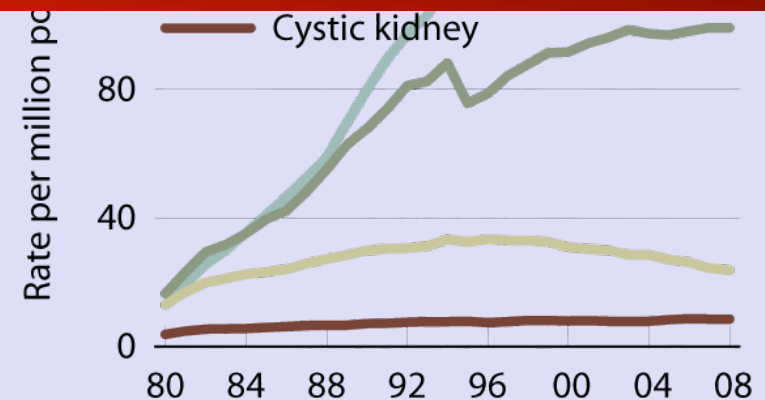


# Incident counts & adjusted rates, by primary diagnosis



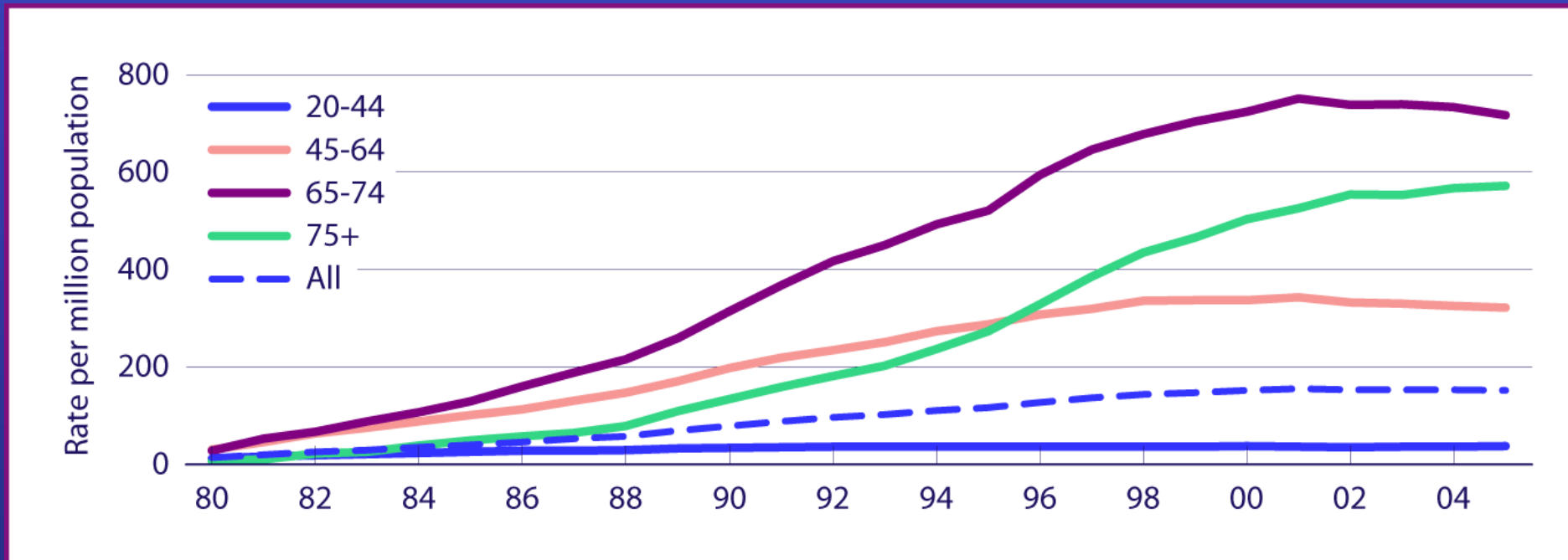
Diabetes continues to account for the greatest number of new ESRD cases; incidence rates for patients with a primary diagnosis of diabetes have been level since 2000.

Incident ESRD patients; rates adjusted for age, gender, & race.

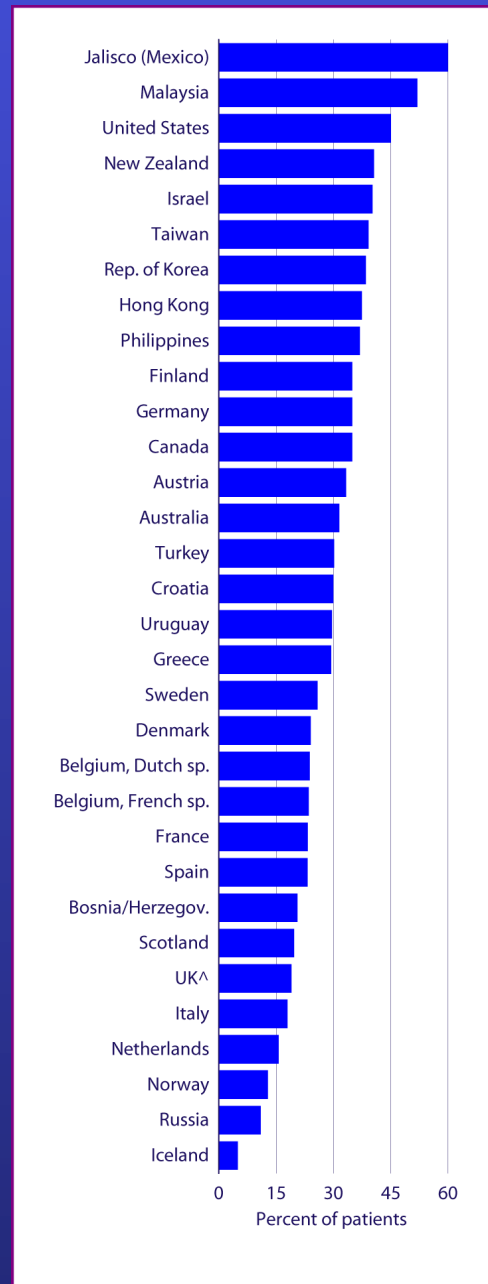


Overall incidence rates of ESRD due to diabetes have increased 68% since 1992.

Rates have been stable for patients age 20-44.  
For those age 75 and older rates have more than tripled.



# Percentage of incident patients with diabetes, 2005

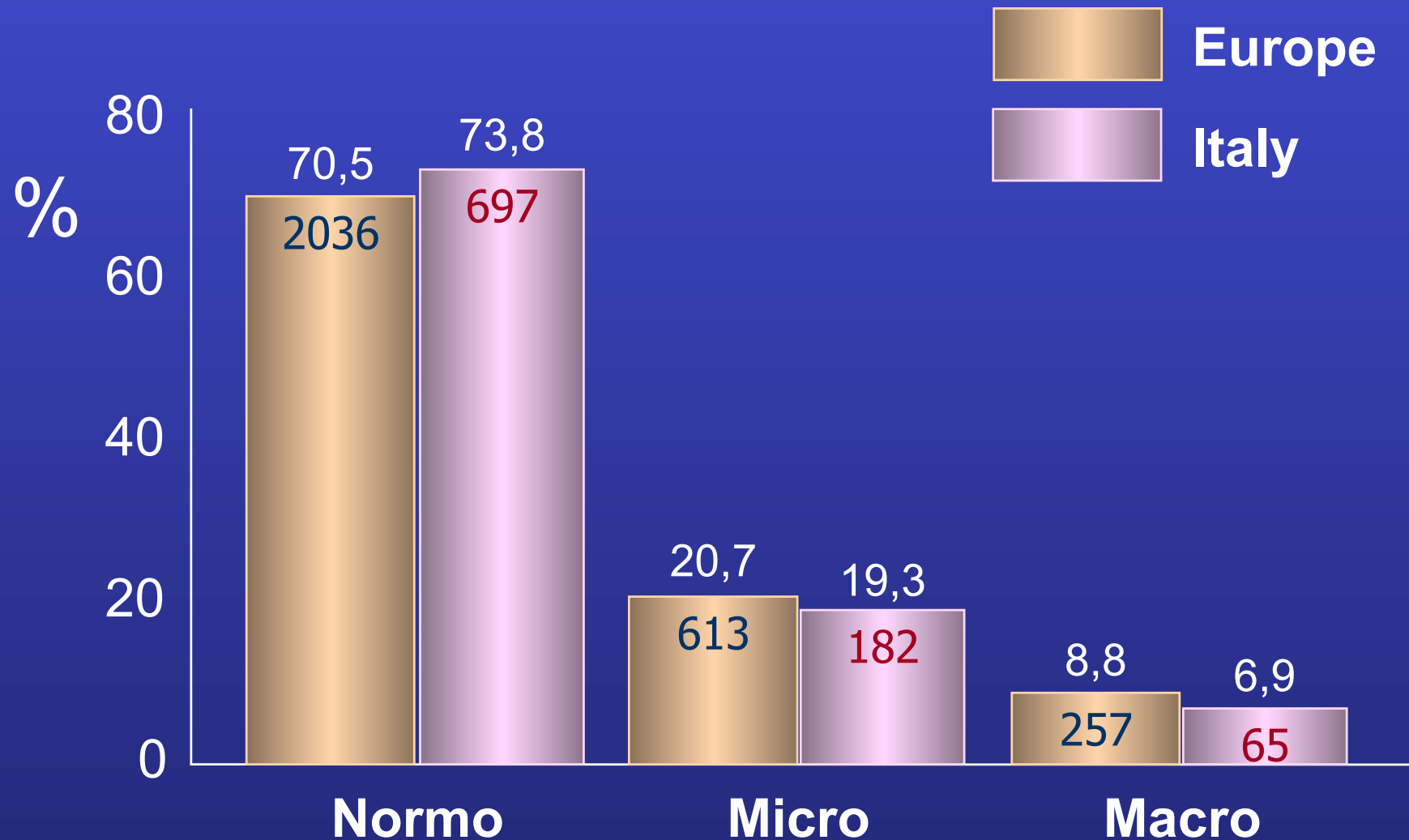


# DIABETE TIPO 1

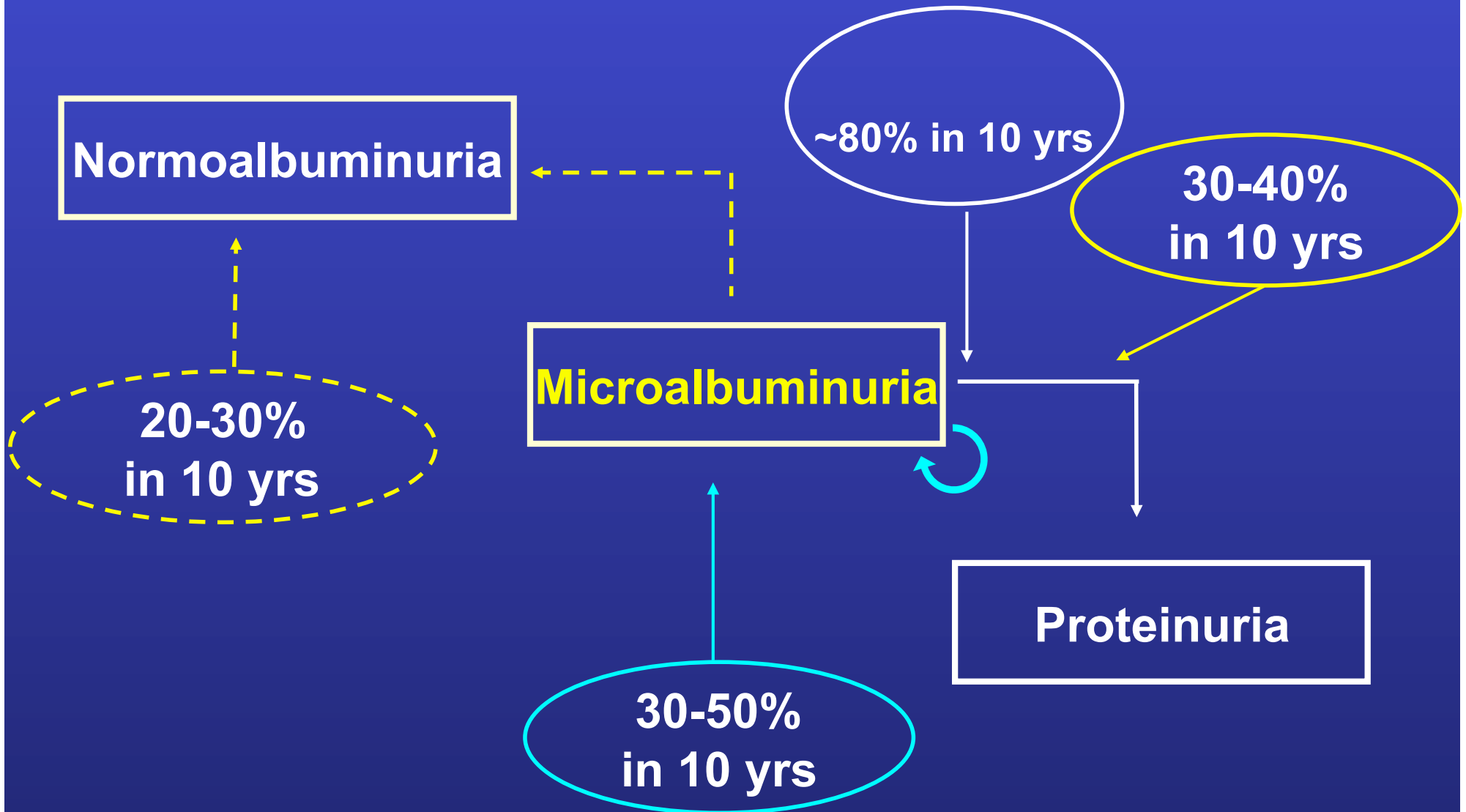
Rene: Epidemiologia

# Microvascular complications in IDDM patients

## The EURODIAB IDDM Complications Study



# Type 1 diabetes



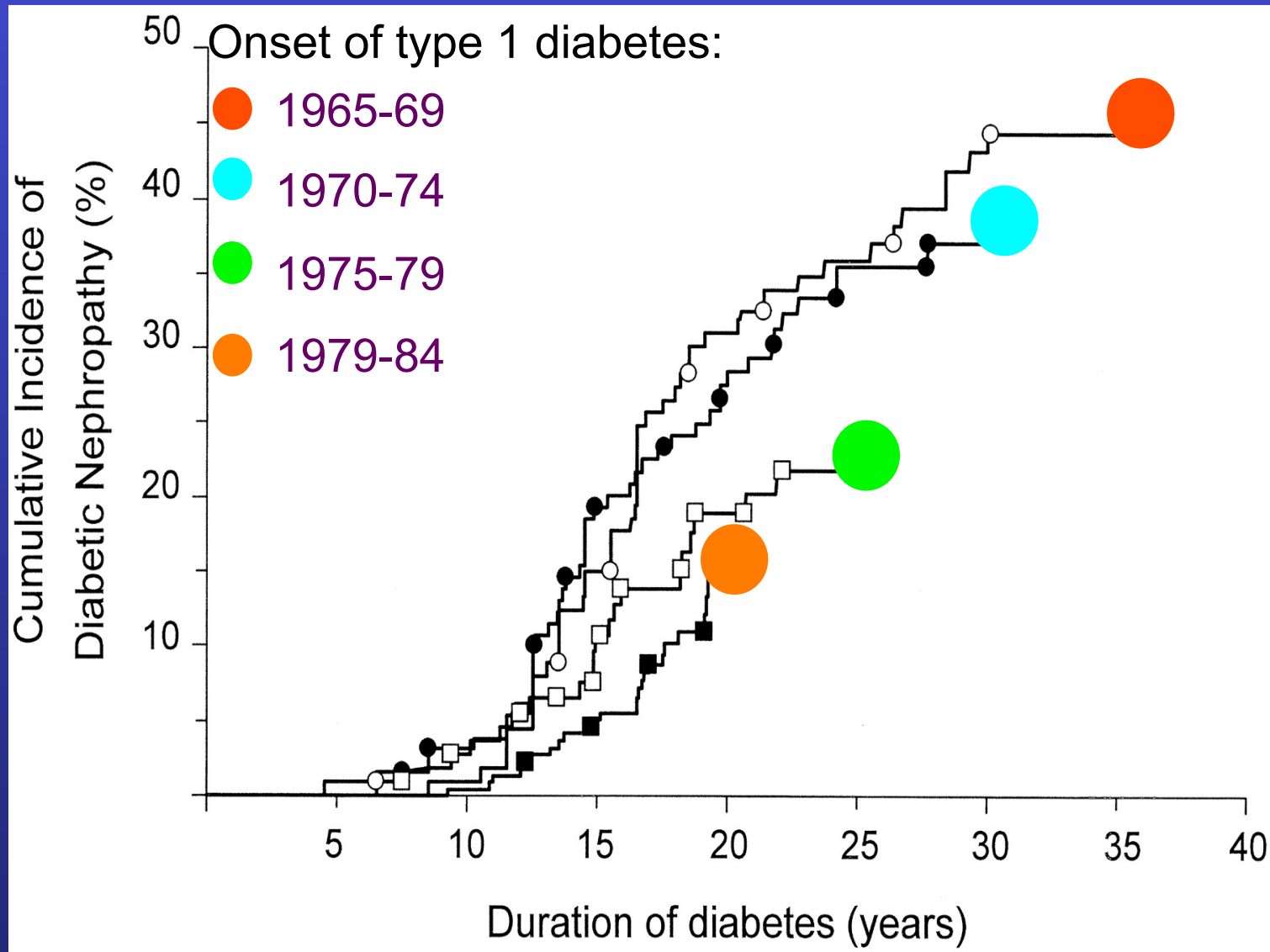


# Epidemiology and clinical course of diabetic nephropathy

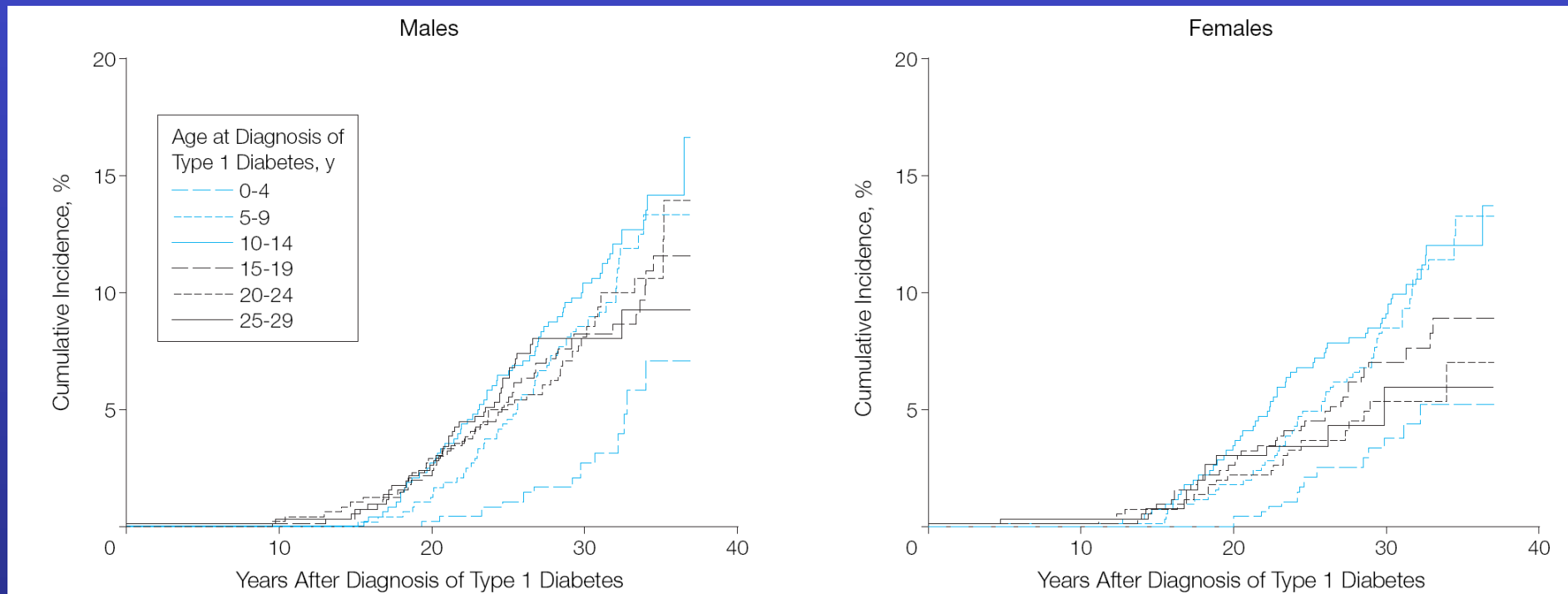
## In Type 1 diabetes

- **Microalbuminuria:** incidence rate 1-2% per yr, GFR stable
- **From Microalbuminuria to Macroalbuminuria:** incidence rate 3-4% per year
- **GFR Decline in Macroalbuminuric Type 1 Diabetic patients:** median 4-5 ml/min/year
- **Actual median time from macroalbuminuria to ESRD:** from 10 to 20 yrs

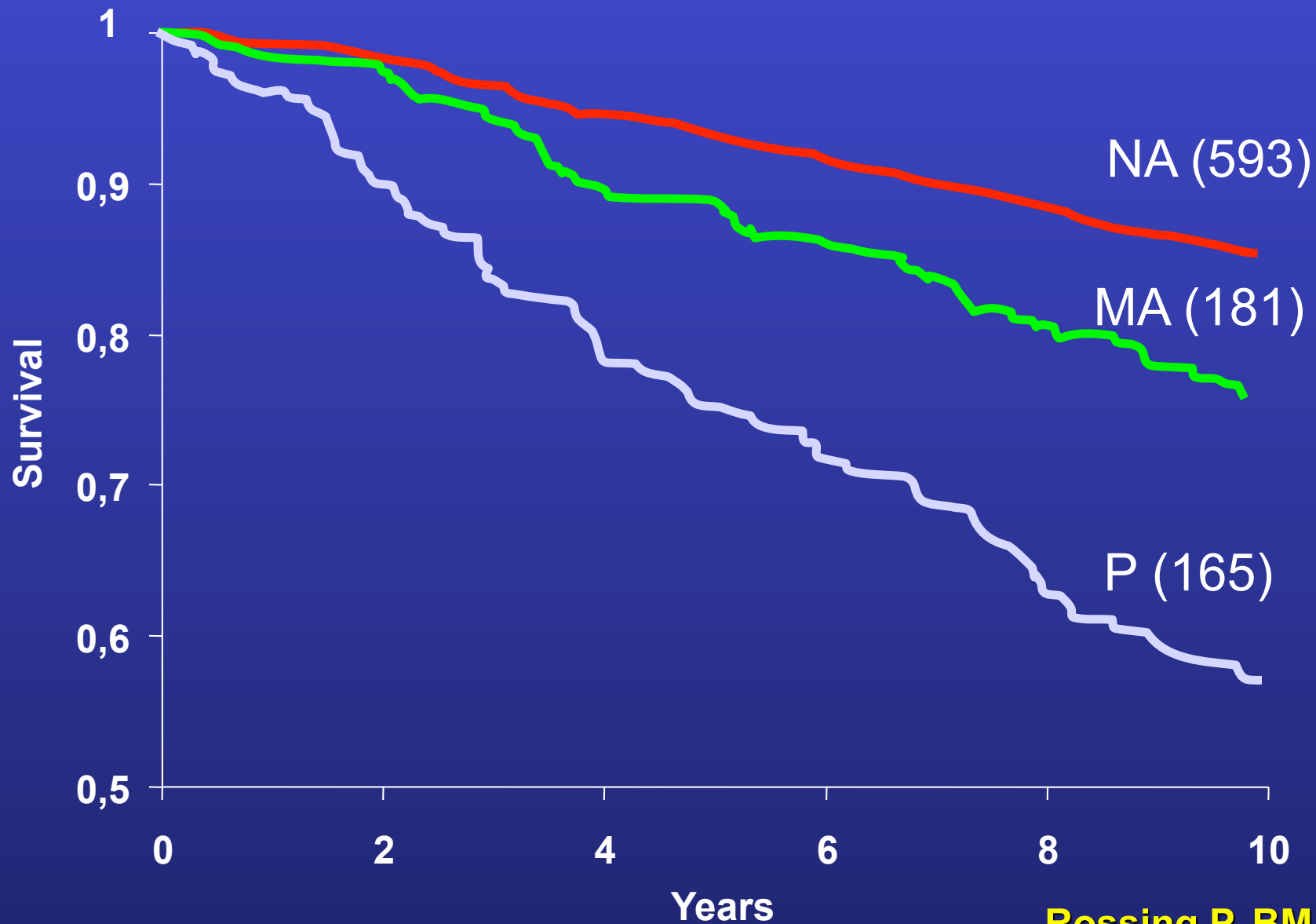
# Decreasing Incidence of Diabetic Nephropathy in Type 1 Diabetes.



# Cumulative incidence of ESRD in Type 1 Diabetic patients according to age at diagnosis of diabetes

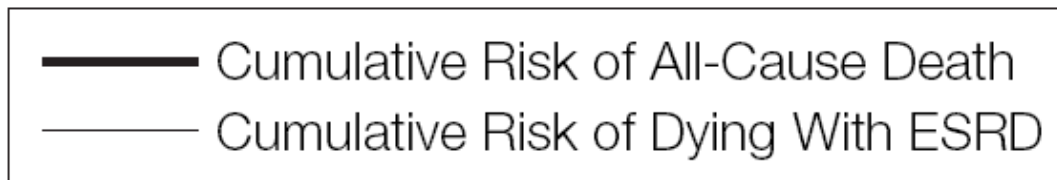


# SURVIVAL IN TYPE 1 DIABETES

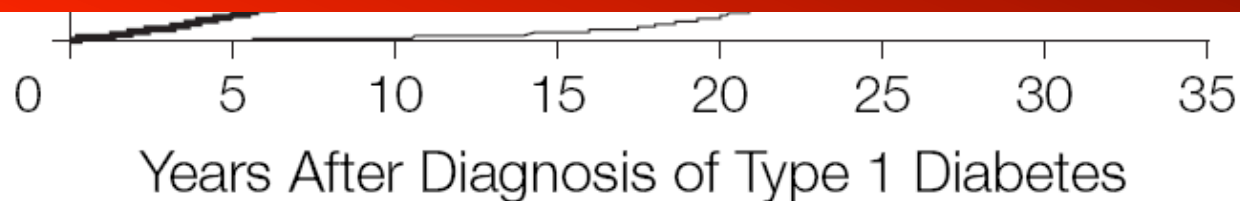


Rossing P, BMJ, 1996

# Cumulative risk of DEATH after diagnosis of Type 1 Diabetes



**Patients with ESRD had a relative risk of 13.1 (95% CI, 11.1-15.3) compared with other patients with type 1 diabetes when adjusting for age, sex, and time period of diabetes diagnosis**



**P. Finne et al.,  
JAMA 2005;  
294: 1782**

# DIABETE TIPO 2

Rene: Epidemiologia

# UKPDS Progression 2

	Baseline N = 5097	5 yrs N = 4791	10 yrs N = 2799	15 yrs N = 435
MAU or worse	7.3 % (370)	17.3 % (830)	24.9 % (696)	28.0 % (122)
CP or worse	0.7 % (37)	3.1 % (149)	5.3 % (148)	7.1 % (31)
PCr > 175 $\mu$ M or RRT	0	0.4 % (19)	0.8 % (22)	2.3 % (10)

# UKPDS Progression 3

	Proportion alive at 10 yrs	Years spent in stage (IQR)
No nephropathy	87.1 %	18.9 (7.8 – 37.8)
MAU	70.8 %	10.9 (4.5 – 21.8)
CP	65.1 %	9.7 (4.0 – 19.4)
PCr > 175 $\mu$ M or RRT	8.5 %	2.5 (1.0 – 5.0)

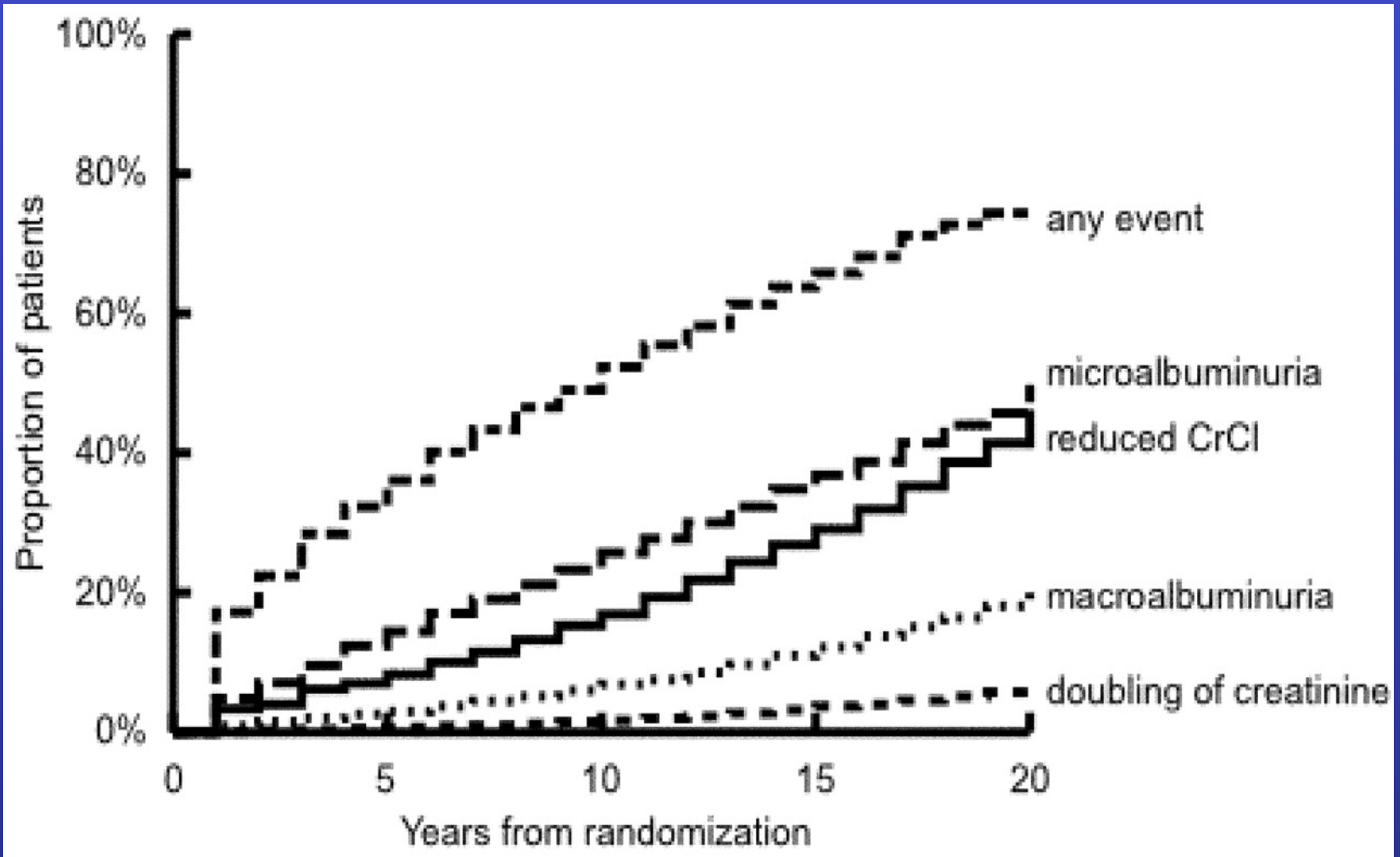


# UKPDS Progression 4

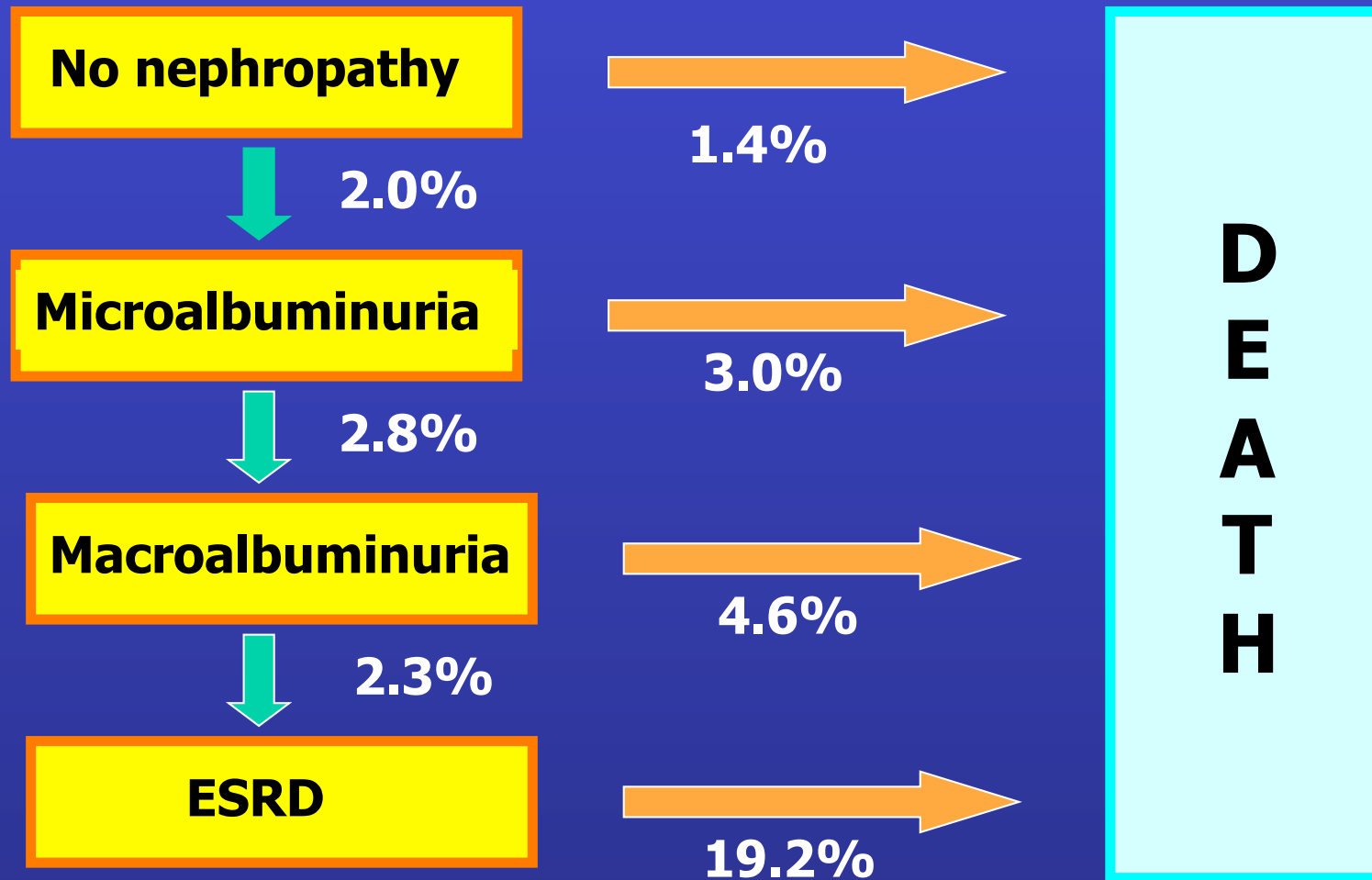
- 38 % of 4031 developed MAU at 15 yrs
  - 64 % had eCrCl > 60 ml/min/1.73m<sup>2</sup>
  - 24 % had eCrCl < 60 ml/min/1.73m<sup>2</sup> after MAU
  - 12 % had eCrCl < 60 ml/min/1.73m<sup>2</sup> pre MAU
- 29 % of 5032 developed reduced eCrCl < 60 ml/min/1.73m<sup>2</sup> at 15 yrs
  - 51 % had UAC < 50 mg/L
  - 16 % had UAC > 50 mg/L after reduced eCrCl
  - 33 % had UAC > 50 mg/L pre reduced eCrCl
- Thus MAU does not always precede declining renal function

# Proportion of patients reaching a renal event in UKPDS

Retnakaran et al Diabetes 2006 ; 55 : 1832 - 9

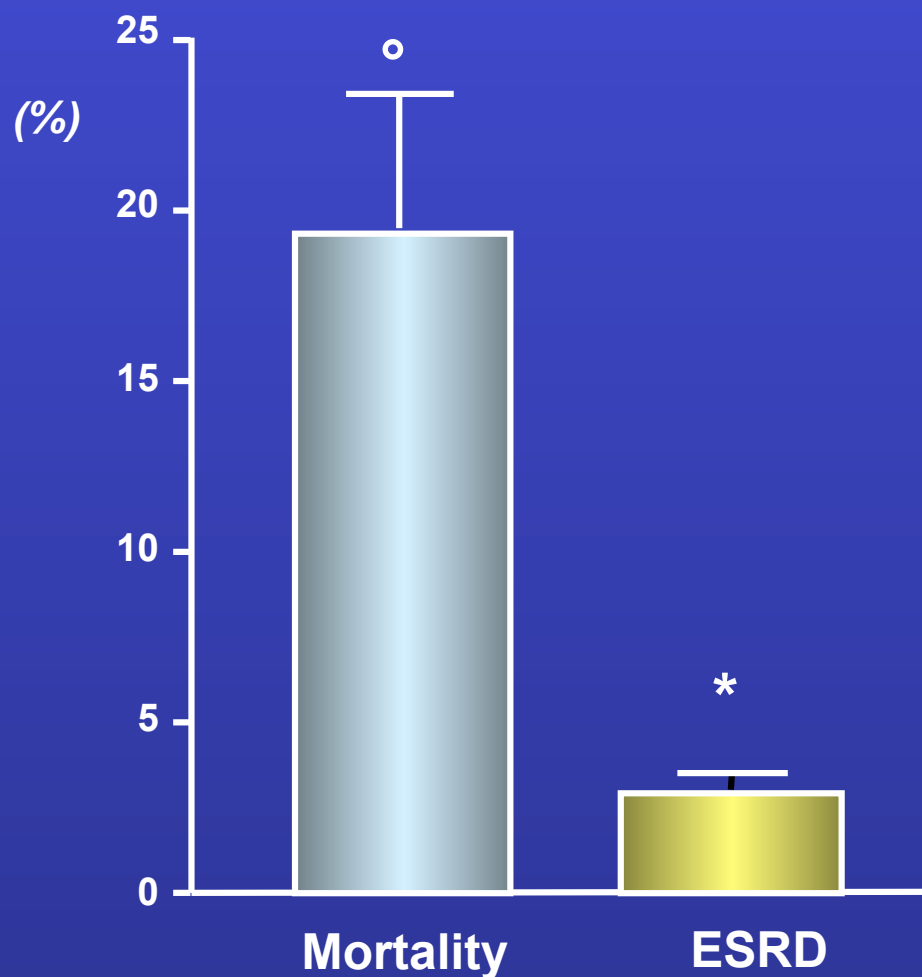


# ANNUAL TRANSITION RATES THROUGH THE STAGES OF NEPHROPATHY AND TO DEATH FROM ANY CAUSE



*UKPDS 64: Kidney International 2003*

# ANNUAL ESRD AND MORTALITY IN TYPE 2 DIABETICS WITH OVERT NEPHROPATHY



Estimate from the °UKPDS and the \*RENAAL studies

# Microalbuminuria: renal risk in diabetes

***Diabete tipo 2***

**Normoalbuminuria**



**20 - 58%  
in 10 yrs**

**30 - 40%  
in 10 yrs**

**Microalbuminuria**



**20 - 40%  
in 10 yrs**

**Proteinuria**

# DIABETE TIPO 2

La riduzione della funzione renale in assenza  
di albuminuria

# Renal Insufficiency in the Absence of Albuminuria and Retinopathy Among Adults With Type 2 Diabetes Mellitus

*JAMA. 2003;289:3273-3277*

**Table 2.** Prevalence of Chronic Renal Insufficiency Among Subjects 40 Years of Age or Older With Type 2 Diabetes Mellitus\*

GFR, mL/min per 1.73 m <sup>2</sup> BSA†	Subjects With Type 2 Diabetes Mellitus, % (95% Confidence Interval)‡	Population Estimate in Millions (95% Confidence Interval)
≥60 (sampled n = 981)	87 (84-90)	7.3 (6.4-8.1)
59-30 (sampled n = 151)	12 (9-15)	1.0 (0.7-1.3)
<30 (sampled n = 20)	1 (0.4-1.6)§	0.1 (0.03-0.1)§

\*Excludes subjects with type 2 diabetes mellitus without gradeable fundoscopic examinations or missing urine data.

†Glomerular filtration rate (GFR) calculated with the Modification of Diet in Renal Disease Study formula.<sup>19</sup>

‡Subjects with newly diagnosed type 2 diabetes mellitus as defined by American Diabetes Association criteria.<sup>13</sup> Percentages are based on weighted data.

§Number of sample subjects too small to provide stable population estimate.

# Renal Insufficiency in the Absence of Albuminuria and Retinopathy Among Adults With Type 2 Diabetes Mellitus

**Table 3.** Presence of Microalbuminuria and Macroalbuminuria and Retinopathy in Subjects With Type 2 Diabetes Mellitus With Chronic Renal Insufficiency\*

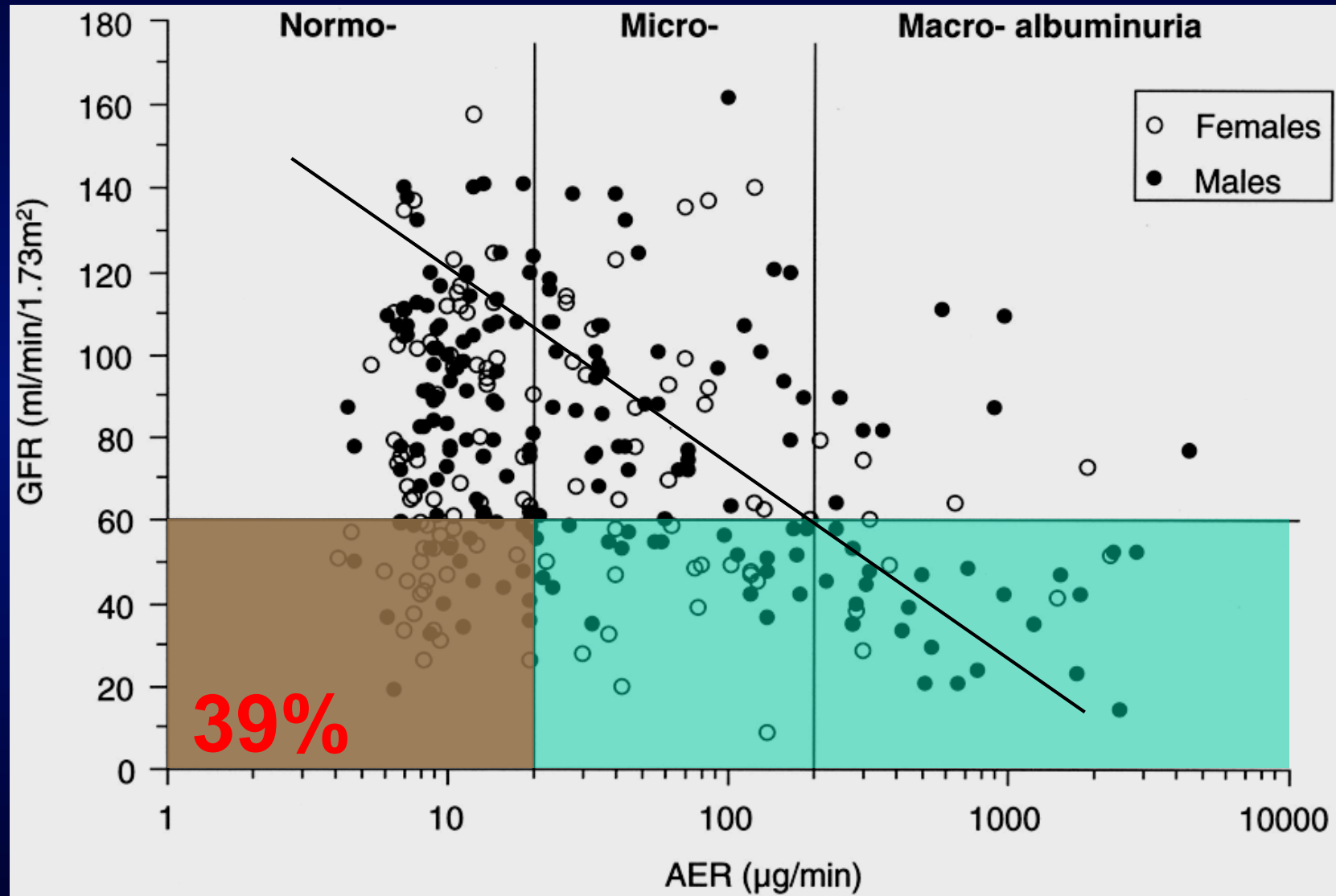
	Subjects With Type 2 Diabetes Mellitus, % (95% Confidence Interval)†	Population Estimate in Millions (95% Confidence Interval)
Microalbuminuria (sampled n = 64)	45 (31-59)	0.6 (0.3-0.7)
Macroalbuminuria (sampled n = 47)	19 (10-28)	0.2 (0.1-0.3)
Retinopathy (sampled n = 58)	28 (21-36)	0.3 (0.2-0.4)
No retinopathy or albuminuria (sampled n = 51)‡	30 (21-39)	0.3 (0.2-0.4)

\*Includes angiotensin-converting enzyme users. Chronic renal insufficiency defined as glomerular filtration rate less than 60 mL/min per 1.73 m<sup>2</sup> body surface area calculated with the Modification of Diet in Renal Disease Study formula.<sup>19</sup>

***JAMA. 2003;289:3273-3277***



# Normoalbuminuric Renal Insufficiency in Type 2 Diabetes



Maclsaac RJ et al., Diabetes Care 2004.

# Normoalbuminuric Renal-Insufficient Diabetic Patients

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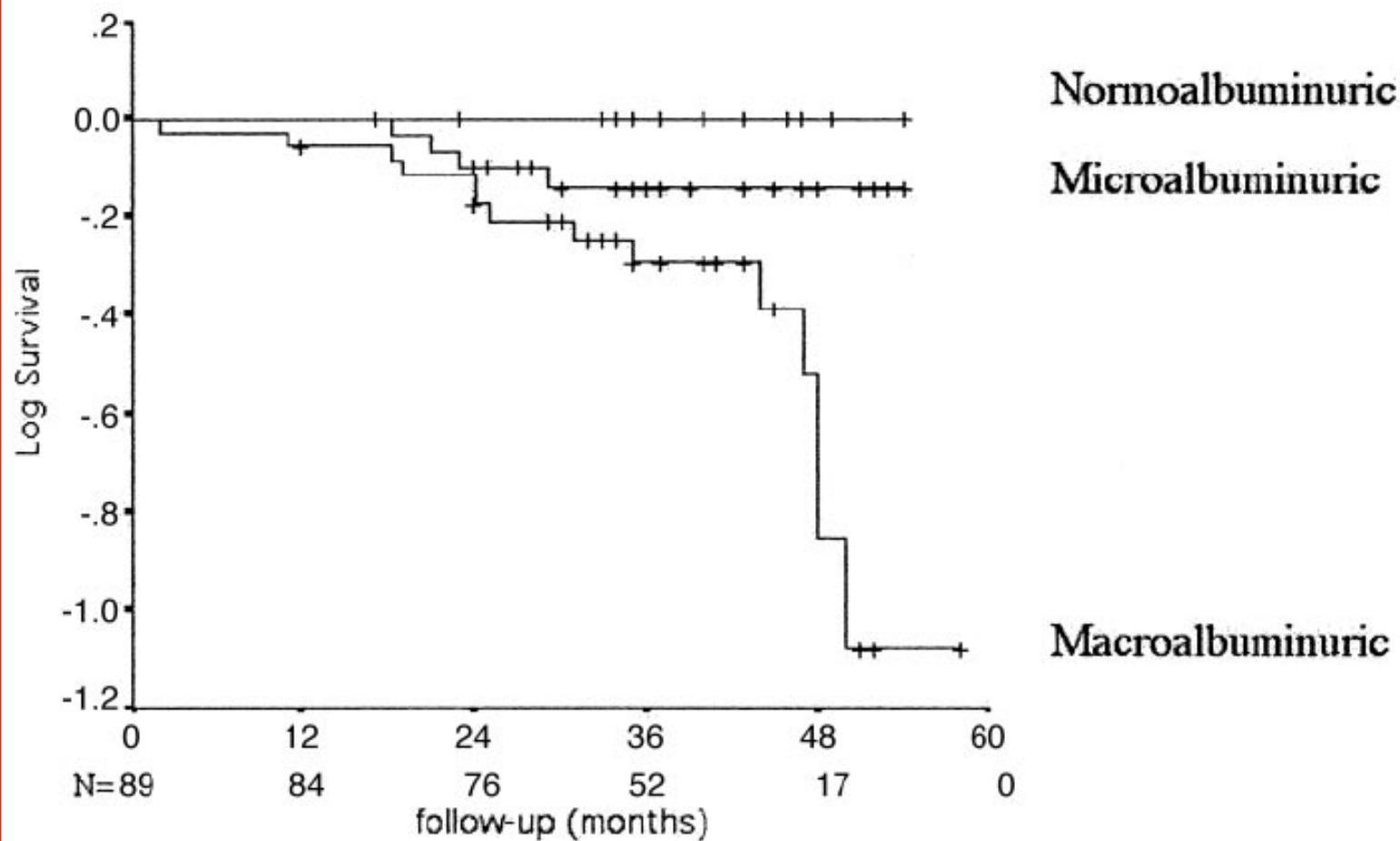


Figure 1—Log survival plot (end point: death or dialysis).

# Conclusioni

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- Circa il 30-40% dei diabetici sia di tipo 1 che di tipo 2 sviluppano nefropatia diabetica
- L'incidenza di nefropatia diabetica sta diminuendo nel diabete di tipo 1
- Nel diabete di tipo 2 la mortalità per malattie cardiovascolari supera di gran lunga la ESRD
- Nel diabete di tipo 2 è frequente la presenza di ridotto GFR anche in assenza di micro- o macro-albuminuria
- IL significato prognostico renale di questa condizione è ancora incerto