



*a  
multicentre  
study*

**EuroSIDA**

## *11<sup>th</sup> International Congress on Drug Therapy in HIV Infection*

### **Advanced Chronic Kidney Disease, End-Stage Renal Disease and Renal Death in HIV-positive individuals in Europe**

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on behalf of EuroSIDA in EuroCoord

# Background

- Advanced Chronic Kidney Disease (Adv CKD) and End-Stage Renal Disease (ESRD) have been poorly studied in modern cART era, especially in Europe
- Estimated ESRD incidence 0.4-9.7/1000 PY<sup>1-7</sup>  
prevalence 1.9-9.2/1000 persons<sup>2-4</sup>
- Risk factors; Traditional renal & HIV-related factors<sup>3-7</sup>
- Adv CKD/ESRD is associated with high mortality/morbidity  
- General population; 1 yr mortality after initiating chronic dialysis 19.6%<sup>8</sup>

1. Lucas AIDS 2007, 2. Trullas J AIDS 2008, 3. Bansi AIDS 2009, 4. Bickel CROI 2012 # 867,

5. Jotwani Am J Kidn Dis. 2011, 6. Atta CID 2007, 7. Choi J AM Soc Nephrol 2007, 8. US renal data report 2007

# Objectives

- Assessment of incidence of Adv CKD/ESRD/Renal Death in EuroSIDA
- Identify independent risk factors for Adv CKD/ESRD/Renal Death
- Assessment of outcomes following Adv CKD/ESRD

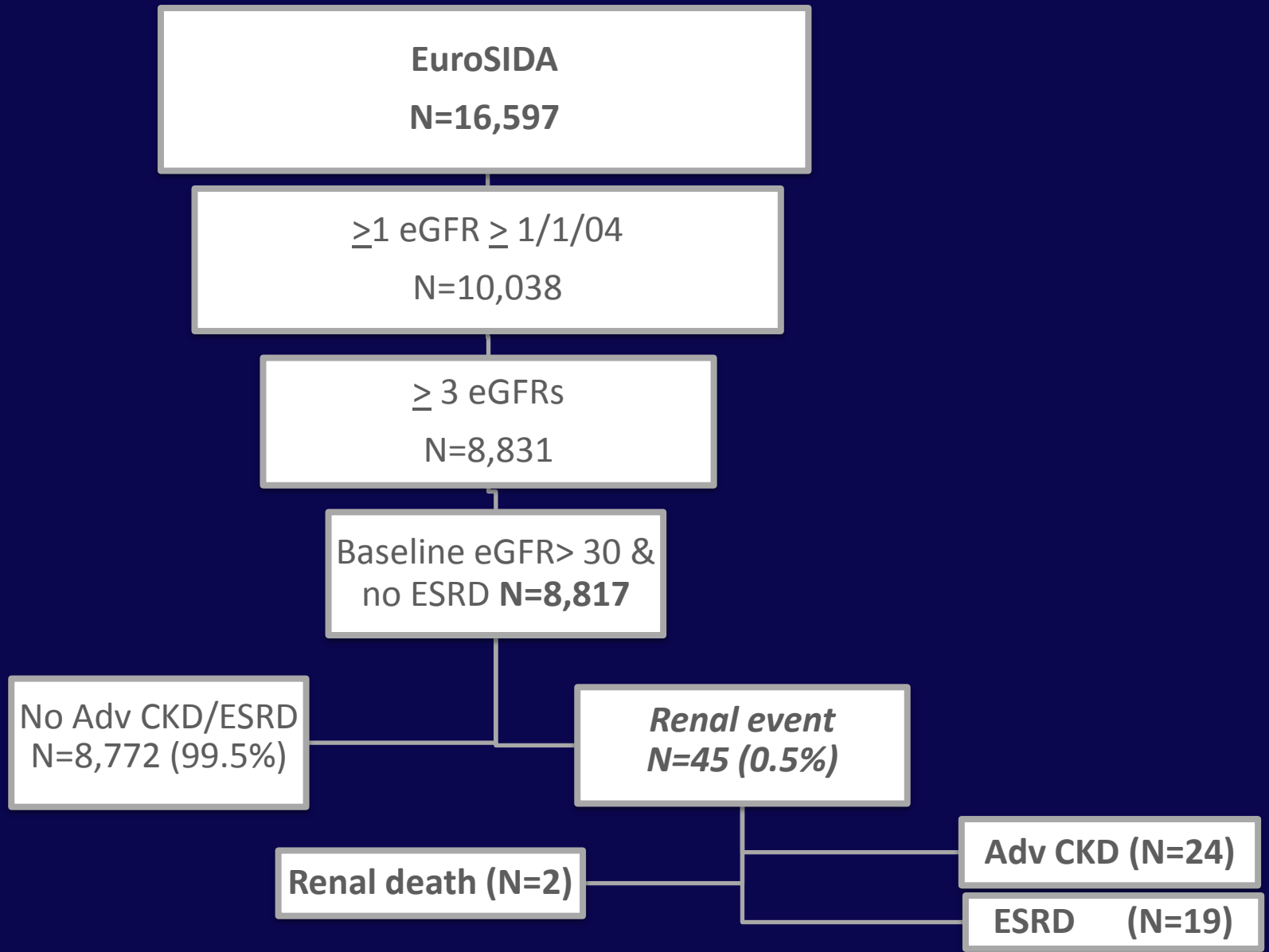
# Definitions

- Adv CKD: Confirmed ( $\geq 3$  months apart)  $eGFR \leq 30$  ml/min per  $1.73m^2$
- ESRD: Hemo- or peritoneal dialysis for  $>1$  month or renal transplantation
- Renal Death: Renal failure as underlying cause of death using CoDe methodology<sup>1</sup>

1. Kowalska. *Epidemiology* 2011

# Methods

- Follow-up from first eGFR measurement  $>1/1/2004$  to last eGFR or Adv CKD/ESRD/Renal Death, whichever occurred first
  - Prevalent Adv CKD/ESRD led to exclusion
- eGFR calculated with Cockcroft-Gault
- Poisson Regression Models adjusted for
  - Demographic factors (ethnicity, gender, age)
  - Traditional renal risk factors (baseline eGFR, prior CV event, diabetes or hypertension)
  - HIV- related factors (current/nadir CD4 count, VL, HCV/HBV and prior AIDS)
- Kaplan-Meier method used to estimate time to events and outcome following Adv CKD/ESRD



Median Follow-up 4.5 yrs (IQR 2.7-5.8) and 37,056 PYFU  
 Incidence Rate 1.21/1000 PYFU (95%CI 0.86-1.57)

# Baseline Characteristics

		N (%)	
		No AdvCKD/ESRD/ Renal Death	Adv CKD/ESRD/ Renal Death
All		8772 (99.5)	45 (0.5)
Race	(Caucasian)	7663 (87)	37 (82)
Gender	(Male)	6478 (74)	37 (82)
Risk	(MSM)	3637 (42)	19 (42)
	(IDU)	1722 (20)	9 (20)
Prior AIDS	(Yes)	2560 (29)	19 (42)
HBV (HBsAg) Pos	(Yes)	554 (6)	2 (4)
HCV (ab) Pos	(Yes)	1900 (22)	10 (22)
Hypertension	(Yes)	1686 (19)	17 (38)
Diabetes	(Yes)	393 (5)	9 (20)
Prior CV event*	(Yes)	240 (3)	2 (4)

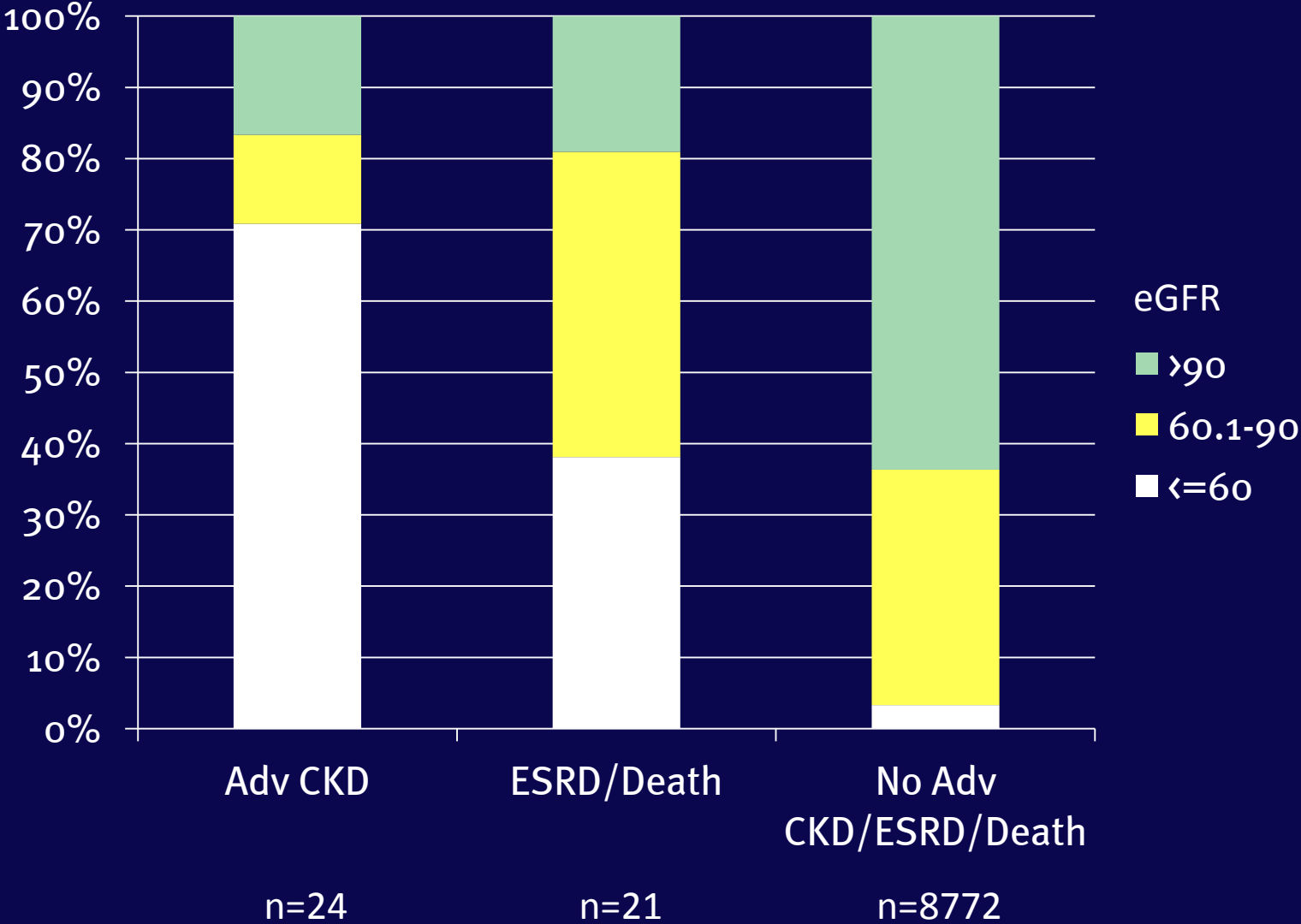
\*MI, stroke or invasive cardiovascular procedure

# Baseline Characteristics cont.

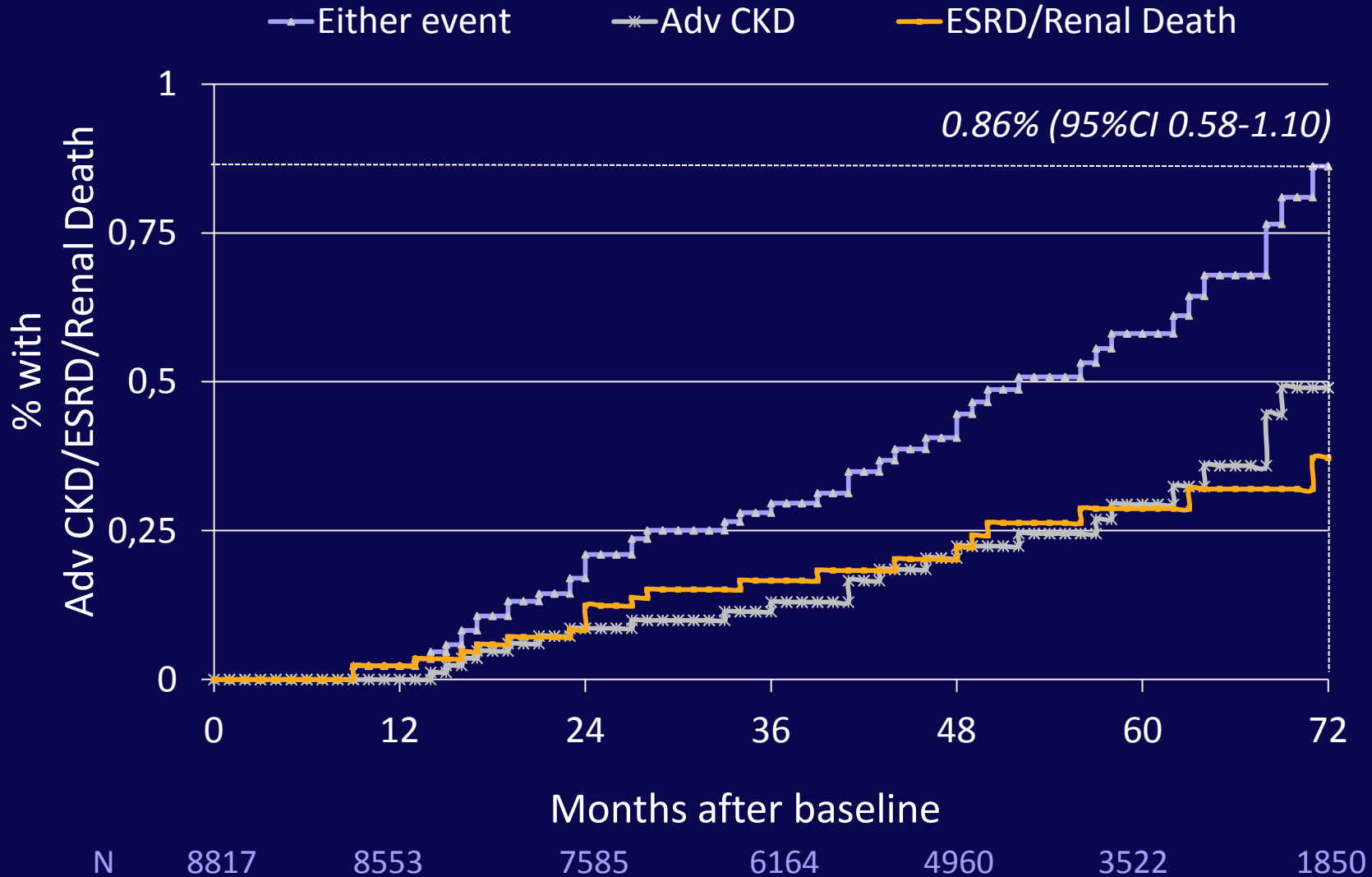
		Median (IQR)	
		No Adv CKD /ESRD/ Renal Death	Adv CKD/ESRD/ Renal Death
eGFR	(ml/min/1.73m <sup>2</sup> )	97 (84-113)	56 (44-76)
CD4	(cells/mm <sup>3</sup> )	438 (294-622)	378 (240-500)
Nadir CD4	(cells/mm <sup>3</sup> )	164 (65-274)	89 (42-160)
HIV-RNA	(log <sub>10</sub> /ml)	1.7 (1.7-3.2)	1.7 (1.7-2.5)
Age	(years)	42 (36-49)	54 (42-63)



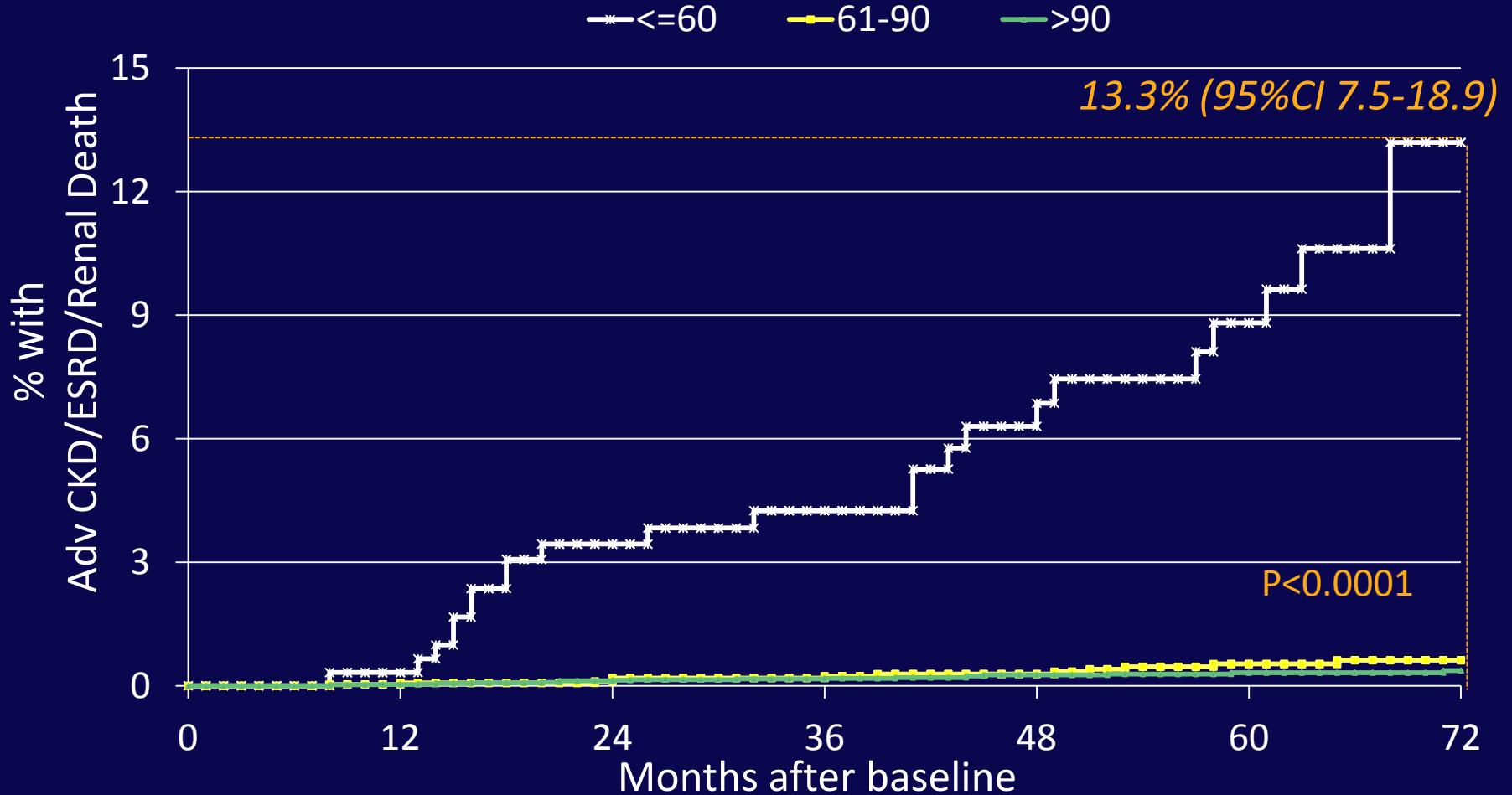
# Distribution of Baseline eGFR



# Kaplan-Meier progression to Adv CKD/ESRD/Renal Death

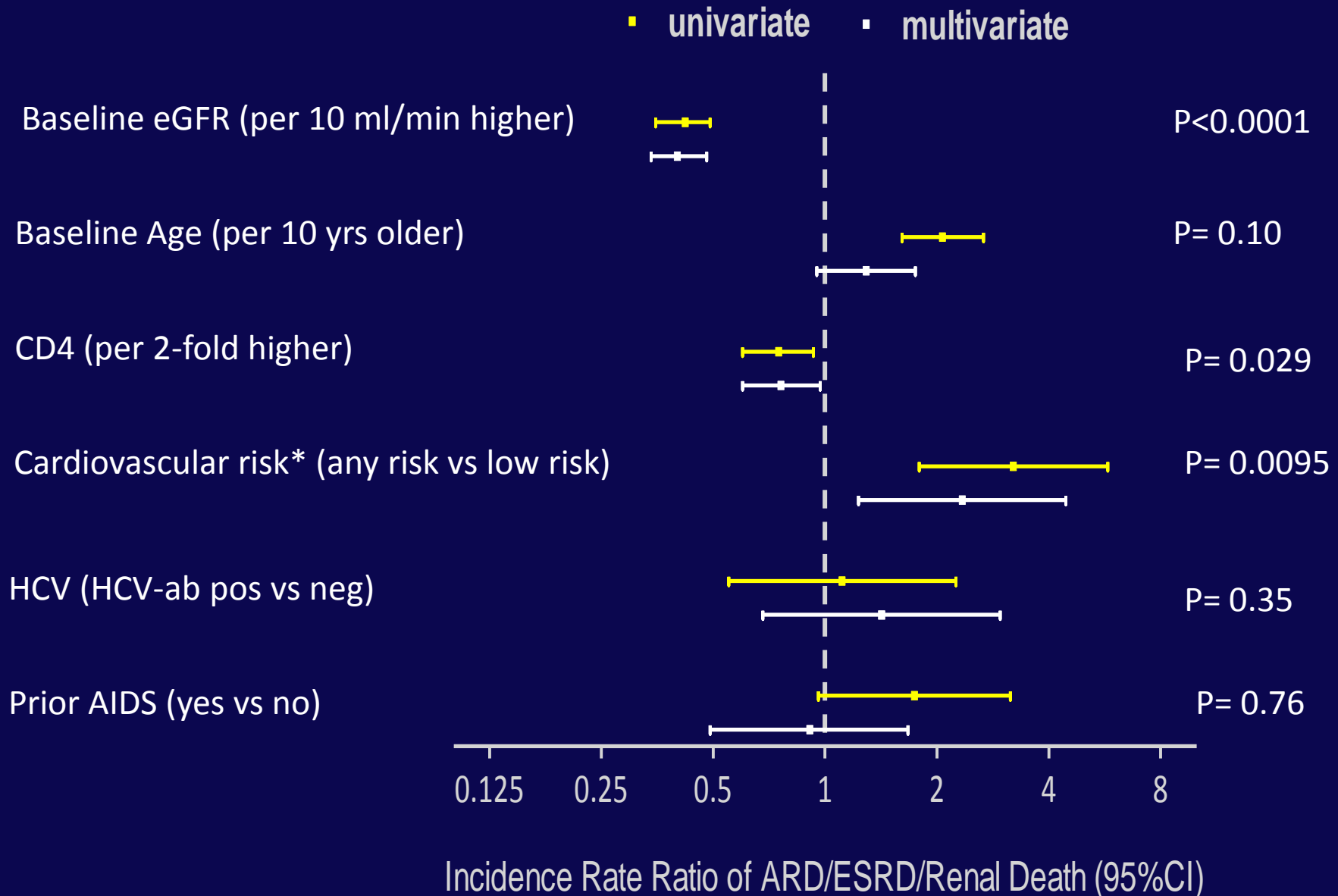


# Baseline eGFR Stratified Kaplan-Meier progression to Adv CKD/ESRD/Renal Death



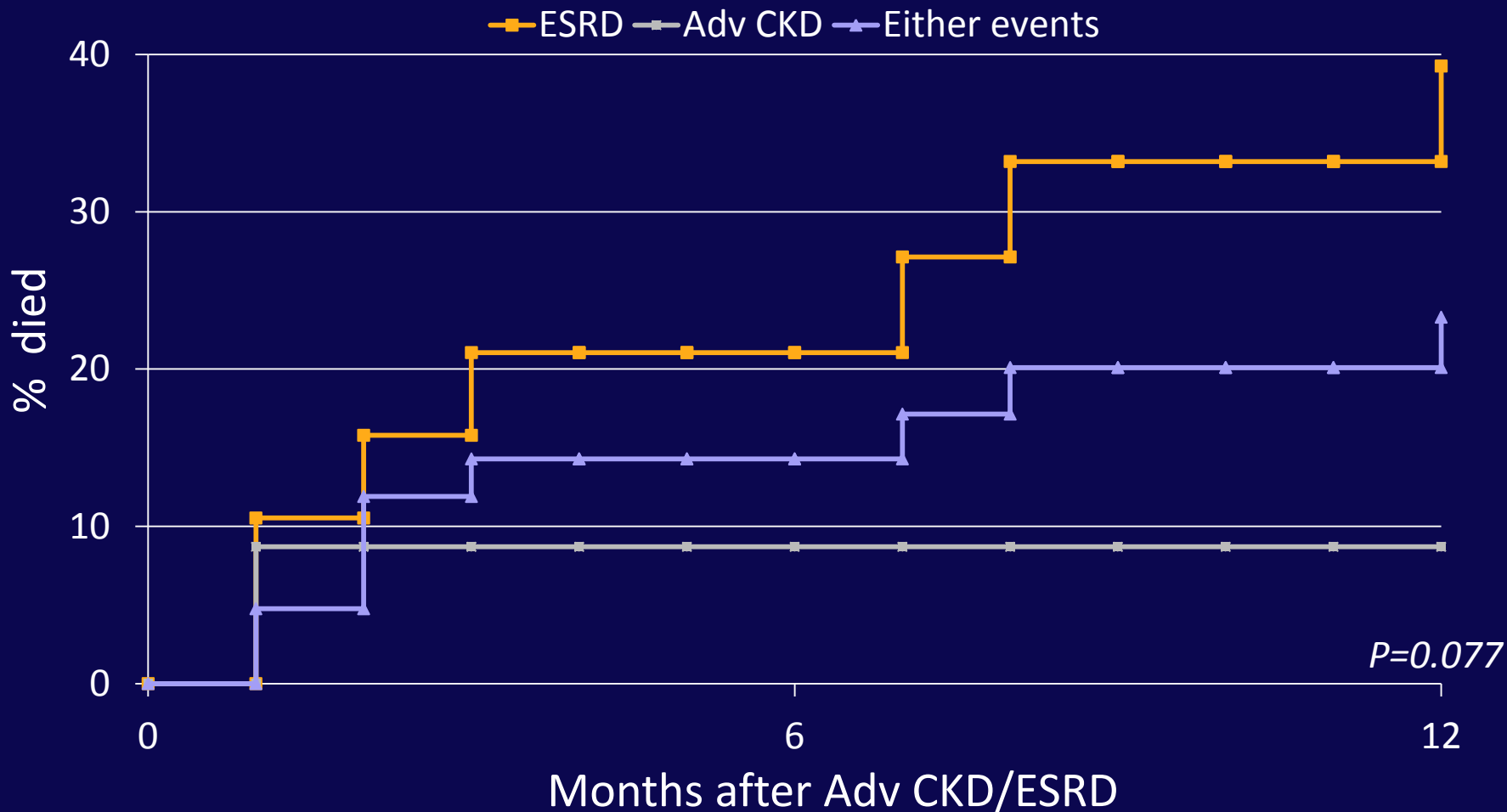
N	0	12	24	36	48	60	72
$<60$	312	305	251	212	163	118	54
61-90	2912	2826	2485	2080	1727	1273	651
$>90$	5593	5422	4849	3872	3070	2131	1145

# Predictors in Uni- & Multivariate analyses



\* Cardiovascular risk: diabetes, hypertension or prior CV event (MI, stroke, invasive cardiovascular procedure)

# Kaplan-Meier progression to death following Adv CKD/ESRD

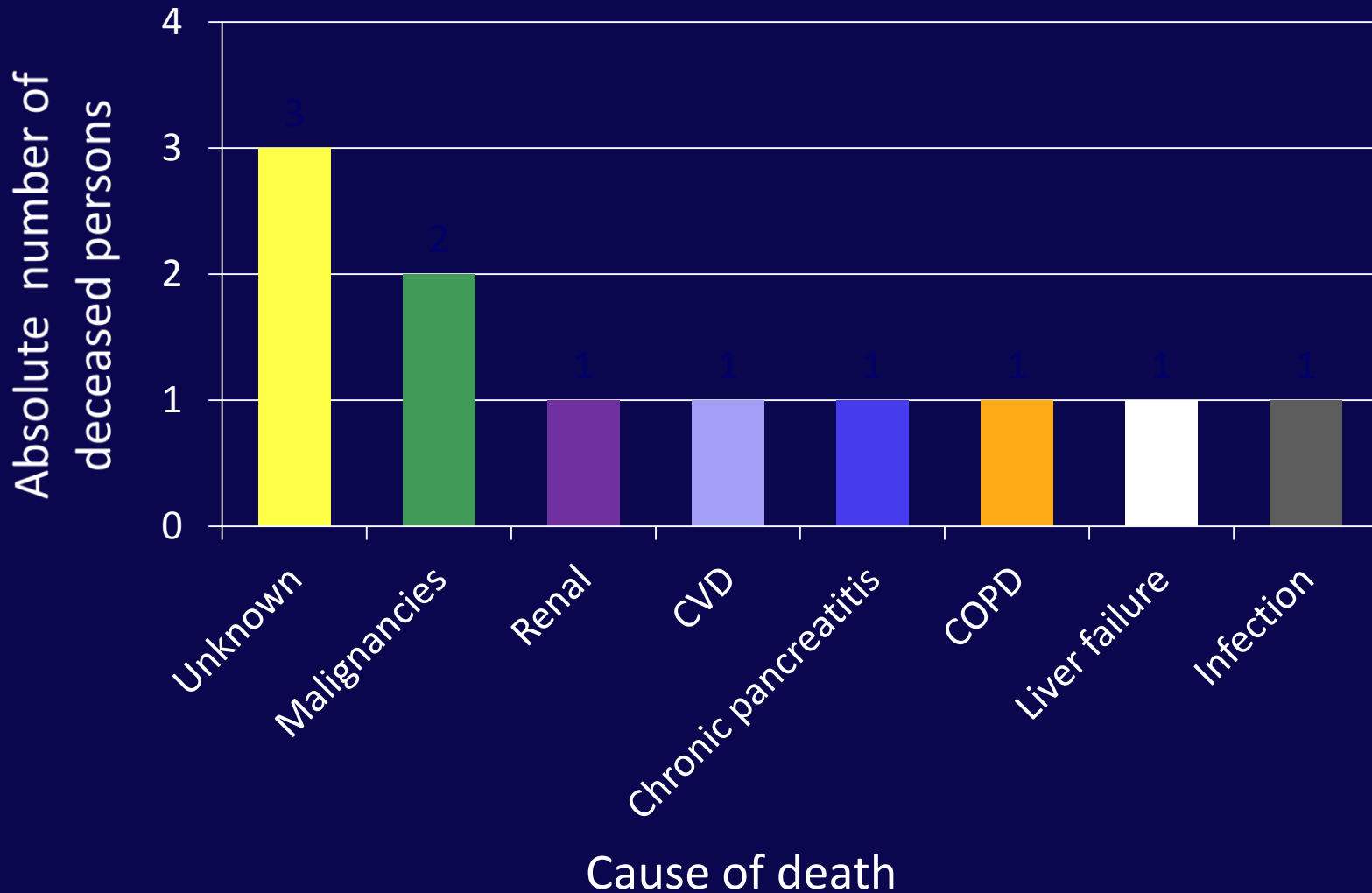


23  
19  
42

19  
13  
32

14  
10  
24

# Underlying causes of deaths after Adv CKD/ESRD



# Limitations

- Infrequent events
- Competing risks
- eGFR availability- Adv CKD underascertainment
- Case definition
- No proteinuria or other urinary markers
- Results may not be generalisable to non-Caucasian populations or those in treatment-limited settings

# Summary and Conclusions

- Adv CKD/ESRD/Renal Death incidence in EuroSIDA was low (1.2/1000 PYFU) during 4.5 years median follow-up
- Most cases had pre-existing renal impairment, but few experienced rapid progression from normal eGFR levels
- Independent predictors: baseline eGFR, CD4 count and any cardiovascular risk
- Underpowered to assess relation to individual ARVs- such analyses are ongoing in the D:A:D study
- Outcome after Adv CKD/ESRD was poor with >20% estimated to have died within 12 months



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The multi-centre study group of EuroSIDA (national coordinators in parenthesis).

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