

# Screening for Chronic Kidney Disease

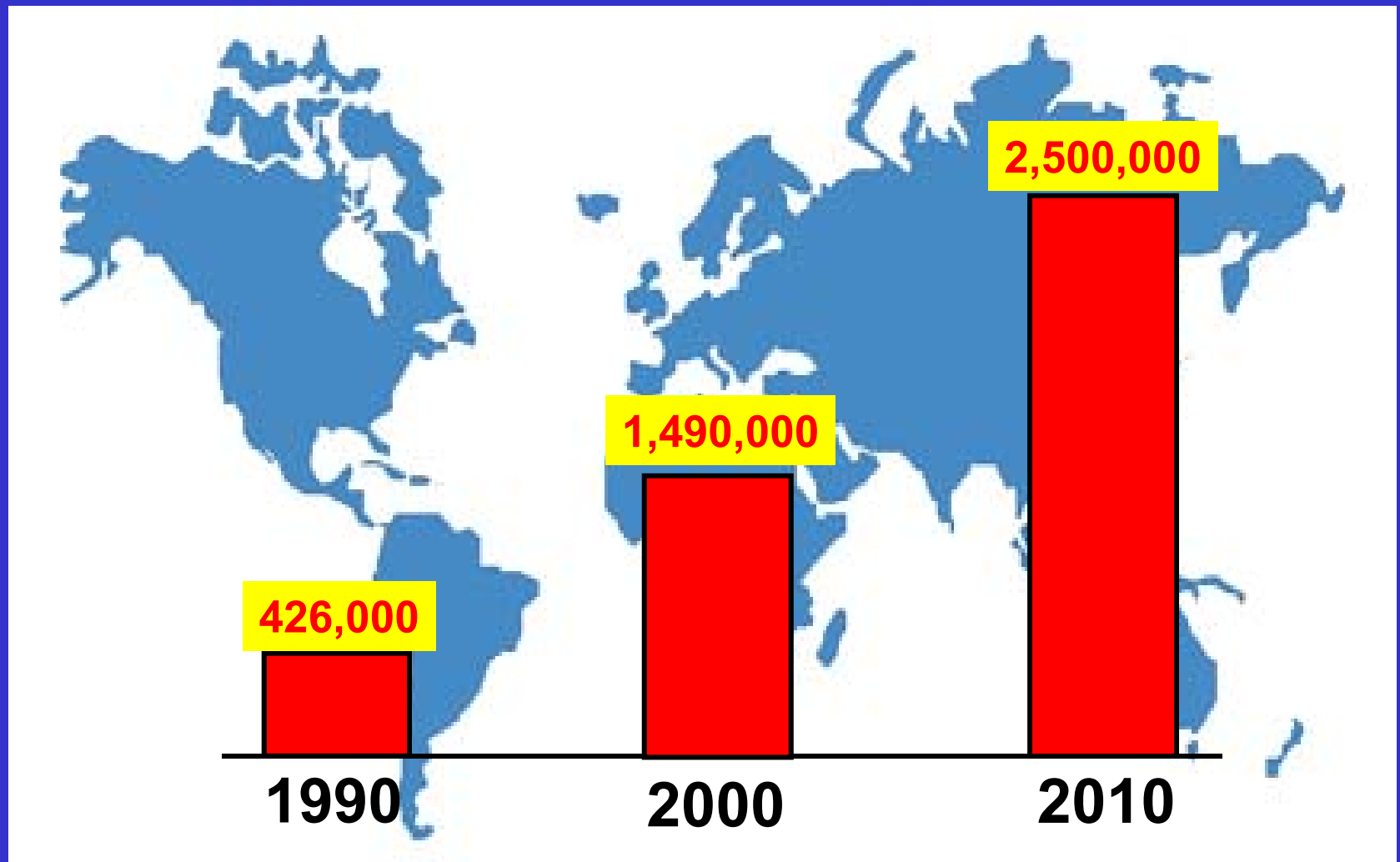
## Where does Europe go?

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University Medical Center Groningen  
The Netherlands

# Patients in chronic dialysis world-wide dialysis costs ~ € 50.000/year

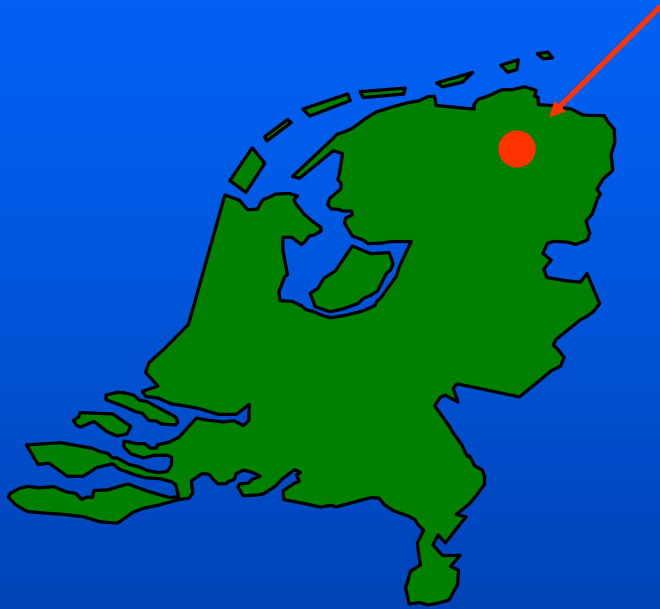




# The stages 1-5 of Chronic Kidney Disease



# PREVEND: **P**revention of **R**enal and **V**ascular **E**nd stage **D**isease

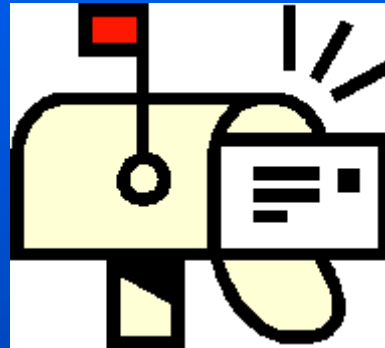


**n= 85421**

**age 28-75 yrs**

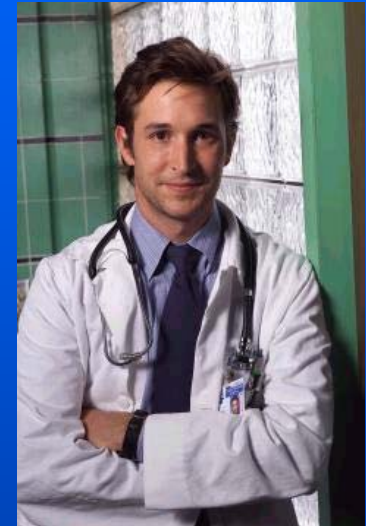
**1997**

[www.prevend.org](http://www.prevend.org)



**n= 40856**

- morning urine sample
- short questionnaire



**n= 8592**

oversampling  
elevated UAE

permanent follow  
up of this cohort

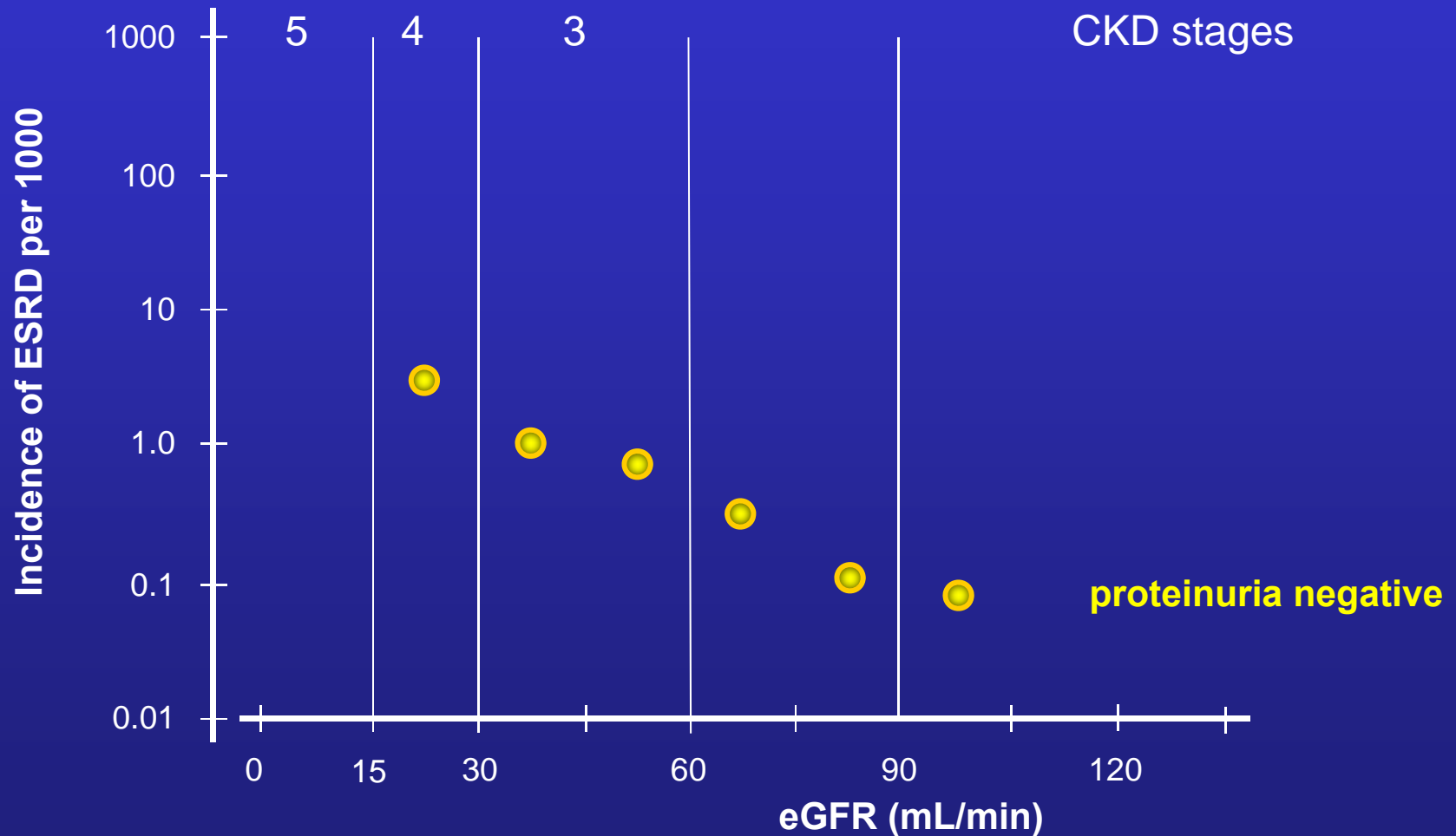


PREVEND

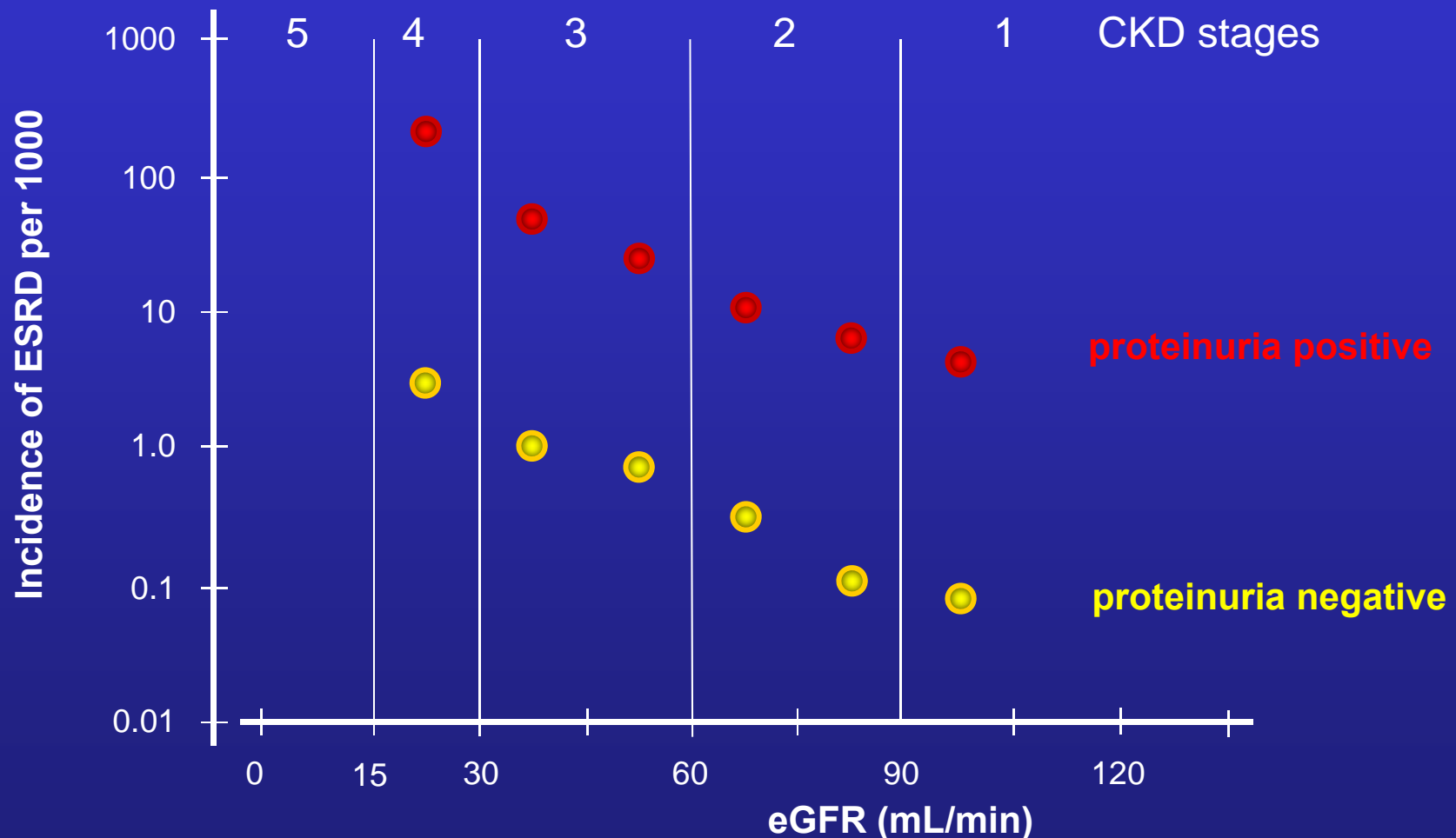
**CKD as predictor of renal events,**

**GFR or albuminuria?**

# eGFR as predictor of end stage renal disease



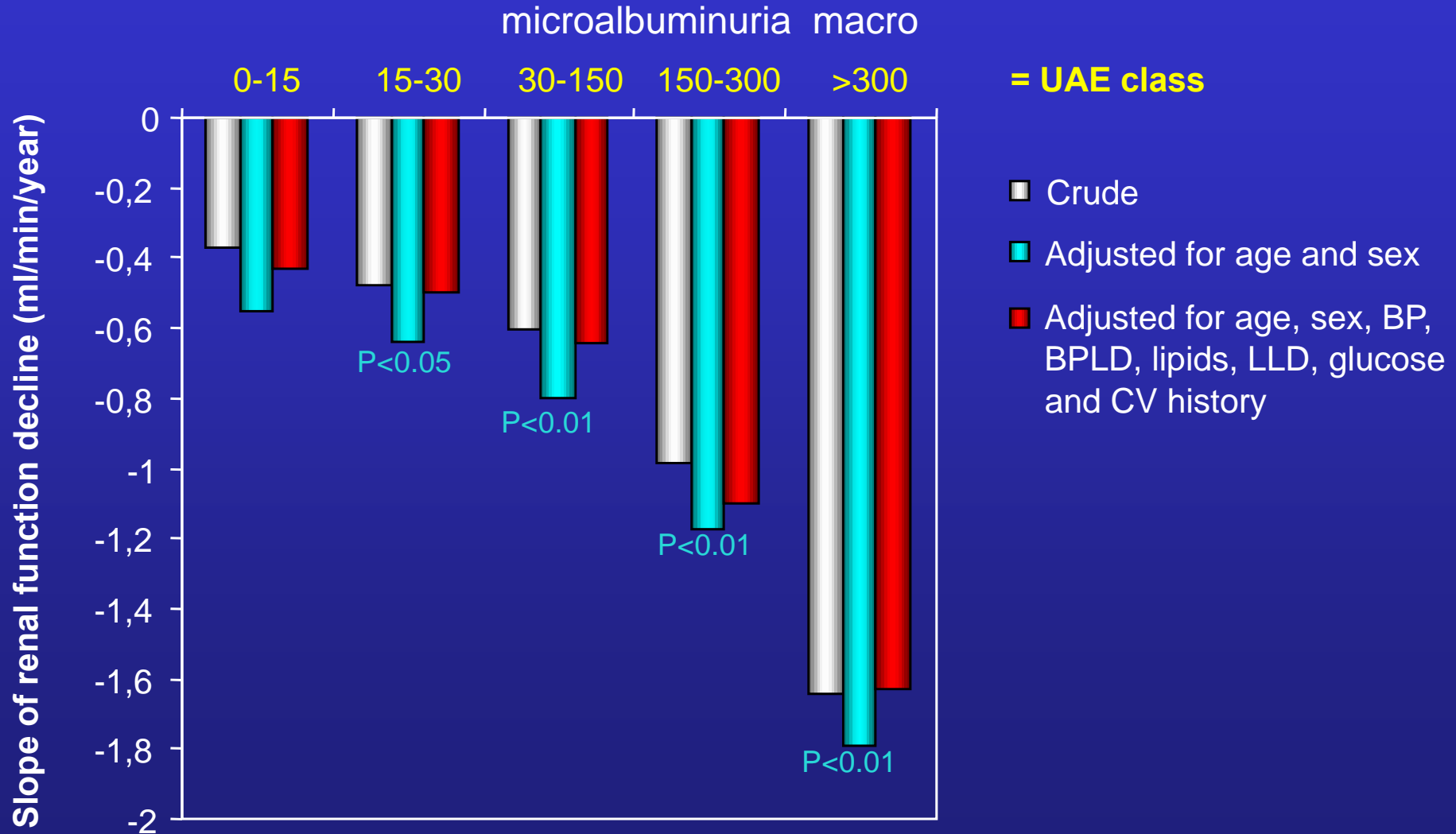
# eGFR and dipstick proteinuria as predictor of end stage renal disease





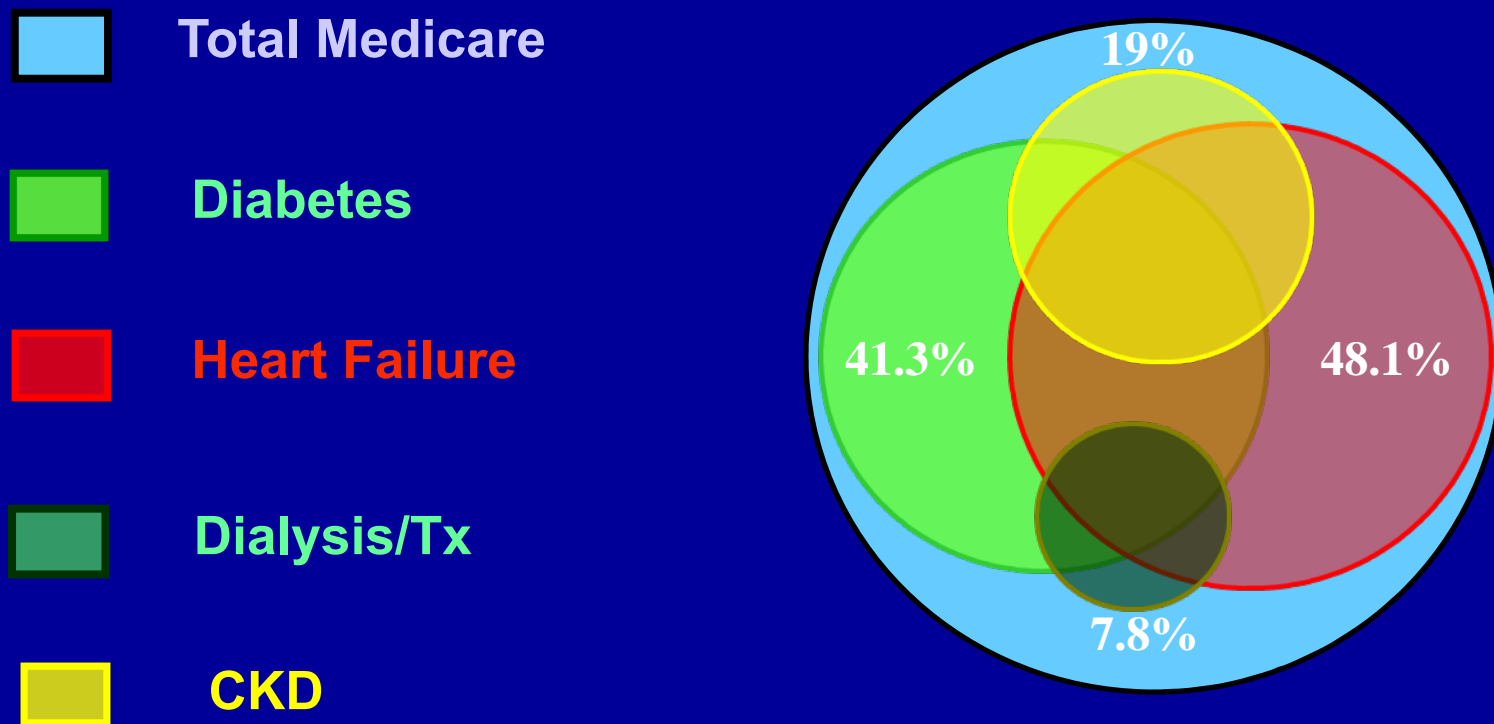
# Albuminuria predicts rate of renal function decline in the general population

PREVEND





# Costs for kidney failure overlap with costs for diabetes and heart failure in age >60



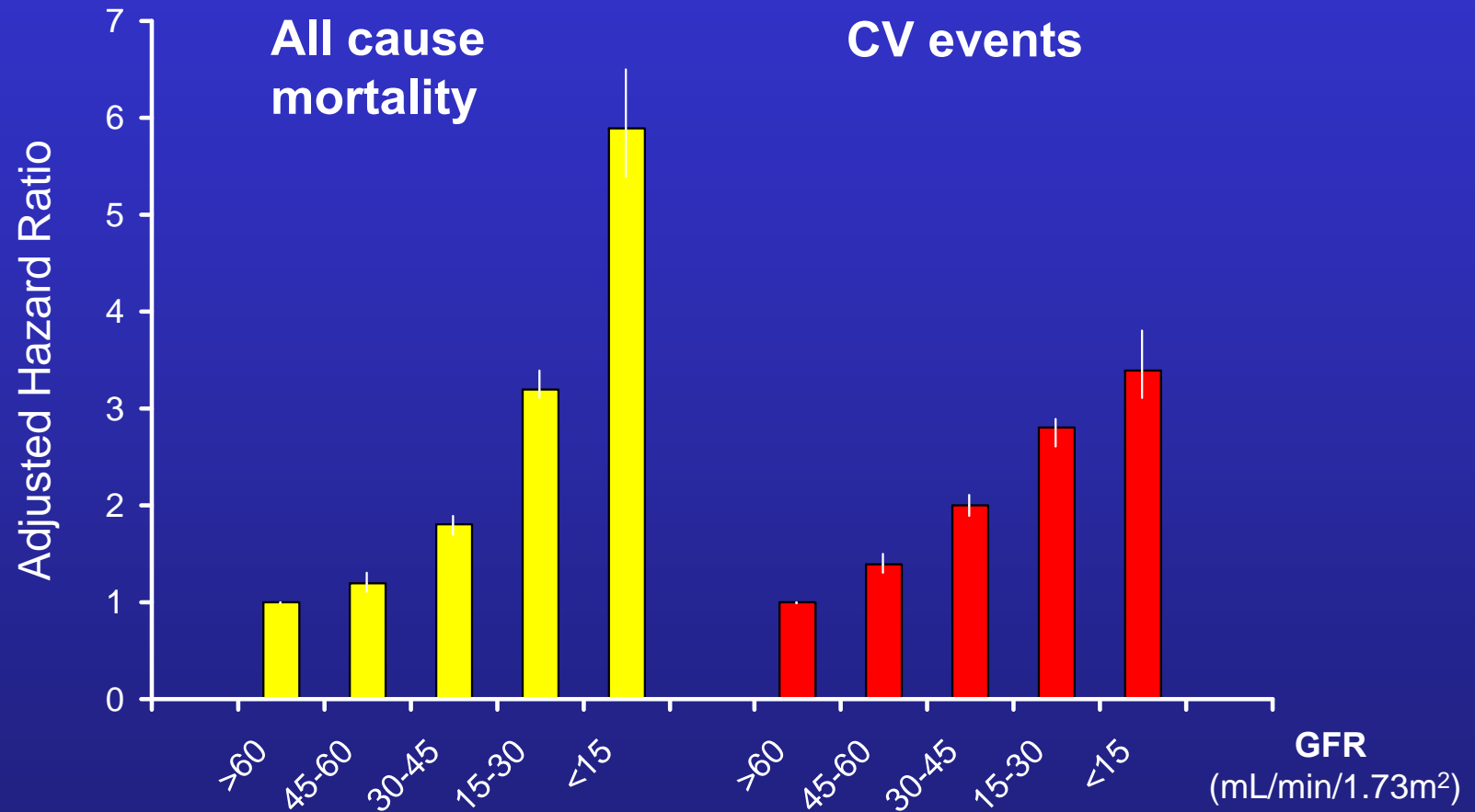


PREVEND

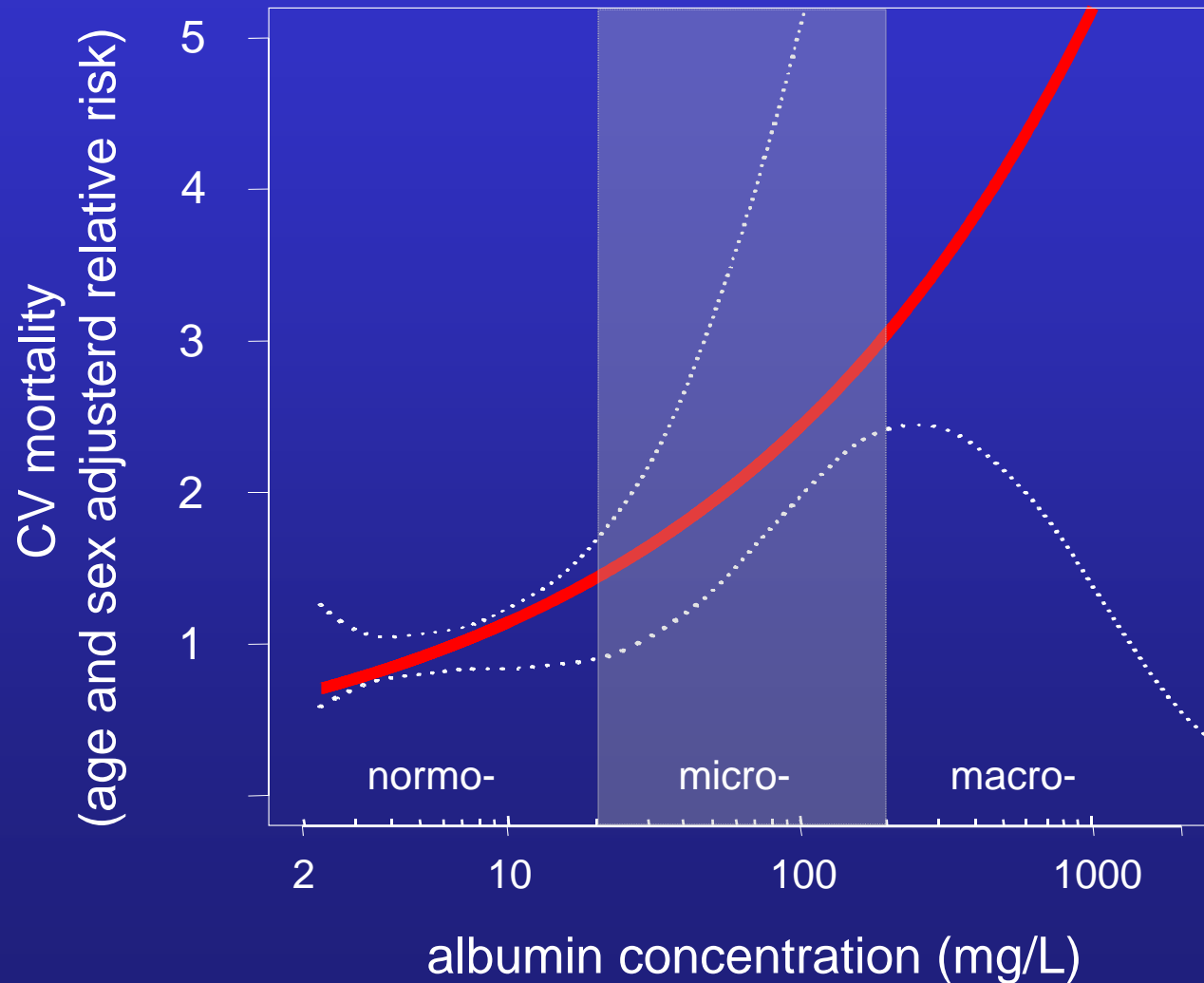
**CKD as predictor of CV events:**

**GFR or albuminuria?**

# eGFR as predictor of all cause mortality and cardiovascular events



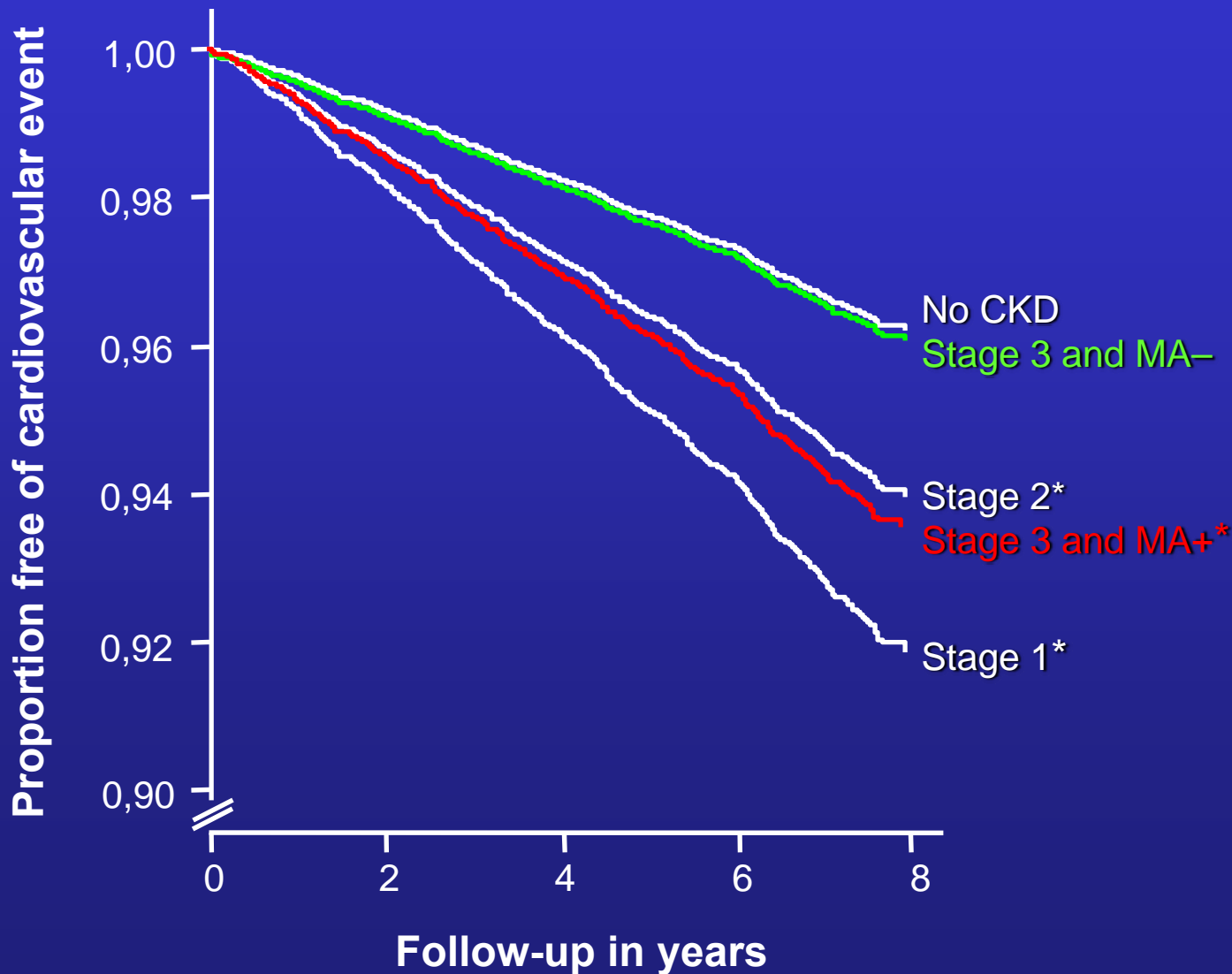
# Albuminuria as predictor of cardiovascular mortality





PREVEND

# CV outcome according to CKD class - age and sex adjusted -





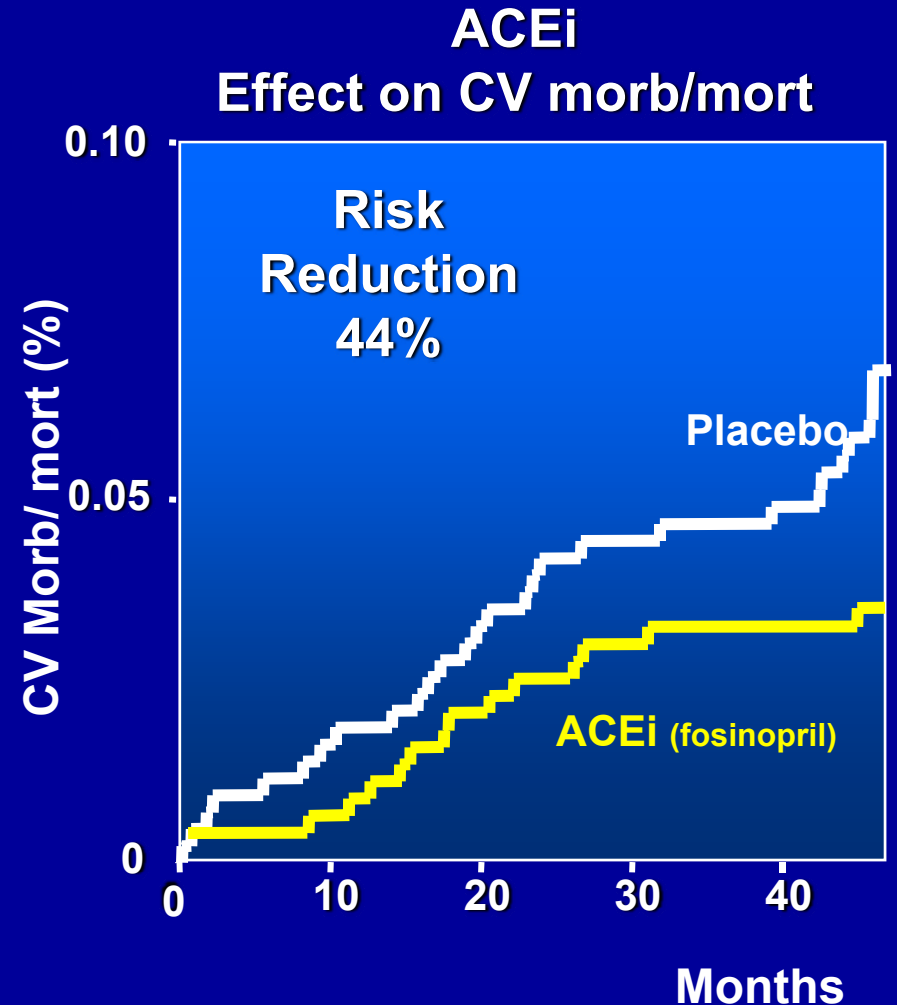
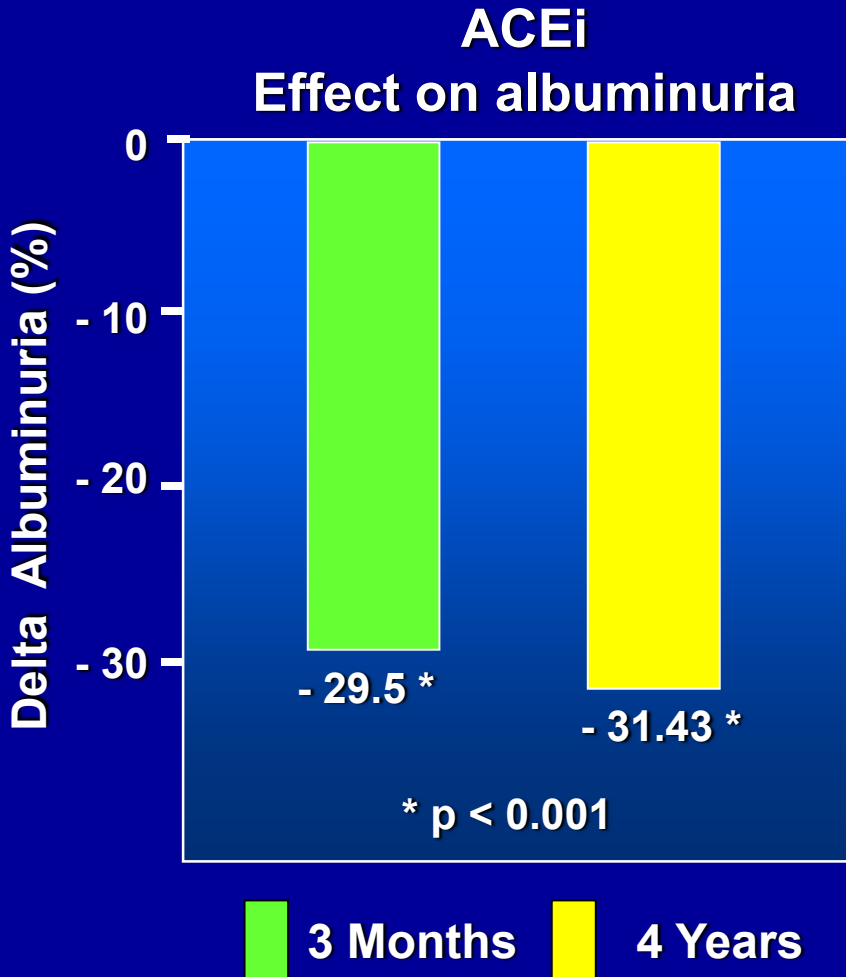
PREVEND

**Is it just identification of a subject with  
increased risk**

**or, ...**

**can we offer him a treatment?**

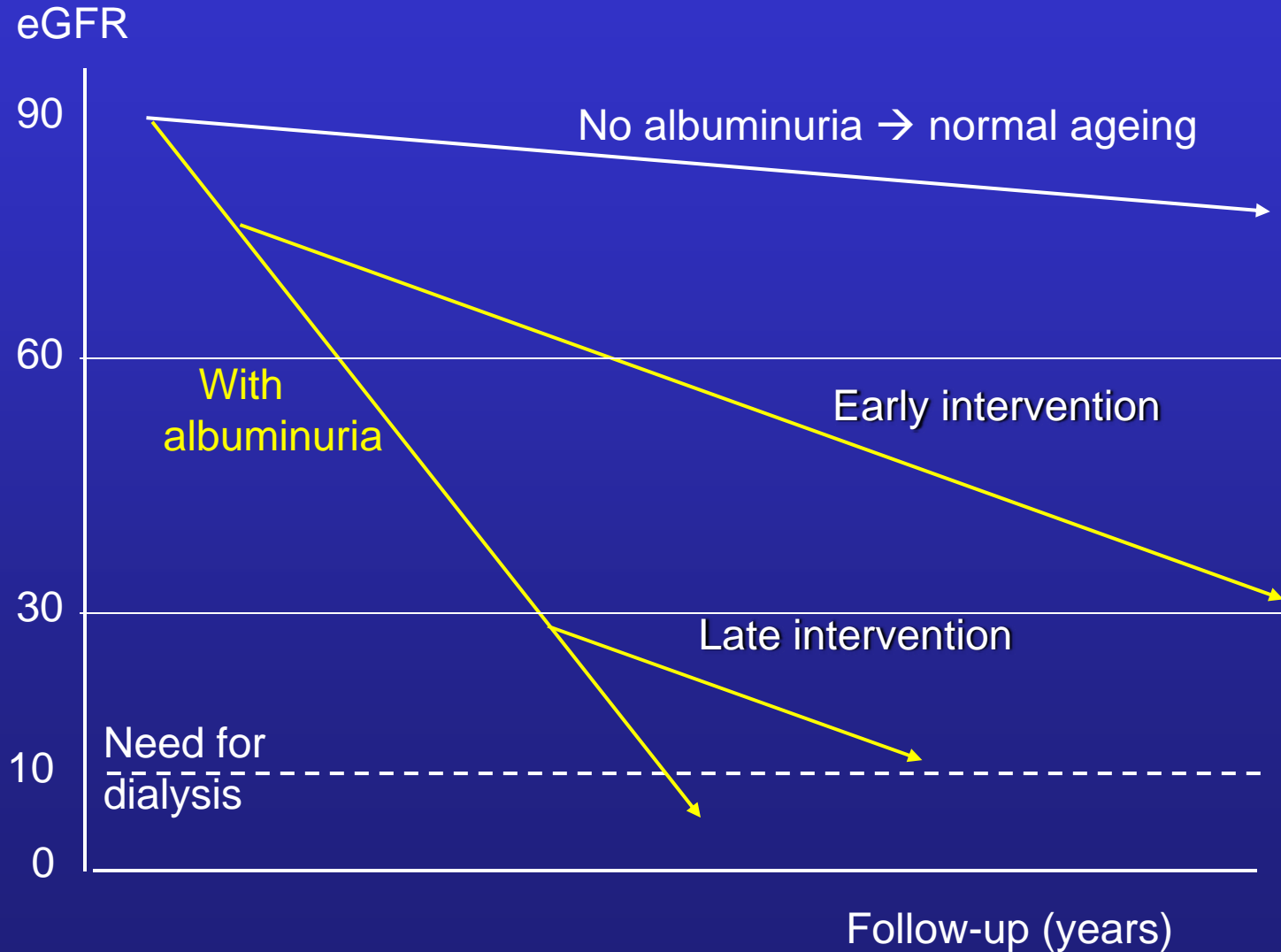
# Lowering albuminuria reduces CV events in “healthy” microalbuminurics (n=864)





PREVEND

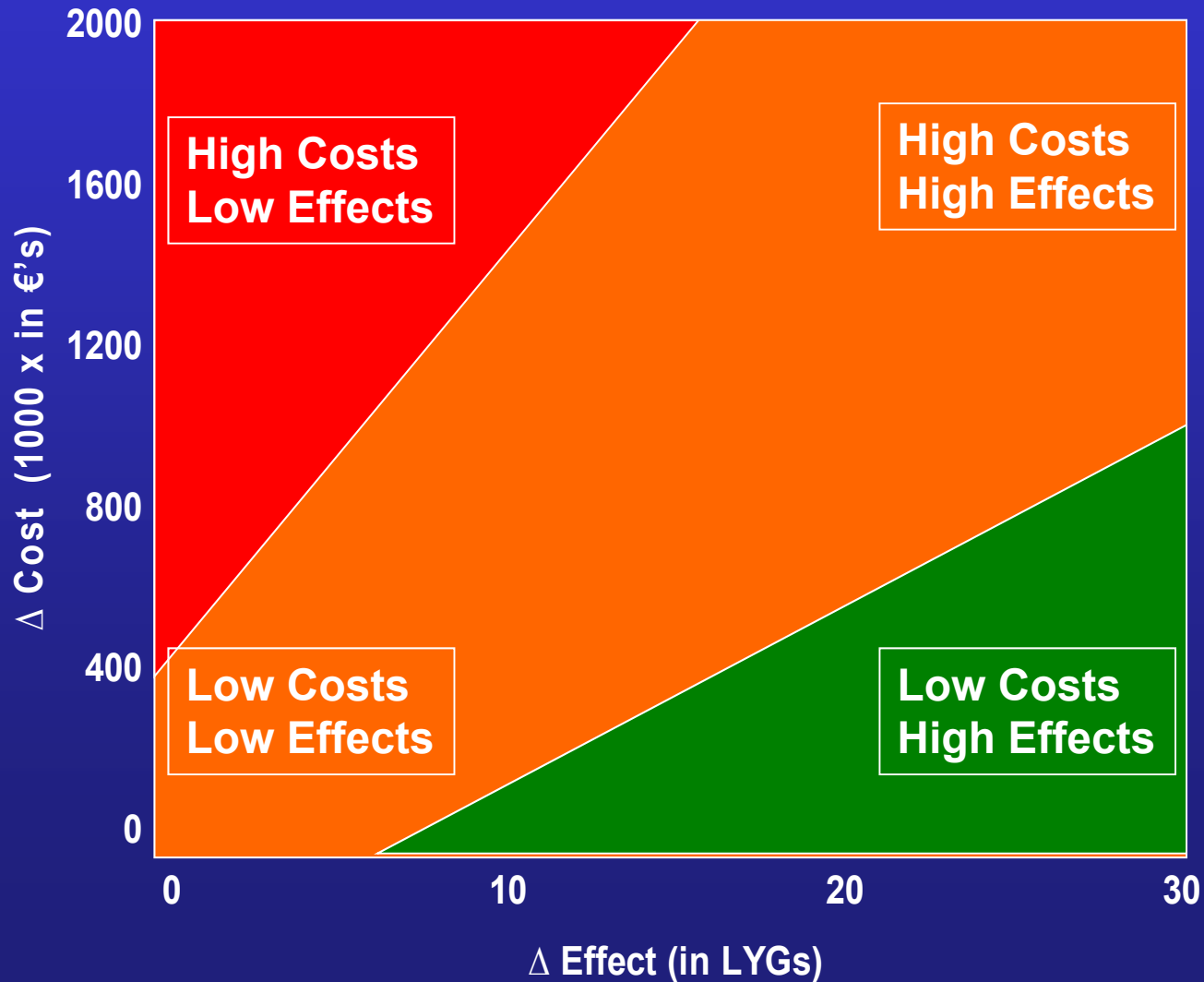
# GFR slope calculation affords early intervention



Gansevoort et al. JASN 2009, 20: 465-8



# Cost-effectiveness plane





# Cost vs effects:

PREVEND





# Cost vs effects:

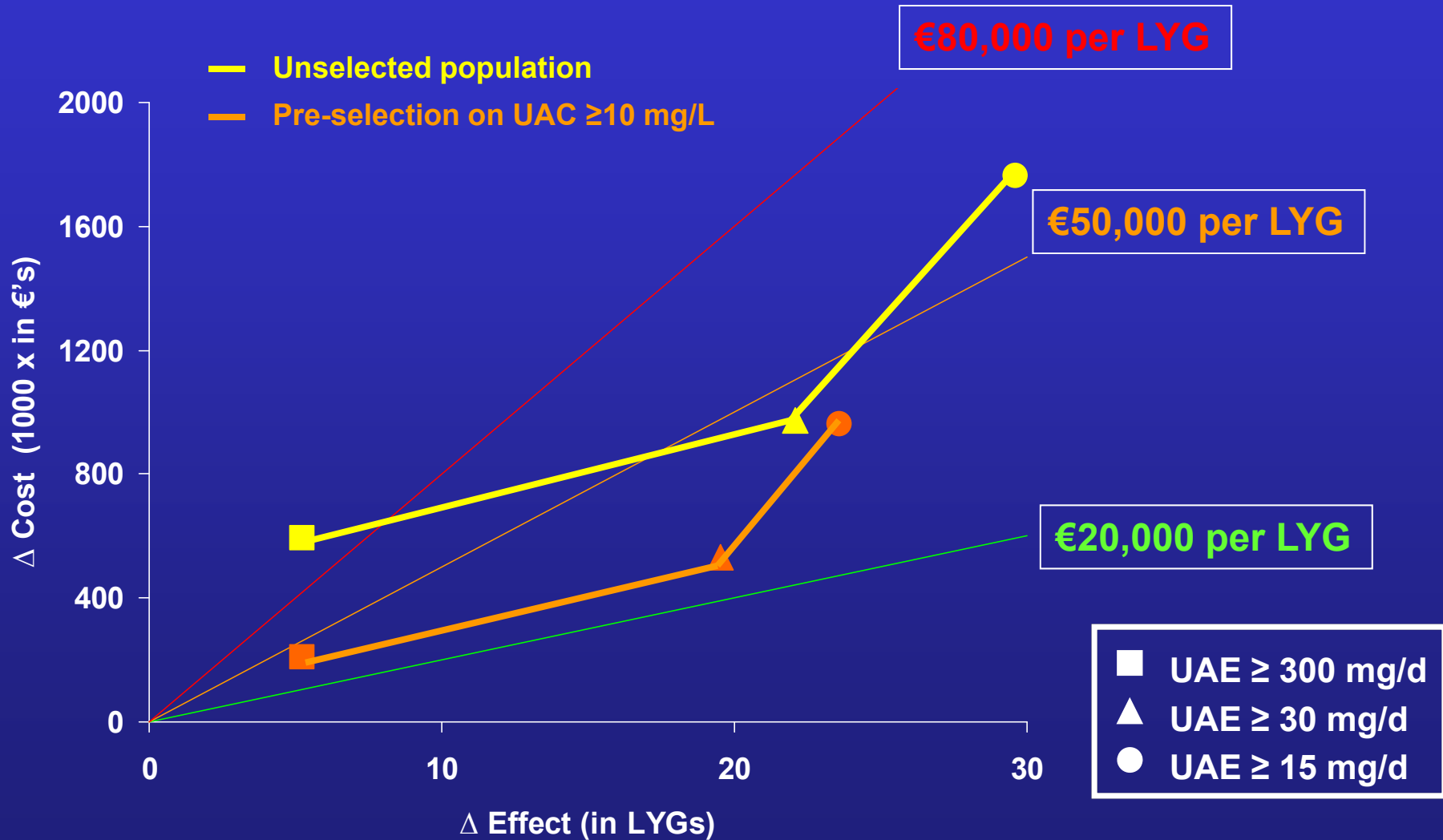
## impact of pre-selection on one morning urine





# Cost vs effects:

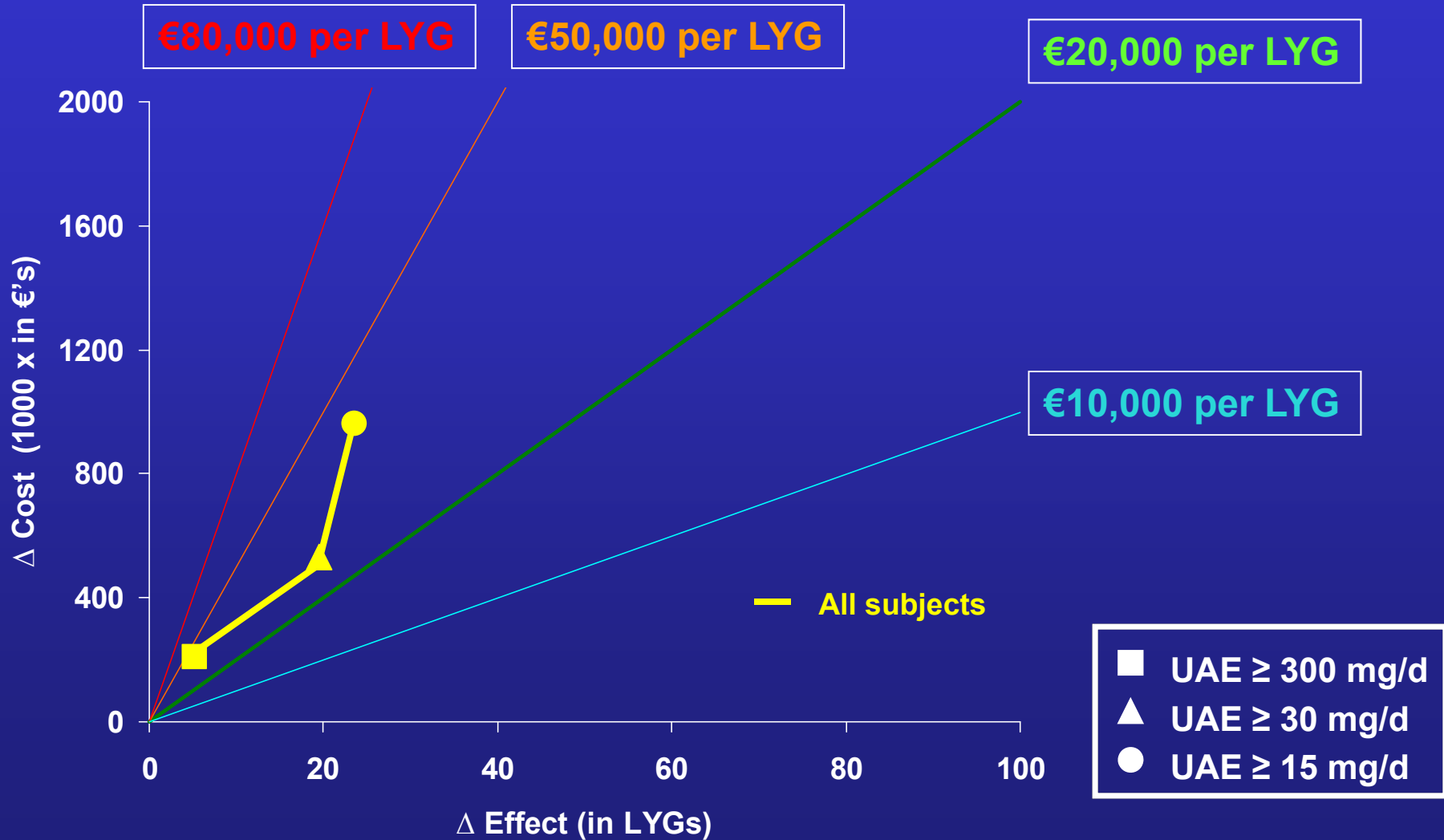
## impact of pre-selection on one morning urine





# Cost versus Effects: impact of age-limitation

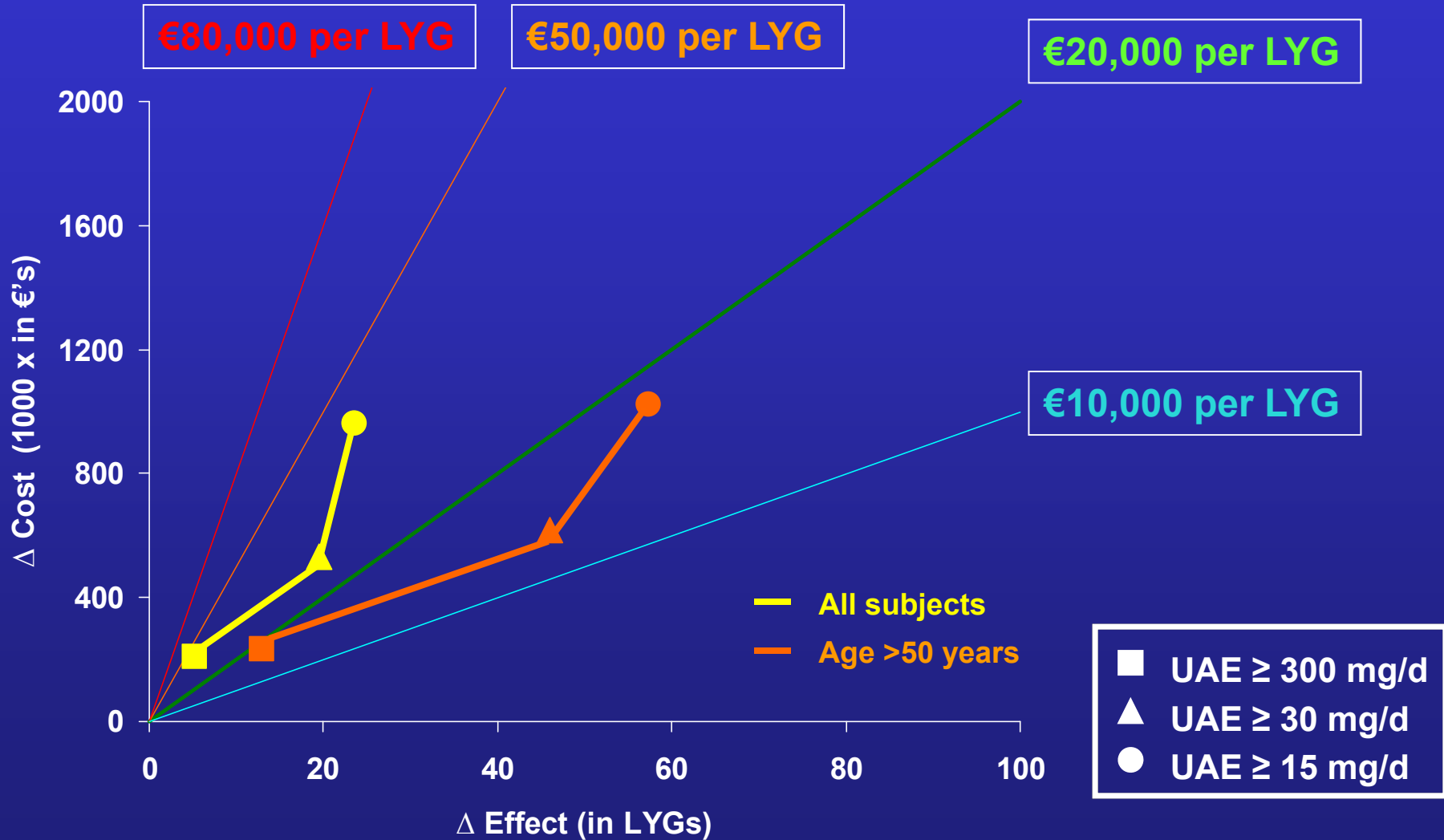
PREVEND





PREVEND

# Cost versus Effects: impact of age-limitation



## SCREENING

## APPROACH-USA

## APPROACH-UK

## APPROACH-Netherlands

**Overall population**

**Target population**

If known with DM, HT, CV-history, or age>50 yr

**Percentage visiting GP**

30-50%

**Measurements**

History on renal and cardiovascular end organ damage

Measure renal and cardiovascular risk factors

Measure eGFR and albuminuria

**Action**

When suspicion of primary renal disease: additional investigations + specific treatment

In case of CKD without suspicion of primary renal disease: treat CV risk factors

## SCREENING

## APPROACH-USA

## APPROACH-UK

## APPROACH-Netherlands

**Overall  
population**

**Target  
population**

If known with DM, HT, CV-  
history, or age>50 yr

**Percentage  
visiting GP**

30-50%



**Disadvantage:**

- the patients diagnosed mostly are on treatment yet

**Advantage:**

- being aware of CKD requires more aggressive treatment goals



# SCREENING

# APPROACH-USA

# APPROACH-UK

# APPROACH-Netherlands

Overall population

Target population

If known with DM, HT, CV-history, or age>50 yr

If known with eGFR <60:

3-4%

Confirm impaired eGFR;  
If positive

Percentage visiting GP

30-50%

2-3%

Measurements

History on renal and cardiovascular end organ damage  
Measure renal and cardiovascular risk factors  
Measure eGFR and albuminuria

Action

When suspicion of primary renal disease: additional investigations + specific treatment  
In case of CKD without suspicion of primary renal disease: treat CV risk factors

# SCREENING

# APPROACH-USA

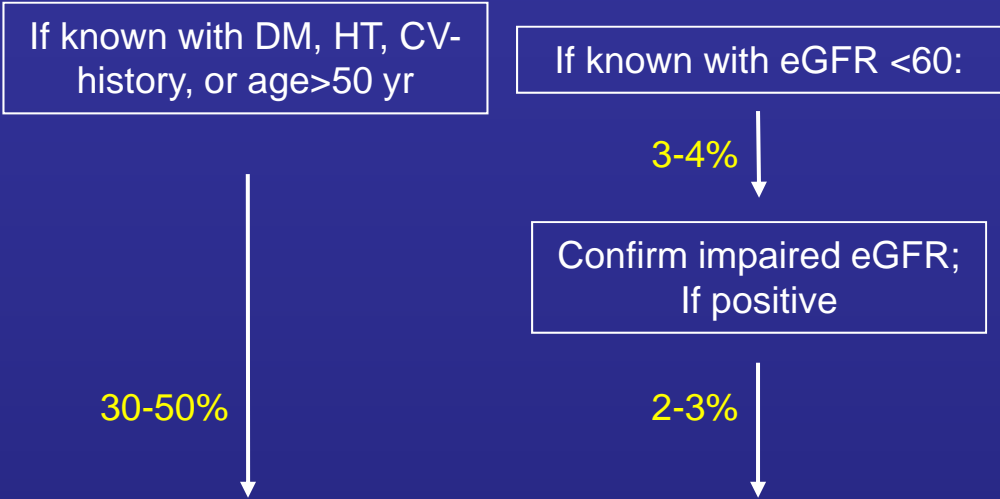
# APPROACH-UK

# APPROACH-Netherlands

Overall population

Target population

Percentage visiting GP



Disadvantage:

- there is just detection of stage 3 or more CKD
- focus might be incorrect as it detects only patients with a reason to do serum creatinine measurements

Advantage:

- it does not require prior selection

# SCREENING

## APPROACH-USA

## APPROACH-UK

## APPROACH-Netherlands

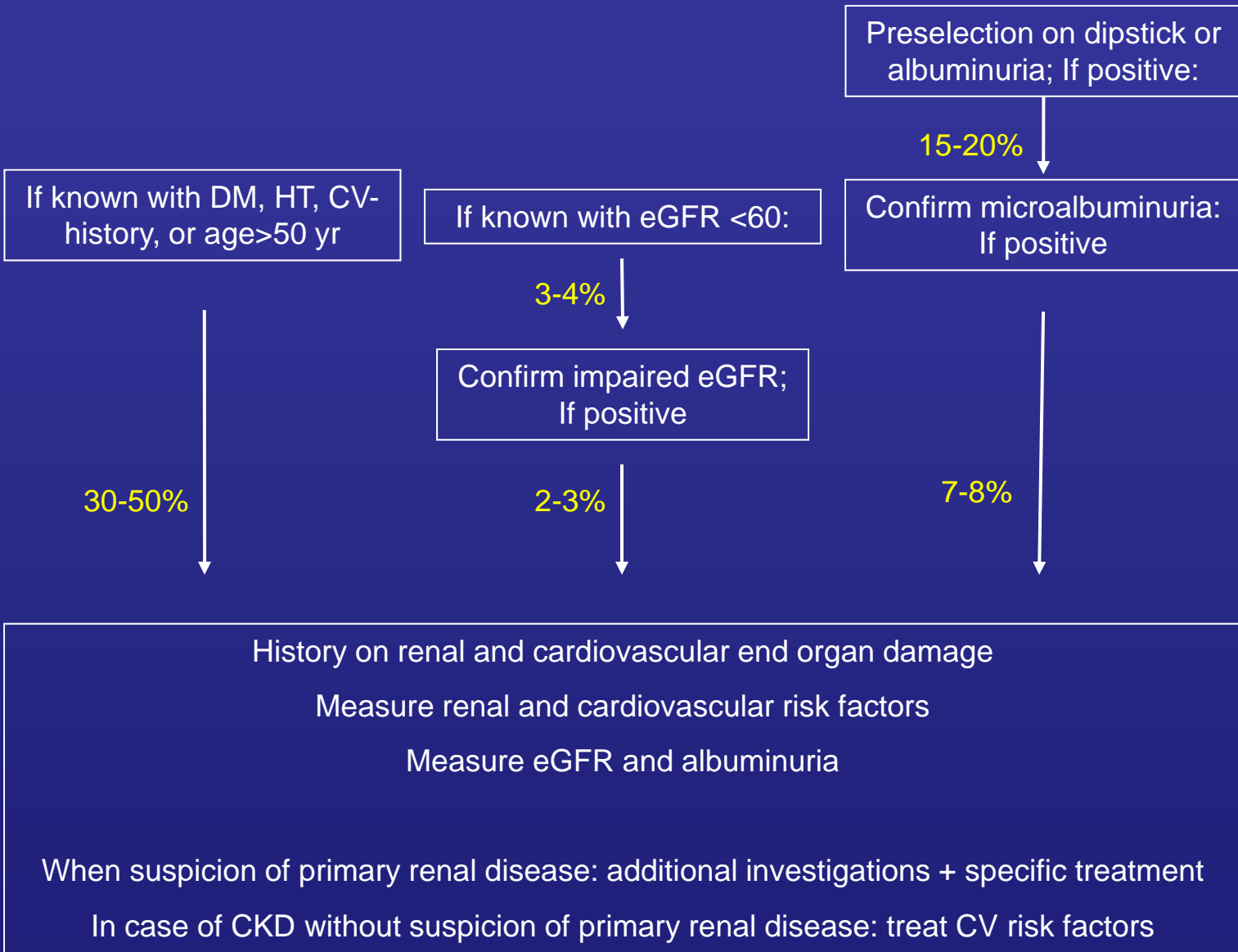
Overall population

Target population

Percentage visiting GP

Measurements

Action



# Dutch GP-nephrologist CKD cooperation

age < 65

age > 65

	Normo albuminuria	Micro albuminuria	Macro albuminuria
GFR > 90	254	15	-
GFR 60-90	678	27	2
GFR 45-60	20	2	1
GFR 30-45	-	-	-
GFR < 30	-	-	-

	Normo albuminuria	Micro albuminuria	Macro albuminuria
GFR > 90	66	10	-
GFR 60-90	687	72	8
GFR 45-60	119	21	6
GFR 30-45	5	3	1
GFR < 30	1	-	-

- green = GP follows DM and CVD guidelines whenever appropriate
- yellow = CKD guidelines followed by GP, unless x<sup>1</sup>;
- orange = consultation between GP and nephrologist
- red = nephrologist

x<sup>1</sup> = rapid eGFR decline, underlying kidney disease, or metabolic complications

figures in cells refer to the number of subjects per 1000 population



PREVEND

## Conclusions

- CKD is found in about 10% of the population
- The level of albuminuria is of more impact than the level of GFR to predict both renal and CV prognosis
- Lowering albuminuria prevents CV events
- Screening for albuminuria is cost-effective to prevent CV events
- Screening for albuminuria affords early intervention
- It can be implemented in GP practice