

# Chronic kidney disease:

M Habas

# CKD: Staging System and Prevalence

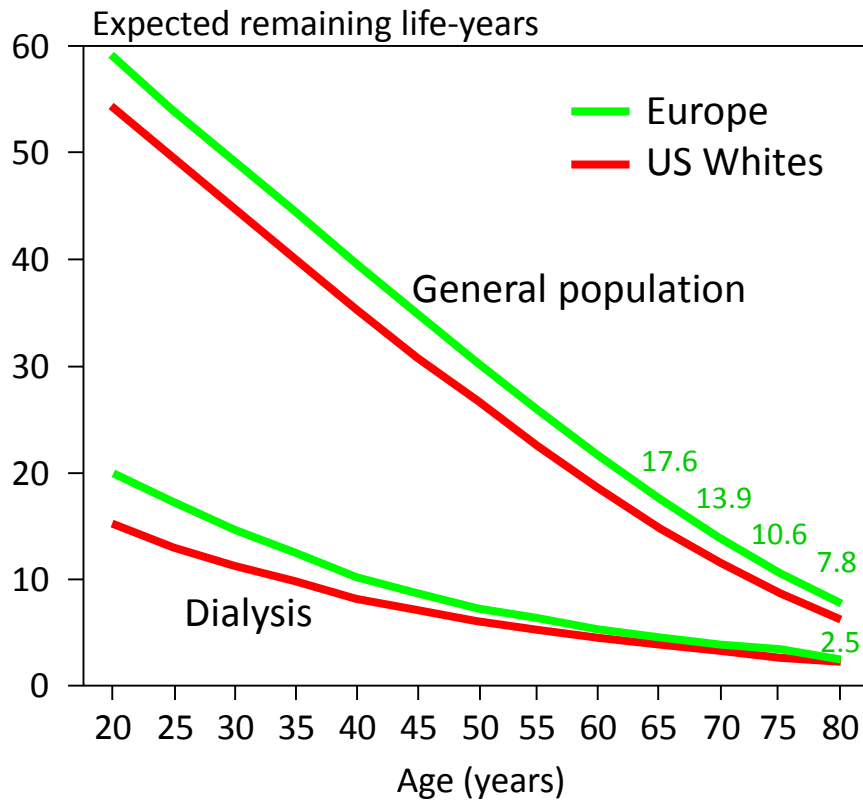
Stage	Description	GFR (ml/min/1.73 m <sup>2</sup> )	U.S Prevalence (1000s)	China Prevalence (1000s)
1	Kidney Damage with Normal or ↑ GFR	≥ 90	5,600	62,894
2	Kidney Damage with Mild ↓ GFR	60-89	5,700	37,516
3	Moderate ↓ GFR	30-59	7,400	17,655
4	Severe ↓ GFR	15-29	300	1103
5	Kidney Failure	< 15 or Dialysis	391	331

# Future definitions of CKD may also incorporate information on proteinuria

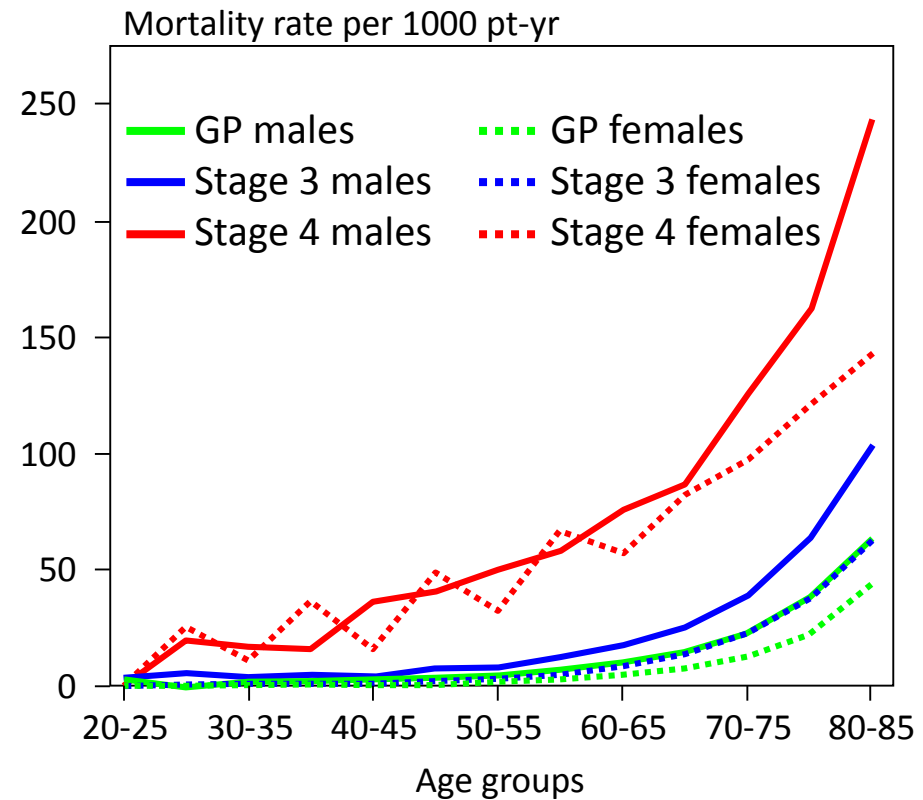
			Composite ranking by adjusted relative risk					Composite ranking by unadjusted absolute risk				
			Albuminuria stage					Description and range of proteinuria stages, ACR or dipstick				
			A1		A2	A3			Normal	Mild	Heavy	
			Optimal and high-normal		High	Very high and nephrotic						
GFR stage	Description	Range (ml/min/1.73m <sup>2</sup> )	<10 mg/g	10-29 mg/g	30-299 mg/g	300-1999 mg/g	≥2000 mg/g		Range (ml/min/1.73m <sup>2</sup> )	10-29 mg/g or negative	30-300 mg/g or trace to 1+	>300 mg/g or ≥ 2+
1	High and optimal	> 105							> 90			
		90-104										
2	Mild	75-89							60-89			
		60-74										
3a	Mild to moderate	45-59							45-59			
3b	Moderate to severe	30-44							30-44			
4	Severe	15-29							15-29			
5	Kidney failure	< 15							< 15			

# CKD and ESRD are associated with exceedingly high mortality

## ESRD vs general population

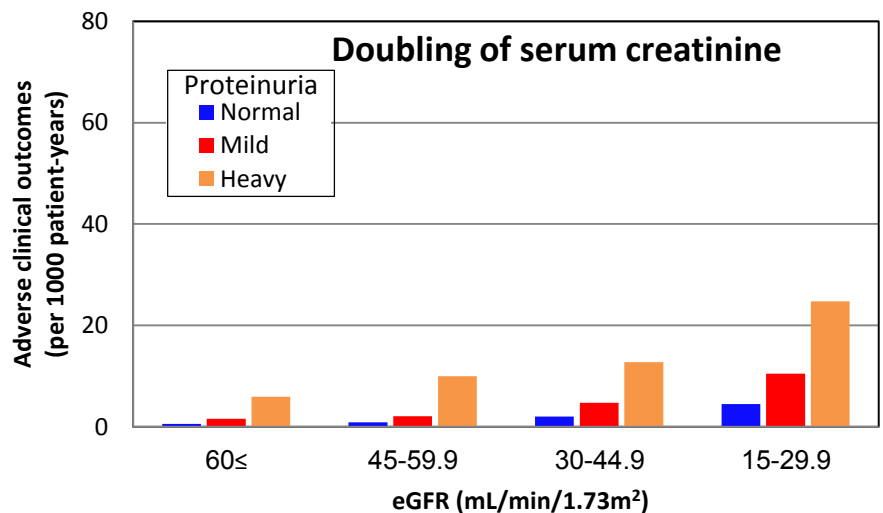
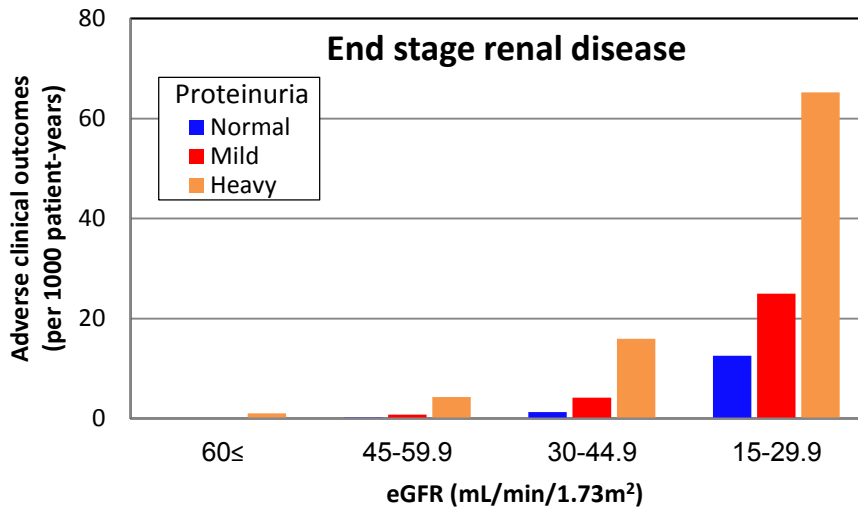
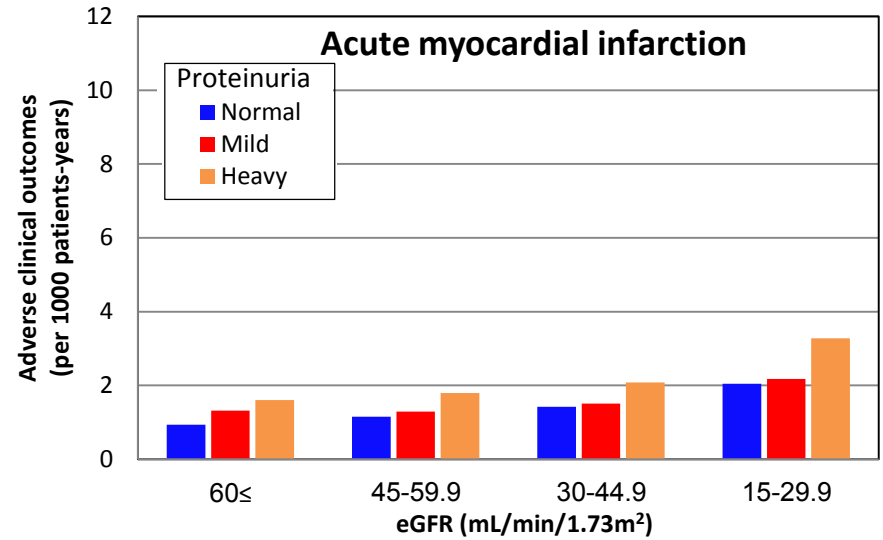
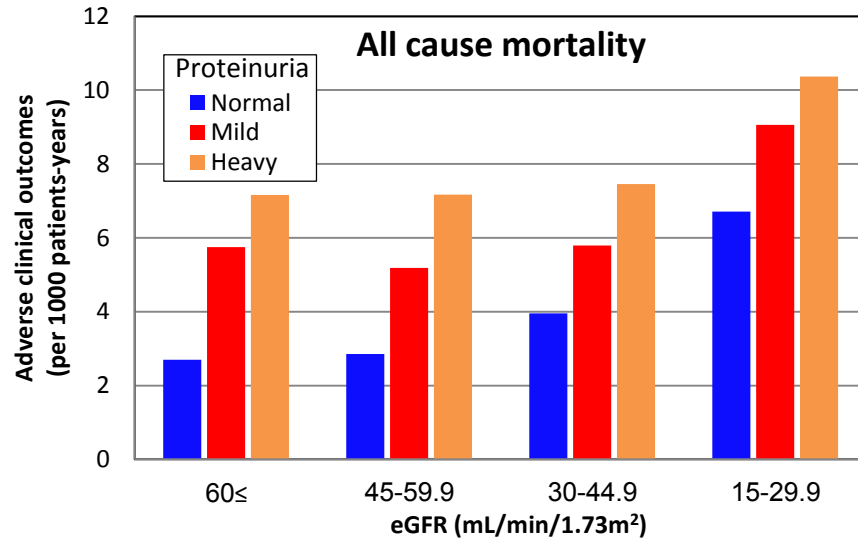


## Stage 3-4 CKD vs general population (GP)



# Proteinuria by dipstick further increases the risk of poor outcomes

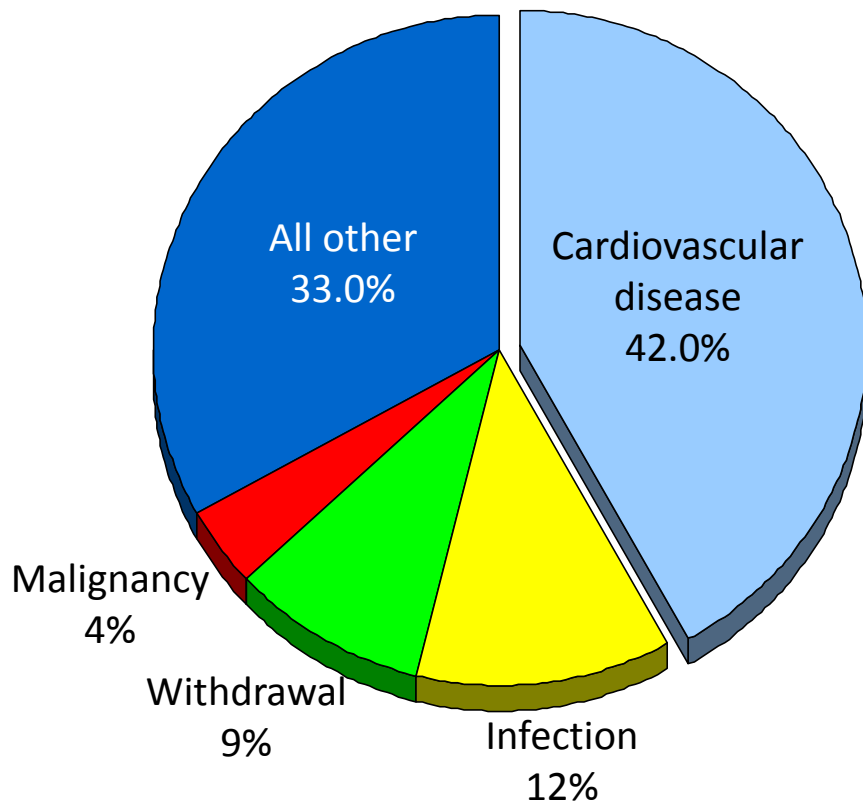
N=920,985



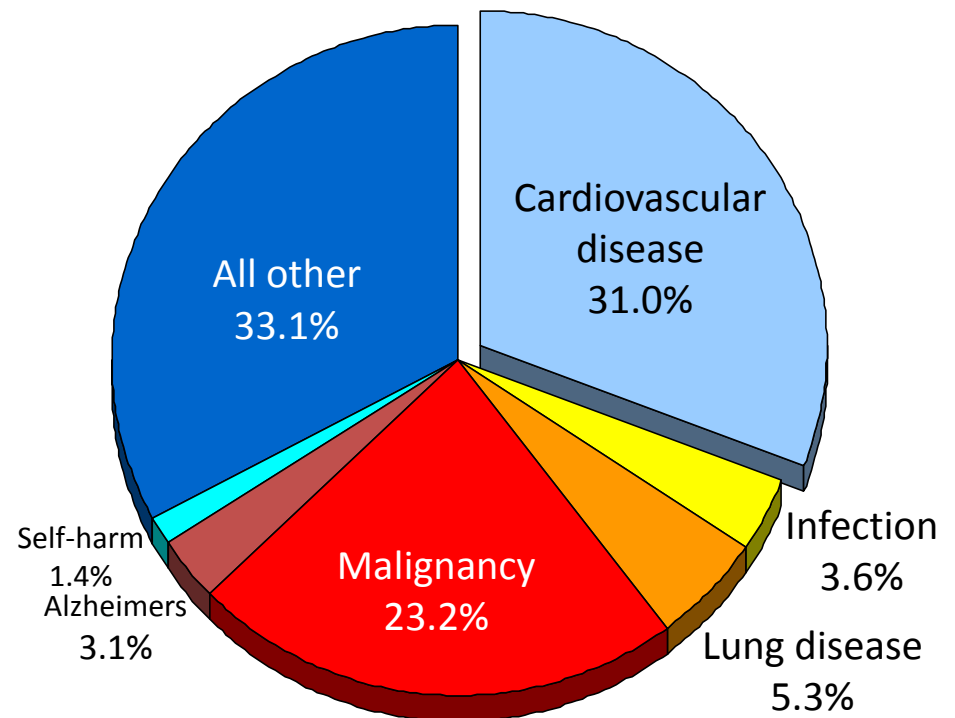
# What do people with CKD die from?

Cardiovascular disease is a major cause

**ESRD, USA**



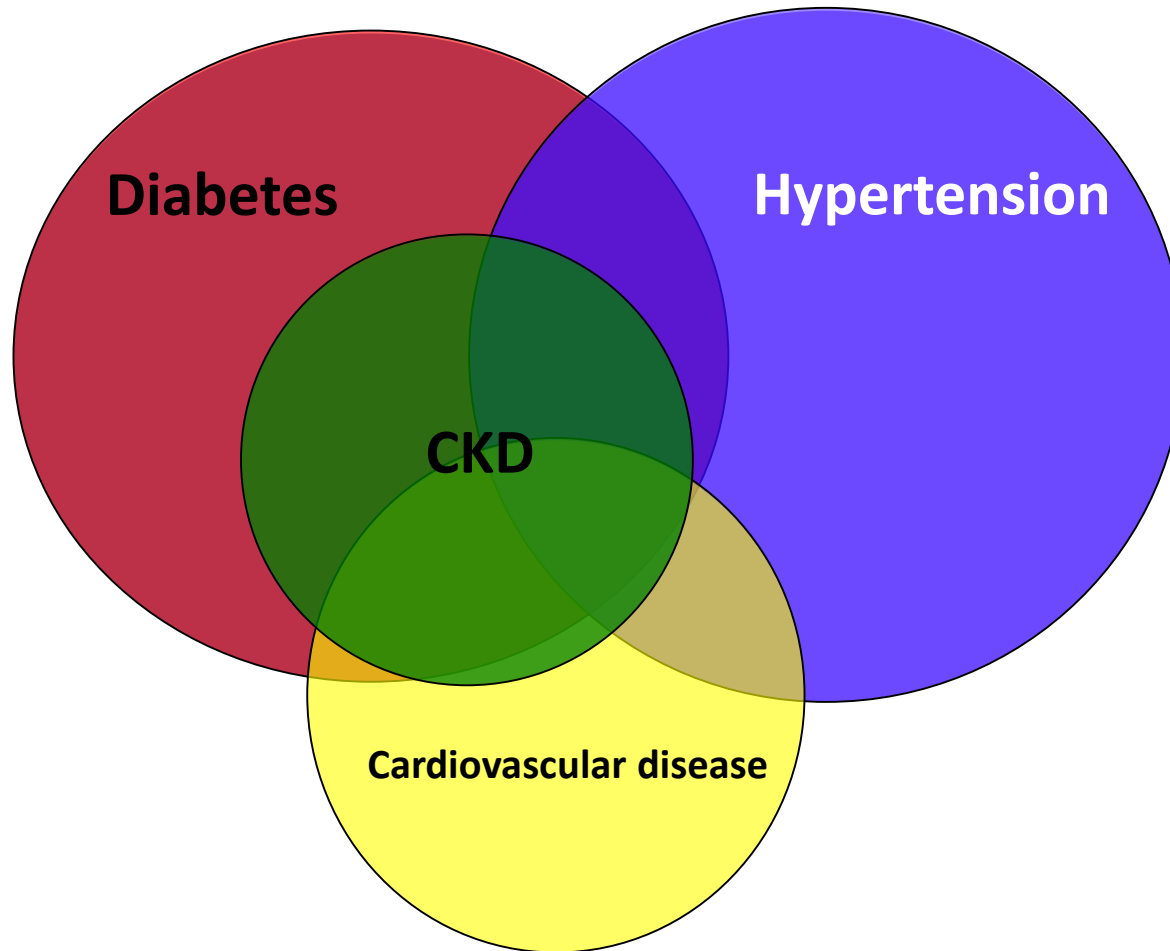
**General population, USA**



# Risk factors for CKD are similar to those for other NCDs

- Diabetes
- Hypertension
- Relative with CKD
- CV disease
- Age, minority status
- UTI, nephrolithiasis
- Acute renal failure
- UT obstruction
- Chronic infections
- Nephrotoxins
- Smoking, obesity, dyslipidemia

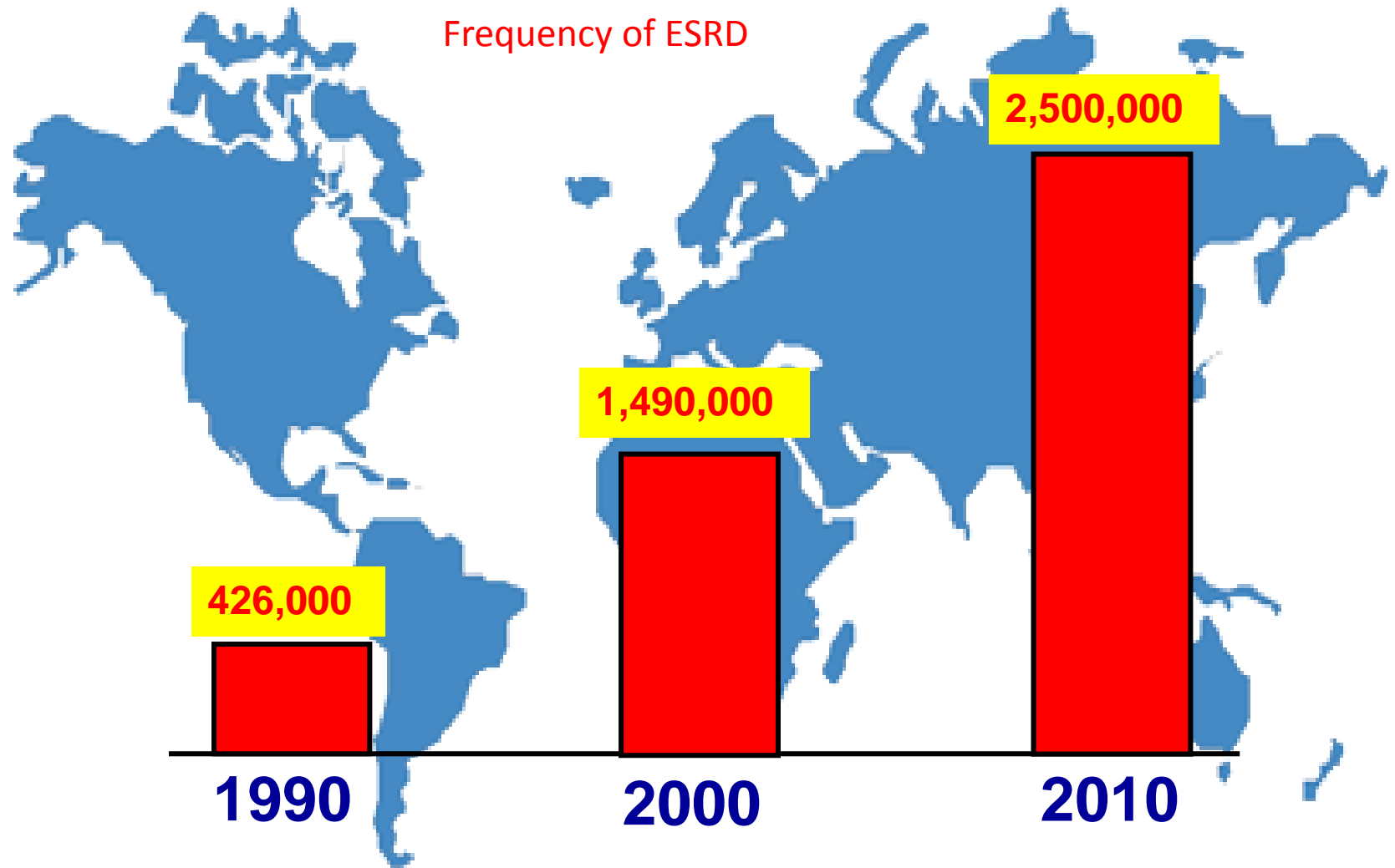
# CKD often coexists with other NCDs



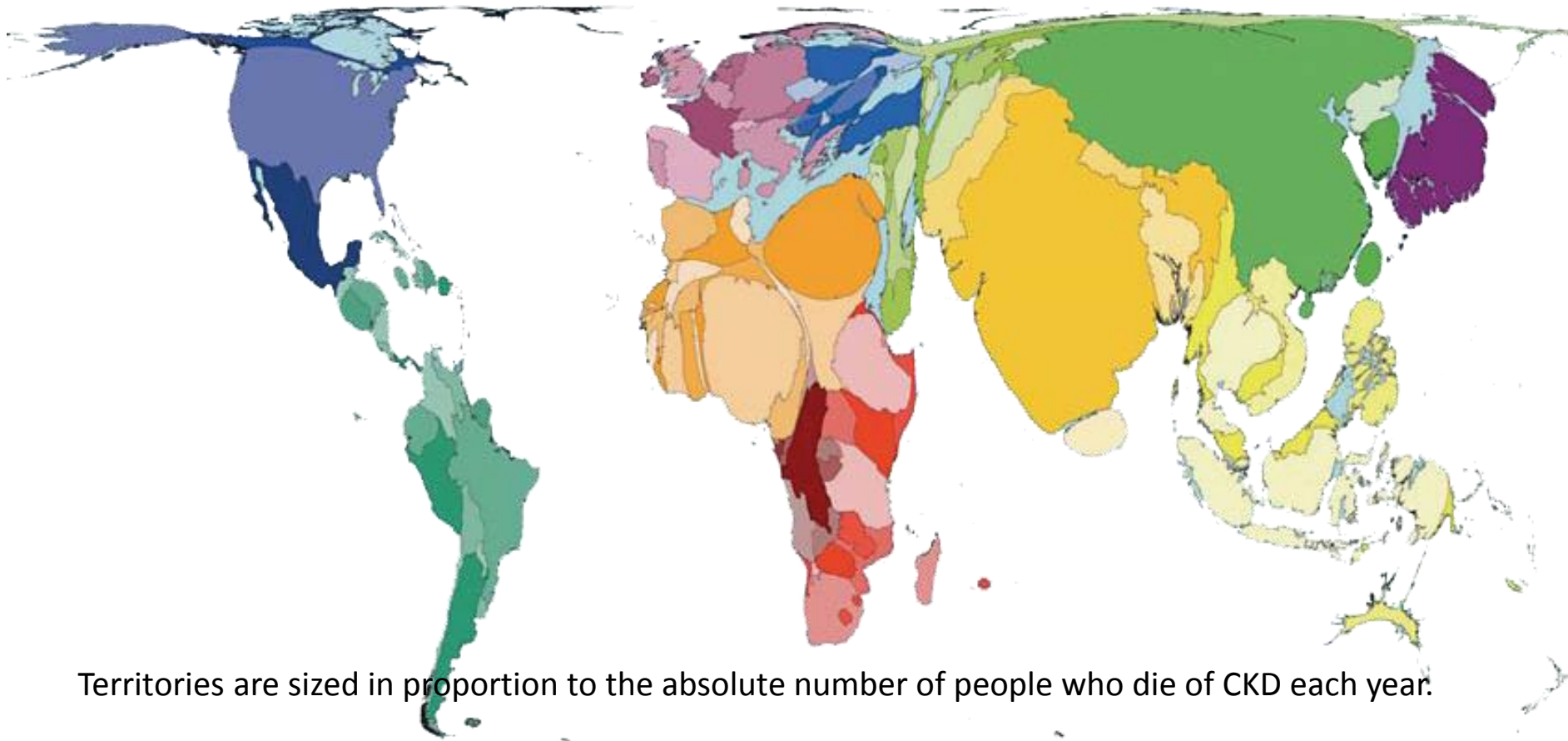
This suggests that addressing CKD will improve outcomes for other NCDs also



# ESRD is increasingly common worldwide



# The global burden of CKD is greatest in developing countries and in the poor

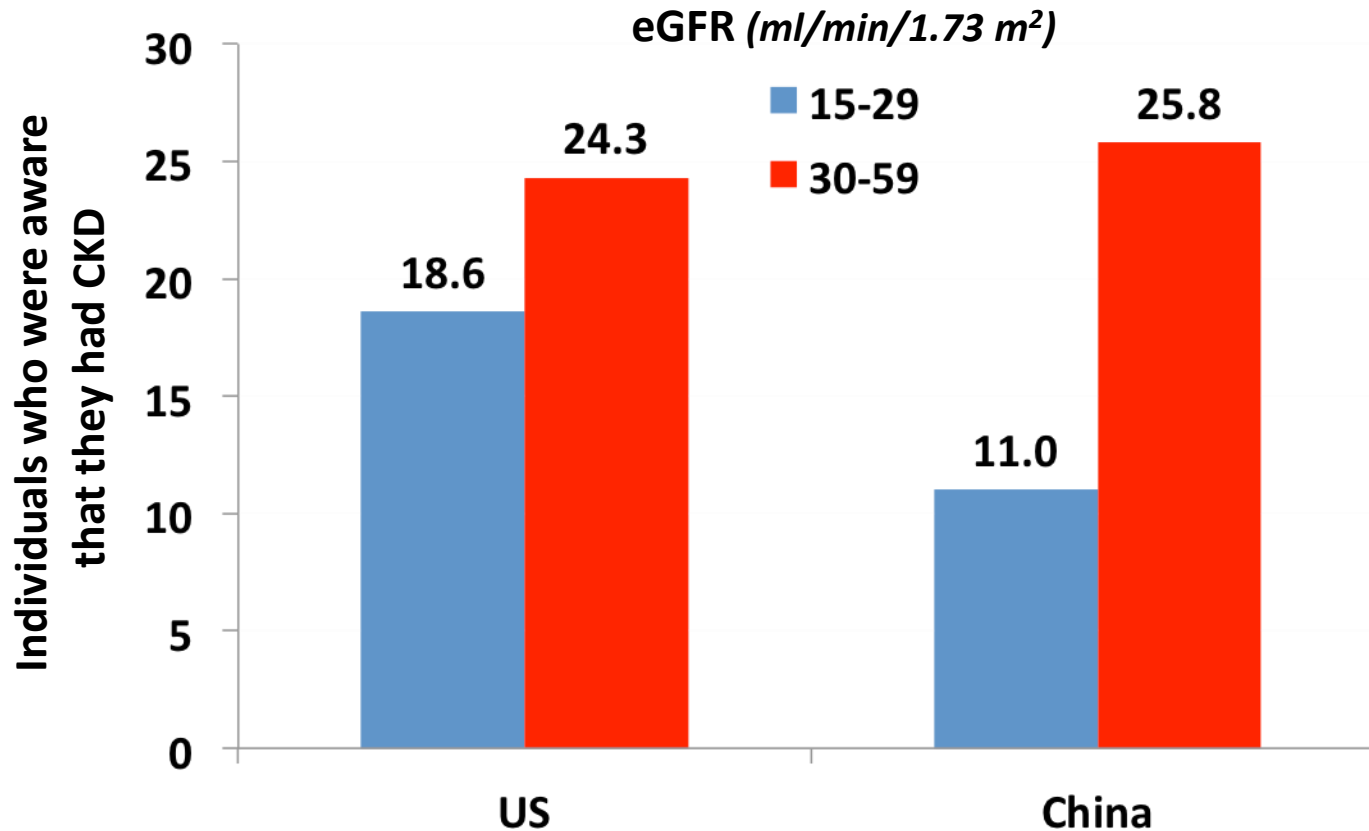


Territories are sized in proportion to the absolute number of people who die of CKD each year.

Even within countries, burden of CKD is concentrated among the poorest.

Renal replacement is available only to a wealthy few.

# Most people affected by CKD are unaware



- NHANES 1988-94 and 1999-2000 surveys in the US general population (19,589); Adults aged 20 years and older;
- China National Survey of Chronic Kidney Disease; Adults aged 18 years and older;
- Self-reported awareness of CKD
- Awareness of CKD is even lower in developing countries

# Detecting CKD is cheap and efficient

- Kidney function (eGFR) estimated using simple equations applied to results of blood test (serum creatinine; \$0.75)
- Albuminuria detected using semi-quantitative urine dipstick (\$0.02) or quantitative urine albumin:creatinine ratio (\$2.50)
- Consistent presence of low eGFR or abnormal albuminuria indicates presence of CKD

# Inexpensive treatments for CKD improve CV and renal outcomes

- Control of hypertension
- ACEI or ARB use
- Statin use
- Control of blood sugar (in diabetic patients)
- Smoking cessation
- Prevention of obesity

# Summary

- CKD is common, expensive, and associated with very poor outcomes
- CKD often coexists with other NCDs
- Many of the affected are unaware...but CKD is cheaply and easily detected using routine tests
- Effective and cost-effective treatments for CKD are available
- Detection and management of CKD should be integrated into national NCD programs