The ABCD Debate: Joint Diabetes/Nephrology Services Provide Few Additional Benefits to Patients With Diabetic Nephropathy

Dr Paul Stevens

Consultant Nephrologist

East Kent Hospitals NHS Trust

Joint Diabetes/Nephrology Services: Depends on How You Look at Things

- Good thing?
- Bad thing?

What This Talk Is About

- How big is the problem?
- Does it matter?
- Just what are we trying to achieve?
- Stated aims of joint clinics
- What is the evidence?
- What is the alternative?

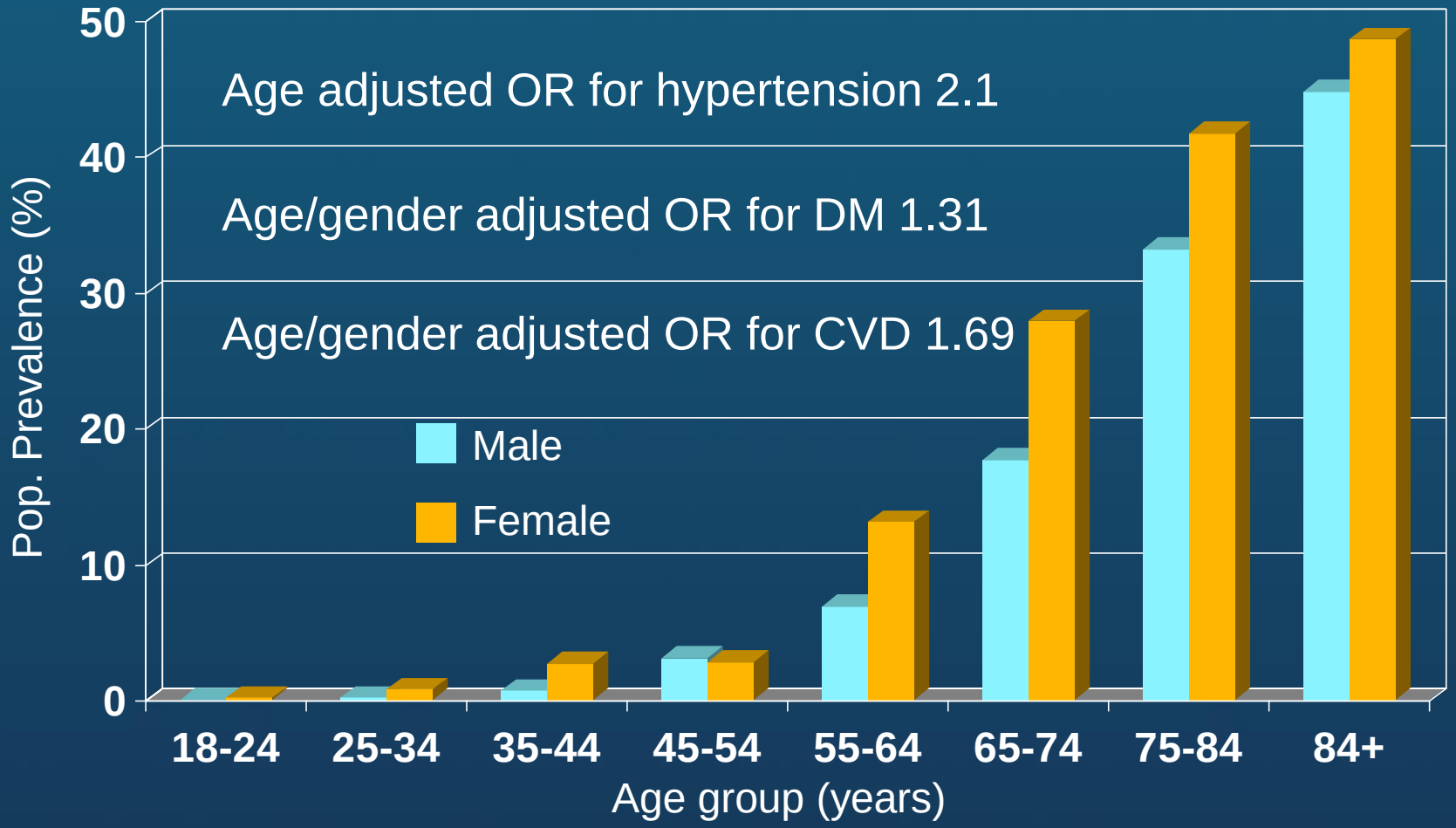
UK Demographics

- 60.2 million people
- Mean age 38.8 years
- 4% Asian
- 2% African -caribbean
- DM 3.7%
- Hypertension 12.5%
- IHD 3.5%
- CVA/TIA 1.6%
- Heart failure 0.8%

ONS & QMAS data 2006/7

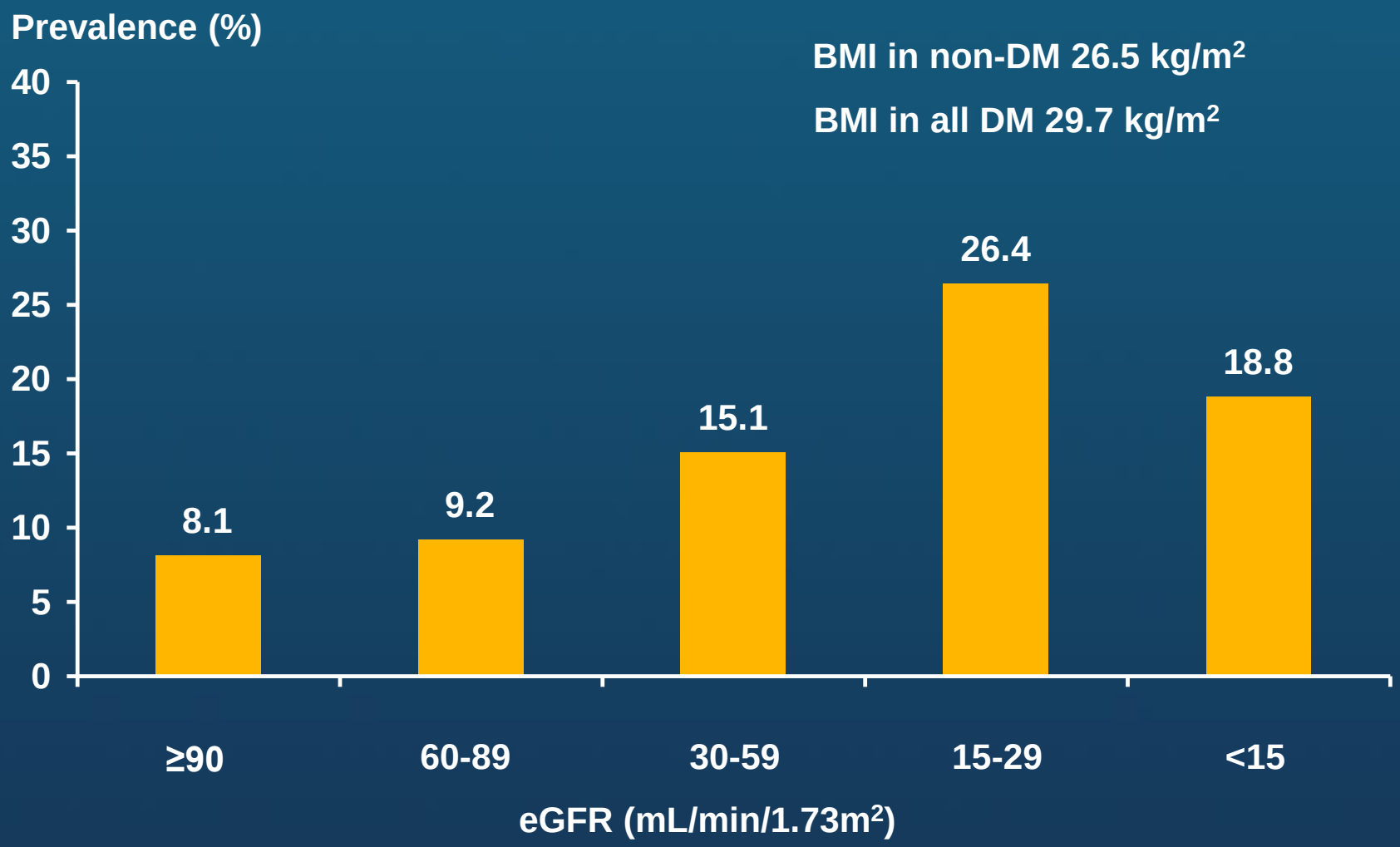
NEOERICA: Adult CKD Prevalence - UK

Age standardised prevalence of stage 3-5 CKD ~ 8.5%



Stevens et al. Kidney Int 2007;72:92-99

NEOERICA: Diabetes Prevalence by eGFR



New et al. Diabet. Med. 2007;24:364–369

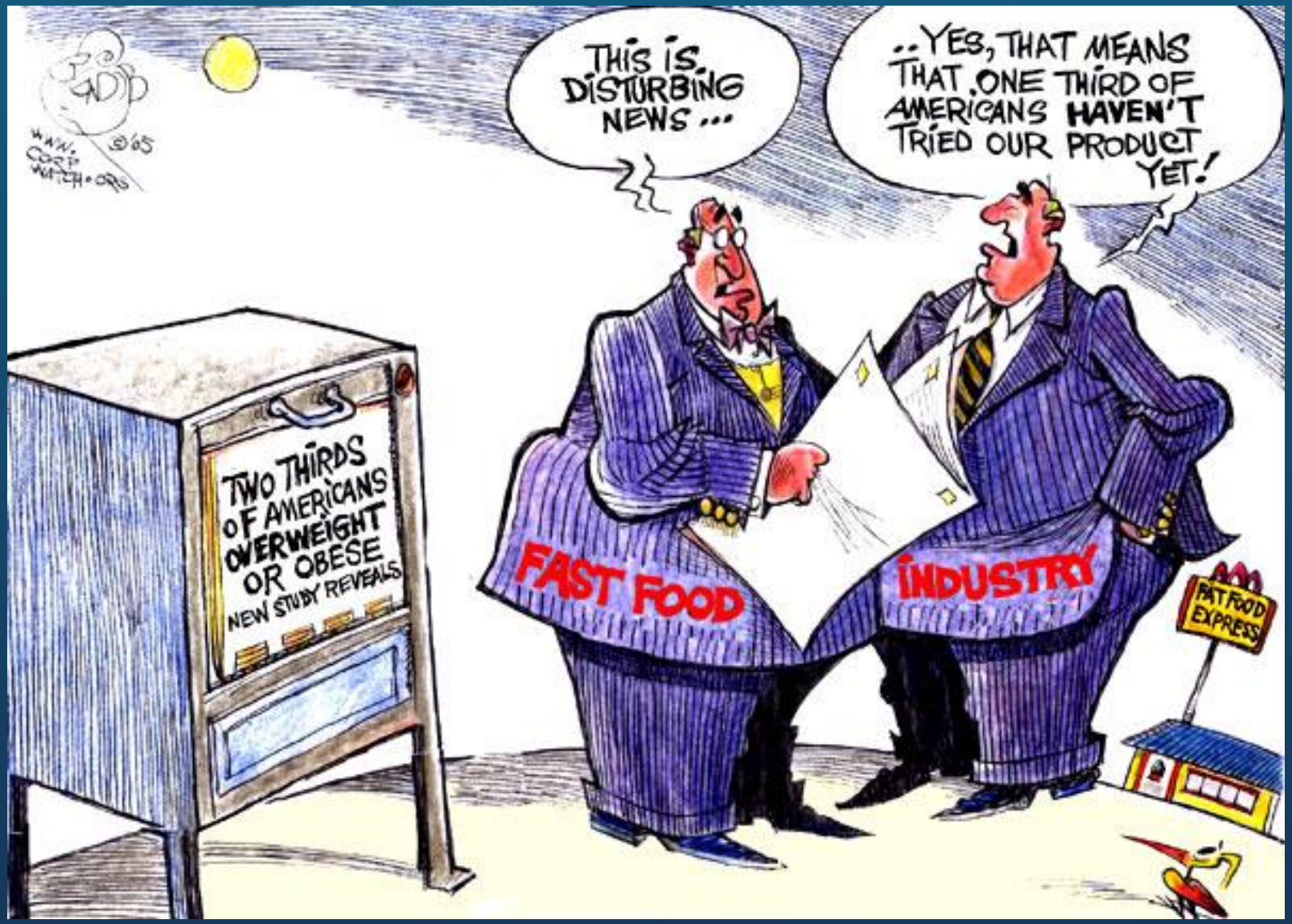
Diseases and Epidemics

NHANES CKD Prevalence

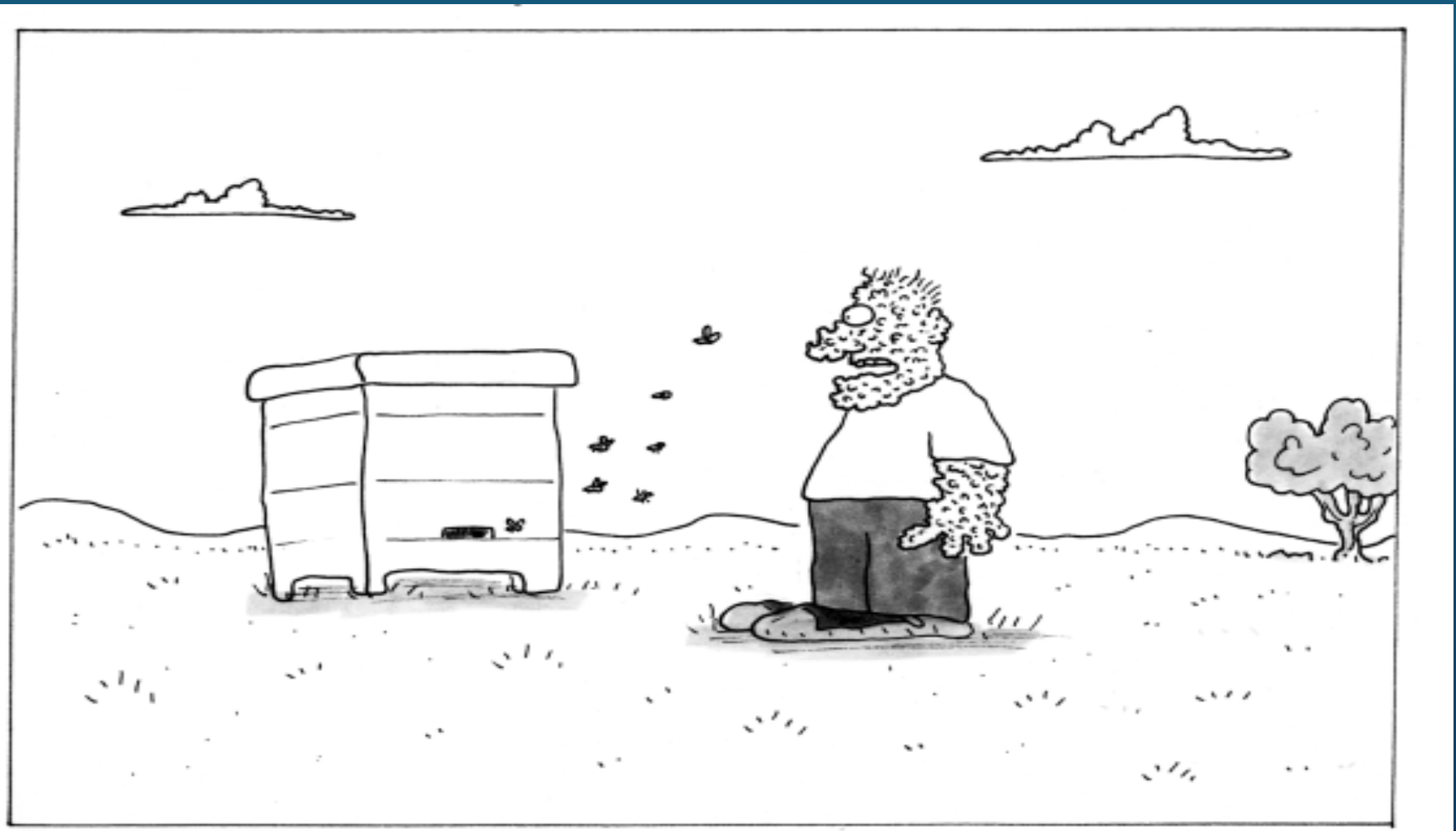
CKD Stage	NHANES 1988-1994	NHANES 1999-2004
1	1.71%	1.78%
2	2.70%	3.24%
3	5.42%	7.69%
4	0.21%	0.35%
5	NA	NA
Total	10.03%	13.07%

Coresh et al. JAMA 2007;298(17):2038-2047

Diabetes: A Worldwide Epidemic



Does it Matter?



"You had your fun, didn't you? Well, I've got news for you. You're all going to die now. So there."

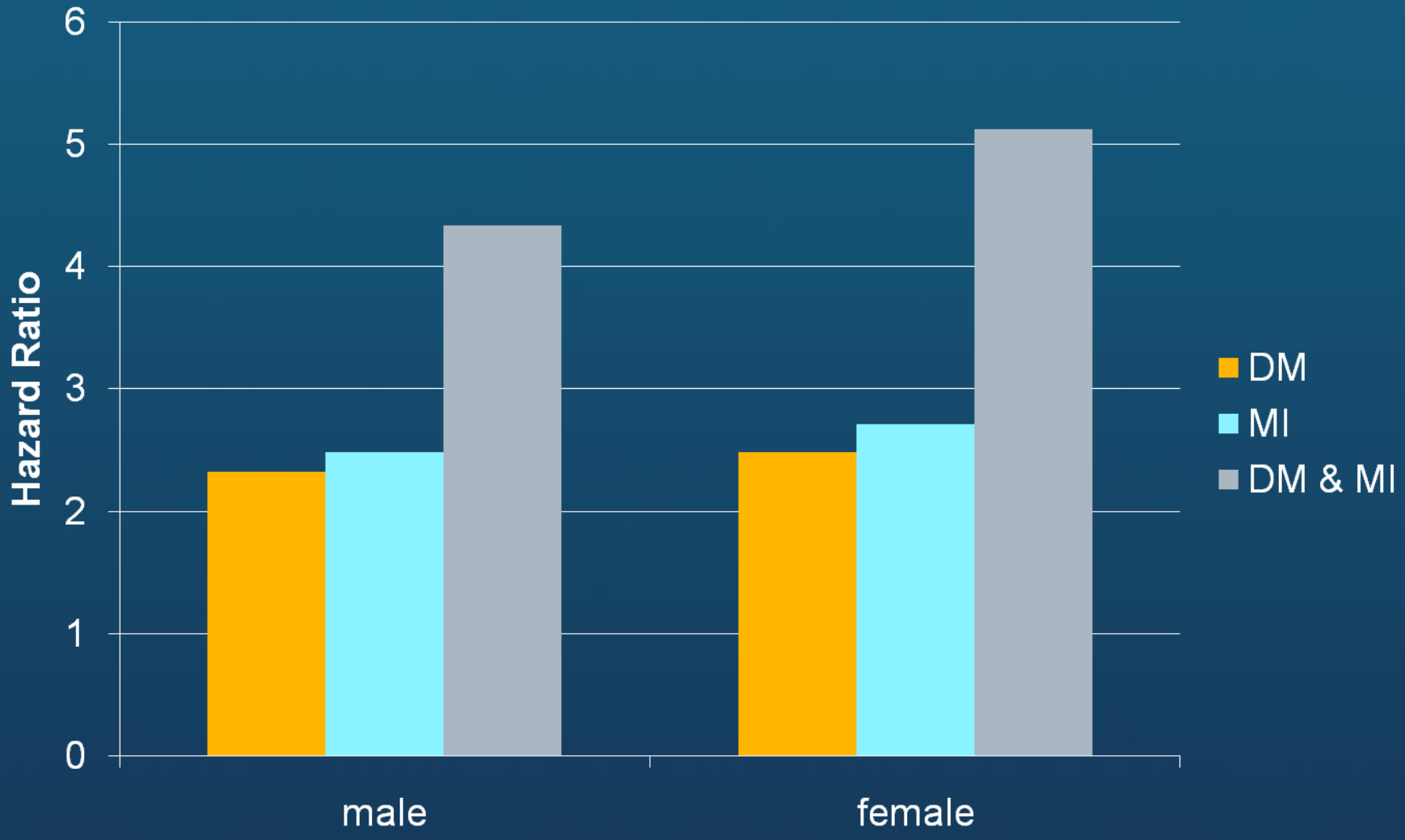
Circulation
JOURNAL OF THE AMERICAN HEART ASSOCIATION

Diabetes Patients Requiring Glucose-Lowering Therapy and Nondiabetics With a Prior Myocardial Infarction Carry the Same Cardiovascular Risk. A Population Study of 3.3 Million People

Tina Ken Schramm, Gunnar H. Gislason, Lars Køber, Søren Rasmussen, Jeppe N. Rasmussen, Steen Z. Abildstrøm, Morten Lock Hansen, Fredrik Folke, Pernille Buch, Mette Madsen, Allan Vaag and Christian Torp-Pedersen

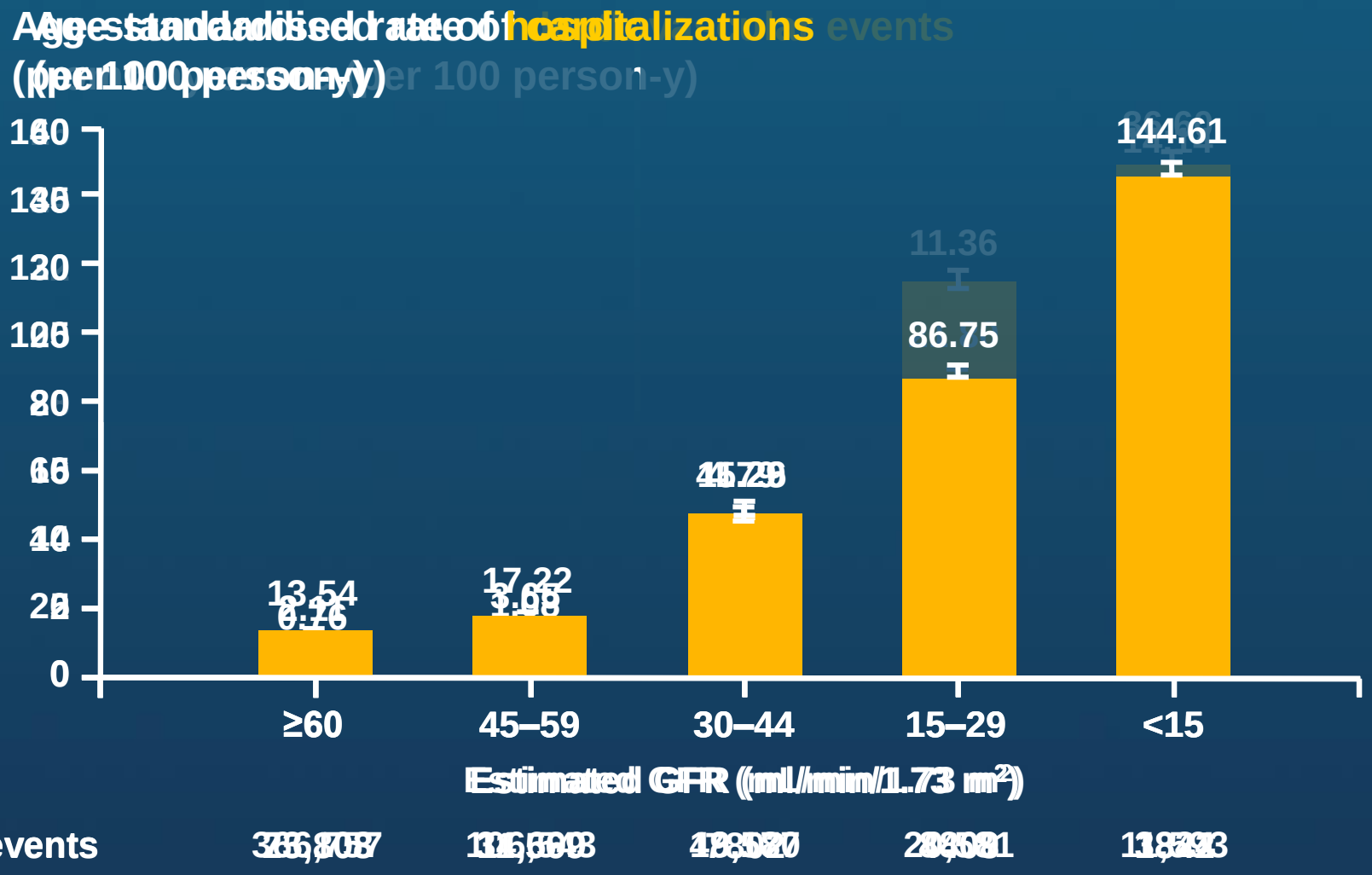
Circulation published online Mar 31, 2008;
DOI: 10.1161/CIRCULATIONAHA.107.720847
Circulation is published by the American Heart Association. 7272 Greenville Avenue, Dallas, TX 72514
 Print ISSN: 0009-7322. Online ISSN: 1524-4539

Risk of MI, Stroke or Cardiovascular Death



Schramm et al. Circulation 2008, published online

CKD is a Major Health Burden



Go et al, N Engl J Med 2004;351:1296-1305

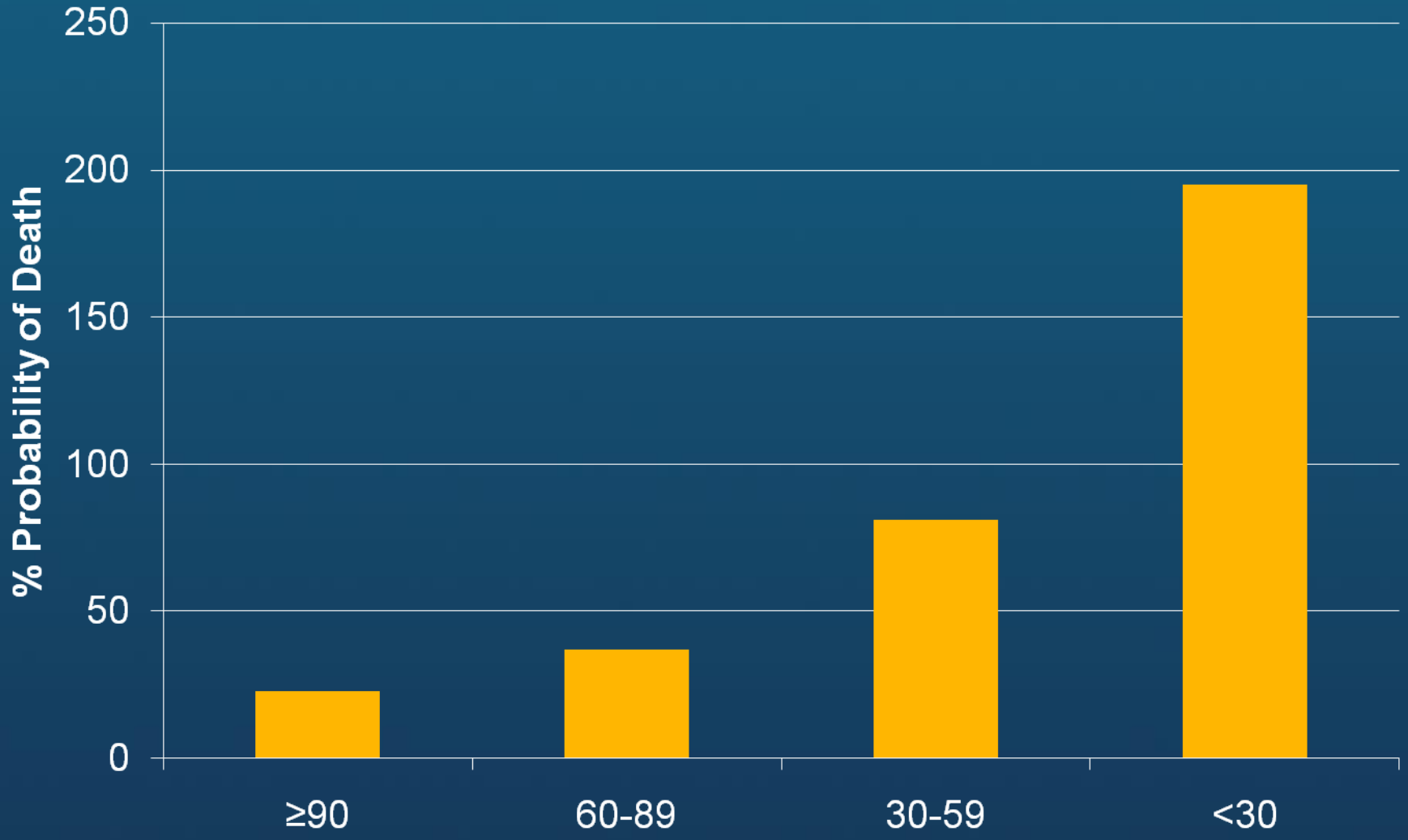
South Tees Diabetes Mortality Study

- N = 3288, mean age 58.4 yrs, 43.9% female
- Mean DM duration at baseline 8.7 yrs
- Mean GFR at baseline 72.8 ml/min/1.73m^2
- Median follow up 10.5 yrs (28,342 patient yrs)

- A decline in GFR of 10 ml/min conferred a 31% increase in risk of death
- Hypertension increased the risk of death by a third

Nag et al. Diabet Med 2007;24:10-17

South Tees Diabetes Mortality Study



Nag et al. Diabet Med 2007;24:10-17

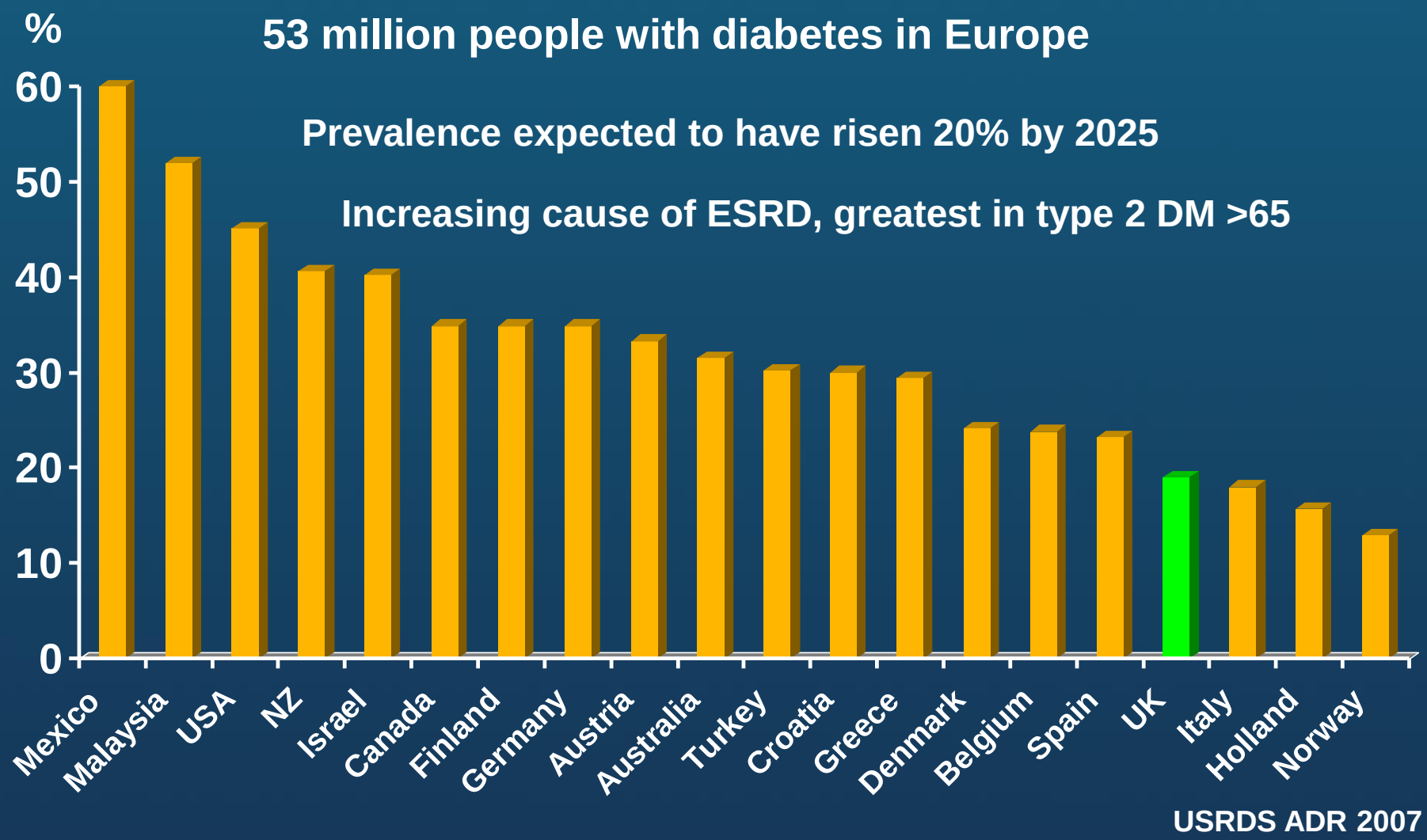
Diabetes Mellitus and CKD

- **Retrospective cohort study**
- **Clinic users with DM and stage 3 & 4 CKD**
- **Baseline period 12 mths and median FU 19.3 mths**

GFR (ml/min/1.73m2)	45-59	30-44	15-29
Number	27,312	8,760	2,959
Dialysis-free death	**14.1%**	**20.7%**	**26.7%**
Dialysis	**0.7%**	**2.9%**	**13.1%**

Tseng et al Arch Intern Med 2008;168:55-62

Incident ESRD With Diabetes 2005



USRDS ADR 2007

What Determines Outcomes?

- Non-modifiable
  - Older age
  - Male gender
  - CKD diagnosis
  - Menopause
  - Family history
- Traditional
  - Older age
  - Male gender
  - ↑ BP and LVH
  - ↑ LDL-C ↓ HDL-C
  - Diabetes control
  - Smoking
  - Inactivity
  - Menopause
  - CKD diagnosis
  - Family history
- CKD related
  - Albuminuria / proteinuria
  - ↓ GFR
  - RAS activity
  - ECFV overload
  - Ca/PO4 abnormalities
  - Anaemia
  - MIA syndrome/ ↑CRP
  - Oxidative stress
  - ↑ homocysteine
  - Lipoprotein a
  - Thrombogenic factors
  - Kidney bone disease
- Modifiable
  - Blood pressure
  - Diabetes control
  - Smoking
  - Inactivity
  - Protein leak
  - Anaemia
  - Cholesterol
  - Loss of GFR
  - Fluid overload

CKD & Diabetes Management Programme

- Target BP range
  - 120–130/70–80 mmHg (NICE CKD draft)
- Diabetes control
  - Follow Jiten's instructions
- Directed therapy to reduce albuminuria
- Treatment of hyperlipidaemia
- Consider anti-platelet therapy
- Smoking, exercise and dietary advice
- Treatment of anaemia
- Treatment of acidosis and bone disease

NEOERICA

Diabetes, treatment and renal function

	eGFR <60 mL/min/1.73m^2		eGFR ≥60 mL/min/1.73m^2	
	n	%	n	%
ACEI / ARB	755	66	1601	51
anti-platelet agents	460	40	913	29
lipid lowering therapy	652	57	1786	57
Hb A1C >7.5%	429	38	1226	39
Treated hypertension	932	82	1955	62
BP <130/80 mmHg in treated HT	198	21	353	18

New et al. Diabet. Med. 2007;24:364–369

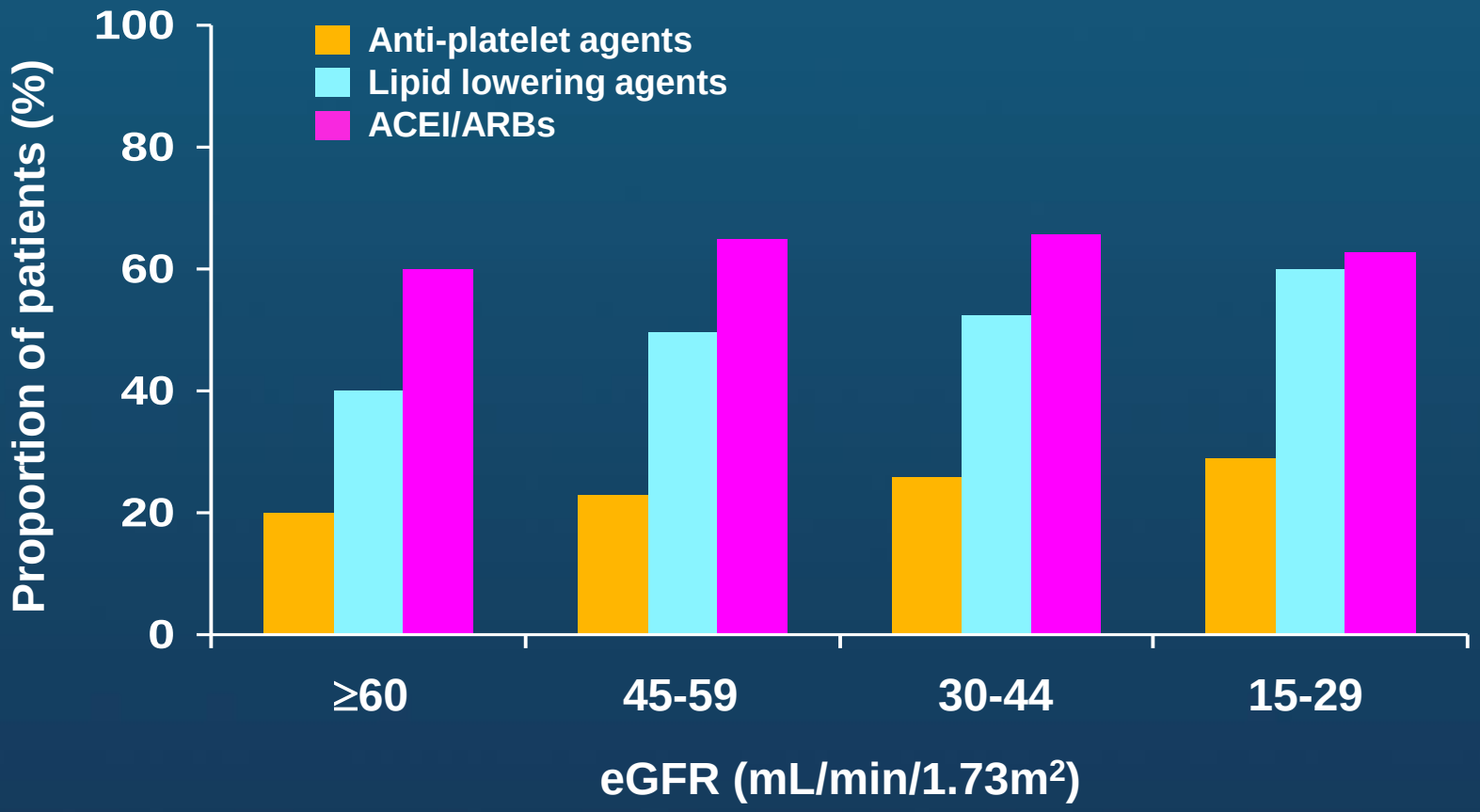
IRIDIEM: Achievement of Targets

	Median (IQR)	Guidelines target	% meeting target*
$HbA1_c$, %	7.4 (6.8, 8.4)	<7	30.9
SBP, mmHg	140 (130, 155)	<130	30.9
DBP, mmHg	80 (70, 85)	<80	69.4
Total cholesterol, mg/dL	221 (187, 680)	<135	10.6
LDL-C, mg/dL	108 (84, 137)	<100	42.5
HDL-C, mg/dL	44 (37, 53)	>40	61.7
Triglycerides, mg/dL	159 (108, 227)	<150	45.4

*Proportion of patients calculated from total number of patients with valid measurements
DBP = Diastolic blood pressure; Hb = Haemoglobin; HDL-C = High density lipoprotein cholesterol; LDL-C = Low density lipoprotein cholesterol; SBP = Systolic blood pressure

Stevens et al. World Congress of Nephrology 2007

IRIDIEM: Medicines Management



Stevens et al. World Congress of Nephrology 2007

Requirements for Optimal Care of Individuals

- Scientific understanding of disease(s)
- Ability to identify the disease
- Ability to identify patients at risk
- Knowledge of best therapies and strategies
- Ability to deliver effective therapies in a timely manner
- Supportive health environment

ABCD-DUK Survey of Specialist Diabetes Services 2006 -Results

- 92% of consultants are on new NHS contract – 11.5 PAs (3 Acute-Gen Med , 3 DM, 1 Endo) – 76% do NO community DM – 21% no Endo
- Examples of Diabetes Sub-specialist clinics: Foot 38% ; Pump 26% ; Renal 22%
- Examples of Endo Sub-specialist clinics : Bone 16% ; Obesity 24% ; Reproductive 14% ; Paediatric- adolescent 12%

Joint Diabetes/Nephrology Services

- Implement practice advocated by clinical trials
- Provide early intervention to delay progression of renal disease effectively
- Identify non-diabetic renal disease
- Improve cardiovascular risk factor profile
- Treat renal and diabetic complications
- Prepare patients for dialysis
- Improve communication between diabetologists and nephrologists

Liew et al. Q J Med 1997;90:353-358
Joss et al. Q J Med 2002;95:41-49

Testing the Water

- Liew et al. Q J Med 1997;90:353-358
- Joss et al. Q J Med 2002;95:41-49
- Jayapaul et al. Q J Med 2006;99:153-160
- Henderson et al. Scottish Renal Association 2006 (abstract)

The Joint Service Set Up

- Referrals from primary care and secondary care
- Clinic staff
  - Nephrologist and Diabetologist
  - Specialist diabetes nurse
  - Renal Dietitian
  - Podiatrist
- Up to 4 visits per year

The Joint Service: Key Results

- Joss et al, 2002
  - Improved blood pressure control, reduced albuminuria, reduced HbA1C, reduced serum cholesterol
  - Reduction in median rate of decline in renal function from 0.52 ml/min/month to 0.27 ml/min/month
  - Extension in renal survival of c. 8 years
- Jayapaul et al, 2006
  - Improved blood pressure control, reduced cholesterol
  - No improvement in HbA1C or cholesterol
  - Reduction in rate of decline in renal function from 1.09 ml/min/month to 0.39 ml/min/month
  - Extension in renal survival of c. 7 years

The Joint Service:Cardiovascular Risk & Medicines Management

	Joss et al	Jayapaul et al
CVD at referral	68%	56%
ACEI s	51% at referral 81% after 3 years	54% at referral 64% after 3 years
Statins	15% at referral 50% after 3 years	81% at referral
Anti-platelet therapy	49% at referral	27% at referral
Smoking	No data	19% current No impact on smoking

Where Do We Go From Here?

Q J Med 2004; **97**:219–227
doi:10.1093/qjmed/hch039

Intensified treatment of patients with type 2 diabetes mellitus and overt nephropathy

N. JOSS, C. FERGUSON, C. BROWN, C.J. DEIGHAN, K.R. PATERSON[1] and J.M. BOULTON-JONES

From the Renal Unit and [1]Diabetes Centre, Glasgow Royal Infirmary, Glasgow, UK

- **90 patients with Type 2 DM and nephropathy**
- **Randomised to intensive and control groups**
- **No difference in groups at baseline (duration of DM, BP, renal function, ACR, salt excretion, lipids, BMI and prevalence of CVD)**
- **Treatment targets the same in each group but more visits in the intensive group (19 cf 8) over 2 years**

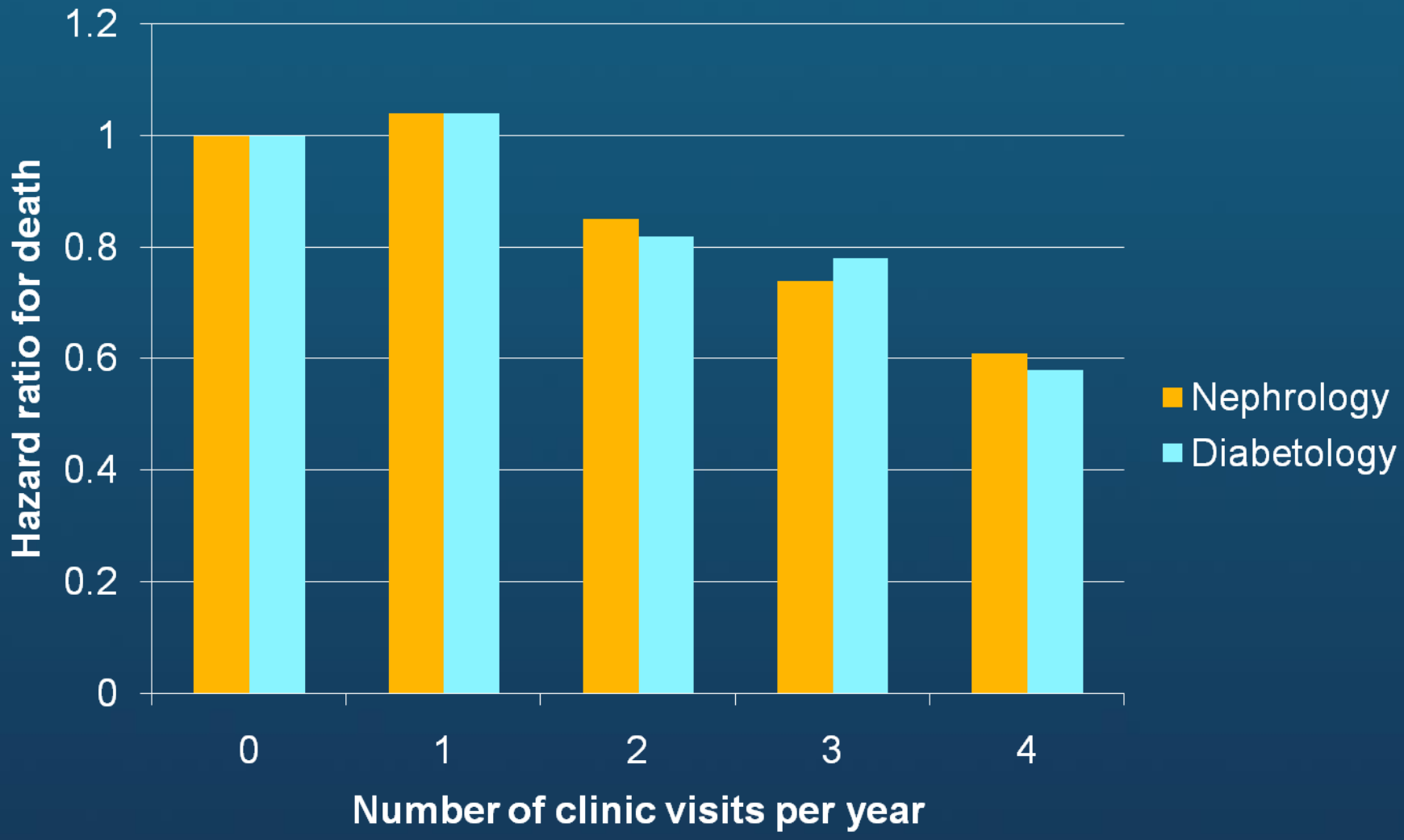
Intensive Treatment: Key Outcomes

	Intensive group	Control group
Loss of renal function (ml/min/month)	0.44 at baseline 0.14 after 2 years	0.49 at baseline 0.53 after 2 years
Hospitalisation (bed days)	496	842
Cardiovascular events	13	21

- The reduction in loss of renal function in the intensive group was equivalent to a delay in starting dialysis of 20 years
- Targets were more likely to be met in the intensive group
- Use of aspirin and lipid lowering agents were significantly higher in the intensive group

Joss et al. Q J Med 2004;97:219-227

Number of Clinic Visits and Mortality



Tseng et al Arch Intern Med 2008;168:55-62

What are the alternatives?

Urban Subspecialty CKD Clinic

- Patients referred from Nephrologists to a community nurse-practitioner clinic
- BP management by algorithm developed to reduce the risk of complications related to kidney disease
- 487 patients seen at the clinic during 2005 to 2007
- Mean age of 70.9, M=F, 83.8% African-American
- 85.4% prevalence of stage 3 to 4 kidney disease, 56.6% with diabetes
- Proportion of patients with controlled BP (<130/80) increased by 16% from baseline despite patients already being on a mean of 2.8 anti-hypertensives

Ogletree et al. NKF Spring Meeting, 2008

Towards Integrated Strategies

1. Public awareness
2. Professional & patient education
3. Policy influence
4. Care delivery systems
5. Research
   - basic, clinical and outcome-based

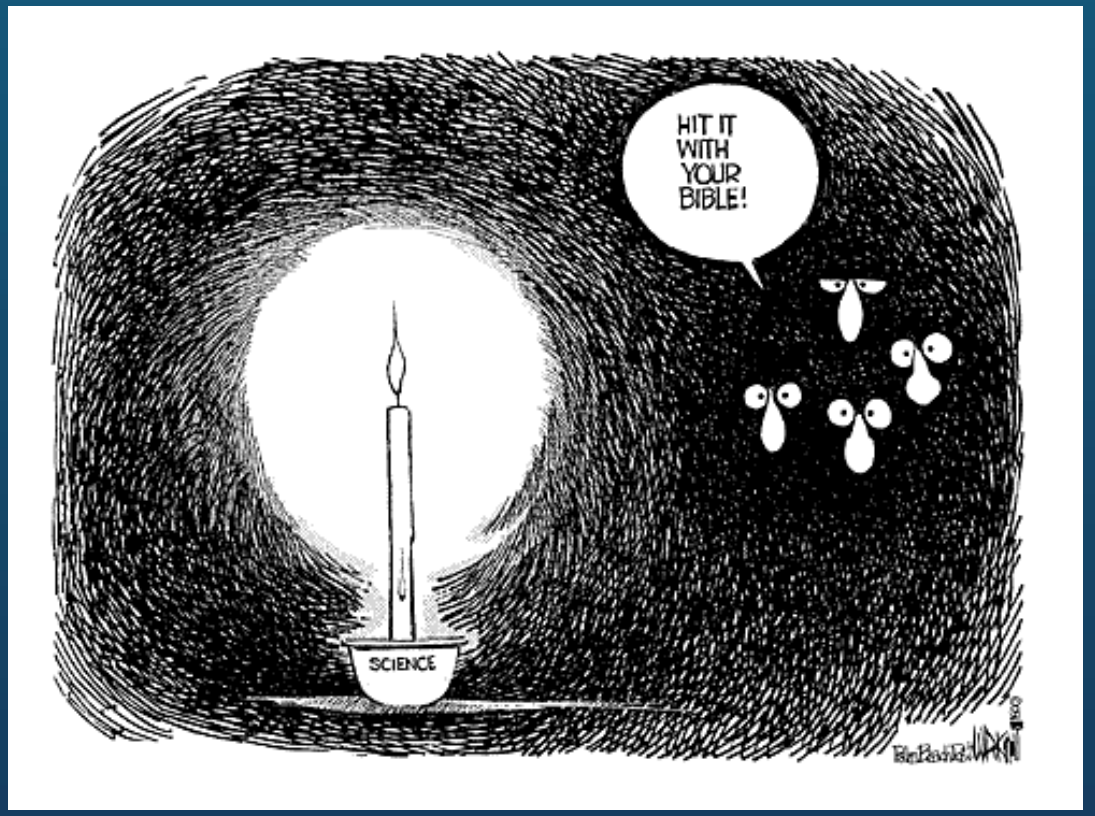
With kind permission Adeera Levin

Strategies Already Out There

- Guidelines
- Implementation of eGFR reporting
- Quality and Outcomes Framework
- National Diabetes and Kidney Support Team

Guidelines

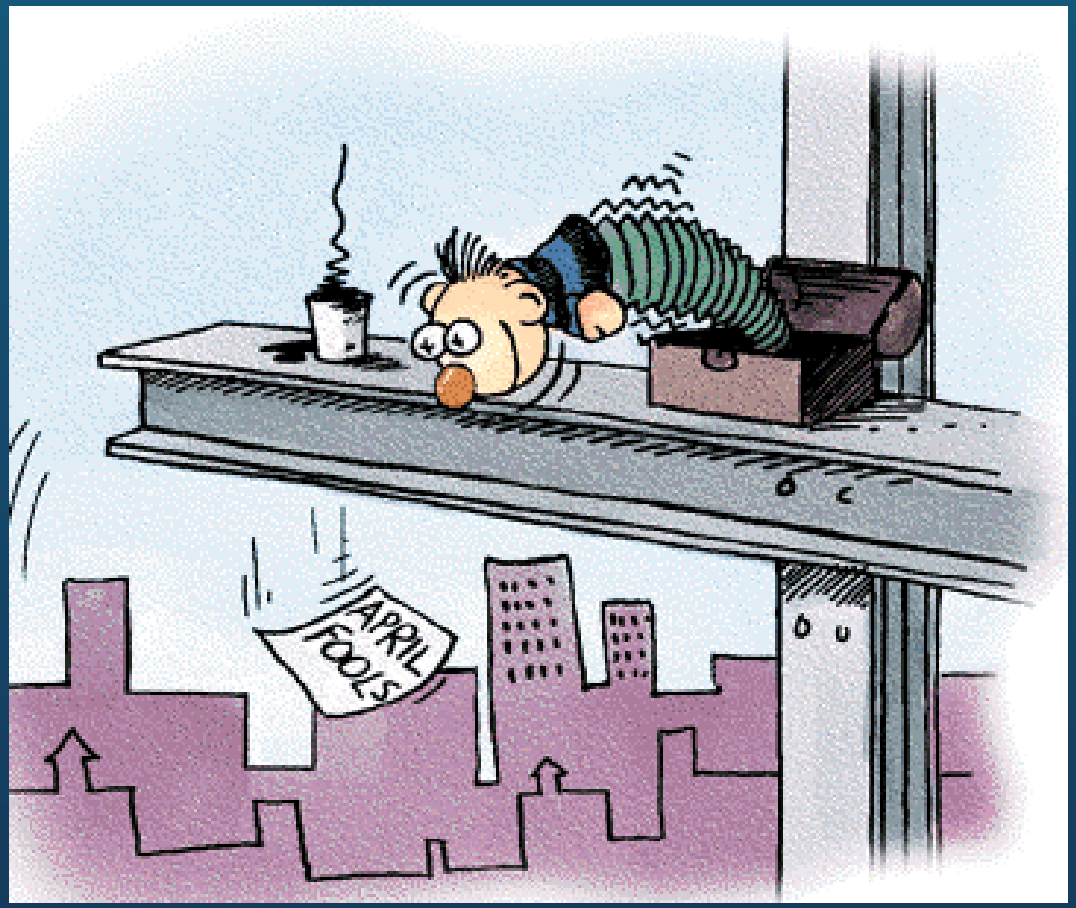
- UK CKD
  - 116 pages
  - 519 references
- NICE Diabetes
  - 433 pages
  - 388 references
- NICE CKD
  - 296 pages
  - 365 references



April Fools Day 2006

eGFR reporting

QOF



Quality and Outcomes Framework

- **The QOF is intended to measure, encourage and support clinical care and a patient experience which is constantly improving**

National Diabetes and Kidney Support Team

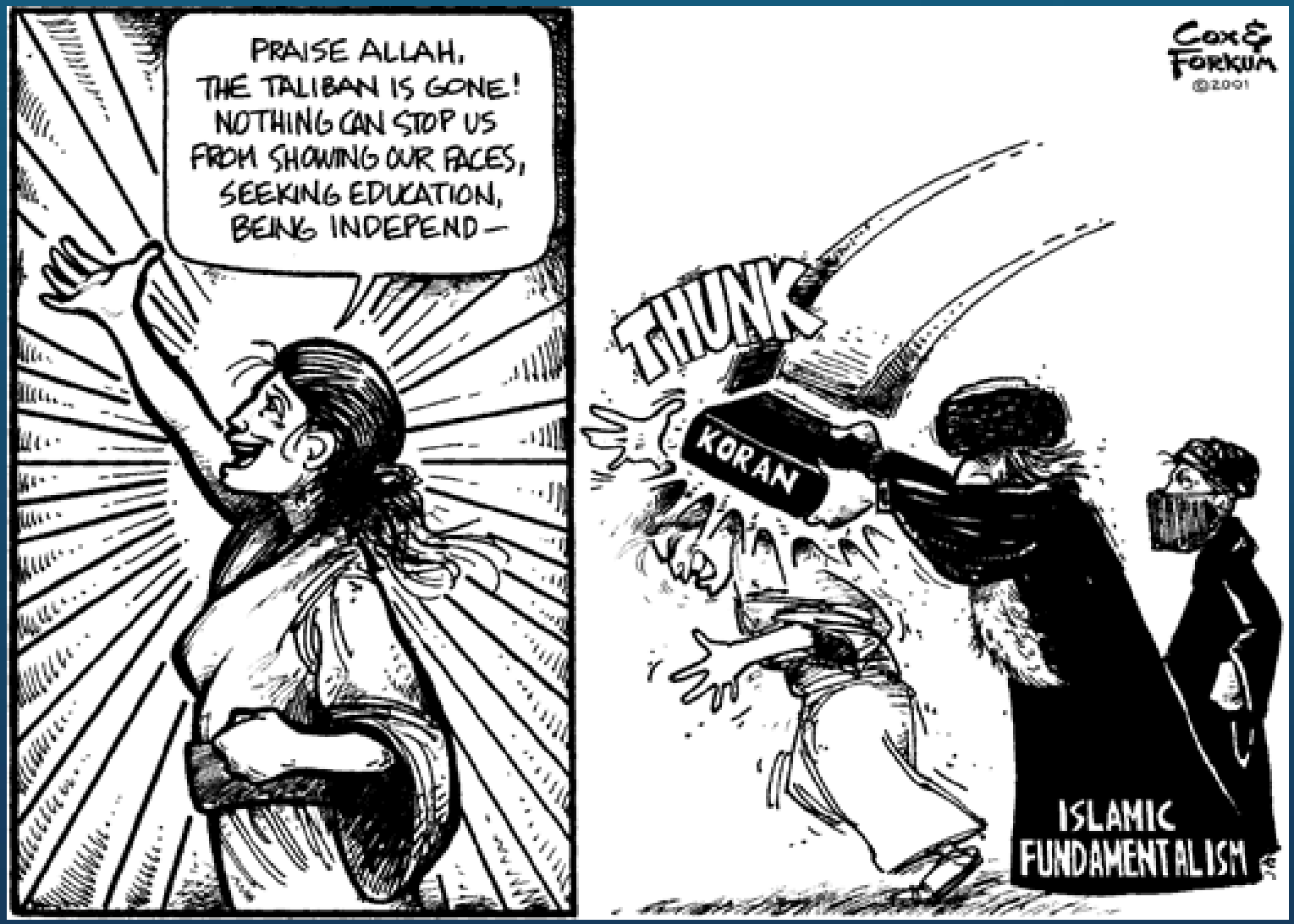
facilitate
l of good practice
oundaries
CTs and local
ully implement the

cy and priorities,
idelines

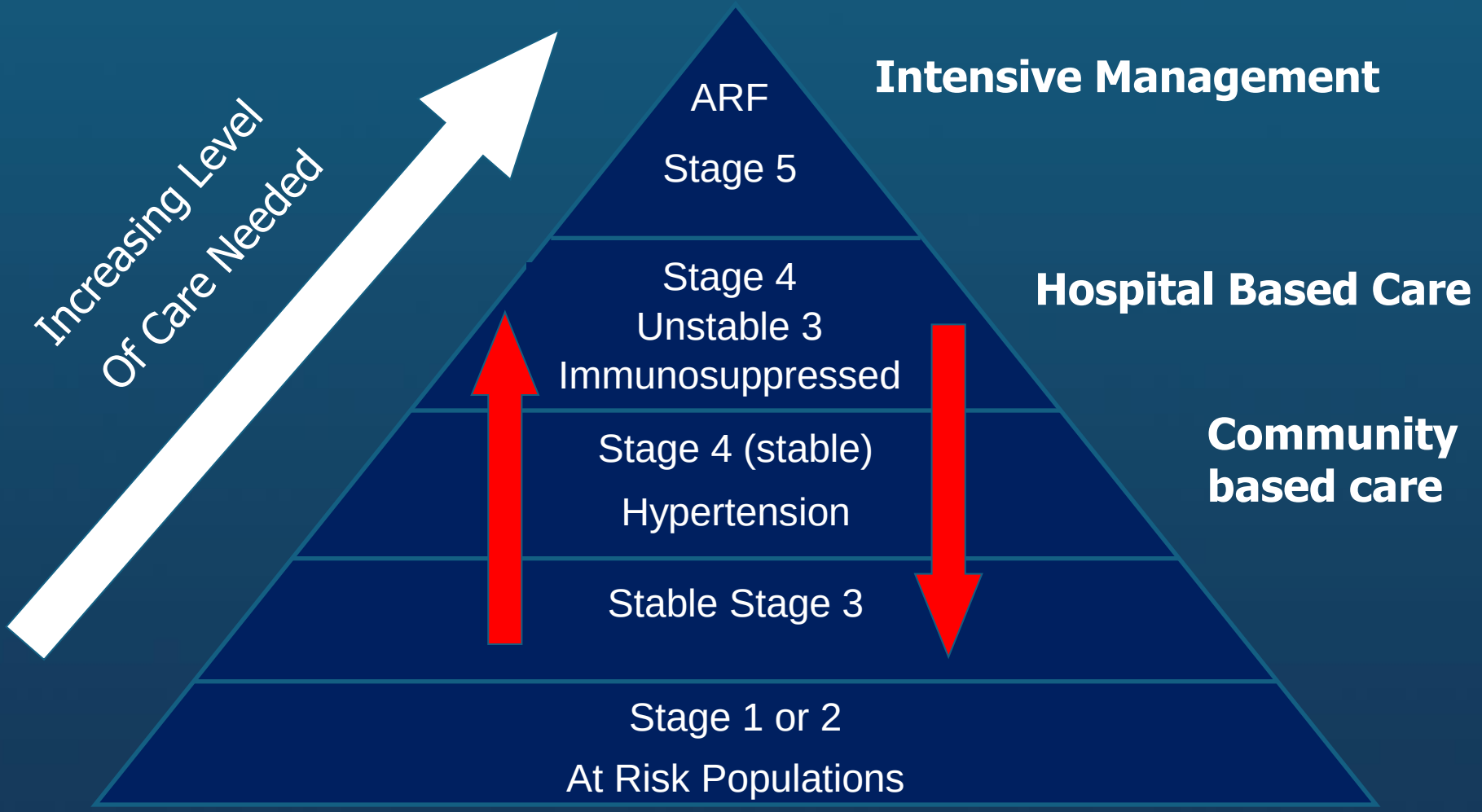
o influence policy


CARDIOLOGISTS
CHRONIC
DISEASE
MANAGEMENT
NEPHROLOGISTS

Patient Education and Empowerment



Structured Delivery of Care



So……

- Joint Diabetes and Nephrology services do have added value
- But they neither go far enough nor do they cater for patients at an early enough stage of their disease
- Alternative strategies are required to prevent or ameliorate the vascular triumvirate that is CKD

Chronic

Kidney

Disease

Cardiovascular disease

Kidney disease

Diabetes