



Is it risky for epidemiologists to be advocates?

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Four idealized roles of science in policy and politics:

- The pure scientist
- The science arbiter
- The honest broker
- The issue advocate

The science arbiter

“The science arbiter serves as a resource for the decisionmaker, standing ready to answer factual questions that the decisionmaker finds relevant. The science arbiter does not tell the decisionmaker what he or she ought to prefer.”

The honest broker

“The defining characteristic of the honest broker of policy alternatives is an effort to expand (or at least clarify) the scope of choice for decision-making... honest brokering of policy alternatives is often best achieved through a collection of experts working together with a range of view, experiences, and knowledge.”

Advocacy and epidemiology

- Why we sometimes need to be advocates
- Why sometimes it is “risky” and a bad idea



200µg PER METERED DOSE
200 METERED DOSES

Adverse Reactions®

The Fenoterol Story



Neil Pearce

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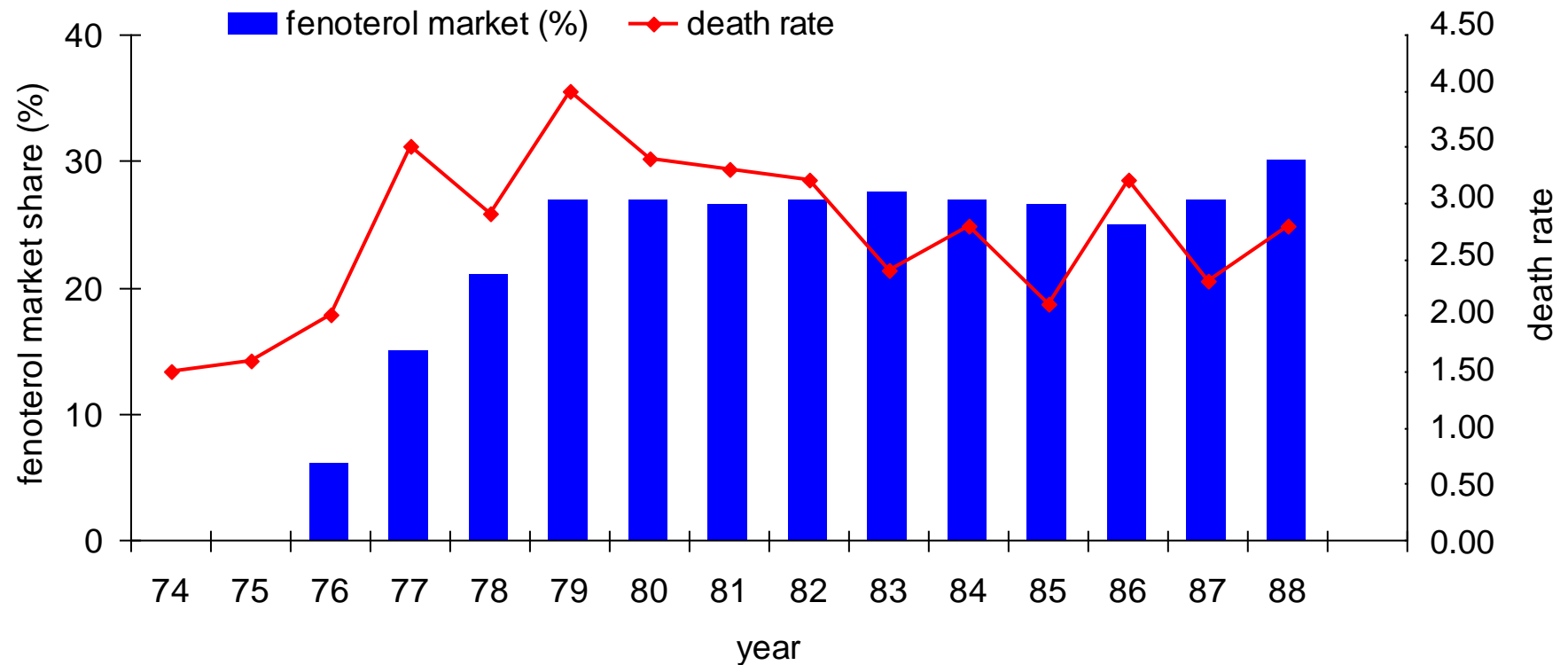
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RESPIRATORY MEDICINE
PRESCRIPTION ONLY

KEEP OUT OF REACH OF CHILDREN
BEST BEFORE: 05/89

Asthma Mortality and Fenoterol Market Share (%)





Prescribed Fenoterol and Death From Asthma in New Zealand, 1981-1983: a Case-Control Study

Crane J, Pearce NE, Flatt A, Burgess C,
Jackson R, Kwong T, Ball M, Beasley
R. Lancet 1989; i: 917-22



Media Publicity

29 April 1989

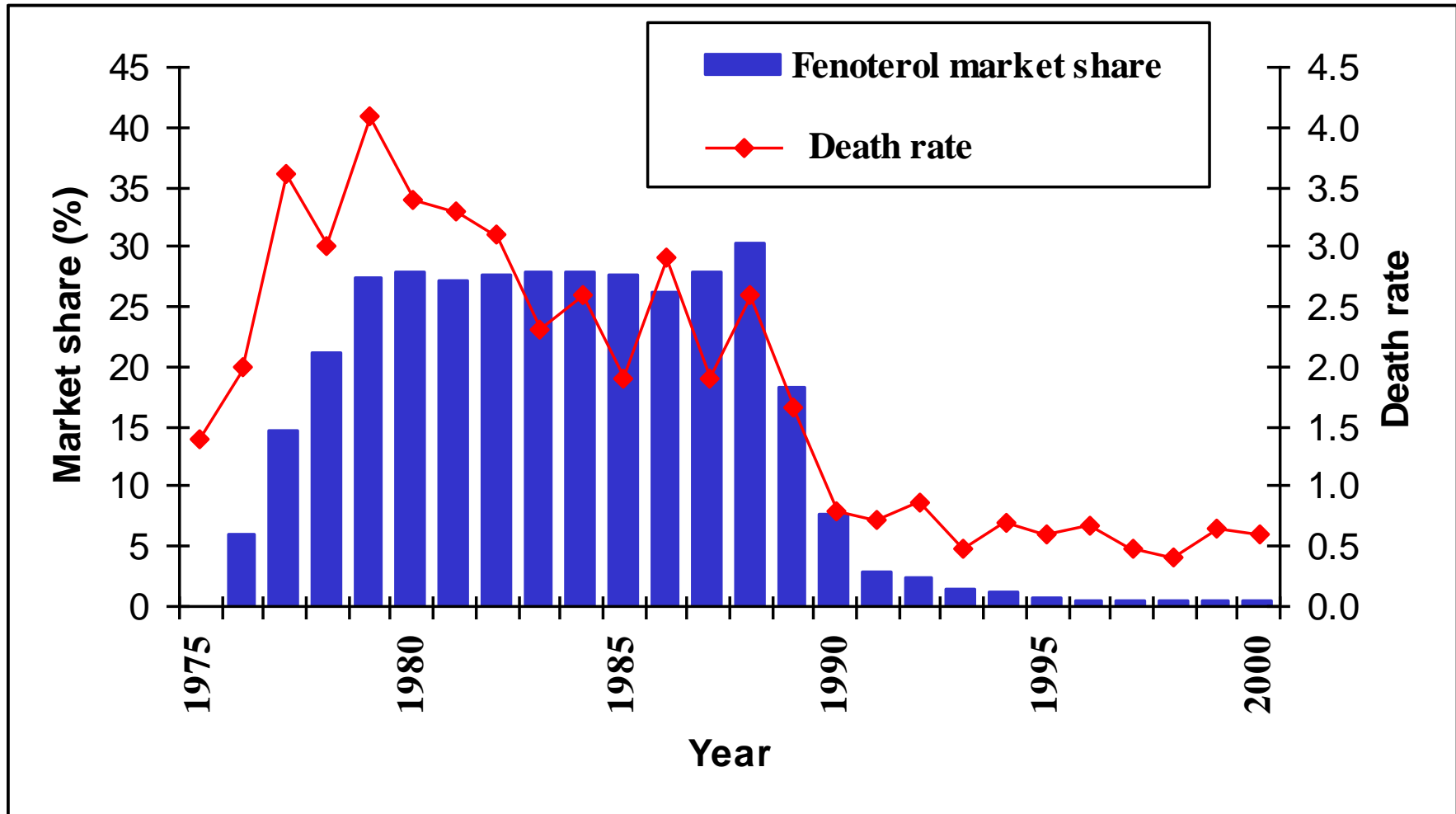
“Serious flaws in study says panel”

19 May 1989

“Asthma study flawed say foreign experts”

“Experts from the United States, Canada and Britain have attacked a New Zealand study which linked the asthma drug fenoterol with an increased risk of death saying that it was ‘seriously flawed’.”

The End of the Epidemic





*How a Handful of Scientists
Obscured the Truth on
Issues from Tobacco
Smoke to Global
Warming*

Merchants of DOUBT

Naomi Oreskes
& Erik M. Conway

THE TRIUMPH OF DOUBT

DARK MONEY
AND THE SCIENCE
OF DECEPTION

DAVID MICHAELS

Casting doubt has been one strategy used by the tobacco industry

- **“Doubt is our product, since it is the best means of competing with the ‘body of fact’ that exists in the minds of the general public. It is also the means of establishing controversy.”**

- Source: Brown and Williamson doc
332506



It is a strategy used by others, too

- **“The scientific debate remains open. Voters believe that there is *no consensus* about global warming within the scientific community. Should the public come to believe that the scientific issues are settled, their views about global warming will change accordingly. Therefore, you need to continue to make the lack of scientific certainty a primary issue in the debate, and defer to scientists and other experts in the field.”**
 - Source: Frank Luntz (2002) “Straight Talk”

Things are getting more organised

- Funding of 'alternative' studies
- Ghost-authoring of papers
- Websites attacking 'junk science'
- Publication of critical reviews just before court cases or IARC Monograph meetings (some of these are authored by journal editors and receive little or no peer-review)

Times when it is good to be an advocate (to some extent)

- The evidence is completely clear
- You have specialized knowledge to help interpret the evidence
- Others are not speaking out

Advocacy and epidemiology

- Why we sometimes need to be advocates
- Why sometimes it is “risky” and a bad idea
 - Snow on cholera
 - CKDu

The Broad Street Pump



C. F. Cheffins, Lith. Southampton St. London.

SCALE 30 INCHES TO A MILE.



Snow on Cholera

Water Supplier	Population	Deaths From Cholera	Death Rate
Southwark & Vauxhall	167,654	844	5.0
Lambeth	19,133	18	0.9
Both	300,149	652	2.2

Snow and cholera

“We saw drains and sewers emptying their filthy contents into [the open sewer]... [London Morning Chronicle, 1849]

“Within a period of about six years, thirty thousand cesspools were abolished, and all house and street refuse was turned into the river”. [Balgazette]

“The Thames is now made a great cesspool instead of each person having one of his own.” [Thomas Cubbitt]

Snow and cholera

“As the air of London is not supplied like water to its inhabitants by companies, the air has had the worst of it both before Parliamentary Committees and Royal Commissions. For air no scientific witnesses have been retained, no learned counsel has pleaded; so the atmosphere has been freely charged with the propagation and the illicit diffusion of plagues of all kinds; while father Thames... and the water gods of London, have been loudly proclaimed immaculate and innocent.” [William Farr, 1866]

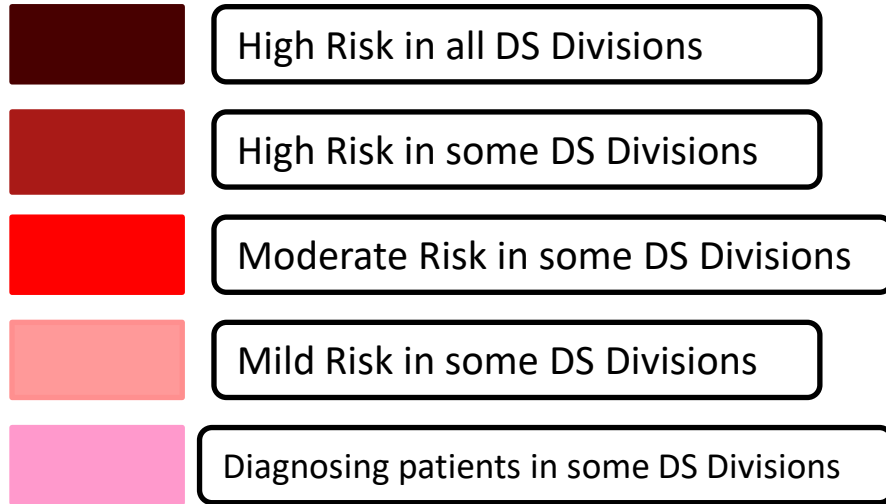
CKDu in Central America

- A dramatic increase of chronic kidney disease of unknown origin (CKDu)
 - Unexplained by conventional risk factors such as hypertension and diabetes
- Primarily affecting adult male agricultural workers, in particular sugarcane workers

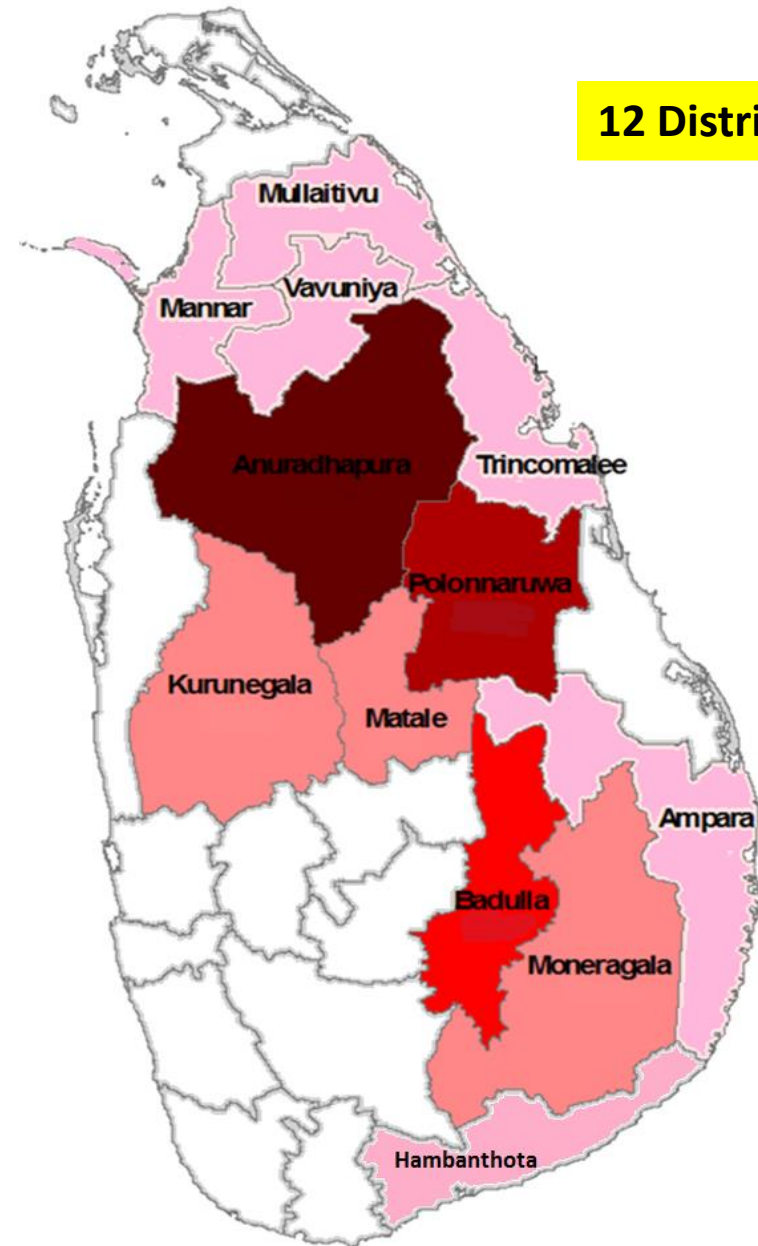


Along the Pacific coast, in the lowlands

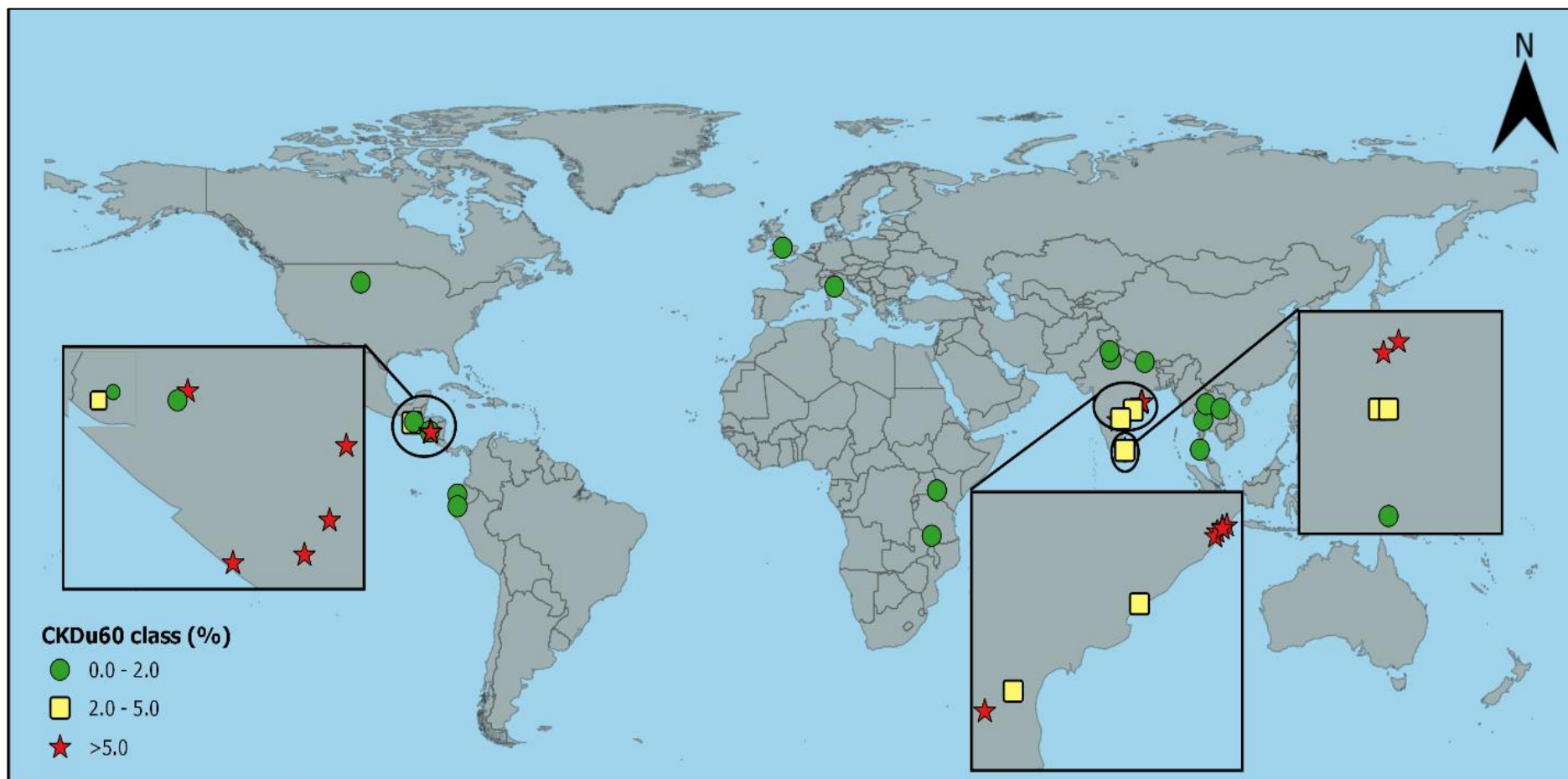
Distribution of CKD/CKDu Patients in 2002-2015



12 Districts



Courtesy: Dr. Asanga Venura Ranasinghe
Renal Diseases Prevention & Research Unit
Ministry of Health Nutrition & Indigenous Medicine in Sri Lanka



World map of age standardized prevalence of CKDu in **men**
 aged 18-60 in **rural* areas**

*USA includes rural and urban together

Hypotheses in Sri Lanka

- 2006 – Organophosphate – Peiris-John et al.,
- 2007 – Agro chem. Expo. – Wanigasuriya et al.,
- 2007 – Genetic – Wanigasuriya et al.,
- 2007 – Ayurvedic Medicine - Wanigasuriya et al.,
- 2008 – Cadmium - Bandara et al.,
- 2009 – Substandard Aluminum pots – Illeperuma et al.,
- 2012 – Fluoride – Johnson et al.,
- 2012 – Cyanobacterial toxins – Johnson et al.,
- 2013 – Arsenic / Fertilizers – Jayasumana et al.,
- 2013 – High ground water hardness – Paranagama,
- 2013 – Low BMI – Elledge et al.,

Epidemiological Associations shown in Sri Lanka

- 2007 – Family history - Wanigasuriya et al.,
- 2007 – Snake bites - Wanigasuriya et al.,
- 2007 – Drinking well water - Wanigasuriya et al.,
- 2009 - Male gender – Athuraliya et al.,
- 2011 – Farmer - Athuraliya et al.,
- 2013 – Advance age – Jayathilaka et al.,
- 2013 – Alcohol consumption - Jayathilaka et al.,
- 2014 – Tobacco chewing – Nanayakkara et al.,

Current thinking - the aetiology of CKDu could be multi-factorial

Main hypotheses for CKDu

- Pesticide exposures
- Heat stress (particularly at work)
- Heavy metals in water
- Infections

POLITICAL COMMENTARY

We need a new agricultural revolution that is not against nature – President

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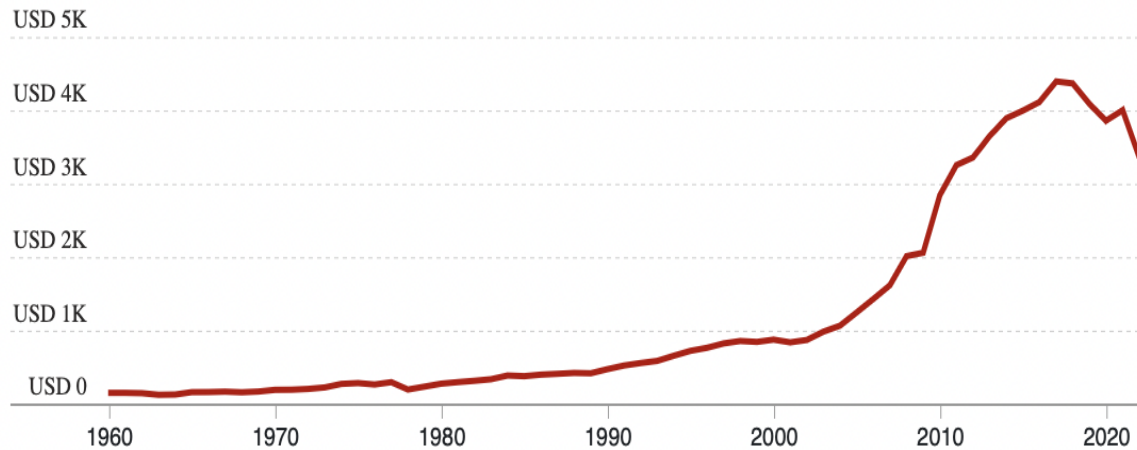


“The challenge facing us now is to use modern scientific techniques and practices to enhance agricultural production without causing environmental degradation... For decades, chronic kidney disease has been a serious issue in Sri Lanka’s agricultural heartland. The overuse of chemical fertilizers has contributed significantly to this problem,”

the President said,

adding in this context that his Government took firm steps to reduce imports of chemical fertilizer, and strongly encourage organic agriculture.

Gross domestic product per capita in Sri Lanka



Sri Lanka’s Plunge Into Organic Farming Brings Disaster

The economically troubled country banned chemical fertilizers without preparing farmers, prompting a surge in food prices and worries about shortages.

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The Inquiry

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Why did Sri Lanka's organic farming dream fail?

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- NEXT: Can Europe give up Russian gas?

Times when it is not good to be an advocate

- The evidence is not completely clear
- You get it wrong and do actual harm
- You go so far out on a limb that you cease to function as a scientist
- You therefore lose your scientific credibility
- There are other people around who are much better at advocacy



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The “25x25” strategy

- Four priority diseases:
 - Cardiovascular diseases (CVD)
 - Diabetes
 - Cancer
 - Chronic respiratory diseases

Target: 25% reduction in mortality by 2025

[Lancet 2012; 380: 1-3]

The "25x25" strategy

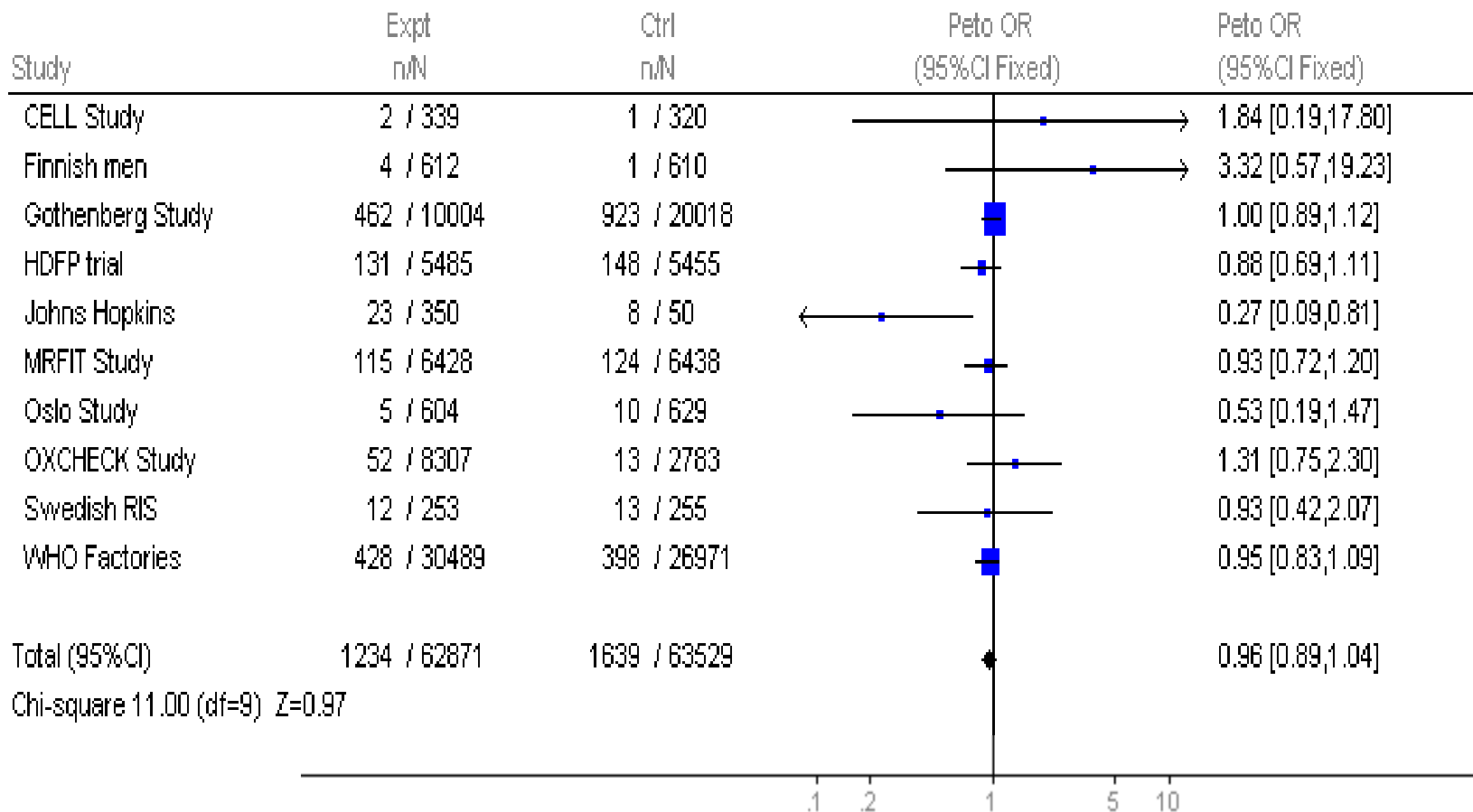
- Five priority interventions:
 - Tobacco control
 - Salt reduction
 - Improved diets and physical activity
 - Reduction in hazardous alcohol intake
 - Essential drugs and technologies

[Lancet 2012; 380: 1-3]

Systematic review of multiple risk factor interventions: effect on CHD mortality

Comparison: Multiple risk factor intervention versus control

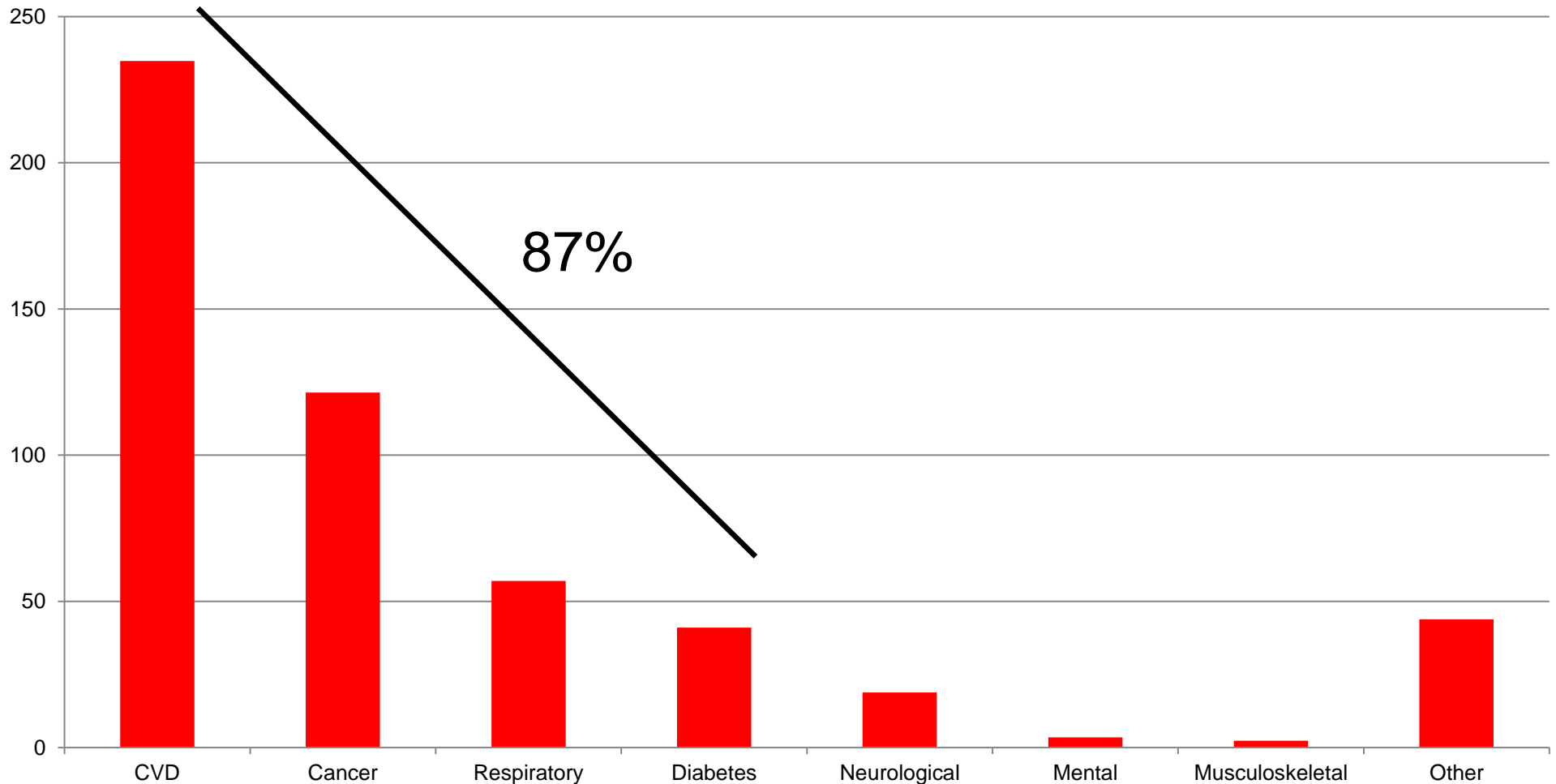
Outcome: Coronary heart disease mortality



The 'main four' NCDs account for 87% of NCD deaths

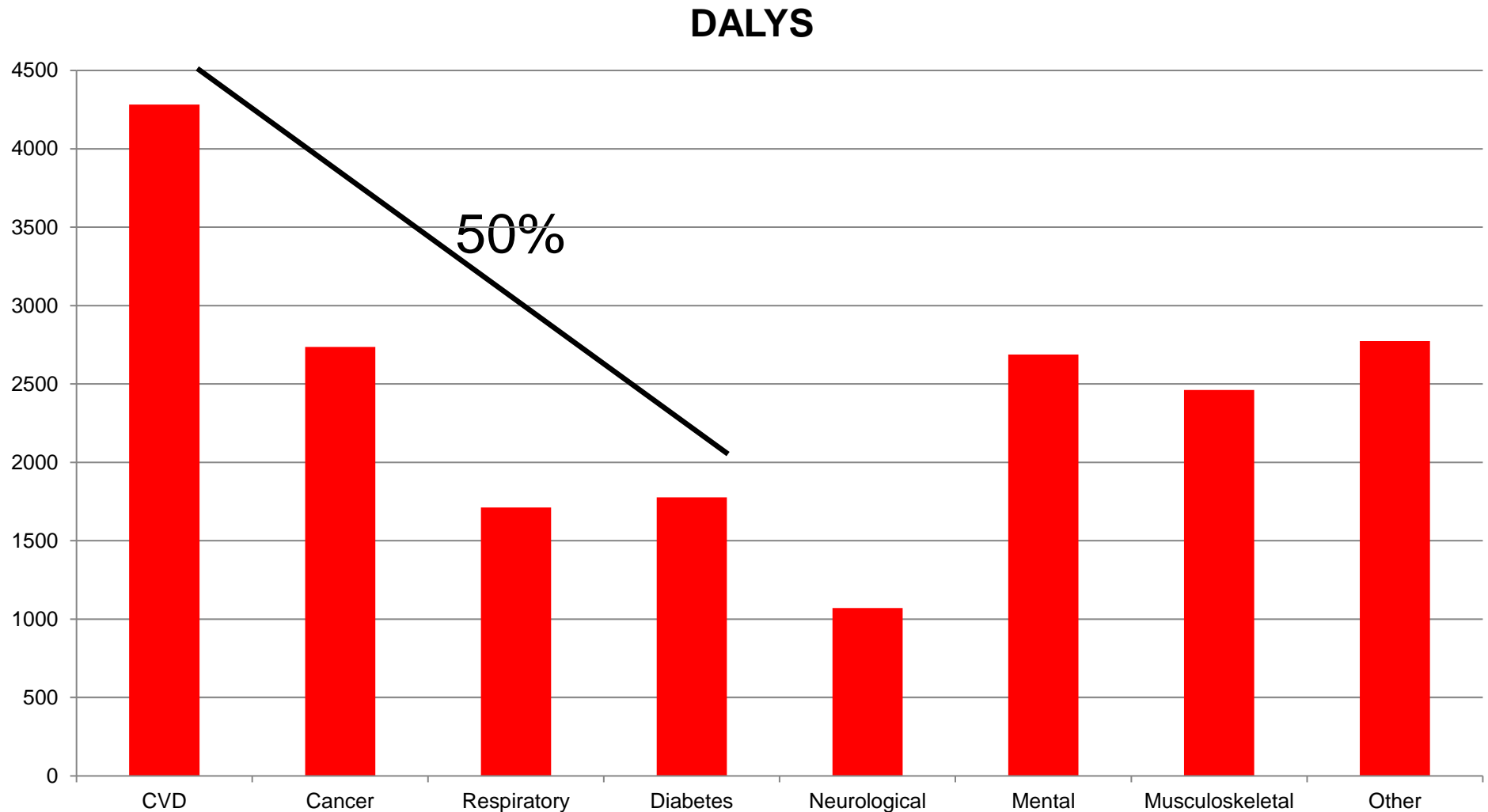
[Lancet 2012; 380: 2095-2128 (GBD)]

Mortality



The 'main four' NCDs account for 50% of NCD DALYS

[Lancet 2012; 380: 2197-2223 (GBD)]



Preventing Global NCDs

