



Vitamin D in Diabetes and Vascular Health

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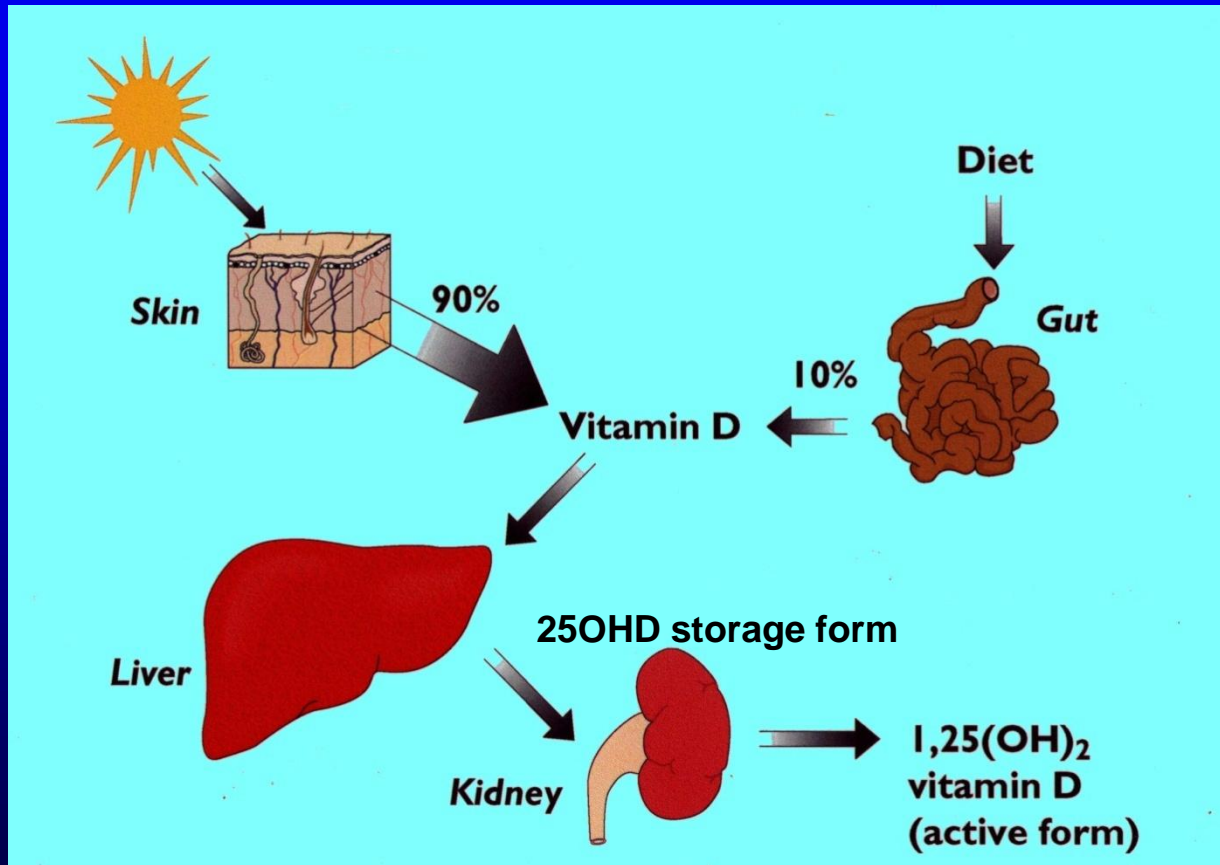
Declarations of interest

- Personal pecuniary
 - Internis – Consultancy
- Non-personal non-pecuniary
 - Director of Manchester SAS Vitamin D laboratory

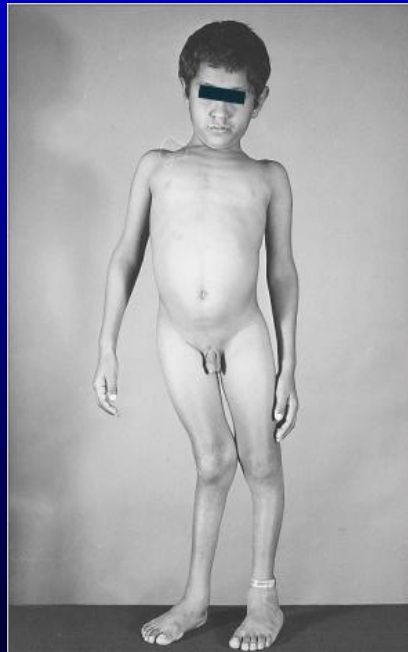
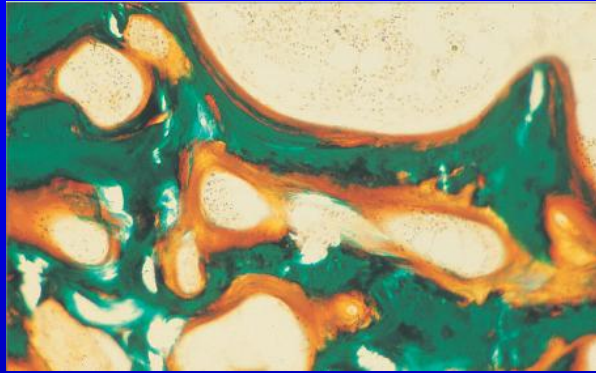
Overview

- Vitamin D:
 - Physiology
 - Deficiency
- Role of vitamin D in:
 - Diabetes incidence and outcomes
 - CVD incidence and outcomes
 - Mortality
- Conclusions

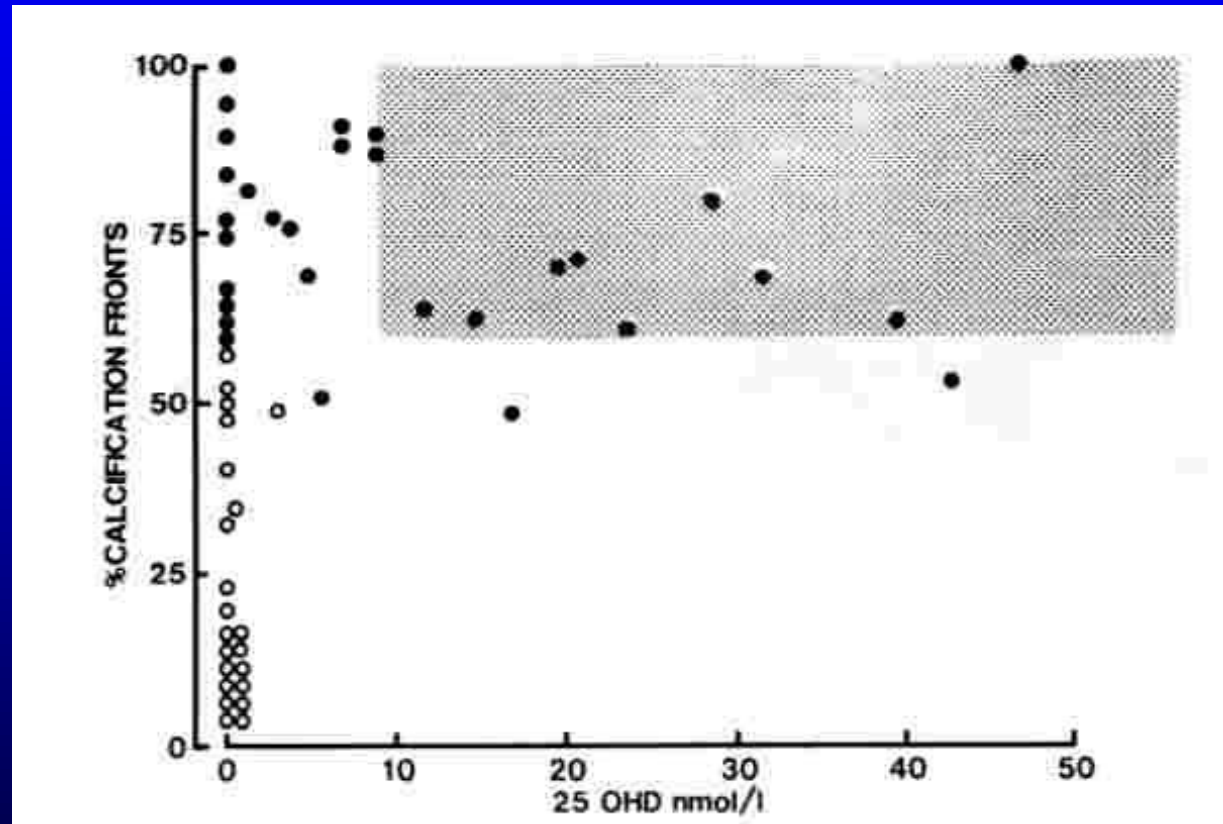
Vitamin D metabolism



Rickets/Osteomalacia

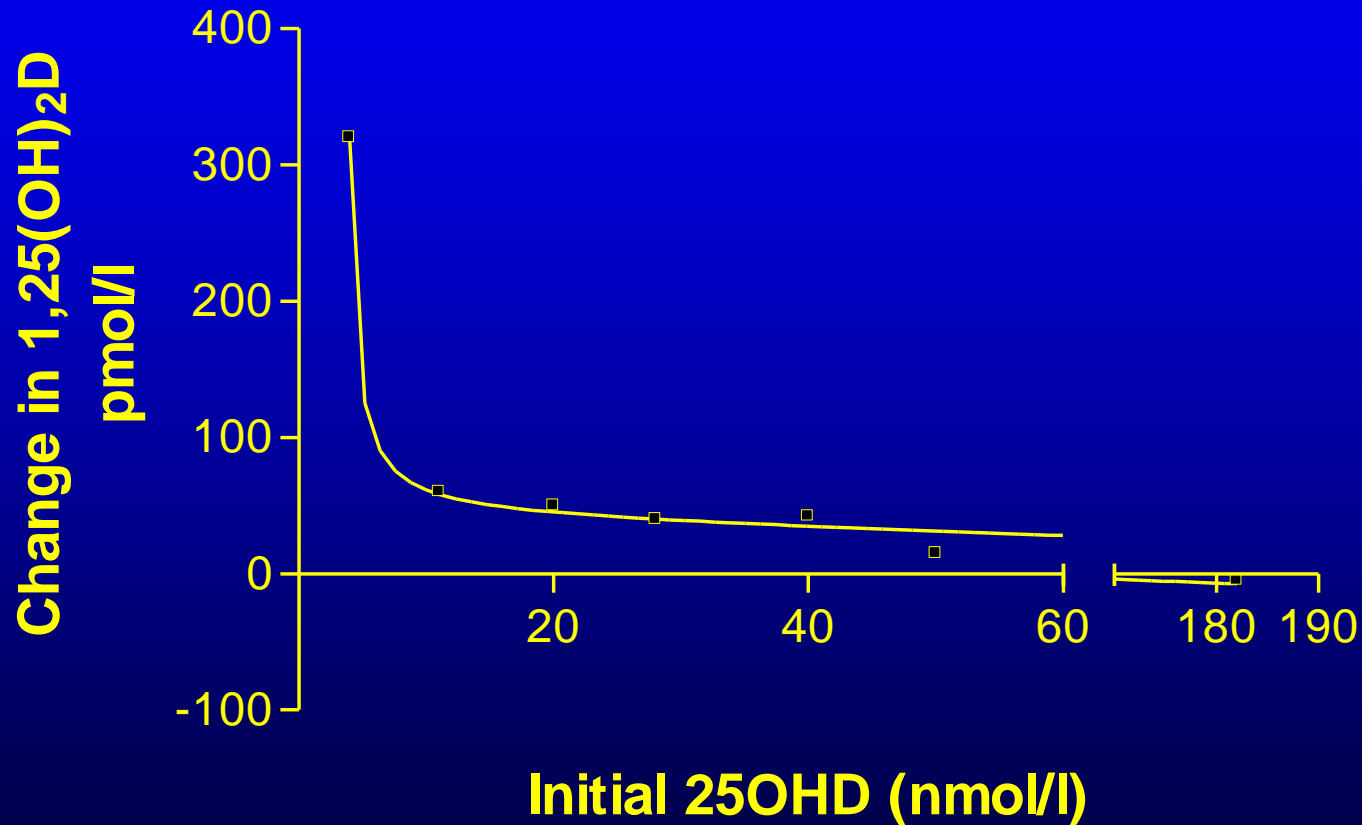


Osteomalacia and Vitamin D



Peacock, 1984

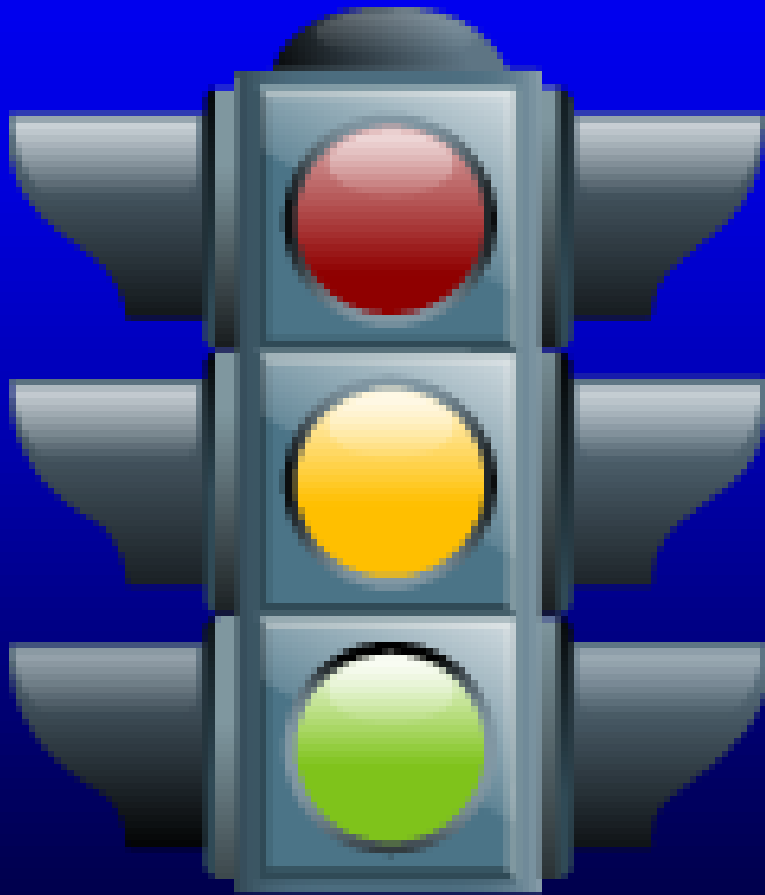
What is sufficient vitamin D?



The screenshot shows the website of the Institute of Medicine of the National Academies. The header includes navigation links for Media Room, Directory, Meetings and Events, Videos, and Member Login. The main navigation bar has tabs for ABOUT THE IOM, REPORTS, and ACTIVITIES. A search bar and 'Explore by Topic' dropdown are also present. The main content area features a 'Browse History' section and a 'Report Release' section. The report release is titled 'Dietary Reference Intakes for Calcium and Vitamin D' and was released on November 30, 2010. The report is categorized as a 'Consensus Study' and covers 'Food and Nutrition, Public Health'. A small image of a bowl of food is shown next to the report title.

- Threshold of 50 nmol/l (20ng/ml)

What level do we need?



Deficient

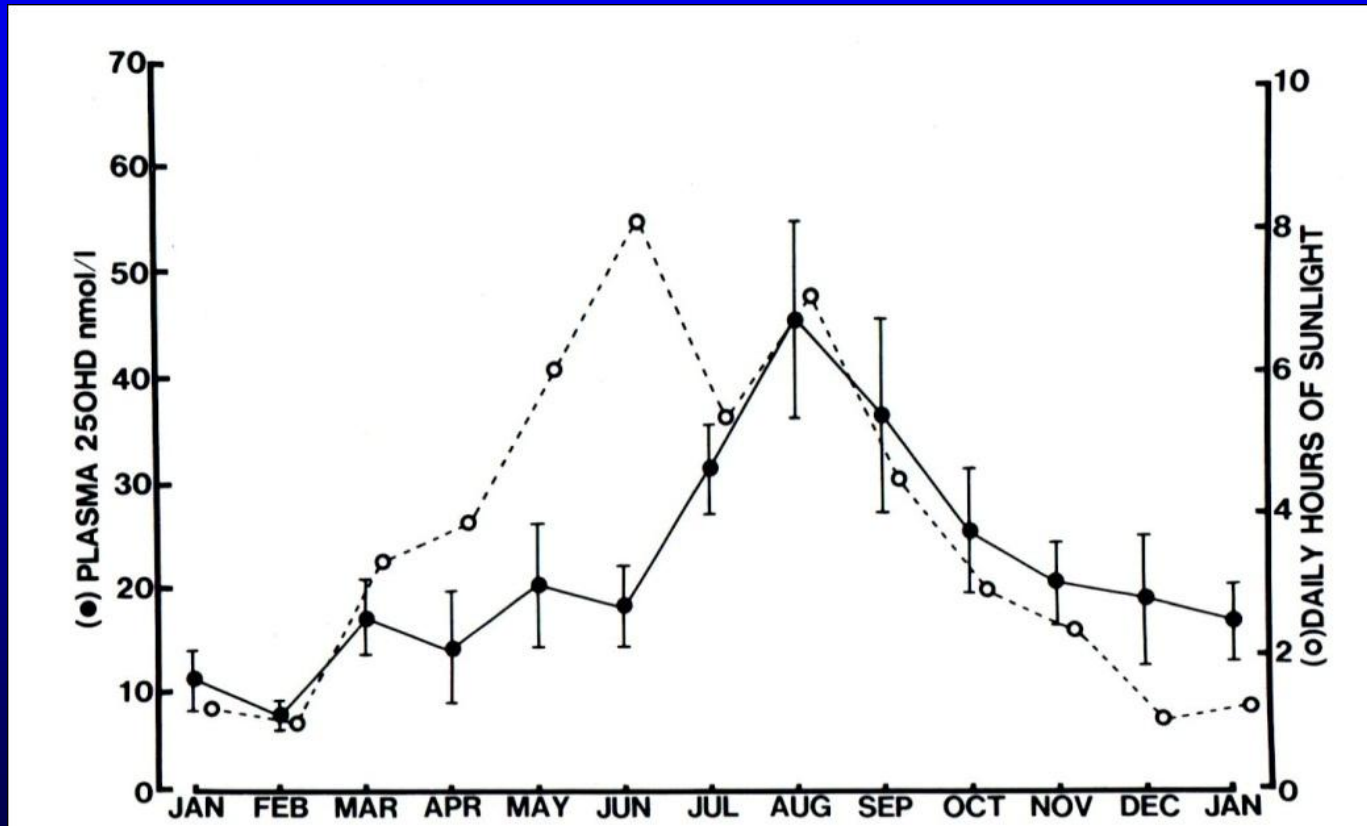
<30 nmol/l
(12ng/ml)

Insufficient

Sufficient

>50 nmol/l
(20ng/ml)

Vitamin D and Season



Peacock, 1984

Problem with sunshine

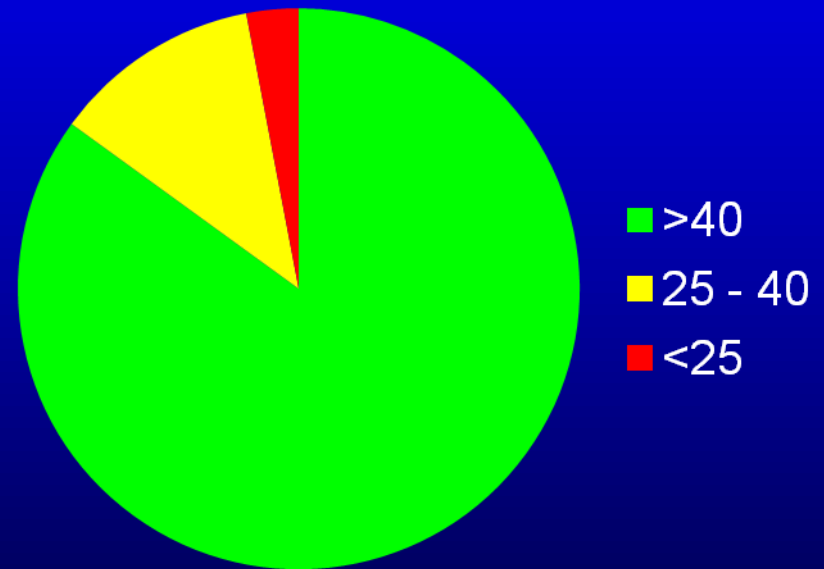


Vitamin D status in middle age

Winter



Summer



Hypponen, 2007

Other Effects of Vitamin D

- Bone and Fracture
 - Bone loss
 - Falls
- Vascular Disease
- Diabetes
- Cancer
- Infection
- Inflammation

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Home > News > Health > Vitamin D pill every day can beat diabetes

Vitamin D pill every day can beat diabetes

A DAILY vitamin D pill could be the key to staving off Type 2 diabetes, experts have revealed.

By: Jo Willey

Published: Wed, October 23, 2013

 Recommend 69

 Tweet 23

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The 'sunshine vitamin' could be used in the battle against diabetes (PIC POSED BY MODEL) [GETTY]

Most Read Stories in Health

-  Millions of Britons face hay fever hell...and it's going to get worse
-  EXCLUSIVE: Cure for ALL cancers is on the way as scientists discover major breakthrough
-  How to lose half a stone in 14 days: Menu and exercise plan
-  EXCLUSIVE: Quality of death is linked to where you live
-  Green fingers giving a hand up: Ed Miliband backs Mental Health Campaign

More Health

More 

Green fingers giving a hand up: Ed Miliband backs Mental Health Campaign

 Comments  Share

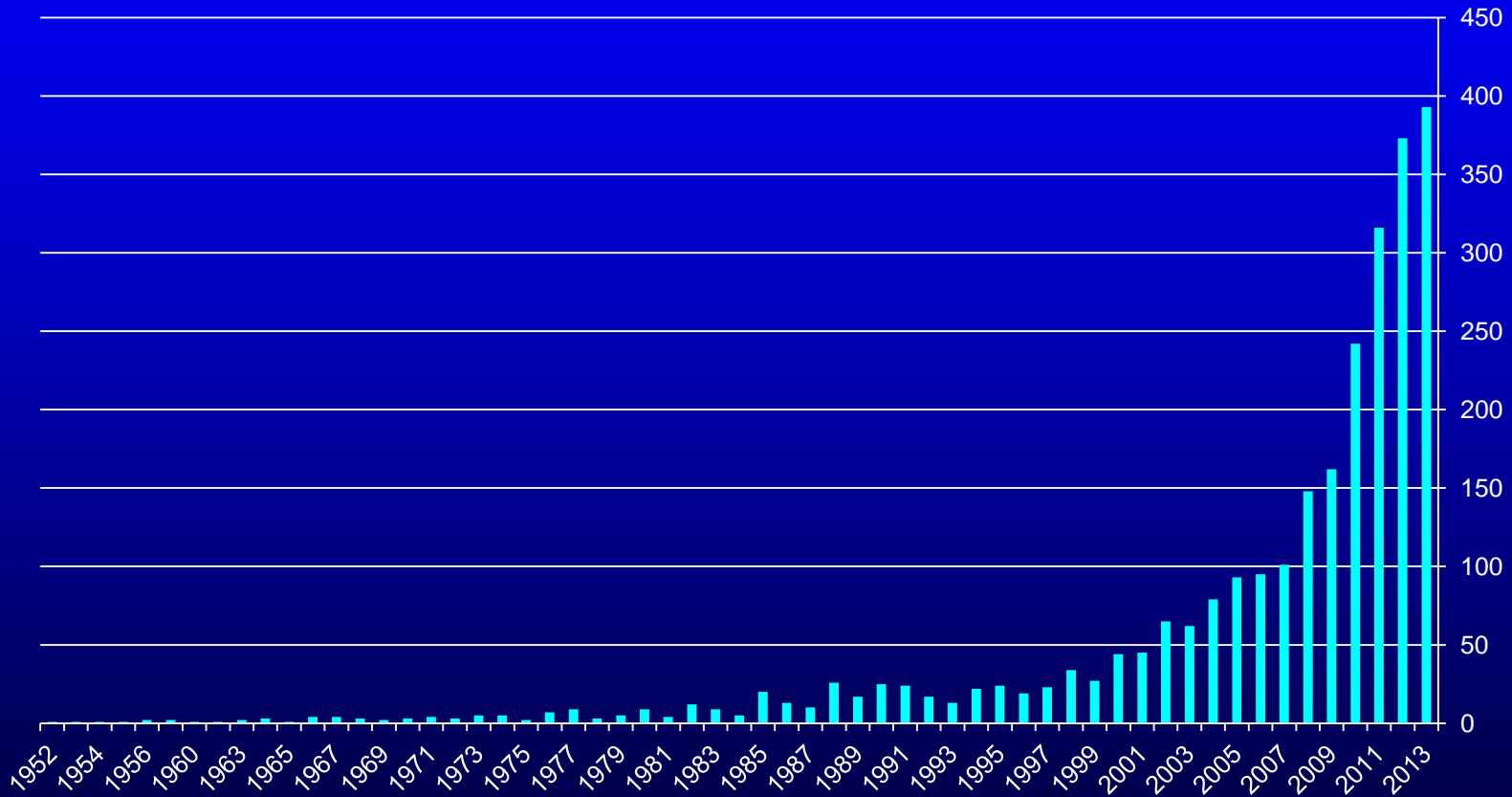


EXCLUSIVE: Quality of death is linked to where you live

 Comments  Share

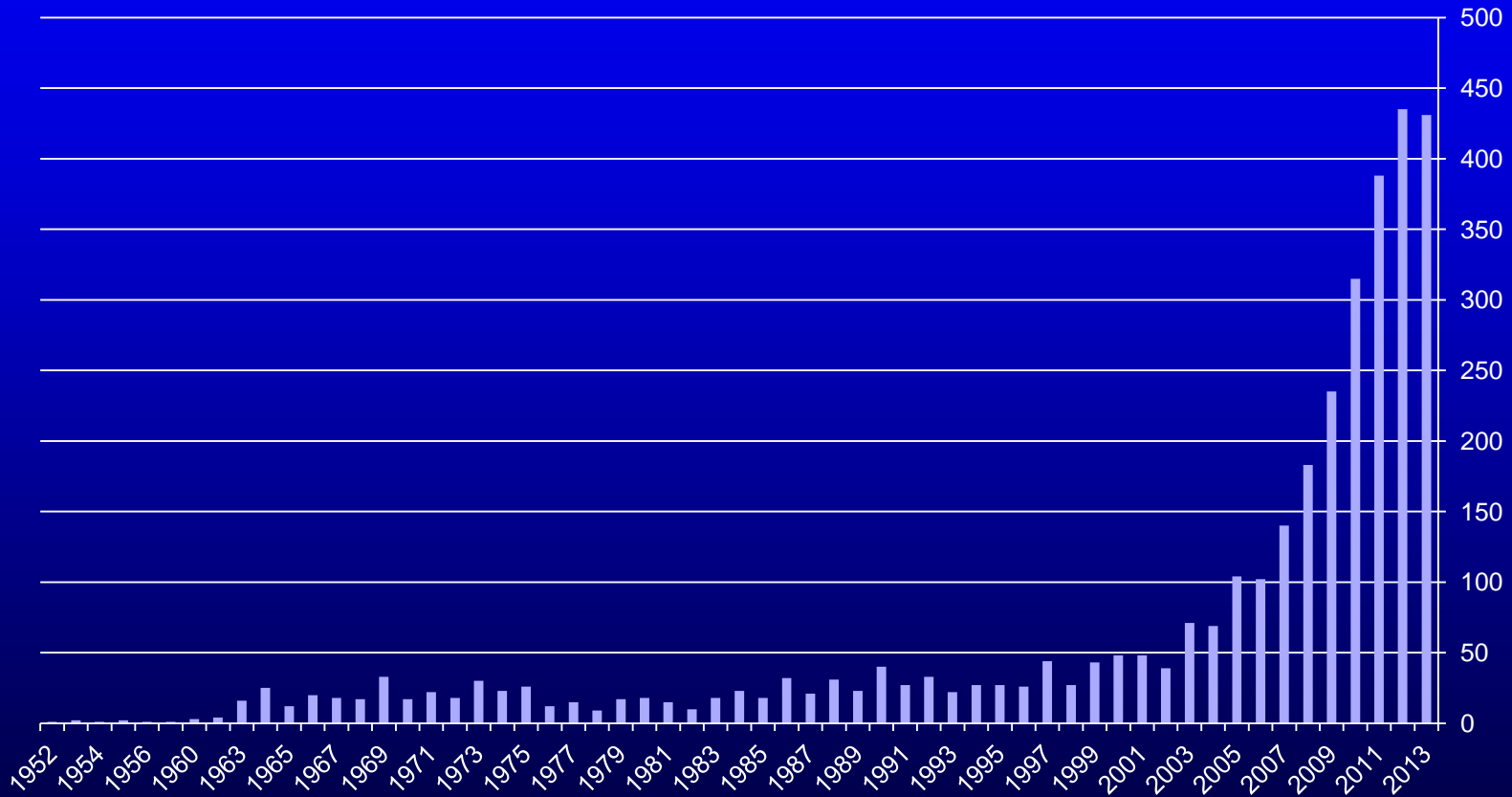


PubMed citations of Diabetes and Vitamin D



Total = 2838 April 2014

PubMed citations of Cardiovascular Disease and Vitamin D



Total = 3601 April 2014

Diabetes and vitamin D Meta analyses

- 290 cohort studies
- Cohort studies show relationship between 25OHD and health outcome
- Diabetes – 2 studies:

Diabetes incidence					
Diabetes incidence	2013 (8)5	14	76220	4996	0.62 (0.54-0.70)
Diabetes incidence	2013 (9)5	16	72204	4877	0.67 (0.60-0.75)

10 studies in common

Autier, 2014

CVD and vitamin D Meta analyses

- 290 cohort studies
- Cohort studies show relationship between 25OHD and health outcome
- CVD – more studies:

Cardiovascular disease incidence and mortality					
Cardiovascular disease	2010 (4)†	5	19376	2417	0.42 (0.28-0.65)
Cardiovascular disease	2011 (5)†	7	27620	2530	0.60 (0.44-0.81)
Cardiovascular disease	2012 (6)†	17	65994	6123	0.66 (0.56-0.77)
Coronary heart disease	2012 (6)	8	33249	1973	0.72 (0.64-0.83)

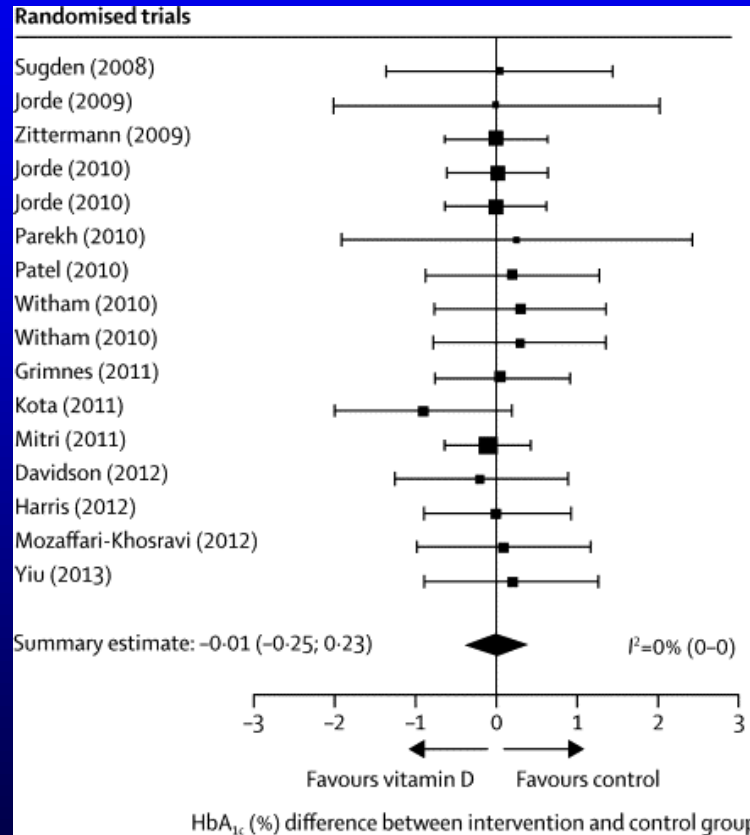
Autier, 2014

Diabetes and vitamin D Intervention meta analysis

- 172 RCTs
- Interventional studies no effect of vit D on same health outcomes
- Diabetes – Single study:

Glucose metabolism							
HbA _{1c}	2013¶ (appendix pp 6-7)	16	1491	CO	1-12	20-317	% of total Hb ES -0.01 (-0.25 to 0.23)

Diabetes and vitamin D Meta analysis HbA1c



Autier, 2014

CVD and vitamin D Intervention meta analyses

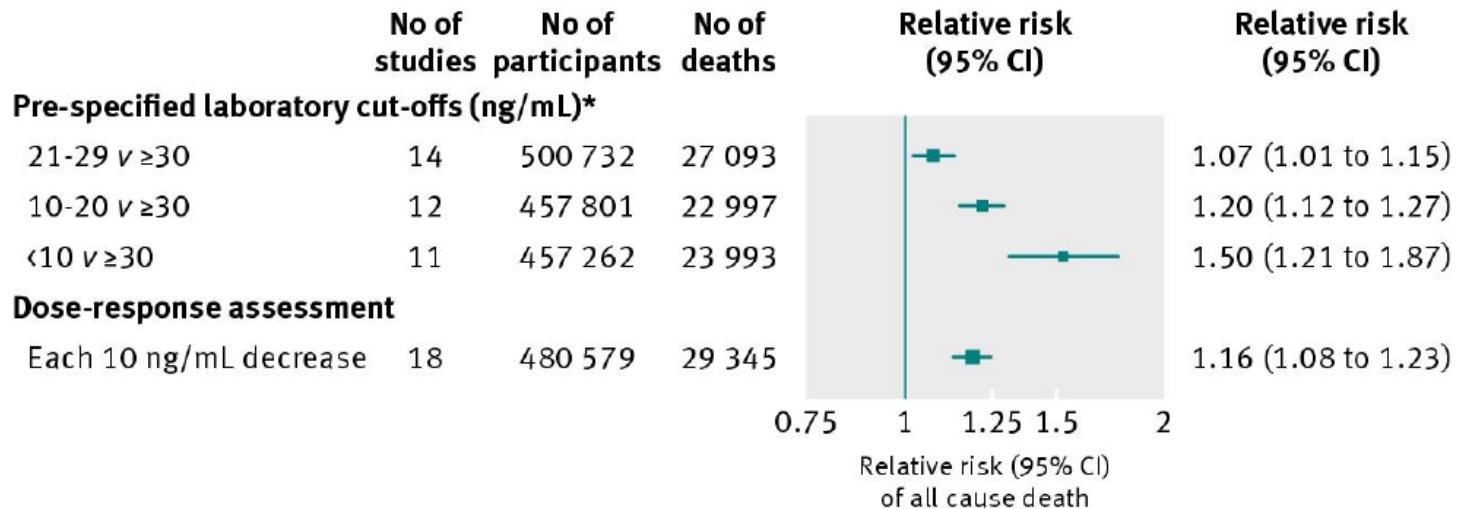
- 172 RCTs
- CVD – More studies:

Cardiovascular diseases								
Cardiovascular diseases	2010 (1)	4	41 346	1976	12–60	10–25	Incidence	RR 0.99† (0.89–1.09)
Myocardial infarction	2011 (2)	6	39 879	1353	1–84	8–25	Incidence	RR 1.02 (0.93–1.13)
Stroke	2011 (2)	6	39 879	1006	1–84	10–25	Incidence	RR 1.05 (0.88–1.25)
Systolic blood pressure	2011 (2)	14	NR	CO	1–84	NR	Change (mm Hg)	ES –0.06 (–1.98 to 1.87)
Diastolic blood pressure	2011 (2)	14	NR	CO	1–84	NR	Change (mm Hg)	ES –0.34 (–1.03 to 0.35)
Cardiovascular mortality	2011 (3)	7	41 879	1229	1–84	8–35	Deaths	RR 1.02 (0.91–1.13)

- Still no effect

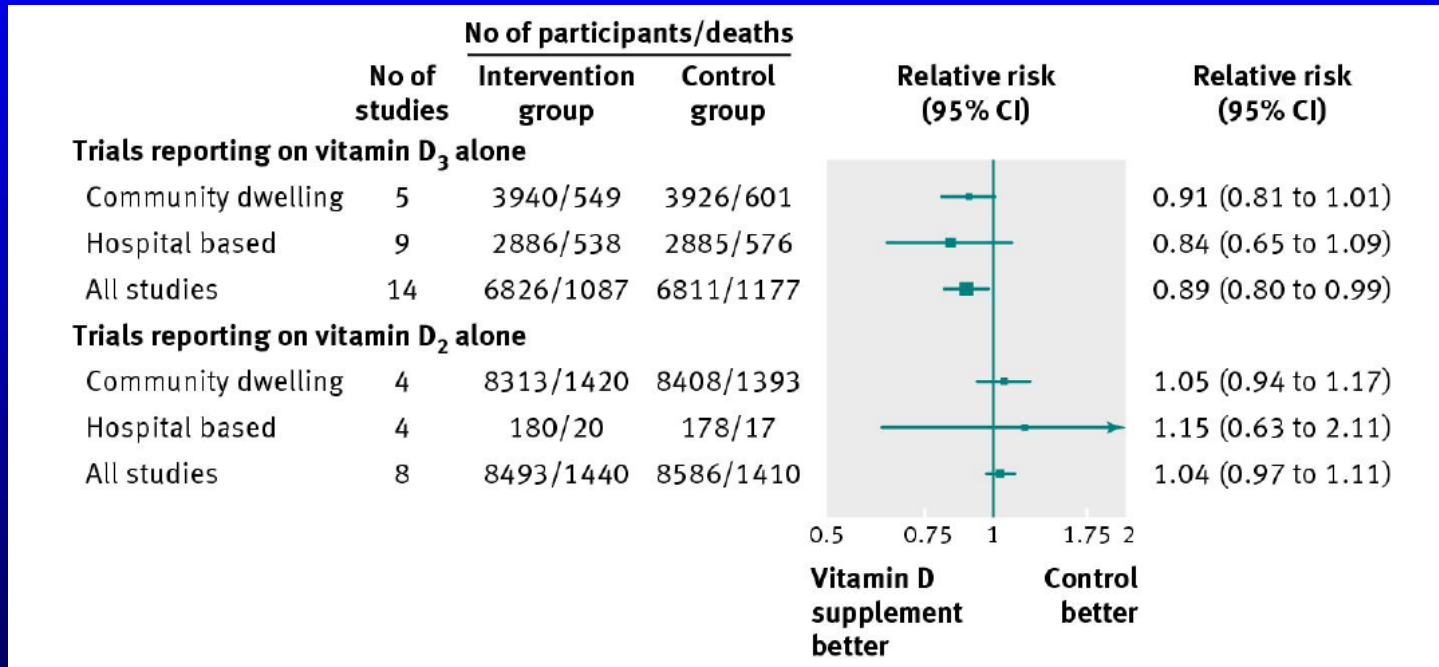
Autier, 2014

Mortality and vitamin D Meta analysis



Chowdhury, 2014

Mortality and vitamin D Meta analysis

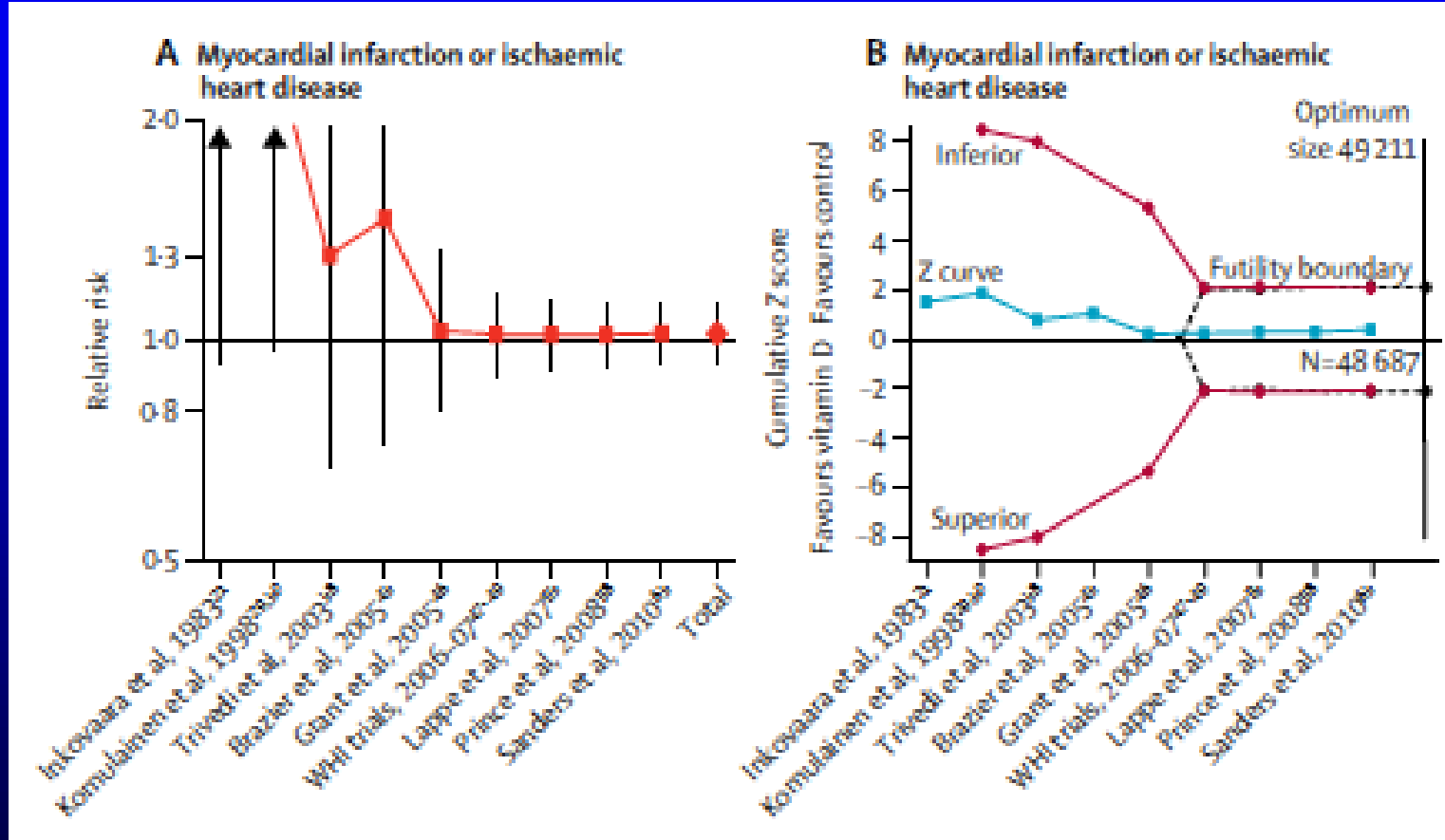


Chowdhury, 2014

BUT

- Prospective study meta analysis included 3 studies using active vitamin D and one looking at exercise and vitamin D
- If they are excluded RR \rightarrow 0.92 (0.84 – 1.02)
- Must read the small print!

Trial Sequential Analysis



Summary

- Low vitamin D is common in people:
 - With diabetes
 - With CVD
 - Who are likely to die
- Giving vitamin D doesn't seem to help

Possible Explanation

- Disease

- ↓ nutrition
- reduced sunlight exposure

- ↓ 25OHD

Other Effects of Vitamin D

- Falls
- Vascular Disease
- Diabetes
- Cancer
- Infection
- Inflammation

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- “Only robust evidence is in regards bone disease”

Conclusion

- Low vitamin D levels in diabetes and CVD are probably the result of underlying disease states than their cause
- There is no evidence to indicate any benefit of vitamin D replacement on the incidence or consequences of diabetes or CVD



Vitamin D and Bone Health: A Practical Clinical Guideline for Patient Management

National Osteoporosis Society Practical Guides

Endorsed by:



for a breakfree future