



Vitamin D Deficiency and Osteoporosis

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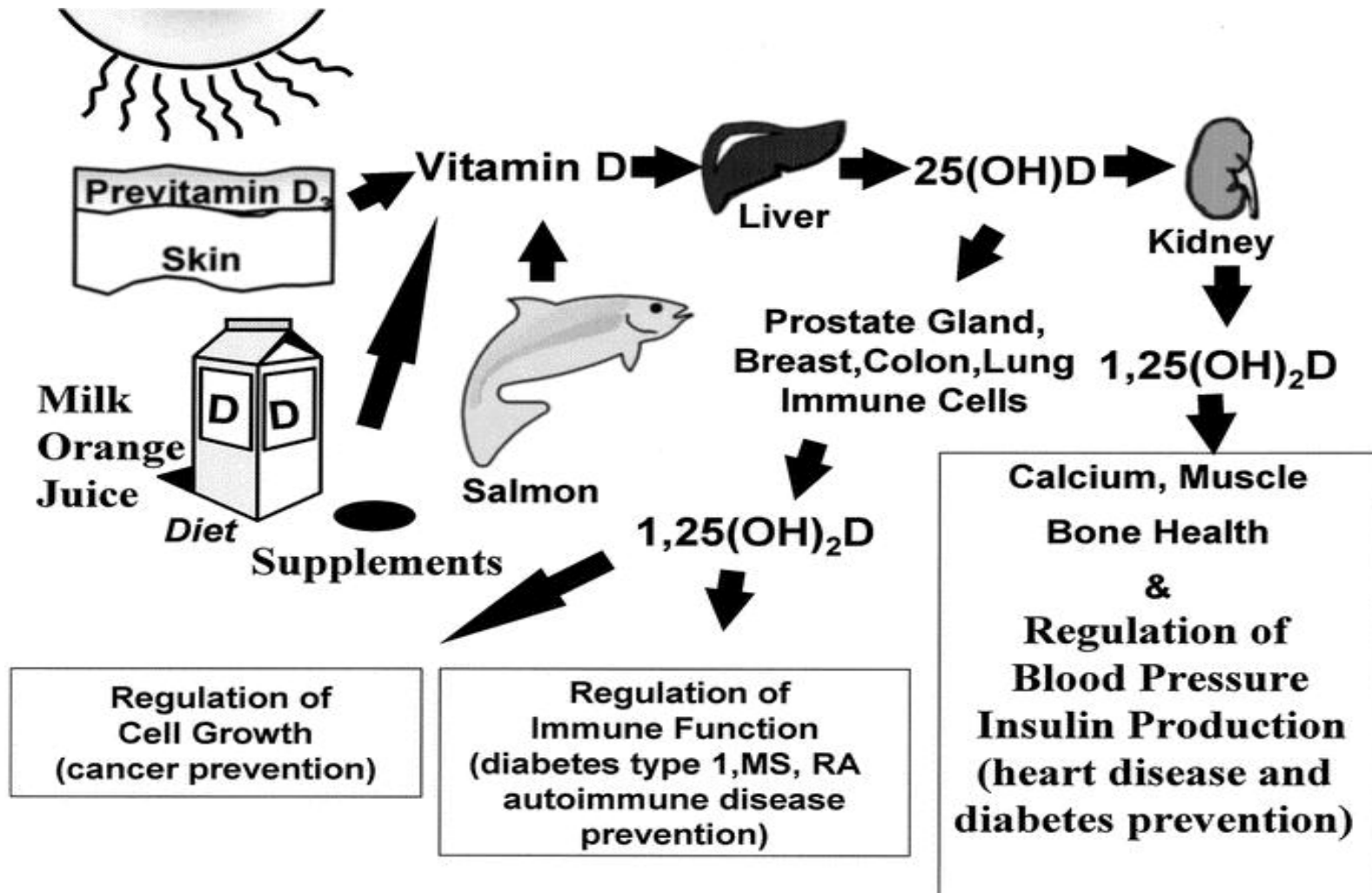
Outline

- ❑ Vitamin D metabolism
- ❑ Hypovitaminosis D: mean levels /prevalence
- ❑ Vitamin D and musculoskeletal outcomes
- ❑ Desirable vitamin D levels

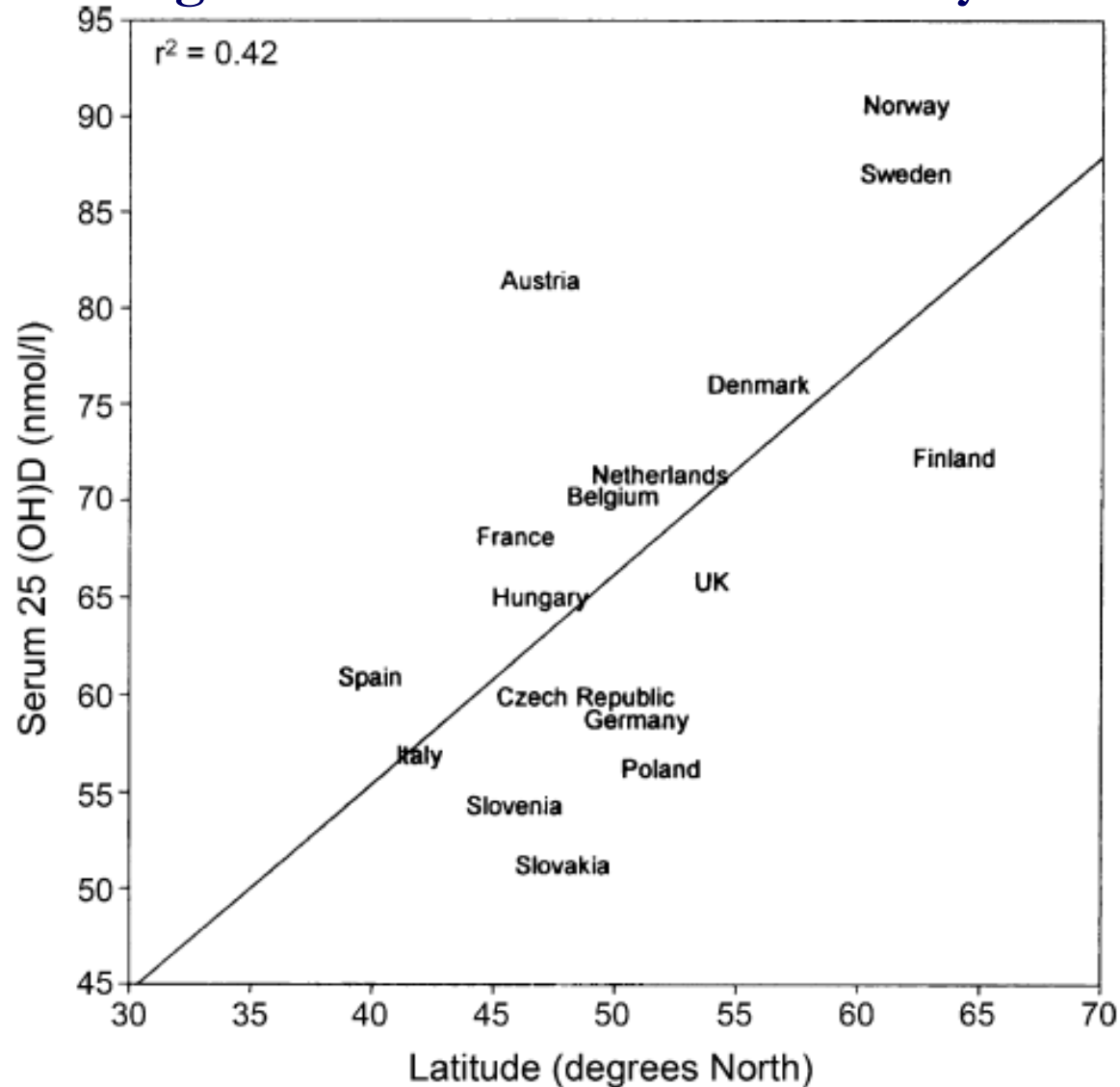
Disclosures

- Grant support from Eli Lilly, Novartis and Sanofi-Aventis.
 - SERM advisory Board Eli Lilly
 - Lecture fees Eli Lilly
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Photo-production and Sources of Vitamin D

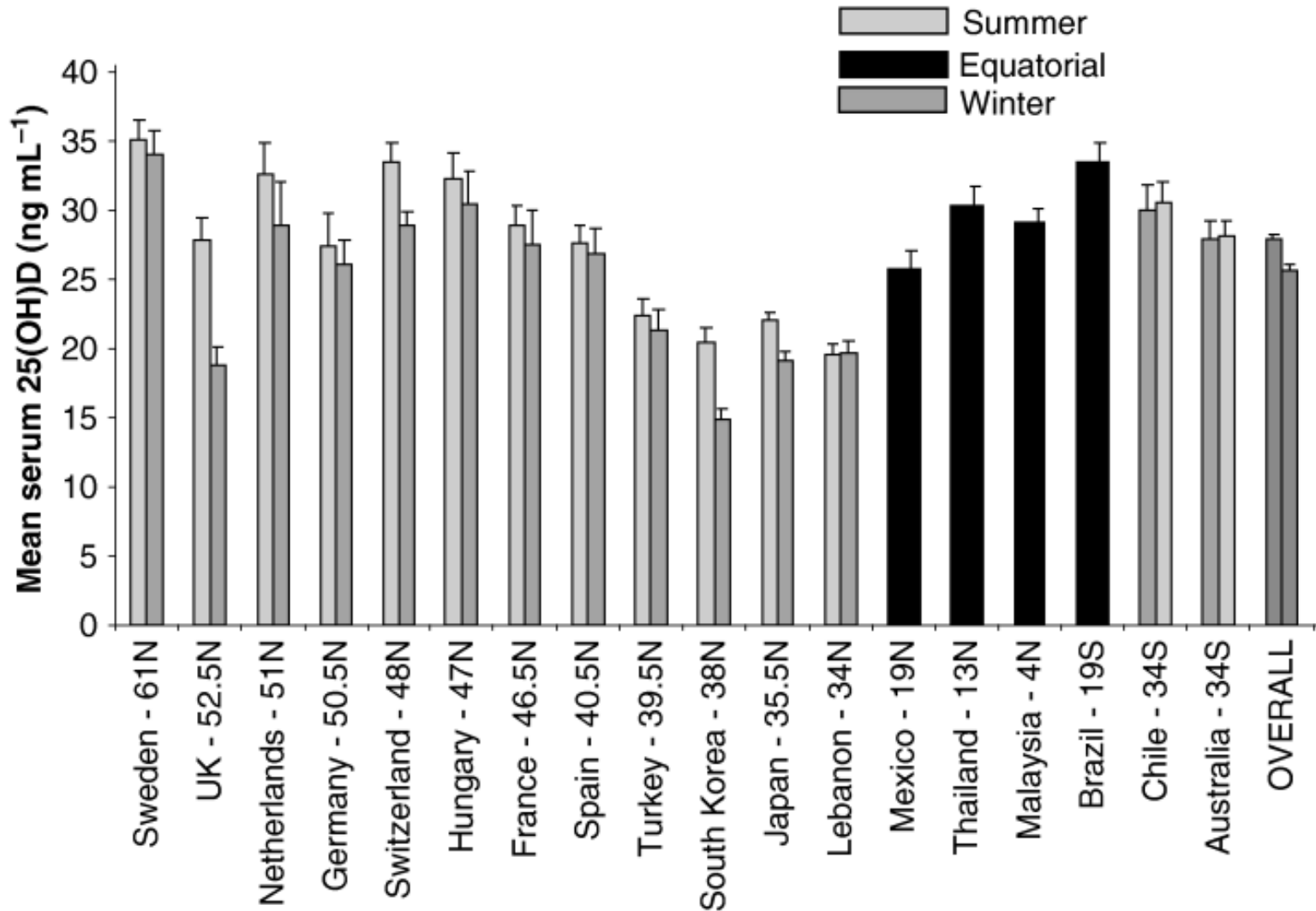


Vitamin D status in postmenopausal women with osteoporosis in Europe according to latitude in the MORE study



Mean serum 25-hydroxyvitamin D by country

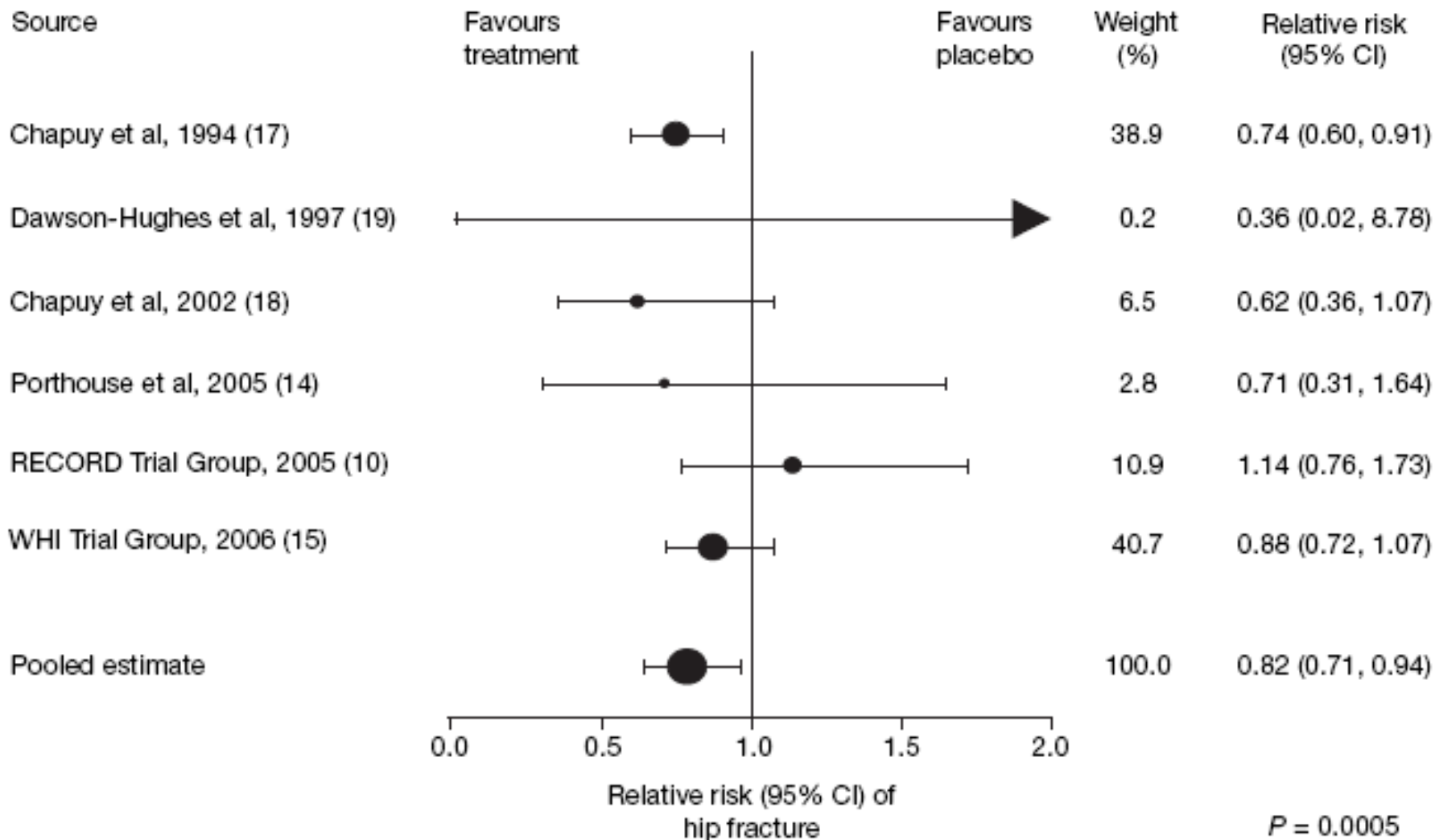
Mean 25(OH)D (ng/mL) by country and descending latitude (North to South)
(n = 2589)



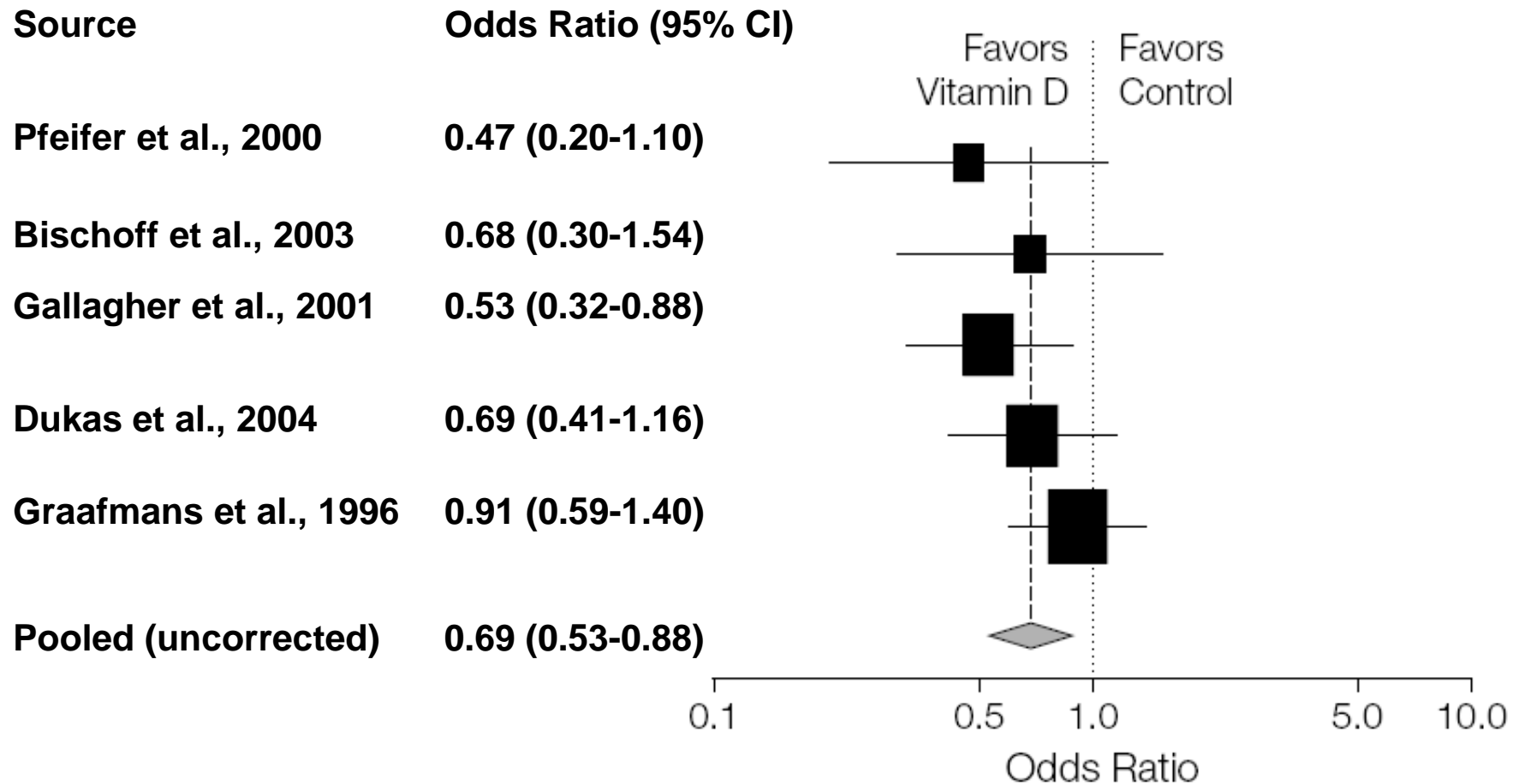
Risk of hip fracture between vitamin D and calcium and placebo/no-treatment groups including the WHI trial

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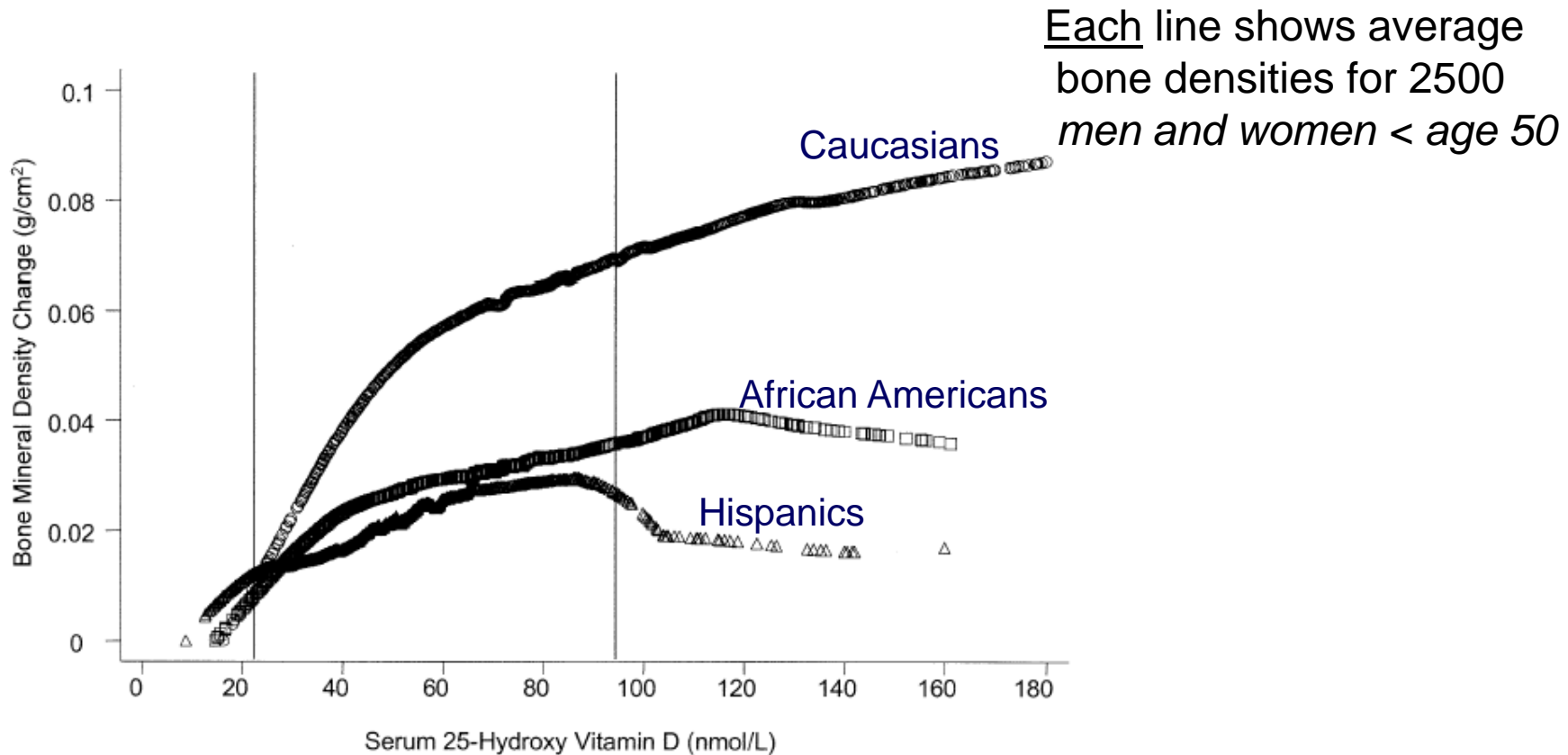
Risk of hip fracture
Vitamin D plus calcium vs. placebo



Risk of Falling Between Vitamin D-Treated Groups and Control Groups: Primary Analyses



Vitamin D and bone density in adults <50yrs



Hypovitaminosis D in Children

- Vit D is essential for skeletal growth during childhood.
- High prevalence of low D levels in children/adolescents
- Low D levels inversely correlate with PTH and directly correlate with BMD
- RCT: Vitamin D increases bone area and mass, lean mass
- Predictors for low D: latitude, season, gender, SES, culture, skin-pigmentation
 - Mean summer, N= 2200: 28 ng/ml (70 nmol/L).
 - Mean winter, N= 3584: 16 ng/ml (43 nmol/L).
Winter: 40-100% < 20 ng/ml.
 - NHANES III: 20% < 20 ng/ml in winter, 30% girls, 13% boys

*El-Hajj Fuleihan G and Vieth R International Congress series, Elsevier, 2007;1297:91-
El-Hajj Fuleihan G et al JCEM 2006; 91:405-*

Hypovitaminosis D

Conclusions

- Hypovitaminosis D is strikingly common in “apparently healthy” individuals, lowest levels are in the Middle East
 - Predictors age, gender, veiling, season, parity, SES

 - This has a negative impact of musculoskeletal health
 - Vit D status inversely correlates with PTH ($R=-0.2$ to -0.37) and directly with bone mass ($R=0.2-0.35$)
 - Elderly with OP have lower 25-OHD, and in some studies higher levels of PTH
 - 25-OHD level positively correlates with bone mass
 - RCT show that Ca/D ($> 700\text{IU/day}$) reduce falls and fracture risk.
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Hypovitaminosis D

Conclusions

- Deleterious impact on maternal & neonatal health is anticipated but not established
 - ❑ Musculoskeletal outcomes (*Morley et al. JCEM 2006, Javaid et al. Lancet 2006*)
 - ❑ Cardiovascular: Pre-eclampsia (*Bodnar JCEM 2007*)
 - ❑ Insulin resistance & gestational diabetes: (*Pittas Diabetes Care 2007*)
 - ❑ Infections

 - Evidence lacks to define optimal dose in pregnant and breast-feeding women, infants, pre-pubertal children and the elderly

 - Meanwhile, suggest increments in recommended doses
 - ❑ To achieve desirable 25-OHD level 30 ng/ml
 - 2000 IU/day in adolescents is suggested (if baseline 25-OHD <15ng /ml)
 - Adults 2000-4000 IU/day
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