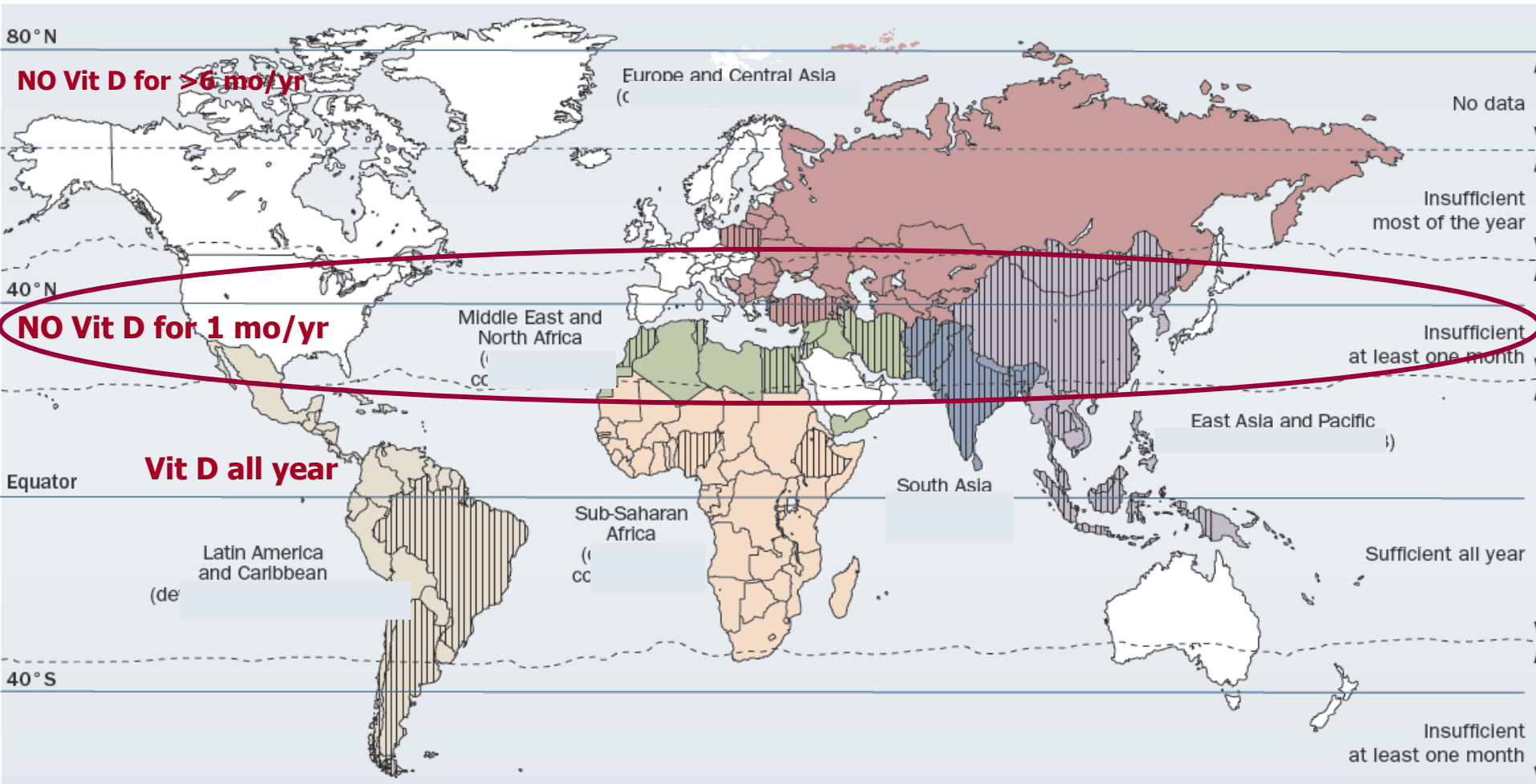


# Vitamin D Synthesis by Latitude



World map relating latitude by geographic regions to skin ability to synthesize vitamin D

# Nutritional Rickets in ME

- Prevalence 27% in 197 children <5 yrs North Yemen
- No population-based incidence rates, but estimates
  - 10% Egypt
  - 1% Kuwait , < 2yrs, 1981-86
  - 0.5% of Saudis < 2 yrs 1997-1999
- **Rates 100 folds higher than incidence rates in developed western countries: 3-7/100,000**
- **Accounts for substantial number of hospital admissions**
  - 1.8% of hospital admission in Saudi Arabia
  - 6.5 % in admissions of newborns in Kuwait
  - 10.6% of infants admission with acute illness in Jordan

# Hypovitaminosis D: Adults ME and Africa

<u>Mean 25-OHD</u>	10 ng/ml in Lebanese, Saudi, Emirati, Iranian	El-Hajj Fuleihan et al., 1999; Ghannam et al., 1999; Gannage et al., 2000; Saadi et al., 2006; Arabi et al., 2006
% < 10ng/ml	60-66% Lebanese, Jordanian, Iranian	El-Hajj Fuleihan et al., 1999; Mishal et al., 2001 Hashemipour et al., 2006
% < 15ng/ml	48% Tunisia	Meddeb et al., 2005
<u>Elderly</u>	37% Lebanese men and	Arabi et al., 2006
% < 10ng/ml	56% Lebanese women	
	8% men and 14% women	LASA Lips et al. 2004

*Adapted from El-Hajj Fuleihan. Clinical Reviews in Bone and Mineral Metabolism , 2009*

## Vitamin D intakes recommended by the IOM and the Endocrine Society (ES) Practice Guidelines Committee / Adults

Life stage group	IOM recommendations			ES recommendations for patients at risk for vitamin D deficiency	
	EAR	RDA	UL	Daily	UL
<b>Adults</b>					
19-30 yr	400 IU (10 µg)	600 IU (15 µg)	4,000 IU (100 µg)	1,500–2,000 IU	10,000 IU
31-50 yr	400 IU (10 µg)	600 IU (15 µg)	4,000 IU (100 µg)	1,500–2,000 IU	10,000 IU
51-70 yr	400 IU (10 µg)	600 IU (15 µg)	4,000 IU (100 µg)	1,500–2,000 IU	10,000 IU
> 70 yr	400 IU (10 µg)	600 IU (20 µg)	4,000 IU (100 µg)	1,500–2,000 IU	10,000 IU

# Hypovitaminosis D in EMR

- **Hypovitaminosis D is strikingly common in “apparently healthy” individuals, lowest levels are in the Middle East-silent precursor of CNDs**
  - ❑ Predictors age, gender, veiling, season, parity, SES
  - ❑ Genetic polymorphisms in metabolic pathway may contribute: CYP21R
- **This has a negative impact on 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 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.
  - ❑ Deleterious impact on maternal & neonatal health is anticipated but not established (*Morley et al. JCEM 2006, Javaid et al. Lancet 2006*)
- **There may be an effect on non-classical outcomes need for RCT**
  - ❑ Cardiovascular: for eg Pre-eclampsia (*Bodnar JCEM 2007*)
  - ❑ Insulin resistance & DM including gestational diabetes: (*Pittas Diabetes Care 2007*)
  - ❑ Infections

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# Hypovitaminosis D in EMR

- **Assay variation** somewhat limits comparability across studies and is a major obstacle in advancing field-Need for QA programs
  - **Calcium intake** does, and **VDR polymorphisms** may, modulate effect of hypovitaminosis D on major outcomes
  - **Recommendations** in western populations need to be adjusted upwards in Eastern Mediterranean Region
  - **Evidence lacks to define optimal dose in:**
    - pregnant and breast-feeding women, infants, pre-pubertal children and the elderly in the EMR and for non-classical outcomes worldwide
  - **Meanwhile, suggest increments in recommended doses**
    - To achieve desirable 25-OHD level 25-30 ng/ml
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