

Table S1. Cross sectional cohorts with measurements of 25-OHD in Sweden

Author, Study	Cohort, Location Time Period	Study population, Sex, age	25-OHD (nmol/L)	Seasonal variation in 25-OHD (nmol/L)	Proportions of vit D deficient participants (25-OHD, nmol/L)	Comments
Arnljots 2017 [1]	Nursing homes, 57-58°N, Jan-March 2012	n=545, 32% men Mean age 86	27 (4–125)	No data	41% < 25 82% < 50	17% on vitamin D supplementation
Samefors 2014 [2] SHADES	Nursing homes Southern Sweden, 2007-11	n=333, 32% men Mean age women 86, men 83	40 (16) Min-max 12–120	May-Oct 39 Nov-April 35 (mean, p<0.01)	80% < 50	Vitamin D supplementation = exclusion criterion
Samefors 2017 [3] CARDIPP	Community dwelling, DM II, 57-58°N, 2005-08	n=698, 66% men Mean age 60	51 (22)	Correction for season in multivariate analysis	8% < 25 55% < 50	Vitamin D supplementation = exclusion criterion
Carlsson 2016 [4]	County hospital + general public 56,7°N Feb 2014-April -15	n=475 45% men Mean age 78 in healthy controls	HC ≥75 years: 74 (22-154) Fractures: 50 (10-128) Stroke: 62 (16-135) FA: 56 (16-165) Nursing homes: 38 (15-132)	Small difference April-Sept vs Oct-March (p=0.003).	Healthy controls: 13% < 50 Nursing home residents: 75% < 50	Vitamin D prescription: 15.5% FA, 0% HC. No information on supplements.
Klingberg 2015 [5]	Blood + trc donors 57.4°N April-Nov 2008	n=540 blood donors, 62% men, mean age 40.5 n=75 trc donors, 92% men, mean age 46	Mean 60 (10-224)	July: 82 (26) vs Feb: 48 (21), p<0.001 Q1: 48 (20) vs Q3: 78 (27), p<0.001	Q1: 59% <50, 88% <75 Q2: 36% <50, 76% <75 Q3: 8% <50, 45% <75 Q4: 30% <50, 80% <75	8 % on multivitamin supplementation
Nälsén 2020 [6] Riksmaten	All Swedish regions 2010-11	n=268	May-Oct 65 (24-168) Nov-Apr 55 (20-94)	May-Oct: 5%<30, 18%<50 Nov-Apr: x%<30, 40%<50	See “seasonal variation”	7.5% on dietary supplements
Buchebner 2019 [7] OPRA	Community dwelling, Southern Sweden, 1995-99, 16 years follow up	75 years: n=1044 80 years n=715 85 years n=382 100% women	75 years: 62 (19) 80 years: 78 (30) 85 years: 79 (26)	No data	Data not shown	75 years: 6 % vit D suppl. 80 years: 47 % 85 years: 52%
Lundström 2019 [8]	Overweight, impaired glucose tolerance 59°N, 2006-08	n=158 45% men	Before summer: 55 (22) After summer: 66 (21)	Seasonal variative also in non-users (p 0.03)	Before summer: 37% < 30 , After summer: 4% < 30, 18% < 50	13 % on supplements, mean dose 7.5 ug
Björk 2019[9]	Community dwelling (MrOS Sweden), 2000-02	n=2924 100% Men Mean age 75	79 (22.5)	Vitamin D values were deseasonalized	1% < 25	No information on vitamin D “ supplementation

For cross-sectional 25-OHD, median values with (min-max) or mean values with standard deviation (SD) are presented. **Abbreviations:** 25-OHD: 25-hydroxyvitamin D, DM: Diabetes mellitus, FA: Frequent admissions, HC: healthy controls °N: degrees North (latitude), Q: Quarter (of the year), trc: thrombocytes, vit:vitamin

References

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Table S2. Baseline levels and change in 25-OHD (nmol/L) after 12 weeks supplementation of vitamin D3 4000 IU/day in relation to cutoff levels in a cohort of patients with cancer in palliative phase.

Baseline 25-OHD	Number of patients (%)	25-OHD at 12 weeks				
		≤ 25	26-50	51-75	76-100	>100
≤ 25	9 (13)	0	2 (22)	3 (33)	2 (22)	2 (22)
26-50	58 (87)	0	7 (12)	15 (26)	23 (40)	13 (22)

Table S3. 25-OHD in the screening cohort (n=530) i relation to season.

Time period	Number of cases, N (%)	25-OHD Median (IQR) Min-max	25-OHD Mean (SD)	25-OHD <25 n (%)	25-OHD 25-49 n (%)	25-OHD 50-74 n (%)	25-OHD 75-124 n (%)	25-OHD ≥125 n (%)	Comparison of mean 25-OHD-levels between Q1-Q4
Q1	186 <i>Jan: 67 Feb: 51 March: 68</i>	52 (37-67) 8-195	55,4 (28.4)	18 (9)	69 (37)	72 (39)	22 (12)	5 (3)	Q1vs Q2: 0.85 Q1vs Q3: 0.86 Q1vs Q4: 0.86
Q2	85 <i>April: 33 May: 40 June: 12</i>	50 (35-72) 15-149	56.1 (28.4)	10 (12)	32 (38)	24 (28)	16 (19)	3 (3)	Q2 vs Q3: 0.74 Q2 vs Q4: 0.25
Q3	84 <i>July: 16 August: 24 Sept: 44</i>	53 (39-70) 8-129	54.7 (23.9)	8 (10)	27 (32)	33 (39)	15 (18)	1 (1)	Q3 vs Q4: 0.44
Q4	175 Oct: 34 Nov: 92 Dec: 49	50 (39-63) 9-175	52.3 (22.9)	18 (10)	67 (38)	64 (37)	25 (14)	1 (1)	
Nov-April	360	50 (37-66) 8-195	54.2 (26.5)	35 (10)	140 (39)	130 (36)	48 (13)	7 (2)	Nov-April vs May-Oct: 0.82
May-Oct	170	53 38-70 8-149	54.8 (24.8)	19 (11)	55 (32)	63 (37)	30 (18)	3 (2)	
All	530	ref	ref	54 (10)	210 (40)	183 (34)	73 (14)	10 (2)	

Table S4. Change in 25-OHD over 12 weeks in relation to season in vitamin D supplemented patients and in patients receiving placebo.

Change in 25-OHD in nmol/L over 12 weeks in patients randomized to placebo			
Time period	Number of subjects	Change in 25-OHD Median (IQR) <i>min-max</i>	p=
Q1	21	3 (-3 – 14) -25 – 44	Q1 vs Q2: 0.90 Q1 vs Q3: 0.15 Q1 vs Q4: 0.03
Q2	14	4 (-6 – 13.5), -15 – 23	Q2 vs Q3: 0.37 Q2 vs Q4: 0.15
Q3	12	0 (-7.25– 5.5) -10 – 13	Q3 vs Q4: 0.34
Q4	31	-3 (-10 – 6.5) -17– 20	
May-October	24	0 (-6 – 12) -25 – 44	Nov-April vs May-Oct: 0.60
Nov-April	59	1 (-8 – 6) -13 – 23	
All	83	0 (-6 – 10.5) -25 – 44	
Change in 25-OHD over 12 weeks in patients randomized to vitamin D 4000 IU/day			
Time period	Number of subjects	Change in 25OHD Median (IQR) <i>min-max</i>	p=
Q1	19	44 (36 – 62) 26 – 116	Q1vsQ2: 0.87 Q1vsQ3: 0.27 Q1vsQ4: 0.07
Q2	11	47 (35 – 65) 7– 84	Q2vsQ4: 0.30 Q2 vs Q3: 0.54
Q3	12	35.5 (8.5 – 61) -2 – 122	Q3 vs Q4: 0.98
Q4	25	37 (20 – 55) -2 – 94	
May-October	24	41 (20 – 61), -2 – 122	Nov-April vs May-Oct: 0.95
Nov-April	43	39.5 (28.5 – 55) -2 - 116	
All	67	39.5 (27 – 58.5) -2 – 122	0.95