Supplemental Tables and figures

Table S1. Allele frequencies of SNPs lying on selected genes involved in the metabolism of vitamin D.

						Minor Allele Frequency		
No.	**Gene**	**SNP**	**Minor Allele**	**Major Allele**	**Location**	**CEU[1]**	**MXL[2]**	**HWCS[3]**
1	*PDE3B*	rs7116978	T	C	14838347	37	38	36.5
2	*CYP2R1*	rs1993116	C	T	14866810	59	62	37.4
3	--	rs12794714	A	G	14870151	43	51	44.2
4	*CYP2R1*	rs10741657	A	G	14871454	40	38	37.4
5	*CYP2R1*	rs2060793	G	A	14871886	60	60	37.7
6	*CYP2R1*	rs10766197	A	G	14878456	46	33	25.6
7	*VDR*	rs10783219	A	T	46581755	64	44	42.7
8	*VDR*	rs4516035	C	T	46586093	37	27	26.7
9	*VDR*	rs7139166	G	C	46586601	37	27	26.5
10	*CYP24A1*	rs2244719	T	C	52216265	60	48	40.2
11	*CYP24A1*	rs2296241	A	G	52219626	54	33	39.5
12	*CYP27B1*	rs4646536	G	A	56444255	33	34	36.8
13	*CYP27B1*	rs703842	G	A	56449006	33	34	36.9
14	*DHCR7*	rs1790349	C	T	70819998	19	16	16.1
15	*NADSYN1*	rs7944926	G	A	70843273	70	47	46.8
16	*NADSYN1*	rs4944957	G	A	70845683	70	47.7	47.7
17	*NADSYN1*	rs12800438	A	G	70848651	70	47.7	46.1
18	*NADSYN1*	rs3794060	T	C	70865327	70	47	45.4
19	*NADSYN1*	rs3829251	A	G	70872207	19	20	19.4
20	*LOC645474*	rs4945008	G	A	70898896	70	47	46.4
21	*LOC645474*	rs11234027	A	G	70911755	20	20	16.5
22	*GC*	rs12512631	C	T	72820195	35	31	41.1
23	*GC*	rs17467825	G	A	72824381	26	30	23.9
24	*GC*	rs2282679	G	T	72827247	24	30	23.9
25	*GC*	rs3755967	T	C	72828262	26	30	24
26	*GC*	rs2298850	C	G	72833131	23	27	22.9
27	*GC*	rs7041	C	A	72837198	57	45	47.6
28	*GC*	rs1155563	C	T	72862352	27	27	22.3
29	*C10orf88*	rs6599638	A	G	124694139	49	31	34.4

[1]Utah residents with Northern and Western European ancestry (CEU) obtained from 1000 Genomes. [2]Mexican ancestry in Los Angeles, California (MXL) obtained from 1000 Genomes. [3]Postmenopausal women of Health Workers Cohort Study (HWCS). SNPs with *p*-value >0.05 of the chi-square test for Hardy-Weinberg equilibrium.

Table S2. Multiple logistic regressions for Vitamin D deficiency as the dependent variable.

Variables	**OR (95% CI)**	***p* Value**
Age	1.04 (1.02–1.06)	<0.001
45-59 years	1.0	
60-74 years	1.95 (1.36–2.79)	<0.001
>74 years	3.07 (1.70–5.56)	<0.001
Education		
Elementary/Secondary	1.0	
High school	1.15(0.72–1.84)	0.560

University or more	1.30 (0.89–1.93)	0.173
Non smoker	1.0	
Smoking Current	1.59 (0.84–3.03)	0.155
Past	0.80 (0.55–1.16)	0.244
Vitamin D intake (UI)		
Tertile 1	1.0	
Tertile 2	0.79 (0.53–1.16)	0.229
Tertile 3	0.61 (0.39–0.95)	0.028
Season of blood collection		
Winter	1.0	
Spring	0.62 (0.40–0.96)	0.032
Summer	0.99 (0.57–1.70)	0.968
Autunm	0.99 (0.48–2.02)	0.973
Leisure time physical activity (min/day)		
Active (≥30 min/day)	0.91 (0.63–1.30)	0.597
BMI, Normal		
Overweight	0.98 (0.66–1.45)	0.913
Obesity	1.08 (0.70–1.66)	0.725
Body fat proportion	1.00 (0.97–1.04)	0.829
Tertile 1	1.0	
Tertile 2	1.29 (0.87–1.91)	0.203
Tertile 3	0.95 (0.64–1.41)	0.792

Multivariate models.

Table S3: Odds ratio for the association of vitamin D metabolism genetic variants and vitamin D deficiency in a sample of 400 postmenopausal women.

	Gene	SNP	Genotypes	Not Deficient*, n (%)	Deficient*, n (%)	Crude OR(CI 95%)	P value	Model OR(CI 95%)	P value
1	*VDR*	rs10783219	TT	94 (38.5)	39 (26.5)	1.0		1.0	
			TA	105 (43.0)	76 (51.7)	1.74(1.08-2.81)	0.022	1.72(1.04-2.87)	0.036
			AA	45 (18.4)	32 (21.8)	1.71(0.95-3.08)	0.072	1.89(1.02-3.53)	0.045
		Additive model				1.34(1.01-1.79)	0.042	1.40(1.03-1.90)	0.031
2	*VDR*	rs4516035	TT	146 (60.1)	61 (41.5)	1.0		1.0	
			TC	86 (35.4)	72 (49.0)	2.00(1.30-3.09)	0.002	2.00(1.27-3.17)	0.003
			CC	11 (4.5)	14 (9.5)	3.05(1.30-7.09)	0.01	3.27(1.35-7.96)	0.009
		Additive model				1.87(1.33-2.62)	<0.001	1.89(1.32-2.70)	0.001
3	*VDR*	rs7139166	CC	149 (60.8)	61 (41.5)	1.0		1.0	
			CG	84 (34.3)	72 (49.0)	2.09(1.36-3.23)	0.001	2.14(1.35-3.40)	0.001
			GG	12 (4.9)	14 (9.5)	2.85(1.25-6.51)	0.013	3.11(1.30-7.44)	0.011
		Additive model				1.87(1.34-2.61)	<0.001	1.93(1.35-2.75)	<0.001
4	*GC*	rs12512631	TT	77 (31.4)	56 (38.1)	1.0		1.0	
			TC	121 (49.4)	74 (50.3)	0.84(0.54-1.32)	0.45	0.89(0.56-1.43)	0.63
			CC	47 (19.2)	17 (11.6)	0.50(0.26-0.96	0.036	0.59(0.30-1.16)	0.129
		Additive model				0.74(0.54-0.99)	0.047	0.80(0.58-1.10)	0.165
5	*GC*	rs17467825	AA	150 (61.5)	72 (49.0)	1.0		1.0	
			AG	87 (35.7)	64 (43.5)	1.53(1.00-2.35)	0.051	1.64(1.04-2.60)	0.033
			GG	7 (2.9)	11 (7.5)	3.27(1.22-8.80)	0.019	3.48(1.19-10.20)	0.023
		Additive model				1.64(1.16-2.33)	0.005	1.73(1.19-2.52)	0.004
6	*GC*	rs2282679	TT	150 (61.5)	72 (49.0)	1.0		1.0	
			TG	87 (35.7)	64 (43.5)	1.53(1.00-2.35)	0.051	1.65(1.04-2.61)	0.032
			GG	7 (2.9)	11 (7.5)	3.27(1.22-8.80)	0.019	3.45(1.18-10.12)	0.024
		Additive model				1.64(1.16-2.33)	0.005	1.73(1.19-2.52)	0.004

7	*GC*	rs3755967	CC	150 (61.2)	72 (49.0)	1.0		1.0	
			CT	88 (35.9)	64 (43.5)	1.52(0.99-2.32)	0.057	1.61(1.02-2.54)	0.040
			TT	7 (2.9)	11 (7.5)	3.27(1.22-8.80)	0.019	3.48(1.19-10.18)	0.023
		Additive model				1.63(1.15-2.31)	0.005	1.71(1.18-2.49)	0.005
8	*GC*	rs2298850	GG	154 (62.9)	75 (51.0)	1.0		1.0	
			GC	84 (34.3)	62 (42.2)	1.52(0.99-2.33)	0.057	1.64(1.04-2.60)	0.034
			CC	7 (2.9)	10 (6.8)	2.93(1.07-8.01)	0.036	2.88(0.98-8.51)	0.055
		Additive model				1.59(1.12-2.27)	0.010	1.67(1.14-2.43)	0.008
9	*GC*	rs7041	AA	59 (24.1)	51 (34.7)	1.0		1.0	
			AC	123 (50.2)	67 (45.6)	0.63(0.39-1.02)	0.059	0.70(0.42-1.15)	0.156
			CC	63 (25.7)	29 (19.7)	0.53(0.30-0.95)	0.033	0.60(0.33-1.10)	0.099
		Additive model				0.72(0.54-0.96)	0.027	0.77(0.57-1.04)	0.087
10	*GC*	rs1155563	TT	155 (63.3)	72 (49.0)	1.0		1.0	
			TC	86 (35.1)	69 (46.9)	1.73(1.13-2.64)	0.011	1.76(1.13-2.76)	0.013
			CC	4 (1.6)	6 (4.1)	3.23(0.88-11.80)	0.076	2.96(0.71-12.34)	0.135
		Additive model				1.75(1.20-2.54)	0.004	1.76(1.18-2.61)	0.006

*Not deficient: Vitamin D >20 nmol/L; Deficient: Vitamin D <19.9 nmol/L. Adjusted model: adjusted for age (<60,60-74,>74 years), body fat proportion (tertiles), vitamin D intake (tertiles), season of blood collection (winter, spring, summer, autumn), leisure time physical activity (≥30 min) and ancestry (three factors).

Table S4: Multivariate ORs and 95% CIs for the association between *DHCR7/NADSYN1* tag SNP and osteopenia/osteoporosis (n=689).

SNP	Genotype	Normal	Osteopenia/ Osteoporosis	Crude model	P value	Model	P value
rs3794060	CC	130 (30.7)	59 (22.7)	1.0		1.0	
	CT	215 (50.8)	140 (53.9)	1.43(0.99-2.09)	0.059	1.57(1.03-2.40)	0.035
	TT	78 (18.4)	61 (23.5)	1.72(1.09-2.72)	0.020	1.83(1.10-3.06)	0.021
	Additive model			1.32(1.05-1.65)	0.016	1.36(1.06-1.76)	0.017
rs4944957	AA	125 (29.6)	58 (22.2)	1.0		1.0	
	AG	207 (48.9)	134 (51.3)	1.40(0.95-2.04)	0.086	1.58(1.03-2.42)	0.036
	GG	91 (21.5)	69 (26.4)	1.63(1.05-2.54)	0.029	1.77(1.08-2.91)	0.025
	Additive model			1.28(1.03-1.59)	0.028	1.33(1.04-1.71)	0.023

Adjusted model: adjusted for age (<60, 60-74,>74 years), and body fat proportion (tertiles).

Figure S1. Flowchart of study population.

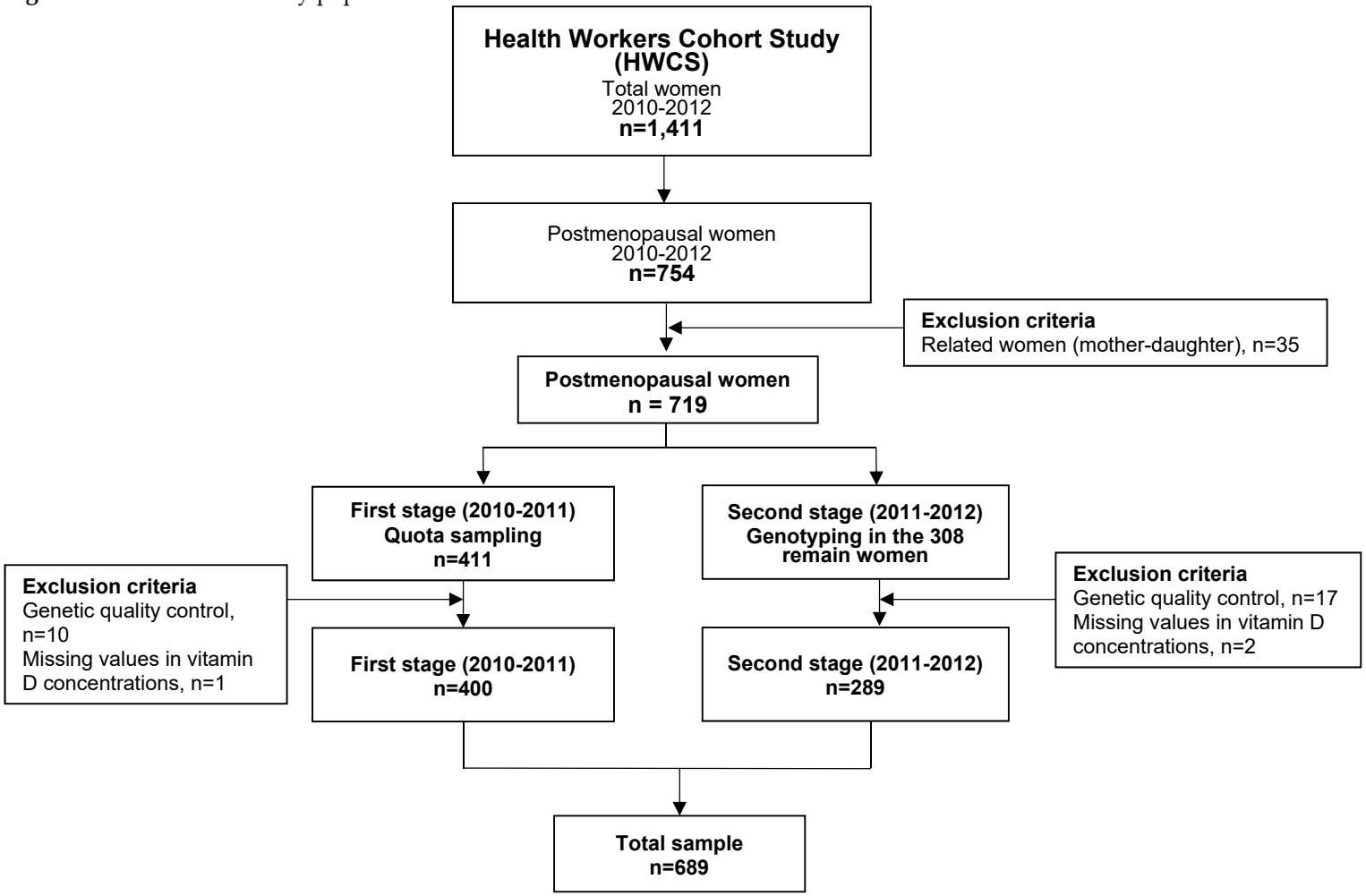

Figure S2: Linkage disequilibrium map of single nucleotide polymorphisms in the VDR and GC genes.