

Table S1: Search strategy

1) Search 1

Database PubMed

Date 6th February 2019

Total records 2194

String:

(vitamin d[MeSH Terms] OR vitamin d deficiency[MeSH Terms] OR 25-hydroxyvitamin d[MeSH Terms] OR "vitamin d"[Title/Abstract] OR "25-hydroxyvitamin d"[Title/Abstract] OR "25(OH)D"[Title/Abstract] OR "1,25(OH)2D"[Title/Abstract] OR "1,25 dihydroxyvitamin d"[Title/Abstract] OR 1,25 dihydroxyvitamin d[MeSH Terms]) AND (aged[MeSH Terms] OR aging[MeSH Terms] OR "Aged, 80 and over"[Mesh] OR "old age people" OR elder* OR adult* OR retired OR ancient*) AND (healthy aging[MeSH Terms] OR Quality-Adjusted Life Years[MeSH Terms] OR longevity[MeSH Terms] OR "healthy ag*" OR "healthy status" OR "health status" OR "ill health" OR longevity OR mortality OR "all-causes death*" OR death* OR diseas* OR "physical function*" OR "cognitive function*" OR "cognitive impairment" OR "social function*" OR wellbeing OR well-being OR "quality of life" OR "aging status" OR "ageing status" OR balance OR "physical performanc*" OR frailt*) NOT supplement* NOT therapy[MeSH Terms] NOT patients[MeSH Terms] NOT patient*[Title/Abstract] NOT ill* NOT "medicin* use" NOT "drug* use" NOT "medicin* therap*" NOT "drug* therap*" NOT treat* NOT care NOT cure Filters: Publication date from 2000/01/01 to 2019/12/31

#25	#24 Filters: Publication date from 2000/01/01 to 2019/12/31, 2194
#24	(#17 AND #1 AND #7) NOT supplement* NOT therapy[MeSH Terms] NOT patients[MeSH Terms] NOT patient*[Title/Abstract] NOT ill* NOT "medicin* use" NOT "drug* use" NOT "medicin* therap*" NOT "drug* therap*" NOT treat* NOT care NOT cure, 3294
#23	(#17 AND #1 AND #7) NOT supplement*, 14959
#22	Search NOT therapy[MeSH Terms] NOT patients[MeSH Terms] NOT patient*[Title/Abstract] NOT ill* NOT "medicin* use" NOT "drug* use" NOT "medicin* therap*" NOT "drug* therap*" NOT treat* NOT care NOT cure, 1339825
#21	(#17 AND #1 AND #7) NOT (#20 OR #2), 837
#20	Search supplement*, 310371
#19	#17 AND #1 AND #7, 19991
#18	#17 AND #1, 30405
#17	Search (vitamin d[MeSH Terms] OR vitamin d deficiency[MeSH Terms] OR 25-hydroxyvitamin d[MeSH Terms] OR "vitamin d"[Title/Abstract] OR "25-hydroxyvitamin d"[Title/Abstract] OR "25(OH)D"[Title/Abstract] OR "1,25(OH)2D"[Title/Abstract] OR "1,25 dihydroxyvitamin d"[Title/Abstract] OR 1,25 dihydroxyvitamin d[MeSH Terms]), 87537
#16	Search (vitamin d[MeSH Terms] OR vitamin d deficiency[MeSH Terms] OR 25-hydroxyvitamin d[MeSH Terms] OR "vitamin d"[Title/Abstract] OR "25-hydroxyvitamin d"[Title/Abstract] OR "25(OH)D"[Title/Abstract] OR "1,25(OH)2D"[Title/Abstract] OR "1,25 dihydroxyvitamin d"[Title/Abstract] OR 1,25 dihydroxyvitamin d[MeSH Terms]) Filters: Observational Study, 538
#15	#14 Filters: Publication date from 2000/01/01 to 2019/12/31, 4532
#14	#13 Filters: Observational Study, 4532

#13	Search ((aged[MeSH Terms] OR aging[MeSH Terms] OR "Aged, 80 and over"[Mesh] OR "old age people" OR elder* OR adult* OR retired OR ancient*) NOT therapy[MeSH Terms] NOT patients[MeSH Terms] NOT "medicin* use" NOT "drug* use" NOT "medicin* therap*" NOT "drug* therap*" NOT treat* NOT care NOT cure AND (untreat*) AND (vitamin d[MeSH Terms] OR vitamin d deficiency[MeSH Terms] OR 25-hydroxyvitamin d[MeSH Terms] OR "vitamin d" OR "25-hydroxyvitamin d" OR "25(OH)D") AND (association[MeSH Terms] OR associat* OR predict*) AND ("healthy aging"[MeSH Terms] OR "Quality-Adjusted Life Years"[MeSH Terms] OR longevity[MeSH Terms] OR "healthy ag*" OR "healthy status" OR "health status" OR "ill health" OR longevity OR mortality OR "all-causes death*" OR death* OR diseas* OR "physical function*" OR "cognitive function*" OR "cognitive impairment" OR "social function*" OR wellbeing OR well-being) OR "quality of life" OR "aging status" OR "ageing status" OR balance OR "physical performanc*" OR frailt*)), 640487
#9	Search ((aged[MeSH Terms] OR aging[MeSH Terms] OR "Aged, 80 and over"[Mesh] OR "old age people" OR elder* OR adult* OR retired OR ancient*) NOT therapy[MeSH Terms] NOT patients[MeSH Terms] NOT "medicin* use" NOT "drug* use" NOT "medicin* therap*" NOT "drug* therap*" NOT treat* NOT care NOT cure AND untreat* AND (vitamin d[MeSH Terms] OR vitamin d deficiency[MeSH Terms] OR 25-hydroxyvitamin d[MeSH Terms] OR vitamin d 3[MeSH Terms] OR "vitamin d" OR "vitamin d3" OR "25-hydroxyvitamin d" OR "25(OH)D" OR 1,25 dihydroxyvitamin d3[MeSH Terms] OR "1,25 gihydroxyvitamin d*" OR "1,25(OH)2D3") AND (association[MeSH Terms] OR associat* OR predict*) AND (healthy aging[MeSH Terms] OR Quality-Adjusted Life Years[MeSH Terms] OR longevity[MeSH Terms] OR "healthy ag*" OR "healthy status" OR "health status" OR "ill health" OR longevity OR mortality OR "all-causes death*" OR death* OR diseas* OR "physical function*" OR "cognitive function*" OR "cognitive impairment" OR "social function*" OR wellbeing OR well-being OR "quality of life" OR "aging status" OR "ageing status" OR balance OR "physical performanc*" OR frailt*))), 27
#8	(#1 AND #5 AND #6 AND #7) NOT #2, 15
#7	Search ("healthy aging"[MeSH Terms] OR "Quality-Adjusted Life Years"[MeSH Terms] OR longevity[MeSH Terms] OR "healthy ag*" OR "healthy status" OR "health status" OR "ill health" OR longevity OR mortality OR "all-causes death*" OR death* OR diseas* OR "physical function*" OR "cognitive function*" OR "cognitive impairment" OR "social function*" OR wellbeing OR well-being OR "quality of life" OR "aging status" OR "ageing status" OR balance OR "physical performanc*" OR frailt*), 11981403
#6	Search (association[MeSH Terms] OR associat* OR predict*), 5191641
#5	Search (vitamin d[MeSH Terms] OR vitamin d deficiency[MeSH Terms] OR 25-hydroxyvitamin d 2[MeSH Terms] OR 25-hydroxyvitamin d[MeSH Terms] OR vitamin d 3[MeSH Terms] OR "vitamin d" OR "vitamin d3" OR "25-hydroxyvitamin d" OR "25(OH)D" OR 1,25 dihydroxyvitamin d3[MeSH Terms] OR "1.25 gihydroxyvitamin d*" OR "1.25(OH)2D3"), 94347
#4	Search 1,25 dihydroxyvitamin d3[MeSH Terms], 13805
#3	Search untreat*, 164004
#2	Search (NOT therapy[MeSH Terms] NOT patients[MeSH Terms] NOT "vitamin d2" NOT "medicin* use" NOT "drug* use" NOT "medicin* therap*" NOT "drug* therap*" NOT treat* NOT care NOT cure), 1700995
#1	Search (aged[MeSH Terms] OR aging[MeSH Terms] OR "Aged, 80 and over"[Mesh] OR "old age people" OR elder* OR adult* OR retired OR ancient*), 6851141

2) Search 2 (longevity and mortality)

Database PubMed

Date 28th March 2019

Total records 219

String:

(((((vitamin d[MeSH Terms] OR vitamin d deficiency[MeSH Terms] OR 25-hydroxyvitamin d[MeSH Terms] OR "vitamin d"[Title/Abstract] OR "25-hydroxyvitamin d"[Title/Abstract] OR "25(OH)D"[Title/Abstract] OR "1,25(OH)2D"[Title/Abstract] OR "1,25 dihydroxyvitamin d"[Title/Abstract] OR

1,25 dihydroxyvitamin d[MeSH Terms])) AND ((aged[MeSH Terms] OR aging[MeSH Terms] OR "Aged, 80 and over"[Mesh] OR "old age people" OR elder* OR adult* OR retired OR ancient*)) AND ((longevity[MeSH Terms] OR longevity OR mortality OR "all-causes death*" OR death* OR surviv*)) NOT ((supplement* OR therapy[MeSH Terms] OR patients[MeSH Terms] OR patient*[Title/Abstract] OR therap*)) NOT ((cross-sectional[Title/Abstract] OR trial*[Title/Abstract])) Filters: Humans

#13	#1 AND #2 AND #3 NOT #10 NOT #11 Filters: Humans, 219
#12	#1 AND #2 AND #3 NOT #10 NOT #11, 261
#11	Search (OR cross-sectional[Title/Abstract] OR trial*[Title/Abstract]), 1231368
#10	Search (OR supplement* OR therapy[MeSH Terms] OR patients[MeSH Terms] OR patient*[Title/Abstract] OR therap*), 10127305
#9	Search (NOT cross-sectional[Title/Abstract] NOT trial*[Title/Abstract]), 294801
#8	Search (NOT supplement* NOT therapy[MeSH Terms] NOT patients[MeSH Terms] NOT patient*[Title/Abstract] NOT therap*), 180940
#7	#1 AND #2 AND #3, 1399
#6	#1 AND #2 AND #3 NOT #4 Schema: all, 0
#5	#1 AND #2 AND #3 NOT #4, 0
#4	Search (NOT supplement* NOT therapy[MeSH Terms] NOT patients[MeSH Terms] NOT patient*[Title/Abstract] NOT ill* NOT "medicin* use" NOT "drug* use" NOT "medicin* therap*" NOT "drug* therap*" NOT treat* NOT care NOT cure), 116372
#3	Search (longevity[MeSH Terms] OR longevity OR mortality OR "all-causes death*" OR death* OR surviv*), 1948735
#2	Search (aged[MeSH Terms] OR aging[MeSH Terms] OR "Aged, 80 and over"[Mesh] OR "old age people" OR elder* OR adult* OR retired OR ancient*), 6919264
#1	Search vitamin d[MeSH Terms] OR vitamin d deficiency[MeSH Terms] OR 25-hydroxyvitamin d[MeSH Terms] OR "vitamin d"[Title/Abstract] OR "25-hydroxyvitamin d"[Title/Abstract] OR "25(OH)D"[Title/Abstract] OR "1,25(OH)2D"[Title/Abstract] OR "1,25 dihydroxyvitamin d"[Title/Abstract] OR 1,25 dihydroxyvitamin d[MeSH Terms], 88545

3) Search 3 (cardiovascular, coronary, and cerebrovascular diseases)

Database PubMed

Date 28th March 2019

Total records 255

String:

(((((vitamin d[MeSH Terms] OR vitamin d deficiency[MeSH Terms] OR 25-hydroxyvitamin d[MeSH Terms] OR "vitamin d"[Title/Abstract] OR "25-hydroxyvitamin d"[Title/Abstract] OR "25(OH)D"[Title/Abstract] OR "1,25(OH)2D"[Title/Abstract] OR "1,25 dihydroxyvitamin d"[Title/Abstract] OR 1,25 dihydroxyvitamin d[MeSH Terms])) AND (((aged[MeSH Terms] OR aging[MeSH Terms] OR "Aged, 80 and over"[Mesh] OR "old age people" OR elder* OR adult* OR retired OR ancient*)) AND (((("cardiovascular diseas*" OR "cardio heart diseas*" OR "coronary diseas*" OR "ischemic" OR "infarction" OR "atrial fibrillation" OR "angina" OR "cerebrovascular diseas*" OR "stroke"))) NOT ((supplement* OR therapy[MeSH Terms] OR patients[MeSH Terms] OR patient*[Title/Abstract] OR therap* OR cross-sectional[Title/Abstract] OR trial*[Title/Abstract] OR pregnan* OR child* OR adolescent* OR gene*)) Filters: Publication date from 2000/01/01 to 2019/03/01; Humans

#14	#13 Filters: Publication date from 2000/01/01 to 2019/03/01, Humans, 255
#13	(#1 AND #2 AND #9 AND Humans[Mesh]) NOT #12, 297
#12	Search (supplement* OR therapy[MeSH Terms] OR patients[MeSH Terms] OR patient*[Title/Abstract] OR therap* OR cross-sectional[Title/Abstract] OR trial*[Title/Abstract] OR pregnan* OR child* OR adolescent* OR gene*), 14133250
#11	(#1 AND #2 AND #9 AND Humans[Mesh]) NOT #7 Filters: Publication date from 2000/01/01 to 2019/03/01, Humans", 283
#10	(#1 AND #2 AND #9 AND Humans[Mesh]) NOT #7 Filters: Humans, 325
#9	Search (((("cardiovascular diseas*" OR "cardio heart diseas*" OR "coronary diseas*" OR "ischemic" OR "infarction" OR "atrial fibrillation" OR "angina" OR "cerebrovascular diseas*" OR "stroke"))) AND Humans[Mesh]) Filters: Humans, 1263250
#8	(#1 AND #2 AND #3 AND Humans[Mesh]) NOT #7 Filters: Humans, 310

#7	Search (((supplement* OR therapy[MeSH Terms] OR patients[MeSH Terms] OR patient*[Title/Abstract] OR therap* OR cross-sectional[Title/Abstract] OR trial*[Title/Abstract] OR pregnan* OR child* OR adolescent*) Filters: Humans, 10296659
#6	(#1 AND #2 AND #3 AND Humans[Mesh]) NOT #5 Filters: Humans, 404
#5	Search (supplement* OR therapy[MeSH Terms] OR patients[MeSH Terms] OR patient*[Title/Abstract] OR therap* OR cross-sectional[Title/Abstract] OR trial*[Title/Abstract]) Filters: Humans, 8423982
#4	(#1 AND #2 AND #3 AND Humans[Mesh]) Filters: Humans, 2096
#3	Search ("cardiovascular diseas*" OR "cardio heart diseas*" OR "ischemic" OR "infarction" OR "atrial fibrillation" OR "angina" OR "cerebrovascular diseas*" OR "stroke") Filters: Humans, 1214268
#2	Search (aged[MeSH Terms] OR aging[MeSH Terms] OR "Aged, 80 and over"[Mesh] OR "old age people" OR elder* OR adult* OR retired OR ancient*) Filters: Humans, 6381469
#1	Search (vitamin d[MeSH Terms] OR vitamin d deficiency[MeSH Terms] OR 25-hydroxyvitamin d[MeSH Terms] OR "vitamin d"[Title/Abstract] OR "25-hydroxyvitamin d"[Title/Abstract] OR "25(OH)D" [Title/Abstract] OR "1,25(OH)2D"[Title/Abstract] OR "1,25 dihydroxyvitamin d"[Title/Abstract] OR 1,25 dihydroxyvitamin d[MeSH Terms]) Filters: Humans, 65034

4) Search 4 (diabetes and metabolic diseases)

Database PubMed

Date 28th March 2019

Total records 218

String:

(((((vitamin d[MeSH Terms] OR vitamin d deficiency[MeSH Terms] OR 25-hydroxyvitamin d[MeSH Terms] OR "vitamin d"[Title/Abstract] OR "25-hydroxyvitamin d"[Title/Abstract] OR "25(OH)D" [Title/Abstract] OR "1,25(OH)2D"[Title/Abstract] OR "1,25 dihydroxyvitamin d"[Title/Abstract] OR 1,25 dihydroxyvitamin d[MeSH Terms]))) AND ((aged[MeSH Terms] OR aging[MeSH Terms] OR "Aged, 80 and over"[Mesh] OR "old age people" OR elder* OR adult* OR retired OR ancient*))) AND ((diabetes OR "diabetes mellitus" OR "type 2 diabetes" OR "T2DM" OR "type 2 DM" OR "metabolic syndrome*"))) NOT ((supplement* OR therapy[MeSH Terms] OR patients[MeSH Terms] OR patient*[Title/Abstract] OR therap* OR cross-sectional[Title/Abstract] OR trial*[Title/Abstract] OR pregnan* OR child* OR adolescent* OR gene* Or mendelian OR prevalenc)) Filters: Publication date from 2000/01/01 to 2019/03/01; Humans

#15	#14 Filters: Humans, 218
#14	#13 Filters: Publication date from 2000/01/01 to 2019/03/01, 255
#13	(#1 AND #2 AND #3) NOT #12, 290
#12	Search (supplement* OR therapy[MeSH Terms] OR patients[MeSH Terms] OR patient*[Title/Abstract] OR therap* OR cross-sectional[Title/Abstract] OR trial*[Title/Abstract] OR pregnan* OR child* OR adolescent* OR gene* Or mendelian OR prevalenc*), 14283922
#11	#10 Filters: Humans, 276
#10	#9 Filters: Publication date from 2000/01/01 to 2019/03/01, 321
#9	#5 NOT #8, 357
#8	Search mendelian, 11692
#5	(#1 AND #2 AND #3) NOT #4, 361
#7	#6 Filters: Publication date from 2000/01/01 to 2019/03/01, Humans, 279
#6	(#1 AND #2 AND #3) NOT #4 Filters: Publication date from 2000/01/01 to 2019/03/01, 324
#4	Search (supplement* OR therapy[MeSH Terms] OR patients[MeSH Terms] OR patient*[Title/Abstract] OR therap* OR cross-sectional[Title/Abstract] OR trial*[Title/Abstract] OR pregnan* OR child* OR adolescent* OR gene*), 14133250
#3	Search (diabetes OR "diabetes mellitus" OR "type 2 diabetes" OR "T2DM" OR "type 2 DM" OR "metabolic syndrome*"), 691310
#2	Search (aged[MeSH Terms] OR aging[MeSH Terms] OR "Aged, 80 and over"[Mesh] OR "old age people" OR elder* OR adult* OR retired OR ancient*), 6919264
#1	Search (vitamin d[MeSH Terms] OR vitamin d deficiency[MeSH Terms] OR 25-hydroxyvitamin d[MeSH Terms] OR "vitamin d"[Title/Abstract] OR "25-hydroxyvitamin d"[Title/Abstract] OR "25(OH)D" [Title/Abstract] OR "1,25(OH)2D"[Title/Abstract] OR "1,25 dihydroxyvitamin d"[Title/Abstract] OR 1,25 dihydroxyvitamin d[MeSH Terms]), 88545

5) Search 5 (cancer)

Database PubMed

Date 29th March 2019

Total records 167

String:

(((((vitamin d[MeSH Terms] OR vitamin d deficiency[MeSH Terms] OR 25-hydroxyvitamin d[MeSH Terms] OR "vitamin d"[Title/Abstract] OR "25-hydroxyvitamin d"[Title/Abstract] OR "25(OH)D"[Title/Abstract] OR "1,25(OH)2D"[Title/Abstract] OR "1,25 dihydroxyvitamin d"[Title/Abstract] OR 1,25 dihydroxyvitamin d[MeSH Terms]))) AND ((aged[MeSH Terms] OR aging[MeSH Terms] OR "Aged, 80 and over"[Mesh] OR "old age people" OR elder* OR adult* OR retired OR ancient*))) AND ((cancer* OR tumor* OR tumour* OR melanoma OR neoplasm*))) NOT ((supplement* OR therapy[MeSH Terms] OR patients[MeSH Terms] OR patient*[Title/Abstract] OR therap* OR cross-sectional[Title/Abstract] OR trial*[Title/Abstract] OR pregnan* OR child* OR adolescent* OR gene* OR mendelian OR prevalenc* OR protocol[Title/Abstract]))) AND ((cohort OR longitudinal OR prospectiv* OR "nested case-control")) Filters: Publication date from 2000/01/01 to 2019/03/01; Humans

#9	#7 NOT #8 Filters: Publication date from 2000/01/01 to 2019/03/01, Humans", 167
#8	Search (cohort OR longitudinal OR prospectiv* OR "nested case-control"), 2356311
#7	#6 Filters: Humans, 443
#6	#5 Filters: Publication date from 2000/01/01 to 2019/03/01, 466
#5	(#1 AND #2 AND #3) NOT #4, 680
#4	Search (supplement* OR therapy[MeSH Terms] OR patients[MeSH Terms] OR patient*[Title/Abstract] OR therap* OR cross-sectional[Title/Abstract] OR trial*[Title/Abstract] OR pregnan* OR child* OR adolescent* OR gene* OR mendelian OR prevalenc* OR protocol[Title/Abstract]), 14368617
#3	Search (cancer* OR tumor* OR tumour* OR melanoma OR neoplasm*), 3916485
#2	Search (aged[MeSH Terms] OR aging[MeSH Terms] OR "Aged, 80 and over"[Mesh] OR "old age people" OR elder* OR adult* OR retired OR ancient*), 6919264
#1	Search (vitamin d[MeSH Terms] OR vitamin d deficiency[MeSH Terms] OR 25-hydroxyvitamin d[MeSH Terms] OR "vitamin d"[Title/Abstract] OR "25-hydroxyvitamin d"[Title/Abstract] OR "25(OH)D"[Title/Abstract] OR "1,25(OH)2D"[Title/Abstract] OR "1,25 dihydroxyvitamin d"[Title/Abstract] OR 1,25 dihydroxyvitamin d[MeSH Terms]), 88545

6) Search 6 (respiratory diseases)

Database PubMed

Date 28th March 2019

Total records 15

String:

((((((((vitamin d[MeSH Terms] OR vitamin d deficiency[MeSH Terms] OR 25-hydroxyvitamin d[MeSH Terms] OR "vitamin d"[Title/Abstract] OR "25-hydroxyvitamin d"[Title/Abstract] OR "25(OH)D"[Title/Abstract] OR "1,25(OH)2D"[Title/Abstract] OR "1,25 dihydroxyvitamin d"[Title/Abstract] OR 1,25 dihydroxyvitamin d[MeSH Terms]))) AND ((aged[MeSH Terms] OR aging[MeSH Terms] OR "Aged, 80 and over"[Mesh] OR "old age people" OR elder* OR adult* OR retired OR ancient*))) AND (("lung function*" OR "pulmonary function*" OR "pulmonary diseas*" OR "lung diseas*")))) AND ((cohort OR longitudinal OR prospectiv*))) NOT ((supplement* OR therapy[MeSH Terms] OR patients[MeSH Terms] OR patient*[Title/Abstract] OR therap* OR cross-sectional[Title/Abstract] OR trial*[Title/Abstract] OR pregnan* OR child* OR adolescent* OR gene* OR mendelian OR prevalenc* OR protocol[Title/Abstract]))

#8	#7 NOT #5, 15
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#7	#6 AND #4, 222
#6	#1 AND #2 AND #3, 657
#5	Search (supplement* OR therapy[MeSH Terms] OR patients[MeSH Terms] OR patient*[Title/Abstract] OR therap* OR cross-sectional[Title/Abstract] OR trial*[Title/Abstract] OR pregnan* OR child* OR adolescent* OR gene* OR mendelian OR prevalenc* OR protocol[Title/Abstract]), 14368617
#4	Search (cohort OR longitudinal OR prospectiv*), 2356311
#3	Search ("lung function*" OR "pulmonary function*" OR "pulmonary diseas*" OR "lung diseas*"), 540157
#2	Search (aged[MeSH Terms] OR aging[MeSH Terms] OR "Aged, 80 and over"[Mesh] OR "old age people" OR elder* OR adult* OR retired OR ancient*), 6919264
#1	Search (vitamin d[MeSH Terms] OR vitamin d deficiency[MeSH Terms] OR 25-hydroxyvitamin d[MeSH Terms] OR "vitamin d"[Title/Abstract] OR "25-hydroxyvitamin d"[Title/Abstract] OR "25(OH)D" [Title/Abstract] OR "1,25(OH)2D"[Title/Abstract] OR "1,25 dihydroxyvitamin d"[Title/Abstract] OR 1,25 dihydroxyvitamin d[MeSH Terms]), 88545

7) Search 7 (Osteoporosis)

Database PubMed

Date 28th March 2019

Total records 126

String:

(((((vitamin d[MeSH Terms] OR vitamin d deficiency[MeSH Terms] OR 25-hydroxyvitamin d[MeSH Terms] OR "vitamin d"[Title/Abstract] OR "25-hydroxyvitamin d"[Title/Abstract] OR "25(OH)D" [Title/Abstract] OR "1,25(OH)2D"[Title/Abstract] OR "1,25 dihydroxyvitamin d"[Title/Abstract] OR 1,25 dihydroxyvitamin d[MeSH Terms]))) AND ((aged[MeSH Terms] OR aging[MeSH Terms] OR "Aged, 80 and over"[Mesh] OR "old age people" OR elder* OR adult* OR retired OR ancient*))) AND ((osteoporosis OR "bone loss" OR "bone mineral density"))) AND ((cohort OR longitudinal OR prospectiv* OR "nested case-control")))) NOT ((supplement* OR therapy[MeSH Terms] OR patients[MeSH Terms] OR patient*[Title/Abstract] OR therap* OR cross-sectional[Title/Abstract] OR trial*[Title/Abstract] OR pregnan* OR child* OR adolescent* OR infant* OR gene* OR mendelian OR prevalenc* OR protocol[Title/Abstract])) Filters: Publication date from 2000/01/01 to 2019/03/01; Humans

#10	#9 Filters: Publication date from 2000/01/01 to 2019/03/01, Humans, 126
#9	#7 NOT #8, 157
#8	Search (supplement* OR therapy[MeSH Terms] OR patients[MeSH Terms] OR patient*[Title/Abstract] OR therap* OR cross-sectional[Title/Abstract] OR trial*[Title/Abstract] OR pregnan* OR child* OR adolescent* OR infant* OR gene* OR mendelian OR prevalenc* OR protocol[Title/Abstract]), 14553783
#7	#6 AND #4, 1955
#6	#1 AND #2 AND #3, 7575
#5	Search (supplement* OR therapy[MeSH Terms] OR patients[MeSH Terms] OR patient*[Title/Abstract] OR therap* OR cross-sectional[Title/Abstract] OR trial*[Title/Abstract] OR pregnan* OR child* OR adolescent* OR gene* OR mendelian OR prevalenc* OR protocol[Title/Abstract]), 14368617
#4	Search (cohort OR longitudinal OR prospectiv* OR "nested case-control"), 2356311
#3	Search (osteoporosis OR "bone loss" OR "bone mineral density"), 122123
#2	Search (aged[MeSH Terms] OR aging[MeSH Terms] OR "Aged, 80 and over"[Mesh] OR "old age people" OR elder* OR adult* OR retired OR ancient*), 6919264
#1	Search (vitamin d[MeSH Terms] OR vitamin d deficiency[MeSH Terms] OR 25-hydroxyvitamin d[MeSH Terms] OR "vitamin d"[Title/Abstract] OR "25-hydroxyvitamin d"[Title/Abstract] OR "25(OH)D" [Title/Abstract] OR "1,25(OH)2D"[Title/Abstract] OR "1,25 dihydroxyvitamin d"[Title/Abstract] OR 1,25 dihydroxyvitamin d[MeSH Terms]), 88545

8) Search 8 (physical functionality)

Database PubMed

Date 29th March 2019

Total records 122

String:

(((((vitamin d[MeSH Terms] OR vitamin d deficiency[MeSH Terms] OR 25-hydroxyvitamin d[MeSH Terms] OR "vitamin d"[Title/Abstract] OR "25-hydroxyvitamin d"[Title/Abstract] OR "25(OH)D"[Title/Abstract] OR "1,25(OH)2D"[Title/Abstract] OR "1,25 dihydroxyvitamin d"[Title/Abstract] OR 1,25 dihydroxyvitamin d[MeSH Terms]))) AND ((aged[MeSH Terms] OR aging[MeSH Terms] OR "Aged, 80 and over"[Mesh] OR "old age people" OR elder* OR adult* OR retired OR ancient*))) AND (("physical performance" OR "physical function*" OR "ADL" OR "IADL" OR fall* OR fractur* OR balance))) AND ((cohort OR longitudinal OR prospectiv* OR "nested case-control")) NOT ((supplement* OR therapy[MeSH Terms] OR patients[MeSH Terms] OR patient*[Title/Abstract] OR therap* OR cross-sectional[Title/Abstract] OR trial*[Title/Abstract] OR pregnan* OR child* OR adolescent* OR gene* OR mendelian OR prevalenc* OR protocol[Title/Abstract])) Filters: Publication date from 2000/01/01 to 2019/03/01; Humans

#10	#9 Filters: Publication date from 2000/01/01 to 2019/03/01, Humans, 122
#9	(#4 AND #8) NOT #5, 145
#8	Search (cohort OR longitudinal OR prospectiv* OR "nested case-control"), 2356311
#7	#4 NOT #5 Filters: Publication date from 2000/01/01 to 2019/03/01, Humans, 311
#6	#4 NOT #5 Filters: Publication date from 2000/01/01 to 2019/03/01, 339
#5	Search (supplement* OR therapy[MeSH Terms] OR patients[MeSH Terms] OR patient*[Title/Abstract] OR therap* OR cross-sectional[Title/Abstract] OR trial*[Title/Abstract] OR pregnan* OR child* OR adolescent* OR gene* OR mendelian OR prevalenc* OR protocol[Title/Abstract]), 14368617
#4	#1 AND #2 AND #3, 5334
#3	Search ("physical performance" OR "physical function*" OR "ADL" OR "IADL" OR fall* OR fractur*), 536420
#2	Search (aged[MeSH Terms] OR aging[MeSH Terms] OR "Aged, 80 and over"[Mesh] OR "old age people" OR elder* OR adult* OR retired OR ancient*), 6919264
#1	Search (vitamin d[MeSH Terms] OR vitamin d deficiency[MeSH Terms] OR 25-hydroxyvitamin d[MeSH Terms] OR "vitamin d"[Title/Abstract] OR "25-hydroxyvitamin d"[Title/Abstract] OR "25(OH)D"[Title/Abstract] OR "1,25(OH)2D"[Title/Abstract] OR "1,25 dihydroxyvitamin d"[Title/Abstract] OR 1,25 dihydroxyvitamin d[MeSH Terms]), 88545

9) Search 9 (cognitive functionality)

Database PubMed

Date 28th March 2019

Total records 31

String:

(((((vitamin d[MeSH Terms] OR vitamin d deficiency[MeSH Terms] OR 25-hydroxyvitamin d[MeSH Terms] OR "vitamin d"[Title/Abstract] OR "25-hydroxyvitamin d"[Title/Abstract] OR "25(OH)D"[Title/Abstract] OR "1,25(OH)2D"[Title/Abstract] OR "1,25 dihydroxyvitamin d"[Title/Abstract] OR 1,25 dihydroxyvitamin d[MeSH Terms]))) AND ((aged[MeSH Terms] OR aging[MeSH Terms] OR "Aged, 80 and over"[Mesh] OR "old age people" OR elder* OR adult* OR retired OR ancient*))) AND (("cognitive function*" OR "cognitive declin*" OR "cognitive performanc*" OR "cognitive impairment*" OR "dementia" OR "Alzheimer")))) AND ((cohort OR longitudinal OR prospectiv* OR "nested case-control")) NOT ((supplement* OR therapy[MeSH Terms] OR patients[MeSH Terms] OR patient*[Title/Abstract] OR therap* OR cross-sectional[Title/Abstract] OR trial*[Title/Abstract] OR pregnan* OR child* OR adolescent* OR infant* OR gene* OR mendelian OR prevalenc* OR protocol[Title/Abstract])) Filters: Publication date from 2000/01/01 to 2019/03/01; Humans

#7	#6 Filters: Publication date from 2000/01/01 to 2019/03/01, Humans, 31
#6	(#1 AND #2 AND #3 AND #4) NOT #5, 35

#5	Search (supplement* OR therapy[MeSH Terms] OR patients[MeSH Terms] OR patient*[Title/Abstract] OR therap* OR cross-sectional[Title/Abstract] OR trial*[Title/Abstract] OR pregnan* OR child* OR adolescent* OR infant* OR gene* OR mendelian OR prevalenc* OR protocol[Title/Abstract]), 14553783
#4	Search (cohort OR longitudinal OR prospectiv* OR "nested case-control"), 2356311
#3	Search ("cognitive function*" OR "cognitive declin*" OR "cognitive performanc*" OR "cognitive impairment*" OR "dementia" OR "Alzheimer"), 302300
#2	Search (aged[MeSH Terms] OR aging[MeSH Terms] OR "Aged, 80 and over"[Mesh] OR "old age people" OR elder* OR adult* OR retired OR ancient*), 6919264
#1	Search (vitamin d[MeSH Terms] OR vitamin d deficiency[MeSH Terms] OR 25-hydroxyvitamin d[MeSH Terms] OR "vitamin d" [Title/Abstract] OR "25-hydroxyvitamin d" [Title/Abstract] OR "25(OH)D" [Title/Abstract] OR "1,25(OH)2D" [Title/Abstract] OR "1,25 dihydroxyvitamin d" [Title/Abstract] OR 1,25 dihydroxyvitamin d[MeSH Terms]), 88545

10) Search 10 (healthy years)

Database PubMed

Date 28th March 2019

Total records 27

String:

(((((vitamin d[MeSH Terms] OR vitamin d deficiency[MeSH Terms] OR 25-hydroxyvitamin d[MeSH Terms] OR "vitamin d"[Title/Abstract] OR "25-hydroxyvitamin d"[Title/Abstract] OR "25(OH)D" [Title/Abstract] OR "1,25(OH)2D"[Title/Abstract] OR "1,25 dihydroxyvitamin d"[Title/Abstract] OR 1,25 dihydroxyvitamin d[MeSH Terms])) AND ((aged[MeSH Terms] OR aging[MeSH Terms] OR "Aged, 80 and over"[Mesh] OR "old age people" OR elder* OR adult* OR retired OR ancient*))) AND (("healthy ageing" OR "healthy aging" OR "health status" OR "wellbeing" OR "well-being" OR "quality of life" OR "healthy year*" OR "illness free" OR DALY OR "disability-adjusted life year*" OR "years of life lost" OR "YLL" OR "year* of potential life lost" OR YPLL OR "potential years of life lost" OR PYLL))) AND ((cohort OR longitudinal OR prospectiv* OR "nested case-control")) NOT ((supplement* OR therapy[MeSH Terms] OR patients[MeSH Terms] OR patient*[Title/Abstract] OR therap* OR cross-sectional[Title/Abstract] OR trial*[Title/Abstract] OR pregnan* OR child* OR adolescent* OR infant* OR gene* OR mendelian OR prevalenc* OR protocol[Title/Abstract])) Filters: Publication date from 2000/01/01 to 2019/03/01; Humans

#7	#6 Filters: Publication date from 2000/01/01 to 2019/03/01, Humans, 27
#6	(#1 AND #2 AND #3 AND #4) NOT #5, 30
#5	Search (supplement* OR therapy[MeSH Terms] OR patients[MeSH Terms] OR patient*[Title/Abstract] OR therap* OR cross-sectional[Title/Abstract] OR trial*[Title/Abstract] OR pregnan* OR child* OR adolescent* OR infant* OR gene* OR mendelian OR prevalenc* OR protocol[Title/Abstract]), 14553783
#4	Search (cohort OR longitudinal OR prospectiv* OR "nested case-control"), 2356311
#3	Search ("healthy ageing" OR "healthy aging" OR "health status" OR "wellbeing" OR "well-being" OR "quality of life" OR "healthy year*" OR "illness free" OR DALY OR "disability-adjusted life year*" OR "years of life lost" OR "YLL" OR "year* of potential life lost" OR YPLL OR "potential years of life lost" OR PYLL), 491735
#2	Search (aged[MeSH Terms] OR aging[MeSH Terms] OR "Aged, 80 and over"[Mesh] OR "old age people" OR elder* OR adult* OR retired OR ancient*), 6919264
#1	Search (vitamin d[MeSH Terms] OR vitamin d deficiency[MeSH Terms] OR 25-hydroxyvitamin d[MeSH Terms] OR "vitamin d" [Title/Abstract] OR "25-hydroxyvitamin d" [Title/Abstract] OR "25(OH)D" [Title/Abstract] OR "1,25(OH)2D" [Title/Abstract] OR "1,25 dihydroxyvitamin d" [Title/Abstract] OR 1,25 dihydroxyvitamin d[MeSH Terms]), 88545

11) Search 11

Database Scopus

Date 5th March 2019

Total records 209

String:

ALL ("vitamin d") OR ALL ("25-hydroxyvitamin d") OR ALL ("25(OH)D") OR ALL ("1,25 dihydroxyvitamin d") OR ALL ("1,25(OH)2D") AND (ALL ("aging") OR ALL ("ageing") OR ALL ("elder*") OR ALL ("80 and over") OR ALL ("50 and over") OR ALL ("adult*")) AND (ALL ("healthy ageing") OR ALL ("health status") OR ALL ("mortality") OR ALL ("ill health") OR ALL ("death") OR ALL ("wellbeing") OR ALL ("well-being") OR ALL ("diseas*") OR ALL ("physical function") OR ALL ("cognitive function") OR ALL ("quality of life") OR ALL ("physical performance") OR ALL ("frail*") OR ALL ("longevity")) AND NOT ALL ("patient*") AND NOT ALL ("therap*") AND NOT ALL ("treat*") AND NOT ALL (human) AND (LIMIT-TO (SRCTYPE , "j")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2017) OR LIMIT-TO (PUBYEAR , 2016) OR LIMIT-TO (PUBYEAR , 2015) OR LIMIT-TO (PUBYEAR , 2014) OR LIMIT-TO (PUBYEAR , 2013) OR LIMIT-TO (PUBYEAR , 2012) OR LIMIT-TO (PUBYEAR , 2011) OR LIMIT-TO (PUBYEAR , 2010) OR LIMIT-TO (PUBYEAR , 2009) OR LIMIT-TO (PUBYEAR , 2008) OR LIMIT-TO (PUBYEAR , 2007) OR LIMIT-TO (PUBYEAR , 2006) OR LIMIT-TO (PUBYEAR , 2005) OR LIMIT-TO (PUBYEAR , 2004) OR LIMIT-TO (PUBYEAR , 2003) OR LIMIT-TO (PUBYEAR , 2002) OR LIMIT-TO (PUBYEAR , 2001) OR LIMIT-TO (PUBYEAR , 2000)) AND (EXCLUDE (EXACTKEYWORD , "Nonhuman") OR EXCLUDE (EXACTKEYWORD , "Animal") OR EXCLUDE (EXACTKEYWORD , "Animal Tissue") OR EXCLUDE (EXACTKEYWORD , "Animal Experiment")) AND (LIMIT-TO (LANGUAGE , "English") OR LIMIT-TO (LANGUAGE , "Spanish") OR LIMIT-TO (LANGUAGE , "Italian"))

12) Search 12

Database Web of Science

Date 6th March 2019

Total records 377

String:

# 16	377	#5 NOT #14 Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=2000-2019
# 15	385	#5 NOT #14 Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=All years
# 14	15,234,767	#6 OR #7 OR #8 OR #11 OR #12 OR #13 Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=All years
# 13	1,028,730	TS=(animal*) Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=All years
# 12	1,013,582	TI=(trial OR meta-analys* OR review* OR cross-sectional OR protocol*) Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=All years
# 11	12,559,436	ALL=(therap* OR treat* OR drug* OR patient* OR pharmac* OR operativ* OR postoperativ* OR surger* OR hospital* OR inpatient*) Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=All years
# 10	4,314,428	TI=(therap* OR treat* OR drug* OR patient* OR pharmac* OR operativ* OR postoperativ* OR surger* OR hospital* OR inpatient*) Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=All years
# 9	919,036	TI=(trial OR meta-analys* OR review* OR cross-sectional) Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=All years
# 8	1,134,488	TI=(gene OR genet* OR polymorph*) Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=All years
# 7	328,321	TI=(supplement* OR diet* OR intak*) Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=All years
# 6	1,402,603	TI=(child* OR infant* OR adolescent* OR young OR youth OR gestational OR fetal* OR pregnan* OR neonatal* OR maternal*) Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=All years
# 5	1,535	#1 AND #2 AND #3 AND #4 Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=All years

# 4	1,417,741	ALL=(cohort* OR longitudinal OR prospectiv*) Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=All years
# 3	4,457,786	ALL=(healthy ageing OR healthy aging OR health status OR quality of life OR mortality OR death* OR longevity OR survival OR ill health OR cognitive function* OR physical function* OR physical performance* OR frail*) Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=All years
# 2	3,382,836	ALL=(aging OR ageing OR 80 and over OR 50 and over OR elder* OR ancient*) Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=All years
# 1	43,429	TI=(vitamin d OR 25-hydroxyvitamin d OR 25(OH)D OR 1,25 dihydroxyvitamin d OR 1,25(OH)2D) Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=All years