

**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 diseases\* 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

|            |  |
|------------|--|
| <b>#25</b> | <b>#24 Filters: Publication date from 2000/01/01 to 2019/12/31, 2194</b>   |
| <b>#24</b> | (#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  |
| <b>#23</b> | (#17 AND #1 AND #7) NOT supplement*, 14959   |
| <b>#22</b> | 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  |
| <b>#21</b> | (#17 AND #1 AND #7) NOT (#20 OR #2), 837   |
| <b>#20</b> | Search supplement*, 310371   |
| <b>#19</b> | #17 AND #1 AND #7, 19991   |
| <b>#18</b> | #17 AND #1, 30405  |
| <b>#17</b> | 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                            |
| <b>#16</b> | 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 |
| <b>#15</b> | #14 Filters: Publication date from 2000/01/01 to 2019/12/31, 4532  |
| <b>#14</b> | #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 diseases* 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 dihydroxyvitamin 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 diseases* 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 diseases* 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 dihydroxyvitamin 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 diseases\*" OR "cardio heart diseases\*" OR "coronary diseases\*" OR "ischemic" OR "infarction" OR "atrial fibrillation" OR "angina" OR "cerebrovascular diseases\*" 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

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| #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 diseases*" OR "cardio heart diseases*" OR "coronary diseases*" OR "ischemic" OR "infarction" OR "atrial fibrillation" OR "angina" OR "cerebrovascular diseases*" OR "stroke")) AND Humans[Mesh]) Filters: Humans, 1263250 |
| #8  | (#1 AND #2 AND #3 AND Humans[Mesh]) NOT #7 Filters: Humans, 310  |

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| #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 diseases*" OR "cardio heart diseases*" OR "ischemic" OR "infarction" OR "atrial fibrillation" OR "angina" OR "cerebrovascular diseases*" 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

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|----|---|
| #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]))

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|----|---------------|
| #8 | #7 NOT #5, 15 |
|----|---------------|

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

|     |                           |   |
|-----|---------------------------|---|
| # 4 | <a href="#">1,417,741</a> | ALL=(cohort* OR longitudinal OR prospectiv*)<br>Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=All years  |
| # 3 | <a href="#">4,457,786</a> | 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*)<br>Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=All years |
| # 2 | <a href="#">3,382,836</a> | ALL=(aging OR ageing OR 80 and over OR 50 and over OR elder* OR ancient*)<br>Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=All years   |
| # 1 | <a href="#">43,429</a>    | TI=(vitamin d OR 25-hydroxyvitamin d OR 25(OH)D OR 1,25 dihydroxyvitamin d OR 1,25(OH)2D)<br>Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=All years   |