

Supplementary Table S1. Topic 1:140 publications, Vitamin D in vulnerable populations and its impact on child development

		Citation network	Word cloud
Sub-topics and number of publications	Indicative publication	Word cloud	Top 5 most unique topic terms
1a: (n=44) Vitamin D deficiency in Australians and migrants	Nowson CA, Margerison C. Vitamin D intake and vitamin D status of Australians. Med J Aust. 2002;177(3):149-152. doi: 10.5694/j.1326-5377.2002.tb04702.x. (1)		defici* risk high migrant* popul*
1aa: (n=27) Vitamin D deficiency in women and child migrants	Grover SR, Morley R. Vitamin D deficiency in veiled or dark-skinned pregnant women. Med J Aust. 2001;175(5):251-252. doi: 10.5694/j.1326-5377.2001.tb143558.x. (2)		defici* risk health children migrant*
1aaa: (n=16) Vitamin D deficiency in adult migrant women	Skull SA, Ngeow JY, Biggs BA, Street A, Ebeling PR. Vitamin D deficiency is common and unrecognized among recently arrived adult immigrants from The Horn of Africa. Intern Med J. 2003;33(1-2):47-51. doi: 10.1046/j.1445-5994.2003.00344.x. (3)		health risk migrant* among Australia

<p>1bbb: (n=7) Treatment for children with vitamin D deficiency</p>	<p>Rigterink T, Appleton L, Day AS. Vitamin D therapy in children with inflammatory bowel disease: A systematic review. <i>World J Clin Pediatr.</i> 2019;8(1):1-14. doi: 10.5409/wjcp.v8.i1.1. (13)</p>		<p>children defici* therapi* insuffici* daili*</p>
<p>1bc: (n=7) Maternal vitamin D and child development</p>	<p>Whitehouse AJ, Holt BJ, Serralha M, Holt PG, Kusel MM, Hart PH. Maternal serum vitamin D levels during pregnancy and offspring neurocognitive development. <i>Pediatrics.</i> 2012;129(3):485-493. doi: 10.1542/peds.2011-2644. (14)</p>		<p>matern* offspr* age mother infant</p>
<p>1c: (n=26) Vitamin D deficiency and bone health in children</p>	<p>Pasco JA, Henry MJ, Nicholson GC, Sanders KM, Kotowicz MA. Vitamin D status of women in the Geelong Osteoporosis Study: association with diet and casual exposure to sunlight. <i>Med J Aust.</i> 2001;175(8):401-405. doi: 10.5694/j.1326-5377.2001.tb143643.x. (15)</p>		<p>bone supplemen t intak* effect offspr*</p>
<p>1ca: (n=12) Vitamin D supplement intake and bone health in children</p>	<p>Jones G, Dwyer T, Hynes KL, Parameswaran V, Greenaway TM. Vitamin D insufficiency in adolescent males in Southern Tasmania: prevalence, determinants, and relationship to bone turnover markers. <i>Osteoporos Int.</i> 2005;16(6):636-641. doi: 10.1007/s00198-004-1733-z. (16)</p>		<p>bone children supplemen t defici* effect</p>
<p>1cb: (n=8) Vitamin D intake during gestation and bone health of children</p>	<p>Pasco JA, Wark JD, Carlin JB, Ponsonby AL, Vuillermin PJ, Morley R. Maternal vitamin D in pregnancy may influence not only offspring bone mass but other aspects of musculoskeletal health and adiposity. <i>Med Hypotheses.</i> 2008;71(2):266-269. doi:</p>		<p>matern* offspr* pregnanc* intak* gestation</p>

10.1016/j.mehy.2008.01.033.
(17)

1d: (n=17)
Vitamin D
deficiency in
child refugees

Tiong AC, Patel MS, Gardiner
J, Ryan R, Linton KS, Walker
KA, Scopel J, Biggs BA.
Health issues in newly arrived
African refugees attending
general practice clinics in
Melbourne. Med J Aust.
2006;185(11-12):602-606. doi:
10.5694/j.1326-
5377.2006.tb00724.x. (18)



refuge*
health
children
diseas*
screen*

Note: The citation network provides an overview of the top 40 citation links within the topic. The nodes indicate the first author of the publication, and the lines linking the nodes represents the citation links. The publication year is plotted on the left. The word cloud shows the frequency words within the topic and sub-topics, where words with a higher frequency have a larger size and opacity.

Supplementary Table S2. Topic 2: 116 publications, Impact of sun exposure and UVB radiation on various health conditions

Citation network		Word cloud	
Sub-topics and number of publications	Indicative publication	Word cloud	Top 5 most unique topic terms
2a: (n=34) Vitamin D and multiple sclerosis	van der Mei IA, Ponsonby AL, Dwyer T, Blizzard L, Taylor BV, Kilpatrick T, Butzkueven H, McMichael AJ. Vitamin D levels in people with multiple sclerosis and community controls in Tasmania, Australia. <i>J Neurol.</i> 2007;254(5):581-590. doi: 10.1007/s00415-006-0315-8. (19)		multipl* sclerosi* risk relaps* birth
2b: (n=34) Impact of the environment on vitamin D status and CNS demyelination	Lucas RM, Ponsonby AL, Dear K, Valery PC, Pender MP, Taylor BV, Kilpatrick TJ, Dwyer T, Coulthard A, Chapman C, van der Mei I, Williams D, McMichael AJ. Sun exposure and vitamin D are independent risk factors for CNS demyelination. <i>Neurology.</i> 2011;76(6):540-548. doi: 10.1212/WNL.0b013e31820af93d. (20)		time day Australian physic* fractur*

2ba: (n=16) Latitude gradient and vitamin D status	Lucas RM, Ponsonby AL, Dear K, Valery PC, Taylor B, van der Mei I, McMichael AJ, Pender MP, Chapman C, Coulthard A, Kilpatrick TJ, Stankovich J, Williams D, Dwyer T. Vitamin D status: multifactorial contribution of environment, genes and other factors in healthy Australian adults across a latitude gradient. <i>J Steroid Biochem Mol Biol.</i> 2013;136:300-308. doi: 10.1016/j.jsbmb.2013.01.011. (21)		exposur* uvr sun physic* use
2bb: (n=12) Vitamin D status and CNS demyelinati on	Lucas R, Ponsonby AL, McMichael A, van der Mei I, Chapman C, Coulthard A, Dear K, Dwyer T, Kilpatrick T, Pender M, Taylor B, Valery P, Williams D. Observational analytic studies in multiple sclerosis: controlling bias through study design and conduct. <i>The Australian Multicentre Study of Environment and Immune Function. Mult Scler.</i> 2007;13(7):827-839. doi: 10.1177/1352458507077174. (22)		risk case fcd (CNS demyelination) demyelin* first
2c: (n=19) Vitamin D and food allergies	Staples JA, Ponsonby AL, Lim LL, McMichael AJ. Ecologic analysis of some immune-related disorders, including type 1 diabetes, in Australia: latitude, regional ultraviolet radiation, and disease prevalence. <i>Environ Health Perspect.</i> 2003;111(4):518-523. doi: 10.1289/ehp.5941. (23)		food allergi* rate age region

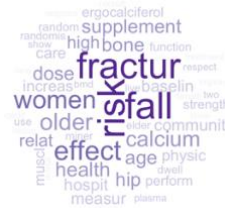
2d: (n=13) Vitamin D status and melanoma	Jablonski NG, Chaplin G. The evolution of human skin coloration. <i>J Hum Evol.</i> 2000;39(1):57-106. doi: 10.1006/jhev.2000.0403. (24)		skin melanoma folat* may cmm (cutaneous malignant melanoma)
2e: (n=9) Vitamin D status and myopia risk	van der Mei IA, Blizzard L, Ponsonby AL, Dwyer T. Validity and reliability of adult recall of past sun exposure in a case-control study of multiple sclerosis. <i>Cancer Epidemiol Biomarkers Prev.</i> 2006;15(8):1538-1544. doi: 10.1158/1055-9965.EPI-05-0969. (25)		sun exposur* myopia concentr* measur*
2f: (n=7) Vitamin D status and type 1 diabetes	Elliott JC, Lucas RM, Clements MS, Bambrick HJ. Population density determines the direction of the association between ambient ultraviolet radiation and type 1 diabetes incidence. <i>Pediatr Diabetes.</i> 2010;11(6):394-402. doi: 10.1111/j.1399-5448.2009.00620.x. (26)		uvr preval* case incid* diabet*

Note: The citation network provides an overview of the top 40 citation links within the topic. Each node is labelled with the surname of the first author of the citation, and the lines linking the nodes represents the citation links. The publication year is plotted on the left. The word cloud shows the frequency words within the topic and sub-topics, where words with a higher frequency have a larger size and opacity.

10.1093/gerona/glt059.
(34)

3f: (n=13) Association between low vitamin D status and falls and fracture risk in older adults

Latham NK, Anderson CS, Lee A, Bennett DA, Moseley A, Cameron ID; Fitness Collaborative Group. A randomized, controlled trial of quadriceps resistance exercise and vitamin D in frail older people: the Frailty Interventions Trial in Elderly Subjects (FITNESS). *J Am Geriatr Soc.* 2003;51(3):291-299. doi: 10.1046/j.1532-5415.2003.51101.x (35)



risk
fractur*
effect
dose
relat*

3g: (n=10) Vitamin D status and bone mineral density

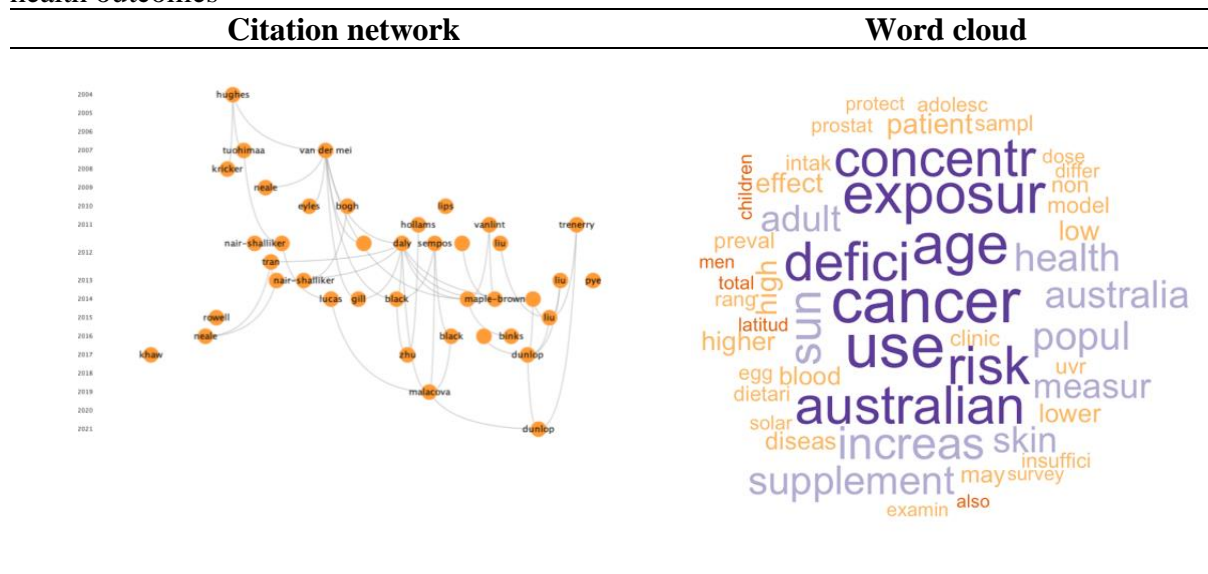
Morris HA, Morrison GW, Burr M, Thomas DW, Nordin BE. Vitamin D and femoral neck fractures in elderly South Australian women. *Med J Aust.* 1984;140(9):519-521. doi: 10.5694/j.1326-5377.1984.tb108222.x. (36)



bone
miner*
alpaca
calcium
increas*


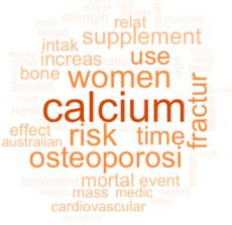


Note: The citation network provides an overview of the top 40 citation links within the topic. Each node is labelled with the surname of the first author of the citation, and the lines linking the nodes represents the citation links. The publication year is plotted on the left. The word cloud shows the frequency words within the topic and sub-topics, where words with a higher frequency have a larger size and opacity.

Supplementary Table S4. Topic 4: 110 publications, Vitamin D and its association with health outcomes



Sub-topics and number of publications	Indicative publication	Word cloud	Top 5 most unique topic terms
<p>4a: (n=29) Vitamin D supplementation and health outcomes</p>	<p>Daly RM, Gagnon C, Lu ZX, Magliano DJ, Dunstan DW, Sikaris KA, Zimmet PZ, Ebeling PR, Shaw JE. Prevalence of vitamin D deficiency and its determinants in Australian adults aged 25 years and older: a national, population-based study. <i>Clin Endocrinol (Oxf)</i>. 2012;77(1):26-35. doi: 10.1111/j.1365-2265.2011.04320.x. (37)</p>		<p>age concentr* adult supplement t higher</p>
<p>4aa: (n=13) Vitamin D deficiency and metabolic syndrome</p>	<p>Gagnon C, Lu ZX, Magliano DJ, Dunstan DW, Shaw JE, Zimmet PZ, Sikaris K, Ebeling PR, Daly RM. Low serum 25-hydroxyvitamin D is associated with increased risk of the development of the metabolic syndrome at five years: results from a national, population-based prospective study (The Australian Diabetes, Obesity and Lifestyle Study: AusDiab). <i>J</i></p>		<p>defici* patient popul* met aor*</p>

Note: The citation network provides an overview of the top 40 citation links within the topic. Each node is labelled with the surname of the first author of the citation, and the lines linking the nodes represents the citation links. The publication year is plotted on the left. The word cloud shows the frequency words within the topic and sub-topics, where words with a higher frequency have a larger size and opacity.

young women	Health Res. 2015;4(3):594. doi: 10.4081/jphr.2015.594. (54)		
6b: (n=15) Prevention and treatment of osteoporosis in patients with minimal trauma fracture	Sambrook PN, Seeman E, Phillips SR, Ebeling PR; Osteoporosis Australia; National Prescribing Service. Preventing osteoporosis: outcomes of the Australian Fracture Prevention Summit. Med J Aust. 2002;176(S8):S1-16. doi: 10.5694/j.1326-5377.2002.tb04475.x. (55)		osteoporosi* patient prevent trauma minim*
6c: (n=13) Calcium supplement and bone health	Ebeling PR, Daly RM, Kerr DA, Kimlin MG. Building healthy bones throughout life: an evidence-informed strategy to prevent osteoporosis in Australia. Med J Aust. 2013;199(S7):S1-S46. doi: 10.5694/j.1326-5377.2013.tb04225.x. (56)		calcium risk time supplement increas*
6d: (n=9) Preventing osteoporotic fractures with vitamin D and calcium supplement	Nguyen TV, Center JR, Eisman JA. Osteoporosis: underrated, underdiagnosed and undertreated. Med J Aust. 2004;180(S5):S18-22. doi: 10.5694/j.1326-5377.2004.tb05908.x. (57)		fractur* use hip osteoporot* servic*
6e: (n=8) Treatment of osteoporosis	Bleicher K, Naganathan V, Cumming RG, Seibel MJ, Sambrook PN, Blyth FM, Le Couteur DG, Handelsman DJ, Waite LM, Creasey HM. Prevalence and treatment of osteoporosis in older Australian men: findings from the CHAMP study. Med J Aust. 2010;193(7):387-391. doi: 10.5694/j.1326-5377.2010.tb03964.x. (58)		treatment mortal* men manag* exercis*

Note: The citation network provides an overview of the top 40 citation links within the topic. Each node is labelled with the surname of the first author of the citation, and the lines linking

the nodes represents the citation links. The publication year is plotted on the left. The word cloud shows the frequency words within the topic and sub-topics, where words with a higher frequency have a larger size and opacity.

Supplementary Table S7. Topic 7: 40 publications, Testing of vitamin D status in Australia

Citation network

Word cloud



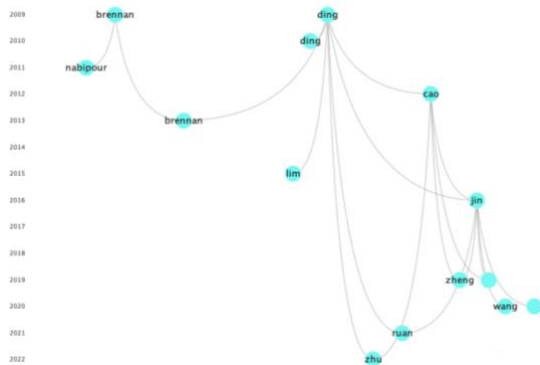
Sub-topics and number of publications	Indicative publication	Word cloud	Most unique topic terms
7a: (n=14) Clinical practice guidelines for vitamin D testing	Bilinski K, Boyages S Evidence of overtesting for vitamin D in Australia: an analysis of 4.5 years of Medicare Benefits Schedule (MBS) data. <i>BMJ Open</i> . 2013; 3:e002955. doi: 10.1136/bmjopen-2013-002955. (59)		increas* patient general defici* practic*
7b: (n=13) Testing Vitamin D status and incidence of type 2 diabetes	Gagnon C, Lu ZX, Magliano DJ, Dunstan DW, Shaw JE, Zimmet PZ, Sikaris K, Grantham N, Ebeling PR, Daly RM. Serum 25-hydroxyvitamin D, calcium intake, and risk of type 2 diabetes after 5 years: results from a national, population-based prospective study (the Australian Diabetes, Obesity and Lifestyle study). <i>Diabetes Care</i> . 2011;34(5):1133-1138. doi:		concentr* risk diabet* cancer incid*

Note: The citation network provides an overview of the top 40 citation links within the topic. Each node is labelled with the surname of the first author of the citation, and the lines linking the nodes represents the citation links. The publication year is plotted on the left. The word cloud shows the frequency words within the topic and sub-topics, where words with a higher frequency have a larger size and opacity.

Supplementary Table S8. Topic 8: 14 publications, Vitamin D status and knee osteoarthritis

Citation Network

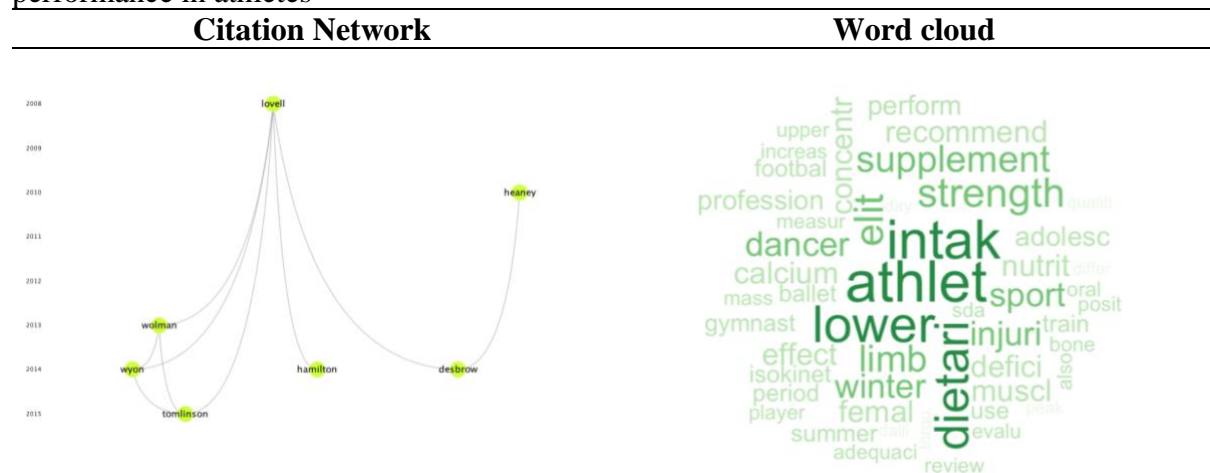
Word cloud



Indicative publication	Most unique topic terms
Ding C, Cicuttini F, Parameswaran V, Burgess J, Quinn S, Jones G. Serum levels of vitamin D, sunlight exposure, and knee cartilage loss in older adults: the Tasmanian older adult cohort study. <i>Arthritis Rheum.</i> 2009;60(5):1381-1389. doi: 10.1002/art.24486. (61)	knee chang* pain cartilag* osteoarthr*

Note: The citation network provides an overview of the citation links within the topic. Each node is labelled with the surname of the first author of the citation, and the lines linking the nodes represents the citation links. The publication year is plotted on the left. The word cloud shows the frequency words within the topic and sub-topics, where words with a higher frequency have a larger size and opacity.

Supplementary Table S9. Topic 9: 7 publications, Vitamin D status and exercise performance in athletes



Indicative publication	Most unique topic terms
Lovell G. Vitamin D status of females in an elite gymnastics program. Clin J Sport Med. 2008;18(2):159-161. doi: 10.1097/JSM.0b013e3181650eee. (62)	athlet* intak* lower dietari* strength

Note: The citation network provides an overview of the citation links within the topic. Each node is labelled with the surname of the first author of the citation, and the lines linking the nodes represents the citation links. The publication year is plotted on the left. The word cloud shows the frequency words within the topic and sub-topics, where words with a higher frequency have a larger size and opacity.

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3. Skull SA, Ngeow JY, Biggs BA, Street A, Ebeling PR. Vitamin D Deficiency Is Common and Unrecognized among Recently Arrived Adult Immigrants from the Horn of Africa. *Intern Med J.* (2003) 33(1-2):47-51. doi: 10.1046/j.1445-5994.2003.00344.x.
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10. Thomas SD, Fudge AN, Whiting M, Coates PS. The Correlation between Third-Trimester Maternal and Newborn-Serum 25-Hydroxy-Vitamin D in a Selected South Australian Group of Newborn Samples. *BMJ Open*. (2011) 1(2):e000236. doi: 10.1136/bmjopen-2011-000236.
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19. van der Mei IA, Ponsonby AL, Dwyer T, Blizzard L, Taylor BV, Kilpatrick T, et al. Vitamin D Levels in People with Multiple Sclerosis and Community Controls in Tasmania, Australia. *J Neurol*. (2007) 254(5):581-90. doi: 10.1007/s00415-006-0315-8.
20. Lucas RM, Ponsonby AL, Dear K, Valery PC, Pender MP, Taylor BV, et al. Sun Exposure and Vitamin D Are Independent Risk Factors for Cns Demyelination. *Neurology*. (2011) 76(6):540-8. doi: 10.1212/WNL.0b013e31820af93d.
21. Lucas RM, Ponsonby AL, Dear K, Valery PC, Taylor B, van der Mei I, et al. Vitamin D Status: Multifactorial Contribution of Environment, Genes and Other Factors in Healthy Australian Adults across a Latitude Gradient. *J Steroid Biochem Mol Biol*. (2013) 136:300-8. doi: 10.1016/j.jsbmb.2013.01.011.
22. Lucas R, Ponsonby AL, McMichael A, van der Mei I, Chapman C, Coulthard A, et al. Observational Analytic Studies in Multiple Sclerosis: Controlling Bias through Study Design and Conduct. The Australian Multicentre Study of Environment and Immune Function. *Mult Scler*. (2007) 13(7):827-39. doi: 10.1177/1352458507077174.
23. Staples JA, Ponsonby A-L, Lim LL-Y, McMichael AJ. Ecologic Analysis of Some Immune-Related Disorders, Including Type 1 Diabetes, in Australia: Latitude, Regional Ultraviolet Radiation, and Disease Prevalence. *Environ Health Perspect*. (2003) 111(4):518-23. doi: 10.1289/ehp.5941.

24. Jablonski NG, Chaplin G. The Evolution of Human Skin Coloration. *J Hum Evol.* (2000) 39(1):57-106. doi: 10.1006/jhev.2000.0403.
25. van der Mei IA, Blizzard L, Ponsonby AL, Dwyer T. Validity and Reliability of Adult Recall of Past Sun Exposure in a Case-Control Study of Multiple Sclerosis. *Cancer Epidemiol Biomarkers Prev.* (2006) 15(8):1538-44. doi: 10.1158/1055-9965.Epi-05-0969.
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