



Fig. 1 Age-standardised incidence rates of type 1 diabetes per 100,000 boys <14 years of age, by latitude, in 51 regions worldwide, 2002. Data points are shown by dots; names shown adjacent to the dots denote location, where space allows. Where space was limited, numerical codes (below) designate location. Source: data from WHO DiaMond [3]. Lux., Luxembourg. Numerical codes for areas: 2. Beja, Tunisia; 3. Gafsa, Tunisia; 4. Kairoan, Tunisia; 5. Monastir, Tunisia; 7. Mauritius; 8. Wuhan, China; 9. Sichuan, China; 10. Huhehot, China; 16. Nanjing, China; 17. Jinan, China; 21. Harbin, China; 23. Changsha, China; 25. Hainan, China; 29. Hong Kong, China; 31. Israel; 32. Chiba, Japan; 33. Hokkaido, Japan; 34. Okinawa, Japan; 36. Novosibirsk, Russia; 38. Antwerp, Belgium; 39. Varna, Bulgaria; 40. Denmark; 43. France; 44. Baden, Germany; 45. Attica, Greece; 48. Sicily, Italy; 49. Pavia, Italy; 50. Marche, Italy; 52. Lazio, Italy; 59. Krakow, Poland; 61. Algarve, Portugal; 62. Coimbra, Portugal; 63.

Madeira Island, Portugal; 64. Portalegre, Portugal; 65. Bucharest, Romania; 67. Slovakia; 68. Catalonia, Spain; 71. Leicestershire, UK; 72. Northern Ireland, UK; 77. Allegheny, PA, USA; 80. Avellaneda, Argentina; 82. Corrientes, Argentina; 87. Paraguay; 88. Lima, Peru; 90. Caracas, Venezuela; 97. Auckland, New Zealand. Data points not labelled because of space constraints (latitude in degrees, rate per 100,000): 11. Dalian, China (39, 1.1); 12. Guilin, China (24, 0.6); 13. Beijing, China (40, 0.7); 14. Shanghai, China (32, 0.7); 15. Chang Chun, China (44, 0.6); 18. Jilin, China (43, 0.4); 19. Shenyang, China (42, 0.4); 20. Lanzhou, China (36, 0.5); 22. Nanning, China (23, 0.3); 24. Zhengzhou, China (35, 0.2); 26. Tie Ling, China (42, 0.2); 27. Zunyi, China (28, 0.1); 28. Wulumuqi, China (44, 0.9); 35. Karachi, Pakistan (25, 0.5); 37. Austria (48, 9.8); 46. Hungary (47, 8.7); 51. Turin, Italy (45, 11.9); 53. Lombardia, Italy (46, 7.6); 66. Slovenia (46, 6.8); 79. Chicago, IL, USA (42, 10.2). $R^2=0.25$, $p<0.001$

than those whose mothers did not (OR 0.67, 95% CI 0.53–0.86) [9], and a case–control study by Stene and colleagues found that the risk of diabetes in children of mothers who took cod liver oil during pregnancy was lower than in mothers who did not (OR 0.30, 95% CI 0.12–0.75) [10]. Neither study measured serum 25(OH)D in the participants.

In a cohort study in Colorado, intake of vitamin D during the third trimester of pregnancy was assessed in the mothers of 233 children. The children were then followed

for an average of 4 years [11]. Maternal intake of vitamin D from food had a protective effect against the appearance of islet cell autoantibodies (multiple-adjusted HR 0.37, 95% CI 0.17–0.78). Such antibodies are associated with the development of type 1 diabetes [12]. Another study reported lower incidence rates of type 1 diabetes in association with higher ultraviolet radiation in Australia [13].

Some findings from previous research appear to be inconsistent with the hypothesis regarding an overall