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Table: Estimated carrier frequencies of alpha-, beta-thalassemia and sickle cell disease by region.*

Geography		Alpha Thal Carrier Frequency	Beta Thal Carrier Frequency	Sickle Cell Carrier Frequency
North American First Nations				1 in 176[1]
Africa	All Countries/Regions	5-50%[2,3,4]	0.8-12%[4,5]	1-45%[1,4,6]
Mediterranean	Sardinia, Corsica, Sicily, Italy, Spain, Portugal, Greece, Cyprus, Turkey, Egypt, Algeria, Libya, Tunisia, Morocco, Malta	5-19%[2,3,7]	1-20%[4,7,8,9]	2-13%[10,11]
Middle East	Iran, Iraq, Syria, Jordan, Saudi Arabia and other Arabian Peninsula countries, Qatar, Lebanon, Palestine, Israel (both Arabs and Sephardic Jews affected), Kuwait	60%[2,4]	1-11%[9]	0-29%[1,4,12]
South Asian/ Indian Subcontinent	India, Afghanistan, Pakistan, Bangladesh	15-80%[2,4,9]	1-15%[4]	17-30%[4]
East Asia	China, Japan, Mongolia, North Korea, South Korea, and Taiwan. Hong Kong and Macau	1-15%[4]	2%[4]	
Southeast Asia	Indonesia, Thailand, Myanmar, Vietnam, Philippines, Malaysia, Cambodia, Laos, Singapore, Tibet, Nepal, Bhutan, Papua New Guinea	1-80%[2,3,4]	0-11%[4]	
Caribbean Countries	All Countries/Regions	20%[17]		1-10%[13,14,15,16,17]
South America	All Countries/Regions	13-15%[18]		1-6%[19]

*This table does not include other types of hemoglobinopathies that may have high carrier frequencies in certain regions. Calculating carrier frequencies is difficult as there are regional differences even within the same country. Therefore, additional references in the literature may provide different risk estimates.

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