

Human Biology: A Global Perspective

Human Biology · Answer Key · 17 Questions

1. The highest prevalence of lactase persistence in adult populations is observed in regions historically associated with pastoralism, particularly in Northern Europe. Which of these European countries exhibits one of the highest lactase persistence allele frequencies?

- A) Greece
- B) Finland**
- C) Italy
- D) Portugal

2. The sickle cell trait, a genetic adaptation providing some resistance to malaria, is most prevalent in populations originating from regions historically endemic to the Plasmodium falciparum parasite. Which of these regions is NOT typically considered a high-prevalence area for the sickle cell allele?

- A) The Mediterranean Basin**
- B) Sub-Saharan Africa
- C) Southeast Asia
- D) The Middle East

3. The genetic bottleneck effect, leading to reduced genetic diversity, is often observed in founder populations that have migrated to new geographical areas. Which of these isolated island populations is a classic example of a genetic bottleneck?

- A) Native Hawaiians
- B) Maori people of New Zealand
- C) Easter Islanders (Rapa Nui)**
- D) Indigenous Australians

4. Melanin production, crucial for UV radiation protection, is genetically linked to geographical latitude. Populations indigenous to regions near the equator generally exhibit higher melanin levels. Which of these indigenous groups, historically residing in a high-UV equatorial region, is known for dark skin pigmentation?

- A) Inuit of the Arctic
- B) San people of Southern Africa
- C) Aboriginal Australians**
- D) Sami people of Scandinavia

5. The distribution of ABO blood groups shows geographical variations. The O allele is most frequent in Native American populations. Which of these regions has a particularly high frequency of the A allele?

A) West Africa

B) East Asia

C) South America

D) Australia

6. Endemic goiter, caused by iodine deficiency, is often found in mountainous regions where soil iodine content is low due to leaching by glacial meltwater. Which of these major mountain ranges is associated with a historically higher incidence of goiter?

A) The Andes

B) The Rocky Mountains

C) The Alps

D) The Himalayas

7. The prevalence of certain genetic disorders can be linked to geographical isolation and founder effects. Tay-Sachs disease, for example, has a higher incidence in populations of Ashkenazi Jewish descent. Which other population group, historically concentrated in a specific geographical area, also shows an elevated risk for Tay-Sachs disease?

A) Native Americans of the Pacific Northwest

B) French Canadians in Quebec

C) Irish Travellers

D) Maori of New Zealand

8. Human migration patterns have significantly influenced the genetic makeup of populations worldwide. The 'Out of Africa' model posits that modern humans originated in Africa and then migrated outwards. Which of these continental regions generally exhibits the highest level of human genetic diversity, consistent with this model?

A) North America

B) Europe

C) Asia

D) Africa

9. The development of adaptations to high altitudes, such as increased lung capacity and red blood cell production, is evident in populations living at extreme elevations. Which of these indigenous populations, residing in the high Andes, exhibits remarkable physiological adaptations to altitude?

A) The Maasai

B) The Inuit

C) The Quechua

D) The Aboriginal Australians

10. The distribution of certain infectious diseases is heavily influenced by climate, vector availability, and human population density, which are often geographically determined. Dengue fever, a mosquito-borne illness, is most prevalent in tropical and subtropical regions. Which of these geographical areas has a significantly lower risk of endemic dengue fever due to its climate?

A) The Amazon Basin

B) Southeast Asia

C) Northern Europe

D) Sub-Saharan Africa

11. The ability to digest lactose in adulthood (lactase persistence) evolved independently in several populations. Besides Northern Europe, where else has lactase persistence evolved and become common due to a history of dairy farming?

A) West Africa

B) Eastern Australia

C) The Middle East

D) South Asia

12. The genetic disorder cystic fibrosis has varying carrier frequencies across different populations. Which of these populations, historically concentrated in a specific European region, has a notably high carrier frequency for cystic fibrosis?

A) Iberian Peninsula

B) Scandinavia

C) Central/Eastern Europe

D) British Isles

13. The Human Genome Diversity Project has mapped genetic variations across global populations. Which of these geographic regions, characterized by long periods of relative isolation and distinct evolutionary pressures, contributes significantly to understanding human genetic diversity?

- A) The Siberian Arctic
- B) The Sahara Desert
- C) The Pacific Islands**
- D) The Ganges River Delta

14. Vitamin D deficiency is more common in populations residing at higher latitudes with less intense sunlight. Which of these countries, located at a high latitude, has a relatively high rate of vitamin D deficiency, necessitating supplementation for many residents?

- A) Brazil
- B) India
- C) Canada**
- D) Egypt

15. The Neanderthal genome has been found to contribute a small percentage of DNA to modern non-African populations, indicating interbreeding events. The geographical areas where this interbreeding is thought to have occurred primarily involve migration out of Africa into which continent?

- A) Asia**
- B) Australia
- C) The Americas
- D) Antarctica

16. The prevalence of Type 2 diabetes is influenced by a complex interplay of genetics and lifestyle, with some populations exhibiting higher susceptibility. Which of these indigenous groups, historically inhabiting the Pacific Islands, has one of the highest rates of Type 2 diabetes globally?

- A) Maori
- B) Samoans**
- C) Indigenous Australians
- D) Native Americans (Navajo)

17. The spread of agriculture and the development of settled societies led to changes in human diets and disease profiles. The Neolithic Revolution, originating in the Fertile Crescent, is associated with the domestication of plants and animals. Which of these regions experienced a later, more independent development of agriculture, influencing local human biology and health?

A) Mesoamerica

B) Western Europe

C) North Africa

D) Siberia