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Prelims PYQ, Mains model answers, and copy evaluation. Write to the desk for this paper, a doubt, or the AI waitlist.

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Q1(e)

Hemoglobin in health and disease.

UPSC Civil Services Mains 2024 · Anthropology GS 1 · 10 marks · Epidemiological Anthropology

9.8 Epidemiological Anthropology: Health and disease. Infectious and non-infectious diseases, Nutritional deficiency related diseases.

Facts & figures for this PYQ only.

Numbers move. Confirm the latest Budget, Economic Survey or census round. This sheet is for revision, not a substitute for the model answer.

<https://wrapexams.com/upsc/mains-answers/anthropology-gs-1/2024/hemoglobin-in-health-and-disease/>

HbA and HbF

Major adult HbA is $\alpha_2\beta_2$. Fetal HbF is $\alpha_2\gamma_2$ and binds oxygen more strongly, facilitating placental oxygen transfer.

HbS mechanism

A beta-globin missense variant promotes polymerisation of deoxygenated HbS, leading to sickling, haemolysis and vaso-occlusion in HbSS disease.

Thalassaemia

A quantitative defect in alpha- or beta-globin production. Clinical severity depends on the affected genes and partner allele.

Malaria selection

Haldane framed the hypothesis; Allison showed a survival advantage of sickle trait in falciparum-malaria environments.

Indian relevance

Sickle variants, beta-thalassaemia and HbE have differing regional and community frequencies; screening requires consent and non-stigmatising counselling.

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