South America challenges FIFA altitude ban

South America's Football Federation is on a collision course with FIFA over a ruling banning matches at high altitude. Many of the continent's teams – and several national stadia – are located high in the Andes

Banned stadia

La Paz, Bolivia **3,600m**

Cuzco, Peru **3,500m**

3,000m

Quito, Ecuador **2,800m**

Bogota, Colombia **2,640m**

2,500m

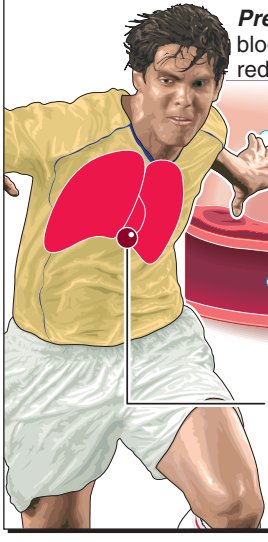
FIFA "safe zone"

2,000m

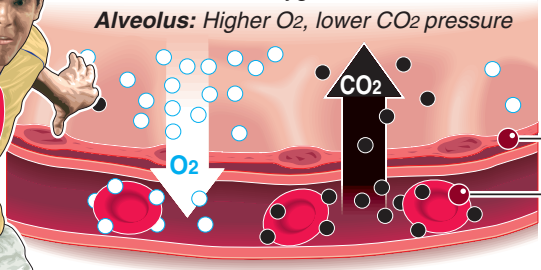
Temperature drops 1˚C for every 100m rise in altitude

High temperature and humidity are arguably greater risk than altitude

OXYGEN DEFICIENCY (HYPOXIA): During endurance events



Pressure gradient drives gas exchange from lungs into blood vessels. Low atmospheric pressure at high altitude reduces diffusion of oxygen across ***alveoli*** walls in lungs



Blood vessel: *High CO_2, low O_2 pressure*

As oxygen reaching red blood cells decreases, heart and breathing rates increase to boost oxygen uptake

Altitude training: Hypoxia stimulates production of ***erythropoietin*** (EPO) which increases number of oxygen-carrying red blood cells