Vitamin D deficiency and low dietary calcium intakes act synergistically in increasing the prevalence of rickets in communities where both problems are present.

key insights
An important role of vitamin D is to modulate the body’s ability to adjust to changing calcium supply and demand. This is particularly important in developing countries, where calcium intakes are low. For dietary calcium, the consumption of dairy products was found to be a major source of this mineral. Although many children in developing countries do not meet the recommended daily intake of calcium, a large proportion of them are considered to have good bone status.

Current knowledge
Nutritional rickets is a global public health problem, affecting mainly infants and adolescents in developing countries. In some countries, vitamin D deficiency is the cause, resulting from social customs that limit sunlight exposure. In other countries where sunlight exposure is not a problem, low dietary calcium underlies the onset of rickets in older toddlers and children. The negative effects of calcium and vitamin D deficiency may have varying influences depending on genetic background and ethnic origin.

Practical implications
The factors that contribute to low vitamin D status in infants and children include overcrowding, atmospheric pollution, and clothing customs. The infant and adolescent age groups are at highest risk, particularly girls. Calcium homeostasis can effectively be adapted to low calcium intakes even with diets which are thought to impair intestinal calcium absorption. However, very low calcium intakes (below 200 mg/day) greatly increase the risk of rickets and osteomalacia. Calcium supplements should be used with caution, as they do not appear to improve growth and may have adverse effects on height, although there are benefits on bone mass.

Recommended reading