



## Background

- Suboptimal breastfeeding and micronutrient deficiencies, specifically Vitamin A and Zinc, are responsible for more than one third of all child deaths under 5 and 11% of the total disease burden.
- Stunting, wasting, and micronutrient deficiencies were associated with almost 45% of all worldwide deaths in young children
- Vitamin A deficiency (VAD) is a major public health problem in low- and middle-income countries, affecting 190 million children under five years of age and leading to many adverse health consequences, including death
- Vitamin A, B, D, calcium, folic acid, fluoride and iron; all micronutrients heavily supplemented to children in the United States, were found to be deficient in impoverished communities.

## Objectives

- Describe and recognize 3 presenting symptoms of vitamin A, vitamin B, vitamin D, folic acid and iron deficiencies in malnourished pediatric populations
- Describe 2 treatment plans to provide supplemental micronutrients to vitamin and iron deficient pediatric populations

## Search Criteria

- A search was conducted to determine what is currently known about micronutrient deficiencies in low income countries and the current interventions being implemented
- Thirteen peer-reviewed articles were reviewed from 2013-2018

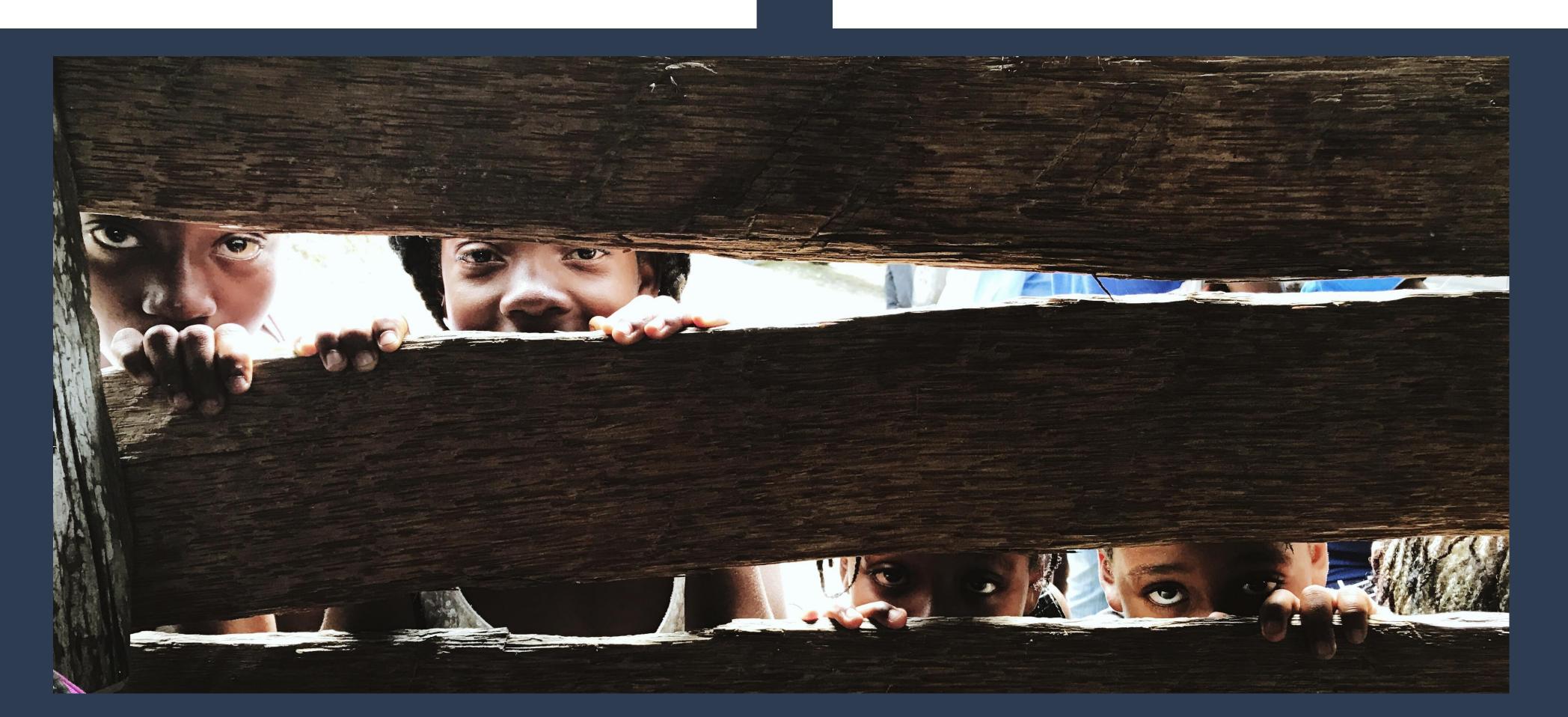
# **Micronutrient Supplementation as Preventative Medicine**

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## **Review of Literature and Findings**

The most common findings in anemia are as follows:

- growth-developmental retardation
- gastrointestinal motility disorders (diarrhea)
- Hyperpigmentation
- Stomatitis
- Glossitis
- Irritability
- Weakness
- Lethargy
- Hypotonia
- Ataxia
- Hyporeflexia
- Tremor
- Convulsions
- movement disorders
- abnormal mental states
- retardation in acquired motor skills
- Iron, vitamin A, zinc, and iodine are important micronutrients for growth, development, and survival of children
- The most important and frequent infectious disease of childhood is dental caries and are a risk factor for anemia in children



- Vitamin A is required for normal functioning of the visual system, maintenance of cell function for growth, epithelial integrity, red blood cell production, immunity, and reproduction
- Vitamin A deficiency is a risk factor for blindness and for mortality from measles and diarrhea in children aged 6–59 months
- People with vitamin A deficiency are more likely to be exposed to measles, diarrhea, and respiratory diseases. When these problems are comorbid, depressed appetite and poor absorption may lower intake of vitamin A
- Vitamin A deficiency causes xerophthalmia, a range of eye conditions from night blindness to more severe clinical outcomes such as keratomalacia and corneal scars, and permanent blindness
- Dietary intakes of calcium and vitamin D in lower income countries are associated with the prevalence of rickets
- Children diagnosed with vitamin D deficiency rickets had a greater risk of fracture, greater prevalence of asthma, and more dental enamel defects compared with healthy children



## Conclusion

World Health Organization (WHO) suggested the use of micronutrient powder (MNP) to increase the intake of vitamins and minerals in complementary feeding in settings where the prevalence of anemia in children under 5 years old is 20% or higher

A study conducted in children that were introduced to vitamin D supplements and fluoride in the first 12 months of life showed that the children had less dental caries at the 10-year-old visit

## **Implications for Practice**

A simple intervention to combat lack of supplementation is to educate the public and provide low cost micronutrient supplementation to prevent more serious and consequential diseases.

Advanced practice providers with an interest in public health can use inexpensive interventions to combat the slow onset of much more serious disorders with micronutrient supplementation

The current research is aimed at providing micronutrient supplementation in third world countries to combat nutritional deficiencies.

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