

Photo essay

The UN Sustainable Development Goals; using World Health Organization's 'Health Promoting Schools' to create change

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The global epidemiological relevance of the United Nations Sustainable Development Goals (SDGs) is implicit from the range of targets they address. The 17 SDGs have the overarching aim of addressing poverty worldwide [1].



Figure 1. The UNDP poster illustrating the 17 Sustainable Development Goals (SDGs)

As SDGs 1-6 directly address factors that contribute to health, disease and well-being in children (poverty, malnutrition, health, education, empowering women and girls and water), an innovative approach is to use the World Health Organization's (WHO) Health Promoting School (HPS) model to create change [2-4].



Figure 2. Child malnutrition and disease are addressed specifically in SDGs 1 and 4

School-based health promotion employs multi-disciplinary strategies to engage a school community. WHO's ultimate objective is to generate life-long awareness that choice and behavior offer a way to positively influence the social determinants of health [1,2,5]. HPS programs have been used successfully to address many specific locally-identified diseases, living circumstances and lifestyles that negatively impact health, e.g. diarrhea, dental caries, diet, hygiene,

malaria, mental health, sexual health, and worms [4,6-12].



Figure 3. A WHO Health Promoting School classroom: the visual aids around the walls speak to health knowledge, factors that are protective and healthy behaviors

The fundamental HPS approach is suited to the SDGs as two synergistic educational principles drive change; the acquisition of knowledge via creative additions to the curriculum and learning health-promoting behaviors through conduct of school-based healthy practice exercises.



Figure 4. Visual aid production by pupils and the use of age-appropriate ‘voice’ and ‘messaging’ underscore HPS learning principles

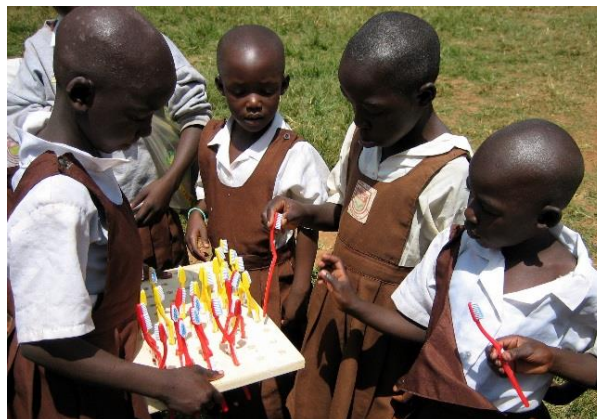


Figure 5. Healthy practices are learned through sessions that teach and reinforce health-related skills (e.g. tooth brushing, hand washing, mosquito control, and food cultivation, preparation and safe storage)

HPS programs, particularly in low and middle income countries, often include planting a school garden. It has been documented that school gardening contributes to improved nutrition and academic achievement, promotes healthier eating, enhances environmental awareness and fosters skill development in multiple fields [13]. These skills which range from how to grow food, through team building to commercial expertise from produce marketing are all relevant to SDGs 1-6, and are accrued comparably worldwide [14].



Figure 6. School gardens generate awareness of cultivation techniques, food security and sustainable agriculture and acquisition of life skills, in addition to growing produce



Figure 7. Lunch programs that use school garden produce to supplement the nutrition of pupils who come to school hungry improve health and educational attainment



Figure 8. Sweet potatoes grow as an underground tuber on the plant *Ipomoea batatas*.

When a garden's produce is also used to feed children who come to school hungry improved educational achievement results, presumably reflecting reversal of the effects of malnutrition on the cognitive behavior of these children and their ability to learn [15,16]. Hence, while local factors will drive the choice of crops schools grow, the nutritional benefit of the produce chosen is relevant. In our HPS programs in Africa we plant maize with iron-rich beans grown under the canopy; together these provide a good yield with a nutritious combination of complex carbohydrates, protein, and micronutrients. Recently we have successfully introduced a new orange fleshed sweet potato varietal (OFSP) which is particularly rich in bioavailable nutrients including Vitamins A, B5, B6 and C [17].



Figure 9. Orange fleshed varietals offer important nutritional benefits in low and middle income countries, and contain high levels of beta-carotene

OFSP cultivation should be promoted as Vitamin A deficiency (VAD) is prevalent in >50% of countries worldwide, with > 250,000 preschool children and many pregnant and lactating mothers affected [18]. VAD weakens immunity, stunts growth, increases child and maternal mortality and is the commonest preventable cause of blindness worldwide [19]; eating OFSP reduces rates of blindness [20].



Figure 10. Eating fruit and vegetables has known beneficial effects for health; increased awareness, production and consumption are fundamental aims of the SDGs.

When parents understand that micronutrients in fruit and vegetables improve child health and learning, and especially that they can prevent delayed reading, they are motivated to engage in helping to plant and maintain school gardens [15,21]. Parents and children then benefit by acquiring knowledge and skills side by side, and robust improvements in nutrition, food security and sustainable agriculture are achievable [22,23]



Figure 11. Vitamin A deficiency is the principal preventable cause of blindness. Orange sweet potato consumption preserves vision and is a nutritional adjunct that aids learning

The SDGs are a challenge, but importantly, WHO now endorses school programs as a way to address the social determinants of health worldwide [24, 25]. Schools are recognized to provide the most effective and efficient way to reach a large segment of the population, and globally more than 1 billion children have the potential to benefit from change created through SDG-focused initiatives based on the WHO HPS model.



Figure 12. Education in safe and supportive schools is a powerful determinant of health (5). Children engaged in effective WHO health promoting school initiatives will acquire knowledge and behaviours that directly address the UN Sustainable Development Goals.

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Consent: The children and adults (identifiable) photographed have given their consent for their pictures to be used in the dissemination and publication of this research.

Conflict of Interests: None

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