



Anemia Prevention and Treatment Program Outcomes in Santiago Atitlan

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Introduction

Mayanza is a physician assistant-led charitable organization that works to improve the health of school children in Santiago Atitlan, Guatemala. Mayanza supports a number of programs in the schools and community and this poster will present the program outcomes of an Anemia Prevention and Treatment Program over an 18 month period from February 2018 – July 2019.

The community of Santiago Atitlan is a primarily indigenous Maya Tzutujil population with a presumed high incidence of soil transmitted helminthic infections (STHI) due to lifestyle factors including poor sanitation. Combined with a high rate of infection there is widespread poverty and malnutrition which can cause iron deficiency anemia and growth stunting leading to chronic deficits in health, cognitive development, learning and educational achievement.¹

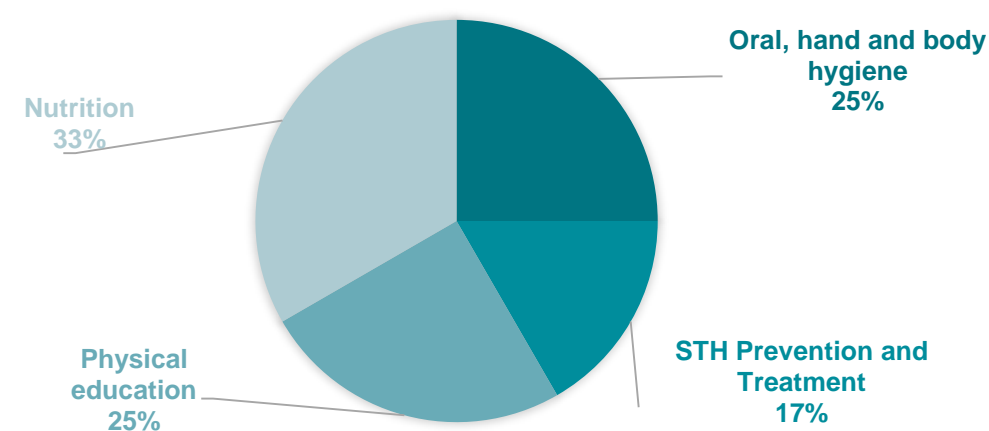
A program was devised focusing on a three pronged approach to addressing the issues of STHI and subsequent anemia; education of prevention, providing resources for change and treatment of the STHI and anemia. Program outcomes data were collected and analyzed revealing a significant improvement in the level of anemia.

Methodology

The program uses a three-pronged approach: education of prevention, treatment and providing resources with an expected outcome of decreased levels of anemia in school children over time. Program evaluation data was collected from 3 schools with children aged 3 – 20.

EDUCATION: A Maya teacher from the community was recruited and trained to provide weekly health education in the schools about hand washing, nutrition and home prevention of STH infection among other topics. Records were kept by the community health educator detailing the number of hours spent on each topic.

COMMUNITY HEALTH EDUCATION TOPICS

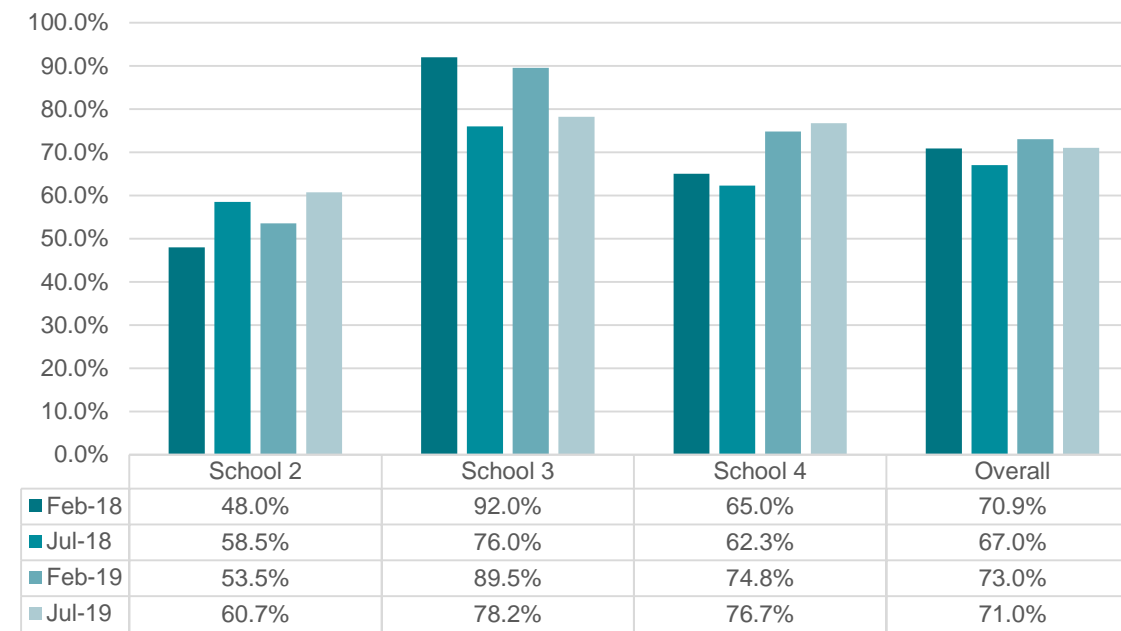


RESOURCE DISTRIBUTION: A team of physician assistants, students and other health care professionals traveled to Guatemala twice yearly, in February and July, to facilitate a school clinic and distribute soap to each child. In addition, the schools were provided with soap to support hand washing during the school day. In accordance with WHO guidelines, daily multivitamins with iron were given to the administrative team of each school with a plan for daily administration of the vitamins over the school year.²

TREATMENT: In alignment with WHO treatment protocols for presumed high rate of community STHI, each child who was consented by parents, was given a dose of albendazole in February and July of 2018 and 2019. Additionally, the hemoglobin of the children was measured using a point of care HemoCue Hb 201 hemoglobin analyzer according to all manufacturer's recommendations. Initial measurements at baseline were obtained in February 2018 and additional measurements were taken in July 2018, February 2019 and July 2019.

Results

LEVEL OF SCHOOL PARTICIPATION

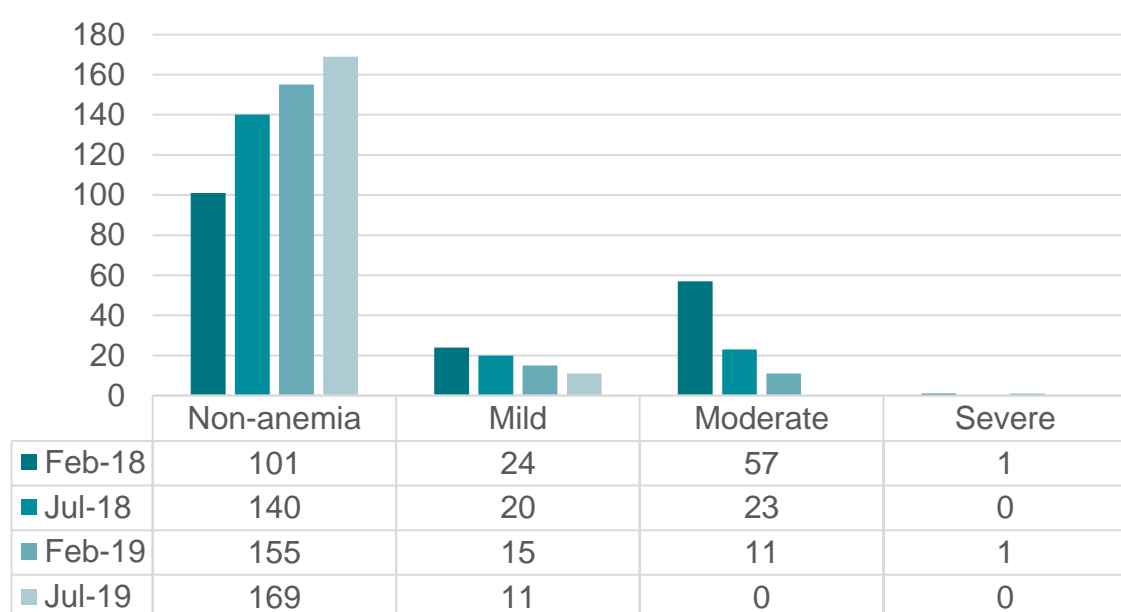


The level of participation fluctuated over time at each school but provided a representative sample of the population from which to draw some conclusions. Over the 18 months, 182 children were present and had their hemoglobin assessed at all four interventions. Analysis of this cohort who attended all interventions revealed a number of important points. At the initial baseline hemoglobin testing in February 2018, 44.8% of the 182 children were found to be anemic. This amount decreased over time at each intervention and in July 2019, only 6% of these children were anemic with no severe cases seen.² Although the level of anemia decreased steadily over time, the time in which the most significant change occurred was during the first six months on intervention.

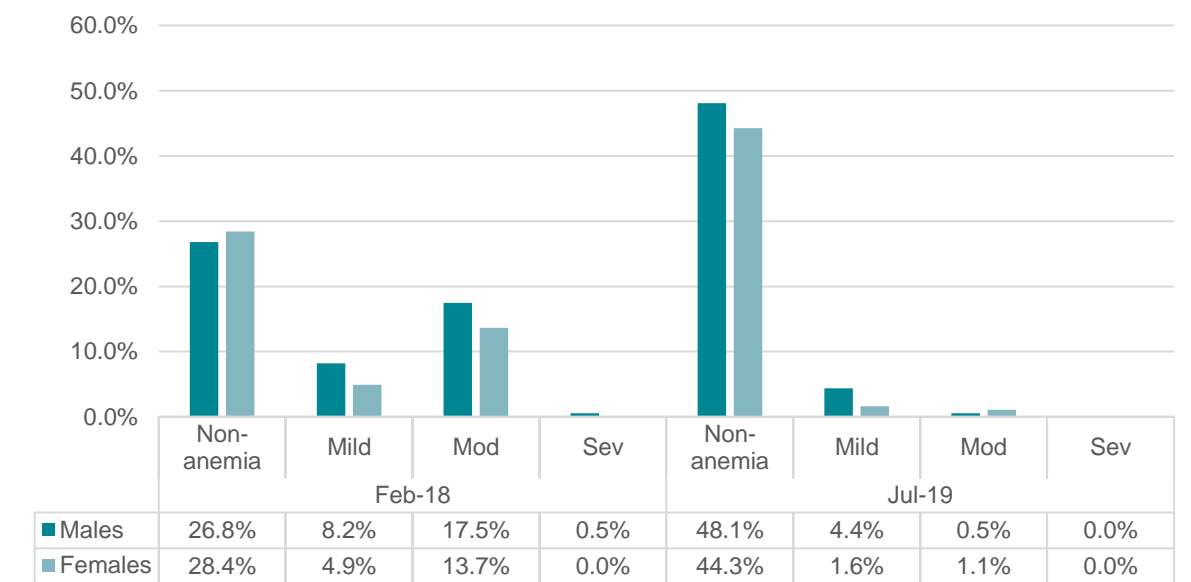
When analyzed by gender, at baseline more males than females were found to be anemic. Although there was improvement in the overall rate of anemia in both groups, when reassessed 18 months later, this trend continued where more males were anemic than females.

In addition, the data was analyzed from all 532 children who were evaluated when baseline data was collected in February 2018. The children were divided into groups consistent with WHO anemia guidelines age groupings.² At baseline, 22% of children from 5 – 11 years of age were anemic. The group with the next highest rate of anemia was children aged 12-14 years with a rate of 3.27%.

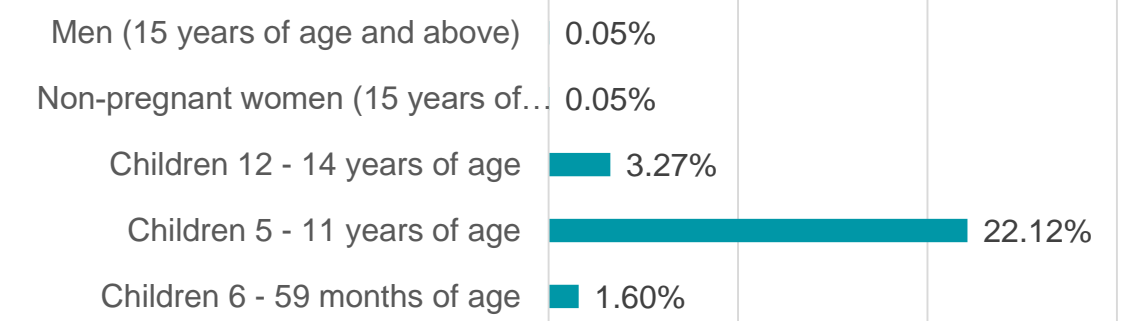
LEVEL OF ANEMIA IMPROVEMENT



LEVEL OF HEMOGLOBIN SEVERITY BY GENDER



INCIDENCE OF ANEMIA AT BASELINE



Discussion and Conclusion

Analysis indicated that the incidence of anemia has decreased over time in this population after the implementation of the three-pronged approach. Based upon the analysis, it appears that the most significant decrease in the incidence of anemia occurred within the first six months. This speaks to the importance of having all resources ready for the beginning of an intervention and working with an experienced community health educator. For this analysis, 182 out of 532 children (34%) were evaluated at all four interventions allowing for a robust population from which to evaluate program outcomes.

This analysis was conducted as part of program evaluation and therefore some limitations are noted. Limitations of the data include that no control group or independent arms were utilized which limits the ability to determine which of the three parts of the intervention was most effective.

The analysis of this data leads to additional questions to explore and understand in this population including why there is a higher incidence of anemia in boys than girls in this population? and why are the ages of 5 – 11 are most affected? Additionally, long term observation of this population would help to determine if the improvements are sustained. This is a program that could be portable to other schools within Guatemala and other communities with children at high risk for anemia and STHI.

References

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2. WHO. Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity. Vitamin and Mineral Nutrition Information System. Geneva, World Health Organization, 2011 (WHO/NMH/NHD/MNM/11.1) (<http://www.who.int/vmnis/indicators/haemoglobin.pdf>, accessed May 5, 2020).
3. Saboyá MI, Catalá L, Ault SK, Nicholls RS. Prevalence and intensity of infection of Soil-transmitted Helminths in Latin America and the Caribbean Countries: Mapping at second administrative level 2000-2010. Pan American Health Organization: Washington D.C., 2011.
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