

Healthy Pequeños



Holistic and sustainable interventions to prevent pediatric infectious disease and help little ones grow up healthy.

A report on the Healthy Pequeños program pilot year
July 2018 – July 2019



Forward

Today in low Socio Demographic Index (SDI) countries, pediatric infections make up the top three causes of early death and disability.¹ In contrast, in high SDI countries, infectious diseases are no longer leading causes of early death and disability. This difference between low and high SDI countries reveals that we, as a global health community, have the knowledge of how to successfully prevent infections, however we have failed to do so in low SDI countries around the world.

This disparity is what has inspired the design of the Healthy Pequeños program. Healthy Pequeños combines existing global health knowledge on effective ways to prevent infections in children to create a holistic and community-specific program model for infection prevention. The program consists of interventions that address three primary components to infection prevention – pathogen exposure reduction, health education and promotion, and infection surveillance.

This report highlights the work done by Healthy Pequeños during the 2018-2019 pilot year implementation of the program. This initial implementation took place at the Nuestros Pequeños Hermanos (NPH) organization in Mexico. NPH is a nonprofit organization that cares for over 3,000 orphaned, abandoned, and impoverished children in 9 Latin American countries. The children are cared for until they are post-university or trade school young adults and prepared to live on their own. NPH Mexico cares for children in 5 locations.²

This first year of Healthy Pequeños marks only the beginning of the work we hope to do. We hope to spread this model for infection prevention to others working to improve the health of vulnerable children. Working together, we can prevent infectious diseases in children, helping them grow up happy and healthy.

¹ Institute for Health Metrics and Evaluation (IHME). **Findings from the Global Burden of Disease Study 2017**. Seattle, WA: IHME, 2018.

² Healthy Pequeños was implemented at the 3 largest locations caring for children (in the towns of Miacatlán, Cuernavaca, and Matamoros), as the other two locations house the young adults attending university or trade school.



Healthy Pequeños Program Model



Pathogen exposure reduction

Health education and promotion

Infection surveillance



Reduced pediatric infections

Pathogen Exposure Reduction



One primary way to prevent infections in a community is to reduce the exposure of its inhabitants to dangerous pathogens. Following environmental assessments at NPH Mexico, Healthy Pequeños identified and eliminated the primary sources of pathogen exposure.

WATER

As a reservoir for many pathogens, contaminated water can be the source of a number of infectious diseases. With the help of a generous private donor, a 7-step Aquaclyva water purification system was installed in the NPH Miacatlán home. Children at the Miacatlán home now have access to clean drinking water. Through filling and transportation of filtered water jugs, children at the Cuernavaca home have access as well. In Matamoros, a broken water filtration system was repaired and is now functioning and providing children with clean water. The piping and pumps through which water flows can also contaminate water. The water piping and water pumps at NPH Mexico were assessed and repairs and cleanings were done at the largest and oldest home in Miacatlán. This cleaning and repair also helps to maintain the water piping and pump system as well as the water filtration system.



water filtration systems at NPH in Miacatlán (top) and Matamoros (bottom)



water jugs being filled with filtered water

**615 children
with new access
to clean water**

**15 water-related
services provided**



SANITATION

Adequate sanitation is imperative to preventing exposure to pathogens carried in human waste. Through the initial environmental assessment, several problems with sanitation were noted in Miacatlán and Matamoros. In Miacatlán, these problems included old and damaged sewage piping, and an overflowing and damaged septic tank, all of which contributed to leakage of sewage near the children's living spaces. In Matamoros, the existing septic tank was close to the living spaces of the children and shallow in its depth with little volume capacity. This led to sewage leakage from the tank and exposure of pathogen containing waste to the children. In Miacatlán, we provided repairs to the piping and septic tank which eliminated sewage leaks and therefore exposure of waste to children. In Matamoros, a new septic tank was created farther from the living spaces and it was made deeper into the ground and with greater volume capacity. This eliminated the sewage leakages and pathogen exposure in Matamoros as well. In both Miacatlán and Matamoros there are now maintenance schedules for the septic tanks and pipes so that NPH can sustain the repairs, identify possible problems, and prevent future leaks.

Completion of 6 major sanitation repair projects



Septic system repairs (top: Miacatlán, bottom: Matamoros)



Elimination of 7
sources of sewage
exposure for 461
children

PHYSICAL STRUCTURES

Damaged physical structures can also contribute to pathogen exposure. The environmental assessment revealed damaged structures in the clinic in Miacatlán, related to both the September 2017 earthquake and the old age of the buildings. The damaged spaces were in the bathrooms for sick children, the treatment room, and the dental clinic room. The bathroom damage consisted of nonfunctional toilets, sludge on sinks and shower heads, and broken tiles on the walls and flooring leading to exposed concrete and the entrance of insects. The clinic treatment room and dental clinic room had similar damages with broken tile exposing concrete, sludge on sinks, and damaged windows and screens allowing the entrance of insects. Healthy Pequeños provided renovations to the clinic bathrooms, treatment room, and dental clinic room in order to create clean spaces for treating children and a better environment for healing.



582 children with access to sanitary clinic spaces

8 repaired
clinic spaces





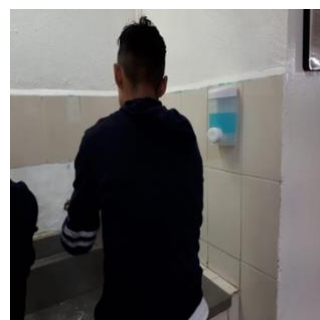
Infection Prevention Health Education and Promotion

Education about and promotion of behaviors that help prevent infections is another key component to preventing pediatric infectious diseases in communities.

HEALTH PROMOTION

To help encourage and facilitate performance of infection prevention behaviors taught in the education lessons, health promotion is needed. The risk behavior analysis combined with the environmental assessment guided the health promotion interventions. The risk behavior assessment revealed the 3 most prevalent risky behaviors at NPH. They include improper hand hygiene – not washing hands with soap and not washing hands at times when it is needed; consumption of soiled food and water, such as unwashed fruits and vegetables or unfiltered water; and placing objects, such as toys, in the mouth. The environmental assessment revealed several factors that may be influencing these risky behaviors. Lack of soap near sinks in Miacatlán and Cuernavaca, long distance of bathrooms and sinks from activity areas in Miacatlán due to the large size of the home, and convenience of unfiltered water spouts throughout the Miacatlán and Cuernavaca homes for children to drink water from were all identified as contributors to risky behaviors. We therefore addressed these factors to promote healthy behaviors in place of risky behaviors. We installed soap dispensers next to all sinks and installed filtered water fountains and soap dispensers next to the spouts around the Miacatlán location to make drinking and handwashing stations. In addition, healthy behavior promotion signs were placed around the homes to encourage behaviors such as washing hands, cleaning fruits and vegetables before consuming, and only putting food in mouths. The caregiver training included information about how to gently correct children when they are seen to perform these risk behaviors and how to encourage them to perform healthy behaviors instead. The ultimate goal of these interventions is to create habits in the children that will help keep them healthy throughout their lives. Finally, another important aspect of health promotion is vaccinations. In July of 2018, 70 indigenous children from the mountains in the state of Guerrero arrived at NPH Mexico. Coming from extreme poverty and limited healthcare, many of these children were missing vaccines. We therefore implemented a vaccination campaign to ensure all children are up to date on all vaccines.

730 children now
up to date on vaccines



Over 50
implemented
health
promotion
interventions

HEALTH EDUCATION

To educate children and caregivers on ways to prevent infections, Healthy Pequeños designed a comprehensive infection prevention education program. The program consists of a developmentally-based curriculum for children with a corresponding resource and activity guide, and a pediatric infection prevention curriculum for caregivers. These curricula were created based on Centers for Disease Control (CDC) National Health Education Standards relating to infection prevention and on United Nations International Children's Emergency Fund (UNICEF) guidelines.^{3,4} In addition, pre- and post-knowledge assessment tools corresponding to the curricula and based on developmentally-based CDC assessments, have been developed for children and caregivers in order to assess the efficacy of the curriculum and activities. To facilitate the provision of health education, Healthy Pequeños developed an education room in the Miacatlán clinic with audio-visual capabilities in order to provide a space dedicated to health education and to allow the clinic staff to provide the Healthy Pequeños health education as well as other health education topics for children and caregivers.



98 education sessions given to
733 children and **37** caregivers

97% of caregivers report seeing an increase in infection prevention behaviors among the children throughout this year

100% of caregivers report making changes in their own behavior to help prevent infections in themselves and the children throughout this year



Healthy Pequeños celebrates
Global Handwashing Day

Increase in percentage of students meeting each infection prevention health education standard after education across all age groups as well as among caregivers

³ Centers for Disease Control and Prevention (CDC). HECAT: health education curriculum analysis tool. Atlanta, GA: Dept. of Health and Human Services, Centers for Disease Control and Prevention, 2012.

⁴ United Nations Children's Fund. (2010). Facts for Life (4th ed.). New York, NY: UNICEF.



Infection Surveillance

To prevent infections in a community environment, infection surveillance is necessary in order to identify signs of increased occurrence and possible disease outbreaks. Therefore, with this surveillance, clinic staff can identify and address increases in specific illnesses and prevent outbreaks. Healthy Pequeños developed an infection surveillance tool that is used by clinic staff to evaluate monthly infections in the home. This tool consists of a table for identifying the number of infections, classified by body system, per month and a section for notes and plans relating to the data. Through the clinic Electronic Medical Record (EMR) system, data of monthly acute diagnoses can be downloaded. This tool is then completed each month based on the EMR data and reviewed by clinic staff to assess the situation of infections at the homes and design interventions as needed.

Vigilancia de infección – Clínica Médica NPH México

Mes: _____

Sistema Corporal:	Casos (número)
General - Diagnóstico (círculo): mialgia, molestar general, dolor del cuerpo, otra:	
Neurológico - Diagnóstico (círculo): meningitis, encefalitis, otra:	
Orejas, ojos, nariz, gargantas - Diagnóstico (círculo): tonsilitis, conjuntivitis, otitis externa/media/interna, mastoiditis, rinosinusitis, epiglottis, paperas, sarampión, varicela, rubéola, Epstein-Barr virus, otra:	
Integumentario (pelo, piel, uñas) - Diagnóstico (círculo): celulitis, absceso, escabiosis, MRSA, dermatitis, impétigo, otra:	
Respiratorio - Diagnóstico (círculo): bronquiolitis, bronquitis, neumonía, virus sincitial respiratorio, crup, tuberculosis, influenza, otra:	
Cardiovascular y vascular periférica: - Diagnóstico (círculo): miocarditis, endocarditis, la enfermedad de Kawasaki, otra:	
Gastrointestinal - Diagnóstico (círculo): gastroenteritis (N/V/D), parásitos, hepatitis A, botulismo, otra:	
Gentourinario - Diagnóstico (círculo): enfermedad de transmisión sexual, infección de vías urinarias, nefritis, síndrome uretral agudo, otra:	
Esquelético/muscular - Diagnóstico (círculo): osteomielitis, artritis bacteriana, otra:	
De insectos - Diagnóstico (círculo): dengue, chikungunya, Zika, enfermedad de Lyme, malaria, otra:	

Notas:



NPH Mexico internal clinic in Miacatlán



Healthy Pequeños infection surveillance guide



Healthypequenos.org

Acknowledgements:

Healthy Pequeños would like to thank The University of Pennsylvania and the President's Engagement Prize for making this project possible through its funding and support.

We are also thankful for the project's advisors, Dr. Cynthia Connolly and Nancy Biller, of the University of Pennsylvania School of Nursing, who provided endless support throughout the design and implementation of this project. The engineering consulting provided by Dr. Jorge Santiago and Rachel Hoying of Penn Engineering was also critical to this project.

Finally, we are grateful for our partnership with NPH Mexico and NPH International. Their support, guidance, and collaboration were imperative to this first year of Healthy Pequeños.



Resources

If you or your organization are interested in using any of the Healthy Pequeños program documents for your work, the following can be accessed on our website, healthypequenos.org.

Available documents (available in both English and Spanish):

Healthy Pequeños Program Guide

Healthy Pequeños Infection Prevention Education Curriculum for Children

Healthy Pequeños Infection Prevention Education Curriculum for Children – Resource Guide

Healthy Pequeños Infection Prevention Education Curriculum for Caregivers

