

# GLOBAL HEALTH REPORT

Department of Pediatrics



Boston Children's Hospital  
Global Health Program



Department of Pediatrics  
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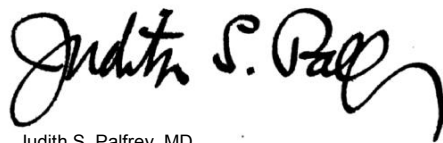
# Introduction

Families around the world depend on health care providers to support the growth, health and development of their children. Communities count on doctors, nurses and other health professionals to ensure that each generation of children and adolescents is protected as much as possible from harm – whether that be from infection, malnutrition, injuries, environmental toxins, behavioral excesses, interpersonal violence or the lack of health and education services. The Sustainable Development Goals are an acknowledgment that economic disadvantage, poverty, war, unstable government structures, prejudice and intolerance are major threats to children’s health and growth. As a global community, we have the biologic, social, and scientific knowledge and resources to prevent many ill consequences for children and to intervene when a health or developmental problem has occurred despite all the best efforts. For nearly a decade, the Global Pediatrics Program (GPP), has been playing a part in the world-wide child health effort to address the root causes of childhood illness and disability and to promote the health of all children and adolescents.

The Global Pediatrics Program brings together the faculty, residents, fellows, and staff of the Department of Pediatrics at Boston Children’s Hospital who share the commitment to addressing the clinical and health service infrastructural gaps in low resource settings. The work of the GPP is conducted in partnership with child health colleagues and programs in numerous sites around the globe. Through clinical service, education, research and advocacy, the GPP’s teams strive to increase the overall capacity of the global child health community to address the challenges that face children and families. The GPP works in close conjunction with the global health teams in the Department of Nursing, Surgery, Anesthesia and Psychiatry as an active participant in the Boston Children’s Hospital Global Health Program.

As we reflect on the GPP for this report, we are gratified by the maturation of our efforts and take a measure of pride in the impact our partnerships have had on the development of the pediatric workforce and health care systems in several countries that have faced internal conflict, natural disaster and other complex dynamics. We also see the need for a redoubling of effort in an unsettled and unsettling world.

We are grateful to so many people at the Boston Children’s Hospital and beyond for their caring advice, backing and donations. We especially want to thank Dr. Gary Fleisher, the Chief of the Department of Pediatrics, Dr. Fred Lovejoy, the Associate Chief of the Department of Pediatrics, Dr. Joanne Cox, the Interim Chief of the Division of General Pediatrics and Dr. Michelle Niescierenko, Director of the Boston Children’s Hospital Global Health Program as well as Dr. Jeffrey Burns, and Ms. Cynthia Haines from International Health Services for all their encouragement and support. And special thanks to our funders, especially Patti Satterthwaite and John Muresianu, who have sustained us from the very beginning.



Judith S. Palfrey, MD  
Director, Global Pediatrics Program

# Where We Work



Chile  
China  
Dominican Republic  
Ethiopia  
Ghana  
Guatemala  
Haiti  
India  
Laos  
Liberia  
Rwanda  
Tanzania

## Haiti

### INFANT MORTALITY RATE = 51

probability of dying by  
age 1 per 1000 live  
births

### UNDER 5 MORTALITY RATE = 67

probability of dying  
by age 5 per 1000  
live births

### MATERNAL MORTALITY RATIO = 359

per 100,000 live births

### NUMBER OF HOSPITAL BEDS = 1.3

per 100,000 population

### POPULATION AGED < 15 = 33 %

Haiti is a Caribbean country located on the island of Hispaniola along with the Dominican Republic. Home to 10 million people, Haiti has experienced significant turmoil and societal upheaval throughout its history. Currently, the human development index of Haiti is 0.49, the lowest in the Western Hemisphere and 163rd of 187 countries. The health and education systems are fragile at best and the country depends on significant foreign aid.

In 2010, a devastating earthquake struck Haiti and destroyed much of the capital city of Port Au Prince including hospitals, the national medical school and the national nursing school. This disaster caused over 230,000 deaths and left large numbers of people with injuries and disabilities. Many children were orphaned, forcing them to live on the streets or be cared for by already overburdened relatives. At the time of the Haitian earthquake, the Boston Children's Hospital sent over 100 staff members in response. Also, the hospital provided medicines and supplies to aid the disaster teams. Boston Children's Hospital's global health programs have continued to work in Haiti since that time. The Global Pediatrics Program has made a formal relationship with Partners. In Health and Global Pediatric fellows and staff work in PIH programs in St. Marc and Mirebalais. Increasingly, we are sponsoring observers from the Mirebalais Residency Program to spend time in the sub-specialty units at Boston Children's Hospital. The GPP also has a close relationship with the Kay Mackenson Center.

# Liberia

**INFANT MORTALITY RATE = 51**

probability of dying by age 1  
per 1000 live births

**UNDER 5 MORTALITY RATE = 67**

probability of dying by age 5  
per 1000 live births

**MATERNAL MORTALITY RATIO = 725**

per 100,000 live births

**NUMBER OF Hospital Beds = 0.8**

per 100,000 population

**POPULATION AGED < 15 = 42 %**

The Liberian nation of 4.5 million people is now 16 years post-conflict and 3 years out from the devastating Ebola epidemic that affected over 11,000 people, claimed nearly 5000 lives and paralyzed much of the country including the health care system. For a decade the Boston Children's Hospital has collaborated with Liberian and other US academic institutions to support the delivery of medical education in Liberia. During the Ebola outbreak Dr. Michelle Niescierenko led efforts among the partners to conduct emergency response to all 23 government hospitals in Liberia providing emergency infection control and triage with the needed equipment and water and sanitation infrastructure with support from the Paul G. Allen Family Foundation. During the Post Ebola recovery period funded by the US CDC Dr. Niescierenko in partnership with Liberia College of Physicians and Surgeons implemented a national hospital quality improvement program to support ongoing safe practice in Liberia. Currently Boston Children's is collaborating with the Ministry of Health and Liberia College of Physicians and Surgeons as the partner to the pediatric residency program and implementer for a clinician point of care ultrasound training program with the goal of generating a long term sustainable pediatric workforce in Liberia.



# Rwanda

**INFANT MORTALITY RATE = 29**

probability of dying by age 1  
per 1000 live births

**UNDER 5 MORTALITY RATE = 38**

probability of dying by age 5  
per 1000 live births

**MATERNAL MORTALITY RATIO = 290**

per 100,000 live births

**NUMBER OF Hospital Beds = 1.6**

per 100,000 population

**POPULATION AGED < 15 = 40 %**

Rwanda is located in central and east Africa, bordered by Uganda, Tanzania, Burundi and the Democratic Republic of the Congo. Three ethnic groups (the Hutu, Tutsi and Twa peoples) make up the population. From 1990 to 1994, the country was trapped in a devastating civil war, characterized by ethnic genocide that claimed the lives of as many as 1,000,000 people. Since the end of the war, Rwanda has witnessed a high level of social stability and an increase in economic growth.

The health of the Rwandan people was profoundly affected by the 4 years of civil war and the health indicators at the time were some of the worst in the world. With the reconstruction of the country and the economic recovery, the government of President Kigami has been committed to improving the health systems infrastructure to benefit the citizens and to improve the overall health status of the population. The Health Ministry has initiated a number of innovative programs to advance the state of health services. The Boston Children's Hospital is actively involved with the USAID funded Human Resources for Health project. This program is directed at increasing the number of well-trained Rwandan health professionals. As of 2011, prior to the beginning of the HRH program, there were only 625 physicians, 8,000 nurses and 10 dentists for over 10 million people. The seven year goal for HRH was to train over 400 physician specialists and improve the skills of over 4000 nurses. Boston Children's Hospital physicians participated in the HRH program providing training to residents in pediatrics, surgery and anesthesia. A very exciting development has been the exchanges and mentorship programming with partner Rwandan Physicians.

# Laos

## INFANT MORTALITY RATE = 49

probability of dying by age 1 per 1000 live births

## UNDER 5 MORTALITY RATE = 64

probability of dying by age 5 per 1000 live births

## MATERNAL MORTALITY RATIO = 197

per 100,000 live births

## NUMBER OF Hospital Beds = 1.5

per 100,000 population

## POPULATION AGED < 15 = 33 %

Laos is a landlocked country in Southeast Asia with a population of 6.8 million. The Lao economy depends heavily on investment and trade with its neighbors, Thailand, Vietnam, and China. Early childbearing has taken a toll on both the infant mortality rate and maternal mortality rate in Laos. Laos has an infant mortality rate of 49/1,000 live births and a maternal mortality ratio of 220 per 100,000 live births. However, in an effort to decrease the magnitude of these statistics, GPP fellows have been working with the Lao Friends Hospital for Children to expand the hospital's Neonatal Unit and increase the presence of hospital faculty during high-risk deliveries at the nearby Provincial Hospital.

Lao Friends Hospital for Children is currently an NGO supported children's hospital in Luang Prabang that is in the process of transitioning to a government run facility. GPP faculty, fellows, nurses and other BCH faculty have continued to support the educational mission of the hospital as it provides free care to many children in the northern half of the country, often from the minority communities of Hmong. BCH nurses, fellows, and faculty support the goals of Laos Friends Hospital through peer education and mentoring of Laos clinicians to provide necessary care and have been able to contribute to the almost 50% increase in the number of patients being seen by the hospital.

# Chile

Chile is a middle-income country that is experiencing strong economic growth. The GDP Annual Growth Rate in Chile has averaged 5.05% between 1987 and 2017, eventually reaching an all-time high of 16.15% (Banco Central de Chile). Despite the strong economy, the benefits of the improvements have not accrued to everyone. Chile has the second highest financial inequity measure in South America. GPP faculty have been working in conjunction with the David Rockefeller Center at Harvard on two major projects- Un Buen Comienzo, an early childhood development project, and Recupera Chile, an initiative to assist with community recover after the 2010 8.8 earthquake.

# Dominican Republic

The Dominican Republic occupies the eastern half of the Caribbean island of Hispaniola. Its population is 10.8 million and its economy is increasingly growing with a current designation as an upper-middle income developing country. While the Dominican health care infrastructure is relatively well developed, health indices continue to reflect significant needs, especially among the poor. Under 5 mortality rate is 31/1000 live births and immunization completion is well below the recommended levels, with additionally high stunting rates. GPP faculty have partnered with primary care and hospital programs in the DR to both improve maternal and infant care issues and provide infectious disease prevention.

# India

With a population of over a billion people, India is the 2<sup>nd</sup> most populous country in the world. India has recently experienced very positive economic growth, but the country still has a low nominal GDP per capita and the average life expectancy is very low at 66 years for men and 68 years for women. The 2016 under 5 mortality rate was 43 per every 1000 births and the 2015 stunting rate was 38%. GPP affiliated faculty member Vibha Krishnamurthy has developed a child development program in Mumbai that has a national outreach arm to train health and social care providers about children with developmental disabilities. GPP faculty collaborates with Ummeed to spread the use of standardized developmental tools.

# Guatemala

The central American country of Guatemala has a population of 17 million, with nearly half of the population under the age of 15. The country's health statistics reflect significant health care insufficiencies with an under 5 mortality rate of 28/1000 live births and high rates of malnutrition and stunting, especially among the indigenous populations living in poor, isolated areas. GPP affiliated faculty member Peter Rohloff has been confronting the health care issues in several indigenous communities. He has developed clinical, nutritional, and educational programming.

## China

China is the world's most populous country with a population of over 1.3 billion people as well as the world's second largest economy as measured by GDP and purchasing power parity. The infant mortality rate in China is reported to be 8.5/1000 live births with a neonatal mortality rate of 5.1/1000 live births. The under 5 mortality rate is 9.9/1000 which is an impressive improvement from the 1991 rate of 61/1000 live births. The Chinese maternal mortality ratios runs at approximately 23.2/100,000 live births. However, despite this improving health care statistics, China has a significant shortage of health personnel, which is being aggravated by the rescinding of the "one child policy". China now has a very low ratio of pediatricians at 0.43/1000 children and it is estimated that China is short about 200,000 pediatricians. In collaboration with the China Medical Board, GPP faculty are helping to develop improved residency training methodology.

## Tanzania

Tanzania is an East African country with a population of 57.3 million people and a landmass of 365,756 square miles. Its major industries are textiles and agriculture, while the country's booming mining industry yields its most valuable export: gold. Although the under 5 mortality rate for 2016 was 56.7/1000 live births, this is a vast improvement since the 2009 under 5 mortality rate of 167/1000 live births. Members of the GPP have worked in partnership with colleagues in Dar es Salaam at the Muhimbili University through training exchanges and quality improvement projects. In addition, faculty of the GPP are engaged in research studies on nutrition and on the use of digital health methods in collaboration with the Harvard T.H. Chan School of Public Health Global Health Program.

## Ghana

Located along the Gulf of Guinea, Ghana is bordered by Côte d'Ivoire, Togo, and Burkina Faso and is home to 27.5 million people. Ghana has been hit significantly by the HIV/AIDS epidemic, resulting in an under 5 mortality rate of 58/1000 live births and an infant mortality rate of 41.2/1000 live births. In addition, nearly 40% of Ghana's population is under 14 years old. The country's economy has, however, experienced a recent upswing in the exportation of cocoa beans, timber, and gold. GPP faculty are assisting in the treatment and prevention of HIV, the development of various protocols regarding the treatment of Sickle Cell Disease, and the tracking of neurological disease prevalence in children.

## Ethiopia

Located in the Horn of Africa, and sharing borders with Eritrea, Djibouti, Somalia, Sudan, South Sudan, and Kenya, Ethiopia is a highly populated country, home to over 100 million people. Its human development index (HDI) is 0.396, placing the country with the very low ranking of 173<sup>rd</sup> in the world. 85% of the labor force is involved in agricultural pursuits growing crops including coffee, cereals, and sugarcane. Ethiopia has recently seen improvement in its economy and health systems, even with the persistent conflict that has afflicted the country for many years. Nonetheless, the life expectancy of men is 63 and for women, it is 67. GPP faculty members and affiliates who are working in Ethiopia on projects to improve maternal and infant health.



# What We Do

The Global Pediatrics Program engages with our global partners to address pediatric health needs in low resource settings.

Our initiatives focus on at least one of the following three areas:



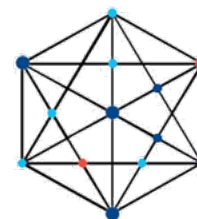
## Personnel

To provide child health care personnel with the knowledge and skills to meet the medical needs of their communities. The partnership goal is that the trainees will develop competency in leadership and advocacy so that they are the drivers of change in their health care environments.



## Material

Identify the medical supplies and equipment that are necessary to meet the medical needs of a community, while also being location appropriate. Working with the local child health specialists and agencies, identify sources for the needed materials and supplies.



## Systems

Address the systematic challenges that act as roadblocks to progress in sustainable health services. Working together with Ministries of Health and Health Provider Organizations such as Hospitals, we aim to develop strong, sustainable clinical service delivery for children at the primary care, consultative and tertiary care levels.



# Strategic Priorities

The global health work of Boston Children's Hospital is focused on strengthening child health care delivery in low resource settings. Our partnerships address: Care Delivery, Research, Education and Advocacy.

In the following sections, we provide illustrative examples of the global projects and programming in these four key areas:

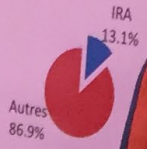




### Résultats

Sur 954 admissions, 2 patients ont été exclus, 125 ont présenté une IRA donnant une prévalence de 13.13%. L'étiologie la plus fréquemment retrouvée a été la déshydratation 28%, suivie de la décompensation cardiaque 25%, l'HTA maligne et le sepsis ont compté pour 10% chacun. Les groupes de moins de 40 ans et entre 40 et 60 ans ont présenté le même profil étiologique : la déshydratation comme première cause (33.9% et 28.2% respectivement). Alors que le groupe des plus de 60 ans a différé des autres avec la décompensation cardiaque comme première cause 39.3% ( $p=0.045$ ).

### Prévalence



Source: Archives de l'HUM de Janvier 2

Source: Archives de l'HUM

Tableau 1. Age, Déshydratation, Décompensation cardiaque

Niveau de connaissance	hypertrophie ventriculaire gauche	insuffisance cardiaque	insuffisance rénale chronique
1	22	184	69
2	10	142	24

connaissance de l'HTA et la présence de l'hypertrophie ventriculaire gauche. Ce constat est conforme aux études notant un lien entre le niveau de connaissance de l'HTA et la présence de facteurs de risques cardiovasculaires.

Parmi 180 patients contactés: 1 seul a refusé de passer le questionnaire, 6 ont répondu aux critères d'exclusion, 9 ont présenté des données manquantes.

### Conclusion

Les patients ayant été informés par un personnel médical connaissent mieux l'HTA. Un niveau de connaissance plus élevé de cette pathologie est remarqué chez ceux qui n'ont pas d'hypertrophie ventriculaire gauche.

Le personnel médical devrait prendre les dispositions nécessaires pour mieux éduquer les patients hypertendus afin de réduire la survenue d'au moins une de leurs complications.

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# Care Delivery

**Excellence and innovation in global health care delivery is central to the work of the Department of Medicine's Global Pediatrics Program (GPP) at BCH. Here we present the current areas of clinical focus and some exemplary projects.**

## Maternal, Infant, & Child Care

Since the 2000 publication of the Millennium Development Goals, child survival around the world has improved with the under 5 mortality decreasing from over 12 million per year to 5.6 million in 2017. Despite these great overall achievements, ensuring infant survival remains a major challenge in resource poor environments. Moreover, the greatest hurdle in maternal and child health has been the provision of adequate care for premature and low birth weight infants. With our global colleagues, faculty, fellows and affiliates of the GPP strive to improve the perinatal and newborn care experience of children in our partner countries. GPP faculty and fellows become proficient in the Helping Babies Breathe curriculum and offer regular trainings at our partner sites. GPP faculty and fellows provide direct care in newborn nurseries, establish clinical guidelines, initiate and implement quality improvement protocols and provide on-going training and technical assistance with our partner pediatric and nursing colleagues. Together with the Department of Nursing, we work to assure that the neonatal staffs in our partner sites are equipped with appropriate materials and have access to ongoing consultation.

In Rwanda, the Ministry of Health has put a high priority on improving neonatal survival. The Rwandan neonatal mortality rate declined from 26/1000 live births in 2005 to 21/1000 live births in 2011 to 18.7 in 2016. GPP staff and fellows have served as active partners in these efforts.

Dr. Anne Hansen and her team helped the Ministry of Health develop standard clinical neonatal guidelines in 2012. A major innovation in the Rwandan nurseries is the introduction of bubble CPAP. In addition, Dr. Hansen and GPP former fellow Leanna May have been developing an infant warmer which has the potential of transforming newborn care (See Research Section). Neonatology staff have also helped develop



protocols for the Neonatal Intensive Care Unit at the PIH Hospital in Mirebalais. Several of the GPP fellow projects have focused on promoting breast feeding. The All Babies Count (ABC) project in Rwanda is an intensive follow up program for babies born prematurely or of low birth weight. Dr. Kim Wilson has collaborated with local doctors and nurses to establish a comprehensive out-reach and clinical program to identify children with chronic conditions and disabilities that stem from birth complications. The ABC program has been so successful that it is now being expanded and replicated to several other sites.

In Lao, the GPP team is working to assist the Lao Friends Hospital in developing the neonatal intensive care program. In addition, child health care staff from Lao Friends are attending the majority of the high risk deliveries at the local Provincial Hospital and seeing a promising decrease in neonatal deaths as a result of implementing standard delivery room practices (a drop from 3.1% mortality rate in mid-2016- mid-2017 to 2.6% in mid-2017-mid 2018).

## Nutrition

Recognizing that malnutrition is a contributing factor to childhood mortality in upwards of 40% of cases, the GPP teams emphasize the integration of nutritional interventions into health care delivery. In Rwanda, former fellow, Dr. Jennifer Werdenberg and colleagues have created a Malnutrition Checklist (MLNC) for children admitted to the hospital with Severe Acute Malnutrition. This 23 item checklist was piloted and run through a series of Plan-Do-Study-Act cycles to ensure the feasibility of introducing it into the clinical setting. The checklist incorporates all 10 of the WHO recommendations for the treatment of SAM and puts them into a ready form for implementation at the bedside



In several sites, GPP staff, fellows and affiliates are working to promote the health of children by involving community health workers in delivering practical information and skills training to families in the communities and in their homes. In Guatemala, affiliate Dr. Peter Rohloff has introduced nutritional supplementation in indigenous communities. This has moderated the malnutrition that has caused widespread stunting among poor children. He has also documented that in many rural communities in Guatemala, families have limited access to natural foods and end up feeding their children calorie dense, but nutrient poor “junk food” as a result. He has begun an intervention in which community health workers document the actual intake of the children through 24 hour recalls and then work with the families to institute strategies for introducing more varied and nutritious foods. Early findings are encouraging.

In Haiti, PIH has developed nutritional clinical services for infants and children. These programs provide high density, high calorie supplements for children who are chronically malnourished. Over the past few years at St. Nicholas Hospital in St. Marc, GPP fellows have focused their scholarly projects on the care of malnourished children. During her fellowship at St. Nicholas, Dr. Brittany Potts upgraded the in-patient protocols used to treat severely malnourished children. Babies and young children are admitted to the unit with weights significantly below what would be expected for age. Dr. Potts focused on progressive increases in feeding as the children improved and could tolerate greater amounts of intake. Dr. Xi and Dr. Saji Perrera followed this work with expanding the program to a community-based outreach component that emphasizes the importance of child development enhancement as well as the provision of appropriate food. Dr. Perrera will be reviewing the findings from this pilot program to determine how well it was implemented and how successful it has been.

Dr. Christopher Duggan and other members of the BCH Faculty and the HSPH Nutrition Department have a long-standing collaboration with Muhimbili University in Dar es Salaam, Tanzania. They have established comprehensive interventions to ameliorate the acute and chronic effects of malnutrition on children with a wide variety of illnesses, including cholera and HIV. In addition, their nutritional team has been working on maternal nutritional programming to assure that the mothers remain healthy during the pregnancy and that the babies are born at an adequate birth weight. The team has also been working on providing the appropriate micro-nutrients such as iron and vitamins to mothers and infants with a wide variety of health and social risks.

## Infectious Disease

At every care site, the staff and fellows of the GPP care for children with a wide range of common infectious diseases including pneumonia, diarrheal disease, sepsis, meningitis, HIV, TB, malaria, etc. GPP physicians treat conditions that are routinely prevented by immunizations in the United States – including measles, tetanus, and rotavirus. They also manage tropical illnesses such as dengue, cholera, and chikungunya. They follow the established national protocols and employ quality improvement methodologies to ensure accurate diagnosis as well as timely and appropriate treatment of the children and adolescents they care for. When there are staff and materials shortages, they do the best they can to manage the children with supportive care.

In Haiti, GPP doctors must treat children affected by infections caused by agents such as cholera, malaria, Chikungunya and increasingly with Zika virus. GPP fellow Dr. Virginie Clavel worked with the PIH team and public health officials on efforts to curb an epidemic of diphtheria which has affected large numbers of children in the Mirabilais area. At its height in November 2016, there were 20 suspected cases in a 3 week period with a mortality rate close to 90%. There have also been serious periodic outbreaks of pertussis. Much of the problem is due to inconsistent availability of vaccines to prevent these diseases.



In Lao, infections which have been largely eliminated in high resource settings such as dengue, malaria and parasitic diseases remain common.

The doctors working at the Lao Friends Hospital have encountered many of these diseases and learned to provide the necessary supportive care within the wards of the hospital.

Boston Children's Hospital's Division of Infectious Diseases has had a long-standing commitment to the prevention and treatment of HIV disease. With support from the Aerosmith Fund at BCH, Dr. Kim Wilson has been mentoring Dr Febronie Mushimiyimana on two HIV related projects to improve the care afforded to adolescents with HIV in Butare, Rwanda. They are emphasizing interventions that increase adherence to medication and they are planning for the transition of adolescents with HIV into the adult health care system.

The tragic Ebola crisis of 2014-2015 has had a major impact on the health infrastructure of Liberia. Dr. Michelle Niescierenko led a collaborative effort in Liberia to train health care providers in safe Ebola care. Liberia was declared Ebola free in June of 2016 with the successful reopening of many health care facilities which now are much better prepared to deal with infectious disease outbreaks from a variety of agents. Hospitals now have protocols for infection control and guidelines for the use of appropriate personal protective gear by hospital and clinical staff. Dr. Niescierenko continues to serve as a consultant to several global public health bodies. She travels frequently to countries where there are vulnerabilities for the re-emergence of the Ebola virus.

## Non Communicable Disease

Increasingly, around the world, it has become clear that much of the burden of disease for children and adolescents stems from non-infectious origins. The GPP doctors and teams work to develop programs that address such conditions as cancer, heart disease, hematologic disorders such as sickle cell anemia, diabetes, congenital anomalies and other conditions that compromise the health, growth, development and well-being of children.

GPP affiliate physician, Dr. Natasha Archer from the Division of Hematology has focused on the identification and care of children with sickle cell disease in Haiti. Together with nursing fellow Rose Mintor and GPP fellow, Meghan Craven, the team has been establishing programs of sickle cell screening. In addition, they have created a chronic disease clinic where children with sickle cell disease can receive treatment with penicillin and hydroxy urea. This type of care has not been available routinely in Haiti and already patients and their families are reporting great improvement and satisfaction. The team aims to establish a national program of sickle cell screening and care protocols to be used in health facilities.

The Kay Mackenson Center (<http://www.kaymackenson.org>) was established in 2012 by former GPP fellow, Dr. Chris Carpenter and colleagues. Kay Mackenson was the first program in Haiti to care for children and adolescents with diabetes. The Center is now affiliated with PIH and collaborates with the Pediatrics programs at Mirabilais and Mirabilais and St. Marc Hospitals.



There is a close working relation with the GPP fellowship and the Haitian Pediatric Residency program at Mirabilais. The Kay Mackenson center continues to grow and to accept patients with a wide variety of chronic conditions such as heart disease, rheumatologic and immunologic diseases. Kay Mackensen has also expanded the educational facilities for the children and offers a summer camp. The children and adolescents cared for at Kay Mackensen have witnessed great functional improvement and quality of life since the program's inception only in 2103.

In Rwanda, GPP has collaborated with Cardiologist Emmanuel Kamanzi Rusingiza and OPEN PEDIATRICS on a training program on congenital heart disease. We have also been collaborating on improving the preventive care routines for children in Rwanda with rheumatic heart disease. Children's physicians and nurses participate in a number of programs that provide cancer care to children. For instance, in Guatemala, Dr. Asya Agulnik has been leading an effort to improve the in-hospital care of children with cancer by incorporating the Pediatric Early Warning System (PEWS) into routine practice.

In Lao, there are a large number of children with thalassemia and other hemoglobinopathies that present to the Lao Friends Hospital for care. The GPP team is working on improving the detection and care of these children with chronic hematologic disorders.

## Child Development & Behavioral Health

Children's health and development are closely linked. The GPP is working to enhance the delivery of coordinated health and developmental services in low resource settings.



In India, our affiliated faculty member, Dr. Vibha Krishnamurthy runs the Ummeed program (see <https://ummeed.org/>) that provides both center and community based care for children with physical and developmental disabilities. Dr. Krishnamurthy has created a highly effective and accessible care model that engages community workers in the on-going support for families of children with developmental disabilities and autism. At the Ummeed Center, her team delivers comprehensive developmental and behavioral services for children with a wide range of conditions including cerebral palsy, Down Syndrome, intellectual disability and autism. Dr. Krishnamurthy has developed screening methodologies that are being adopted around the world.

In Zanzibar, Tanzania, Dr. Kim Wilson and her team are initiating begin a program to enhance neonatal follow-up care with community-based developmental interventions. She is working with d-Tree, Unicef and Save the Children to develop a model program of child development programming that can be scaled up in communities all over Zanzibar and ultimately in many other sites. In Guatemala, Dr. Peter Rohloff is introducing developmental interventions along with the nutritional advice that the community health workers provide to the families that they visit. In Rwanda, Dr. Wilson and Hege's teams are monitoring the development of babies born at low birth weight or premature (see Research Section) and providing them with child development guidance.

Since 2011, Dr. Palfrey, Dr. Lili Peacock and Dr. Sean Palfrey have participated in Recupera Chile. This disaster recovery project takes place in the Bio Bio region of Chile which is the area of Chile that was devastated in 2010 by an 8.8 earthquake and subsequent tsunamis. Among other interventions, Recupera Chile has established school-based services and promoted opportunities for community rebuilding with a strong emphasis on caring for children's mental health. Recupera Chile is also focusing on educational programming for children about marine life and conservation of marine resources.



An annual summer school in Dichato, Chile now provides working parents with a safe place for their children to be during the day. The 2018 summer school saw the inauguration of a Nautical Center where the children could learn boating and sailing. The Center also provided arts and crafts activities as well as opportunities for children to learn Yoga and other self-soothing techniques. A number of the children attending the Nautical Center were children with disabilities and behavioral concerns. The community based activities provided all the children and families an atmosphere that was healthy and fun where their children could grow and thrive.





# Research

**Members of the General Pediatrics Program are involved in research on topics relating to maternal, infant and child health, non-communicable diseases, infectious diseases, nutrition, child development and other child health concerns. GPP researchers work in multi-disciplinary teams with research colleagues in our partner sites. A bibliography is presented in pages 35-44.**

## Prevalence, Epidemiological and Observational Studies

Determining the prevalence of health conditions and their impact on diverse populations is a key component of any global health effort. It is critical for clinicians, program planners and policy makers to have accurate information about:

- 1) what conditions are affecting what people
- 2) what is the severity of those conditions, and
- 3) what kinds of interventions are needed to address the problems.

Using both local observational studies and large regional and national data sets, GPP team members assess the prevalence of common pediatric conditions. With the opportunity to describe clinical conditions and their correlates in detail, GPP physicians have added to the understanding of many disease conditions in low resource settings. For example, in Rwanda, the All Babies Count project is documenting the prevalence of post-neonatal chronic conditions and disabilities in a cohort of 2-3 year old children who were born prematurely. The team has shown high levels of developmental delay among this group of children with 68% of the children having abnormal developmental screening results. In addition, 78% of the cohort were stunted, 8% wasted and 40% had anemia. Natasha Archer is doing basic epidemiology to call attention to the large number of children with sickle cell anemia in Haiti. Because there is no current universal sickle cell screening in Haiti, her data is demonstrating the need for increased identification and treatment of children with sickle cell disease.

Chris Carpenter and his team have conducted one of the first community based studies of lead poisoning in Haiti. They have documented that in a sample of 273 children in Haiti (ages 9 mos to 6 years), the median Blood Level Concentration was 5.8 microgm/dl. Among these children, 66% had BLC > 5 microgm/dl. Exposure to discarded batteries and living in the mountains were two factors that increased the children's risk of having high blood lead levels. In post-disaster Chile, hearing, vision and dental screenings were not routinely performed. The Recupera Chile team instituted routine screenings in the school setting. Dr. Wilson has been collaborating with Dr. Roger Nuss on instituting newborn hearing screening in Rwanda.



## Intervention Implementation.

Intervention studies provide valuable information for clinical improvement in global settings. These studies often involve complex design and large team efforts.

A number of the GPP faculty and fellows are conducting nutritional intervention research. For example, Dr. Chris Duggan and his co-workers conduct randomized controlled studies of infant feeding to determine the best nutritional interventions for children in settings where their access to food is often compromised. In a study of iron deficiency anemia, the team in Tanzania in collaboration with the Department of Pediatrics at the Muhimbili University in Dar es Salaam, tested how zinc supplementation would affect the iron and anemia status of infants. They set up a randomized controlled trial comparing the addition of zinc or multivitamins, a combination of zinc and multivitamins or a placebo. They found that zinc supplementation actually had a negative effect on the babies and was associated with iron deficiency (although not with anemia). Babies who received both zinc and multivitamins did not experience iron deficiency. As a result of this carefully controlled and executed study, they concluded that babies who receive zinc supplementation should be routinely screened for iron deficiency and receive additional multivitamin supplementation.



In collaboration with the Institute for Globally Transformative Technologies at Lawrence Berkeley National Laboratory, Partners in Health, and the Rwanda Ministry of Health, Dr. Anne Hansen, Dr. Leanne May and their team have been working to solve one of the most serious problems facing newborn infants in low resource settings – temperature stabilization. Newborns (and especially premature babies) often have serious difficulty with hypothermia which can lead them to become very ill or to die. The intervention that Dr. Hansen's group is studying is a very simple infant

warmer that does not depend on electricity ( in the way that incubators do) and so is very reliable in low resource settings. The warmer is a blanket may of wax that can be heated up to the ideal temperature for keeping babies safe and lasts for about six hours. So far, the intervention has been tested 200 times in Rwanda and has proved extremely successful Mothers are very pleased with the warmer and in 98% of uses, it has been effective in proper temperature regulation with no adverse effects except seven cases of mild hyperthermia. The team hopes to spread these warmers globally to prevent deaths from hypothermia. The warmer has been tested over 200 times in two provincial hospitals in Rwanda. In 98% of uses, it corrected or prevented hypothermia and there were no adverse effects except seven cases of mild hyperthermia. We received overwhelmingly positive feedback from mothers and nurses. Our goal is to make these warmers available in low income countries around the global to ensure basic warmth for infants who are currently dying or suffering from hypothermia.



In Haiti, Dr. Virginie Clavel has introduced an intervention on the pediatric wards to increase the precision of monitoring vital signs on sick patients. Each house officer is now equipped with a portable pulse oximeter that easily measures a child's heart rate and oxygen level right at the bedside. This assessment fits readily into the routine of the physician's physical exam. Dr. Clavel and her colleagues are using quality improvement techniques to determine how well this methodology is being integrated into the daily routine and how it is helping in the earlier identification of children who require more intensive clinical interventions.

## Educational Research and Evaluation

Several GPP members are conducting educational research to test a variety of approaches to the training of health care providers. Educational research has focused on:

- 1) the creation of partnerships in global education,
- 2) the content of global health education delivery,
- 3) the effectiveness of various educational methodologies and
- 4) the dissemination of educational materials for the scaling up of training programs.

In Liberia, Michelle Niescierenko and colleagues have been closely monitoring the impact of educational activities for resident trainees and for health workers. In Haiti, Virginie Clavel, Sean Palfrey Christiana Russ have been working with the faculty of Mirabilais Hospital to introduce new teaching techniques to faculty and residents in the clinical setting.

Christiana Russ and her team have been analyzing the global workforce development needs, assessing which countries are meeting the necessary preparation of generalists and subspecialists and which countries are in need of augmented educational and training resources. She has worked with the IPA, the APPD and the American Board of Medicine to help design surveys to capture the educational experiences in pediatrics around the world.

Many members of the GPP faculty have been involved in the design and evaluation of teaching tools and curriculae for global pediatric training for learners in both the United States and in global partner sites.. Dr. Russ has participated in the development and evaluation of curricular teaching tools and has also assessed the long-term outcomes of Global Health training. She and Dr. Beth Harper are involved in a study in collaboration with the International Pediatric Association, Global Pediatric Education Consortium and International Pediatric Academic Leaders Association to describe the current global pediatric workforce, distribution of training opportunities and structure and pediatric subspecialty availability and training. The opportunity for bidirectional exchange is an important feature of equitable global partnerships. Dr. Russ has worked with colleagues in the Association of Pediatric Program Directors to advocate for bidirectional exchange. GPP has facilitated visits from trainees and faculty in Liberia, Rwanda, Tanzania and Haiti to expand their training and networking opportunities.

Together with OPENPediatrics™ at the Boston Children’s Hospital, GPP members are developing web-based teaching materials on global pediatrics topics including maternal and child health, nutrition and common cardiac problems. In collaboration with the American Academy of Pediatrics, GPP members participate actively in the scaling up one of the major global educational initiatives – Helping Babies Breathe. This program teaches a wide range of people how to provide life-saving simple intervention in the “golden minute” after birth and during the immediate post- delivery period. Dr. Grace Chan is studying the impact of HBB in Tanzania.

Drs. Palfrey and Russ are partnering with the China Medical Board in evaluating the efforts of a number of the Chinese University Hospitals to improve and standardize pediatric training in order to meet the increasing demand for child health care as a result of the rescinding of the One Child Policy. The central government in China has called for changes to be in place with the next few years which is a major challenge for the Universities and Hospitals who have few faculty members. The GPP team is focusing on how best to provide Faculty Development that prepares teachers for the task.





# Advocacy

**As we endeavor to enhance services and strengthen health systems, the Global Pediatrics Program partners actively advocate at the local, regional, national and international level for necessary resources, training and systems' changes that can improve the health and developmental chances for children and families. The Millennial Development Goals and the Sustainable Development Goals provide aspirational benchmarks for monitoring progress.**









Advocating at a local level, we look to identify areas of practice that might benefit from new training, new protocols, new equipment and try to integrate changes into the day to day practices at our sites. Our advocacy is also directed at identifying the root causes of problems and filling in systems gaps. For instance, we have identified malnutrition as a major target for advocacy and have been promoting improved feeding practices, family education about healthful foods and are working with government and private partners to increase the availability of food and nutritional supplementation for children who are stunted and developmentally challenged. Peter Rohloff's program in Guatemala is an example of this type of coordinated advocacy. In addition, our staff and fellows in Haiti have been collaborating with local partners to enhance the provision of milk and healthy food to children hospitalized because of malnutrition. In both of these cases, we are also advocating for adding a component of child development education to the nutritional intervention.

At the regional and national level, GPP members call on government agencies, NGOs, universities and philanthropic organizations to obtain funding and support for improved health training and health systems strengthening. In Haiti, Dr. Natasha Archer is calling on the government to institute universal sickle cell screening. GPP team members also make the case for children's rights. In Guatemala, Dr. Rohloff is working with government officials to increase the quality and quantity of food offered in schools. In India, faculty affiliate Dr. Krishnamurthy advocates for improved disability services and teaches parents family advocacy skills to keep up the drumbeat for the rights of their children. Drs. Kim Wilson and Roger Nuss have been successful in advocating for the establishment of universal newborn hearing screening in Rwanda. Dr. Niescierienko and her team are gathering data in displaced persons camps in the Middle East to inform the humanitarian response for the children and families.

On the international level, the GPP has been involved with organizations and networks that promote the global spread of high quality interventions for children and families, including the World Bank, Save the Children, Unicef, the Clinton Global Initiative, Helping Babies Breathe, MAMA, the International Pediatric Association, the Association of Pediatric Program Directors, the American Board of Pediatrics and the American Academy of Pediatrics and many others. GPP faculty promote the idea that advocacy needs to be an integral part of the global child health response. GPP faculty members have also joined with our child health colleagues around the world through the Consortium of Global Child Health Programmes in order to support the work toward achieving the Millennium Development Goals and the Sustainable Development Goals. GPP physicians have been involved with a major international effort to increase the availability of developmental and behavioral and mental health services for children. The need for these services is increasingly being recognized for their potential to improve the health, growth, cognitive ability and life spans of children with disabilities and chronic illnesses. In addition, early childhood developmental interventions have been proved to serve as major antidotes to poverty, maltreatment and neglect. Dr. Palfrey and Dr. Hansen are involved with a new partnership that has the potential to bring improved services to mothers and infants worldwide through a partnership with Square Roots and the Vatican. A number of GPP faculty have been participating with the International Developmental Association on their major advocacy efforts to make a "World of Difference" for children with physical and developmental disabilities.



# Global Child Health Advocacy

MILLENNIAL DEVELOPMENT GOALS	SUSTAINABLE DEVELOPMENT GOALS	GLOBAL PEDIATRICS PROGRAM ACTIVITIES
 <p>Eradicate Extreme Poverty and Hunger</p>	<p>End Poverty; Ensure food security, good nutrition, and access to water</p>	<p>Nutritional programming; Promote economic opportunities</p>
 <p>Achieve Primary Education</p>	<p>Provide quality education and lifelong learning opportunities for all</p>	<p>Early childhood programming; Support educational initiatives</p>
 <p>Promote Gender Equality and Empower Women</p>	<p>Achieve gender equality and empower all women and girls</p>	<p>Strengthen opportunities for women and girls; Speak out against sexual violence</p>
 <p>Reduce Child Mortality</p>	<p>Ensure health and mental health; Promote wellbeing for all</p>	<p>Infant, child and adolescent programs; Acute and chronic care</p>
 <p>Improve Maternal Health</p>	<p>Ensure healthy lives</p>	<p>Maternal and infant health training and guidelines</p>
 <p>Combat HIV/AIDS, Malaria, and Other Diseases</p>	<p>Ensure healthy lives</p>	<p>Infectious disease programs; Prevention and treatment</p>
 <p>Ensure Environmental Sustainability</p>	<p>Ensure sustainable consumption and production patterns</p>	<p>Increase consciousness of environmental sustainability</p>
 <p>Global Partnership for Development</p>	<p>Establish a global partnership for development</p>	<p>Advocate for appropriate financing, health equity and wellness for all</p>







# Education

**Education is a core activity of the GPP. The goal of the educational programs is to provide clinical, health care and advocacy skills to a wide variety of learners who in turn will improve health care delivery in low resource settings. The learners include US medical students, residents, fellows and attending and partner site medical students, residents, fellows, staff and other child health professionals.**

## **Pediatric Residency Training at Partner Sites**

A core element of many of the GPP programs is residency training in the partner sites. In conjunction with the Ministries of Health and other groups, GPP is a key player in efforts to increase the number of pediatrically trained and certified doctors in countries, where there are currently not enough child health physicians to meet the needs of the hospitals and clinics. Residency training is an organized, structured approach that ensures a new generation of highly qualified child health providers and leaders. The educational methods include bedside teaching, lectures and conferences, telemedicine, journal clubs and curriculum development.

In the Fall of 2018, seven pediatricians graduated from the pediatric residency program in Liberia, quadrupling the pediatric workforce that had been obliterated by a long civil war. In Rwanda, GPP participated in the Human Resources for Health Program, a decade long consortium effort by the Rwandan Ministry of health and a consortium of 23 US organizations to rebuild the country's health system. This program has been highly successful; as of 2018, the Rwanda HRH Program is now primarily conducted by Rwandan faculty and health care personnel. GPP faculty are also working with the residency programs in Haiti and Laos and since 2017, GPP faculty have been assisting the China Medical Board with a program to advance Residency Faculty Development in China. In 2017, the GPP began a program of Faculty Development Training in China in conjunction with the China Medical Board.

## **Mentoring in Research and Quality Improvement**

At the partner sites, GPP faculty and fellows join partner faculty and trainees on research and quality improvement projects. These activities include significant educational components as together the teams learn research and quality improvement techniques. Much of the positive impact of the GPP programs has come from the development and implementation of clinical protocols followed by rigorous quality improvement monitoring of the roll-out of the new pediatric care procedures.

## **Helping Babies Breathe**

The GPP has linked with the American Academy of Pediatrics and other global child health groups in the dissemination of the Helping Babies Breathe curriculum. Faculty and fellows present HBB at the partner sites both as direct teaching and as train-the-trainers methodology. The elegantly simple, curricular materials aid health workers at both the community and the clinical level to appreciate the importance of pre-delivery planning and the critical nature of life's first "Golden Minute." The simple HBB icons direct learners through every step of the newborn process.

## **OPENPediatrics™**

OPENPediatrics is a groundbreaking initiative with the aim of being "an online community of clinicians sharing best practices from all resource settings around the world through innovative collaboration and digital learning technologies." The GPP is connecting with OPENPediatrics to develop internet modules that focus on common pediatric problems, such as maternal and infant care, diarrhea and malnutrition as well as modules on non-communicable disease issues that are emerging in the global child health context. Modules are under development on topics such as the approach to congenital heart disease in low resource settings.

# Educational Opportunities

In conjunction with the Boston Children's Hospital Global Health Program, we offer courses, seminars, and travel opportunities that complement the GPP programmatic work. These offerings emphasize the skills, tools, and attitudes that equip child health care providers to address health care needs in low resource settings.



## Skills Course

### Helping Babies Breathe

Simulation-based course on neonatal resuscitation designed for those who will be responsible to train other birth attendants in low-resource settings.

### Clinical Topics in Global Health

Didactic course for pediatric clinicians with an overview of key topics in preparation for clinical work in resource limited and tropical settings. Topics include: parasites, malnutrition, TB, newborn care, malaria, IMCI, and HIV.

### Ultrasound

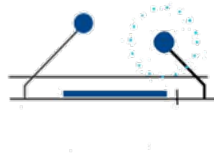
This interactive didactic and hands-on course exposes participants to a range of point-of-care ultrasound applications including FAST, cardiac, lung, vascular access, and a variety of others.

### Trauma, Emergencies, & Sedation

Simulation-based course to discuss response to trauma and emergencies and how to do sedation safely in resource limited settings.

### Nursing, Pharmacy, & Lab Skills

Hands-on course on useful skills for clinical work in resource limited settings. Topics include: administration of IV medications and fluids, skin and wound care, lines and tubes, skin & wound care, a review of basic laboratory procedures.



## Seminars & Workshops

### Global Health Seminar Series

A monthly seminar series in which faculty & trainees come together to share their experiences and learn about current global health issues and strategies.

### Global Health Research Day

An annual event to provide trainees and junior faculty with the knowledge and skills to conduct global health research. Topics include: IRB hurdles, developing data management systems, building partnerships, and securing funding.

### Ethics in Global Health

Preparation for common ethical challenges encountered when working abroad, through small-group discussion and case-based simulation.

### Communication & Advocacy

Written and oral communication skills in the context of advocacy for specific global health issues.

### Medical Education

Clinicians learn curriculum design and evaluation as well as innovative teaching techniques.

# Residents

## RESIDENT GLOBAL HEALTH PATHWAY

Starting in the 2018-2019 Academic Year, we have developed a Global Health Pathway in the Boston Combined Residency Program, for select pediatrics residents with a significant career interest in global health. Participants will develop an in-depth understanding of child global health to prepare graduates for leadership roles in clinical care, healthcare delivery, and child advocacy for the underserved globally.

### Components of the Global Health Pathway

- Form a community of six residents (two per year) and dedicated faculty with a deep interest in global child health\*
- Provide each resident with mentorship for a global health career
- Develop and implement a robust curriculum to Pathway residents provided through three protected academic afternoons each year, and during our annual Global Health Clinical Skills Week.
- Support the generation of additional resident-driven curriculum including journal clubs and Boston-wide global health networking events.
- Allow for up to 4 weeks of contiguous call-free field work junior year and 6 weeks senior year.
- Support the resident in the development and implementation of a global health oriented scholarly project during junior and senior years.

### Inaugural Global Health Pathway Residents:

#### Seniors

- Jeffrey Campbell
- Kelsey Egan

#### Juniors

- Faraz Alizadeh
- Alexandra Power-Hayes
- Cody Gathers
- Christina Braiscoe-Abath (combined track with neurology)
- Christina Williams (combined track with anesthesia).

#### Interns

- Mohsin Ali
- Nitin Shrivastava

\*in our inaugural year we agreed to include additional and combined track juniors given the dissolution of the former Community and Global Health Academy

## RESIDENT GLOBAL HEALTH ELECTIVES AND PROJECTS 2017-2018

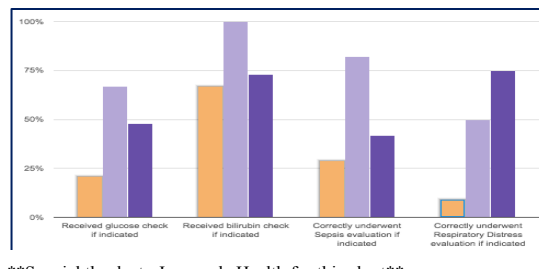
Leslie Hayes, a junior resident in the combined pediatrics and neurology track traveled with attending pediatric neurologist Archana Patel to the University Teaching Hospital of Kigali, Rwanda, to develop and implement neurology curriculum for pediatric attendings and residents there. She plans to continue building partnerships there with a goal of continuing to work in global health as a pediatric neurologist.

Riaz Gillani, a senior pediatric resident traveled to Cairo, Egypt for an elective at 57357 Children's Cancer Hospital as part of an ongoing partnership between 57357 Hospital and Dana-Farber/Boston Children's Cancer and Blood Disorders Center. He collaborated with faculty there on a feasibility study to explore inter-tumor heterogeneity in neuroblastoma.

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### UPDATE: JACARANDA HEALTH

In 2017-2018, three BCRP residents began a collaborative project with Jacaranda Health in Kenya. They provided consultation to Jacaranda Health around newborn care practices. Two months post intervention, the nursing practices around newborn care, including glucose and bilirubin testing, sepsis and respiratory evaluations. The group was able to document improvement at 2 months as well as variable sustainability at 4 months. The model of residents working as consultants on this type of quality improvement intervention is one that can be replicated widely.



\*\*Special thanks to Jacaranda Health for this chart\*\*

# Bidirectional Exchange

Since 2015, the GPP has sponsored visits to the Boston Children's Hospital by observers from our partner sites. These observers have used their time at the BCH to deepen their knowledge in a variety of clinical subjects including cardiology, child development, neurology, emergency medicine and critical care.

## RWANDA

**Dr. Emanuel Kamanzi Rusinga** joined us for 2 visits in 2015 and 2016. He is a cardiologist in Rwanda who wished to increase the service he could offer to children with congenital heart disease and children with rheumatic fever. In addition to spending time with the cardiology department here, Dr. Kamazi Rusinga worked with Dr. Kim Wilson and others on the development of a curriculum about congenital heart disease. This program has been produced as an OPEN Pediatrics training course that is now in active use in Rwanda.



As **Dr Jean Paul Rukabyarwema** was in the process of finishing his residency, he became very interested in the problems of children with developmental disabilities. In Rwanda, there were no Developmental Pediatricians. He spent a month at BCH observing in the Developmental Medicine Program. He was able to attend the World of Difference Conference in Mumba He is now beginning to provide some developmental services and continues to work toward establishing a Developmental Medicine Center in Rwanda.

**Dr. Ariane Ndayikeje** spent several weeks visiting with the GPP program working with Dr. Wilson. She then attended the annual American Academy of Pediatrics meeting where she received an award from the Section on International Health for her work with transitional care for children with HIV. **Dr. Christian Umuhoza** participated in an observership in the Pediatric Emergency Department in the spring of 2018. Other observerships for physicians from Rwanda are in the planning stages for the future.

## HAITI

**Dr. Mathline Fortunat**, a third year Resident at the Mirabilais Hospital in Haiti joined us in 2017 to study nephrology. She was eager to increase her own skills in working with patients with renal disorders and also wanted to bring back diagnostic and other technics to her residency classmates in Mirabilais.

**Dr. Raymonde Pinchinat**, who is a third year resident at Mirabilais Hospital in Haiti, spent the month of June, 2018 studying in the Medical Critical Care Department. She was particularly interested in the ways that parents were involved in morning rounds as part of Family Centered Care. She hopes to bring the idea of back to her residency program.

**Dr. Tania Ramilus** came in July of 2018 to spend a month studying Medicine Critical Care. She is also a third year resident at the Mirabilais Hospital in Haiti. She was very interested in the Quality Improvement Initiatives and particularly the careful monitoring to ensure that all members of the staff were following through on the planned QI interventions. She planned to bring this back to her residency.



We are planning for more observers to join us from the Haitian Residency Program at Mirabilais during late 2018 and early 2019.

## LAOS

In the spring of 2018, two observers joined us from Laos. **Dr. Bounloth Sordaluck** and **Dr. Lakihe Leetongxay** participated in a program in the cardiology department and joined in on many of the offerings of the Harvard and Boston Children's global health educational opportunities. It was a special treat to have them attend the graduation ceremony of the 2018 GPP and Global Nurses Graduation.



# Global Pediatric Fellowship

The Global Pediatric Fellowship Program at Boston Children’s Hospital aims to train future leaders in global child health as well as support the development of essential child health services in regions of the world with limited access to child health providers. Our goal is to train a cadre of pediatricians who have the necessary skills and long term commitment to make an impact in improving child health in some of the world’s neediest settings.

## PROGRAM STRUCTURE

The fellowship is a two year training program in which Fellows rotate in 6 month blocks between a field placement in countries such as Haiti, Rwanda, and Liberia, and a clinical placement in Boston, Massachusetts. The focus of the fellowship is on skills in global health service delivery, including skills in clinical care, medical education, program development, management, evaluation, quality improvement, and in implementation focused research.

### Boston

During their clinical placement in Boston, fellows combine service in general pediatrics with an extensive global health curriculum that strengthens their core clinical, public health, quality improvement, and teaching skills relevant to global health. Fellows attend the Global Health Delivery Summer Intensive Program at the Harvard School of Public Health, in addition to courses in clinical skills, ultrasound, research, and QI.

### Field Sites

During their field placement, fellows work in collaboration with groups including Partners in Health (Haiti/Rwanda) and Lao Friends Hospital to provide direct clinical care and to study, teach, and learn alongside site-based colleagues and students. Together with local clinicians, they strive to strengthen existing child health programs, and expand access to pediatric health care. Prior to departing, fellows attend a 1-week “bootcamp” orientation to field work in Haiti through PIH.

## HOW TO APPLY

### Requirements

Applicants must have board certification/eligibility in pediatrics or medicine pediatrics. International applicants must submit their USMLE Scores: Steps 1–3 by December 31st, 2018 and their ECFMG certificate & Green Card. The application can be found on our website:

<http://tiny.cc/fellowship2019>

### Timeline (for July 2019 start)

<b>July 2018</b>	Application period opens
<b>September 30, 2018</b>	Application deadline
<b>October 16 and 22, 2018</b>	Interview Days (in Boston)
<b>July 1, 2019</b>	Fellowship start date



# Current Fellows

## Meghan Craven, MD

2017-2019

### MD

Drexel University College of Medicine

### Residency in Pediatrics

Cohen Children's Medical Center

### Field Site

University Hospital in Mirebalais, Zanmi Lasante/Parters in Health (Mirebalais, Haiti)

## Rebecca Krey, MD

2018-2020

### MD

Virginia Commonwealth University School of Medicine

### Residency in Internal Medicine & Pediatrics

University of Maryland Medical Center and Baltimore Veterans Affair Medical Center

### Chief Residency in Pediatrics

University of Maryland Medical Center

### Field Site

University Hospital in Mirebalais, Zanmi Lasante/Parters in Health (Mirebalais, Haiti)

## Neera Narla, MD

2017-2019

### MD

Mayo Clinic School of Medicine

### MPH (in progress)

Harvard T.H. Chan School of Public Health

### Residency in Pediatrics

Boston Combined Residency Program

### Field Site

Laos Friends Hospital for Children (Luang Prabang, Laos)

## Shela Sridhar, MD

2018-2020

### MD

Morsani College of Medicine, University of South Florida

### Residency in Internal Medicine & Pediatrics

Medical College of Wisconsin

### Field Site

Kirehe District Hospital, Inshuti Mu Buzima/Partners in Health

## Sindu Govindapillai, MD

2017-2019

### MD

University of Toronto

### MPH (in progress)

Harvard T.H. Chan School of Public Health

### Residency in Pediatrics

The Hospital for Sick Kids at University of Toronto

### Field Site

Laos Friends Hospital for Children (Luang Prabang, Laos)

## Edwin Palmer, MD

2018-2020

### MD

Ross University

### MPH (in progress)

Harvard T.H. Chan School of Public Health

### Residency in Internal Medicine & Pediatrics

University of Cincinnati- Cincinnati Children's Hospital

### Field Site

Laos Friends Hospital for Children (Luang Prabang, Laos)

## Priya Tanna, MD

2018-2020

### MD

Chicago Medical School

### MPH (in progress)

Harvard T.H. Chan School of Public Health

### Residency in Internal Medicine & Pediatrics

University of Florida Shand's Children's Hospital

### Field Site

Rwanda

## Leah Ratner, MD

2018-2020

### MD

St. George's University School of Medicine

### Residency in Internal Medicine & Pediatrics

Georgetown University Hospital

### Field Site

Rwanda

## Global Pediatric Research Fellow: Oludare Odumade, MD/PhD 2017-2019

### MD

University of Minnesota Medical School

### Residency in Pediatrics

University of California at San Diego

### Field Site

Ethiopia

### Research Focus

- Maternal and Infant Health
- Neonatal Interventions
- Mechanisms governing anti-pathogen immunity in neonates

### Clinical Work and Medical Education

Critical Care

# Graduates

## **Vanessa Wolfman, MD** 2010-2012

Dr. Wolfman worked as a district clinical advisor in pediatrics in rural Rwanda during her fellowship. Her activities included clinical mentorship and health systems strengthening. Dr. Wolfman works for the International Medical Corps of Los Angeles and has continued her active role in global health response. She served as the Emergency Medical Director of the International Medical Corps in Sierra Leone during the Ebola outbreak.

## **Sara Gonzalez, DO** 2011-2013

During her fellowship, Dr. Gonzalez worked at the St. Marc's Hospital in rural Haiti providing inpatient clinical services. She carried out several projects on neonatal nursing education. She had a special interest in programs that promoted breast feeding to prevent malnutrition in infants. She is a trained HBB instructor. Dr. Gonzalez is currently an attending physician at the St. Luke's Hospital in New Bedford, MA.

## **Jill Veselik, MD** 2012- 2014

Dr. Veselik worked in rural Rwanda during her fellowship where she provided pediatric care and participated on the teams that wrote the protocols for the newly established Pediatric Development Clinic. The PDC is an innovated program of non-communicable disease care for children with chronic illnesses and complex medical problems. Dr. Veselik has worked as a hospitalist and chronic care physician since her graduation.

## **Brittany Potts, MD** 2013-2015

Dr. Potts spent her fellowship serving as a pediatrician at St. Nicholas Hospital in St. Marc, Haiti. She focused on acute care delivery and on improving the delivery of nutritional support to severely malnourished children. She also assisted colleagues at the St. Damien Hospital in Port au Prince with their programming around children with severe chronic health conditions. Dr. Potts is currently the Associate Director of Pediatric Global Health at Akron Children's Hospital.

## **Molly Moore, MD** 2010-2012

During her fellowship, Dr. Moore served as a district clinical advisor in pediatrics in rural Rwanda. She worked on national pediatric oncology protocols, supported a pilot program to prevent mother-to-child transmission of HIV, and ran an HIV education program for nurses. She is currently the Direct of Global Health for the Department of Pediatrics at the University of Vermont College of Medicine, where she is heavily involved with global health medical education.

## **Chris Carpenter, MD, MPH** 2011-2013

During his fellowship, Dr. Carpenter worked in Haiti where he improved pediatric care by training local doctors and nurses at St. Marc's district hospital. At the end of his fellowship, he co-founded the Kay Mackenson clinic for children with chronic diseases in Pierre Paven. He is the Pediatric Department Chair and Vice Chief of Staff of a UCSF affiliated hospital. He continues as a close colleague and consultant to the Boston Children's Hospital Global Pediatrics Program.

## **Theresa Strong, MD** 2013-2015

Dr. Theresa Strong spent part of her fellowship working at the JFK Hospital in Liberia on the partnership medical residency training program. During the Ebola outbreak, she was redeployed to Indonesia and to Laos to support program development. After fellowship Dr. Strong joined the staff of the South Shore Hospital.

## **Xinshu She, MD** 2014-2016

Dr. She spent 6 months of each year of fellowship in Saint Marc, Haiti, working with Partners in Health to pilot a participatory art project aimed at reducing stress, enhancing patient self-expression, and prompting community bonding. She also helped start an Early Childhood Development Program using a home-based intervention for malnourished children. She is currently a pediatric hospitalist in California.



### **Ophelia Adipa, MD** 2014-2016

Dr. Adipa traveled to Mbale, Uganda as a consultant pediatrician at the CURE Children's Hospital of Uganda and was in Liberia as pediatric faculty, teaching and mentoring residents and interns at the John F. Kennedy Medical Center in Monrovia and the Phebe Hospital in Suakoko. Dr. Adipa is currently a hospitalist in the Children's National Hospital community network. She is also a faculty member at the University of Ghana, where she supports pediatric residency training.

### **Sajithya Perera, MD** 2015-2017

During her fellowship, Dr. Perera provided care, supervision, and teaching to patients and staff at Hospital St. Nicolas in Haiti. Her work was centered around development of an early childhood development program for malnourished children. She is currently joining the faculty of Nationwide Children's Hospital where she will practice pediatric academic hospitalist medicine and assist with global health programming.

### **Unami Mulale, MD** 2015-2017

After completing her college education in Botswana, Dr. Mulale attended medical school in Grenada and subsequently did Pediatric Residency and Pediatric Critical Care Fellowships in New York, with a longstanding vision to contribute to building Botswana's first children's hospital. She spent her fellowship providing care in Liberia and Rwanda to learn systems she can incorporate as the Head of Pediatric Critical Care and Lecturer at the University of Botswana School of Medicine.

### **Bianca Quinones, MD** 2017-2018

Dr. Quinones spent her fellowship working at the Lao Friends Hospital for Children in Luang Prabang, Laos where she primarily focused on a multidisciplinary simulation-based resuscitation curriculum for the hospital. Dr. Quinones-Perez will be starting her new position as a Pediatric Hospitalist for Boston Children's Hospital in November.

### **Jen Werdenberg, MD** 2014-2017

Dr. Werdenberg's fellow placement was in Rwinkwayu, Rwanda. She provided clinical care and participated in the roll-out of the All Babies Count Program. From 2016-2017, she was a staff member of the PIH Rwanda team. She returned to Boston in the fall of 2017 to complete her MPH and later moved to Texas. She is currently on staff at the Texas Children's Hospital. She recently published a paper on nutritional care for children in low resource global settings.

### **Jessica Bradford, MD** 2015-2017

Dr. Bradford spent her fellowship expanding to the Pediatric Development Clinic from Southern Kayonza to the Kirehe District Hospital in Rwanda. She met with hospital leadership, ensured equipment and supply availability, identified a space for the clinic, and served as a mentor for oncoming staff. After fellowship, Dr. Bradford stayed on with Inshuti Mu Buzima/Partners In Health, as a pediatric district clinical advisor.

### **Virginie Clavel, MD** 2016-2018

During her fellowship, Dr. Clavel spent her time at the Mirabalais University Hospital site working in conjunction with Zanmi Lasante/Partners in Health (Mirebalais, Haiti). She focused her work primarily on neonatal intensive care and resident teaching. She conducted a study using the Pediatric Early Warning Score in the Pediatric Ward. She is currently a staff physician at Montreal Children's Hospital.

### **Chiquita Palha de Sousa, MD** 2016-2018

Dr. de Sousa spent her global clinical time at Kirehe District Hospital, Inshuti Mu Buzima/Partners in Health in Rwanda. She provided neonatal pediatric care and provided trainings to the local clinic staff on malnutrition, resuscitation, and neonatology. Her scholarly project was on "Promoting Breast Feeding in the Neonatal Care Unit and Strengthening Linkage to Care after Discharge".



# Bibliography

## PUBLICATIONS

Here we present a cumulative list of representative publications by GPP faculty, fellows, alumni and affiliates. These papers document the work of the GPP and partners since the inception of the program in 2008.

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- Xu H, Zhao Z, Wang H, Ding M, Zhou A, Wang X, Zhang P, **Duggan C**, Hu F. Bone mineral density of the spine in 11,898 Chinese infants and young children: A cross-sectional study. *PLoS One*. 2013;8. doi:10.1371/journal.pone.0082098. PMID: 2434752
- Yoshikawa H, Leyva D, Snow CE, Treviño E, Barata MC, Weiland C, Gomez CJ, Moreno L, Rolla A, D'Sa N, **Arbour MC**. Experimental impacts of a teacher professional development program in Chile on preschool classroom quality and child outcomes. *Dev Psychol*. 2015;51(3):309-22. doi: 10.1037/a0038785.



## PRESENTATIONS

Here we present a cumulative list of representative presentations by GPP faculty, fellows, alumni/ae and affiliates. These papers document the work of the GPP and partners since the inception of the program in 2008.

- Amerson EH, Forrestel A, Maurer TA, **Butler LM**, Grant M, Laker MO, Bwana MB, Martin J. Why is Kaposi Sarcoma diagnosed so late in East Africa? Poster presented at: The International AIDS Society; Washington, DC, 2012.
- Amerson E, Forrestel A, **Butler L**, Laker- Oketta M, Bwana M, Maurer T, Martin J. Delayed diagnosis of HIV-associated Kaposi sarcoma in Uganda: A qualitative analysis. Poster presented at: International Conference on Malignancies in AIDS and Other Immunodeficiencies: Basic, Epidemiologic and Clinical Research; Bethesda, MD, 2014.
- Amoroso C, Nisingizwe M, Bucyana T, Thompson D, Nahimana E, **Magge H**, Jackson S, Murray M, Ngabo F. Developing a verbal and social autopsy tool to evaluate and reduce under-five death in Rwanda. Poster presented at: Second Global Congress on Verbal Autopsy, Rhodes, Greece, 2013.
- Anatole M, **Magge H**, et al. Supporting Best Practices in Integrated Management of Childhood Illness: On-site Mentorship and Enhanced Supervision Program and Health Centers. Poster and selected abstract for platform presentation at: Rwanda Child Health Conference, Kigali, Rwanda, 2012.
- Anatole M, Mezzacappa C, **Magge H**, Pace L, Saint-Fleur J, Chaw GF, Finnegan K, Cyamatare F, Nahimana E, Mukanzabikeshimana L, Bigirimana E, Drobac P, Hirschhorn LR. Integrated Mentoring and Enhanced Supervision to Improve the Quality of Maternal Health Care Delivery in Resource-Limited Settings. Selected abstract for platform presentation: Global Maternal Health Conference, Arusha, Tanzania, 2013.
- Anatole M, Iyer H, Kanyamuhanda JB, Bakundukize B, Bihibindi V, Nahimana E, Nkikabahizi F, **Magge H**. Mentorship and Quality Improvement Strengthens Nutrition Assessments in IMCI Clinics in Rural Rwanda. Selected abstract for platform presentation: Rwanda National Nutrition Summit. Kigali, Rwanda, 2014.
- Arbour MC**, Lorch A, Rolla A, Barata MC, Treviño E, Yoshikawa H, **Palfrey JS**. "Research for Equity: A Good Start. A Cluster - Randomized Controlled Trial of a Preschool Health and Education Intervention in Santiago, Chile." Poster presented at: Massachusetts Medical Society Fellow, Resident, Medical Student Annual Research Symposium; April 2009.
- Arbour MC**, Yoshikawa H, Rolla A, Lorch A, Ramirez MJ, Treviño E, Moreno L, Barata MC, Snow C, Palfrey JS. "Un Buen Comienzo: Cluster Randomized Trial of Early Education and Health Intervention in Preschools in Santiago, Chile." Poster presented at: American Public Health Association Annual Meeting; November 2009.
- Arbour MC**, Barata MC, Rolla A, Treviño E, Moreno L, **Palfrey JS**, Snow CE, Murray M, Yoshikawa H. "Identification of Young Children With Special Health, Mental Health and Educational Needs and Links to School Readiness in Chile." Presented at: Society for Research in Child Development, Biennial Meeting. April 2011.
- Arbour MC**, Murray K, Yoshikawa H, Arriet F, Moraga C, Cordero M. Predictors of physical, emotional and social needs among young children living in camps for internally displaced people, nine months after the 2010 Chilean earthquake. Oral presentation at: 140th APHA Annual Meeting, October 2012.
- Arora G, Le P, **Russ CM**. First, Do No Harm: Preparing for Global Health Experiences. Workshop given during Pediatric Hospital Medicine Conference; San Antonio, TX, July 2015
- Butler LM**, Horvath T, Kennedy G, Spaulding A, Rutherford G. Interventions for supporting adolescents to safely and effectively disclose HIV sero-status in resource-constrained settings: A systematic review. Oral presentation at: World Health Organization Adolescent HIV Guidelines Expert Meeting; Harare, Zimbabwe, 2012.
- Butler LM**, Horvath T, Kennedy G, Spaulding A, Rutherford G. Community-based approaches for improving adherence to treatment and retention to care: a systematic review. Oral presentation at: World Health Organization Adolescent HIV Guidelines Expert Meeting; Harare, Zimbabwe, 2012.
- Butler LM** and Horvath T. Mobile health technologies (mHealth) for promoting adherence to antiretroviral therapy: a systematic review. Oral presentation at: World Health Organization Adolescent HIV Guidelines Expert Meeting; Harare, Zimbabwe, 2012.
- Butler LM**, Horvath T, Kennedy GE, Chan J, Rajan J, Spaulding AB, Baggaley RC, Ferguson BJ. Community-based approaches for improving adherence to treatment and retention to care: a systematic review. Poster presented at: International AIDS Society Conference on HIV Pathogenesis, Treatment and Prevention; Kuala Lumpur, Malaysia, 2013.
- Butler LM**, Horvath T, Baggaley RC, Suthar AB, Negussie EK, Rutherford GW. Mobile health technologies (mHealth) for promoting adherence to antiretroviral therapy: a systematic review. Poster presented at: International AIDS Society Conference on HIV Pathogenesis, Treatment and Prevention; Kuala Lumpur, Malaysia, 2013.
- Butler LM**, Laker-Oketta MO, Kadama-Makanga P, Baguma J, Martin JN. Engaging traditional health practitioners in the early detection of Kaposi's sarcoma in Uganda. Poster presented at: International Conference on Malignancies in AIDS and Other Immunodeficiencies: Basic, Epidemiologic and Clinical Research; Bethesda, MD, 2013.
- Butler LM**. Families and Children: HIV Disclosure. Oral Presentation at: Botswana Harvard AIDS Institute; Gaborone, Botswana, 2014.

- Butler LM**, Horwood C, Ngidi W, Grant M, Reddy J, Barker P, Rollins N. The effectiveness of a quality improvement intervention to supervise community health workers in South Africa. Invited Speaker at: International AIDS Society Conference on HIV Pathogenesis, Treatment and Prevention; Melbourne, Australia, 2014.
- Butler LM**. The power of knowing: Experiences of youth and caregivers with pediatric HIV disclosure. Invited speaker at: 6th HIV Pediatrics Workshop; Melbourne, Australia, 2014.
- Butteris S, St. Clair N, Pitt M, Arora G, Suchdev P, Schubert C, **Russ CM**. Be Prepared! Global Health Rotation Preparation Best Practices and Common Concerns. Workshop given during Association of Pediatric Program Directors Conference; Orlando, FL, March 2015.
- Butteris S, Schubert C, Batra M, Conway J, Dickerson T, Garfunkel L, Howard C, Kuzminski J, **Russ CM**, St. Clair N, Staton D, Suchdev P. Engaging Students and Residents in Global Health. Selected abstract for pre-conference workshop at: American Pediatric Program Directors Conference; Nashville, TN. April 2013.
- Carpenter C, Potts B, von Oettingen J**, Bonnell R, Sainvil M, Lorgeat V, Mascary M, **She X**, Jean-Baptiste E, Palfrey S, Wolfe A, **Palfrey J**. Elevated Lead Levels and High Rates of Lead Poisoning in Haitian Infants and Children. Consortium of Universities for Global Health Conference; San Francisco, United States. 2016.
- Dickerson T, **Russ CM**, Pitt M, Butteris S, St. Clair N, Schubert C, Pak-Gorstein S. Interactive Web-Based Global Health Education for Pediatric Residents: The Global Child Health Educational Modules Project. Selected abstract for workshop at: American Pediatric Program Directors Conference; Chicago, IL, April 2014.
- Etima M, Kurji J, King R, Musoke P, Fowler MG, **Butler L**. Low level of disclosure to HIV-infected children age 7 to 12 years old, Kampala, Uganda. Poster presented at: 6th HIV Pediatrics Workshop and International AIDS Society Conference on HIV
- Fitzgerald E, **Hooli SB**, Kazembe PN. The Outcome of an Advocacy Letter Written by Physicians in Malawi. Presented at: 15th Annual Baylor International Pediatric AIDS Initiative Network Meeting; June 2013.
- Ganapathi L**, Martins Y, Schumann D, **Russ CM**. Establishing general pediatric residency training programs in low and middle income countries where few prior precedents exist: can it be done? Poster presentation at: Pediatric Academic Society; Boston, MA, April 2012.
- Ganapathi L, Tran T**, Brownstein J, **Niescierenko ML**. Leveraging health informatics for a global health needs assessment at home. Poster presented at: Pediatric Academic Society; Vancouver, Canada, May 2014.
- Hansen A**. Neonatal Neonatal Care Protocols: Republique Du Rwanda Ministere De La Sante. Ministry of Health, Rwanda, 2011.
- Harper B**, Silverman M, Nganga W, Armstrong R, Forsyth K, Keenan W, **Russ C**. Understanding the Global Pediatric Workforce. Oral presentation. Pediatric Academic Societies Conference; San Francisco, CA, May 2017.
- Hirschhorn LR, Sindano N, Awoonor-Williams JK, Hingora A, Michel C, **Magge H**. The Design, Implementation, and Preliminary Results of African Health Initiative (AHI) Strategies for Improving the Quality of Primary Health Care in Five Countries. Selected abstract for panel presentation at: Health System Research Conference; Cape Town, South Africa, 2014.
- Hooli SB** and Kazembe PN. The Development of a Global Health Leadership Curriculum. Presented at: 15th Annual Baylor International Pediatric AIDS Initiative Network Meeting; June, 2013 .
- Horvath T, Kennedy GE, Lindegren ML, Royce S, Azman H, **Butler LM**, Baggaley RC, Ferguson BJ. Interventions for supporting adolescents to safely and effectively disclose HIV sero-status in resource constrained settings: A systematic review. Poster presented at: International AIDS Society Conference on HIV Pathogenesis, Treatment and Prevention; Kuala Lumpur, Malaysia, 2013.
- Kanagasabai U, Camanor S, **Tubman V**, Staton D, Conn A, Okoh E, Marshall R, McQuilkin P, **Niescierenko ML**. A novel model for managing pediatric non-communicable disease in resource limited settings. Poster presented at: Pediatric Academic Societies; Vancouver, Canada, May 2014.
- Krishnamurthy V** and Cama S. Behavioral Profiles of Typically Developing (TD) Siblings of Children with Autistic Disorder (AD) in Mumbai, India. Poster presented at: Society for Developmental Pediatrics (SDBP); November 2008.
- Kurji J, King R, Etima M, Musoke P, **Butler LM**. Importance of ARV adherence driving paediatric HIV disclosure: Experiences of parents of 7-12 year old children in Kampala, Uganda. Poster presented at: International AIDS Society Conference on HIV Pathogenesis, Treatment and Prevention; Melbourne, Australia, 2014.
- Kuzminski J, Batra M, Butteris S, Dickerson T, Garfunkel L, Howard C, **Russ CM**, Schubert C, St. Clair N, Suchdev P. ACGME Goes Global: Creating an Individualized Curriculum for Residents with Global Health Interests. Selected abstract for workshop at: American Pediatric Program Directors Conference; Nashville, TN, April 2013.
- Magge H**. Utilizing Health Care Encounters to Prevent HIV in Adolescents in Gaborone, Botswana. Topic able presentation in Infectious Diseases, HIV/AIDS: Global Health Education Consortium Conference. 2009.
- Magge H**, Meyers A, Sprinz P, Adams WG. Zinc Protoporphyrin (ZPP) and Iron Deficiency: Trends and Response to Therapy in a Low-Income Primary Care Center. Poster presentation at: Pediatric Academic Societies; Boston, MA, April 2012.
- Magge H**, Anatole M, Mezzacappa C, Finnegan K, Nkikabahizi F, Niyonzima S, Drobac P, Ngabo F, Hirschhorn LR. Measuring the Effect of Mentoring and Enhanced Supervision on Quality of Care of Integrated Management of Childhood Illness in Rural Rwanda. Selected abstract for platform presentation at: Pediatric Academic Societies; Washington, DC, May 2013.

- Magge H.** Programs in Global Health and Social Change Safe Motherhood, Safe Childhood Symposium. Invited Speaker. "Bridging the Gap: Innovations in Neonatal Healthcare Delivery." Harvard Medical School, Department of Global Health and Social Medicine. 2013.
- Magge H,** Uwamungu JC, Mwizerwa L, et al. Pediatric Development Clinic: An Integrated Model to Support Nutrition and Early Childhood Development of Vulnerable Infants and Children. Selected abstract for platform presentation at: Rwanda National Nutrition Summit; Kigali, Rwanda. 2014.
- Marcil L, Seimars T, Schreiner C.** Neonatal Capacity Building in Peri-Urban Kenya. Poster Presentation at the Pediatric Academic Societies Meeting, May, 2017. San Francisco.
- Matthay K, Parikh N, **May L.** Graduated intensity treatment guidelines for neuroblastoma. Oral presentation at the International Society of Pediatric Oncology; Auckland, NZ, October 2011.
- McQuilkin P, **Niescierenko ML,** Camanor S, Chauncey R, Gautier J, Kempf J, Koster M, Marshall R, O'Callahan C, Staton D. Building Academic Partnerships in Pediatric Global Health at Home and Abroad: From Concept to Implementation. Workshop at: Pediatric Academic Societies; Vancouver, Canada, 2014.
- Meyers A, **Magge H,** Sprinz P, Adams WG. High prevalence of iron deficiency in an urban low-income infant/toddler population. Poster presented at: Pediatric Academic Societies; Boston, MA, April 2012.
- Migabo GK, Mukwege D, Amisi C, Muhima G, Mwambali S, Esperance V, Kulwonda D, Nakamina C, Armas J, McWhorter C, **Butler LM,** Ruel T, Bress J. Cloud-based inventory management systems are essential for delivering post-exposure prophylaxis to rape victims in the Eastern Democratic Republic of the Congo. Oral presentation at: International Conference on AIDS and STIs in Africa; Cape Town, South Africa, 2013.
- Montgomery E, Hoban R, Cognata A, **Werdenberg J,** Moten A, Saldarriaga A, Levison J, Aagaard K, Thahane L, Mohapi E. Knowledge and Skill Acquisition after "Helping Babies Breathe" Training in Sub-Saharan Africa: A 4-Country Experience. Oral presentation/ Best Poster Finalists at: International Congress of Pediatrics, the 27th Congress of the International Pediatric Association; Melbourne, Australia. August 28, 2013.
- Mukhopadhyay S, Opiyo-Omolo B, **Russ CM.** Barriers to effective neonatal resuscitation in Kenya. Poster presented at: International Conference on Urban Health; New York, NY. October 2010.
- Niescierenko ML.** Improving Global Healthcare Delivery through Collaboration and Partnership. Global Health Grand Rounds at: University of Texas Southwestern.
- Palfrey JS .** Global health advocacy. Consortium of Universities for Global Health (CUGH). Annual Meeting, Washington DC, 2014.
- Palfrey JS.** Respuestas Comunitaria a los Desastres; Protegiendo a los Niños de Impacto Psíquico. Primer Congreso Internacional de Salud Mental y Gestión de Riesgos en Emergencias y Desastres. University of Concepcion, Concepcion, Chile, September 2017.
- Palfrey JS.** Early Childhood Development: Public Policies to Assure Adequate Implementation. A World of Difference Conference 2<sup>nd</sup> International Conference of the International Developmental Pediatrics Association, Mumbai, India. December, 2017.
- Palfrey JS.** Early Childhood Development Featured Presentation at Congreso Futuro sponsored by the Senate of Chile, Santiago, Chile. January, 2018.
- Palfrey JS** Residency Training in the United States. Invited Presentation at the 2018 Xiangya International Symposium on Medical Education. Changsha, Hunan, China, April 2018.
- Phakathi S, Haskins L, **Butler LM,** Grant M, Mntambo N, Horwood C. A review of integration of maternal, child and women's health (MCWH), HIV and PMTCT services in primary health care (PHC) clinics in KwaZulu-Natal (KZN). Oral presentation at: Rural Health Conference; St. Lucia, KwaZulu-Natal. 2013.
- Robinson M, Carolan E, Altenor K, Sainvil M, Carpenter C, Bonnell R, **von Oettingen JE.** High incidence of early microvascular complications in a cohort of Haitian children and adolescents with diabetes. Canadian Pediatric Endocrine Group Meeting, Canada. 2017.
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