Global Child Health

RESEARCH AND TRAINING DETAILS

Faculty
Joint Appointment Faculty
Support Personnel
Direct Annual Grant Support
Direct Annual Industry Support
Peer Reviewed Publications

Steven Black, MD
The Risk of Narcolepsy following Adjuvanted Pandemic Influenza Vaccine

In this U.S. Center for Disease Control and Prevention (CDC) funded study, Dr. Steven Black, and colleagues, will evaluate the risk of narcolepsy following adjuvanted influenza vaccines. Three such vaccines were used during the 2009-2010 pandemic and one was associated with an increased risk of narcolepsy in children in several European studies. The goal of this project is to expand the scope of prior studies to include the other two adjuvanted vaccines by performing studies in Brazil, Taiwan, Canada, Israel, the Netherlands, Spain and Argentina. The results of this study will inform the future use
and selection of adjuvants for future pandemics.

**Global Vaccine Safety Initiative Pilot Data Linkage Project**

This is a World Health Organization (W.H.O.) sponsored pilot to evaluate existing infrastructure regarding feasibility of a global consortium to evaluate vaccine safety concerns. Participating sites include eight sites in Latin America plus sites in Iran, Albania, India, Uganda, South Africa, Singapore, China and Australia.

Adekunle Dawodu, MBBS, FRCPCH

**Maternal vitamin D supplementation alone to prevent vitamin D deficiency in breastfeeding mothers and their infants**

In this ongoing randomized controlled trial funded by Qatar National Research Fund to evaluate the effect of maternal vitamin D supplementation alone to prevent vitamin D deficiency in Qatari breastfeeding infants and their mothers, Adekunle Dawodu, MBBS, FRCPCH, in collaboration with researchers in Doha, Qatar found a high prevalence of vitamin D deficiency in the first 60 consecutive enrolled mother-infant pairs. 76% percent of the mothers and 84% of the infants were found to be vitamin D deficient at enrollment in an environment with abundant sunlight. Vitamin D deficiency was associated with lack of sunlight exposure and inadequate vitamin D intake. This is an important finding because it supports a justification to evaluate a combined mother-infant vitamin D supplementation strategy to prevent vitamin D deficiency in this high-risk population.

Elizabeth Schlaudecker, MD, MPH

Dr. Schlaudecker's research continues to focus on the immunologic responses to maternal immunization. After completing a comprehensive epidemiologic study of the etiology and seasonality of viral respiratory infections in rural Honduras, her interests have shifted to prevention of these infections with maternal immunization.

Her recent work has demonstrated an altered isotype profile in pregnant women compared to non-pregnant women consistent with a decreased response to the vaccine. She is working in Dr. Sing Sing Way's laboratory with the mentorship of Dr. Fred Finkelman in the Division of Immunobiology, and with the support of a K12 Child Health Research Career Development Award from the National Institutes of Health (NIH). She is also investigating a novel respiratory syncytial virus (RSV) vaccine in pregnant women with Novavax, Inc., and the immunologic responses to immunization in breast milk with Cincinnati Children's NIH-supported Vaccine and Treatment Evaluation Unit (VTEU).

Mark Steinhoff, MD

In tropical regions, influenza circulates for many months of the year, which makes the policy of using influenza vaccine during the flu "season" not feasible. Mark Steinhoff, with colleagues at Johns Hopkins University, and in Nepal, have designed and are carrying out a prospective placebo-controlled trial of year-round influenza immunization in pregnancy. The study was carried out for two separate annual cohorts with a total of 3,600 women, and surveillance has just been completed. Preliminary evidence shows that the vaccine was effective at least part of the year and further analysis is being carried out.

Dr. Steinhoff's group was one of several groups involved in the evaluation of a new respiratory syncytial virus (RSV) vaccine designed for use in pregnancy to protect the newborn infant. The strategy of maternal immunization to prevent RSV is likely to be a new approach to reducing severe respiratory illness in infants.

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**Significant Publications**

Vitamin D deficiency is common in breastfed infants and their mothers but a global comparison is lacking. This study which is part of the global exploration of human milk bioactive factors is one of the first to use a standardized protocol for global comparison of Vitamin D status of breastfeeding mothers and their infants. The prevalence of Vitamin D deficiency was found to be higher in a cohort of Mexican and Shanghai than Cincinnati mothers while Vitamin D deficiency was more common in Mexican and Cincinnati than Shanghai infants. Vitamin D deficiency in breastfeeding mothers and their infants appears to be a global problem and the prevalence in diverse population depends on sun exposure behaviors and Vitamin D supplementation. The findings suggest that when sun exposure is inadequate, greater attention to maternal and infant Vitamin D supplementation starting during pregnancy is warranted worldwide.


RSV is the most common cause of respiratory hospitalization in the first year of life in the USA. We carried out this study in Bangladesh to assess the transfer of RSV antibody from mother to infant, to estimate the duration of infant protection in this Asian population.


With colleagues in Nepal we have carried out a randomized placebo-controlled evaluation of influenza immunization in rural Nepal. This trial and similar trials in South Africa and Mali were supported by the Bill and Melinda Gates Foundation. We are participating in an analysis of all three trials to summarize the effects of maternal immunization in the three very different lower income regions.

Division Publications


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**Faculty, Staff, and Trainees**

**Faculty Members**

**Mark Steinhoff, MD,** Professor  
**Leadership** Division Director, Global Child Health  
**Research Interests** Maternal immunization; infant infections.

**Steven Black, MD,** Professor  
**Research Interests** Vaccine safety.

**Adekunle Dawodu, MD,** Professor  
**Leadership** Director, International Patient Coordination  
**Research Interests** Vitamin D supplementation.

**Elizabeth Schlaudecker, MD, MPH,** Assistant Professor  
**Research Interests** Maternal immunization.

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**Grants, Contracts, and Industry Agreements**

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<td>Global Alignment of Immunization Safety Assessment</td>
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<td>Maternal Vitamin D Supplementation to Prevent Vitamin D Deficiency in Mothers and their Infants</td>
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<td>Steinhoff, M</td>
<td>Mother's GIFT Field Trial</td>
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**Total Current Year Direct**  
$3,795,113

**Industry Contracts**

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<td>Dawodu, A</td>
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**Current Year Direct Receipts**  
$280,346

**Total**  
$4,075,459
A n international collaboration led by Mark Steinhoff, MD, Director of the Division of Global Child Health, is advancing scientific understanding of how to protect infants from respiratory syncytial virus (RSV), the most important viral cause of infant pneumonia, though there is limited information from tropical regions.

The study, published Nov. 15, 2014, in The Journal of Infectious Diseases, is crucial research because, globally, pneumonia is the leading cause of childhood mortality.

The research team, which included colleagues in Seattle, WA, Rochester, NY, and Dhaka, Bangladesh, examined the role of maternal serum antibody in protecting infants from RSV. The team found that efficient transplacental transfer of RSV-specific antibody from mother to the fetus was documented in mother-infant pairs in Asia, and that higher cord-blood antibody titers were associated with infant protection from serologic RSV infection.

Findings were based on serial serum samples collected from mother-infant pairs in Bangladesh, from the third trimester of pregnancy to 72 weeks postpartum. They tested these using an RSV antibody microneutralization assay, and defined serologic infection as a four-fold increase in antibody titer (the highest dilution factor at which a positive reading is yielded). Maternal antibody half-life was calculated using infant antibody titers from birth to 20 weeks.

Researchers found that the ratio of infant cord blood to maternal serum RSV antibody titers in 149 mother-infant pairs was 1.01, and that there was a clear association between higher cord blood RSV antibody titers and lower risk of infant serologic infection.

In addition to this major initiative in battling pneumonia in Bangladesh, Global Child Health also works to assess the disease risks and increase the availability of childhood vaccines for pneumococcal and influenza viruses in other countries with limited resources, including India, Sri Lanka, Indonesia and Nepal.
In a study examining the role of transplacental antibody transfer in infant health, these titer testing images show how mean maternal Ab titers in the third trimester were correlated with titers at birth and week 72 of the postpartum period (R = 0.68 and R = 0.47, respectively). The top charts compare the mother’s antibody titer to respiratory syncytial virus (RSV) in the third trimester (left) and at birth. The bottom charts show the levels at birth (left) and then 72 weeks later. The findings show a clear association between higher cord blood RSV antibody titers and lower risk of infant infection.