

Division Photo



M. Steinhoff, A. Dawodu, S. Black

Division Data Summary

Research and Training Details

Number of Faculty	3
Number of Support Personnel	6
Direct Annual Grant Support	\$364,871
Peer Reviewed Publications	9

Faculty Members

Mark Steinhoff, MD, Professor ; *Division Director, Global Child Health*

Steven Black, MD, Adjunct Professor

Adekunle Dawodu, MD, Professor ; *Director, International Patient Care and Education*

Significant Accomplishments in FY08

Mother's Gift Clinical Trial

This is the first randomized controlled trial of immunization of pregnant women with influenza vaccine, which was undertaken as part of a broader trial of the strategy of immunizing the mother during pregnancy, and the infant with pneumococcal vaccines, as a strategy to prevent pneumococcal disease.

The Mother's Gift study in Bangladesh, conducted by Dr. Mark C. Steinhoff showed that influenza immunization of pregnant women was safe for the mothers and their infants. The use of influenza vaccine reduced all febrile illnesses in the mother by 35-40%, and in the 0-6 month infants by 29%. We evaluated the infant using an influenza antigen test which showed that infants born to the mothers who received influenza vaccine had a 63% reduction of proven influenza infection. Overall, our data showed that every 5 doses of influenza vaccine given to pregnant women prevented 1 febrile respiratory illness in the mothers or infants. We also can estimate that every 16 immunizations prevented one proven influenza infection in the vulnerable infants. In summary, this project carried out in Bangladesh provided unique and useful information showing the effectiveness of the strategy of immunizing pregnant women. These data are also

important for immunization policy in the United States and other countries. In addition, this project carried out in Asia, for the first time showed the clear effect of influenza vaccine in healthy young adults, when given throughout 11 months of the year.

The clear effectiveness of this strategy in a tropical setting has prompted interest in carrying out a wider field trial of the strategy of maternal immunization in the Asian continent, and has been the subject of an invited grant proposal.

Vitamin D Deficiency Research

Severe vitamin D deficiency in childhood often manifests as rickets while vitamin D insufficiency has been associated with inadequate bone mineral content and impaired growth. Vitamin D deficiency is re-emerging in many Western countries especially in minority populations but remain public health problem in the Middle East, parts of Asia and Africa because of limited sun exposure and poor vitamin D intake. Vitamin D insufficiency is also common in women of child bearing age affecting almost 80% of Arab women and 42% of African American women. In addition to bone health, it is now recognized that vitamin D may be involved also in the regulation of cell growth and differentiation and immune function. Recent studies have linked vitamin D deficiency with increased risk of respiratory infection and autoimmune disease such as type1diabetes in childhood and with disorders including common cancers, autoimmune and cardiovascular diseases in adult.

In earlier studies, Dr. Adekunle Dawodu and others have shown that poor vitamin D stores at birth and in early infancy; associated with vitamin D deficiency in the mothers may be an important risk factor for the high prevalence of rickets and low vitamin D status in children in many high risk populations. We suggested that vitamin D deficiency be regarded a maternal-childhood health problem with adverse health consequences. Dr. Dawodu is the principal investigator of one of the first randomized controlled trial of high-dose prenatal vitamin D supplementation to prevent vitamin D deficiency in Arab mothers and their newborn infants in the United Arab Emirates. The research will provide important data on the efficacy and safety of high-dose prenatal vitamin D supplementation to prevent vitamin D deficiency in mothers and their offspring which could be applicable to other Middle Eastern and Asian populations where severe vitamin D deficiency is extremely common. The study is in collaboration with researchers at the Faculty of Medicine and Health Sciences, UAE University and Medical University of South Carolina and is funded by Thrasher Research Fund, Salt Lake City; Utah. The results will be compared with a similar NIH funded high-dose prenatal vitamin D trial that is on-going in South Carolina. Together, these two studies will provide data to guide a new policy recommendation on prenatal vitamin D requirement to prevent vitamin D deficiency in mothers and their infants.

Global Vaccine Safety DataNet

Although vaccines are among the most effective of public health interventions, in many cases their very success has eradicated the public's memory of the diseases they were designed to prevent. Consequently, fear of disease has been replaced by concern about vaccine safety. Although in some cases these concerns are scientifically valid; more often they are based on rumor and unsubstantiated claims, and with the advent of the internet, these rumors can spread quickly. Unfortunately, while the scientific community is in the process of collecting data to support or refute these claims, vaccine uptake may decline, with subsequent increases in disease, morbidity, and mortality, as has occurred with pertussis in Japan and measles in the UK and elsewhere. Similarly, a safety scare regarding oral polio vaccine significantly derailed the global eradication program for this disease.

Historically, most vaccines have been developed, produced, and first introduced in countries (primarily in North America and Europe) with considerable resources for evaluating safety in clinical trials and with postmarketing surveillance. However, vaccine manufacturing is globalizing, with production in Brazil, India, Cuba, China, and other countries, and new vaccines, wherever they are manufactured, are being introduced first in developing countries that lack extensive infrastructure for monitoring safety. For these reasons, there is a great need for a global approach to evaluating vaccine safety. Using computer databases for this evaluation is attractive because such databases allow rapid identification of possible cases and vaccine exposure information, and with appropriate standardization of definitions, allow comparison or combination of data across several sites. Several developed countries, such as the US, UK, and Denmark, already have linked electronic databases to track vaccinations and clinical outcomes within their countries, Computer databases and technology to utilize such databases exists in other countries which would allow the development of a Global Vaccine Safety DataNet (GVSD). Gathering information on vaccine safety over larger populations will provide additional statistical power for identifying rare events and will enable results obtained in one geographical area to be tested in additional populations. Furthermore, the development of data networks in locations that currently lack them will facilitate the local evaluation of safety issues or hypotheses in populations around the world.

Dr. Steve Black organized a planning meeting in France in September of 2007 to discuss the establishment of a GVSD. Attendees included experts from 22 developed and developing countries as well as public health agencies and WHO. The goals of the meeting included assessing current capabilities and interest in establishing a global vaccine safety data

network, exploring the infrastructure and funding required to bring such a project to fruition, and discussing the best approach to implementation.

The results of a survey of participants showed that capacity and experience varied widely, even between countries within a region. Of note, was that the majority of countries present had computerized information on at least outcomes available on all or a subset of their populations. In all, this information was available for a surveillance population of over 250 million based upon the survey of participating countries.

At the end of the meeting, it was the general consensus of the group, that the establishment of a GVSD is both desirable and feasible. Next steps have included site visits to Brazil and Mexico and planning for upcoming meetings with possible sponsors.

Division Publications

1. Black S. [Global Vaccine Safety DataNet meeting](#). *Expert Rev Vaccines*. 2008; 7: 15-20.
2. Black S, Friedland LR, Ensor K, Weston WM, Howe B, Klein NP. [Diphtheria-tetanus-acellular pertussis and inactivated poliovirus vaccines given separately or combined for booster dosing at 4-6 years of age](#). *Pediatr Infect Dis J*. 2008; 27: 341-6.
3. Black S, Ray P, Shinefield H, Saddier P, Nikas A. [Lack of association between age at varicella vaccination and risk of breakthrough varicella, within the Northern California Kaiser Permanente Medical Care Program](#). *J Infect Dis*. 2008; 197 Suppl 2: S139-42.
4. Klein NP, Massolo ML, Greene J, Dekker CL, Black S, Escobar GJ. [Risk factors for developing apnea after immunization in the neonatal intensive care unit](#). *Pediatrics*. 2008; 121: 463-9.
5. Dawodu A, Tsang R. [Vitamin D deficiency and rickets: possible role of maternal vitamin D deficiency](#). *Ann Trop Paediatr*. 2007; 27: 319.
6. Dawodu A, Wagner CL. [Mother-child vitamin D deficiency: an international perspective](#). *Arch Dis Child*. 2007; 92: 737-40.
7. Saadi H, Dawodu A. **Vitamin D deficiency in Arabian women and children: it is time for action**. *Emirates Med J*. 2007; 25: 201-207.
8. Gessner BD, Sedyaningsih ER, Griffiths UK, Sutanto A, Linehan M, Mercer D, Mulholland EK, Walker DG, Steinhoff M, Nadjib M. [Vaccine-preventable haemophilus influenza type B disease burden and cost-effectiveness of infant vaccination in Indonesia](#). *Pediatr Infect Dis J*. 2008; 27: 438-43.
9. Kerdpanich A, Hutagalung Y, Watanaveeradej V, Bock HL, Steinhoffmd M. [The immunological response of Thai infants to haemophilus influenzae type B polysaccharide-tetanus conjugate vaccine co-administered in the same syringe with locally produced diphtheria-tetanus-pertussis vaccine](#). *J Med Assoc Thai*. 2007; 90: 1330-6.

Grants, Contracts, and Industry Agreements

Grant and Contract Awards

Annual Direct / Project Period Direct

Dawodu, A

High Prevalence of Rickets and Subclinical Maternal and Childhood Vitamin D Deficiency

Thrasher Research Fund

01/01/08 - 12/31/10

\$125,658 / \$362,284

Steinhoff, M

Hib Initiative

The Global Alliance for Vaccines and Immunizations (Johns Hopkins University)

08/01/07 - 07/31/08

\$35,835 / \$35,835

Planning a Field Trial of Maternal Pneumococcal Immunization in South Asia

Bill & Melinda Gates Foundation

10/01/07 - 09/30/08

\$166,109 / \$166,109

Development of Pneumococcal and Influenza Vaccines

PATH Vaccine Solutions

01/01/07 - 12/31/08

\$37,269 / \$127,885

Current Year Direct

364,871

Service Collaborations

Dawodu, A

Procter & Gamble China Scholars Program

\$ 240,000

Current Year Direct

240,000

Total 604,871
