

Division Details

Division Data Summary

Research and Training Details

Number of Faculty	4
Number of Support Personnel	9
Direct Annual Grant Support	\$2,730,677
Direct Annual Industry Support	\$320,000
Peer Reviewed Publications	17

Division Photo



Left to Right: A Dawodu, M Steinhoff, E Schlaudecker

Significant Accomplishments

Influenza in Suzhou China

Steven Black, MD, and Mark Steinhoff, MD, evaluated the epidemiology of laboratory-proven influenza hospitalizations in children in the People's Republic of China, collaborating with colleagues at the Suzhou Children's Hospital near Shanghai, and Fudan University in Shanghai. They show that during a two year period, influenza occurred throughout the year with peaks in the winter and in August/September, and was a significant cause of childhood hospitalization. This is one of the first population-based studies of influenza disease in children in the People's Republic of China, and has prompted further studies of the burden of vaccine preventable influenza in Chinese children.

Influenza Vaccine Trial in Bangladesh

Steinhoff and colleagues in Bangladesh evaluated the effects of antenatal influenza vaccine on fetal growth. A secondary analysis of data from a randomized prospective trial showed that there was a substantial increase of 200g in mean birth weights among infants who were born to mothers who received the influenza vaccine, a new finding regarding the effects of influenza in pregnancy. They also showed that the proportion of infants who were small for gestational age was decreased in infants of immunized mothers, from 44.8 percent to 25.9 percent, which is a significant 42 percent reduction. These new findings provide information useful for pregnant women.

Vitamin D in the Middle East

Adekunle Dawodu. MBBS, MRCP, carried out an interesting practical assessment of the effect of sunlight exposure on vitamin D status in Middle Eastern women, who are known to have relatively low serum vitamin D levels, despite abundant sunlight, related to cultural norms. He arranged for volunteers to expose in a culturally

acceptable manner the face, arms and hands to direct sunlight for 15 minutes a day, twice a week, for four weeks. In comparison to women who did not have this sun exposure, the mean serum vitamin D levels increase by 31 percent, a statistically significant increase. These data suggest that specific culturally appropriate sun exposure can improve vitamin D status.

Division Highlights

Influenza Vaccine during Pregnancy

Our studies of the effect of influenza vaccine during pregnancy have provided increased evidence that influenza vaccine improves outcomes for the pregnant mother, her fetus, and the infant. We had earlier shown from a randomized controlled trial done with colleagues in Bangladesh that influenza vaccine reduced influenza illness in the mother and the infant for up to six months, reducing laboratory-proven influenza illness by 63%.

International Visitors' Office

The International Visitors' Office within the Global Health Center continued its growth during fiscal year 2012. In FY12, we saw an increase of 25% of international visitors coming through our center, bringing the total for the year to 212. These international visitors came from 27 different countries and observed in 30 separate divisions.

Nurturing Children's Development Program

The Nurturing Children's Development Program, CCHMC-P&G partnership funded by the Pampers Brand and formerly known as Bang Bao, was extended to include research scholars and observers from China, Latin America (Brazil and Mexico) and Africa (Nigeria). The program is intended to sponsor 4 research scholars as well as 22 observers from these countries. The four research scholars arrived May 1, 2012 for their 9-month research programs, and 6 observers have already completed their two-month clinical observer programs.

Birth Weights

Further analysis of birth outcomes in Bangladesh showed that infants of mothers who received influenza vaccine had an increase of 200g in mean birth weights, and a 57% reduction in the proportion born small for gestational age. These findings of the effect of antenatal influenza immunization on newborn outcomes have been replicated in four other recent studies in the United States, Canada, and Britain. These findings suggest that influenza infection of the pregnant woman reduces intruterine growth, a new observation. It is becoming clear that immunization of pregnant women benefits all members of the triad of the mother, fetus, and infant.

Division Publications

1. Ahmed SS, Plotkin SA, Black S, Coffman RL. **Assessing the safety of adjuvanted vaccines.** *Sci Transl Med.* 2011; 3:93rv2.
2. Black S. **Effectiveness of the pneumococcal conjugate vaccine for pneumonia in children.** *Pediatr Infect Dis J.* 2011; 30:917-8.
3. Black S, Nicolay U, Vesikari T, Knuf M, Del Giudice G, Della Cioppa G, Tsai T, Clemens R, Rappuoli R. **Hemagglutination inhibition antibody titers as a correlate of protection for inactivated influenza vaccines in children.** *Pediatr Infect Dis J.* 2011; 30:1081-5.
4. Black S, Pizza M, Nisum M, Rappuoli R. **Toward a meningitis-free world.** *Sci Transl Med.* 2012; 4:123ps5.

5. Dawodu A. **What's new in mother-infant vitamin D deficiency: a 21st century perspective.** *Med Princ Pract.* 2012; 21:2-3.
6. Dawodu A, Kochiyil J, Altaye N. **Pilot study of sunlight exposure and vitamin D status in Arab women of childbearing age.** *East Mediterr Health J.* 2011; 17:570-4.
7. Dawodu A, Tsang RC. **Maternal vitamin D status: effect on milk vitamin D content and vitamin D status of breastfeeding infants.** *Adv Nutr.* 2012; 3:353-61.
8. Dawodu A, Wagner CL. **Prevention of vitamin D deficiency in mothers and infants worldwide - a paradigm shift.** *Paediatr Int Child Health.* 2012; 32:3-13.
9. Ellington LE, Gilman RH, Tielsch JM, Steinhoff M, Figueroa D, Rodriguez S, Caffo B, Tracey B, Elhilali M, West J, Checkley W. **Computerised lung sound analysis to improve the specificity of paediatric pneumonia diagnosis in resource-poor settings: protocol and methods for an observational study.** *BMJ Open.* 2012; 2:e000506.
10. Monto AS, Black S, Plotkin SA, Orenstein WA. **Response to the 2009 pandemic: effect on influenza control in wealthy and poor countries.** *Vaccine.* 2011; 29:6427-31.
11. Rappuoli R, Black S, Lambert PH. **Vaccine discovery and translation of new vaccine technology.** *Lancet.* 2011; 378:360-8.
12. Rappuoli R, Mandl CW, Black S, De Gregorio E. **Vaccines for the twenty-first century society.** *Nat Rev Immunol.* 2011; 11:865-72.
13. Ray P, Black S, Shinefield H, Dillon A, Carpenter D, Lewis E, Ross P, Chen RT, Klein NP, Baxter R. **Risk of rheumatoid arthritis following vaccination with tetanus, influenza and hepatitis B vaccines among persons 15-59 years of age.** *Vaccine.* 2011; 29:6592-7.
14. Rowhani-Rahbar A, Klein NP, Lewis N, Fireman B, Ray P, Rasgon B, Black S, Klein JO, Baxter R. **Immunization and Bell's palsy in children: a case-centered analysis.** *Am J Epidemiol.* 2012; 175:878-85.
15. Schlaudecker EP, Steinhoff MC, Moore SR. **Interactions of diarrhea, pneumonia, and malnutrition in childhood: recent evidence from developing countries.** *Curr Opin Infect Dis.* 2011; 24:496-502.
16. Steinhoff MC, Omer SB, Roy E, El Arifeen S, Raqib R, Dodd C, Breiman RF, Zaman K. **Neonatal outcomes after influenza immunization during pregnancy: a randomized controlled trial.** *CMAJ.* 2012; 184:645-53.
17. Wagner CL, Taylor SN, Dawodu A, Johnson DD, Hollis BW. **Vitamin d and its role during pregnancy in attaining optimal health of mother and fetus.** *Nutrients.* 2012; 4:208-30.

Faculty, Staff, and Trainees

Faculty Members

Mark Steinhoff, MD, Professor

Leadership Division Director, Global Child Health

Research Interests Maternal Immunization

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

Division Collaboration

Neonatology and Pulmonary Biology » Ardythe Morrow, PhD
Research involving Vitamin D supplementation in breastfeeding mothers

Grants, Contracts, and Industry Agreements

Grant and Contract Awards			Annual Direct
STEINHOFF, M			
Mother's Gift 241 Field Trial			
Bill & Melinda Gates Foundation			
50274	12/1/08-11/30/14		\$2,698,231
BLACK, S			
Epidemiology and Burden of Influenza in Children, Suzhou, China			
Centers for Disease Control and Prevention			
2010-N-12676	9/30/10-9/29/13		\$32,446
Current Year Direct			\$2,730,677
Industry Contracts			
DAWODU, A			
P&G			
Current Year Direct Receipts			\$320,000
Total			\$3,050,677