TO: Dr. John N. Williams, Dean  IU School of Dentistry  
FROM: Karen M. Yoder, PhD  
DATE: July 21, 2010  
RE: Report: 2010 IUSD - Moi University School of Dentistry Academic Partnership

Site: Moi University School of Dentistry; Eldoret Kenya  
Team Members: Faculty - Dr. Jeffrey Platt, Dr. Darlene West, Dr. Keith Yoder, Dr. Karen Yoder (Group Leader). Third year Dental Students - Christopher Cummings, Patrick Kelly, Christopher Kutanovski (Service Learning Assistant)  
Dates of Visit: June 5 – 25, 2010

This three-week program marks the initiation of Indiana University School of Dentistry (IUSD) students and faculty traveling to Kenya to work in academic and community settings with faculty and students of Moi University School of Dentistry (MUSOD). The program exceeded our expectations in scope, accomplishments and potential for future collaborations. Many thanks go to my Kenyan and Indiana colleagues for their unflagging professionalism, wonderful spirit, tenacity to task, skill in identifying potential for future collaboration and ability to communicate effectively in this intercultural setting. It is important to acknowledge that none of the program goals could have been accomplished without two invaluable assets: (1) the extensive preparation that Dean Kibosia and her faculty and staff did in preparation for the MUSOD-IUSD team’s research and community-based work, and (2) the amazing Indiana and Kenya based infrastructures that have been developed by IU School of Medicine in partnership with Moi University. Dr. Joseph Mamlin, Dr. Robert Einterz and a host of other key players deserve enthusiastic accolades!

Background:  
Indiana University School of Dentistry’s (IUSD) affiliation with Moi University is a component of the IU-Kenya Partnership which was established by Indiana University School of Medicine in 1989. In 2003, when plans for establishing a Moi University School of dentistry were underway, IUSD faculty members Drs. Timothy Carlson, Keith and Karen Yoder first visited Eldoret, Kenya to lay the groundwork for future academic collaborations. Kenya’s only other dental school is in Nairobi and has trained most of the approximately 700 dentists who serve Kenya’s 36 million residents.

In November 2007, IUSD’s Dean Lawrence Goldblatt was invited to participate in the official opening of Moi University’s School of Dentistry (MSOD); since that time he has participated in two additional programs at Moi University.
While at MUSOD in 2009 and again this year, our work was primarily with Dean Caroline Kibosia, and faculty members Drs. Kenneth Okemwa, Mohammed Arnaout, and Conway Sang. MUSOD is now in its third year of operation with eleven students in the third year class, 23 in the second year, and 22 in the first year. Students are accepted to the five year program, through a competitive process, following completion of secondary school. The first two academic years are dedicated to a problem based learning curriculum, and tutorial groups are composed of students from all disciplines; dentistry, medicine, nursing and public health. During the third year of education, Community Based Education and Service (COBES) also involves multidisciplinary groups of students. COBES is a three-week residential experience during which students are assigned to rural sites to conduct research and provide health related services, supervised by faculty members.

Moi University is currently constructing a new building on campus that will house dentistry, nursing and public health. We were able to witness construction in progress and our IUSD dental students volunteered an afternoon to help mix and pour concrete.

Goals for the 2010 IUSD-MUSOD Partnership:

- Develop a sustainable partnership with mutually beneficial outcomes
- Provide academic input to augment MUSOD and Moi University School of Medicine (MUSOM) faculty available to teach dental specialty areas
- Initiate collaborative research with MUSOD and IUSD
- Develop innovative community-based programs for MUSOD and IUSD dental student and faculty participation

Preparation

- Orientation for IUSD student/faculty participation. From October 2009, when the team was selected, until departure in June 2010, the IUSD Kenya team held monthly discussion meetings to enable broad preparation for working in a new cultural environment. Following arrival, as part of the on-site orientation, the IUSD team participated in four one-hour private tutorials in the Swahili language. These lessons concentrated on greetings, numbers and dental/medical terminology. The IUSD team members used the words liberally and enthusiastically during our work in Kenya. They were, therefore, able to greet the teachers and the children in their national language, ask the children’s age, their grade level and independently gain their cooperation in opening their mouth. Although many of the children and all of the teachers use some English, the children are more comfortable in Swahili and it was apparent that this effort was appreciated. In many cases, communicating with children using Swahili was necessary. Teaching at Moi University is in English and all faculty and students are fluent; therefore collegial communication is not problematic.

Specific Activities Accomplished:

- Launched community and school-based dental programs involving Moi & IUSD faculty and Moi & IUSD 3rd year dental students.
o **Initiated Kenya’s first school based dental sealant program** The team comprised of MUSDO faculty members Dr. Kibosia, Dr. Okemwa and Dr. Scott and MUSDO dental students together with the IUSD dental students, Dr. West and Drs. Yoder launched school-based programs at five sites involving 451 children from four differing population groups: 190 children at two traditional primary schools, Sociani and Kimalele Primary Schools; 110 children at The Special School, a home for children with developmental disabilities; 97 children at the Remand Center, a site housing detained children awaiting court orders; 54 children at a drop-in site for street children who are living, without adults, in small groups on the streets of Eldoret.

Using a portable dental unit and portable chair, children were triaged for caries risk and for selected children dental sealants were applied. Concurrently, faculty supervised Moi and IU dental students who provided screening using standard chairs and flashlights. MUSOD faculty and students will return to sites to complete sealants for additional children who were identified as at higher risk for dental caries.

o **Conducted a pilot assessment of children’s oral health.** Prior to visiting the five sites listed above, Moi and IUSD faculty met to finalize data collection protocols and forms. Epidemiologic data were collected to reflect the oral health and related variables for the 451 children at five sites. Although final data summaries are not yet tabulated, it was apparent that the street children and the children with developmental disabilities had better oral health than the other children. It was also revealing to note that although considerable dental caries existed among the five groups, there was not a single restoration present in the mouths of the 451 children who were examined; clear evidence pointing to a void in access to dental services.

o **Explored potential use of Atraumatic restorative technique (ART).** MUSOD faculty have considerable experience in the use of ART. They demonstrated its use for the IUSD team members and laid groundwork to incorporate ART into the Eldoret school based dental sealant program.

- **Launching a pilot study on sterilizer effectiveness.** In cooperation with the Kenyan Dental Association; Eldoret Chapter, we launched a pilot study to examine the effectiveness of sterilizers used in dental offices in the Eldoret area. Dr. Okemwa in cooperation with IUSD’s Dr. Charles Palenik drafted a study protocol. Dr. Okemwa is directing sample collection, incubation and data entry. A 60 percent failure rate of the spore tests from the first 10 dental clinics indicate that this may be an important project for Kenya. Dr. Okemwa is anticipating policy implications of this research.

- **Provided classroom and laboratory teaching for MUSOD.**
  - **Dental Materials**
    - Dr. Jeffrey Platt provided 25 hours of dental materials lectures for 3rd year MUSOD dental students. He gave each student a dental materials manual and a
CD including each of his PowerPoint lectures. Dr. Platt also provided a presentation for 22 members of the Kenya Dental Association – Eldoret Branch, about recent research related to early intervention in the caries process.

- Dr. Keith Yoder taught nine hours of dental materials laboratory including a demonstration and laboratory clinical session to teach application of dental sealants. IUSD dental students served as laboratory assistants. He also presented one hour of lecture on the private practice model of dentistry in the USA.
- Dr. Karen Yoder provided six hours of lecture for 3rd year dental students on the use of fluoride for caries prevention and research conducted in East Africa related to excessive natural fluoride, severe dental fluorosis and crippling skeletal fluorosis.

- **Provided Oral health educational programs for Moi School of Medicine**
  - Grand Rounds: Dr. Darlene West presented grand rounds for approximately 100 Moi University Teaching and Referral Hospital physicians, staff and students. Her topic was *Management Considerations for Person with Neurodevelopmental Disorders and Intellectual Disabilities*.
  - Dr. West also provided two-three hour Lectures for fifth year medical students

- **Laid the groundwork for Moi SOD students to visit IUSD annually.** The IUSD team is committed to annually raising adequate funds to bring two MUSOD dental students to IUSD for a month. We are hoping to begin this exchange in April 2011 together with annual IUSM’s annual visit from Moi medical students.

- **Launched a system to analyze and map Kenya’s natural fluoride distribution** (with Moi School of Medicine and Nairobi School of Dentistry). When first arriving in Nairobi we toured University of Nairobi School of Dentistry (UNSOD). There we talked with with Dr. Gladys Opinya, Chair of Pediatric Dentistry, who I met when we both attended an NIH Conference in the mid-90s. We discussed the potential of a joint project to gather fluoride samples from a variety of locations in Kenya and plot a GIS map to illustrate the natural fluoride distribution. East Africa, including Kenya and Tanzania are known to have geographic areas that have excessive natural fluoride. Comprehensive identification of the exact location of these unsafe water sources; however, does not exist. Identifying specific high fluoride areas would facilitate defluoridation of communal water supplies and focus the potential development and distribution of affordable home water defluoridation units to targeted rural areas that are not served by communal water supplies in Kenya and potentially other East African countries. Dr. Opinya recommends gathering samples at each site three times corresponding with the varying climatic conditions. She also expressed concern that any home defluoridation unit be thoroughly tested to assure that the resulting water would not only be appropriately defluoridated, but also that it be thoroughly tested and be free of other impurities/chemicals that could potentially be harmful.
Dr. Opinya and Dean Kibosia are colleagues and are enthused about this first collaboration between their two schools and IUSD. A plan was developed to send water sample vials home with all medical and dental students when they go to their home villages for school breaks in April, August and December. These dates would correspond with the seasonal precipitation variations. The students will be instructed to photograph and plot the location of the water source and photograph a sign identifying the name of the town/village. Analysis will be done at MUSOD. The IUSD team brought two fluoride electrodes for this project.

Additional Information:

- Program Coordination: This program was coordinated through IUSD International Service-Learning in cooperation with the IUSD Committee on Community Engaged Scholarship (Chair, Dr. Timothy Carlson), the Division of Community Dentistry, and approved by the IUPUI Office of International Affairs (Director of Study Abroad; Stephanie Leslie).

- To augment MUSOD’s teaching capacity we provided two data projectors.

- Funding: Cost for the three-weeks trip was $3,650 per person including airfare, in-country travel, housing, and meals. The three dental students raised support through contributions from friends and family channeled through the IU Foundation. Four faculty members were awarded approximately half of the cost through matching funds from the IU Foundation, Donald W. Johnson Public Health Fund, and Dean’s Priority Fund. Faculty travelers personally paid the remainder of the cost.

- Housing: IU maintains comfortable, modern housing in Eldoret for faculty, staff and visitors. The compound is protected by two gates with 24 hour guards at each gate. Most meals are included in the daily rate which is $50 for faculty and $30 for students. The IUSD dental students joined in numerous activities with medical students and residents who were also staying at IU House or the Moi Student Hostel. Their activities included accompanying medical students and residents on hospital rounds, participating in sports and exercise events and finding a television to enable watching the World Cup games.

- Follow-up: Dental student and team member, Chris Kutanovski contacted ADA News to lay the groundwork for news coverage about the partnership. The three IUSD students have completed the first draft of an article to be submitted to the Journal of the Indiana Dental Association or the IUSD Alumni Bulletin.

Ongoing and Future Partnership Initiatives:

- IU School of Medicine annually sponsors Kenyan medical students to visit and work at IUSM during six weeks beginning early in April. The IU-Kenya Partnership clearly identifies this as an
important component of the program. The 2010 IUSD- Kenya team has agreed to develop a plan and raise funds to enable two MUSOD students to visit IUSD for four weeks in April 2012. This exchange is expected to occur during each year of the partnership. The IUSD Kenya team will meet with IUSD administrators to plan an appropriate program.

- Continue dental student exchange experiences including IUSD and MUSOD students working together in public health, research and clinical settings.

- Promote faculty development and faculty exchange with MUSOD and IUSD

- The concept of MUSOD using podcasts for basic lectures and Skype for discussions and questions will be explored in cooperation with IUSD faculty. Several IUSD faculty members have already offered to share their podcast lecture materials with MUSOD. Currently, areas of expertise needed are dental materials, molecular cell biology, periodontics, and oral pathology.

- Dr. Lawrence Goldblatt is scheduled to work at Moi University for the month of January 2011. His work is likely to center on oral manifestations of HIV/AIDS and other oral pathology related research.

- Research initiatives that the IUSD-MUSOD partnership intends to continue are:
  - Dental clinic sterilizer biological indictor testing in cooperation with IUSD’s Dr. Charles Palenik
  - Securing, analyzing water samples and mapping the fluoride concentration of Kenya’s water supplies in cooperation with Oral Health Research Institute and Dr. Angeles Martinez-Mier
  - Developing a safe, effective and inexpensive home water defluoridation unit, made of local materials to enable water supplies with appropriate fluoride concentrations for rural dwellers.
  - Gathering epidemiological data on the oral health of Kenyan populations beginning with children in school and institutional settings

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