2012–2013 Assignment Opportunities

Third- and Fourth-Year Medical and Veterinary Student Projects
- Evaluation of a Proposed Animal Bite Reporting System to Prevent Canine Rabies — Haiti
- Infectious Disease Epidemiology — Haiti

Fourth-Year Medical and Veterinary Student Projects
- Assessing Quality of Information from Hospitals Participating in Sentinel Surveillance for Invasive Bacterial Diseases and Rotavirus — Western Pacific or Southeast Asia
- Population-Based Surveillance — Rural Thailand

Third- and Fourth-Year Medical Student Projects
- Evaluation of Pneumococcal Conjugate Vaccine on *Streptococcus pneumoniae* and *Haemophilus influenzae* Nasopharyngeal Carriage in Healthy Children — Brazil
- HIV Serosurveillance in Antenatal Clinics — Guyana
- Piloting the World Health Organization’s Workload Indicators of Staffing Needs Survey — Mozambique or Botswana
- Population-Based Surveillance for Emerging Infectious Diseases, Kibera Informal Housing Settlement (Nairobi) — Kenya
- Population-Based Surveillance for Emerging Infectious Diseases, Rural Lwak Area (Kisumu) — Kenya
- Quality Assessment of the Implementation of an Impact Evaluation of the National PMTCT Programs at Population Level Using a Facility-Based Approach — Zimbabwe
- Selection of Patient Specimens for Pathogen Detection/Discovery from Outbreak of Infectious Disease Occurring in East Africa from 2007–2011 — Kenya

Third- and Fourth-Year Veterinary Student Projects
- Populations Exposed to Bats in Guatemala and Associated Vampire Bat Rabies Epizootiology — Guatemala

The CDC-Hubert Global Health Fellowship is made possible by the joint efforts of the CDC Foundation and CDC with an endowment established by the O.C. Hubert Charitable Trust; additional support is provided by an educational grant from External Medical Affairs, Pfizer Inc.
Project title: Evaluation of a Proposed Animal Bite Reporting System to Prevent Canine Rabies

Location (country): Haiti  Project duration: 6 weeks

Fellow requested:
Year: ☑ Third year  ☑ Fourth year  Type: ☑ Medical student  ☑ Veterinary student

Project availability: September 1, 2012 – June 30, 2013

Languages: Spanish, French, or Creole highly recommended.

Skills:
- Familiarity with descriptive statistics
- Basic computer skills and familiarity working with spreadsheets and large datasets
- Ability to work in rural post-reconstruction setting
- Familiarity with survey design and public health surveillance

Student responsibilities:
- Visit with health and agriculture authorities on status of current reporting sites
- Visit sentinel surveillance sites/clinics
- Gather data on site services, capacity, and occurrence of animal bites
- Compile data and write a descriptive report

Project supervisor(s):
Jesse Blanton, MPH, Epidemiologist, Division of High-Consequence Pathogens and Pathology, Poxvirus and Rabies Branch
Sergio Recuenco, MD, DrPH, MPH, Division of High-Consequence Pathogens and Pathology, Poxvirus and Rabies Branch

Project description:
In collaboration with CDC personnel and local collaborators, an assessment of current regulations, health services, and surveillance systems in Haiti pertaining to dog bites and rabies exposure is planned. Currently a sentinel surveillance system is used in Haiti which relies on reporting of various conditions from participating clinics. While rabies is recognized as being a problem in Haiti, current surveillance systems are inadequate to quantify the problem. An assessment is planned to evaluate the current surveillance system and identify a baseline of human and animal rabies cases if available. Number of animal bites, biting species, types of healthcare establishment, and rabies prophylaxis availability will be assessed. In addition, site capacity for capturing, recording, and reporting cases of disease will be evaluated. Activities require work in the field and observation of activities in a healthcare setting.

Objectives:
- Identify sentinel surveillance sites currently reporting data on animal bites and rabies prophylaxis
- Collect information on rates of rabies related healthcare visits
- Identify barriers in capture and reporting of information regarding rabies related healthcare visits
- Provide recommendations to improve animal bite and rabies prophylaxis reporting systems

Project design:
- Cross-sectional descriptive study
- Knowledge, Attitude and Practice (KAP) Survey and capacity evaluation
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<th><strong>Project title:</strong></th>
<th>Infectious Disease Epidemiology</th>
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<td><strong>Location (country):</strong></td>
<td>Haiti</td>
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<td><strong>Project duration:</strong></td>
<td>8–12 weeks</td>
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<td><strong>Project availability:</strong></td>
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<td><strong>Skills:</strong></td>
<td>Project management, familiarity with basic database software (Excel, Access). Knowledge of statistical software is a plus. Ideally some experience working internationally. Functional (ideally fluent) French is highly preferred.</td>
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<td><strong>Student responsibilities:</strong></td>
<td>The student will be involved in operationalizing surveillance for infectious diseases (diarrheal disease, with a focus on cholera, respiratory disease, and febrile illness) at hospitals throughout Haiti and the national laboratory. The project will include training personnel at hospitals and at the national laboratory on specimen collection, case identification, and questionnaire administration. In addition, the fellow could be involved in database development and data analysis. Finally, the fellow could be involved in disease outbreak investigations if they were to occur during the period of the fellowship.</td>
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<td><strong>Project supervisor(s):</strong></td>
<td>Mark Katz, MD, Advisor for Surveillance and Epidemic-Prone Diseases, CDC-Haiti</td>
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<td><strong>Project description:</strong></td>
<td>See above for project description.</td>
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| **Objectives:** | 1. Help operationalize facility-based infectious disease surveillance  
2. Improve database development and data analysis skills  
3. Gain experience working in various international public health settings |
| **Project design:** | Prospective facility-based surveillance |
Project title: Assessing Quality of Information from Hospitals Participating in Sentinel Surveillance for Invasive Bacterial Diseases and Rotavirus

Location (country): Priority country in WHO Western Pacific Region (possibly Papua New Guinea or Viet Nam) or Southeast Asian Region (possibly Nepal)

Project duration: 6–8 weeks

Fellow requested: Year: ☐ Third year ☒ Fourth year Type: ☒ Medical student ☐ Veterinary student

Languages: English

Project availability: September 1, 2012 – June 30, 2013

Skills: Skills in epidemiology helpful

Student responsibilities:

The student must be able to observe day-to-day practices at selected sentinel hospitals in less developed countries without disrupting normal operations. Students must be flexible, self-directed and respectful of hospital staff. The student will be expected to:

- Spend time at sentinel hospitals to observe patient evaluation for inclusion in the surveillance system, specimen collection and transport to the laboratory, laboratory procedures, data collection and completion of required surveillance activities
- Spend time in hospital laboratories to become familiar with logistics of specimen processing, data management and laboratory methods
- Evaluate the completeness and accuracy of information collected by the international team of experts during site assessment
- Practice applying data from sentinel surveillance sites to national data sources to estimate the national burden of IBDs and rotavirus diseases

Through these experiences, the fellow will learn about sentinel surveillance for vaccine-preventable diseases, will be able to critique data from sentinel surveillance sites and will see how these data can be useful in less developed countries with limited capacity for disease surveillance. The student will prepare a 10-page (maximum) report on the project that will be revised with the mentor and shared with the Ministry of Health of the selected country, the World Health Organization (WHO) and CDC.

Project supervisor(s):

Terri Hyde, MD, Team Lead, Surveillance and Vaccine Introduction, Strengthening Immunization Systems Branch, Global Immunization Division

Project description:

CDC is supporting the WHO to strengthen national surveillance capacity for vaccine-preventable, invasive bacterial diseases, including those caused by Haemophilus influenzae type b (Hib), Streptococcus pneumoniae, and Neisseria meningitidis. Countries participating in the global surveillance network for invasive bacterial diseases (IBD) or rotavirus disease select "sentinel" hospitals to perform testing for bacterial pathogens in patients meeting suspected IBD case definitions, or to test for rotavirus in patients hospitalized for acute gastroenteritis. In coordination with national Ministries of Health, technical experts from CDC and WHO visit selected sites to assess capacity to conduct surveillance, as well as training and resource requirements.

The purpose of the fellowship project will be to accompany the international team of experts during sentinel site assessments, and to observe and record standard practices at selected sentinel sites during the period following the visit of the international team. The fellow will critically evaluate the consistency of data collected by the international team of experts, and will compare data from the sentinel site to national data sources for estimating the burden of IBDs and rotavirus disease in the country.
**Project title:** Assessing Quality of Information from Hospitals Participating in Sentinel Surveillance for Invasive Bacterial Diseases and Rotavirus

**Objectives:**
To assess the quality of information from hospitals participating in sentinel surveillance for vaccine-preventable, invasive bacterial diseases and rotavirus diseases in a country participating in WHO’s global New Vaccines Surveillance Network.

**Project design:**
The fellow will accompany the international team of experts, including the project mentor, during sentinel site assessments in a selected country (week 1). Under the supervision of the national Ministry of Health and WHO focal point for new vaccine surveillance, the fellow will then observe and take notes on standard practices at selected sentinel sites during the period following the visit of the international team (weeks 2–3). Activities will include observing adherence to surveillance case definitions, specimen collection and laboratory methods. With the WHO focal point, the fellow will then compare data from the sentinel site to national data sources for estimating the burden of IBDs and rotavirus disease in the country (week 4). An initial period of orientation or final period of reporting back to WHO and CDC will be scheduled depending on the fellow’s availability.
Project title: Population-Based Surveillance in Rural Thailand

Location (country): Bangkok, Sa Kaeo, and Nakhon Phanom, Thailand

Project duration: 8–12 weeks

Project availability: September – November 2012 and January – June 2013

Fellow requested:
Year: ☐ Third year ☑ Fourth year

Type: ☑ Medical student ☐ Veterinary student

Languages: English. Thai would be a bonus.

Skills:
Epidemiology, data analysis, and writing. Basic laboratory skills required for laboratory based projects. Experience in clinical infectious diseases or infectious disease epidemiology would be helpful

Student responsibilities:
The fellow will be primarily responsible for analyzing the relevant data to meet project objectives and for developing clear summaries that can be shared with IEIP staff and Ministry of Public Health (MOPH) partners. The fellow will meet regularly with mentors to develop a sound analysis plan and timeline. Before analyzing the data, the fellow will need to understand the surveillance system. To facilitate this they will visit the surveillance provinces to review surveillance procedures. This includes understanding case ascertainment, data collection and entry, and specimen collection. The fellow will spend time in the provincial and IEIP laboratories to familiarize themselves with laboratory testing procedures and appreciate the importance of integrated epidemiologic and laboratory surveillance. The fellow will also assist with and oversee collection of supplemental data for the specific analyses. They will gain experience in Thailand on clinical, laboratory, and epidemiological research, as well as exposure to the management of infectious disease in an international public health setting. An understanding of surveillance systems, study design, data collection, clinical laboratory analysis, and the challenges in coordinating a project with language and/or cultural barriers will be some of the expected knowledge areas the student will gain. Candidates should be in excellent health, have a strong work ethic, be culturally astute, and not be averse to a tropical climate. For more information on the program, interested persons are referred to our website at: http://www.cdc.gov/ncidod/global/ieip/index.htm.

Project supervisor(s):
Toni Whistler, PhD, Chief, Laboratory Section, International Emerging Infections Program, Thailand
Julia Rhodes, PhD, Senior Epidemiologist, International Emerging Infections Program, Thailand

Project description:
The International Emerging Infections Program (IEIP), part of the Thailand MOPH – U.S. CDC Collaboration (TUC) and CDC’s Global Disease Detection Program, conducts active, population-based surveillance for community-acquired pneumonia (CAP) requiring hospitalization in two rural Thai provinces, Sa Kaeo and Nakhon Phanom. Nasopharyngeal specimens are collected from a subset of pneumonia patients and tested for a panel of viral and bacterial respiratory pathogens by PCR. In 2005, a laboratory capacity-building project added bloodstream infection surveillance capabilities to both provinces, allowing identification of non-viral causes of pneumonia and sepsis through an automated blood culture system. This system has increased our knowledge of the burden and causes of CAP in Thailand and highlighted the need for more detailed understanding of the epidemiology of specific pathogens. IEIP is one of seven sites world-wide that has just begun the Pneumonia Etiology Research for Child Health (PERCH) project that aims to improve the evidence-base for pneumonia prevention and treatment in children less than 5 years of age in developing countries. We also use the surveillance and laboratory infrastructure to evaluate new diagnostic approaches to important public health pathogens, including a study to evaluate novel diagnostic approaches for Streptococcus pneumoniae, which launched in 2010. Finally, the surveillance system allows in-depth investigations of new diseases, such as pandemic influenza A (H1N1), as well as evaluation of potential interventions, such as vaccines.
Objectives:

Depending on the timing of the fellow’s arrival and professional interests, at least one of the following projects would be available for consideration:

1. Examine the antimicrobial susceptibility patterns of bacterial isolates obtained from bloodstream infections over a 7 year period in Sa Kaeo and Nakhon Phanom, Thailand.
   
   **Primary objective:** The fellow will analyze an existing dataset to describe the clinical, laboratory, and epidemiological characteristics of bacterial pathogens and their associated antimicrobial sensitivities, examining changes over time. This could be expanded to examine 1) the organisms that grew from persons reporting pre-culture antibiotic use, or those testing positive for antimicrobial serum activity, and 2) correlation of changes over time in antimicrobial susceptibility with changes in pre-culture antibiotic use. Current pathogens of interest include E. coli, Cryptococcus, Mycobacteria, and non-typhoidal Salmonella. In addition there is the possibility that the fellow may assist in the laboratory testing for anti-microbial susceptibility.

2. Expansion of molecular diagnostic testing for *Streptococcus pneumoniae*
   
   **Primary objective:** *Streptococcus pneumoniae* (pneumococcus) is a leading cause of morbidity and mortality worldwide. The prevalent pneumococcal serotypes responsible for invasive diseases vary between developing and developed countries. Thus, determination of the prevalent pneumococcal serotypes causing invasive disease in each region is crucial for the formulation of vaccines suitable for each region. Currently we have a multiplex-PCR test that identifies 23 serotypes and are expanding the assays to include a further 10 types. The fellow will be involved in assisting IEIP molecular biologists in implementing these new diagnostic assays.

In addition to these ideas, there are also potential opportunities to work with Thai Ministry of Public Health partners on analytic or field projects. We have had good success in the past tailoring projects to the fellow’s interests.

Additional overall project objectives include:

- Develop a project summary and presentation to facilitate data sharing with CDC partners in the MOPH
- Develop an understanding of the key attributes of a good surveillance system and how surveillance data are used for public health action.
- Draft a manuscript for publication in a peer-reviewed journal.

Project design:

The primary data for this project is collected through IEIP’s active, population-based surveillance systems. Bacterial and fungal pathogens are identified through surveillance for bloodstream infections, and pre-culture antibiotic usage has been collected through self-report and by antimicrobial serum disc testing.

For molecular epidemiology projects, the student will be integrated into the current laboratory projects.
**Project title:** Evaluation of Pneumococcal Conjugate Vaccine on *Streptococcus pneumoniae* and *Haemophilus influenzae* Nasopharyngeal Carriage in Healthy Children

**Location (country):** Sao Paulo, Brazil  
**Project duration:** 10–12 weeks

**Project availability:** March – May 2013

**Fellow requested:**  
Year: ☒ Third year ☒ Fourth year  
**Type:** ☒ Medical student ☐ Veterinary student

**Languages:** Portuguese (at least professional working proficiency)

**Skills:** Must be organized and able to work well on a team. Familiarity with data entry software is preferred.

**Student responsibilities:**  
Student will help to coordinate a team of study workers who will be gathering nasopharyngeal samples and epidemiologic data for children <5 years old in Sao Paulo, Brazil. Student will work closely with Dr. Cristina Brandileone, the project principal investigator at the Adolfo Lutz Institute, which is a national public health reference laboratory in Brazil. Likely activities for the student include: developing a plan for sample and data collection, training and preparing, data collection teams, accompanying and overseeing data and sample collection, ensuring quality and completeness of data, data entry, basic descriptive data analysis. Student will interact with the scientific community in Brazil through collaboration with Brazilian researchers on the project. In addition, student will have contact with Brazilian children and families through oversight of the data collection process.

**Project supervisor(s):** Jennifer Verani, MD MPH, Medical Epidemiologist, Division of Bacterial Diseases

**Project description:**  
The project is the second phase of a study aimed at measuring the impact of introduction of a 10-valent pneumococcal conjugate vaccine (PCV10) on nasopharyngeal carriage of *Streptococcus pneumoniae*. *S. pneumoniae* is an important cause of illness and death among children worldwide. Nasopharyngeal colonization is a precursor to invasive pneumococcal disease (mostly meningitis and sepsis) and pneumococcal pneumonia. Thus, one means of measuring the impact of pneumococcal vaccines is by examining colonization pre- and post-vaccine introduction. Brazil was the first country to introduce PCV10 at a national level and this study will provide important data on the vaccine impact. The study will also provide an opportunity to measure the impact of PCV10 on colonization with *Haemophilus influenzae*. Although *H. influenzae* type b (Hib) has been reduced to extremely low levels in Brazil since the introduction of the Hib vaccine, non-type b *H. influenzae* continues to cause otitis media, pneumonia and (less commonly) invasive disease. The carrier protein for PCV10 is from *H. influenzae*, and therefore it is anticipated that the vaccine will reduce *H. influenzae* carriage and disease.

**Objectives:**
1. Measure the impact of PCV10 introduction on the prevalence of colonization with vaccine-type *S. pneumoniae* and *H. influenzae* among vaccinated children (direct effect) in the municipality of São Paulo
2. Measure the impact of PCV10 introduction on the prevalence of colonization with vaccine-type *S. pneumoniae* and *H. influenzae* among non-vaccinated children (indirect effect) in the municipality of São Paulo
3. Assess antimicrobial resistance rates of *S. pneumoniae* and *H. influenzae*

**Project design:**  
The project will consist of a cross-sectional cohort of healthy vaccinated and non-vaccinated children up to 5 years old recruited from 16 immunization rooms located in the municipality of São Paulo. Data on the prevalence of colonization with vaccine-type *S. pneumoniae* and *H. influenzae* will be compared with data from a baseline survey to assess the direct and indirect impact of PCV introduction.
Project title: HIV Serosurveillance in Antenatal Clinics

Location (country): Guyana  Project duration: 6–12 Weeks

Project availability: Sep 1, 2012 – May 12, 2013

Fellow requested:
Year: ☑ Third year ☑ Fourth year Type: ☑ Medical student ☐ Veterinary student

Languages: English

Skills:
Experience with basic computing skills (MS package including MS Access), analytical software packages (EpiInfo), writing. Strong epidemiology and statistical background is preferred.

Student responsibilities:
The student’s overall responsibilities will include: working with senior staff members, Ministry of Health (MOH), National Public Health Reference Lab, and regional sentinel sites; providing training for the survey; and assisting and overseeing data collection, data entry, and specimen collection. If arriving after the field data collection has been completed, the student will be primarily responsible for: assisting senior staff members with data cleaning; disseminating the relevant data to the pertinent parties; and writing clear and concise summaries that can be shared with the senior staff and MOH partners. Throughout this process, the student must: meet regularly with mentor to develop and follow a sound analysis plan and timeline; identify the laboratory testing procedures in use; and recognize the importance of integrated epidemiology and laboratory testing. In the end, the student will have gained experience in study design, data collection, data analysis and coordinating a public health research/surveillance project. Candidates must be in excellent health with a strong work ethic; culturally astute, independent and flexible; and capable of adapting to a tropical rainforest climate.

Project supervisor(s):
Maxia Dong, MD, PhD, Medical Epidemiologist, Division of Global HIV/AIDS

Project description:
HIV surveillance data are essential to guide HIV/AIDS prevention and control program efforts, especially in the current context of scaling up to universal coverage of Prevention of Mother to Child Transmission (PMTCT) and care programs in Guyana. In Guyana, routine HIV surveillance among antenatal clinic (ANC) attendees were conducted in 2004 and 2006. The current survey will monitor trends in HIV infection over time. The other seroprevalences to be investigated are hepatitis B, hepatitis C, syphilis, chlamydia, and gonorrhea.

Objectives:
1. Assess the prevalence of HIV and syphilis infection among pregnant women (proxy of the general adult population)
2. Monitor trends in the prevalence of HIV infection over time
3. Assess the prevalence of STIs and create a baseline data
4. Provide data to assist public health decision making

Project design:
The study protocol will be developed in advance by MOH, CDC Atlanta and CDC Guyana in order to obtain appropriate human subjects and agency clearance. Primarily the sentinel sites (regional hospital laboratories) will conduct syphilis testing for pregnant women referred from ANCs located in rural and urban areas among all 10 regions except hinterland regions, 1, 8 and 9. The sampling period will last no more than 20 weeks with sampling to commence soon after the ANC survey training is conducted. A total of approximately 4000–5000 pregnant women will be included in the survey. The data will be disseminated at a stakeholders meeting, including heads of sentinel laboratories and ANCs, MOH and other ministries, NGOs and international organizations involved in HIV/AIDS programs. A surveillance report will be generated and distributed widely.
**Project title:**

Piloting the World Health Organization's Workload Indicators of Staffing Needs Survey

**Location (country):**

| Mozambique or Botswana |

**Project duration:**

8 Weeks

**Project availability:**

| Sep 1, 2012 – Dec 30, 2012 OR Spring 2013 |

**Fellow requested:**

| Year: [ ] Third year [X] Fourth year |

| Type: [X] Medical student [ ] Veterinary student |

**Languages:**

| Portuguese for Mozambique |

**Skills:**

Survey design, data collection tools, statistical software for data analysis. Ability to work in an international setting, strong communication and scientific writing, success in working with international teams, inter-cultural skills, problem solving skills, project management experience.

**Student responsibilities:**

The fellow will be invited to assist CDC Atlanta, CDC Mozambique (or CDC Botswana) country office and Ministry of Health Mozambique (Botswana) team in piloting the World Health Organization’s (WHO) Workload Indicator Staffing Needs) survey tool (WISN). The fellow will be responsible for adapting the tool to the country needs (may need translation in Portuguese for Mozambique), make field trips to regional and district hospitals to conduct the survey, analyze the data from field, making an oral presentation and writing the draft manuscript for submission to a peer-reviewed journal and developing future recommendations on the importance and feasibility of such a tool for the country. The fellow will also be responsible for coordinating and managing this project to assure timely completion of the study (e.g. coordinating visits with Ministry of Health, site visit preparations). The fellow will have the opportunity to work and experience public health issues in low-income setting. The fellow will get a week-long orientation in Atlanta before his/her departure to the country office. There will be a supervisor in the country office and a mentor from the CDC Atlanta office. The fellow will have an opportunity to learn to work in multi-agency environment and engage with CDC Atlanta, CDC –Mozambique (Botswana), Ministry of Health, WHO – Mozambique (Botswana), and provincial and district health officials. The fellow is expected to be available for 8 weeks, approximately 3–5 weeks of field work which should take place in rural Mozambique and rest of the time in CDC Mozambique Office.

**Project supervisor(s):**

| Nagesh Borse, PhD, MS, MBA, Health System Scientist, Center for Global Health |

| Patricia Riley, MPH, Team Lead, Health Systems and Human Resource Team, CDC-Atlanta |

| Amy Boore, PhD, MPH, Associate Director of Science, CDC-Mozambique |
Project title: Piloting the World Health Organization’s Workload Indicators of Staffing Needs Survey

Project description:
Mozambique is one of 57 countries in the world identified by the WHO as facing a critical shortage of health workers. In terms of disease characteristics and public health challenges, it is similar to those found all across the African region. Its health indicators, however, are lower than the average for sub-Saharan Africa and the Millennium Development Goals will be hard to achieve.

In 1998, the WHO published guidance on using the WISN to analyze staff utilization and workloads in a health care system. Many countries have applied the survey to improve the performance of their local health systems, using the WISN to establish a more balanced distribution of their human resources. The updated WISN method benefited from having been applied in many contexts.

In August of 2011, the World Bank sponsored a rural retention workshop in Maputo, Mozambique. The CDC Atlanta representative (Dr. Borse) with CDC Mozambique staff (Dr. Boore) and WHO staff discussed the potential of using WISN to quantify HRH issues in rural Mozambique. Dr. Dgedge, Director of Human Resources for Health (HRH), Ministry of health also agreed that his team could benefit from such information.

The study protocol will be developed in advance, and the fellow will assist in adapting the tool, piloting the tool in the field, analyzing the data, presenting findings from the study and writing up the final manuscript for submission in a peer-reviewed journal.

It is expected that the fellow will be present in Atlanta at the CDC Division of Global AIDS for 1 week for orientation, 1–2 weeks in Maputo CDC Mozambique office to prepare for the field work, followed by 3–5 weeks in rural Mozambique for field work, and 1 week back in Maputo to conduct data analysis, oral presentations and writing. The fellow will be asked to return to CDC Atlanta for 1–2 days to present findings.

Objectives:

1. Determine how many health workers of a particular type are required to cope with the workload of a given hospital in rural Mozambique
2. Assess the workload pressure of the health workers in that hospital in rural Mozambique

This information will quantify staffing issues in rural areas and help us understand the burn-out rate and impact of workload and work conditions on rural retention of health workers in rural areas. Finally, the fellow will be asked to make recommendations on how this tool can be used for better human resource management at the district and provincial level and how to improve the workload issues in sampled hospitals. The fellow will work closely with CDC Mozambique (Botswana), CDC Atlanta and Ministry of Health researchers.

Project design:
The study methods include adaptation of the WISN tool. The fellow will collect cross-sectional data at provincial and district hospitals by reviewing human resource data and by interviewing provincial and district level human resource management staff. Since this is a pilot study, the sampling of hospitals will be based on convenience sampling (this should also help the fellow to minimize the time and cost of travel). The fellow will be expected to use a statistical software package to analyze the data collected from the field.

Based on the fellow’s interest, additional staffing related research questions can be included such as comparing staffing/workload issues with existing district and provincial staffing plans to identify gaps.

In case we cannot find a fellow fluent in Portuguese, the same study can be carried out in Botswana in English. The CDC Botswana has already expressed interest in the study.
Project title: Population-Based Surveillance for Emerging Infectious Diseases, Kibera Informal Housing Settlement (Nairobi)

Location (country): Kenya  Project duration: 8 weeks

Project availability: TBD – will work with student to finalize timeframe. Unable to predict travel schedule for this time period.

Fellow requested:
Year: ☑ Third year ☑ Fourth year  Type: ☑ Medical student  ☐ Veterinary student

Languages: English

Skills:
Experience with basic computer programs helpful, especially those programs similar to Epi Info™ and Microsoft Access® (familiarity with statistical software like SAS would also be helpful, but is not required)

Student responsibilities:
The student will work on a special project within the population-based surveillance area. Possibilities include developing protocols for collecting, digitalizing and reading x-rays taken in the facilities; evaluating the accuracy of symptom reporting on biweekly home visits; evaluating the clinical spectrum of illness for people coming into the clinic; and implementing and evaluating the success of active case-finding for tuberculosis. In addition, the student may have the opportunity to participate in several intervention trials including pharmaceutical (e.g., vaccine clinical trials) and non-pharmaceutical (e.g., WASH projects, nutritional supplementation). The student's activities will be field-based in a rural area of Kenya. The student should be independent, flexible, and self-motivated.

Project supervisor(s):
Joel Montgomery, PhD, MS, Director, International Emerging Infections Program (IEIP), CDC-Kenya

Project description:
The incidence of important infectious disease syndromes, such as pneumonia, diarrhea, fever and jaundice, is currently being described in Kibera, which is one of the largest contiguous slums in Africa. Additional information is needed and will be crucial in helping to develop targeted intervention and prevention studies.

Objectives:
To define the burden of these infectious disease syndromes in Kibera, leading to introduction of intervention and prevention strategies that may decrease their burden.

Project design:
Household visits: Enrolled households are visited every two weeks to identify individuals who meet the case definition of the syndromes in which we are tracking. All family members in each enrolled household are administered a questionnaire using a PDA or smart phone. Anyone who is sick is encouraged to visit the field clinic and will be linked to the program for additional clinical information and sample collection.

Clinic visits: Enrolled participants are encouraged to visit the program field clinic for their illnesses. Clinic staff will provide free medical care, treatment or refer them for further follow up as needed for their illness. After receiving medical care, a short questionnaire will be conducted by clinic staff. Besides the routine laboratory tests done at the clinic, additional specimens will be taken to accurately diagnose illness.
Project title: Population-Based Surveillance for Emerging Infectious Diseases, Rural Lwak Area (Kisumu)

Location (country): Kenya  
Project duration: 8 weeks

Project availability: TBD – will work with student to finalize timeframe. Unable to predict travel schedule for this time period.

Fellow requested:
Year: ☒ Third year ☒ Fourth year  
Type: ☑ Medical student ☐ Veterinary student

Languages: English

Skills:
Experience with basic computer programs helpful, especially those programs similar to Epi Info™ and Microsoft Access® (familiarity with statistical software like SAS would also be helpful, but is not required)

Student responsibilities:
The student will work on a special project within the population-based surveillance area. Possibilities include developing protocols for collecting, digitalizing and reading x-rays taken in the facilities; evaluating the accuracy of symptom reporting on biweekly home visits; evaluating the clinical spectrum of illness for people coming into the clinic; and implementing and evaluating the success of active case-finding for tuberculosis. In addition, the student may have the opportunity to participate in several intervention trials including pharmaceutical (e.g., vaccine clinical trials) and non-pharmaceutical (e.g., WASH projects, nutritional supplementation). The student’s activities will be field-based in a rural area of Kenya. The student should be independent, flexible, and self-motivated.

Project supervisor(s):
Deron Burton, MD, JD, MPH, Medical Epidemiologist, International Emerging Infectious Program (IEIP), CDC-Kenya
Godfrey Bigogo, Deputy Branch Chief, IEIP, Kenya Medical Research Institute, Kisumu, Kenya

Project description:
The incidence of important infectious disease syndromes, such as pneumonia, diarrhea, fever and jaundice, is currently being described in Lwak. Additional information is needed and will be crucial in helping to develop targeted intervention and prevention studies.

Objectives:
To define the burden of these infectious disease syndromes in Kisumu, leading to introduction of intervention and prevention strategies that may decrease their burden.

Project design:
Household visits: Enrolled households located in rural Lwak are visited every two weeks to identify individuals who meet the case definition of the syndromes in which we are tracking. All family members in each enrolled household are administered a questionnaire using a PDA or smart phone. Anyone who is sick is encouraged to visit the field clinic and will be linked to the program for additional clinical information and sample collection.

Clinic visits: Enrolled participants living in rural Lwak are encouraged to visit the program field clinic for their illnesses. Clinic staff will provide free medical care, treatment or refer them for further follow up as needed for their illness. After receiving medical care, a short questionnaire will be conducted by Lwak clinic staff. Besides the routine laboratory tests done at the clinic, additional specimens will be taken to accurately diagnose illness.
Project title: Quality Assessment of the Implementation of an Impact Evaluation of the National PMTCT Programs at Population Level Using a Facility-Based Approach

Location (country): Zimbabwe  Project duration: 10–12 weeks

Project availability: September 1, 2012 – June 30, 2013

Fellow requested:
Year: ☒ Third year ☒ Fourth year Type: ☒ Medical student ☐ Veterinary student

Languages: English

Skills: Project management, basic computer skills, written and oral communication, attention to detail

Student responsibilities
The student's primary task will be an assessment of quality of implementation of a complex, multisite study on the ground. This will involve developing an evaluation plan, getting input from study partners, conducting field evaluations, including extensive site visits around the country, drafting a report of findings, including recommendations for improving study implementation quality, and presenting findings and recommendations to study partners, which includes the Ministry of Health, University of Zimbabwe, UNICEF, EGPAF, and others. The student will have extensive interactions with multiple types of people from front-line health care workers in public clinics in peripheral areas to high-level leaders in the Ministry of Health and international organizations.

Project supervisor(s) (name, degrees, title, e-mail):
Peter Kilmarx, MD, Country Director, CDC/Zimbabwe
Thu-Ha Dinh, MD, MS, Medical Epidemiologist, Prevention of Mother-to-Child Transmission of HIV (PMTCT) Team, Global AIDS Program, CDC-Atlanta

Project description:
The overall project is a high-priority evaluation of the Zimbabwe national program for prevention of mother-to-child transmission of HIV. This study will be initiated in 2012 with an 18-month follow-up period. The student's project will be to assess the quality of study implementation likely including field observations, key informant interviews, and reviews of data and laboratory systems. There will be strong oversight from CDC staff and a significant degree of autonomy requiring a high level of judgment and tact.

Objectives:
Primary objective: Assess the impact of the national PMTCT intervention on HIV-free survival at 18 months of age.
Secondary objectives, assess:
- HIV acquisition during pregnancy
- PMTCT missed opportunities – PMTCT cascade
- Feeding practices
- Adherence to antiretroviral medicines
- Linkage between PMTCT services and care/treatment

Project design:
Baseline assessment:
- Design: A retrospective cross-sectional survey
- Location: primary health care centers where infants are vaccinated
- Duration: ~4–5 weeks at each facility
Follow-up assessment
- Design: A closed prospective cohort until 18 months
- Survey follow-up visit: 6 – 9 – 12 and 18 months
- Location: primary health care centers where HIV-exposed infant receiving nevirapine and cotrimoxazole
### Project title:
Selection of Patient Specimens for Pathogen Detection/Discovery from Outbreak of Infectious Disease Occurring in East Africa from 2007–2011

<table>
<thead>
<tr>
<th>Location (country):</th>
<th>Kenya</th>
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<tr>
<td>Project duration:</td>
<td>8 weeks</td>
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**Project availability:** TBD - will work with student to finalize timeframe. Unable to predict travel schedule for this time period

**Fellow requested:**
- Year: ☑ Third year  ☑ Fourth year
- Type: ☑ Medical student  ☐ Veterinary student

**Languages:** English

**Skills:**
Experience with basic computer programs helpful, especially those programs similar to Epi Info™ and Microsoft Access® and Freezerworks (familiarity with statistical software like SAS would also be helpful, but is not required)

**Student responsibilities:**
The student will analyze data on outbreaks of infectious disease investigated by GDD Kenya from 2007 to present. The purpose of this analysis will be to identify specimens from cases with no etiologic agent identified for subsequent pathogen discovery work. The student will identify all outbreaks during the period and attempt to identify a subset of archived specimens that are appropriate for additional investigation. This will require review of patient data as well as laboratory results and specimen archiving.

**Project supervisor(s):**
Barry Fields, PhD, Director, Diagnostics and Laboratory Systems Program (DLSP), CDC-Kenya

**Project description:**
DLSP laboratories have the capacity to perform state of the art multiple pathogen assays deep sequencing and pathogen discovery both independently and with international collaborators. Identification of appropriate specimens from freezer archives is the most critical step in conducting these studies. Successful identification of candidate specimens for follow up investigation is essential for efficient use of these novel diagnostics assays.

**Objectives:**
To identify a subset of outbreak specimens represently the most likely candidates for successful pathogen detection/discovery.

**Project design:**
Identify relevant outbreak by reviewing existing data files. Characterize these datafiles and develop a common accession system. Within each outbreak file, review data to identify cases representative of the suspect syndrome, and specifically those with no etiologic agent identified. Review archived specimens (NP/OP, blood clot, sera, stool) to identify available specimens adequate for subsequent molecular testing. Develop a database/spreadsheet containing these specimens and relevant patient data for future use.
**Project title:** Populations Exposed to Bats in Guatemala and Associated Vampire Bat Rabies Epizootiology

**Location (country):** Guatemala  
**Project duration:** 6 weeks

**Fellow requested:**  
**Year:** ☒ Third year ☐ Fourth year  
**Type:** ☐ Medical student ☒ Veterinary student

**Project availability:** TBD – will work with student to finalize timeframe. Unable to predict travel schedule for this time period.

**Languages:**  
English and Spanish

**Skills:**  
- Familiarity with descriptive statistics and database creation  
- Basic computer skills and familiarity working with spreadsheets and datasets  
- Familiarity with survey design and public health surveillance  
- History of adequate pre-exposure rabies vaccination

**Student responsibilities:**  
- In coordination with local partners the fellow will compile data available on rabies outbreaks in humans and animals that may be recorded in the national surveillance system and other similar sources  
- In addition, the fellow will participate in a community assessment survey in the field and build upon a preliminary database for epizootiological analysis  
- Compile data and write a descriptive report

**Project supervisor(s):**  
Sergio Recuenco, MD, DrPH, MPH, Division of High-Consequence Pathogens and Pathology, Poxvirus and Rabies Branch
Project title: Populations Exposed to Bats in Guatemala and Associated Vampire Bat Rabies Epizootiology

Project description:
Vampire bat rabies is enzootic in Latin America. Human outbreaks due to vampire bat rabies are not rare in Latin America, especially in the Amazon Basin. Evidence of vampire bat rabies is expressed in the frequent bovine rabies outbreaks in Mexico, Central America, and South America. Surveillance for rabies is less than ideal in Central America, and encephalitis deaths in the region are not always properly diagnosed. Recent research of our group in several rural villages of Guatemala identified frequency of bat-human contacts similar to other areas of rural Latin America. Sampling of local bats in those areas provided evidence for Bartonella spp. strains not previously identified, increasing the interest for understanding the real health risks from human-bat contacts. Because vampire bats, such as Desmodus rotundus (only present in Latin America), are species that specifically feed on blood, when rabid they act as vectors transmitting the rabies virus through bites. Vampire bat rabies outbreaks are important indicators of both rabies circulation and increased contact of vampire bats with humans and animals. Preventing rabies and other potential infections transmitted by vampire bats requires a good knowledge of the spatial distribution of the problem and targeted interventions that are adequate for this specific type of rabies. House modification to avoid entry of bats is one example of such strategies. Also, the rabies prophylaxis strategies used for vampire bat rabies can be different than the ones used for canine rabies. Proper monitoring of the vampire bat rabies enzootic is necessary, but resources need to be properly targeted to areas that require this type of rabies.

This project has two primary components: one is to compile information on vampire bat rabies occurrence and synthesize existing descriptive reports; a second part relates to participation in a field survey in communities exposed to bats.

Guatemala is an area of interest for vampire bats rabies, however, the presence of canine rabies cases overlap with areas of reports of bovine rabies and the definition of areas that may be of higher risk for vampire bat rabies occurrence is unclear. Improving our spatial/temporal understanding of rabies epidemiology in Guatemala is important to develop more efficient prevention and control interventions targeted to priority areas. Maps will be elaborated to represent identified risk areas, and location of known outbreaks. If data obtained merits additional spatial analyses will be performed to evaluate risk with spatial epidemiology methods.

The field survey for a community will include the administration of a questionnaire, blood sampling from participants, and sampling of bats in the area of the survey. Bats captured will be sampled for rabies testing and for other disease.

Objectives:
1. Evaluate potential risks of occurrence of vampire bat rabies in Guatemala based upon disparate epidemiological records
2. Obtain information on community knowledge, attitudes and practices (KAP) regarding bats and rabies in rural areas of Guatemala

Project design:
This is intended as a descriptive epidemiological study and community KAP survey meant to build upon historical information and prior work conducted in the country, based in part upon similar work designed for bat workers in Thailand (Robertson K et al. Rabies-related knowledge and practices among persons at risk of bat exposures in Thailand. PLoS Negl Trop Dis.2011;5:e1054) and risk modeling of raccoon rabies in the USA (Recuenco S et al. A spatial model to forecast raccoon rabies emergence. Vector Borne Zoonotic Dis. 2011 Epub Oct 13).