

## Integrating Scholarship, Service, and Global Perspectives: Biology Study Abroad on Andros Island, Bahamas

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### Author Biography

Dr. Lauren B. King joined the faculty at Columbus State University in 2014 and is currently an Associate Professor of biology specializing in microbiology and immunology. She regularly teaches courses at both the graduate and undergraduate levels including General Biology, Microbiology for the Health Sciences, Microbial Pathogenesis, and Immunology. She is also highly involved with undergraduate and graduate student research focusing primarily on bacterial pathogens' interaction with the innate immune system and novel therapeutic approaches in multi-drug resistant pathogens.

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### Context

A teaching challenge in STEM fields can be engaging students in a way that demonstrates real-world applicability of the curriculum. Furthermore, some of the more medically-relevant subdisciplines are often limited in their ability to utilize high-impact practices like study abroad and service-learning (Kuh, 2008) due to patient privacy, safety, and limited opportunities for patient interaction. I have developed a course entitled “Contemporary Health Issues of Andros Island” as a medically-focused version of a long-standing study abroad course that travels to Andros Island, Bahamas. In this class, students travel abroad one week over spring break and are given the opportunity to experience human and veterinary medical care in an international context as well as contributing to both through service projects.

### Goals

The goals I set for this class are common to many of my classes: I aim to engage students with course material in a meaningful way that not only results in the mastery of set learning outcomes, but promotes passion, excitement, and a sense of personal ownership of the insights, discoveries, and achievements that come about during the course. I aim to give students baseline knowledge of and hands-on experience with human and animal medicine as global concerns by addressing the following mini-goals:

- 1) To engage students with curriculum centered on human and animal health and disease, including basic microbiology, infectious disease, immunology, and vaccination;
- 2) To guide students in the design and deployment of research projects relevant to health and disease on Andros Island by collecting either quantitative or qualitative data both pre-departure and while abroad;
- 3) To engage students with service-learning pre-departure and during their time abroad.



## Description

With a total landmass of 2,300 square miles, Andros Island is the largest island in the Bahamas, but it is rural and largely underdeveloped with a total population of fewer than 8,000 counted in the last census (The Government of the Bahamas Department of Statistics, 2010). Access to healthcare is limited, with nine clinics and no hospitals on the island. Patients with serious health problems or injuries and pregnant women nearing their delivery date are flown to nearby New Providence to obtain medical attention.

Veterinary medicine is an even greater challenge, as there is currently no veterinarian on Andros despite a large population of indigenous dogs and other companion animals. These dogs are “loosely” owned, but a large number receive very little care. Furthermore, in 2014 an outbreak of distemper killed a large number of the dogs on Andros due to their limited access to vaccination. Each year, Columbus State University partners with animal rescue organization Potcakes of Andros to bring in a veterinarian to run a two-day spay/neuter clinic as a part of this course. Students are the primary labor for this clinic and work closely with the veterinarian to provide care for animals before, during, and following surgical procedures. Students observe surgeries and often develop research projects directly related to animal health, including quantifying internal and external parasites, testing for diseases like heartworms and ehrlichiosis, and characterizing how field surgery and anesthesia approaches differ from the U.S.

## Structure

- Pre-departure
  - Students engage in class discussions that cover microbiology, infectious disease, immunology, and vaccines;
  - Students design small group research projects relevant to health and disease on Andros Island that involve collecting either quantitative or qualitative data before departure and while abroad;
  - Students gather needed supplies to donate to the medical clinics on Andros Island;
  - Students raise funds and gather donations for the spay/neuter clinic to be offered while abroad.
- While Abroad
  - Students participate in a two-day spay/neuter clinic for the people and companion animals of Andros Island;
  - Students conduct research on their pre-chosen topic as a small group and collaborate with other groups when appropriate and/or necessary;
  - Students visit medical clinics on Andros Island to observe healthcare, approaches to infectious diseases, and vaccination practices, and interview community members and medical staff.
- Post-trip
  - Students analyze data collected and present their findings in the form of an oral presentation and optional dissemination at a local conference.

## Reflection

Over the three years that this course has run, students have raised over \$3,000 to sponsor the spay/neuter clinic on Andros, collected over \$25,000 worth of donated flea/tick preventative and canine vaccines, and collected medical donations for the clinics on Andros, including blood glucose meters and blood pressure monitors. Furthermore, this initiative has spayed/neutered and vaccinated over 80 animals on Andros Island, dramatically decreasing the number of stray dogs in the community and their susceptibility to disease. Due to the lack of access to veterinary care, these surgical procedures, opportunities for vaccination, and distribution of donated flea/tick prophylaxis are truly impactful in the lives of the people and animals that live there. Learning outcomes are assessed by examination and students demonstrate proficiency in the areas stated in mini-goal #1 as well as area D learning outcomes. Student research projects are completed

upon return, presented to their peers and professors, and often presented at our University's undergraduate research conference.

Student evaluations from this course have been consistently positive over the three years that I have offered it, with a mean of 5 (5 being highest) on all evaluation scores. Student comments also offer some insight into the perceived benefit and impact:

*"I loved almost everything about this course. From learning about Andros in class to actually on the island [sic], the entire experience was educational, enlightening, and made for an amazing semester. . .My favorite part of the trip besides the people was getting to participate in the spay and neuter clinic."*

*"The trip was a life-changing experience and I really wish I could go again!"*



## Conclusion

This course provides a unique opportunity to utilize several high-impact practices, including international education, service-learning, and undergraduate research. By involving students early in planning for the trip, they are given a sense of autonomy and ownership over their achievements in both service and research projects. When combined with the extraordinary experience of interacting with and providing a service to the international community, this makes for a life-changing experience that reaches far beyond the simple learning outcomes that we typically assess.

## References

2010 Census Data Retrieved from: <https://www.bahamas.gov.bs/statistics>

Kuh, G. D. (2008). High-impact educational practices: What they are, who has access to them, and why they matter. Washington, DC: Association of American Colleges and Universities.