



## Program Overview

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*Sharing the expertise of a world-class university with our partners in Botswana to build capacity and excellence in clinical care, education, and research.*

The University of Pennsylvania (Penn) has worked in Botswana since 2001 and currently employs approximately 80 full-time staff in country working under the name the Botswana-UPenn Partnership. The Botswana-UPenn Partnership works with the Government of Botswana Ministry of Health (MOH) and the University of Botswana (UB) to build capacity in Botswana in response to the HIV/AIDS epidemic. Penn is taking a broad interdisciplinary approach to train health-care personnel throughout Botswana in the treatment of HIV/AIDS and its complications, to help develop post-graduate training programs at the University of Botswana with an emphasis on Internal Medicine and its subspecialties, to offer experience in global health to Penn trainees, and to develop joint research programs that address issues relevant to the health and welfare of the citizens of Botswana.

### History of Penn's Involvement

Penn was originally invited by ACHAP (African Comprehensive AIDS Partnership, the Bill and Melinda Gates Foundation, the Merck Foundation, and the Government of Botswana) in 2001 to train health care workers on the management of HIV-infected patients in Botswana, a country that at that time had the highest HIV prevalence rate worldwide. The mission of the Botswana-UPenn Partnership (BUP) today is to serve as technical advisers for clinical care and education, and build research collaborations with key stakeholders in Botswana.

### Background on Botswana

The landlocked Botswana located in Southern Africa and approximately the size of France, has a widely dispersed population of 2 million people. Botswana is a middle-income country, with English as an official language, a long history of good governance and democratically elected leadership, and the highest ranking of African nations by Transparency International. Botswana also currently has the 2nd highest HIV prevalence rate in the world and, like many African nations, a shortage of trained physicians. Botswana has both a national healthcare and education system that has been primarily funded by the nation's significant diamond wealth.

### Partnership Governance

The Botswana-UPenn Partnership established good formal working relationships through Memoranda of Agreements with the Ministry of Health (2004) and the University of Botswana (2006) for joint projects aimed at improving health and healthcare education in Botswana. Country-based staff and leadership help campus-based leaders fine-tune

plans to fit local needs and navigate local requirements. The University of Pennsylvania registered in Botswana as an external company in 2010 and will soon begin the process of registering as a local non-governmental organization.

### **Current Programs & Initiatives: Clinical**

With primary funding from PEPFAR (President's Emergency Plan for AIDS Relief), the BUP serves as technical advisors for four major clinical areas: HIV Care & Support, Adult & Pediatric TB, Women's Health, and Telemedicine.

#### HIV Care & Support Program

The HIV Care & support is the oldest Botswana-UPenn Program, started in 2003, to provide technical support for the national rollout of antiretroviral therapy treatment for HIV infected citizens. The current goal of the program is to improve the quality of care received by HIV-positive individuals with co-morbid conditions and complications of chronic disease. The three program areas of focus include:

- Providing postgraduate medical education to local healthcare workers
- Providing physician outreach to district hospitals for continuing medical education (in-service training)
- Assisting with the development of national health policy

#### TB – Adult and Pediatric

Tuberculosis is a common co-infection among HIV/AIDS patients in Botswana and is one of the leading causes of death there. The Botswana-UPenn Partnership TB program includes the following:

- Providing expert clinical care for complicated TB/HIV cases, including drug-resistant TB (DR-TB)
- Providing outreach services to medical providers caring for patients with TB/HIV and DR-TB
- Providing clinical training and mentoring for clinicians involved in the management of TB/HIV and DR-TB
- Supporting the University of Botswana in undergraduate and post-graduate medical education
- Providing technical assistance to the Ministry of Health on issues related to TB/HIV and DR-TB

#### Women's Health: Cervical Cancer Screening & Treatment

The BUP Women's Health Program was established in 2009 and is led by BUP Country Director, Doreen Ramogola-Masire, MD. The first program was a pilot project to screen and treat pre-cervical cancer lesions using the "See & Treat" approach for cervical cancer prevention service. Current projects include:

- Providing cervical cancer prevention services for HIV-infected women using visual inspection after acetic acid (VIA) with enhanced digital imaging (EDI)
- Providing treatment of precancerous cervical lesions using cryotherapy provided by nurses and loop electrical excision procedure (LEEP) provided by specialists, when necessary

- Providing technical assistance to the Ministry of Health for other women's health issues including advising on national HIV issues, and maternal mortality issues in Botswana
- Providing technical assistance to the University of Botswana's new school of medicine in teaching undergraduates and training postgraduates

### Telemedicine

Carrie Kovarik, MD, launched the BUP teledermatology program in 2007 which has expanded into a broad telemedicine program that seeks to circumnavigate the challenging landline IT infrastructure in the region and a severe shortage of healthcare workers (particularly specialists) by using cell phone equipped with digital cameras and other electronic tools for to transmit health information for education, diagnosis, and eventual treatment. Current efforts include:

- Organizing and hosting a national Health Informatics Conference with local partners
- Providing support to the MOH for a national informatics strategy and in-service training
- Providing curriculum integrations and development to schools at UB
- Providing support to a live robotic telepathology system whereby a motorized microscope in Gaborone is used to remotely read and assess pathology slides by off-site technicians.
- Providing access to specialty care with mobile oral telemedicine, mobile cervical cancer screening, mobile teledermatology, and mobile teleradiology
- Providing access to medical resources including national treatment guidelines using an SMS query system and mobile telementoring

### **Current Programs & Initiatives: Educational**

The Partnership has two main medical initiatives, one directed at medical students and trainees in Botswana and the other for students and trainees at Penn. The first program is a collaboration with UB School of Medicine, and the Harvard School of Public Health, under MEPI (Medical Education Partnership Initiative) to strengthen medical education in Botswana. The second program provides global experiences for Penn students and trainees in Botswana and includes providing global health experiences for students from Penn's Schools of Dental Medicine, Medicine, Nursing, and Veterinary Medicine. The program also provides global health experiences for Penn residents and trainees in medicine, OB/GYN, surgery and other programs; pediatric residents from CHOP, plus dermatology residents from Penn and elsewhere to rotate to Botswana. Undergraduate and graduate students from other Penn schools work in summer internship positions in Botswana.

### **Current Programs & Initiatives: Research**

The BUP has 5 major National Institutes of Health (NIH) grants plus funding for many pilot projects funded by the Penn Center for AIDS Research and others. BUP-affiliated researchers in Botswana and at Penn have co-authored more than 85 scientific articles to date.

## Measuring the Impact

In 2011, the Partnership had 177 people participate in some part of the Botswana-UPenn Partnership. This included 19 Penn faculty members and researchers (from assorted schools), 5 Penn & CHOP Staff, 4 Penn & CHOP Fellows, and 29 Penn Medicine Residents. There were 89 Penn students including 2 Doris Duke Charitable Research Foundation Medical Student Fellows, 6 Penn Dental Students, 33 Penn Medicine Students, 12 Penn Nursing Students, 14 Penn Summer Interns, 1 Penn Law, and 21 Wharton Undergrads as part of WIP (Wharton International Programs).

In 2012 there were 151 people who traveled to Botswana to work on assorted Botswana-UPenn Partnership activities, 164 people in 2009, and 109 in 2008. In the eleven years that Penn has been working in Botswana, approximately 1200 Penn faculty, and students have traveled to Botswana to work in a Partnership program.

Below we summarize key aspects of the Partnership clinical program this past year. In all of the activities Penn providers work closely with local health care workers in an effort to build capacity in country.

Human resources provided by Penn:

- Number of medical specialists (Internists, Infectious Disease sub-specialists, Pediatricians, Combined Medicine/Pediatrics) working as clinicians in Botswana: 10 full time in past year
- Number of medical residents working on the wards of the major teaching hospital for 5 week rotations: 12 in past year
- Number of senior (4th) year medical students working on the wards of the major teaching hospital or a district hospital for 7 week rotations: 24 in past year

Inpatient clinical care:

- One or more of the Penn Specialists round on the Internal Medicine ward of the teaching hospital 12 months annually
- One or more of the Penn Specialists round on the Pediatric ward of the teaching hospital 12 months annually

Outpatient clinical care provided by Penn Specialists working in Partnership with MOH and UB:

- Number of HIV patients screened for cervical cancer in past year: 1200
- Number of HIV patients treated in past year: 750
- Number of adult HIV/TB patients treated in past year: 900
- Number of pediatric TB patients treated in past year: 100