

On the Frontline: BHP Contributes to COVID-19 PCR Testing



BHP Laboratory Scientists

Pursuant to the Memoranda of Agreement for SARS-CoV-2/COVID-19 testing between the Ministry of Health and Wellness (MOHW) and the Botswana Harvard AIDS Institute Partnership (BHP), as at 16th August 2021, of the 1,599,459 SARS-CoV-2 tests undertaken in Botswana, the BHP had done 514 000 polymerase chain reaction (PCR) tests.

Clinical Laboratory Manager, Comfort Maphorisa has noted that at the beginning of the testing initiative, BHP had capacity for 800 samples per eight-hour shift which has since been expanded to two shifts, increasing

capacity to about 1500 samples a day in response to increased demands for testing from outbreaks within the greater Gaborone Health Management Team (DHMT) area and border samples.

Due to the worsening COVID-19 pandemic and increasing sample testing volumes, facilitated by the Ministry of Health and Wellness, National Health Laboratory (NHL) and the Presidential Task Force on COVID-19, BHP received major extraction and detection equipment to meet the testing demand.

Cosequently, BHP has since also more than doubled its staff dedicated to the testing. In addition, BHP has provided capacity building technical expertise to other collaborating laboratories on SARS-CoV-2 molecular testing. Botswana has used lessons learnt from establishing the first two testing sites in Gaborone to decentralize testing to multiple sites including Maun, Francistown, Palapye, Kasane, Shakawe and Mamuno. BHP continues to play a collaborative role in various areas to support the expansion national capacity.



Laboratory Scientist, Bonolo Molefe busy at the Amplification and Detection Section

“BHP worked with other local scientists to introduce and evaluate technologies,” explained Maphorisa. He affirmed that BHP has worked with other labs to optimize the following CoV-2 real-time RT-PCR assays;

- PANDAA qDXTM SARS-CoV-2 (Procured by BHP)
- IDT/CDC kit (Procured by BHP)
- Da An Gene SARS-CoV-2 kit (Procured by MOHW)
- BGI Real-time Fluorescent RT-PCR kit (Procured by MOHW)
- FMT Real-time Fluorescent RT-PCR kit (Procured by MOHW)
- Abbott SARS-COV-2 assay (Procured by MOHW)
- Xpert SARS-COV-2 Assay (Equipment procured by BHP and reagents by MOHW).

“Furthermore, we have successfully developed capacity to do sequencing of SARS-COV-2 using the Next Generation Sequencing technology and as a result, BHP has generated over 95% of the whole genome sequences in Botswana. We have also successfully validated and put in use the Rapid Antigen SARS-COV-2 assays and contributed to the development of guidelines. This assay was widely used for testing at some point when the PCR reagents were in short supply and we are at an advanced stage of verification of ELISA antibody assays,” he said.

While BHP continues to successfully carry out its obligation under the agreement with MOHW and NHL for SARS-CoV-2 testing, it has not been without challenges. Initially, delays in adding capacity resulted in very long hours for staffing, which risks staff exhaustion.

This has been resolved by the addition of new staff as requested in the budget, Maphorisa has said. He says there is a challenge with equipment service as most of the Engineers come from South Africa and there are travel restrictions and high demand for their services.

Maphorisa also noted occasional shortages of basic items such as reagents and consumables, which were subsequently resolved with large purchases from Manufacturers by the MOHW and Presidential Task Force. Another challenge is the availability of transport for staff working on night shifts.



LineGene Amplification & Detection Machines



MGISP Extraction Machine

BHP a Critical Player in Botswana's Fight Against COVID-19



BHP Clinical Laboratory Manager-Comfort Maphorisa

Consequent upon the COVID-19 pandemic, the Botswana Harvard AIDS Institute Partnership (BHP) has collaborated with the National Health Laboratory through Ministry of Health and Wellness (MOHW) to participate in adding capacity to the national effort of SARS-CoV-2 testing.

This was facilitated through an addendum to the Collaborative Memorandum of Agreement (MOA) between the Government of the Republic of Botswana represented by MOHW, BHP and President and Fellow of Harvard University acting through The Harvard T.H. Chan School of Public Health (HSPH).

The initial agreement was for a period of three months from 1st April to 30th June 2020. However, due to the protracted pandemic this was followed by a series of agreements, the second one being 1st July to 30th September 2020, third, 1st October 2020 to 31st March

2021 and currently the fourth, from 1st April 2021 to 31st March 2022. The testing is being conducted at the Botswana Harvard HIV Reference Laboratory (BHHRL) in collaboration with the National Health Laboratory.

BHP's Clinical Laboratory Manager, Nyaladzi Comfort Maphorisa explained's BHP's role and execution of tasks as set out in the MOA consistent with the scope of works as follows;

"BHP facilitated urgent purchasing of supplies which included swabs, viral transport media and ancillary testing supplies requested by MOHW, as part of the COVID-19 testing," said Maphorisa.

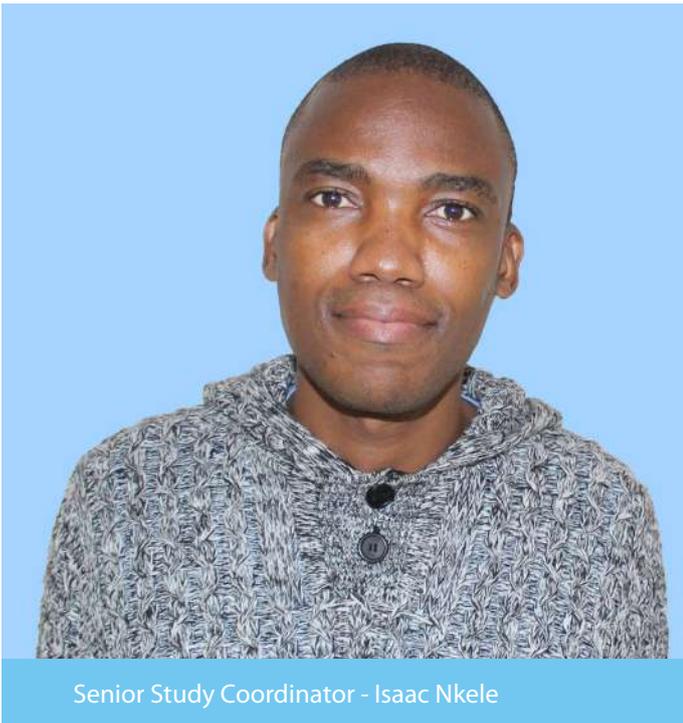
He further underscored that BHP as an International Air Transport Association (IATA) compliant institution, facilitated the handling and transportation of urgent samples to South Africa for testing and external quality assurance before full capacity for testing was developed locally.

"The BHP received specimens for SARS-CoV-2 testing consistent with BHHRL processes and procedures, and following recommended international protocols and guidelines," explained Maphorisa.

BHP has contributed seven Fulltime Equivalents (FTEs) staff to BHHRL's testing efforts for the various stages and platforms of testing. MOHW has on the other hand seconded 17 additional staff members being three Laboratory Scientists, three Laboratory Assistants and 11 Data Clerks to work on COVID-19 testing.

The team works under the direct supervision of Laboratory Managers, Nyaladzi Maphorisa (Clinical) and Terence Mohammed (Operations) together with Quality Assurance Manager, Tshenolo Ntsipe. The testing is conducted under the oversight of two virologists, Dr Sikhulile Moyo (BHP Laboratory Director) and Dr Simani Gaseitsiwe (BHP Research Associate).

ISAAC NKELE: Selfless service in the eye of the COVID-19 storm



Senior Study Coordinator - Isaac Nkele

This Month's Spotlight shines on Isaac Nkele, who has led and provided selfless COVID-19 testing within BHP. The quiet yet confident and soft-spoken Nkele has been on the forefront of SARS-CoV-2 sample collection for PCR testing since the inception of a BHP COVID-19 committee and building of BHP capacity for SARS-CoV-2 testing. Despite his busy work schedule and portfolio commitment, Nkele, a Senior Study Coordinator for BHP Malignancy studies, has been selfless in leading the dreaded COVID-19 PCR swabbing.

Nkele is also the Deputy Coordinator for the BHP COVID-19 Committee and Coordinator for Botswana Oncology Global Outreach (BOTSOGO) Tumor Board which discusses management and best practice for the treatment of various cancers through an interactive platform with participating Oncology experts from Boston and Harvard Medical School affiliated institutions in the United States of America.

"I remember very well when Dr Mmalane (BHP Deputy CEO) announced that there will an opportunity for people who want to volunteer to do COVID-19 swabbing,

I took it as a great opportunity. Swabbing at the time had been something dedicated to medical doctors and since I have passion to study medicine, for me it was a golden opportunity," said Nkele who has been admitted to study for Bachelor of Medicine and Bachelor of Surgery (MBBS) at Eden University in Zambia starting November 2021.

"We had our training, and from there we were given a task to swab the Princess Marina patients and staff. I would use my free time to be in the wards, and many times I would sacrifice my lunch time to help the people up until today," he adds. He would later mentor other people including clinicians and research assistants who are doing COVID-19 testing.

Nkele would soon begin to enjoy swabbing and would sacrifice his weekends to do COVID-19 swabbing in the wards, and out-patient department for both patients and staff. The 'joy' for swabbing did not last for long as early on the job, the lanky fellow tested positive for COVID-19. While in isolation, he prayed for speedy recovery so that he could go back to continue his part in the fight against the pandemic.

Nkele, a staunch Christian, believes his Christian principles and his passion for medicine are his greatest drive to be always willing to help people even when he is swamped with coordinating the research studies he leads. The main challenge for Nkele is time allocation, as he has to strike a balance between the research duties and COVID-19 swabbing.

"I get numerous calls from patients following their results, at the same time people would call me and share some complimentary messages. One would say we heard you are good in COVID-19 swabbing, please come and assist us and for the love of the job I would go all the way to help. Mind you, don't forget that this is an absolutely free service and I use my own airtime to call the patients but what brings me satisfaction is helping people and the sole goal of becoming a Medical Doctor one day," narrated Nkele, cautious not to sound conceited.

Morena Nkele, as he is affectionately called at BHP, would be busy and say "Sorry Morena, I cannot help right now....." And yet still go ahead to assist you.

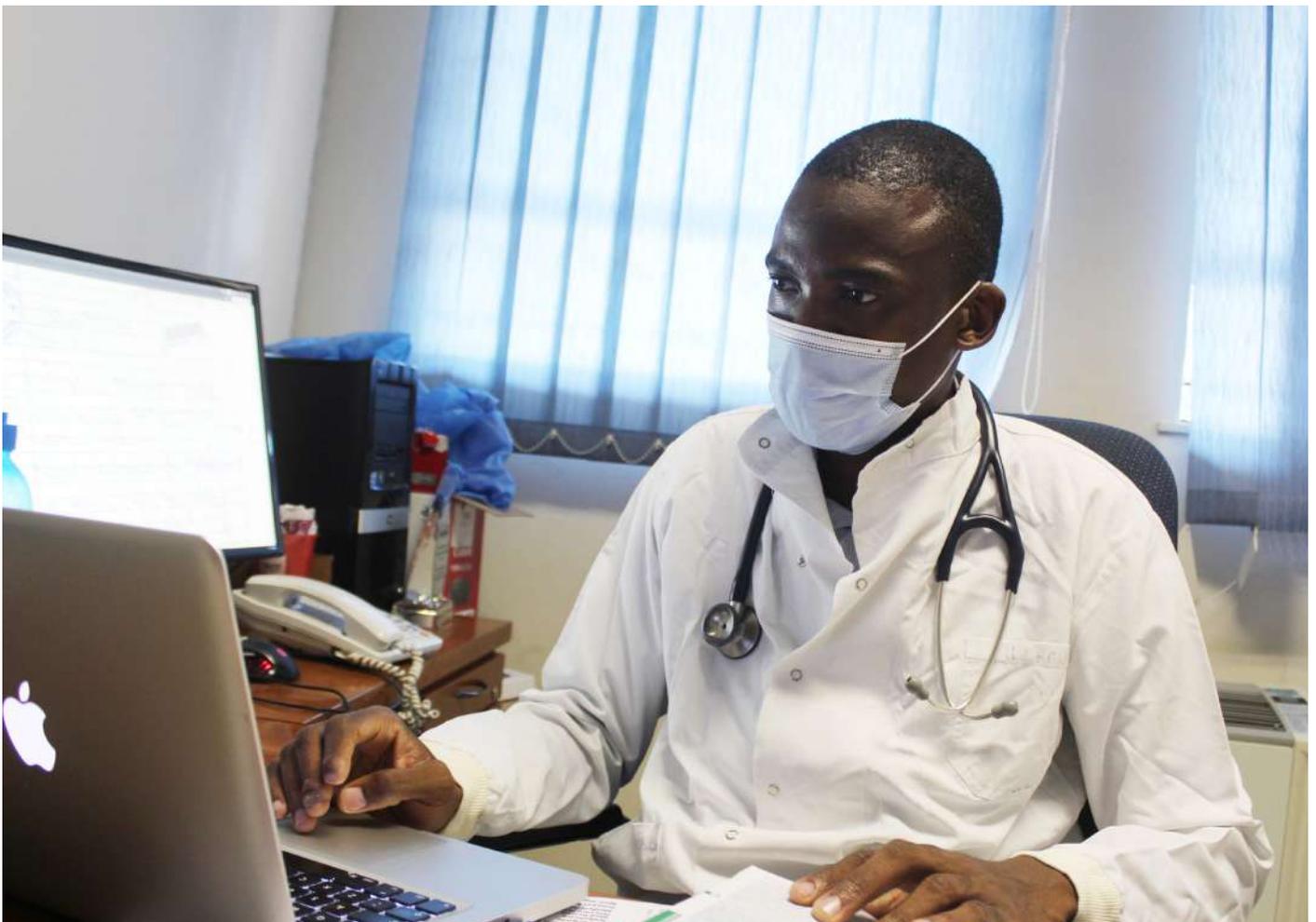
"I have to do COVID-19 testing and at the same time push my research mandate, my desire is to do both at the same time, but when I have to tell someone to come and test later, I would feel so hurt as though I had neglected them," he said.

A very courteous man, Nkele would greet you as "**Morena**" meaning Lord in English, a term synonymous with the disciplined forces in Botswana referring to their seniors and colleagues. Sometimes his "**Morena**" would

be coupled with a little salute, conceivably an indication of the amount of grooming Nkele received when he was still a "Man in Uniform".

Morena Nkele is a former Police Officer and former Prison Warder. He also worked as a Facility Manager at Hukunsi District Health Management Team (DHMT) and as a Nursing Officer at Mahalapye Clinic where he was the Focal person for Tuberculosis Case Management.

He holds a Bachelor of Nursing Sciences (Nelson Mandela Metropolitan University), Certificate in Policing (Botswana Police College) and Certificate in Prisons Cadette Course (Botswana Prisons College).



Isaac Nkele will be starting his Medical Degree at Eden University in Zambia starting in November 2021

BHP Staff heed call to take COVID-19 Vaccine



Tlhaloganyo Rankgabo



Ikanyeng Rulaganyang



Unoda Shadreck

With Social Media awash with COVID-19 vaccine misinformation, convincing people to take the job was always going to be a tough task. At Botswana Harvard AIDS Institute Partnership (BHP) however, staff has heeded the call to take the life saving shot on the arm. As at August 18, 2021, at least 221 employees out of 285 (250 BHP staff and 35 consultants) had taken their first dose of the vaccine, with 137 already fully vaccinated. Botswana has vaccinated a total of 246, 501 people with 161,522 of them fully vaccinated as of August 13, 2021.

BHP staff has benefited from the Government's COVID-19 Vaccination Rollout Plan which prioritized health workers in its phase one. They have taken their inoculations at Princess Marina Hospital where BHP is based. Employees working outside Gaborone took their injections at vaccination stations in their respective areas under the same arrangement.

BHP Deputy Chief Executive Officer, Dr Mompoti Mmalane is at the forefront of the COVID-19 Vaccination campaign. Apart from regularly informing staff of progress of the vaccination campaign, a journal club presentation on COVID-19 vaccines was conducted,

mainly to address vaccination hesitancy. Dr Mmalane was the first BHP staff who was vaccinated not only to protect himself but also as a way of encouraging staff to follow the lead and get inoculated.

"I intentionally decided, as a representative of the leadership, to be the first to go for vaccination so that the staff could gain comfort that if their leaders do take the vaccine, it must be a good thing and thus consider it for themselves," says Dr Mmalane.

The Deputy CEO underscores that BHP as the employer has the responsibility for the wellbeing of employees, which include ensuring safety in the workplace. BHP continues to hold safety and health awareness of staff through health talks, health screening, and institution of appropriate safety protocols and guidelines.

"With regards to COVID-19 vaccination the employer needs to educate staff on benefits and adverse effects of the vaccine as well as the risk of not being vaccinated. It is the responsibility of the employer to guide staff on where they can receive the vaccine," emphasizes Dr Mmalane.

Dr Mmalane contends that the hesitancy to take the vaccine among other issues was caused in part due to some rare side-effects experienced with the AstraZeneca vaccine such as thrombosis or clots, especially amongst those aged around 40 and below, which he says were over publicized and led to fear by some. However, staff started going for vaccination two or so weeks after the start, having noticed that the side effects were transient and resolved fully within two days.

He advises that those who contacted the virus whilst awaiting the second dose of the vaccine, should go and get their second dose once they have been cleared of COVID-19.

Dr Mmalane's message to BHP employees regarding COVID-19 vaccination is that "COVID-19 is real and it is here with us in Botswana. We cannot wish it away. COVID-19 kills and the right decision to take for yourself is to get vaccinated."

He warns that not being vaccinated is like playing Russian Roulette with one's life, a lethal game of chance which must be shunned in favour of the vaccine. Because BHP would like to assess the impact of COVID-19 on its

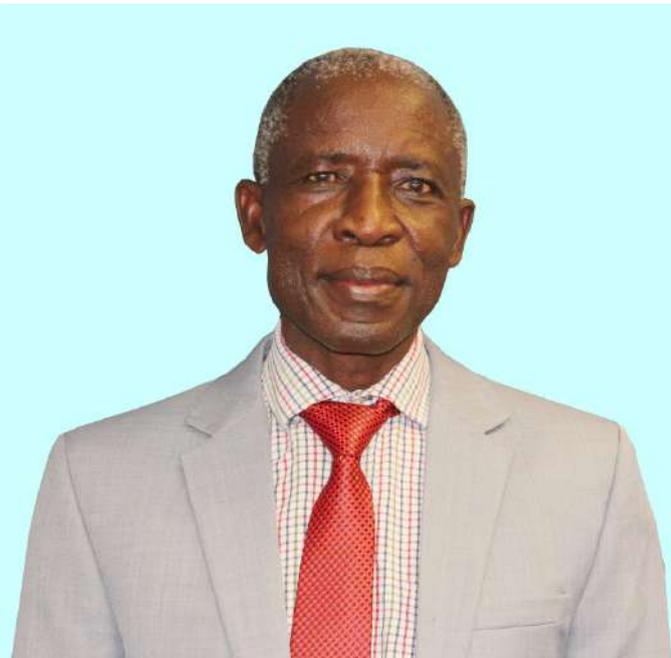
workforce, it keeps track of the number of staff who have tested positive for the virus on weekly basis, irrespective of whether they were tested internally or elsewhere.

COVID-19 monitoring includes best assessment of whether the source of infection was within BHP or from external contact, whether individual had been vaccinated, by which vaccine and whether the individual infected had been fully vaccinated with both doses or had only received the first shot.

BHP also tracks the number of direct contacts (staff and study participants) and the number of staff that has been put under quarantine due to internal and/or external exposures.

These records are necessary to help inform management plans and response to the challenges posed by the COVID-19 pandemic in the workplace.

Guidelines to Working in a Virtual Office (Working From Home) have been developed and are being implemented to further strengthen mitigation strategies from SARS-CoV-2 acquisition and transmission in the workplace.



Leading the BHP Staff Vaccination Campaign:
BHP Deputy CEO, Dr Mompoti Mmalane

"COVID-19 is real and it is here with us in Botswana. We cannot wish it away. COVID-19 kills and the right decision to take for yourself is to get vaccinated"

Dr Mompoti Mmalane

BHP donates Oxygen Concentrators and PPE to PMH and SLH



BHP Deputy CEO, Dr Mompoti Mmalane (2nd from right) handing over an Oxygen Concentrator to the Minister of Health and Wellness, Dr Edwin Dikoloti. Also in the picture is the Ministry's Deputy Permanent Secretary -Corporate Services, Dr Machacha (left), PMH Biomedical Engineer (2nd from left) and PMH Acting Hospital Superintendent, Dr Goepamang.

The Botswana Harvard AIDS Institute Partnership (BHP) has donated 14 five litre Oxygen Concentrators and 200 bunny suits (personal protective clothing) to the country's largest referral hospital, Princess Marina Hospital (PMH) in Gaborone and Scottish Livingstone Hospital (SLH), a district hospital in Molepolole. The donation was presented to and received by the Minister of Health and Wellness, Dr Edwin Dikoloti at the Ministry's Headquarters on Tuesday 10th May 2021.

PMH received 10 Oxygen Concentrators and 100 bunny suits yesterday while SLH has been given four Oxygen Concentrators and 100 bunny suits. Presenting the donation at the Ministry of Health and Wellness, BHP Deputy Chief Executive Officer, Dr Mompoti Mmalane stated that as SARS-CoV-2 is menacingly threatening human existence, the country is in a period of acute need for essential life-saving devices and supplies.

"This is a challenge for the health sector as a whole and not the Ministry of Health and Wellness alone. BHP is part of the health sector and thus we are called to action," said Dr Mmalane.

BHP raised the funds to purchase the equipment and PPE through a fund raising drive by BHP associated Investigators and Research Associates based in the USA and locally. Dr Mmalane highlighted that as the country is faced with escalating mortality due to the delta variant and overwhelmed hospitals, BHP together with its collaborators at Harvard University in USA called for help from whoever could hear their cry.

"Indeed people heard us and we are pleased to be able to assist the government with a few oxygen concentrators which will assist in ambulatory oxygen therapy as there is a dire shortage in capacity for hospital based therapy. This is a drop in the ocean but a drop is better than none

at all," he said.

The Minister of Health and Wellness, Dr Edwin Dikoloti thanked BHP and its collaborators for the noble gesture and appealed to the general public to also do what they can to assist Government to fight the pandemic and save lives.

"This is not a challenge for the Health Department alone, it is a challenge for all of us and your assistance comes at the right time when we are faced with a critical shortage of equipment and the threat of another wave of the pandemic. This will help us as we need this even for our home based care strategy," said Minister Dikoloti.

Through this donation, BHP was continuing its support in the fight against the COVID-19 pandemic. The institute has lent a helping hand to the Government since the beginning of the pandemic in the form of capacity training for laboratory personnel, sample shipping to South Africa before the country developed capacity for testing, PRC testing for SARS-COV-2 and genomic sequencing of the virus at its laboratory.



Dr Mompoti Mmalane handing over Bunny Suits to the Minister of Health & Wellness, Dr Edwin Dikoloti



BHP Research Associate, Dr Sara Shwanke Khilji (R), handing over Bunny Suits to SLH Hospital Matron, Ms Eliza Basimanebotlhe



Dr Sara Shwanke Khilji handing over Oxygen Concentrator to SLH Hospital Superintendent, Dr John Chambo

Selected BHP Associated Research, and Associated Investigators Publications (April to July 2021)

1. Efficacy and safety of dolutegravir with emtricitabine and tenofovir alafenamide fumarate or tenofovir disoproxil fumarate, and efavirenz, emtricitabine, and tenofovir disoproxil fumarate HIV antiretroviral therapy regimens started in pregnancy (IMPAACT 2010/VESTED): a multicentre, open-label, randomised, controlled, phase 3 trial. Lockman S, Brummel SS, Ziemba L, Stranix-Chibanda L, McCarthy K, Coletti A, Jean-Philippe P, Johnston B, Krotje C, Fairlie L, Hoffman RM, Sax PE, Moyo S, Chakhtoura N, Stringer JS, Masheto G, Korutaro V, Cassim H, Mmbaga BT, João E, Hanley S, Purdue L, Holmes LB, Momper JD, Shapiro RL, Thoofer NK, Rooney JF, Frenkel LM, Amico KR, Chinula L, Currier J; IMPAACT 2010/VESTED Study Team and Investigators. *Lancet*. 2021 Apr 3;397(10281):1276-1292. doi: 10.1016/S0140-6736(21)00314-7. PMID: 33812487
2. The Lived Experience Of Participants in an African Randomised trial (LEOPARD): protocol for an in-depth qualitative study within a multisite randomised controlled trial for HIV-associated cryptococcal meningitis. Lawrence DS, Tsholo K, Ssali A, Mupambireyi Z, Hoddinott G, Nyirenda D, Meya DB, Ndhlovu C, Harrison TS, Jarvis JN, Seeley J. *BMJ Open*. 2021 Apr 5;11(4):e039191. doi: 10.1136/bmjopen-2020-039191. PMID: 33820784
3. Pharmacokinetics and Drug-Drug Interactions of Isoniazid and Efavirenz in Pregnant Women Living With HIV in High TB Incidence Settings: Importance of Genotyping. Gausi K, Wiesner L, Norman J, Wallis CL, Onyango-Makumbi C, Chipato T, Haas DW, Browning R, Chakhtoura N, Montepiedra G, Aaron L, McCarthy K, Bradford S, Vhembo T, Stranix-Chibanda L, Masheto GR, Violari A, Mmbaga BT, Aurpibul L, Bhosale R, Nevrekhar N, Rouzier V, Kabughu E, Mutambanengwe M, Chanaiwa V, Nyati M, Mhembere T, Tongprasert F, Hesselting A, Shin K, Zimmer B, Costello D, Jean-Philippe P, Sterling TR, Theron G, Weinberg A, Gupta A, Denti P; IMPAACT P1078 (TB APPRISE) Study Group Team. *Clin Pharmacol Ther*. 2021 Apr;109(4):1034-1044. doi: 10.1002/cpt.2044. Epub 2020 Oct 16. PMID: 32909316
4. Enhanced and Timely Investigation of ARVs for Use in Pregnant Women. Abrams EJ, Mofenson LM, Pozniak A, Lockman S, Colbers A, Belew Y, Clayden P, Mirochnick M, Siberry GK, Ford N, Khoo S, Renaud F, Vitoria M, Venter WDF, Doherty M, Penazzato M; PADO and CADO Experts Groups. *J Acquir Immune Defic Syndr*. 2021 Apr 15;86(5):607-615. doi: 10.1097/QAI.0000000000002597. PMID: 33298793
5. Modest reduction in adverse birth outcomes following the COVID-19 lockdown. Caniglia EC, Magosi LE, Zash R, Diseko M, Mayondi G, Mabuta J, Powis K, Dryden-Peterson S, Mosepele M, Luckett R, Makhema J, Mmalane M, Lockman S, Shapiro R. *Am J Obstet Gynecol*. 2021 Jun;224(6):615.e1-615.e12. doi: 10.1016/j.ajog.2020.12.1198. Epub 2020 Dec 24. PMID: 33347842
6. Cryptococcal meningoencephalitis: time for action. Stott KE, Loyse A, Jarvis JN, Alufandika M, Harrison TS, Mwandumba HC, Day JN, Lalloo DG, Bicanic T, Perfect JR, Hope W. *Lancet Infect Dis*. 2021 Apr 16:S1473-3099(20)30771-4. doi: 10.1016/S1473-3099(20)30771-4. Online ahead of print. PMID: 33872594
7. Next generation sequencing of near-full length genome of norovirus GII.4 from Botswana. Makhaola K, Moyo S, Kebaabetswe LP. *Virus Res*. 2021 Sep;302:198491. doi: 10.1016/j.virusres.2021.198491. Epub 2021 Jun 18. PMID: 34147552
8. Factors Associated with Infant Feeding Choices Among Women with HIV in Botswana. Mussa A, Taddese HB, Maslova E, Ajibola G, Makhema J, Shapiro RL, Lockman S, Powis KM. *Matern Child Health J*. 2021 Sep;25(9):1376-1391. doi: 10.1007/s10995-021-03155-x. Epub 2021 May 5. PMID: 33950327
9. Outcomes of Reflex Cryptococcal Antigen (CrAg) Screening in Human Immunodeficiency Virus (HIV)-Positive Patients With CD4 Counts of 100-200 Cells/L in Botswana. Tenforde MW, Milton T, Rulaganyang I, Muthoga C, Tawe L, Chiller T, Greene G, Jordan A,

- Williams CG, Owen L, Leeme TB, Boose A, Ngidi J, Mine M, Jarvis JN. *Clin Infect Dis*. 2021 May 4;72(9):1635-1638. doi: 10.1093/cid/ciaa899.PMID: 32604411
10. Individual and Composite Adverse Pregnancy Outcomes in a Randomized Trial on Isoniazid Preventative Therapy Among Women Living With Human Immunodeficiency Virus. Theron G, Montepiedra G, Aaron L, McCarthy K, Chakhtoura N, Jean-Philippe P, Zimmer B, Loftis AJ, Chipato T, Nematadzira T, Nyati M, Onyango-Makumbi C, Masheto G, Ngocho J, Tongprasert F, Patil S, Lespinasse D, Weinberg A, Gupta A. *Clin Infect Dis*. 2021 Jun 1;72(11):e784-e790. doi: 10.1093/cid/ciaa1482.PMID: 32997744
 11. To achieve 95-95-95 targets we must reach men and youth: High level of knowledge of HIV status, ART coverage, and viral suppression in the Botswana Combination Prevention Project through universal test and treat approach. Lebelonyane R, Bachanas P, Block L, Ussery F, Alwano MG, Marukutira T, El Halabi S, Roland M, Abrams W, Ussery G, Miller JA, Lockman S, Gaolathe T, Holme MP, Hader S, Mills LA, Wirth K, Bock N, Moore J. *PLoS One*. 2021 Aug 10;16(8):e0255227. doi: 10.1371/journal.pone.0255227. eCollection 2021.PMID: 34375343
 12. Patterns of pre-treatment drug resistance mutations of very early diagnosed and treated infants in Botswana. Moraka NO, Garcia-Broncano P, Hu Z, Ajibola G, Bareng OT, Pretorius-Holme M, Maswabi K, Maphorisa C, Mohammed T, Gaseitsiwe S, VanZyl GU, Kuritzkes DR, Lichterfeld M, Moyo S, Shapiro RL. *AIDS*. 2021 Jul 28. doi: 10.1097/QAD.0000000000003041. Online ahead of print.PMID: 34324451
 13. Prevalence and Sequelae of Cryptococcal Antigenemia in Antiretroviral Therapy-Experienced Populations: An Evaluation of Reflex Cryptococcal Antigen Screening in Botswana. Hurt WJ, Tenforde MW, Molefi M, Mitchell HK, Milton T, Azama MS, Goercke I, Mulenga F, Tlhako N, Tsholo K, Srivastava T, Leeme TB, Simoonga G, Muthoga C, Lechiile K, Mine M, Jarvis JN. *Clin Infect Dis*. 2021 May 18;72(10):1745-1754. doi: 10.1093/cid/ciaa356.PMID: 32236414
 14. Equity in clinical trials for HIV-associated cryptococcal meningitis: A systematic review of global representation and inclusion of patients and researchers. Lawrence DS, Leeme T, Mosepele M, Harrison TS, Seeley J, Jarvis JN. *PLoS Negl Trop Dis*. 2021 May 27;15(5):e0009376. doi: 10.1371/journal.pntd.0009376. eCollection 2021 May.PMID: 34043617
 15. Bringing the Gap between Pilot and Scale-Up: A model of Antenatal Testing for Curable Sexually Transmitted Infections from Botswana. Wynn A, Moucheraud C, Martin NK, Morroni C, Ramogola-Masire D, Klausner JD, Leibowitz A. *Sex Transm Dis*. 2021 Jul 24. doi: 10.1097/OLQ.0000000000001517. Online ahead of print.PMID: 34310524
 16. Maternal weight and birth outcomes among women on antiretroviral treatment from conception in a birth surveillance study in Botswana. Zash R, Caniglia EC, Diseko M, Mayondi G, Mabuta J, Luckett R, Hofmeyr GJ, Morroni C, Ramogola-Masire D, Williams PL, Zera C, Wylie BJ, Makhema J, Lockman S, Shapiro RL. *J Int AIDS Soc*. 2021 Jun;24(6):e25763. doi: 10.1002/jia2.25763.PMID: 34176240
 17. Use of a mutation-specific genotyping method to assess for HIV-1 drug resistance in antiretroviral-naive HIV-1 Subtype C-infected patients in Botswana. Maruapula D, MacLeod IJ, Moyo S, Musonda R, Seatla K, Molebatsi K, Leteane M, Essex M, Gaseitsiwe S, Rowley CF. *AAS Open Res*. 2021 May 7;3:50. Doi 10.12688/aasopenres.13107.2. eCollection 2020. PMID: 34036243
 18. Integrating STI testing and treatment with routine HIV care in Gaborone, Botswana. Carveth-Johnson T, Dunin De Skrzyzynno S, Wynn A, Moshashane N, Ramontshonyana K, Lebelonyane R, Mussa A, Ramogola-Masire D, Klausner J, Morroni C. *Sex Transm Dis*. 2021 Jun 26. doi: 10.1097/OLQ.0000000000001492. Online ahead of print. PMID: 34174039
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Botswana Harvard AIDS Institute Partnership
Private Bag BO320
Gaborone, Botswana
Tel: (+267) 3902671
Fax: (+267) 3901284
Web: www.bhp.org.bw