


Supporting a New Maternal Facility Launch in Tanzania



9 volunteers with varied hospital leadership and clinical experience



62 remote connections over **8** months

394 hours of technical assistance & training

“Magreth, your labor is not progressing and you're losing a lot of blood; we need to do an emergency c-section.”

Magreth, a 32-week pregnant woman, was admitted to CCBRT maternity ward in emergency labor after her water broke early that morning. During an examination, the labor and delivery nurse, Nurse Neema, determined that Magreth was five centimeters dilated, but the baby had not moved to the head-down position vertex presentation. Magreth, exhausted from the labor pain, asked the physician if there was anything that could be done to reposition the baby. The physician and nurse attempted to turn the baby through an external cephalic version procedure, but it was unsuccessful—the baby stayed in the breech position.

Each year in Tanzania, 11,000 women die due to complications of pregnancy and childbirth, and 66,000 babies do not survive their first month of life. Furthermore, only 20% of the dispensaries and 39% of health centers offer coverage of basic emergency obstetric and newborn care and can offer delivery services and resources that allow healthcare providers to recognize early signs and symptoms of potential maternal health complications.

For the past 32 weeks, Magreth had had a smooth pregnancy and planned a natural birth, not expecting an early labor or any delivery complications. Several hours later, Nurse Neema performed another routine examination of Magreth, but the baby had still not moved into a position that would allow for a safe natural birth.

Babies in the breech presentation pose an increased risk of death for both the mother and child. Compared to the vaginal delivery group, mothers with babies in the breech presentation have a 5.48 times higher risk of perinatal mortality, 4.12 times higher risk for birth trauma, and 3.33 times higher risk for Apgar. At the individual level, breech presentation occurs in 3-4% of full-term pregnancies; for Margreth's 32-week pregnancy, that number rises to 7% risk. Though the individual risk is relatively low, aggregate numbers at the systems level results in too many preventable deaths. For patients like Magreth, 70 out of 1,000 patients the hospital serves will have a fetus positioned in the breech presentation. There are 20 neonatal deaths per 1,000 live births, and with the 5.48 times increased risk of death due to the breech presentation, 7 or 8 babies born to those 70 mothers (11%) will die unnecessarily.

Nurse Neema left to check on another patient, and when she returned, she found Magreth appearing pale, drowsy, and confused, with blood soaking the sheets between her legs. The physician and nursing team raced Magreth to the operating room for an emergency delivery. They prepared her for surgery and set up a blood transfusion due to her hemorrhage with donated blood from the hospital's blood bank. Deaths due to hemorrhaging during a cesarean delivery are 5.5 deaths per 10,000 cesareans performed, but over 70% of those deaths are considered to be preventable. The surgeon performed the operation, and Magreth's baby was safely delivered and moved to the NICU for further care.

After delivery, Magreth's healthcare team educated her about caring for a newborn and reviewed safe breastfeeding practices. Each year, malnutrition accounts for 60% of the 10.9 million under-five deaths globally, and two-thirds of these deaths are due to inadequate and/or incorrect feeding practices. Proper breastfeeding practices have the potential to prevent over 595,000 unnecessary childhood deaths and 975,000 cases of childhood obesity each year. Unsafe breastfeeding practices have also been linked to the development of breast and ovarian cancers and type II diabetes—safe practices can prevent 98,000 women from deaths associated with these conditions. In addition to the human lives lost, these deaths from not breastfeeding correctly have significant economic consequences as well. In Sub-Saharan Africa, 23.56 billion USD will be lost due to child mortality, and 42.06 billion will be lost due to maternal and child mortality and cognitive losses. With the support of the maternity wing healthcare professionals, Magreth learned the proper breastfeeding practices and her baby was well cared for in the NICU. Several weeks later, Magreth was able to bring her baby home.

Maternal and infant mortality is one of the many health issues Business for Health Solutions helps address through their work in the healthcare ecosystem. Magreth and her baby lived due to her access to affordable and quality healthcare, but at several points in this story, she or her baby could have died. If Magreth had not had access to a maternity wing at a local hospital, to the blood needed for a transfusion, to a high-quality surgery care team and operating room for emergency surgery, to a NICU for her premature baby, and more, the outcome of this story could have been much different.

Client: CCBRT (Comprehensive Community-Based Rehabilitation in Tanzania) is a large non-profit hospital that seeks to prevent disability through early identification of potential problems and strengthening the maternal and newborn health system throughout Tanzania.

Project Activities: BHS' involvement in this project consisted of three main activities. First, highly-skilled volunteers from Intermountain Healthcare helped create a Facility Occupancy/Launch Plan. This plan defined strategy support for launching new services, reviewing the client's project readiness and schedule, and analyzing selected process/patient flow plans. Secondly, the volunteers provided technical advice and recommendations for the new service's clinical protocols, and education plans specific to scenario planning and the patient experience. Lastly, technical advice and recommendations for setting up designated ancillary services (lab, blood bank, and morgue) were given to help CCBRT expand its patient services.



“Before the support of BHS and Intermountain, we were looking at how to operationalize and did not know where to start. Because of the assistance provided, our maternity wing's neonatal space will become a breastfeeding center of excellence, and our maternity and newborn facility will provide quality and affordable maternal care.”

Dr. Brenda D'mello

Maternal Health Technical Lead, CCBRT

Results

- CCBRT launched its ancillary services (blood bank, laboratory, and morgue) ahead of schedule.
- Creation of a facility launch timeline allowed CCBRT to track milestones and the person responsible for each task. This improved staff efficiency and productivity, as well as provided structure to the launch of the facility.
- Improved patient flow and workflow plans.
- Improved clinical standard operating procedures, and education plans.
- Following breastfeeding (BF) training from Intermountain volunteers, CCBRT nurses applied their knowledge and offered BF counseling courses at the CCBRT academy for nurses and midwives from their partner sites.
- The first baby was born in the new CCBRT maternity wing. The mother delivered a healthy baby, supported by her sister and an amazing team of surgeons and midwives, and her care was 100% compliant with the latest World Health Organization standards.



Notes

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1. "The physician and nurse": Shanahan, M. M., & Gray, C. J. (2022). External Cephalic Version. In StatPearls. StatPearls Publishing LLC. "Each year in Tanzania": Maternal & Newborn Health. CCBRT Hospital - Changing Lives, Changing Communities. (2022, October 20). <https://newsite.ccbrrt.org/maternal-newborn-health/> " Furthermore, only 20%": Maternal and child health. UNICEF United Republic of Tanzania. (n.d.). <https://www.unicef.org/tanzania/what-we-do/health>

"Compared to the": Fernández-Carrasco, F. J., Cristóbal-Cañadas, D., Gómez-Salgado, J., Vázquez-Lara, J. M., Rodríguez-Díaz, L., & Parrón-Carreño, T. (2022). Maternal and fetal risks of planned vaginal breech delivery vs planned caesarean section for term breech birth: A systematic review and meta-analysis. *Journal of global health, 12*, 04055. <https://doi.org/10.7189/jogh.12.04055>

"At the individual level, breech": If your baby is Breech. American College of Obstetricians and Gynecologists. (2019, May). <https://www.acog.org/womens-health/faqs/if-your-baby-is-breech>

"...that number rises to 7%": Shanahan, M. M., & Gray, C. J. (2022). Breech Position. In StatPearls. StatPearls Publishing LLC.

"There are 20 neonatal deaths": United Republic of Tanzania (TZA) - demographics, Health & Infant Mortality. UNICEF DATA. (2020, February 6). <https://data.unicef.org/country/tza/>

"They prepared her for surgery": Abbas, S., Mughal, S., Hussain, S. N. F., & Hossain, N. (2019). Blood transfusion and high-order cesarean delivery; Report from a developing country. *Pakistan Journal of Medical zsciences, 35*(6), 1520–1525. <https://doi.org/10.12669/pjms.35.6.539>

"Deaths due to hemorrhaging": Maswime, S., Buchmann, E. (2016). Causes and avoidable factors in maternal death due to cesarean-related hemorrhage in South Africa, *International Journal of Gynecology & Obstetrics. 134*(3), 320-323. <https://doi.org/10.1016/j.ijgo.2016.03.013>.
2. "Each year, malnutrition": G/Slassie, M., Azene, Z. N., Mulunesh, A., & Alamneh, T. S. (2021). Delayed breast feeding initiation increases the odds of colostrum avoidance among mothers in Northwest Ethiopia: a community-based cross-sectional study. *Archives of public health, 79*(1), 44. <https://doi.org/10.1186/s13690-021-00571-x>

Proper breastfeeding practice": Walters, D. D., Phan, L. T. H., & Mathisen, R. (2019). The cost of not breastfeeding: global results from a new tool. *Health policy and planning, 34*(6), 407–417. <https://doi.org/10.1093/heapol/czz050>

"Unsafe breastfeeding practices": Walters, D. D., Phan, L. T. H., & Mathisen, R. (2019). The cost of not breastfeeding: global results from a new tool. *Health policy and planning, 34*(6), 407–417. <https://doi.org/10.1093/heapol/czz050>

"In Sub-Saharan Africa, 23.56 billion USD": Walters, D. D., Phan, L. T. H., & Mathisen, R. (2019). The cost of not breastfeeding: global results from a new tool. *Health policy and planning, 34*(6), 407–417. <https://doi.org/10.1093/heapol/czz050>

Improving Prime Vendor Inventory Management Procedures to Provide Consistent Access to Life-Saving Drugs in Tanzania




3 volunteers—supply chain operation experts
9 remote connections over **15** months
45 hours of technical assistance & training

"I'm sorry, the drug is out of stock, we will not have the medication available for several weeks."

Tanzania has one of the highest malaria case- and death-rates in the world. 93% of the population in Tanzania lives in malaria transmission areas and accounted for 12.8% of malaria cases in East and Southern Africa in 2020. Jacob was recently exposed to the *Plasmodium falciparum* parasite following a mosquito bite. He experienced a high fever, chills, headache, excessive sweating, general malaise, and other flu-like symptoms. Worried about malaria, Jacob went to his physician, and subsequent laboratory testing confirmed a positive malaria infection. Jacob's physician prescribed him Artemether-Lumefantrine medication, also known as Coartem—an artemisinin combination therapy (ACT) drug that is the first-line treatment option for malaria infections in Tanzania.

Jacob arrives at the pharmacy with his prescription, only to learn that the pharmacy is out of stock of the medication due to limited supply and would not get a new shipment in a timely manner—he would have to wait 14 days before even accessing the medication. Coartem is the first-line drug for treatment due to its high efficacy, and there are not many effective alternative medications available at the pharmacy—or nearby pharmacies—either. Given the strain of parasite infection, it is critical for Jacob to begin treatment with anti-malaria medications as soon as possible to decrease the risk of severe disease.

If Jacob had access to prompt treatment, he would only need to take the medication for three days to resolve malaria symptoms, and would be cured within two weeks. However, it is critical that Jacob starts the medication within 24 hours of fever onset. Coartem's effectiveness in treating malaria decreases each day there is a delay in access treatment, because the parasites have more time to accumulate within the body, which can also lead to severe malarial anemia. 50% of severe anemia cases could be prevented if treatment was started within 24 hours of symptoms onset. Delays can also result in malaria episodes where symptoms return periodically for years. Furthermore, treatment within 24 hours significantly reduces the risk of disease transmission to others, while a delay in treatment increases transmission rates by 50%. Given that Coartem is out of stock at the pharmacy, what is Jacob supposed to do now?

In 2021, over 25,000 individuals in Tanzania died due to malaria infection, and delays in access to treatment contributed to that number. In addition to the significant human-life cost of the disease, malaria infections also make people sick, which reduces work productivity, decreases school attendance, and impairs intellectual development in children, altogether decreasing quality of life. The economic costs of this lost productivity are significant. Malaria infection can cost an individual 20% of their annual income (this value underrepresents the true amount because 20% does not factor in individuals returning to work before they fully recover and are therefore less effective and productive). For Jacob, missing just one week of work results in \$45.00 USD of his monthly wage of \$181 lost; prolonged infection would just increase the amount of time Jacob would need to take off work and the amount of money lost, increasing economic burden on him and his family.

Regionally, malaria infection results in significant economic consequences and reduces growth. Countries with high levels of malaria had an average GDP of 0.4% per year, compared to countries with low rates, where GDP averages 2.3% per year. With access to prompt treatment, 25,000 human lives can potentially be saved and reduce the economic burden on families.

Inventory management to reduce stock-out is one of the many health issues Business for Health Solutions helps address through their work in the healthcare ecosystem. Jacob's health is at risk because he was not able to purchase the anti-malaria medication due to the fact the medication was out of stock. Ensuring that distributors, like pharmacies, are well stocked with the necessary medications is critical so communities have consistent access to their life-saving medications.

Client: Bahari is one of the largest distributors of pharmaceuticals, medical devices, equipment, and laboratory reagents in Tanzania. Bahari serves 4 regions (Dar es Salaam, Morogoro, Dodoma and Singida) as the prime vendor, increasing access to health products and essential medicines for Tanzanian communities. They distribute products to hospitals, health centers, dispensaries or medical stores that are the furthest from urban centers, where healthcare options are few. 90% of sales orders are for essential health products that are out of stock at the government procurement agency (MSD). Bahari's products address key health concerns in the country, including child health visits, reproductive health services for youth and women, and emergency care.

Project Activities: The project focused on improvements to inventory management and procurement practices to better meet public health facilities' demand for essential healthcare products. Orders are frequently sporadic, unpredictable and also urgent, and Bahari struggled to plan and hold sufficient inventory to fulfill these orders. Highly-skilled volunteers from Merck worked with Bahari staff on implementing a data-driven strategy to manage Bahari's business operations, with decision-making informed by data insights drawn from an Excel-data analytical dashboard that was developed to track key KPIs such as safety stock level, minimum order quantity, lead time, inventory value and inventory quantity.



"I am happy that through the project I gained advanced skills which I could immediately put into practice. BHS does not need to convince me to take part in another project as I have seen the benefits of their program."

Heri Wagi

Head of Procurement, Bahari Pharmacy

Results

- Order fulfillment increased from 50% to 95%
- Forecasting accuracy improved from 0% to 85%
- Report preparation was reduced from 1 month to 3 days.
- Order fulfillment time was reduced from 14 days to 3 days

This project resulted in Bahari's increased capacity to deliver more essential products to public health facilities, faster. The following key improvements have been made as a result of the BHS project with Merck experts, directly impacting Bahari's fulfillment rates and timelines for delivery:

1. Frequently ordered items are now ordered on a regular basis, in bulk, and directly from manufacturers, no longer requiring a specific sales order to be received before procuring the items for distribution (proactive purchasing policies implemented).
2. Approvals for internal purchase orders under a designated threshold can be completed by the procurement team, no longer requiring multiple additional approval steps by senior leadership.
3. Products already in stock when a sales order is received are immediately shipped, no longer requiring customers to wait until the full sales order is in stock for a single delivery.

Additionally, Bahari increased the capacity of their procurement team with 2 new hires, and made several organizational improvements to their warehouse



Notes

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1. "Tanzania has one of the highest": Tanzania. Severe Malaria Observatory. (2007, January 17). <https://www.severemalaria.org/countries/tanzania>

"Jacob's physician prescribed": World Health Organization. (2017, November 23). Monitoring the efficacy of antimalarial medicines in Tanzania. World Health Organization. <https://www.afro.who.int/news/monitoring-efficacy-antimalarial-medicines-tanzania>

"However, it is critical": Chuma, J., Okungu, V., & Molyneux, C. (2010). Barriers to prompt and effective malaria treatment among the poorest population in Kenya. *Malaria journal*, 9, 144. <https://doi.org/10.1186/1475-2875-9-144>

"Coartem's effectiveness in": Challenger, J. D., Gonçalves, B. P., Bradley, J., Bruxvoort, K., Tiono, A. B., Drakeley, C., Bousema, T., Ghani, A. C., & Okell, L. C. (2019). How delayed and non-adherent treatment contribute to onward transmission of malaria: a modelling study. *BMJ global health*, 4(6), e001856. <https://doi.org/10.1136/bmjgh-2019-001856>

"50% of the severe anaemia": Mousa, A., Al-Taiar, A., Anstey, N. M., Badaut, C., Barber, B. E., Bassat, Q., Challenger, J. D., Cunningham, A. J., Datta, D., Drakeley, C., Ghani, A. C., Gordeuk, V. R., Grigg, M. J., Hugo, P., John, C. C., Mayor, A., Migot-Nabias, F., Opoka, R. O., Pasvol, G., Rees, C., ... Okell, L. C. (2020). The impact of delayed treatment of uncomplicated *P. falciparum* malaria on progression to severe malaria: A systematic review and a pooled multicentre individual-patient meta-analysis. *PLoS medicine*, 17(10), e1003359. <https://doi.org/10.1371/journal.pmed.1003359>

"Furthermore, treatment within": Challenger, J. D., Gonçalves, B. P., Bradley, J., Bruxvoort, K., Tiono, A. B., Drakeley, C., Bousema, T., Ghani, A. C., & Okell, L. C. (2019). How delayed and non-adherent treatment contribute to onward transmission of malaria: a modelling study. *BMJ global health*, 4(6), e001856. <https://doi.org/10.1136/bmjgh-2019-001856>

"In 2021, over 25,000 individuals": World Health Organization. (2023, March 29). Malaria. World Health Organization. <https://www.who.int/news-room/fact-sheets/detail/malaria>

"In addition to the significant": World Health Organization. (n.d.). Malaria. World Health Organization. <https://www.afro.who.int/health-topics/malaria>

2. "For Jacob, missing": Tanzania wages 2023: Minimum & average. Take Profit. (n.d.). <https://take-profit.org/en/statistics/wages/tanzania/>

"Countries with high levels": World Health Organization. (n.d.). Malaria. World Health Organization. <https://www.afro.who.int/health-topics/malaria>

Improving Inventory Management Procedures to Provide Consistent Access to Life-Saving Drugs in Tanzania



"I'm sorry, the drug is out of stock, we will not have the medication available for several weeks."

By the year 2025, over 125 million people in Sub-Saharan Africa are expected to have hypertension. In Tanzania, 25.7%, or 4 million adults, have hypertension, but only 100,000 individuals have it under control—meaning the remaining 3.9 million individuals have uncontrolled hypertension. Alexander is a middle-aged male who was diagnosed with hypertension, or high blood pressure. Hypertension occurs when the force of blood hitting the artery walls is too high, which is typically defined as a blood pressure of 130/80 mmHg or above, compared to normal readings of 120/80 mmHg and below, where the numbers represent the heart's systolic contractions (top number) over diastolic relaxation between beats (bottom number).

For his symptoms, Alexander's healthcare provider prescribed him the ACE inhibitor medication enalapril (Vasotec), but he recently ran out of his prescription medication. It has been several days since Alexander has been able to take his medication. He was experiencing a blood pressure of 186/122 mmHg and had symptoms of tachycardia where his heart rate was 160 beats per minute, dizziness, headache, chest pain, and shortness of breath.

Alexander arrived at the pharmacy with his prescription renewal, only to learn that the pharmacy was out of stock of the medication due to limited supply and would not get a new shipment in a timely manner—he would have to wait 14 days before even accessing the medication. The pharmacist questioned if Alexander could take a different medication for his condition, but Alexander had experienced negative side effects from the other medication options in the past. To make matters worse, the pharmacy did not have the most effective emergency medications, such as nitroprusside, to counteract the dangerously high blood pressure. If Alexander cannot access the most effective medication for him and his high blood pressure, what is he supposed to do now?

Hypertensive-related complications, such as cardiovascular disease, are leading causes of morbidity in Sub-Saharan Africa. As an individual with hypertension, Alexander has a significantly higher risk of heart damage, heart attack, and stroke, therefore managing his blood pressure with medication is crucial. Hypertension can reduce the elasticity of a person's arteries due to overworking the heart, therefore decreasing blood flow and oxygen to the heart. Essentially the heart is experiencing excessive strain to the point where it becomes permanently damaged. Alexander's hypertension can increase his risk of heart attack and heart disease by up to 30; even smaller 5-10 mmHg increases in pressure can lead to a 4-5% risk of a cardiovascular event. Globally, 47% of coronary heart disease incidents and 54% of strokes have been attributed to hypertension. The high levels of force against the artery walls can cause blood vessels to burst or become blocked, which leads to a stroke. Each 20 mmHg of systolic and 10 mmHg of diastolic increase doubles the risk of stroke death. Effectively managing hypertension has the potential to prevent unnecessary deaths, heart disease prevalence, and stroke occurrence. Ensuring access to treatment and hypertension medications would help the 3.9 million people living with uncontrolled hypertension decrease their risk of developing hypertension-related medical conditions.

With this high risk of disease and symptoms of hypertension, individuals often feel ill and are unable to function efficiently in day-to-day life, not to mention what happens if the individual does develop heart disease or experience a stroke. With this lost productivity, economic costs are significant. The overall cost of stroke and heart disease in South Africa was estimated to be \$1.250 billion USD. For Alexander, missing just one week of work results in \$45.00 USD of his monthly wage of \$181 lost, prolonged illness would increase the amount of time Alexander would need to take off work, and the amount of money lost, increasing the economic burden on him and his family. Lack of access to life-saving medication endangers a person's livelihood by impairing their ability to work to make money, and significantly increasing the burden placed on them due to illness and lost productivity.

Inventory management to reduce stock-outs is one of the many health issues Business for Health Solutions helps address through their work in the healthcare ecosystem. Alexander is risking his health because he was not able to purchase his hypertension medication due to the fact the medication was out of stock. Ensuring that distributors, like pharmacies, are well stocked with the necessary medications is critical so communities have consistent access to their life-saving medications.

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Notes

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1. "By the year 2025": Galson SW, Staton CA, Karia F, et al. (2017). Epidemiology of hypertension in Northern Tanzania: a community-based mixed-methods study. *BMJ Open*. 7:e018829. doi: 10.1136/bmjopen-2017-018829

"In Tanzania, 25.7%": World Health Organization. (n.d.). United Republic of Tanzania Hypertension Fact Sheet. World Health Organization. https://cdn.who.int/media/docs/default-source/country-profiles/hypertension/tza_en.pdf?sfvrsn=e2fe0ede_9&download=true

"Hypertension occurs when": National Center for Chronic Disease Prevention and Health Promotion, Division for Heart Disease and Stroke Prevention. (2021). High Blood Pressure Symptoms and Causes. Centers for Disease Control and Prevention. <https://www.cdc.gov/bloodpressure/about.htm>

"To make matters worse": Stumpf J. L. (1988). Drug therapy of hypertensive crises. *Clinical Pharmacy*, 7(8), 582–591.

"Hypertensive-related complications": Galson, S.W., Staton, C.A., Karia, F. (2017). Epidemiology of hypertension in Northern Tanzania: a community-based mixed-methods study. *BMJ Open*. 7:e018829. doi: 10.1136/bmjopen-2017-018829

"Hypertension can reduce": National Center for Chronic Disease Prevention and Health Promotion, Division for Heart Disease and Stroke Prevention. (2021). High Blood Pressure Symptoms and Causes. Centers for Disease Control and Prevention. <https://www.cdc.gov/bloodpressure/about.htm>

"Alexander's hypertension can": Luo, D., Cheng, Y., Zhang, H., Ba, M., Chen, P., Li, H., Chen, K., Sha, W., Zhang, C., & Chen, H. (2020). Association between high blood pressure and long term cardiovascular events in young adults: systematic review and meta-analysis. *BMJ (Clinical research ed.)*, 370, m3222. <https://doi.org/10.1136/bmj.m3222>

"Globally, 47% of": Wu, C. Y., Hu, H. Y., Chou, Y. J., Huang, N., Chou, Y. C., & Li, C. P. (2015). High Blood Pressure and All-Cause and Cardiovascular Disease Mortalities in Community-Dwelling Older Adults. *Medicine*, 94(47), e2160. <https://doi.org/10.1097/MD.0000000000002160>

2. "Each 20 mmHg of systolic": National High Blood Pressure Education Program. (2004). *Blood Pressure and Cardiovascular Risk. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure*. Bethesda (MD): National Heart, Lung, and Blood Institute (US). <https://www.ncbi.nlm.nih.gov/books/NBK9634/>

"The overall cost of": Gaziano T. A. (2008). Economic burden and the cost-effectiveness of treatment of cardiovascular diseases in Africa. *Heart (British Cardiac Society)*, 94(2), 140–144. <https://doi.org/10.1136/hrt.2007.128785>

"For Alexander, missing": Tanzania wages 2023: Minimum & average. Take Profit. (n.d.). <https://take-profit.org/en/statistics/wages/tanzania/>



Miller Center
for Social Entrepreneurship



BHS Ecosystems Learnings Database Template

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Miller Center Lewis Family Fellows
Fall 2022

The purpose of this document is to provide guidance for BHS employees using the [Ecosystems Learning Database](#) (ELD). The ELD is a comprehensive working annotated bibliography that BHS can add to and tailor in order to fit their needs. This template preserves the basic methodology we established when creating the ELD so that future annotations made use the same format and are of the same quality as the ones provided. This method will help BHS employees progressively develop a library of information that they can use when applying for funding and/or speaking with corporate partners without taking up too much of their time sorting through information. This template contains an outline for design, citing informal knowledge, quotes, and academic literature. A deconstructed example using a section of the ELD is also provided.

ELD Design:

The ELD is designed to organize informal and formal knowledge so that it can be accessed in a timely manner. Informal knowledge refers to unique information and expertise that BHS employees, volunteers, and clients have collected through their experience in the African healthcare ecosystem. We established themes that were prevalent throughout the informal knowledge collected and performed academic literature searches to supplement it within each theme. Any future literature searches should use an academic search engine such as Google Scholar, Microsoft Academic, or other formal resources and should have a clear connection to BHS's model or impact. Important ELD themes are written using Heading 2 (Times New Roman, 16pt font, bold) to help users locate each new section easily. The document is programmed to recognize any text in this format to appear in the table of contents. We first document the informal knowledge collected for that theme, followed by useful quotes and academic literature. This provides a consistent flow to the database. Each theme should begin on a new page to enhance readability. The table of contents also should be refreshed each time a new annotation is made so that it is accurate.

Annotation Format:

Informal Knowledge

Full Name of person who collected this information, Position, Company, Date Collected

Paragraph explaining the informal knowledge, its relevance to BHS, and why it is unique.

List all authors in this section by date the information was collected. Annotations that flow smoothly as paragraphs should be written as such. Consider using bullet points to convey short, unconnected pieces of knowledge if collected from the same source on the same date.

Quotes:

- "Insert quotation here." (Full Name, Date)

This section should be used for quotations that may be useful to BHS when applying for funding or writing case studies. It uses bullet points for easier readability. Quotations should only be listed if the speaker's exact wording is important. If the writer has to paraphrase the quote, it should be listed under the informal knowledge section. Due to this, not every theme may have a quotation section.

Formal Knowledge

One Author -

Last Name, First Name. (Day Month Year). "Article Title." *Journal Title/Publisher*, Volume(Number), pages, link.

Multiple Authors -

Last Name author 1, First Name author 1, Full Name author 2, and Full Name author 2. "Article Title." *Journal Title/Publisher*, Volume(Number), pages, link.

Paragraph containing the annotation for the article/study. The first few sentences should refer to the author's credentials and experience in the field. If there is an organization associated, the organization's mission and connection to the topic should be explained. Any potential bias should be noted here. This will require research outside of the study itself. Next, the purpose of the study, the type of study, how the data is collected, and the sample size should be listed. A summary of the article's key points that would be significant to BHS is next. The annotation ends with an explanation of why the study is relevant to BHS and how it can be used.

These citations use APA format. If an organization wrote the article/study, use the organization's name in place of the author's. All lines subsequent to the first line in the citation should be indented by 0.5. On Google Docs, we accomplished this by highlighting the section, going to Format, selecting Align and Indentation Options, and selecting "Hanging" under Special Indentation. Journal articles should have the DOI as the link. Volume, Number, and Page Range, are typically used for a study published in a journal. Some academic sources will not contain this information because they are published through an organization.

Annotations should roughly be in the 200-350 word range and be written in similar format across the ELD. Annotations with less than 200 words may not contain enough detail to be considered of the same quality and those with more than 350 words may be too long to provide an easy read. The purpose of these annotations is to provide a brief overview of the reliability of the literature, a summary, and its relevance to BHS. If the reader wishes to know more they may click on the link provided to view the full study.

An Example Section of a Theme from the ELD:

The Value of an Intermediary in the Healthcare Ecosystem

Informal Knowledge:

Tyler Nelson, Co-CEO of BHS, 8/22/22

Many healthcare enterprises have difficulty articulating challenges and company needs. BHS is able to identify many of these challenges and facilitate potential solutions by matching healthcare clients with corporate partner volunteers on a business consulting project. These volunteers possess expertise about a specified problem area and techniques to improve it. By doing so, they connect many parties that might never have been in contact through an expansive healthcare network. For example, a pharmacy may have issues with medication stock outs, in response to which BHS coordinates corporate volunteers who can propose inventory management protocols that will prevent stock outs when implemented. Intermediaries like BHS offer corporations access to the private sector, which many have not tapped into yet. BHS acts as a communicator that encourages stakeholders to understand how each piece fits into the larger healthcare ecosystem across industries. Furthermore, intermediaries are able to gather technical, skilled expertise using an extensive network that can be relayed to their healthcare clients and inform their decisions that can benefit the community downstream.

Quote Bank:

- “BHS offers insight and perspective on how something in the systems level of healthcare connects to an individual’s access.” (Tyler Nelson, 9/13/22)

Formal Research:

Results for Development Institute. (July 2016). “Intermediaries: The Missing Link in Improving Mixed Market Health Systems?” *Center for Health Market Innovations*, https://healthmarketinnovations.org/sites/default/files/R4D_Intermediaries_wInfographic.pdf.

The Results for Development Institute aims to improve health, nutrition, and education systems across the world through engaging government officials, civil society leaders, and social innovators. The Center for Health Market Innovations facilitates the global economy by providing a database that holds information about several innovative healthcare solutions strategies that can be used for global learning and adapting. Both of these organizations collaborated on writing this report about the role intermediaries play in healthcare ecosystems where government agencies work alongside many private sector organizations. The report identifies commonalities between 120 intermediary models to determine key elements of how intermediaries strengthen mixed healthcare systems. Data was gathered from the Center for Health Market Innovations. It details how intermediaries can address several challenges in the

healthcare ecosystem including lack of safe, quality care that is accessible and lack of long term management capacity—two areas BHS is heavily involved in. In analyzing the elements of effective intermediaries they also identify promising practices. For example, a promising practice in building management capacity is encouraging innovation and improving communication and learnings across a wide network of investors that will promote an active market with an increased revenue stream. This report maps step-by-step how intermediaries influence the healthcare system. This map may help BHS pinpoint and articulate the significance of their role as intermediary that can be helpful when describing their place in the healthcare ecosystem.

Spena, Tiziana, and Mele Cristina. (18 March 2020). “Practicing Innovation in the Healthcare Ecosystem: the Agency of Third Party Actors.” *The Journal of Business and Industrial Marketing*, 35(3), pp. 390-403,
<https://www.emerald.com/insight/content/doi/10.1108/JBIM-01-2019-0048/full/pdf?title=practising-innovation-in-the-healthcare-ecosystem-the-agency-of-third-party-actors>.

Tiziana Spena and Mele Cristina both work within the Department of Economics, Management, and Institutions at the University of Naples Federico II. Tiziana Spena is an assistant professor at the university and obtained a PhD in management and economics in 2002. Cristina Mele has a PhD in management, is a full professor of service innovation and the coordinator of the PhD in management program at the university. They each have over 100 publications in several business and management journals and also co-authored a book, *Innovative in Practice: Perspectives and Experiences*, that encourages people to rethink how we study innovation within a greater cultural context. Needless to say, the pair is well versed in empirical data research and using a systems level approach to promote business development. This particular study uses pre-existing case theories and academic literature to perform a comprehensive, qualitative examination of the role that e-health third-party intermediaries play in the healthcare ecosystem. Overall, intermediaries were found to facilitate innovative ways of doing business, resulting in the creation of new interconnections between various actors. The word *innovation* in this context refers to bridging the gap between the actor-to-actor level, healthcare businesses, and the collective level, healthcare systems. Their activities take into account the role, context and practices of the actors they are involved with. By analyzing these relationships, the authors were able to identify common practices that intermediaries implement to support innovation. Some of these practices include expanding the knowledge base of their partners, exploiting this knowledge by addressing their partners needs, supporting business infrastructure, and promoting a framework of connecting healthcare actors. By doing so, e-health intermediaries are critical to building the healthcare ecosystem. The description of e-health third-party actors is similar to BHS’s position and activities in the African healthcare system and can be used to further strengthen the significance of their role as an intermediary.



BHS Ecosystem Learnings Database

*A Comprehensive Working Annotated Bibliography on
Best Practices in Delivering Healthcare*

Amber Persson & Linnea Rothi
Miller Center Lewis Family Fellows
Fall 2022

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The Value of the Private Sector of Healthcare in Tanzania

Informal Knowledge:

Tyler Nelson and Margo Carlen, Co-CEOs of BHS, 8/22/22

The private sector fills in the gaps the public sector cannot fulfill in the Tanzanian healthcare system. Many people choose to go to the private sector since the public sector often struggles to deliver equitable services. Furthermore, the private sector plays a role in the healthcare value chain by creating local job manufacturing, distributing, and insurance opportunities. While the private sector is able to better access rural areas than the public sector, many people possess certain assumptions about private healthcare providers and the demographics they cater to. For example, it is common for people to think that private hospitals only serve wealthier patients and that their services are unaffordable for most people. While these sorts of facilities do exist, the private sector is much more expansive than that. There are also several facilities within the private sector that aim to provide accessible, affordable healthcare that many people may not know about. However, there are still similar issues regarding unregulated quality of services that are present within the private sector as seen within the public. Since the private sector is not as dependent on donors or government funding, they can make different choices and enact different policies to maintain the quality of their medical equipment, drugs, or services. This also means that each enterprise may have different quality standards and practices.

Tyler Nelson, Co-CEO of BHS, 9/13/22

The private sector of healthcare can often provide higher quality services and products than the public sector but may also be more expensive since many are driven by profit. A revenue source increases the sustainability of these businesses. Even so, many businesses cannot afford certain types of expertise to improve their business capacity. The private sector is critical to the healthcare ecosystem because it fills in the gaps that are present with the public sector. One of the largest gaps the private sector is able to address is increasing accessibility to healthcare in rural and underserved communities. This is partly because the private sector is able to support businesses with more specific initiatives than the public sector, such as focusing on outreach efforts in rural areas. There is motivation to make services more affordable, which drives industry innovation and increased access. Conversely, the public sector is often unable to keep up with demand whereas the private sector looks to expand. While BHS works more closely with manufacturers, distributors, and hospitals, the private sector as a whole also plays a large role in research and developing techniques or skill sets that advance the healthcare industry.

Tyler Nelson, Co-CEO of BHS, Ecosystems Learnings, Accessed 12/01/22

This is a condensed list of common ecosystems barriers healthcare enterprises face in sustainably operating within the healthcare market as it relates to access to the private sector:

- Standardized platforms created by the government requiring integration/ interoperability can limit private companies' ability to offer a differentiated value proposition, or

companies that opt not to integrate/ be interoperable, are blocked out of the largest customer pool.

- Example: Ghana procurement platform
- NHIS/ NHIF
- Workforce quality and retention leads to employees feeling “brain drain” and moving to other industries. Many private companies face part of their workforce leaving for public sector jobs, even though they may pay less, because these jobs are seen as providing more opportunities in the future (ex. sponsored education). Depending on the job, some may have less responsibilities in the public sector than in their private sector job, granting them more time to pursue other ventures or be with their family while still getting paid.

Quote Bank:

- “The private sector also gives many techniques a way to enter the market. A specific skill set usually starts in the private sector and trickles out until it gradually becomes more broad.” (Tyler Nelson, Co-CEO of BHS, 9/13/22).

Formal Research:

International Finance Corporation. (07 July 2010). “The Business of Health in Africa.” *World Bank Group*,
https://www.unido.org/sites/default/files/2016-01/IFC_HealthinAfrica_Final_0.pdf.

The International Finance Corporation, associated with the World Bank Group, is a large global development organization focused on improving the efficiency and outreach of businesses across the private sector. One of their largest areas of focus is the African healthcare system. This report details the importance of developing, engaging, and supporting the private sector of healthcare throughout Africa. Data was collected from comprehensive literature reviews and over 400 interviews with stakeholders including private health enterprises, government officials, policy makers, and financial institutions. The private sector is able to serve poor and rural communities, offering services that are not accessible via the public sector. The report identifies several strategies that can be used to support enterprises within the private sector, including improving access to capital through educating local banks about the true risk profile of these businesses and encouraging international financial support. Furthermore, it describes why stakeholders and global investors should be interested in private healthcare enterprise opportunities, ways to decrease one donor’s risk through methods like risk pooling arrangements, and how the private sector opens an entirely new market. All data is collected through extensive literature review and consultations with key stakeholders across the globe. Detailed, in-person visits and interviews were also conducted in several African countries, including Tanzania, Rwanda and Ghana. Much of this data is communicated visually and compares similarities and differences across countries and time. There are also several graphics depicting market opportunity and

downstream impact for investors organized by the size of the investment, almost like a guide on investing. Overall, the report concludes that there is a large unfilled political potential in the private sector of healthcare in Africa that investors can benefit from. By improving the private sector, healthcare delivered to African communities is improved. BHS's role as an intermediary in the private sector connects enterprise clients with investors. BHS has the potential to provide useful information to potential investors and give them advice on where to invest. This report has supplemental information related to the appeal of investing and the risk involved that may prove useful.

Yoong, Joanne, Nicholas Burger, Connor Spreng, and Neeraj Sood. (07 Oct. 2010). "Private Sector Participation and Health System Performance in Sub-Saharan Africa." *PLoS ONE*, 5(10), <https://doi.org/10.1371/journal.pone.0013243>.

Joanne Yoong, Nicholas Burger and Neeraj Sood are affiliated with the RAND Corporation in Virginia, whose mission is to help improve policy and decision making through research and analysis. Connor Spreng works with the Investment for Climate Department at World Bank, an organization that aims to fight poverty through sustainable solutions. Joanna Yoong is one of the primary authors who received her PhD in Economics from Stanford University, founded Research for Impact in Singapore, and is well versed in international policy and healthcare. Nicholas Burger is the second primary author with a PhD in Economics and has over 20 publications within the field. This study focuses on the role of the private sector in Sub-Saharan Africa by examining private sector participation and the equity of delivery of treatment for childhood respiratory disease using regression analysis, while accounting for potential confounding factors (background characteristics of the patient). Data was gathered from Demographic and Health Surveys and private sector hospitals. The study acknowledges criticism of the private sector's high prices and potential ability to provide care to the poorest in a community. However, regression analysis revealed that countries with higher private sector participation also have higher maternal education and GDP per capita, which were found to be confounding factors. Overall, authors found that "private sector participation in delivery and treatment of childhood respiratory disease is significantly correlated with greater overall access to these services and reduced disparities between rich and poor as well as urban and rural populations." One large limitation of the study is that they were unable to measure the user fee charged at facilities, meaning that the level of affordability of these private hospitals is relatively unknown. This article provides evidence of why we should support the private sector of healthcare and identifies trends across various countries in Africa. It is valuable to BHS because it supports their involvement in the private sector and provides a wider lens of the greater impact the private sector can have on the wellbeing of individuals in the country.

The Value of an Intermediary in the Healthcare Ecosystem

Informal Knowledge:

Tyler Nelson, Co-CEO of BHS, 8/22/22

Many healthcare enterprises have difficulty articulating challenges and company needs. BHS is able to identify many of these challenges and facilitate potential solutions by matching healthcare clients with corporate partner volunteers on a business consulting project. These volunteers possess expertise about a specified problem area and techniques to improve it. By doing so, they connect many parties that might never have been in contact through an expansive healthcare network. For example, a pharmacy may have issues with medication stock-outs, in response to which BHS coordinates corporate volunteers who can propose inventory management protocols that will prevent stock-outs when implemented. Intermediaries like BHS offer corporations access to the private sector, which many have not tapped into yet. BHS acts as a communicator that encourages stakeholders to understand how each piece fits into the larger healthcare ecosystem across industries. Furthermore, intermediaries are able to gather technical, skilled expertise using an extensive network that can be relayed to their healthcare clients and inform their decisions that can benefit the community downstream.

Tyler Nelson, Co-CEO of BHS, 9/13/22

BHS has a unique perspective on the healthcare industry in Africa and is able to speak about thought leadership. BHS understands the nuance of many problems and has a wide lens since they operate on the systems level of healthcare. They can make connections across the healthcare ecosystem and give organizations specific, technical support that wouldn't happen otherwise due to a limited network and access to this sort of expertise. By doing so, they can address gaps that other businesses cannot address.

Quote Bank:

- “BHS offers insight and perspective on how something in the system's level of healthcare connects to an individual's access.” (Tyler Nelson, 9/13/22)
- “BHS does a good job at bridging the gap between technology and planning the meetings. They have been instrumental in obtaining background information and are able to help from a project management and facilitation standpoint (ex. goals, objectives, accountability, deadlines).” (Denise Kingsbury, MedStar Health, 9/14/22)

Formal Research:

Results for Development Institute. (July 2016). “Intermediaries: The Missing Link in Improving Mixed Market Health Systems?” *Center for Health Market Innovations*, https://healthmarketinnovations.org/sites/default/files/R4D_Intermediaries_wInfographic.pdf.

The Results for Development Institute aims to improve health, nutrition, and education systems across the world through engaging government officials, civil society leaders, and social innovators. The Center for Health Market Innovations facilitates the global economy by providing a database that holds information about several innovative healthcare solutions strategies that can be used for global learning and adapting. Both of these organizations collaborated on writing this report about the role intermediaries play in healthcare ecosystems where government agencies work alongside many private sector organizations. The report identifies commonalities between 120 intermediary models to determine key elements of how intermediaries strengthen mixed healthcare systems. Data was gathered from the Center for Health Market Innovations. It details how intermediaries can address several challenges in the healthcare ecosystem including lack of safe, quality care that is accessible and lack of long term management capacity—two areas BHS is largely involved in. In analyzing the elements of effective intermediaries they also identify promising practices. For example, a promising practice in building management capacity is encouraging innovation and improving communication and learnings across a wide network of investors that will promote an active market with an increased revenue stream. This report maps step-by-step how intermediaries influence the healthcare system. This map may help BHS pinpoint and articulate the significance of their role as intermediary that can be helpful when describing their place in the healthcare ecosystem.

Spena, Tiziana, and Mele Cristina. (18 March 2020). “Practicing Innovation in the Healthcare Ecosystem: the Agency of Third Party Actors.” *The Journal of Business and Industrial Marketing*, 35(3), pp. 390-403, <https://www.emerald.com/insight/content/doi/10.1108/JBIM-01-2019-0048/full/pdf?title=practising-innovation-in-the-healthcare-ecosystem-the-agency-of-third-party-actors>.

Tiziana Spena and Mele Cristina both work within the Department of Economics, Management, and Institutions at the University of Naples Federico II. Tiziana Spena is an assistant professor at the university and obtained a PhD in management and economics in 2002. Cristina Mele has a PhD in management, is a full professor of service innovation and the coordinator of the PhD in management program at the university. They each have over 100 publications in several business and management journals and also co-authored a book, *Innovative in Practice: Perspectives and Experiences*, that encourages people to rethink how we study innovation within a greater cultural context. Needless to say, the pair is well versed in empirical data research and using a systems level approach to promote business development. This particular study uses pre-existing case theories and academic literature to perform a comprehensive, qualitative examination of the role that e-health third party intermediaries play in the healthcare ecosystem. Overall, intermediaries were found to facilitate innovative ways of doing business, resulting in the creation of new interconnections between various actors. The word innovation in this context refers to bridging the gap between the actor-to-actor level, healthcare businesses, and the collective level, healthcare systems. Their activities take into account the role, context and practices of the actors

they are involved with. By analyzing these relationships, the authors were able to identify common practices that intermediaries implement to support innovation. Some of these practices include expanding the knowledge base of their partners, exploiting this knowledge by addressing their partners needs, supporting business infrastructure, and promoting a framework of connecting healthcare actors. By doing so, e-health intermediaries are critical to building the healthcare ecosystem. The description of 3 health third-party actors is similar to BHS's position and activities in the African healthcare system and can be used to further strengthen the significance of their role as an intermediary.

The Value from Engaging with an Intermediary and the Private Sector for Investors

Informal Knowledge:

Paley Sweet, BHS Fundraising Coordinator, 8/16/22

BHS brings value to the investor space by being able to give advice about where to invest, which lowers the risk of investments in certain healthcare enterprises and more specifically, BHS clients. Many corporations see the high value of remote skills-based volunteering. BHS is able to access the developmental space well while creating an opportunity for volunteers to engage globally without leaving the office.

Tyler Nelson, Co-CEO of BHS, 9/13/22

Many impact investors are interested in the value of remote technical assistance, meaning that BHS initially catches the eye of many corporations and investors. However, BHS experiences difficulty in acquiring new funders. For one, many corporations have pre-determined categories and pathways of giving money that BHS does not fit into due to their complex business model. Another large issue is that there is often no existing mechanism to grant money to non-profit organizations present within corporations or investors that BHS interacts with. These challenges create a need to find creative ways for BHS to be funded with a contract so that a new approach of providing funding to BHS can be defined.

Formal Research:

International Trade Administration. (Dec. 2021). "Healthcare." *Tanzania-Country Commercial Guide*, <https://www.trade.gov/country-commercial-guides/tanzania-healthcare>.

The International Trade Administration is based in the US and aims to promote trade and investment through enforcement of trade laws with other countries. In doing so, they have created country-specific "guides" that detail the value investing in a certain country can bring organized by industry. The commercial guide for Tanzania explains how healthcare is the best prospect industry to invest in and includes an overview of the market and trade data. In recent years Tanzania's healthcare sector has been moving toward a universal healthcare model and implementing several healthcare reforms. For one, the government has allocated \$387.9 million toward the healthcare sector and improving the health financing model. As of 2021, international donors contributed 40% to the health budget. The summary also describes how the Tanzanian government is encouraging investors to establish pharmaceutical factories and support pre-existing ones within the country. Many medicines in Tanzania are imported, mainly from India, and there is ambiguity in quality regulation for domestic drug manufacturers. This creates a large gap in the drug demand and production. There are efforts being made toward systems-wide-improvement and investors can play a large role in expediting this process. The pharmaceutical industry in particular is a prime candidate for investment and emphasizes the importance of building the capacity of domestic drug manufacturers and distributors. This

overview supports the importance of BHS's role as an intermediary and why investors should be interested in Tanzanian healthcare.

Sarwal, Rakesh, U. Prasad, K. Madangopal, S. Kalal, D. Kaur, *et al.* (March 2021). "Investment Opportunities in India's Healthcare Sector." *NITI Aayog*, <https://www.india-briefing.com/news/investing-in-indias-healthcare-sector-opportunities-and-enabling-policies-new-issue-of-india-briefing-magazine-out-now-25896.html/>.

The NITI Aayog is the National Institution for Transforming India that aims to evolve a shared vision of national development priorities, sectors and strategies in India. As healthcare has become one of the largest sectors of India's economy, one of these strategies is detailing exactly why their healthcare industry is ripe for investment. The primary author, Rakesh Sarwal, has over 3 decades of experience in public health, public policy, planning and management in India's governing bodies and wrote several reports for the NITI Aayog regarding policy in the healthcare industry. The report begins by explaining how India's healthcare sector has grown over the past few years and the role the government has played in making reforms that will strengthen the sector. One of the more notable points the authors make is that two of the most attractive investment opportunities are the private sector expanding to deliver healthcare in more rural areas and improving domestic manufacturing and distribution of pharmaceutical drugs. India is ranked as the world's third largest pharmaceutical exporter and in order to improve the quality and affordability of these medicines, the government has taken steps to promote investment. One of these tactics is enabling productivity-linked schemes, which offer incentives of a certain percentage of the profit for manufactured goods, in order to improve pharmaceutical domestic manufacturing capacity, drug intermediaries, and exportation. This report can be useful for BHS because Tanzania's healthcare system is also expected to achieve high levels of growth in the next few years, making their healthcare industry also suitable for investment. While India's healthcare sector is more expansive than Tanzania's, it can be considered a reference point for what Tanzania's healthcare industry could look like. Tanzania is also moving toward a more universal healthcare system and implementing reforms to improve access to affordable healthcare, many of which rely on active participation from the private sector. One of the way's BHS's work relates to India's investment strategies is by being actively involved in building the capacity of pharmaceutical manufacturing and distributing companies. This means the same reasons why an investor would invest in India's healthcare industry may apply to Tanzania's and the companies BHS works with.

The Value of a Remote Approach and Dissemination of Knowledge

Informal Knowledge:

Tyler Nelson and Margo Carlen, Co-CEOs of BHS, 8/22/22

BHS's remote approach increases its access to a global network of healthcare enterprises. Furthermore, it decreases cost and encourages a diversity of skill. By engaging with remote-based volunteering programs, corporate volunteers are able to expand their skill set and share their knowledge without the travel costs, which improves the accessibility of their services.

Tyler Nelson, Co-CEO of BHS, 9/13/22

BHS fosters close relationships with their clients and establishes a sense of trust that they will effectively target their client's needs. By doing so, they create a remote space for their client that is dedicated to solving problems and remains apart from everyday duties. This separation prevents distraction during the workday and does not take up too much time from other responsibilities that are more pressing. Then, the level of focus and productivity is increased during the allotted times to solve the problems at hand in collaboration with BHS and corporate partner volunteers.

Tyler Nelson, Co-CEO of BHS, Ecosystems Learnings, Accessed 12/01/22

This is a condensed list of common ecosystems barriers healthcare enterprises face in sustainably operating within the healthcare market as it relates to access to electronic resources:

- User knowledge
 - Difficulties accessing or using health technology and market data regarding the availability or quality of a product creates a gap in the transfer of information and takes up valuable time while enterprises are trying to remedy the issue.
- The lack of ability to predict health-seeking behavior that drives purchasing patterns via electronic resources.
- There is low transparency for pricing variance of products online, creating a need for greater transparency and regulation.

Quote Bank:

- "The nature of BHS's projects and [clients'] deep technical needs are unique... Many corporations are able to conduct general business advisory services but struggle with delivering something so technical." (Tyler Nelson, 8/22/22)

Formal Research:

Chan, Leslie and Sely Costa (2005), "Participation in the Global Knowledge Commons: Challenges and Opportunities for Research Dissemination in Developing Countries", *New Library World*, 106(3/4), pp. 141-163, <https://doi.org/10.1108/03074800510587354>.

Leslie Chan is an associate professor in the global development studies department at the University of Toronto Scarborough and also serves as director of the knowledge equity lab at the same university, which aims to create diverse and equitable knowledge futures. He has several publications regarding open access and knowledge production. Sely Costa is a senior lecturer and researcher in information science at the University of Brazil and has published extensively about knowledge translation and communication. This literature review evaluates recent trends in the open access movement and their implications for the communication of this information in developing countries. As scholars in developing countries have gained improved access to academic literature and electronic resources there has been significant advancements toward reaching their nation's global development goals. One of these initiatives is HINARI, the Health InterNetwork Access to Research Initiative. This program was developed by the World Health Organization and provides free or highly discounted subscription access to major journals in biomedical and related social sciences to non-profit institutions in developing countries. BHS may actually be eligible for this program. One of the drawbacks of a program like HINARI is that hospital techniques, management strategies, and other findings from western countries may not be applicable to a developing nation because they are not economically feasible. This drawback emphasizes the importance of supporting locally generated research and an exchange of knowledge within the country or countries with similar socio-economic profiles. This paper is relevant to BHS because the dissemination of complex knowledge and specifically the preservation of knowledge specific to Eastern Africa is exactly what the ecosystems learnings database is attempting to accomplish. There is a need to bridge the digital gap in health-related knowledge systems. BHS is working to fulfill this need, and by doing so their reputation grows to become a reliable knowledge resource and communicator.

Dempsey-Brench, Kiera, and Amanda Shantz. (Dec. 2022). "Skills Based Volunteering: A Systematic Literature Review of the Intersection of Skills and Employee Volunteering." *Human Resource Management Review*, 32(4), <https://doi.org/10.1016/j.hrmr.2021.100874>.

Kiera Dempsey-Brench is in the School of Business at Maynooth University and Amanda Shantz attends the University of St. Gallen. Both authors have co-published previously in the *International Journal of Human Resource Management* and have contributed to fulfilling the gap in research regarding skills based volunteering. This literature review reviews 36 studies and provides a model of the key features of skills-based volunteering and factors that influence them. Skills-based volunteering has become increasingly popular in recent years with the corporate social responsibility movement (CSR) since it delivers gains to multiple stakeholders and provides an opportunity for employees to utilize their professional skills to aid the greater ecosystem. The authors provide an important framework for any successful skills-based volunteering project: the project is related to the firm's mission, employees donate job-related skills, employees are able to cultivate new or refine existing skills, and nonprofits require the

skills that are donated to them. Many of these characteristics are already present within BHS's corporate volunteering program. These programs provide employees with an opportunity to add significant value to both the business they are working with the corporation they are from. The study also suggests that employees typically gain interpersonal skills in areas such as leadership, teamwork, and communication as well as expanding their pre-existing skillset. BHS offers a unique way for international employees to refine their professional skills because they are challenged to solve problems in a completely different environment, culture, and set of laws. Global volunteers employ outside the box thinking to modify a certain process or procedure in order to make the system realistically usable and work for the company they are partnered with. In addition to the new and improved skill set, employees typically have high levels of satisfaction with skills-based volunteering because they are able to see the impact of their work. The ability to do this remotely connects stakeholders across the globe and provides a pathway for the development of a sustainable solution without taking up too much time. BHS can use this justification when speaking to potential corporate partners and tie their work back to the organization's mission and corporate social responsibility culture.

Another Source to Practice Writing an Annotation For:

The Allen Consulting Group. (May 2007). "Global Trends in Skills-Based Volunteering."

National Australia Bank,

https://www.nab.com.au/vgnmedia/download/Global_trends_in_skill-based_volunteering.pdf.

Hospitals: Common Challenges

Informal Knowledge:

Tyler Nelson, Co-CEO of BHS, 9/13/22

The following challenges common in hospitals have been identified through 50-60 conversations with various healthcare clients.

- Many hospitals may face difficulty with organizational leadership and management (how to operate a team, defining targets). This is compounded by the fact that many hospitals are run by doctors without business training.
- There are usually several issues around drug procurement, the supply chain and inventory management that lead to stock-outs and difficulty in obtaining the right drugs within companies. These challenges can affect the quality of services and products because it results in people negotiating drug prices, which leads to hospitals ending up with a generic drug that isn't what was asked for originally. Many non-profits also receive donated materials that do not fit into their system. To combat this, hospitals should track stock so that an unnecessary drug is not bought.
- Many hospitals have long waiting times for patients (especially lab, pharmacy, radiology). Many try to get through patients and run labs later, but then create an overflow of people who are all waiting on labs at the same time instead of running them as you go.
- There are often reimbursement delays and problems with insurance. Hospitals submit all claims of services provided to patients who have different insurances, but insurance companies have different ways of paying, it takes a long time, or they may not pay at all. This leaves the hospital in a cash deficit.

Courtney Hoffman, MedStar Health Inpatient Pharmacy Manager, 9/23/22

One of the biggest challenges in access to pharmaceutical drugs is inventory management practices. Similar practices can be employed in the Tanzanian healthcare system that are used in Western healthcare systems. These processes can then be accommodated to a different working environment that faces issues with weather and political changes. For example, creating a working process map can be useful for clarifying inventory business strategies and predicting when to place a following order.

Quote Bank:

- “We take advantage of how we can reliably get a medication order every day. But they [TMJ Hospital in Tanzania] can't rely on that delivery every day simply due to weather, political issues.” (Courtney Hoffman, TMJ volunteer, 9/23/22)
- “After meeting BHS we no longer encounter such problems because medicines are available in our storage and this builds our image as an institution.” (TMJ Employer 9/17/22)

- “BHS mobilizes resources and builds strategic partnerships to enable the continuation and sustainable growth of CCBRT, providing individuals and institutions with the opportunity to invest in our efforts to improve access to high-quality, comprehensive healthcare for people and communities in Tanzania, and to strengthen the wider healthcare system” (CCBRT Nurse, 9/12/22).
- “BHS built the capacity of CCBRT to deliver quality, affordable and accessible health products and services to patients and their communities in 2020 and enabled the development of the maternal wing as we know it. Each year in Tanzania, 11,000 women die due to complications of pregnancy and childbirth and 66,000 babies do not survive their first month of life. But BHS tends to look at this by helping us” (Head of Maternal Wings Department, CCBRT Hospital, 9/12/22).
- “Why CCBRT Hospital? First of all, CCBRT has a good character on the streets. They say they have a blood bank and the staff are competent. This attracted me to deliver here. There are many hospitals such as TMJ, MICO and many others nearby but CCBRT is their father. It has helped many nearby women to get better services and to actually help them to deliver safely and reduce risk of death.” (CCBRT Patient, 9/12/22).
- “As a person who deals with the stock of medicine, BHS has played a tremendous role in our hospital to an extent that we can now meet all the medical requirements of patients and win their trust” (TMJ Pharmacist, 9/16/22).

Formal Research:

Mremi, Irene R., Susan F Rumisha, Mercy G Chiduo, *et al.* (20 Nov. 2018). “Hospital Mortality Statistics in Tanzania: Availability, Accessibility, and Quality 2006–2015.” *Popul Health Metrics* 16(16). <https://doi.org/10.1186/s12963-018-0175-3>.

All authors work at the Headquarters for the National Institute for Medical Research in Dar es Salaam, Tanzania. This organization carries out health research in order to alleviate disease of the people in Tanzania and regulatory problems with the delivery of healthcare. This a cross sectional study involving select hospitals in Tanzania to assess the availability, accessibility, and quality of mortality data between 2006 and 2015. Data was collected by reviewing hospital registrars and reporting forms. The study explains that the Health Information Management Systems in developing countries have largely remained paper based and there are inconsistencies in inputting mortality data electronically. This proposes an issue for hospital management staff who need timely and reliable information for evaluating services. This also proposes an issue when making improvements to the health delivery system because there is a lack of preserved, reliable information needed to make decisions to enact change. The rate of reporting mortality data improved over time however the quality of the data was a challenge in all sources. There are inconsistencies in the language used and non-standard nomenclature to describe patient diagnosis in half of the regions data was pulled from. The most common missing variable when inputted

was the age of the patient (6.3%, 15,719 instances), followed by cause of death (3.5%, 8,790 instances). Many facilities have files stored in multiple locations within the hospital and outside the hospital due to lack of storage space with little organizational procedures. The study identifies the root of these challenges as a gap in the education system to properly train medical record keepers to best preserve and archive data. The authors conclude that strengthening the analytical capacity of hospitals is necessary and that moving toward electronic systems will likely revolutionize Health Management Information Systems. This is the type of technical need that BHS may have the ability and skill set to address. This study provides context for the gravity of this challenge and the significance of a potential intervention.

Kuwawenaruwa, August, Kaspar Wyss, Karin Wiedenmayer, Emmy Metta, and Fabrizio Tediosi. (April 2020). “The Effects of Medicines Availability and Stock-Outs on Household’s Utilization of Healthcare Services in Dodoma Region, Tanzania.” *Health Policy and Planning*, 35(3), pp. 323–333, <https://doi.org/10.1093/heapol/czz173>.

Authors are associated with the Ifakara Health Institute in Tanzania, Swiss Tropical and Public Health Institute, University of Basel, Swiss Center for International Health, Health Promotion and System Strengthening in Tanzania, and School of Public Health at Muhimbili University. These organizations provide perspectives from a globally renowned healthcare system in Switzerland and an in country-perspective to provide accurate context in Tanzania. This cross sectional study combines information from 1237 households with surveys and interviews from 4 hospitals and 89 primary health facilities over the course of three months. Descriptive analysis and multivariate regression models were used to assess the effects of medicine availability and stock-outs on utilization patterns and to identify other household-level factors that may affect utilization. Access to essential medicines in developing countries is variable and there are many issues with counterfeit drugs that cause a systemic mistrust in the healthcare system. Furthermore, many individuals pay for medicines out of pocket, putting households at potential financial hardship for a drug that may not be of high quality. In order for families to feel comfortable obtaining a potential life-saving drug, it is necessary for health facilities to offer consistent access to quality medicines. This study found eighteen “tracer” medicines to be available about 70% of the time in reviewed facilities. The most common reasons for medicine stock-outs were that the distributor they purchased from was also out (40.7%), using stocked medicines before the next shipment arrives (34.9%), and never receiving an order shipment (20.9%). These issues can largely be solved with improved inventory management practices in hospitals and distributors. Researchers found a positive correlation between medicine availability and household utilization of essential medicines, indicating the importance of continuous medicine availability in local facilities. There was also a positive correlation found between exposure to health education and household utilization. BHS has already had successful projects regarding hospital challenges that this study identifies. The study provides context for the household level effects of medicine availability, which strengthens any description of BHS’s

downstream impact. It also connects BHS's work with hospitals regarding inventory management practices to improve accessibility of quality medicines with establishing a sense of trust between households and the drug delivery system.

Another Source to Practice Writing an Annotation For:

Shija, Angela E, Judith Msovela, and Leonard E.G Mboera. (18 March 2012). "Maternal Health in Fifty Years of Tanzania Independence: Challenges and Opportunities of Reducing Maternal Mortality." *Tanzania Journal of Health Research*, 13(5), <https://doi.org/10.4314/thrb.v13i5.5>.

Distributors: Common Challenges

Informal Knowledge:

Renaud Mesure, Global Healthcare Operations at MERK, Bahari Volunteer, 9/13/22

One of the main challenges Bahari Pharmacy, a distributor in Tanzania, has faced is improving their inventory management processes. There were several incidents where the company faced stock-outs. Creating a pre-ordering point for medications will prevent this, accomplished through observing data from previous months. In the base of Bahari Pharmacy, there was no pushback in developing the pre-ordering system.

Tyler Nelson, Co-CEO of BHS, 9/13/22

The following challenges common in distributors have been identified through 100 conversations with various healthcare clients.

- Many distributors need a tool for mapping out procurement and systems processes so that they can identify a lack of common understanding among the team and inefficiencies. This system will also allow them to access demand for certain medications so they can better predict its value.
- There are procurement challenges that are a result of equipment and infrastructure difficulties, machine maintenance, and sampling procedures to test the quality of a certain drug. Sampling procedures vary across the company and drug. Furthermore, common practices for checking stock require excess time and labor. Many companies are only able to quantify stock through employees counting each individual pill. When this happens, business activities come to a halt.
- The equivalent of FDA approval processes are cumbersome.
- Several countries have their own standards for importing and exporting pharmaceutical drugs.
- Access to capital gives distributors enough financial resources to negotiate prices.

Tyler Nelson, Co-CEO of BHS, Ecosystems Learnings, Accessed 12/01/22

This is a condensed list of common ecosystems barriers distributing healthcare enterprises face in sustainably operating within the healthcare market:

- Price capping (e.g., gov't health insurance) limits the company's profitability or ability to compete. In turn, this may drive the private sector to consider products and medicines that are not on government lists (e.g., essential medicines) that can be of lower quality.
- Manufacturers and distributors competing with each other for clients complicates the ease of business and end-pricing of the product.

Quote Bank:

- “Since we started the partnership with BHS the stock for Bahari pharmacy has changed, there has been the assurance of our products in our stock. We have been able to manage our stock well through checking the quantification.” (Bahari Staff, 10 yrs, 9/14/22).

Formal Research:

Goodman, Catherine, Patrick S Kachur, Salim Abdulla, Peter Bloland, and Anne Mills. (Nov. 2007). “Drug Shop Regulation and Malaria Treatment in Tanzania—Why do Shops break the Rules, and does it Matter?” *Health Policy and Planning*, 22(6), pp. 393–403, <https://doi.org/10.1093/heapol/czm033>.

Catherine Goodman and Anne Mills are both professors in Health Economics and Policy at London School of Hygiene and Tropical Medicine. Goodman is also associated with the KEMRI Wellcome Trust program in Kenya. Patrick Kachur is the Director for the CDC Malaria Health Program in Tanzania. Salim Abdulla is a senior lecturer in epidemiology at the Ifakara Health Research and Development Center in Tanzania. Peter Bloland is a senior advisor for Global Health for the US National Center for Zoonotic and Vector-borne diseases and the CDC. It is clear that the combination of these authors are well versed in health policy, global considerations, and are able to provide accurate context of Tanzania’s healthcare ecosystem. This paper provides information on the prevalence of regulatory infringements for drug stores in Tanzania and common reasons why stores commit these infringements. It accomplishes this through a case-study analysis of multiple shops providing malaria treatment in rural Tanzania. The study found the most common infringements shops were committing to be: staff members not having the appropriate qualifications, stocked loose medications, stocked unregistered medications or medications requiring a prescription, and not having the correct Pharmacy Board Permit. Regulatory infringements are likely to reflect a combination of infrequent regulatory inspections, a failure of regulatory authorities to implement sanctions, successful concealment of regulatory violations, and the tacit permission of local regulatory staff. The paper emphasizes the complexity of the situation because certain regulatory infringements may provide communities access to essential medicines, as in certain areas drug stores may be the only viable option for life-saving treatment. This means that increasing regulatory enforcement could actually do more harm than good. The authors conclude that drug regulation should reflect societal objectives and should serve to protect and promote public health. They suggest a method of bringing official drug regulation closer in line with locally legitimate practices and greater use of positive incentives for providers and consumer involvement to resolve the issue. This paper is useful because it examines the relationship between drug shops, the government, and the community while providing complex reasons why shops may break regulatory standards and why it continues to happen. This system creates a lack of trust in drug distributors that BHS may be able to target and address through implementing technical quality control and management practices.

Penfold, Suzanne, Donat Shamba, Claudi Hanson, *et al.* (14 Feb. 2013). “Staff Experiences of Providing Maternity Services in Rural Southern Tanzania – a Focus on Equipment, Drug and Supply Issues.” *BMC Health Services Research*, 13(61), <https://doi.org/10.1186/1472-6963-13-61>.

All authors are associated with either the Infectious and Tropical Diseases department at the London School of Hygiene and Tropical Medicine or the Ifakara Health Institute in Tanzania. Both organizations are well known for their research in health-related issues and are able to provide adequate information regarding the Tanzanian healthcare ecosystem. This particular paper pinpoints a specific issue—drug and supply issues as they relate to maternal services. This was conducted as part of the Improving Newborn Survival in rural Southern Tanzania (INSIST) project in six districts of Lindi and Mtwara regions, which had a total population of about 1,000,000 people in 2007. Researchers conducted a cross-sectional survey of over 200 health facilities within the districts, focus-group discussions with staff, and in-depth interviews with staff members. The study found the overall availability of supplies and drugs to be high but inadequate availability of essential drugs and equipment required for maternal services in half of all facilities researched such as suture kits and oxytocin. While many facilities had various pieces of necessary equipment there are commonly inherent issues or difficulty maintaining it, leading to a low-quality instrument. Researchers pinpointed a causal relationship between availability of necessary drugs and working equipment and the staff’s morale and ability to provide adequate maternal services. Many staff members note that there were frequently long delays and stock-outs on the supply chain side of the equation that aggravate the situation. Authors find that improving consistent reliability to essential supplies will improve the health delivery services for mothers and babies and staff working conditions. This study is helpful for many reasons. Firstly, it utilizes staff experiences of the problem, which provides readers an accurate reflection of the situation in real time. It also provides the perspective of the hospital/facility consumer when there are supply chain issues with the distributors regarding essential drugs and equipment. It also identifies a potential gap regarding essential supplies for maternal health services in the larger healthcare ecosystem that must be addressed to improve maternal and infant morbidity mortality. This means that when BHS improves the delivery time and stock of the distributors, specifically for maternal health supplies, they are able to better connect their downstream impact on mothers, children, and employees through this sort of qualitative and quantitative analysis.

Other Sources to Practice Writing an Annotation For:

Munjina, Phares GM and Tausi M. Kida. (2014). “Implications of Health Sector Reforms in Tanzania: Policies, Indicators, and Accessibility to Health Services.” *The Economic and Social Research Foundation*, Discussion Paper 62, <https://www.thdr.or.tz/docs/THDR-BP-8.pdf>.

Wales, Joseph, Julia Tobias, Emmanuel Malangalila, *et al.* (March 2014). “Stock Outs of Essential Medicines in Tanzania.” *Twaweza Ni sisi*, <https://twaweza.org/wp-content/uploads/2021/02/Stock-outs-of-essential-medicines-in-Tanzania-ODI-TWA-final-March2014.pdf>.

Partnership for Supply Chain Management. (11 April 2018). “ Four Common Compliance Challenges Faced by Pharmaceutical Wholesalers and Distributors in Africa.” *PFSCM*, https://pfscm.org/pfscm_news/four-common-compliance-challenges-faced-by-pharmaceutical-wholesalers-and-distributors-in-africa/.

Manufacturers: Common Challenges

Informal Knowledge:

Tyler Nelson, Co-CEO of BHS, 9/13/22

The following challenges common in manufacturers have been identified through 20 conversations with various healthcare clients.

- The equivalent of FDA approval processes are cumbersome. During this time, manufacturers are at risk of losing business.
- There are challenges with product quality and production efficiency. For example, a powder antibiotic needs to be mixed w/ saline and injected. Powder expiring life is 5 years (based on testing) but the consistency of the powder only keeps for 2 years. There are cases of machines that can produce 1000 tablets per hour but in reality only get 70. Many of these machines used in Africa are not fully automated due to expenses. Instead, semi-automated equipment that requires staff is used, which leads to potential error and makes maintenance more difficult. Machines may operate at less capacity and bottleneck the whole process. The production is not at operating capacity.
- Obtaining accuracy in market demand and forecasting in demand is difficult due to lack of market data, inconsistencies, or limited skillset to estimate these numbers.
- There is lots of competition between distributors that can produce the same product cheaper (from China, India, etc.).

Tyler Nelson, Co-CEO of BHS, Ecosystems Learnings, Accessed 12/01/22

This is a condensed list of common ecosystems barriers manufacturing healthcare enterprises face in sustainably operating within the healthcare market:

- Registering new products can be a long process due to DMF capabilities, formats and templates across countries, and raw materials from different countries that are in different formats.
- Price capping (e.g., gov't health insurance) limits the company's profitability or ability to compete. In turn, this may drive the private sector to consider products and medicines that are not on government lists (e.g., essential medicines) that can be of lower quality.
- Manufacturers and distributors competing with each other for clients complicates the ease of business and end-pricing of the product.

Formal Research:

Mujinja, Phares, Maureen Mackintosh, Mary Justin-Temu, and Marc Wuyts. (10 March 2014).

“Local Production of Pharmaceuticals in Africa and Access to Essential Medicines: 'Urban Bias' in Access to Imported Medicines in Tanzania and its Policy Implications.” *Globalization and Health*, 10(12). <https://doi.org/10.1186/1744-8603-10-12>.

Pharres Mujinja and Mary Justin-Temu are associated with the Muhimbili University of Health and Allied Sciences in Dar es Salaam. Maureen Mackintosh is part of the Department of

Economics at the Open University in Milton Keynes and Marc Wuyts works for the International Institute of Social Studies at the University of Rotterdam. Together, these authors provide a combined Tanzanian and Western perspective on the healthcare system and complications within providing accessibility to essential medicines. This paper focuses on the shift in Tanzania from relying mainly on medicines being imported from other countries, mainly India, to more pharmaceutical production and supply. This article uses WHO/HAI data from Tanzania for 2006 and 2009 on prices and sources of a set of 40 tracer essential medicines. It employs graphical analysis and conventional statistical analysis methods. The paper found that essential medicines produced domestically were equally likely to be found in rural and urban areas, however, those imported are typically found more in urban areas, hence establishing an “urban bias.” This is hypothesized to be a result of the global supply chain network, wholesalers focusing on urban areas, and a possibility that Tanzanian consumers have developed greater trust in Tanzanian medicines as compared to Indian competitors. Thus, in order to increase access to medications in rural areas and throughout Tanzania, moving toward more local pharmaceutical companies that have established regulatory standards is necessary. This movement also indicates an area in which healthcare and economic objectives reinforce each other by enriching the Tanzanian domestic market. BHS works with local manufacturers and plays an active role in improving domestic pharmaceutical products. Furthermore, by improving business management, inventory, and regulatory strategies, BHS also contributes to building the reputation of their client as a trustworthy manufacturer.

Mhamba, Robert M, and Shukrani Mbirigenda. (July 2010). “The Pharmaceutical Industry and Access to Essential Medicines in Tanzania.” Institute of Development Studies at the *University of Dar es Salaam, Tanzania*, EQUINET Discussion Paper 83, https://www.equinet africa.org/sites/default/files/uploads/documents/DIS83TZN_medicines_mhamba.pdf.

Robert Mhamba and Shukraini Mbirigenda have PhDs in Development Studies and are senior lecturers at University of Dar es Salaam. They collaborated with The Regional Network for Equity in Health in East and Southern Africa (EQUINET) to implement this study, which is a network of professionals, policy makers, and state officials who have come together to promote and realize shared values of equity and social values in health. Specifically, EQUINET representatives from Rhodes University, Southern and Eastern African Trade Information and Negotiation Institute, and the Training and Research Support Center collaborated on this paper. This study uses case-study examples to explore access to essential medicines in four dimensions: physical availability, affordability, geographic accessibility, and acceptability (quality). Data was collected from three pharmaceutical companies involved in public-private partnerships, governmental departments and agencies, and development partnerships. Overall, the study found that the quality of medicines manufactured in Tanzania was often inadequate and the general manufacturing standards were lower than international standards, with only two of eight

researched pharmaceutical manufacturers able to meet them. Moreover, the government is experiencing difficulties in adequately monitoring these standards. They identify key challenges to meeting an adequate supply of quality medicines including lack of skilled staff, financial constraints, weak local and international industry links, counterfeit medications, and manufacturers only being able to offer a limited range of generic medicines. BHS is able to intervene and address multiple challenges listed to improve quality control processes, connect manufacturers with a larger industry network, and provide further technical support for staff. BHS is able to use this study to describe the severity of the situation and support the importance of their ability to intervene.

Global Healthcare Ecosystem

Informal Knowledge:

Omar Hamade, Quantum Computer Company, 9/7/22

One common misconception about the global healthcare system is that there are not enough resources available to serve under-resourced communities. While this may be true to an extent, what is more common is that communities are not aware of the healthcare resources that already exist. This means that they are unable to utilize these benefits. This knowledge and communication barrier can be remedied with increased advertising about healthcare resources available. Publicity is everything. This also leads to increased competition and consumers, which will drive drug prices down globally.

Many companies need to focus their social justice initiatives so that they are not spread thin across too many areas at once. When determining this, considering what issues large corporations (potential funders) and the government value can be helpful in receiving support of your efforts. This is similar when applying to grants. Appealing to the potential corporate partner's mission is vital, as is understanding how global nuances affect what companies value. For example, many US-based companies value local impact, increasing the desire to map BHS's impact on local African communities. Many global health companies have already taken action against "low-hanging fruit," that is, common diseases, but rare conditions that affect fewer people have not been solved. This is partially due to a desire to make a profit. The recent push toward personalized medicine in the past few years is a step in the right direction.

Tyler Nelson, Co-CEO of BHS, Ecosystems Learnings, Accessed 12/01/22

This is a condensed list of common ecosystems barriers healthcare enterprises face in sustainably operating within the healthcare market:

- Access to capital
 - "Social injunction" can become a barrier to investment. Banks are less likely to invest in something that can be perceived as a social good because if it fails they have moral pressure not to pull out or take actions that reduce the investee's ability to continue to provide services
 - Currency fluctuation may also decrease enterprise's access to capital
- Achieving quality standards may differ from meeting operating demands. Quality standards may require more time and labor that an enterprise may not be able to meet given consumer demand without sufficient resources. Flexibility in regulation of quality control also provides some leeway for businesses manufacturing medications or delivering healthcare. This issue creates a systemic mistrust between communities and healthcare providers.
- Delays from reimbursements down the chain have trickle down (up) effects. For example, a distributor may not have enough money to pay a manufacturer right away because they are waiting on their client to pay them.

- Indian “local” companies have better relationships with Indian suppliers of raw materials. However, African local leaders tend to have better political relationships with African governments (ex. manufacturing new product approvals, engagement with NHIF). Indian local companies sometimes have more difficult relationships with these governments.
- A widely used technique to lower shipping costs is semi-packaging materials.

Formal Research:

Li, Julia F. and Elizabeth W. Garnsey. (April 1, 2011). “Entrepreneurship and Global Health: Catalyzing the Ecosystem.” *Centre for Technology Management (CTM) Working Paper Series, University of Cambridge*, No. 2011/01, <https://dx.doi.org/10.2139/ssrn.1923055>.

Julia Li is a PhD student and Gates scholar in the Centre for Technology Management at the Institute for Management (IFM), associated with University of Cambridge. Her main research focus is on innovation management by global health entrepreneurs and exploration of business models which facilitate discovery, development and diffusion of healthcare innovations.

Elizabeth Garnsey obtained a PhD from University of California, Berkeley and is currently a faculty member at the business school at University of Cambridge. Her research interests include business development, technology transfer, and innovative policies. This paper addresses how integrating entrepreneurship, innovation and ecosystem theories present in business literature build resources and create value in the healthcare ecosystem. Specifically, they focus on the role the private sector has in addressing inequities in global health. The authors recognize the importance that “bottom of the pyramid” healthcare enterprises has for entrepreneurs since their business models can be adapted to serve communities in need while remaining commercially viable. Bottom of the pyramid typically means smaller, newer businesses that are not part of larger corporations. This description may fit several of the client’s that BHS works with.

Increased funds from governments have been allocated toward healthcare logistics and delivery capabilities. In order to target the disease burden in developing countries and overcome the market supply gap, the collaboration between public and private spheres is necessary. The paper also describes the value and efficiency of public-private partnerships in achieving a common health goal through a case study about a vaccine manufacturing company, SERUM. This paper provides an overview of the healthcare ecosystem in developing countries and innovative business models that address gaps in healthcare. This description provides context for BHS’s position as an intermediary in the healthcare ecosystem and the value they have to offer by aiding entrepreneurs at the bottom of the pyramid.

Odero, Patricia, Nicole Davis, Kathleen Axelrod, and Katie Van Es. (2020). “Tanzania Country Consultation Report.” *African Collaborative for Health Financing Solutions*, https://acs.r4d.org/wp-content/uploads/2020/04/ACS-Country-Report_Tanzania_PDF.pdf

The African Collaborative for Health Financing Solutions (ACS) is a 5-year USAID funded project that aims to bolster the capacity of Sub-Saharan countries to move toward a universal healthcare coverage system (UHC). They have worked with several African countries already including Botswana and Uganda. Their goal is to identify challenges present in the healthcare sector and implement health financing policies that are able to support UHC. Data is collected through interviews with stakeholders across actors in the healthcare industry and literature searches. This particular report examines Tanzania’s movement toward UHC in the past few years as part of their 2025 Vision, pinpoints problem areas in the system, and suggests potential health financing policies to implement. One of the largest problem’s Tanzania must combat is arranging health financing in a way that does not impede financial access to healthcare services for the greater population. The major priorities to advancing health financing and achieving UHC in Tanzania were; improving the delivery and quality of primary and preventative healthcare services, improving access to and affordability of care, and bringing stakeholders together to collaborate on UHC efforts. The theme of collaboration in particular appeared continuously in interviews with stakeholders. Specifically, many public stakeholders were interested in increasing collaboration with the private sector through establishing partnerships and a mutual accountability framework to encourage dialogue and increase trust with the private sector. As mentioned previously, the larger population does not always trust private sector healthcare providers due to a lack of regulation regarding quality control of products and services. However, the same could be said for the public sector. Dialogue between the two may help eliminate some of this ambiguity. This paper is significant to BHS because BHS is a prime example of a company that bridges the gap between different stakeholders in the healthcare ecosystem. Intermediaries like BHS offer the resources for improved collaboration, coordination, and communication within healthcare and a route for larger corporations to become involved through investment. Furthermore, a UHC system would require establishment of healthcare enterprises with the capacity to deliver services for an affordable price and ability to outreach to rural communities that will most likely require technical assistance behind the scenes. It is necessary for businesses to operate at their full potential for better healthcare coverage to be achieved, which BHS can help with.



Presentation, Organization, and Storage of Data for Effective Communication



Prepared by Miller Center Lewis Family Fellows:
Linnea Rothi & Amber Persson

EXECUTIVE SUMMARY

This document outlines the outcomes of our proposed project with Business for Health Solutions (BHS) to further its mission of improving access to healthcare throughout Africa by building the capacity of local private healthcare enterprises to serve under-resourced communities. BHS's value and impact as an intermediary in the healthcare ecosystem, however, can be difficult for potential investors to understand. Our first initiative entailed combatting a communication barrier that arises when conveying the significance of BHS's role in the African healthcare system to their key beneficiaries by developing an effective strategy to present BHS's direct and indirect impact on African communities. BHS has also accumulated a variety of informal knowledge on the East African healthcare system—knowledge one only learns through experience on the job—but that information is spread out across several individuals making it inaccessible to all of BHS. Our second initiative addressed the accessibility of informal knowledge BHS has accumulated throughout their projects by designing a methodology to organize and retrieve key information in an Ecosystems Learnings Database.

To address these two needs, we conducted semi-constructed interviews and surveys with BHS employees, clients, and volunteer partners in addition to local community members. These interviews and surveys provided important insights into the type of informal knowledge BHS is gathering and the specific impact BHS has on the host communities their clients serve. We also researched how to best organize and present complex information. Altogether, our data and findings informed our strategy of creating narrative case studies in a way that effectively communicates impact and informs the scope of the Ecosystem Learnings Database through the identification of key information, patterns, and themes.

Our proposed interventions will help ensure the sustainability of BHS and hence that of each healthcare enterprise they partner with. Improving communication between BHS and their key beneficiaries will clarify the importance of BHS's work on African communities, leading to an increase of clients and funding. Designing a methodology for an Ecosystems Learnings database will preserve valuable knowledge that can be easily accessed by all BHS staff and shown to potential investors. Implementing our interventions will increase the influence of BHS and have a downstream impact on local businesses, communities, and families in Africa that will experience better health for years to come as a result.

Prepared by:



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Prepared by:



Introduction

Over 50% of people in Africa lack access to quality healthcare and public hospitals are oftentimes too expensive for middle- and low-income patients. Furthermore, underfunding, lack of regulations, and system-wide constraints limit the public sector's ability to meet the community's growing healthcare needs, leaving large gaps in the healthcare system. As a result, health outcomes are worse, and patients suffer unnecessarily due to inefficient healthcare delivery systems. To bridge the gaps in the public sector, local healthcare enterprises in the private sector attempt to meet the unmet healthcare needs within the community yet are also falling short due to a lack of resources and business expertise. Communities become plagued with preventable diseases and individuals suffer from various ailments that can all be eliminated by making the healthcare system more accessible and efficient. When communities are left without access to the care they need, it leads to much bigger societal problems that must be addressed: lack of access to quality, affordable healthcare across Africa.

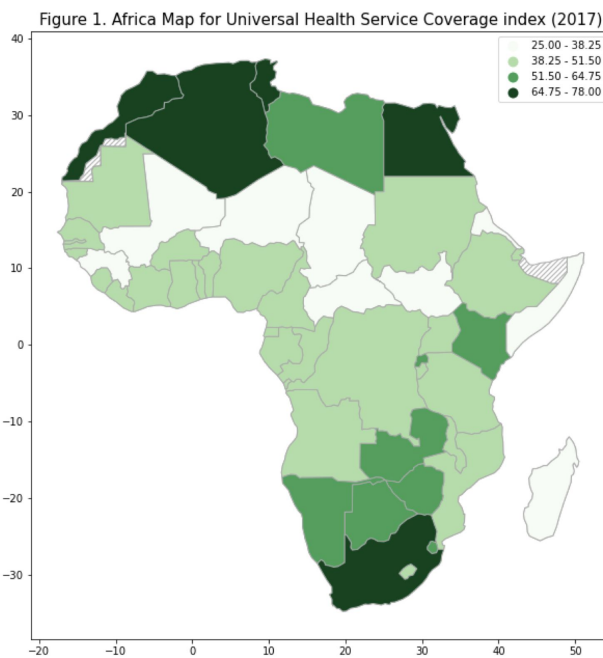


Figure 1. 2017 African Health Coverage Index.
Source: [World Economic Forum](https://www.weforum.org/)

Business for Health Solutions (BHS) helps address these broader social issues. BHS's mission is to increase healthcare access in communities in Africa by building the capacity of local healthcare enterprises to serve under-resourced communities. By matching highly-skilled volunteers with BHS's clients, BHS provides individualized training to build the capacity of local private healthcare enterprises in Africa that will increase accessibility and affordability of healthcare for the community. BHS utilizes a remote technical assistance approach to projects in order to increase their service availability across Africa, limit their disruption of the enterprise, and tailor their training to the needs and ideals of their partnered enterprises.

By targeting the private sector, BHS works to support and improve upon the healthcare infrastructure by increasing the efficiency and productivity of local businesses in a shorter time frame than if they were to work within the public sector.

Prepared by:

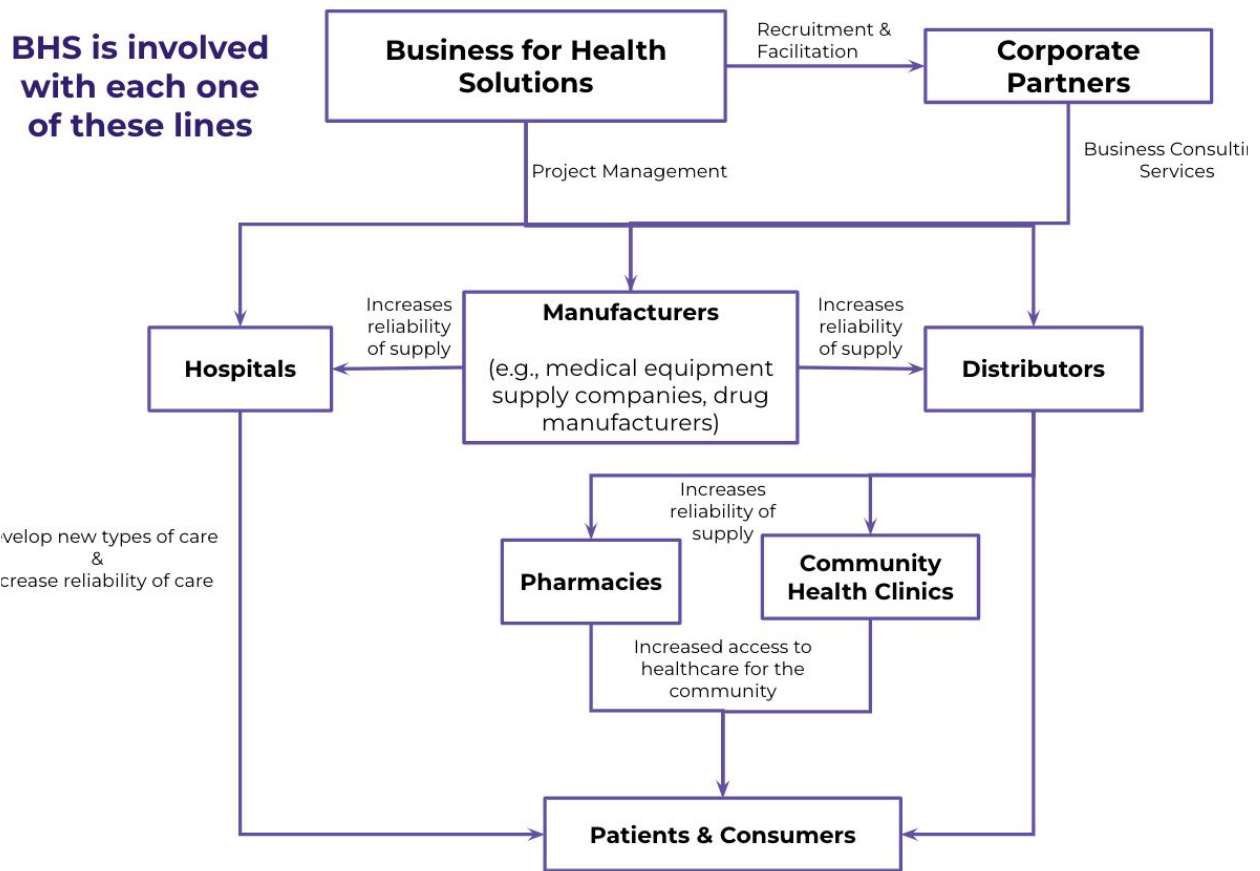


Figure 2. Schematic of Business for Health Solutions's role in the healthcare ecosystem.

Despite the success of their projects, BHS still has two main needs that have to be addressed in order to expand their work. Firstly, BHS's value as an intermediary in the healthcare ecosystem can be confusing for potential investors, especially as they try to understand how BHS's work at the systems level impacts individuals at the community level. Therefore, it is necessary for BHS to effectively communicate their direct and indirect impact in a way that is accessible and compelling to impact investors and corporate partners. Furthermore, BHS employees and volunteers have accumulated unique informal knowledge about the healthcare ecosystem through their projects with a variety of healthcare enterprise clients. This information is spread out across several people and is therefore not accessible to BHS as a whole. Without a methodology of collecting and organizing this information, BHS employees are unable to utilize this knowledge to increase their own productivity. This creates a barrier when relaying this information to global funders, thus making it difficult for BHS to maintain a reputation of being a reliable knowledge source.

Prepared by:

BHS Projects With Selected Clients



Focus Group at CCBRT Hospital (2021).

BHS collaborated with CCBRT to launch a maternity wing.



Restocking Medications at the TMJ Hospital Pharmacy (2022).

BHS provided guidance to improve TMJ Hospital's inventory management practices.



Taking Inventory of Medications at Bahari Pharmacy (2018).

BHS provided guidance to improve Bahari Pharmacy's inventory management practices.

Prepared by:

Overview of Action Research

Challenges

- (1) Effectively communicating BHS's direct and indirect impact in a way that is accessible and compelling to impact investors and corporate partners.
- (2) Organize BHS's informal knowledge and established research on the healthcare system to preserve and access the collective knowledge and build a reputation of being a reliable knowledge source for funders and clients.

Deliverables

- (1) **A collection of case studies that communicates BHS's value to potential partners and investors in a clear, concise, and compelling manner.** We will also provide a template document that BHS can use to continue to develop case studies, thereby supporting the sustainability of their business.
- (2) **A comprehensive working annotated bibliography of best practices in the delivery of healthcare in impoverished areas of East Africa.** This bibliography will increase BHS's reputation of being a reliable knowledge source for funders and clients.

Research Activities

For the case studies deliverables, we gathered data from 3 clients BHS serves as well as the community members that these clients interact with. These projects consisted of the initiation of a maternity wing in a hospital and implementing inventory management processes at another hospital and distributor in Dar es Salaam. Since we were unable to conduct interviews in person, we decided to contact local universities in Dar es Salaam to hire student researchers with previous field work experience to conduct several interviews in our place. We then conducted a zoom training on interview conduct for our 4 student researchers and distributed our question sets. We revised the question sets as we learned that certain staff members were not aware of BHS's project with their company so that we could still obtain impactful data from them. In addition to this, we researched effective ways to communicate complex information and storytelling methods that guided us when designing our case studies. We integrated our data into a strategy of creating case studies in a way that effectively communicates impact.

For the Ecosystems Learnings Database, we conducted semi-constructed interviews with BHS employees and volunteer partners. Our conversations with BHS employees geared more toward the role of BHS in Tanzania, the development of relationships between BHS and corporate partners, and questions about the healthcare sphere that BHS would benefit from answering.

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Overview of Action Research

These interviews provided important insights into the type of informal knowledge BHS has gathered and provided a clearer picture of the role of BHS in the private sector of healthcare. Our conversations with volunteer partners revolved around the project they were on, their expertise in their field, and any surprising findings or themes they were introduced to. These findings act as supplemental information to what we already gathered from BHS and provided a corporate perspective into which challenges are common in Eastern Africa and what was desirable about forming a partnership with BHS. We also researched the informal knowledge BHS already held and pre-existing literature on those topics in order to identify key information, patterns, and themes that will become the structure of our Ecosystem Learnings Database.

Key Findings

- (1) **Utilizing storytelling methods and impact statistics effectively communicates BHS's direct and indirect impact on African communities.** This method of using narrative case studies makes BHS's impact more accessible to corporate partners and funders.
- (2) **Much of BHS's informal knowledge already exists as pre-existing research.** A comprehensive working annotated bibliography that combines previous research and BHS's informal knowledge facilitates effective retrieval, preservation, and use of established best practices.

Deliverables

- (1) A Collection of Case Studies
- (2) Case Studies Template
- (3) Ecosystems Learnings Database
- (4) Ecosystems Learnings Database Template

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Conclusions

Our case studies and database will help ensure the sustainability of BHS because it improves BHS's communication and appeal to funders in addition to preserving their ecosystem learnings. Utilizing storytelling methods combined with statistics acts as an effective communication tool for BHS's impact because telling real people's stories is more emotionally compelling and tangible to investors. This narrative bridges the gap between an intermediary in the healthcare system and the daily lives of individuals in East Africa. A comprehensive annotated bibliography is an effective organization tool that is easy to use and add to. Dividing this database by theme integrates unique knowledge BHS employees and volunteers have accumulated with pre-existing academic research. In turn, this information becomes easily accessible to global funders when making decisions on where to invest. By doing so, BHS's role as an intermediary and communicator between investors and healthcare enterprises in the private sector is clarified, which helps to build BHS's reputation of being a reliable knowledge source in the healthcare ecosystem. Implementing our interventions will increase the influence of BHS because it expands their downstream impact on local healthcare enterprises, communities, and families in Africa that will experience better health for years to come as a result.

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Appendix A. CCBRT Interview Questionnaire

CCBRT Staff:

- Read consent statement; Get the interviewee name (spell it), role/title
- In your own words, can you describe the assistance BHS provided the CCBRT hospital?
 - How has your partnership with BHS affected CCBRT?
 - What was the most important thing BHS did to make a difference?
- Rate your experience with BHS on a scale of 1-5.
- From our understanding, BHS helped the hospital open the maternity ward. How were patients cared for before the ward opened? Specifically, as it relates to the hospital's ability to provide critical and emergency care?
- Why do you think women and families choose to seek care from your maternity ward/hospital and not another hospital or clinic?
 - In your opinion, how much value is the maternity ward in terms of improving the lives of patients in the hospital?
 - How important was BHS's role in supporting the maternity ward project in terms of launching the program?
- Can you tell us more about the blood bank for blood transfusion that BHS helped CCBRT set up?
 - In your opinion, how much value is the blood bank in terms of improving the lives of patients in the hospital?
 - How important was BHS's role in supporting the blood bank project in terms of launching the program?
- Can you tell us more about the head nurse who took it upon herself to set up a breastfeeding project and provide education for providers in hospitals/clinics?
 - If so, what has that process looked like? Impact? Number of healthcare professionals educated? What kind of topics does she/the team teach?
 - In your opinion, how much value is the breastfeeding project in terms of improving the lives of patients in the hospital and greater community?
 - How important was BHS's role in supporting the breastfeeding education project in terms of launching the program?
- We've already heard that CCBRT has already done over 100 deliveries. Can you refer us to any patients that have been affected by the addition of the maternity ward that would be willing to share their experience?
- How did you hear about BHS and what made you decide to partner with them?

CCBRT Patient:

- Read consent statement + Get interviewee name (spell it)
- How did you hear about the CCBRT hospital?
- Were you ever a patient at CCBRT prior to the maternity ward being open?
 - Rate your experience on a scale of 1-5

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Appendix A. CCBRT Interview Questionnaire

- How has the CCBRT maternity ward impacted you?
 - Rate your feeling of comfort in the maternity ward from 1-5
 - Rate your feeling of safety in the maternity ward from 1-5
 - Rate the overall experience as a patient of CCBRT from 1-5
- Why did you choose CCBRT instead of another clinic/hospital?
 - Are there other hospitals with similar maternal services nearby?
 - What is the value of the CCBRT maternity wing hospital in your community?
- Would you go back to the CCBRT maternity ward if you needed medical attention?
- Would you recommend the CCBRT maternity ward to another family?
- What is the single most important thing that you would like to communicate about your experience with the CCBRT maternity ward?

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Appendix B. TMJ Interview Questionnaire

TMJ Staff:

- Get the interviewee name (spell it)/title/read consent statement
- In your own words, can you describe the assistance BHS provided the TMJ hospital?
 - How has your partnership with BHS affected TMJ Hospital?
 - How has the stock of medications and their availability to patients changed since this partnership began?
 - What was the most important thing BHS did that made a difference?
- Rate your experience with BHS on a scale of 1-5.
- Can you refer us to any patients that have been affected by the flux of products at TMJ that would be willing to share their experience? Specifically, frequent patients who may have noticed a difference in flux of medications?
- What would you do if a patient needed a specific medication that was unavailable at the hospital? Has this ever happened? If so, how did you handle it?
- How did you hear about BHS and what made you decide to partner with them?

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Appendix C. Bahari Interview Questionnaire

Bahari Staff:

- Get the interviewee name (spell it)/title/read consent statement, explain project
- In your own words, can you describe the assistance BHS provided Bahari Pharmacy?
 - How has your partnership with BHS affected Bahari Pharmacy?
 - What was the most important contribution the project with BHS has had for Bahari Pharmacy?
- Rate your experience with BHS on a scale of 1-5.
- How has the stock of your products changed since your project with BHS?
 - What is the value of this change in medications/products stock for your clients and for the community?
 - How important was BHS's role in terms of initiating this change?
- How has the delivery time of your products to your clients changed?
 - What is the value of this change in delivery time of medications/products for your clients and for the community?
 - How important was BHS's role in terms of initiating this change?
- Are there companies based in Dar Es Salaam that you distribute to? If so, which ones?
- As part of this project, we are gathering information to create a detailed story about BHS's impact. This story starts with BHS's projects with their clients and continues all the way to the end consumers–patients. Part of this journey includes learning about the significance of certain medications and products, their general availability, and how commonly used they are. Would it be possible for us to contact “X” hospitals/companies and ask about the importance of the products that are shipped to them from Bahari and if they have noticed a change in stock or delivery time of these products?
- How did you hear about BHS and what made you decide to partner with them?

Bahari Staff who are Unfamiliar with BHS:

- Get interviewee name and consent
 - None of this information will be published
- Explain Project: We are student researchers conducting interviews for Business for Health Solutions, a business consultation company, that worked with Bahari Pharmacy on a project to increase stock of medications and business efficiency. These few questions we will ask you are in regard to any changes in the stock of medications or availability in Bahari Pharmacy that will provide information about the flow of operations after the project with BHS.
- How long have you worked at Bahari Pharmacy?

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Appendix C. Bahari Interview Questionnaire

- Have you noticed any changes in the stock of medications in the past few years?
 - What is the value of this change in medications/products stock for your clients and for the community?
- Have you noticed any changes in delivery time of your products to your clients in the past few years?
 - What is the value of this change in delivery time of medications/products for your clients and for the community?
- How consistent has the availability of medications been?
 - Are there any medications that are usually low/out of stock?
 - What is the importance of these medications? What conditions do they treat?
- Has Bahari experienced any challenges with fulfilling an order of medications for their clients due to low availability/stock?
- Do you have any ideas of how to improve the flux of medications at Bahari Pharmacy?

Bahari Customers:

- Read consent statement + Get interviewee name (spell it)
- What medication and products do you purchase from [shop name]?
 - How often?
 - What are they used for?
- As a customer at Bahari, how accessible is the medication and products?
 - Would you say that your medication is frequently available to you? Or is it often out of stock?
- Rate your experience as a customer of Bahari in terms of access to medication on a scale of 1-5.
- What would you do if the medication/product was unavailable? How would that impact your day-to-day life?

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Appendix D. Compiled Interview Notes

Table 1. CCBRT Compiled Interview Notes

Interviewee	Compiled Interviewee Response
Staff	
Operational Manager of Maternal Health Project	The partnership with BHS was beneficial because it enabled the development of a new maternity wing. BHS gave CCBRT technical advice and education plans along with directions to set up ancillary services, which led to the success of the maternity wing. We have delivered more than 100 babies so far.
Nurse	BHS mobilizes resources and builds strategic partnerships to enable the continuation and sustainable growth of CCBRT, providing individuals and institutions with the opportunity to invest in our efforts to improve access to high quality, comprehensive healthcare for people and communities in Tanzania, and to strengthen the wider healthcare system. 100% of BHS resources are dedicated to supporting CCBRT, and this was done 18 months ago. The blood bank was supported by the BHS and is very effective in ensuring that it supplies blood to the mothers that need it during the delivering process.
Head of Laboratory and Blood Bank Services	BHS differs most to the partners because they have a great vision to help Africans by providing services at a lower cost and to help people’s lives. It facilitates the treatment of risks within pregnancy and increases access to emergency obstetric care. BHS supported our patients and staff to achieve their goals, enjoy the work and develop long term relationships. They made our success theirs. This made a great development and reached 152 deliveries.
Head of Maternal Wings Department	BHS built the capacity of CCBRT to deliver quality, affordable and accessible health products and services to patients and their communities in 2020 and enabled the development of the maternal wing as we know it. Each year in Tanzania, 11,000 women die due to complications of pregnancy and childbirth and 66,000 babies do not survive their first month of life. But BHS tends to look on this by helping us

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Appendix D. Compiled Interview Notes

<p>Head of Labor and Deliveries</p>	<p>The midwives trained by BHS are crucial people who helped the development of the maternity wing and aid patients that have reduced movement. Due to availability of facilities from the BHS, patients now begin labor and deliver in the same place. I want all mothers to have safe and respectful care, I want every woman to enjoy giving birth not regard it as a punishment.</p>
<p>Head of Nurses</p>	<p>CCBRT’s breastfeeding projects were established with the motto of “breast for the best” under Kupona foundation. We started pediatric services in our clinic! Our pediatrician supports new parents and babies with services like breastfeeding counseling and thorough examinations. Many people book appointments to give their baby the healthiest start and this has been so helpful. Also, CCBRT discovered the start of breastfeeding for sick and preterm newborns.</p>
<p style="text-align: center;">Patients</p>	
<p>Blind, Pregnant Patient</p>	<p>As you can see, I’m disabled and there is not a good hospital in Tanzania which will treat people in this sort of special group as well as compared to CCBRT. I have been here for years and I know the area because I have been a patient here. There are other hospitals but I keep choosing CCBRT because they are a special help to the disabled people. The maternal wings give family plan education, breastfeeding training and special group education and care which brings impact on the maternity.</p>
<p>New Patient</p>	<p>This is my second child, but the first was not born at this hospital. This time is so much more comfortable because I feel relaxed here. This is a good maternity ward. You enjoy giving birth and the nurses are so kind and polite.</p>
<p>Patient</p>	<p>First of all CCBRT, has a good reputation. They have a blood bank and the staff are competent. This made me want to deliver here. It helps many nearby women to get better services and actually helps them in safe delivery and reduces risk of death.</p>

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Appendix D. Compiled Interview Notes

Patient's Husband	We appreciate CCBRT because my wife failed to give a normal birth due to the big size and location of the child. They used a specialized operation (a C-Section) until our child was delivered with a healthy mother.
Patient	The delivery of quality clinical services and the maternal wing at the hospital has made CCBRT popular and everyone is talking about it. I heard about CCBRT from people.

Table 2. TMJ Hospital Compiled Interview Notes

Interviewee	Compiled Interviewee Response
Staff	
Employer	BHS has been the greatest partnership choice in our hospital and has offered very suitable solutions for dealing with medication in general. It has helped us save more money that we were losing because of not having every required medicine for patients. In the case of unavailability of required medicine, we used to send them to nearby pharmacies. After meeting BHS we no longer encounter such problems because medicines are available in our storage and this builds our image as an institution.
Pharmacist	As a person who deals with stock of medicine, BHS has played a tremendous role in our hospital to an extent that we can now meet all the medical requirements of patients and win their trust.
Pharmacist	The problem of stock outs is no longer common in TMJ because we now have specific medications that most of the hospitals don't have. But in rare cases, we will deal with this problem by immediately purchasing the required medicine because we are located near to suppliers. So, within one day or few hours we are able to handle such emergencies.

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Appendix D. Compiled Interview Notes

Patients	
New Patient	I am a new customer at TMJ for about six months. I have been to so many hospitals but since I came here I have never been told to buy medications somewhere else. This is a big difference compared to other private hospitals in our country.
Patient	I joined TMJ as a customer around January, 2021. At first I wanted to go to another hospital because I was wondering why a large hospital as this lacked some medications, I changed my mind because of their great customer care and later on, after some months the problem was solved. Since then I get everything from the hospital (after the project with BHS).

Table 3. Bahari Pharmacy Compiled Interview Notes

Interviewee	Compiled Interviewee Response
Previous Staff	Since we started the partnership with BHS the stock at Bahari pharmacy has changed. There has been assurance of our products in our stock. We have been able to manage our stock well through checking the quantification. The delivery time has changed due to availability of products in our stock. At first when we had no knowledge on inventory management it was difficult to manage our stock, so our delivery time took long but after receiving inventory management and quantification knowledge the delivery time is shorter.
Staff of 10yrs	In terms of access to medication/product our customers get varieties of products. Also 90% of their orders are fulfilled.
Pharmacy Client	If a medication is not available it depends. If it's urgently needed we have to purchase from another supplier, but this is not common

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Appendix E. Sample BHS Employee Questionnaire

BHS-Specific Questions:

- How would you characterize BHS's strategy of appealing to potential funders/investors?
- What do the investors want to see?
- What difficulties does BHS have in regards to receiving funding?
- What is the information that funders and investors want but BHS has difficulty providing?
- What ideas do you have to improve BHS's ability to communicate their impact/story?
- What can you tell us about the importance of BHS's role as an intermediary to the healthcare system? How is it valuable to the ecosystem?
- What is the significance and value of BHS using remote methods to the healthcare system?
- While we already have a general understanding of this, in your own words, what is the significance of BHS working in the private sector of healthcare?
- What are some of the challenges you've noticed your hospital clients have had?
- What are some of the challenges you've noticed your distributor clients have had?
- What are some of the challenges you've noticed your manufacturer clients have had?

Healthcare Ecosystem Questions:

- What are some of the main barriers individuals face in developing countries when it comes to accessing quality care?
- How has the global health sector changed in the last few years? Where do you think global health funding and the industry itself is going?
- What kinds of statistics or stories will funders and investors find compelling? Does this change across the world?
- What outreach and/or business strategies have you seen (or implemented) that effectively increase access to medicine in underserved communities?
- What have you learned about the global market for pharmaceutical drugs and medical equipment?

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Appendix F. Student Researcher Training: Follow-up Question Activity

Follow-up questions are questions that are asked after you ask the main question on the interview question list. This could be done to get clarification on the interviewees' answer, to have the interviewee expand on their answer if they don't give you enough information, or to ask a related question you have/thought of as the interviewee was answering the question.

For example, one of the questions you will ask is about asking staff members to describe in their own words the assistance BHS provided their company and they responded with: "They helped us with management." or "They helped us open a specific program." These answers are vague and do not provide a lot of information. One potential follow up question could be "What exactly in management did BHS do for TMJ/CCBRT/Bahari?" or another follow-up could be "What kind of specific program?"

What is one follow-up question you will ask as a follow up?

CCBRT

Q: In your opinion, how much value is the maternity ward in terms of improving the lives of patients in the hospital?

A: It helps the community.

Potential follow-ups: What is one example of how the maternity ward has helped the community?

Bahari

Q: What is the value of the resulting increase in medications/products stock for your clients and for the community as a result of the project with BHS?

A: There's more medication

Potential follow-ups: Can you give me an example of a specific medication that is valued and has not always been present in the past?

TMJ

Q: How has the stock of medications and their availability to patients changed since this partnership began?

A: Yes, the stock and availability has changed.

Potential follow-ups: How so? What is an example of a medication whose availability changed after the partnership?

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