

# Executive Report

## A Social Return on Investment Analysis of Touch Foundation's *Treat & Train* External Clinical Rotations Program for Medical and Nursing Students in the Lake Zone of Tanzania

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## **Foreword to the Social Return on Investment Analysis of Touch Foundation's *Treat & Train* External Clinical Rotations Program for Medical and Nursing Students in the Lake Zone of Tanzania**

The External Clinical Rotations program is a core component of Touch Foundation's approach to health system strengthening in Tanzania. The program was originally designed to improve health education and quality of healthcare delivery in the Lake Zone of Tanzania, and has been the main driver behind the creation of the *Treat & Train* Network. *Treat & Train* is a network of health and educational institutions closely collaborating and sharing their resources to improve operational efficiency and deliver better care to the population. The program was co-designed with local partners to have limited ongoing operational costs and be financially sustainable in resource-constrained settings. The *Treat & Train* Network is leveraged by several additional programs that are being successfully implemented in the Lake Zone of Tanzania, such as the M-Mama emergency transport system for newborns and pregnant women.

Having an external, third-party evaluator assess the impact of the External Clinical Rotations program from both an economic and social perspective has been a great opportunity for Touch to document what we have observed from program implementation. We were very pleased to understand more about the significant social and economic value created by the program in terms of improved health education, enhanced quality of health services delivered at *Treat & Train* participating hospitals, and decreased financial burden on patients to access core health services.

The following report details the approach and methodology used to estimate the total social and economic value of nearly \$8M created by the program between 2018 and 2020. Due to the program being designed to be financially sustainable with limited ongoing operational costs, we believe it important to extend the analysis of value created by the program to a 10-year horizon. The total value is then estimated to be \$27 million. Compared with a total cost of \$5.7 million, which includes all capital investments plus ongoing operational costs through 2027, the total return on investment is almost \$5 per every \$1 invested. As Touch has transitioned financial and managerial responsibilities of program implementation to our local partners, we are confident that the program will continue to be implemented in a sustainable manner for years to come.

We would like to thank Vitol Foundation for sponsoring the program evaluation and THEnet: Training for Health Equity Network for the insightful analysis of our program impact from the perspective of key stakeholders. We finally want to highlight how the impact achieved would not have been possible without the generous support of our major funders, including the United States Agency for International Development (USAID), Vitol Foundation, and The ELMA Foundation.

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Chief Program Officer & Executive VP  
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## 1. Introduction

This Social Return on Investment (SROI) analysis<sup>1</sup> measures the impact of Touch Foundation's *Treat & Train* external clinical rotations program (hereafter, referred to as the *Treat & Train* program) on improving the quality of health workforce training and patient care in low-resource rural health facilities in Tanzania's Lake Zone. Key stakeholder outcomes of the *Treat & Train* program were identified, and each given an appropriate financial proxy to allow a cost-benefit ratio of the social and economic value of the program's investments to be calculated retrospectively and into the future.

### 1.1 About Touch Foundation

Founded in 2004, Touch Foundation's mission is to save lives and relieve human suffering. Touch aims to improve healthcare in Tanzania, addressing the shortage of healthcare workers in sub-Saharan Africa and strengthening local health systems. Touch's approach emphasizes the horizontal strengthening of the overall health system. Touch's strategic priorities focus on training new and existing healthcare workers (HCW), influencing national HCW deployment and retention policies, non-communicable disease control, maternal and newborn health, and the *Treat & Train* Network.

The *Treat & Train* Network, one of Touch's five health systems strengthening priorities, strives to improve the capacity and management of health professional education institutions and local and regional healthcare facilities in Tanzania's Lake Zone. The Network connects the education institutions in Mwanza with urban and rural-based health facilities, strengthening their coordination and communication processes, and, ultimately, the quality of health workforce training and patient care.

### 1.2 The *Treat & Train* External Clinical Rotations Program

Illustrated in Figure 1, the *Treat & Train* Network was established in 2011 in close collaboration with the Catholic University of Health and Allied Sciences (CUHAS), and the major tertiary referral and teaching hospital Bugando Medical Centre (BMC). Prior to 2011, Touch undertook a seven-year period of intensive support for these flagship institutions involving extensive infrastructure, didactic and clinical educational resources and operational support provided to three Network hospitals. The implementation of the *Treat & Train* program extended the training of Assistant Medical Officer (AMO) students, Medical students and Nursing students from the tertiary referral hospital BMC to the urban Sekou Touré Hospital and the rural Sengerema Hospital in 2012 and to the rural Shinyanga Hospital in 2015.

The *Treat & Train* program aimed to provide Medical, Nursing and AMO students enrolled in education programs at these institutions with more hands-on experience and patient exposure at

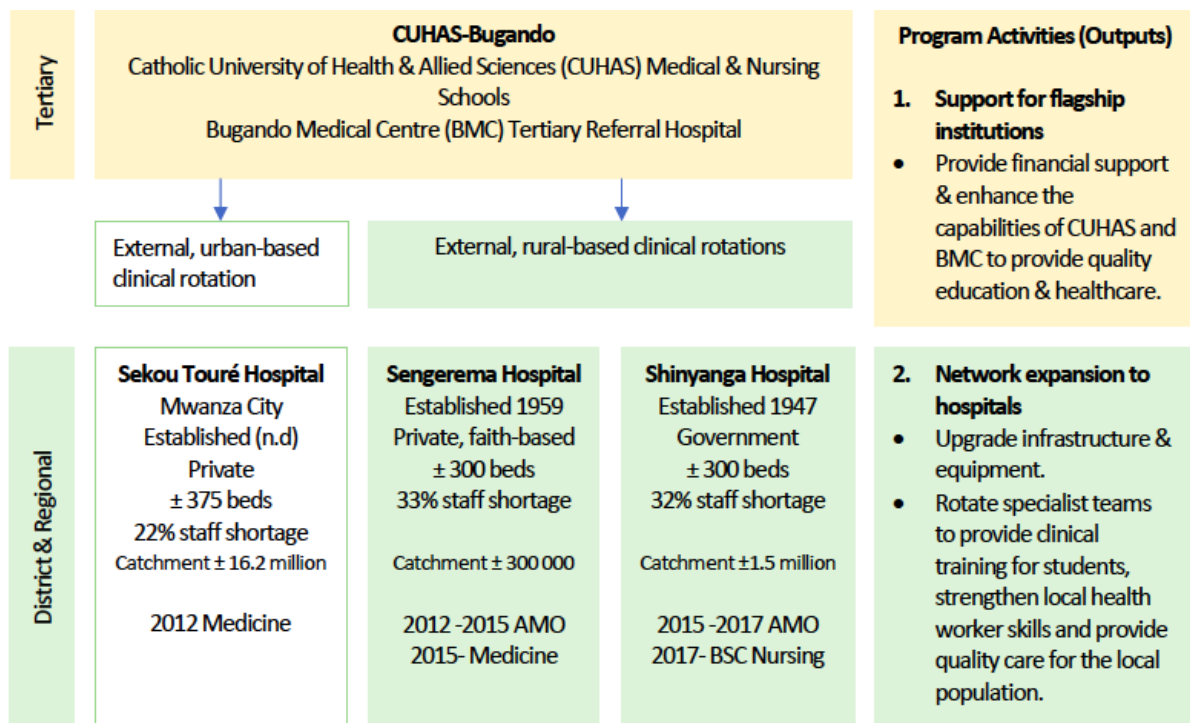
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<sup>1</sup> This is the abbreviated version of the full report that is available at [www.touchfoundation.org/our-work/knowledge-sharing/](http://www.touchfoundation.org/our-work/knowledge-sharing/)

smaller and rural hospitals with high patient volumes. Teams of CUHAS and international specialists were rotated and/or posted to these hospitals to support the clinical training of students and treatment of patients. Other maternal and newborn health interventions were integrated into the *Treat & Train* program in order to leverage and strengthen existing investments. The hypothesis was that this would improve the quality of education, increase the likelihood that graduates would practice in underserved rural areas, and improve the quality of patient care.

Funders of the *Treat & Train* program included Vitol Foundation, the United States Agency for International Development (USAID), The ELMA Foundation, Gilead Sciences, and private donors.

**Figure 1. *Treat & Train* Network's External Clinical Rotations Program**



Between 2012 and 2018 a total of 914 students (177 AMO students, 53 Nursing students and 684 Medical students) participated in the external clinical rotations program with all the AMO and Nursing students (for a total of 230) and 200 (31%) of the 684 Medical students benefitting from rural exposure at either Shinyanga Hospital or Sengerema Hospital.

## 2. Evaluation Approach

The purpose of this evaluation was to provide Touch Foundation program stakeholders with an independent assessment and evidence of the impact of the *Treat & Train* external clinical rotations program. This analysis used an evaluative SROI approach to describe and quantify the value of outcomes associated with the *Treat & Train* external clinical rotations program investment across selected hospitals in the Lake Zone with regards to teaching and hospital infrastructure, equipment, clinical supplies, staff training, student and faculty housing, and Specialist, clinical

preceptor, and training coordinator positions. The scope of this evaluative SROI is described in Section 3.

The SROI evaluation followed the standard protocol for an exploratory mixed-methods 'instrument development' approach which involved conducting qualitative interviews with key stakeholders during the initial exploratory field visits to identify all significant outcomes experienced by the respective stakeholders. This qualitative information was incorporated into student surveys and later a hospital-focused audit.

### **3. The Social Return on Investment (SROI) Analysis of the *Treat & Train* External Clinical Rotations Program**

SROI analysis measures social, environmental, and economic change from the perspective of those who experience or contribute to it (the 'stakeholders'). Through the use of financial proxies, a monetary value is applied to represent each change measured, and the resultant financial value is then adjusted to take account of other influential factors. In this way, the overall impact of each *Treat & Train* program activity is calculated and the value generated compared to the investment in all activities.

While a SROI analysis will provide a headline cost-to-benefits ratio, it also delivers a detailed narrative that explains how change is created and the impacts evaluated. Thus, SROI is more than just a number; it is a story about change, on which to base decisions, as told through qualitative, quantitative, and financial information.

#### **3.1 Scope of the SROI Analysis**

The scope of this evaluative SROI analysis was to calculate the social return-of-investment to key stakeholders in 2018 to 2020 from the main *Treat & Train* program activities implemented between 2012-2018 at the external clinical rotation sites of Sengerema and Shinyanga Hospitals. The *Treat & Train* program activities were aimed at improving the:

- Quality of Medical and Nursing student education,
- Local deployment and retention of Medical and Nursing graduates,
- Quality of in-service health professional training, and
- Delivery of local health services.

The *Treat & Train* program was designed and implemented with the goal of complete sustainability by 2018 by ensuring its adoption by the CUHAS education institution and the BMC, and Sengerema and Shinyanga Hospitals. While the activities developed and implemented at Sengerema and Shinyanga Hospitals through the *Treat & Train* program will be funded and maintained by CUHAS from 2018 onwards, and the social and economic benefits will continue to be experienced by stakeholder groups for many years, this SROI ratio will be calculated for 2020 for *Treat & Train* program inputs between 2012 to 2020, as the key activities can no longer be considered *Treat & Train* program activities due to the varying of inputs and outcomes from 2020 onwards.

## 3.2 Theory of Change

SROI is based on the theory of change that describes how the inputs and outputs of the *Treat & Train* program result in outcomes (changes) for each stakeholder group. The theory of change tells the story of how stakeholders are involved with the *Treat & Train* program activities and resources, and their perception and belief of how their lives have changed as a result. Please see Figure 2 for a schematic illustration of the *Treat & Train* program's Theory of Change.

### 3.2.1 *Treat & Train* Program Inputs & Outputs

The items invested at Shinyanga Hospital for AMO and Nursing programs and at Sengerema Hospital for Nursing and MD programs by the *Treat & Train* program from 2012 to 2020 were valued at a sum total of US\$4 834 946. Investments at the sites focussed primarily on constructing and equipping student hostels and classrooms (US\$542,460,99), purchasing general hospital clinical equipment for improved patient care and teaching (US\$76,950,79), hospital infrastructure at Sengerema (US\$54,190), supporting external clinical rotations operational costs for faculty and students (US\$198,111,36) and at Sengerema and Shinyanga Hospitals currently (US\$130,601,13) and into 2019 and 2020 (US\$188,417), purchasing specific clinical teaching equipment, supplies and consumables (US\$11,828), employing Site Coordinators and Scribes (US\$79,560), supporting CUHAS faculty and Clinical Preceptor training (US\$25,371,97), employing International Specialists and Nurse Educator faculty (US\$636,768,30), and program costs, services, personnel, travel, meetings and donated services (US\$2,890,677,97).

The outputs describe all the relevant activities resulting from the inputs (investments), which then lead to intermediate and longer-term outcomes for the stakeholders. All intermediate and longer-term outcomes are consistent between both Sengerema and Shinyanga Hospitals and confirmed by two or more stakeholder groups in the consultation process. All the outcomes reported were positive, except for one issue related to staff concerns regarding compensation.

### 3.2.2 *Treat & Train* Outcomes Valued by Stakeholders

Stakeholder groups were interviewed via key informant interviews (KII) and focus group discussions (FGD) at the *Treat & Train* program sites to identify and better understand the nature of the outcomes they had experienced resulting from the external clinical rotations program. Eight key stakeholder groups, involving 402 people, were included in this analysis:

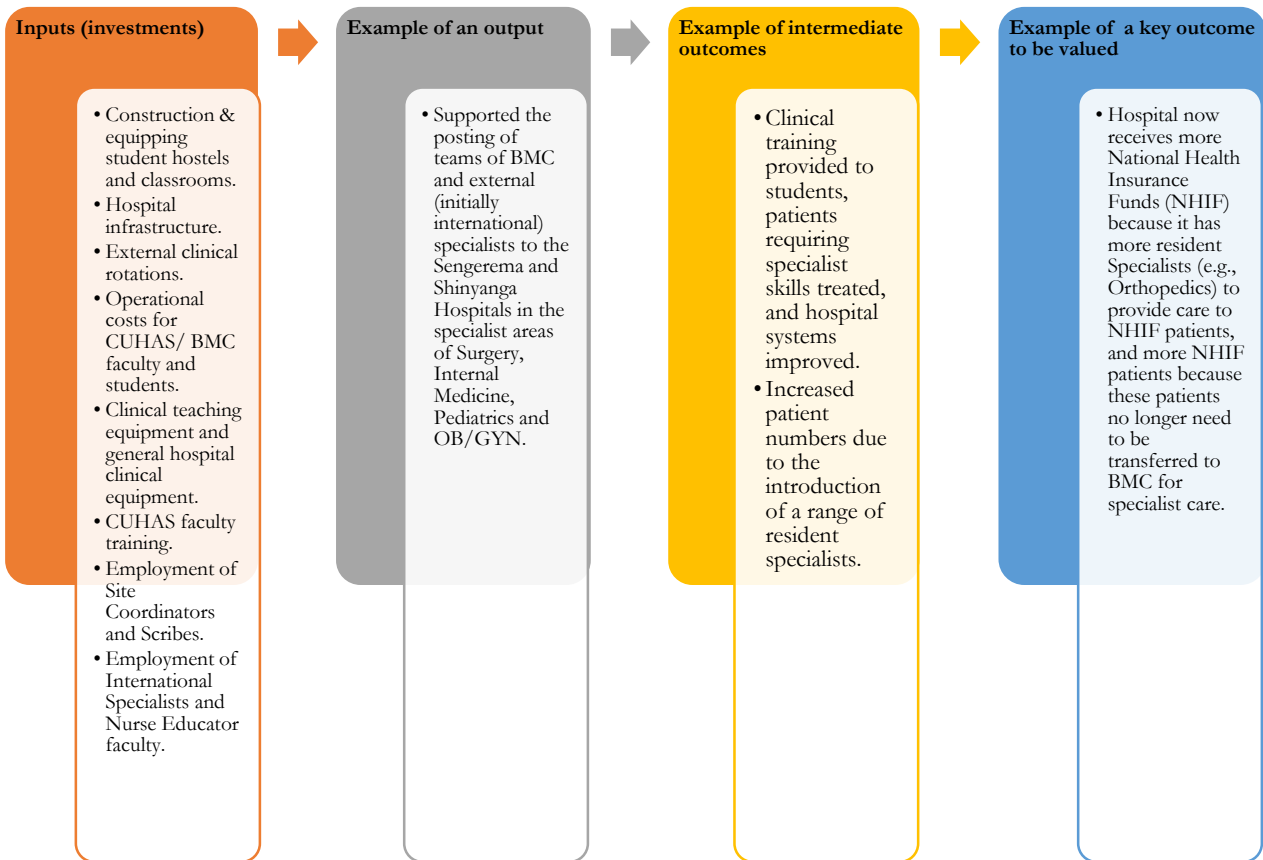
1. The *Treat & Train* Senior Technical Adviser, Tanzanian in-country *Treat & Train* program team (implementing partner representative),
2. Hospital leadership at two rural hospitals (Sengerema Hospital and Shinyanga Hospital),
3. General in-patients at Sengerema Hospital and Shinyanga Hospital,
4. In-patients at Sengerema Hospital and Shinyanga Hospital requiring specialist care,
5. Women giving birth at Sengerema Hospital and Shinyanga Hospital,
6. Mothers of neonates at Sengerema Hospital and Shinyanga Hospital,
7. 3<sup>rd</sup> and 4<sup>th</sup> year CUHAS Nursing students, and
8. 3<sup>rd</sup> and 4<sup>th</sup> year CUHAS Medical students.

Presented in Table 1, thematic analysis of interviews revealed the six key outcomes for hospital, patients, and student stakeholder groups used in the subsequent quantitative data collection and SROI valuation process. The outcomes were discussed and confirmed with funder, hospital and patient stakeholder groups during the second field visit.

**Table 1.** Treat & Train Program Key Outcomes Reported by Stakeholders to be Valued

Key outcome to be valued	Illustrative quote from stakeholder
<b>Hospital now receives more National Health Insurance Funds (NHIF)</b> because it now has more resident Specialists (e.g., Orthopedics, Obstetrics) to provide care to NHIF patients, and more NHIF patients because these patients no longer need to be transferred to BMC for specialist care.	“Because we now have four specialist [resident] doctors [note: one of the four specialists is a direct outcome from the <i>Treat &amp; Train</i> program activities, and three indirect] collections from the NHIF funds have increased through specialist consultation services and procedures offered to NHIF members by our specialist doctors” ( <i>Senior management, Sengerema Hospital.</i> )
<b>In-patients now receive quality specialist support</b> (from resident and visiting specialists) and quality general care (from a high number of later year Medical and Nursing students on the wards), as well as more clinical resources, hospital equipment (e.g. resuscitation equipment, ventilators) and Infection Control infrastructure.	“The care has really been improved. Before we used to come here for delivery service and no nurse even cares for you, they just pass you while you are there on the ground, but nowadays they get to attend you on time and you get timely care.” ( <i>Relative of a mother with a newborn baby at Sengerema Hospital.</i> )
<b>Reduction in maternal mortality and morbidity</b> , as now pregnant women with a high likelihood of having a difficult birth can receive quality care and (if needed) accommodation, specialist Obstetrics support, and delivery/surgery in a well-supplied Emergency Obstetrics Theatre.	“This is my 6th babe and it is my first C-section, I can say the care has really been improved, they are giving me a close monitoring. I give them 10 out of 10 for the quality care.” ( <i>Woman who had obstetric complications and C-section delivery at Shinyanga Hospital.</i> )
<b>Reduction in neonate mortality</b> due to new Obstetrics specialists, non-specialist clinicians trained in Emergency Obstetrics, and a new Emergency Obstetrics Theatre, & NICU unit.	“You know, before we did not have skills on child resuscitation, we were doing it wrongly which contributed to complications among babies, but since we got that knowledge, complication cases have been reduced.” ( <i>Nurse, Shinyanga Hospital.</i> )
<b>Increase in the number of patients who can remain at the hospital</b> to receive quality specialist care & avoid to travel to Bugando Medical Centre (BMC).	“Before <i>Treat &amp; Train</i> the cost we used to transfer pregnant women was high, because you have to transfer her with a nurse, we were using like 500,000tsh per trip. In a month we used to transfer at least 5 women to BMC but now you can find the referrals have cut down up to like 2 women in 3 months.” ( <i>Senior management, Shinyanga Hospital.</i> )
Senior year CUHAS Medical and Nursing <b>students</b> have greater confidence/ work readiness after external rural hospital rotations.	“The experience I gained in Sengerema Hospital would have taken me 1 year at BMC or I would have never gained such an experience at BMC, because in Sengerema Hospital we were given trust and got treated like the full doctors.” ( <i>5<sup>th</sup> Year Medical intern, male, reporting on experience during 4<sup>th</sup> year.</i> )

**Figure 2.** Illustration of the *Treat & Train* Program Theory of Change



#### 4. Evidencing the Outcomes

This section briefly outlines the collection of quantitative data and summarises qualitative and quantitative evidence supporting the key outcomes.

##### 4.1 Outcomes Survey to CUHAS Nursing and Medical Students & Hospital Audit Data

Both online and in-person surveys were given to CUHAS 3<sup>rd</sup> Year Nursing and 3<sup>rd</sup> and 4<sup>th</sup> Year Medical students who undertook external clinical rotations. The surveys were developed based on students' comments during the FGD and from previous studies in the literature evidencing rural health workforce outcomes from undergraduate training in rural health facilities. A total of 229 Medical and 86 Nursing students completed the surveys, with response rates for each survey being: 3<sup>rd</sup> Year Nursing (42 out of a class of 49); 4<sup>th</sup> Year Nursing (44 out of a class of 48); 3<sup>rd</sup> Year Medical (192 out of a class of 245); 4<sup>th</sup> Year Medical (37 out of a class of 144). Not all respondents, however, completed every question in the survey. The evaluation team visited Sengerema and Shinyanga Hospitals and conducted in-person interviews with the Medical Officer In-Charge and other hospital staff members and viewed hospital records to obtain information about hospital data before and after the *Treat & Train* program.



## 4.2 Qualitative & Quantitative Evidence Supporting Key *Treat & Train* Program Outcomes

The overall aim of the *Treat & Train* program is to improve the education and training of CUHAS Nursing and Medical students in the Lake Zone of Tanzania while at the same time providing better healthcare to the local population. The qualitative and quantitative findings provide strong evidence that the *Treat & Train* program has achieved its key intended outcomes:

- Expansion of the CUHAS clinical training programs to the Shinyanga and Sengerema Hospitals has successfully provided students with patient experiences and supervision to improve their clinical competencies and confidence for practice in more remote and low-resource environments. This had the simultaneous effect of reducing student congestion and enhancing student learning experiences on the hospital wards at BMC, thus improving the quality of Medical and Nursing undergraduate training at CUHAS overall.
- The external clinical rotations increased Medical and Nursing students' access to patients and hands-on training, increasing both their readiness to practice independently in any Tanzanian health facility and their willingness to accept postings in rural and poorer areas.
- The findings suggest in-patients and staff at the Shinyanga and Sengerema Hospitals now experience improved hospital facilities, equipment and resources. In particular, through the secondment of specialists and through the presence on the wards of the students themselves, hospital staff upgraded their skills through interaction with CUHAS-BMC faculty and CUHAS students. In addition, in-patients now receive more quality healthcare from rotated specialists and from hospital staff with strengthened clinical skills, and from improved hospital facilities and new and repaired equipment.
- The evidence identifies increased external funding (e.g., from insurance payors) for the Sengerema Hospital since the *Treat & Train* program was implemented as a result of having specialists available to provide care. It also found better outcomes for patients, in particular for the various in-patient groups requiring the types of specialist care that rotated specialist staff can provide, and reductions in maternal and neonatal mortality and morbidity rates. Finally, fewer patients needed referral from Sengerema and Shinyanga Hospitals to tertiary referral hospitals such as BMC.

## 5. Valuing Outcomes: General Principles & Processes Used in Evaluation

Calculating the social return-on-investment from an intervention requires assigning a financial proxy to represent the social and financial value created by each outcome for stakeholders. The financial proxies used in this analysis are a combination of costs of publicly available economic goods and services in Tanzania, and secondary research utilizing existing studies that may or may not have been undertaken in Tanzania. Two illustrative examples are below, and the complete description of key stakeholder outcomes and valuations can be found in the full report.

For the hospital stakeholder group, National Health Insurance Fund (NHIF) had increased significantly since the *Treat & Train* program began. Sengerema Hospital realized an increase to US\$104,723 from US\$42,983 and Shinyanga Hospital to US\$161,911 from US\$44,655. This is due

to an increase in NHIF patients coming for specialist care (e.g., Orthopedics, Obstetrics) because of the availability of resident specialists, and many more non-NHIF patients who, prior to the *Treat & Train* program, would have had to travel to BMC for the same care. Adjusting for inflation and attribution from other factors, this created a value of US\$74,074 for 2018. Similarly, for the patient stakeholder group, approximately 10,272 general in-patients at Sengerema and Shinyanga Hospitals now receive quality specialist care (from resident and visiting specialists) and quality general care from a high number of senior Medical and Nursing students. Comparing the cost of four days admission in a rural district hospital (US\$13) with four days admission in BMC specialist hospital (US\$138) and adjusting for inflation and attribution from other factors, creates a value of US\$83,468 for this patient stakeholder group requiring specialist care in 2018.

## 6. Summary of Findings

This section presents a summary of the overall social and economic value created for various stakeholder groups by the *Treat & Train* program, as well as factors relating to the sources of success and potential for program improvements.

### 6.1 Calculation of the Social & Economic Value of the Key Outcomes

Each outcome that the stakeholder experienced has been valued, considering deductions to avoid over-claiming. These individual values have been added together to create an estimated total value by the year 2020 of **US\$7,980,110**, and then compared with the existing and estimated *Treat & Train* program investment of **US\$4,834,946** from 2012-2020. Thus, the analysis shows a social return on investment of around **US\$1.65 by the year 2020** for every US\$1 invested, based on the assumptions set out in this section, with a high degree of confidence that between US\$1.05 and US\$2.49 of social and economic benefits will be created by 2020 for every US\$1.00 invested.

However, the *Treat & Train* program was designed and implemented towards the goal of complete sustainability by ensuring the continuing support of the local partner sites. Therefore, student and specialist rotations from CUHAS-BMC will continue without Touch Foundation's support for a minimum of two more years, while Sengerema and Shinyanga Hospitals have acknowledged funding will continue indefinitely for employing their resident specialists and for maintaining hospital equipment and infrastructure. The SROI analysis shows continued social and economic benefits to stakeholder groups of approximately US\$2,500,000 or more for 2019 and 2020, and likely to continue post-2020. Thus, the *Treat & Train* external clinical rotation program will show social and economic benefits to stakeholder groups in the Lakes Zone for many years to come.

In addition, while this SROI analysis shows the most immediate and most significant benefits are to the patients who present at Sengerema and Shinyanga Hospitals, there will be significant longer-term benefits to the Tanzanian health system from the Medical and Nursing students' increased competencies and willingness to work in more remote and poorer regions of Tanzania, that were outside the scope of this analysis. Lastly, significant benefits were also identified but not valued for several other stakeholder groups from the *Treat & Train* program – patients with HIV, AMO students, and resident non-specialist doctors and nurses at Sengerema and Shinyanga Hospitals. It

must also be noted that the stakeholder groups included in this SROI analysis were only valued for their most important benefit; thus, there is a significant under-reporting of the range of stakeholders benefitting from the *Treat & Train* program, and the range of benefits experienced by key stakeholder groups.

## 6.2 Key Areas of Success

The SROI analysis found clear evidence of the *Treat & Train* program using their investments to leverage additional investment from other international development organizations to further build infrastructure, purchase specialist equipment, provide training and develop interventions to improve maternal and child health at Sengerema and Shinyanga Hospitals. The combination of leveraged external investments and direct *Treat & Train* support for regular student and specialist rotations to these sites have combined to significantly boost improvements in the quality of health service training and delivery at the external rotation clinical training sites, as well as improvements in the quality of medical and nursing education overall in the CUHAS curriculum. The survey data also suggest positive effects for the local deployment and retention of graduates in the rural and underserved areas surrounding Sengerema and Shinyanga Hospitals.

### 6.2.1 Improvements in the Quality of Health Service Training & Delivery at External Clinical Rotation Sites

- Ninety-eight percent (98%) **reduction in patients requiring specialist care** having to be transferred to BMC in Mwanza, significantly reducing costs for both the patients and the hospitals. It is possible that a proportion of these patients would not have been able to afford the travel and admission to BMC to receive the treatment needed.
- Patients saw noticeable **improvements in the quality of patient care** due to the hospitals having regularly rotating specialists and students, resulting in improvements in hospital systems and procedures and the upskilling of non-specialist doctors and nurses.
- A **significant reduction in maternal and neonatal mortality and morbidity rates** at Sengerema and Shinyanga Hospitals, with rates of maternal complications after delivery and neonatal mortality dropping to less than one third of what they were before the infrastructure, equipment, training and Specialist staff investments by the *Treat & Train* program, and of other health development programs that leveraged the *Treat & Train* program.

### 6.2.2 Improvements in the Quality of Medical & Nursing Education

- CUHAS Medical and Nursing students received a much **higher quantity and quality of one-on-one training** that significantly increased their clinical confidence and skills and readiness for independent and team-based practice across the range of Tanzanian health services.

*“The experience I gained in Sengerema Hospital would have taken me 1 year at BMC or I would have never gained such an experience at BMC, because in Sengerema Hospital we were given trust and got treated like the full doctors.”*  
(Medical student)

*“It has given me confidence and competent of working [sic] as a nurse and by applying teamwork in providing health services to patients as a nurse I feel more valuable.”* (Nursing student)

- The activities of the *Treat & Train* external clinical rotations model that students value highly resonate with best practice recommendations for increasing the proportion of Medical graduates selecting rural practice locations (Pfarrwaller et al., 2015). Accordingly, *Treat & Train* offers 10 to 16 week **rural clinical training placements**, follows a local community health needs curriculum with **diverse clinical learning experiences**, and is concerned with both the **quality of teaching and service delivery**.

*“Because you get enough time to spend with specialist and patient, because of good attitude of workers in the peripheral hospital.” (Medical student)*

*“Students learn to work under limited resources, this helps them develop critical thinking and cooperating [sic] skills in order to provide care.” (Nursing student)*

- The *Treat & Train* program offers students **high quality clinical placements and a positive learning environment**. Students have the opportunity to see a variety of patients and follow up with them over time, and to participate in structured teaching sessions with good quality feedback from clinical preceptors. Additionally, literature in the area of factors associated with students' satisfaction with their clinical rotations shows that satisfaction increases when rotations are well-organized and academic teachers, clinical preceptors and specialists willingly provided hands-on clinical teaching and support.

*“You know, before we did not have skills on child resuscitation, we were doing it wrongly which contributed to complications among babies, but since we got that knowledge, complication cases have been reduced.” (Nursing student)*

### 6.2.3 Positive effects for the local deployment and retention of Medical and Nursing graduates in rural and underserved areas

- In addition, after completing the 10 to 16-week external clinical rotation in a supportive rural hospital environment, both Medical and Nursing students reported a 50% increase in their willingness to work in more remote and/or poorer areas of Tanzania. Two-thirds cited in response to the open-ended question *“Can you explain why you wish to return to practice in your external rotation site?”* that they wished to continue building their competencies and confidence in treating commonly occurring health conditions, the positive learning environment with the local clinical preceptors, and a willingness to improve the access to healthcare for low-resource rural patients (i.e. increased altruism).

*“To increase manpower since there is insufficient co-workers and to contribute my skills to the remote hospital.” (Nursing student)*

*“To learn how as a new doctor can work in resource limited settings, also, it gives us experience of how other communities live.” (Medical student)*

- Although we cannot say with certainty that graduates undertaking the *Treat & Train* external clinical rotations are more likely to practice in rural areas than their counterparts who are not exposed to these rotations, we can confidently make this assumption based on research outcomes in this field. However, deployment and retention is influenced by a range of individual and systems factors such as: conducive and safe living conditions for staff and family; emotional and financial costs of separation from families; the availability of funded

posts at facilities in remote areas; increased work load without compensation; under-resourced and poorly-equipped health facilities; and limited opportunities for further study.

- While the *Treat & Train* program does not directly address the issue of professional retention in rural areas, it does, through the external clinical rotations, the provision of staff housing, better resourced facilities, stipends for clinical preceptors and opportunities for further study, create the conditions for retaining graduates and specialists in these areas and to this extent, the *Treat & Train* faculty activities align with the evidence on health workforce retention strategies.

### 6.3 Factors Underlying the Success

- The *Treat & Train* program was leveraged by other health development programs to provide the larger capital investments of infrastructure and equipment conducive for quality staff training, student learning and patient outcomes in a low-resource environment.

*“As a benefit I can say neonatal mortality has been reduced because of the availability of NICU and the new knowledge we got from the trainings.” (Clinical nurse)*

- Students felt more confident and skilled after their external rotation. Survey and interview data suggest that the rotations allowed students much greater access to patients (often who had not yet been diagnosed) as well as one-on-one learning time with well-trained, experienced and enthusiastic supervisors; all of which are much harder to experience in the BMC rotations but vital in order for students to transition into confident, independent practitioners.

*“In Sengerema, specialists have few students to teach, which gives them one to one teaching moments and they even know each of their students' strength and weakness, they get to help them according to their needs different from BMC where there are a lot of students.” (Medical student)*

- While the *Treat & Train* program has provided quality learning experiences to the CUHAS students, it has also managed to keep the ongoing operating costs of the specialist and student rotations to the external sites reasonably low. This has resulted in CUHAS leadership now recognizing that the external clinical rotations are a key and affordable teaching activity in their Medical and Nursing curriculums. They have stated these rotations will be supported in the longer term.

## 7. Recommendations

- This evidence supports the scale-up and/or replication of the *Treat & Train* model of integrating undergraduate health professional training with healthcare improvements in rural and/or under-served district hospitals across other regions in Tanzania, as well as in other countries of similar contexts facing health workforce constraints and in need of a well-trained altruistic workforce.
- The data shows the importance of obtaining regular student feedback for continuous improvement, and to bring to light any potential challenges such as gender imbalances in student learning. While the *Treat & Train* program has overall achieved a high level of gender

equity across essential clinical experiences at the external clinical rotation sites, male Medical students do have higher levels of participation in non-clinical activities. As part of the quality improvement process, CUHAS leadership could improve the 'gender climate' by offering male and female students and clinical preceptors structured opportunities for reflection on their own experiences of the ways gender impacts their participation in case presentations and leadership activities, and personal and system measures for changing the 'gender climate'.

## 8. Limitations of the SROI analysis

The main potential source of bias for this evaluative SROI analysis is the relatively low sample size of the qualitative data, with the numbers interviewed being very low in proportion to the overall population in the stakeholder group. This reflects both the large numbers in most of the stakeholder groups, the difficulties in accessing patients on hospital wards, and the difficulties in accessing students during end-of-year exams and end-of-year university break. Thus, while the respondents in the qualitative component very clearly identified they had experienced the major benefit ascribed to their stakeholder group, the accuracy of the averaged percentage attribution value for each major benefit may be uncertain. In addition, the survey response rates in the CUHAS Year 4 Medical student cohort was low (approximately 20%), as they had begun university break at the time of data collection. However, surveying the students at the end of the year after they had experienced rotations at the external clinical rotation hospitals and BMC allowed the study to obtain a well-rounded perspective from responding students regarding the advantages and disadvantages of each rotation.

The main limitation of the SROI valuation of key outcomes is that the valuation is calculated for up to the year 2020, while most of the changes will continue for many years after. This is particularly true for longer-term outcomes with hard to define benefits, such as the external clinical rotations in the rural hospital setting, where a significant number of students had increased willingness to work in more remote and lower-resource areas of Tanzania. In addition, the SROI value of the *Treat & Train* program is likely to significantly under-state the true SROI to the various stakeholders. This is due to the exclusion of several other stakeholder groups to avoid over-claiming the value of shared key outcomes.

## 9. Conclusions

These SROI evaluation findings provide strong evidence that the *Treat & Train* program of integrating undergraduate health profession training with healthcare improvements in external rural hospitals has been successful in providing significant value for both student and patient stakeholder groups.

The findings support the scale up and replication of the program across other similar geographies. The effectiveness of the *Treat & Train* program in providing quality learning experiences to students is underpinned by the strength of its partnership with CUHAS. Through this partnership, CUHAS now recognizes that external rotations to lower level Hospitals are a key teaching activity in the CUHAS Medical and Nursing curriculums. As a result, CUHAS has already assumed

ownership and oversight of the MD rotations to Sengerema Hospital and plans to assume responsibility for the Shinyanga Hospital Nursing rotations in April 2019. Thus, the *Treat & Train* program's strong partnership with CUHAS, together with a commitment to containing the operating costs, has resulted in the long-term sustainability of these external rotations at CUHAS.

In addition, the *Treat & Train* program leveraged investments from other organizations and health development programs (i.e. infection control and maternal and newborn health equipment, infrastructure and specialized staff training in the hospitals) that has not only contributed to quality student learning and good patient outcomes in these low-resource environments, but likely exponentially improved the overall impact of the *Treat & Train* program.