



Surgical Training Program Kirurgisk opptreningsprogram

April 2018

Annual Activity Report
2017

 **NTNU**
Norwegian University of
Science and Technology



Summary

In 2017, our **level of activity in Sierra Leone was the highest** since the initiation of the programme in 2011. A total of 34 trainees participated or **performed more than 5300 surgical procedures**, while 18 graduates performed more than 2500 operations. Most operations conducted by the graduates were emergencies performed at district hospitals and almost **80% have been done independently**. This is a considerable contribution to surgical healthcare delivery in Sierra Leone.

Quality of the surgical care offered by our graduates have been high priority since the initiation of the programme. To achieve quality after the training, we put a lot of effort into **selecting the best available** candidates to be trained. Before acceptance into the programme, potential trainees are assessed for a wide range of personal abilities and skills. The training itself is structured in modules and the same modules are thought every year. Many of the **trainers return regularly** and new trainers are always matched with experienced ones. Through the personal logbook system, we are able to **monitor performance** and to some extent outcomes of surgeries performed both during training and after graduation. A thorough analysis of those results were presented and discussed at my PhD defence in September 2017 and found to be a valid evaluation of the programme. Ahead of the defence, CapaCare organized a **global surgical symposium** with more than 20 international speakers, some attached to the Surgical Training Programme. Others were external invitees, many whom are **among the most influential global surgical academics**.

Measuring quality of care offered by single surgical providers are challenging anywhere in the world, and Sierra Leone is no exception. Compared to previously measured outcomes after surgery from hospitals in Sierra Leone and comparable low-income countries, our trainees and graduates **have documented morbidity and mortality outcomes similar or at times improved**. In 2017, CapaCare board member Alex van Duinen completed a yearlong data collection where he for 12 months followed up 1,276 women undergoing caesarean section. The women included in the study were drawn from the nine governmental hospital were both CapaCare graduates (Surgical Assistant Community Health Officer – SACHO) and medical doctors both perform surgery. The preliminary findings demonstrate that the previously described **low postoperative morbidity and mortality of operations performed by the SACHOs can be reproduced**. This allows us to conclude that in hospitals with both SACHOs and medical doctors, the graduates of the CapaCare programme in Sierra Leone now perform more of the emergency caesarean sections than the Sierra Leonean medical doctors do, and that the outcomes are similar. Those findings suggest that surgical task sharing, as introduced with the presented training scheme, is a **safe strategy for expansion of the surgical workforce** in Sierra Leone.

We are proud of those results and have **many to thank for this achievement**. First and foremost, the motivated trainees and graduates, our volunteer international specialist trainers and in particular our main financial contributors, the United Nation Population Fund (UNFPA) in Sierra Leone and the Norwegian Development Agency (NORAD). We also want to thank the Ministry of Health and Sanitation for a good collaboration, and absorption of the graduates in governmental services at the completion of the programme.

But, there are **considerable challenges ahead**. Our main concern still is the **lack of financial remuneration** for the graduates, which is a threat to the sustainability of the whole group, and in particular retention in governmental service. Another concern is the **lack of legal protection and formal regulation** of medical activity performed by the Community Health Officer cadre. CapaCare will continue to advocate for those issues, and also seek assistance among stakeholders for this to be fulfilled.

Trondheim, Norway,
April, 2018



Håkon Angell Bolkan
Chairman CapaCare

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Students during skills training in the skills lab.

About CapaCare

CapaCare is a **member-based** non-governmental organization registered with the Norwegian Central Coordinating Register for Legal Entities, "Brønnøysundsregistret", organization number 992100125 with headquarters in Trondheim, Norway. The Annual General Meeting functions as CapaCare's highest authority.

CapaCare's purpose is to train medical professionals in areas where there is a shortage of such personnel. The International Board is responsible for the association's operations and management of finances between Annual General Meetings. The board hires consultancies for finance management. All positions on the Board are voluntary and there are no paid honorariums for board work. The board was strengthened with two new board members in 2017.

Since 2015, a local organization, **CapaCare Sierra Leone** (CapaCare SL) have been registered at the ministry of Finance and Economic Development under reg. no. INGO/164/2015. The purpose of the organisation is to oversee CapaCare's activities in Sierra Leone and to advise both the local management in Masanga and the international board. CapaCare SL also works to, locally raise funds and recruit health professionals in Sierra Leone to accomplish this purpose. The organisation actively **promotes increased access to emergency surgical and obstetric care** in Sierra Leone by strengthening national human resources for those services.

CapaCare SL is overseen by a board which consist of two board members from CapaCare Norway, a representative of the STP student association and two external board members, a minimum of one representing the Ministry of Health and Sanitation. CapaCare's program coordinator acts as a secretary of the CapaCare SL board and is the main responsible for the implementation of CapaCare's work in Sierra Leone.

In 2017, the second Annual General Meeting since the inauguration was held. A new external board member by the name of Emile Koroma (**Deputy Director HR, MoHS**) was elected, bringing the total number of board members up to six (four members with a Sierra Leonean nationality).

CapaCare-raison d'être

The basic underlying principle of CapaCare's activity is **transfer of medical skills**, to make our beneficiaries able to cope on their own. Our approach to achieve this can roughly be divided into three phases; **initiation, consolidation and handover**. The first phase is driven by expat consultant doctors and nurses on short-term missions in close collaboration with our organization in, in this case, Sierra Leone. An essential element is **close collaboration with local authorities**, both in medical and administrative terms. This collaboration is essential, and has to be developed through the consolidation phase, where we currently find our surgical project in Sierra Leone.

The program is intended to be **integrated in the national health care structure**, forming the basis of a future handover and making the program independent from outside assistance. Such a handover is currently not possible but may be within a few years. Even though CapaCare is working to make itself superfluous, this is not likely to happen in the foreseeable future in Sierra Leone. Even after handover, some support will probably be needed for the programme to continue in one way or another. The plans for new programs are also being implemented, within other clinical areas in Sierra Leone and in other countries.

The growth of CapaCare, in terms of programs and in sheer economic volume necessitates an **organizational remodeling**. The organization has developed in an ad-hoc manner from the modest start in 2011. There is a manifest need of a better defined structure and lines of command and responsibility. This work is under way and will be a priority the next two years. Hopefully, this will create a foundation to take CapaCare into a bright future!

Organization

For 2017, the following organogram depicts the organisation in Sierra Leone (Figure 1). Management capacity remained stable.

The program in Sierra Leone is expanding continuously. The main aim is still to train 60 Surgical Assistant Community Health Workers (SACHOs) by 2021 in partnership with the Minister of Health and Sanitation (MoHS) and United Nation People Fund (UNFPA). In addition, training of medical doctors and continuous professional development of the SACHOs will be prioritized. Therefore, it is necessary to further strengthen the capacity of the local management in Sierra Leone in 2018.



a. Håkon A. Bolkan (chair)
 b. Oversees CapaCare Sierra Leone
 c. Daniel van Leerdam, Martelien Grootjans
 d. Mohammed John Turay
 e. Francis S. Vandy

f. Samuel M. Sankoh
 g. Trainees/housemanship/graduates
 h. Osman Conthe, Alpha Kargbo
 i. Rugiatu Koroma
 j. Usifu Kamara, Idrissa Bangura, Foday Jokai

Figure 1. CapaCare organogram 2017



Driver Alpha Y Kargbo on the way to Liberia



Francis S Vandy and Samuel Mathew Sankoh in the outdoor office

Surgical Training Program

Background

Sierra Leone is a republic in West Africa, bordering Guinea, Liberia and the Atlantic Ocean. It is categorized by the World Bank as a **low-income country**. The country, with roughly seven million inhabitants (census 2016), has been severely affected by **Civil War (1991-2001)**, and more recently by the **Ebola outbreak** (2014-2016). This has affected the whole population, and the effect is evident also in the health sector. Sierra Leone has an estimated maternal mortality ratio of 1360 death per 100 000 births – the world's fifth highest¹, which is in part due to lack of adequate surgical services.

Sierra Leone was the country **most affected** by the devastating West African Ebola outbreak. More than 14 100 infections and close to 4 000 deaths were the direct effects of the epidemic². As devastating as these effects were, there were also **indirect effects** in the form of unemployment, economic stagnation and collapse of the health care system. Health care workers were particular vulnerable to contracting Ebola. **Close to 7 % of the country's doctors, nurses, and midwives died of Ebola**³, which was 100 times higher than for the general population⁴. After the Ebola outbreak, substantial initiatives have been taken to rebuild the Sierra Leonean health care system and its human resources. Central among those are the Reproductive, maternal, new-born, Child and adolescent health strategy 2017-2021⁵, which is a priority area for the Government of Sierra Leone. The strategy states the important of task-sharing as an approach to increase access to emergency obstetric services.

Surgery in Sierra Leone

The **need for surgical care in Sierra Leone is pressing**. Prior to the Ebola outbreak roughly 1 in 4 people in Sierra Leone were in need of some form of surgical treatment, with a similar number of deaths requiring, but not receiving surgical care⁶.

More than **90%** of the estimated surgical need in Sierra Leone was **unmet before the Ebola outbreak**. Only 24 152 surgical procedures were identified in the country in 2012, corresponding to a national rate of 400 surgeries per 100 000 inhabitants⁷. This contrasts to high income countries with rates of 11 000 major surgeries/100 000 inhabitants annually⁸.

Hospitals in Sierra Leone experience a **glaring lack of qualified surgical providers**, with only a handful of specialists. In 2012, there was a total of 164 full time equivalent positions of national and international health care providers (all categories included: surgeons, obstetricians, ophthalmic specialist, ENT specialist, non-specialist medical doctors, nurses, associated clinical staff) providing surgery across all sectors⁹. Only **a quarter of this total surgical workforce** and just one-tenth of the specialists **worked in the rural areas** where more than 60% of the population resides. The overall density of surgical providers was eight times higher in urban areas than in rural areas.

Scarcity of human resources is considered a main reason against expansion of surgical care. There is an **obvious need for innovative strategies** to address this largely unfulfilled need for surgery in Sierra Leone, particular the extensive shortages of qualified surgical providers outside the main urban areas.

1. Central Intelligence Agency. *The World Factbook – Sierra Leone*, 2016.
2. World Health Organization, *Ebola Situation Report - March 2016*
3. Evans et al., *The Lancet Global Health*, 2015
4. Kilmarx et al., *Morb Mortal Weekly Rep*, 2014
5. Ministry of Health and Sanitation, 2017
6. Groen et al., *Lancet*, 2012
7. Bolkan et al., *Surgery*, 2015
8. Weiser et al., *Lancet*, 2008
9. Bolkan et al., *World Journal of Surgery*, 2016.

Vision

The aim of the Surgical Training Program is to **increase the level of surgically-skilled health staff at district hospitals** in Sierra Leone. The goal of the program is **to train a total 60** Medical Doctors or Surgical Assistant Community Health Officers (SACHOs) by 2021, each for three years. We will provide the graduates of the Surgical Training Program **with knowledge and skills** to address the most common **surgical and obstetrical emergencies** that without treatment would lead to disability or death.

Training locations

Masanga Hospital has since the start of the programme been the home of the Surgical Training Program (STP) and is where the local management of CapaCare is based. All of the students commence their training in Masanga with a **theoretical and practical course in basic surgical skills**. After several weeks, they are introduced to the wards, out-patient-department and operation theatre. Half of the new students continue in Masanga hospital for seven months, while the other half are also partly located at Serabu Catholic Hospital in Bo district and in Lion Hearth Medical Centre in Yele.

After seven months, the students are introduced to the CapaCare partner hospitals, for three rotations of five to six months each. In this period, they will receive **further practical training** and gain experience in management of obstetric and surgical emergencies.

After successful completion of the rotations, the students are to take the **final oral and written examinations** at the end of year two, conducted by the Ministry of Health and Sanitation (MoHS) in collaboration with CapaCare. Upon graduation, the students enter a one-year housemanship stage (six months of obstetrics and six months of surgery) in the two largest tertiary governmental hospitals in Freetown. The housemanship is organized by the MoHS.

Fifteen of the surgically most active hospitals in Sierra Leone with experienced surgeons, obstetricians and/or surgically inclined Medical Officers were active **partners of the training program in 2017** (Figure 2). These partner hospitals are selected on the basis of their surgical capacity, coverage of supervision, and the availability of surgical tutors. The hospitals and their national and international staff have offered their premises to the program, ensuring that each candidate is exposed to the most highly-skilled tutors presently available in the country.

Overview partner hospitals:

■ Basic Training:

- 1) Masanga Hospital
- 2) Serabu Catholic Hospital
- 3) Lion Hearth Medical Centre, Yele

● Clinical Rotations

- 4) Makeni Governmental Hospital
- 5) Port Loko Governmental Hospital
- 6) Bo Governmental Hospital
- 7) Kenema Governmental Hospital
- 8) Magburaka Governmental Hospital
- 9) Koidu Governmental Hospital
- 10) Kabala Governmental Hospital
- 11) Magbenteh, Makeni
- 12) Aberdeen Woman's Clinic, Freetown
- 13) Kamakwie Wesleyan Hospital

▲ Housemanships (Government)

- 14) PCMH, Freetown
- 15) Connaught Hospital, Freetown

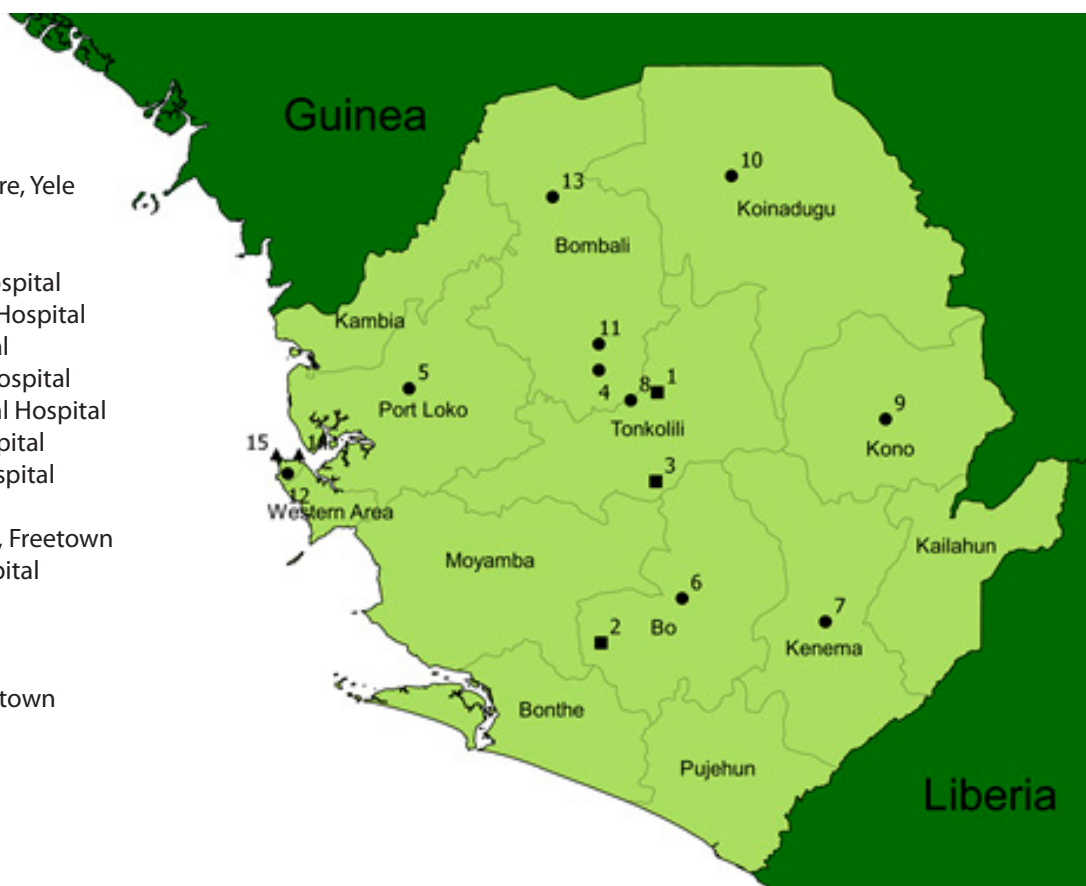


Figure 2. Locations of training institutions in 2017

Output - Students and Graduates

At the beginning of 2017, thirty students were partaking in the STP and since the start of the program 13 graduates had been posted in hospitals by the MoHS (Table 1).

Fourteen new students were selected and started in April (7) and October (7). During the year, **six students graduated** while two students dropped out of the program. By the end of 2017, twenty-three students were still in basic training (first two years of the program), and nine were conducting their internships in Freetown (housemanship students).

Of the twenty-two graduates, fifteen SACHOs are posted to governmental hospitals. Five are currently working in private non-profit hospitals. In addition, two medical doctors (MDs) completed the STP. One is working as the medical officer in charge of a district hospital in Sierra Leone after finalizing surgical specialization in Ghana. The other medical doctor is working as a medical officer in a governmental hospital. Both MDs are conducting research on surgical outcomes in Sierra Leone. All but two of the graduates are posted in hospitals outside of Western Area.

In April 2017, the first **Graduation Ceremony** of the STP was organized. The successful completion of the STP was celebrated for all the graduates since the start of the program.

| | January 2017 | | December 2017 | |
|-------------------------------------|--------------|--------|---------------|--------|
| | MALE | FEMALE | MALE | FEMALE |
| Basic training (2 years) | 21 | 1 | 23 | 0 |
| Housemanship (3 rd year) | 7 | 1 | 8 | 1 |
| Graduates (SACHO/MD) | 12/1 | 1/0 | 18/2 | 2/0 |

Table 1. Number of Students in basic training, housemanship and graduates

■ Governmental

- 1) Magburaka Hospital
- 2) Kenema Governmental Hospital*
- 3) Kabala Governmental hospital
- 4) PCMH Freetown*
- 5) Port Loko Governmental Hospital
- 6) Kambia Governmental Hospital
- 7) Koidu Governmental hospital
- 8) Daru Military Hospital
- 9) Makeni Governmental Hospital
- 10) Bo Governmental Hospital*
- 11) Bonthe Governmental Hospital

▲ Private Non-Profit

- 12) Magbenteh Community Hospital Makeni
- 13) Lion Hearth Medical Center Yele
- 14) Serabu Catholic Hospital
- 15) St. John of God Hospital, Lunsar*
- 16) Panguma Mission Hospital

* Two SACHOs have been posted in these facilities

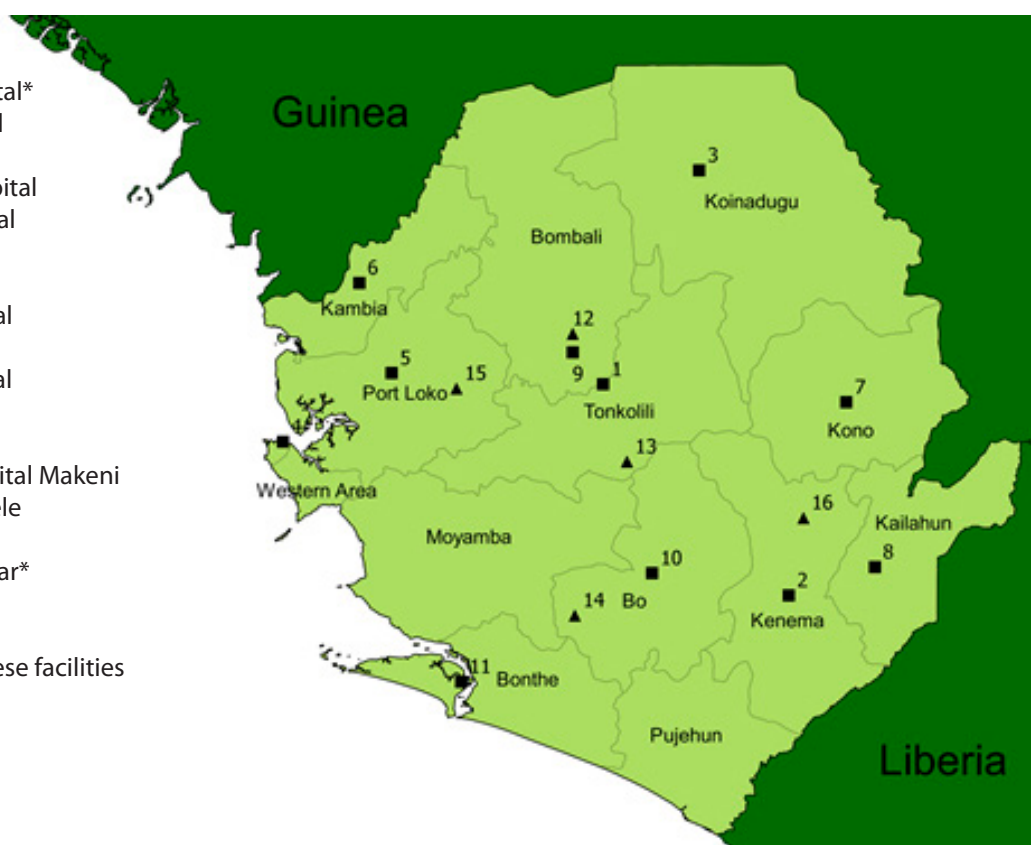


Figure 3. Locations of the graduates (SACHOs)

Output - Surgical activity

Since the start of the program in 2011, the students and graduates combined have participated in and performed more than **39,000 surgeries**. The total **number of operations for 2017 alone was 7,961**. Students within the initial two years of training performed 4,859 procedures, those in housemanship 546, while the graduates performed 2,556.

2,382 (93.2%) of the 2,556 surgeries performed by CapaCare graduates were performed **outside of Western Area**. 625 of the surgeries performed by graduates outside of Western Area were caesarean sections.

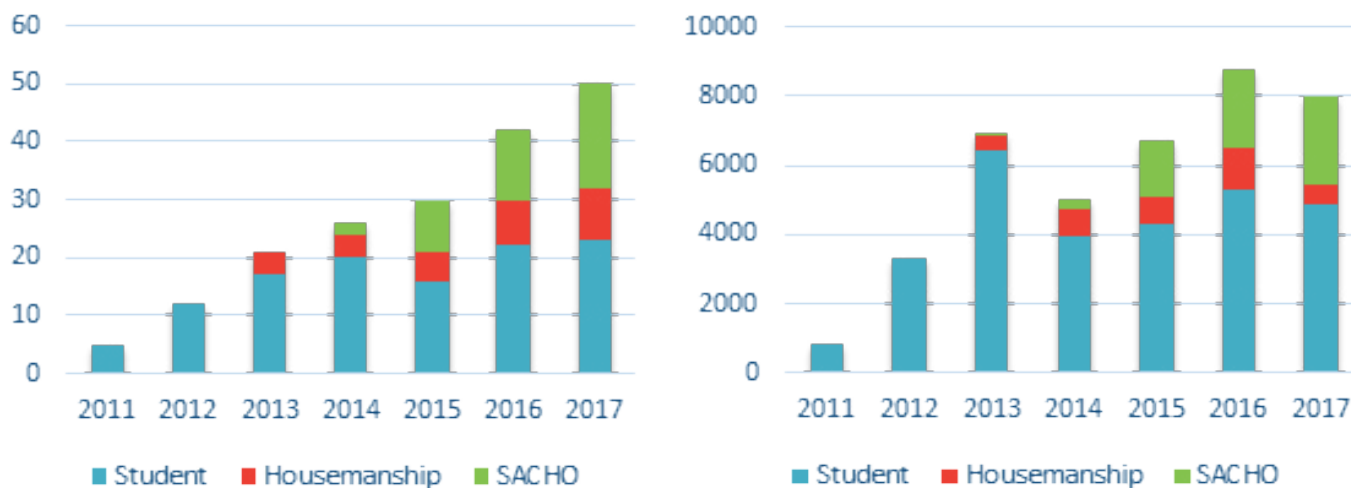


Figure 4. Accumulated number of students, interns and graduates (left) in the program and annual volume of surgical activity (right) since the start of the programme in 2011.

The number of reported entries from 2017 is slightly reduced compared to 2016 results. This is most likely due to missing reports from a combined total of 71 months of activity, ie. approximately 11 % of all CapaCare activity from 2017. Also, a large proportion of the students and graduates went on a strike in the autumn of 2017 to advocate their cause for better licensing. The strike lasted for several weeks, and this had an impact on the total number of procedures. The real number of yearly procedures is therefore probably still increasing.



Trainer, colorectal surgeon Miss Lesley Hunt during practical training in the operating theatre in Masanga

Role and Procedures

The most common procedure for the students in 2017 was **caesarean section**, while the most common procedure for the graduates was **inguinal hernia repair**. The students participate in most procedures either as assistant or as surgeon supervised while the graduates performed almost **80% of their surgeries fully independent**.

| No | Procedure | Students (incl. housemanship) | | Procedure | Graduates | |
|----|--|-------------------------------|------|----------------------------|-----------|------|
| | | n | % | | n | % |
| 1 | Caesarean section | 1,835 | 34.0 | Inguinal hernia repair | 832 | 32.5 |
| 2 | Inguinal hernia repair | 1,152 | 21.4 | Caesarean section | 747 | 29.2 |
| 3 | Laparotomy | 271 | 5.0 | Appendectomy | 161 | 6.3 |
| 4 | Appendectomy | 198 | 3.7 | Laparotomy | 91 | 3.6 |
| 5 | Hydrocele | 172 | 3.2 | Hydrocele | 79 | 3.1 |
| 6 | Dilatation & curettage | 159 | 2.9 | Strangulated hernia repair | 56 | 2.2 |
| 7 | Hysterectomy | 105 | 1.9 | Hysterectomy | 55 | 2.2 |
| 8 | Incision & drainage | 96 | 1.8 | Dilatation & curettage | 54 | 2.1 |
| 9 | Umbilical hernia repair | 86 | 1.6 | Other soft tissue surgery | 49 | 1.9 |
| 10 | Repair cervical/vaginal/perineal tears | 84 | 1.6 | Myomectomy | 37 | 1.4 |
| | Total | 4,574 | 84.8 | Total | 2,161 | 84.5 |

Table 2. Top 10 procedures for students and graduates in 2017.

| No | Role | Students (incl. housemanship) | | Role | Graduates | |
|----|---------------------|-------------------------------|-------|---------------------|-----------|-------|
| | | n | % | | n | % |
| 1 | Assisting | 1,918 | 36.1 | Surgeon independent | 2,002 | 78.3 |
| 2 | Surgeon supervised | 1,841 | 34.6 | Assisting | 257 | 10.1 |
| 3 | Surgeon independent | 1,226 | 23.1 | Surgeon supervised | 288 | 11.2 |
| 4 | Observing | 328 | 6.2 | Observing | 9 | 0.4 |
| | Total | 5,313 | 100.0 | Total | 2,556 | 100.0 |

Table 3. Role during operation for students and graduates in 2017.



Batch of students that started in April 2017 (left) and October 2017 (right)

Tutors

A core element of the STP is module based training by international and national tutors. These training modules are conducted in Masanga by specialist surgeons, gynaecologists, radiologists, anaesthesiologists and nurses. In 2017, the international trainers came from Norway, Sweden, Spain, the Netherlands and the United Kingdom. All international tutors are engaged on a voluntary basis. CapaCare provide support for transportation, accommodation, visa and vaccines.

In 2017, 13 training modules were conducted, compared to 6, 7, 10, 6, 7 and 13 in the previous six years. In addition to this, **local trainers are engaged** for theoretical modules, such as Sierra Leone's only qualified orthopaedic surgeon, Dr. Ibrahim Bundu, whom has provided regular teaching sessions since 2015. Additional local tutors were also engaged in 2017 (Table 4). The local tutors receive an honorarium for the training they provide.

| Module | From | To | Tutor |
|----------------------------|-------------------------|---------|--|
| Surgery & the abdomen | 2-Jan | 20-Jan | Lesley Hunt (S) |
| Trauma & Orthopedics | 2 training days in Jan | | Ibrahim Bundu (O) |
| Emergency obstetrics | 30-Jan | 17-Feb | Gunvor Eikeland (G), Louise Norström (MW) |
| Trauma & Orthopedics | 2 training days in Apr | | Ibrahim Bundu (O) |
| Basic Surgical Skills | 10-Apr | 21-Apr | Lesley Hunt (S), Downie Bailey (OT) |
| B-Lynch procedure | 23-Apr | 24-Apr | Prof C. B-Lynch (G) |
| Pig course & resuscitation | 24-Apr | 28-Apr | Herman Lonnee (A), Åsmund Øpstad (A), Lesley Hunt (S), Thomas Ashley (S in training) |
| Basic Life Support | 17-May | 25-May | Aatish Patel (EM) |
| Basic Obstetrics | 29-May | 2-Jun | Louise Norström (MW) |
| Trauma & Orthopedics | 2 training days in Jun | | Ibrahim Bundu (O) |
| Surgery & the abdomen | 11-Jun | 23-Jun | Lesley Hunt (S) |
| Obstetrics | 28-Aug | 31-Aug | Michael Morlai Kamara (MD) |
| Trauma & Orthopedics | 2 training days in Sept | | Ibrahim Bundu (O) |
| Emergency obstetrics | 11-Sep | 29-Sept | Risa Hoffmann (G), Alice Clack (G) |
| Basic Surgical Skills | 9-Oct | 20-Oct | Lesley Hunt (S), Sigrun Holen (OT) |
| Pig course & resuscitation | 23-Oct | 27-Oct | Åsmund Øpstad (A), Lesley Hunt (S) |
| Trauma & Orthopedics | 2 training days in Oct | | Ibrahim Bundu (O) |
| Ultrasound training | 6-Nov | 17-Nov | Taymoor Asghar (R), Thomas Peachey (R) |
| Trauma & Orthopedics | 2 training days in Nov | | Ibrahim Bundu (O) |
| Plastic Surgery | 12-Nov | 17-Nov | Einar Eiriksen (S) |
| Basic Obstetrics | 20-Nov | 24-Nov | Patricia Titulaer – van Ham (MW), Michael Morlai Kamara (MD) |
| Trauma & Orthopedics | 27-Nov | 15-Dec | Vegard Osland (S), José Sánchez (T/EM) |

Anaesthesiologist (A), Orthopaedic surgeon (O), Gynaecologist (G), Medical Doctor (MD), Midwife (MW), Anaesthesia nurse (AN), Scrub nurse (OT), Surgeon (S), Tropical Doctor (T), Radiologist (R), Emergency Medical Doctor (EM)

Table 4: Rotations of tutors in 2017.

Apart from the trainers, there were also several support visits in 2017, mostly to offer **mentoring and monitoring** of the local administration and **research related activities** (Table 5). The majority of those visits have been externally financed.

| Purpose | From | To | Support staff & Research students |
|--------------------------------|---------|---------|--|
| PhD project | 1-Jan | 10-July | Alex van Duinen (NTNU)* |
| Finance and Project support | 1-Jan | 10-July | Annemarie van Duinen (C)*, Alex van Duinen (B)* |
| Medical bachelor's degree | 2-Feb | 30-Mar | Katinka Taule (NTNU)*, Johanne Sandvand (NTNU)*, Herman Lonnee (B)* |
| Graduation and Annual meeting | 20-Apr | 25-Apr | Håkon Bolkan (B)*, Bart Waalewijn (B), Peter Bo Jørgensen (B)*, Alex van Duinen (B)* |
| Production PR materials | 20-Apr | 28-Apr | Magnus Endal (B) |
| Project support | 11-June | 24-June | Håkon Bolkan (B)* |
| Preparation Hernia Research | 13-June | 20-June | Jenny Löfgren (LU) |
| PhD and Project support | 25-Aug | 29-Aug | Alex van Duinen (NTNU)* |
| Medical master's degree | 9-Sept | 10-Nov | Cathrin Brøndbo Larsen (NTNU)* |
| Medical bachelor's degree | 9-Sept | 18-Oct | Eirik Øseth, Eirik Bakke (NTNU)* |
| PhD and Project support | 8-Oct | 13-Oct | Alex van Duinen (NTNU)* and Håvard Adde (B) |

***External funding, Board (B), CapaCare staff (C), Linköpings universitet(LU), Norwegian University for Science and Technology (NTNU)*

Table 5: Table 5: Rotations of support staff and research personnel in 2017.



Media and publications

Our main communication channels are through the website (www.capacare.org) and Facebook. Other mentions in media are through publications in Medical Journals, as well as magazines and newspapers. We have also presented the program and its preliminary results at **several international medical conferences** (see Publication List).

Website

CapaCare launched a new and updated website in April 2017. According to Google analytics the homepage was viewed 5420 times by 3571 unique users. The new website contains general information about the organisation, fundraising, as well as specific application information for students and trainers. The newsfeed has been updated monthly in 2017 and the website also allows users to access the organisation's annual reports.

CapaCare is present on social media through Facebook and Instagram. We also have a Twitter account and a YouTube channel, but they have been mostly dormant throughout 2017. Our main social media channel is Facebook with 953 followers. In 2017 we posted 38 stories on our newsfeed.

CapaCare board members, trainees and trainers has been active both in scientific publications (3), written books (3) and delivered more than 20 popular and scientific presentations in 11 different



Group picture during the graduation ceremony with chief CHO Conteh and president of the Liberian physician assistant association Theophilus Hampaye.

Publications

Bold – Contributions from CapaCare board members, trainers, trainees and graduates

Scientific peer-review publication:

- **Waalewijn, B. P., van Duinen, A.**, Koroma, A. P., Rijken, M. J., Elhassein, M., & **Bolkan, H. A.** (2017). Learning Curve Characteristics for Caesarean Section Among Associate Clinicians: A Prospective Study from Sierra Leone. *World Journal of Surgery*, 41(12), 2998-3005.
- **urgos, C. M., Bolkan, H. A.**, Bash-Taqi, D., Hagander, L., & Von Screeb, J. (2017). The Met Needs for Pediatric Surgical Conditions in Sierra Leone: Estimating the Gap. *World Journal of Surgery*. doi:10.1007/s00268-017-4244-8
- **Bolkan, H. A., van Duinen A., Waalewijn B.**, Elhassein M., Kamara T. B., Deen G. F., Bundu I., Ystgaard B., von Schreeb J. and Wibe A. (2017). Safety, productivity and predicted contribution of a surgical task-sharing programme in Sierra Leone. *Br J Surg* 104(10): 1315-1326.

Books:

- **Bolkan H. A.** Addressing Surgical Needs Where There is No Surgeon: Status of Surgery in Sierra Leone, Safety and Future Contributions of a Task Sharing Training Programme, and Surgery as an Indicator of Hospital Function During the West African Ebola Outbreak. Doctoral theses at NTNU;2017:223. ISBN 978-82-326-2519-2, Trondheim, Norway Norwegian University of Technology and Science, 2017
- **Bolkan H. A.** Chapter 6: [A clinical officer training program in Sierra Leone and the decline of surgical care due to Ebola] in: *Operation Ebola: surgical care during the West African outbreak*, edited by Sherry M. Wren and Adam L. Kushner. ISBN: 9781421422121, Baltimore, United States, Johns Hopkins University Press, 2017
- **Aliou Mansaray.** Chapter 2: [To learn from each other] in: *Into the world – Experiences and views of medical doctors Global Health and Tropical Medicine*, edited by Marlies Hummelen and Matthijs Botman. ISBN: 9789490357214, Amsterdam, Holland, Boekschap, 2017



Aliou F. Mansaray during the presentation of the book "Into The World" in Amsterdam. (Photo: KopiSusu Fotografie).

Scientific presentations:

- Bolkan H. A. [Task-sharing for expansion of the surgical workforce in LMICs.] **The 10th Conference on Global Health and Vaccination Research, Trondheim, Norway**, March 2017 – Oral presentation
- van Duinen A. [Surgical Task-shifting – Experience from Sierra Leone]. **Physician Assistant Biannual convention. Kakata, Liberia**, May 2017 – Oral presentation
- van Duinen A. [Global Surgery.] **Sierra Leone student conference. Freetown, Sierra Leone**. May 2017 – Oral presentation
- van Duinen A. [Outcome after Caesarean Section in Sierra Leone.] **Brown Bag Lunch WHO country Freetown, Sierra Leone** June 2017 – Oral presentation
- Bolkan H. A. [Global surgery and CapaCare's Surgical Training Programme.] **General Assembly of the Sør-Trøndelag Medical Association, Trondheim, Norway**, June 2017 – Oral presentation
- Bolkan H. A. [Working as a clinician in low-and middle-income countries.] **Global surgery summer school, Royal Society of Medicine, London, UK**, July 2017 – Oral presentation
- van Kesteren J, Bolkan H. A. [Surgical task sharing in Sierra Leone.] **Global surgery summer school, Royal Society of Medicine, London, UK**, July 2017 – Oral presentation
- Bolkan H. A., van Duinen A, Samai M, Bash-Taqi D.A, Gassama I, Waalewijn B, Wibe A, von Schreeb J. [Admissions and surgery as indicators of hospital functions in Sierra Leone during the west-african ebola outbreak.] **World Congress of Surgery, Basel, Switzerland**, August 2017 – Oral presentation
- Bolkan H. A., van Duinen A, Waalewijn B, Elhassein M, Kamara TB, Deen G.F, Bundu I, Ystgaard B, von Schreeb J, Wibe A. [Safety, productivity and predicted contribution of a surgical task-sharing programme in Sierra Leone.] **World Congress of Surgery, Basel, Switzerland**, August 2017 – Oral presentation
- Bolkan H. A. [Global surgery and CapaCare's Surgical Training Programme.] **Summer school International health, University of Copenhagen, Copenhagen, Denmark**, August 2017 – Oral presentation
- Bolkan H. A. [Global Surgery and CapaCare's Surgical Training Program in Sierra Leone], **"Fadderuka" Norwegian University of Science and Technology, Trondheim, Norway** August 2017 – Oral presentation
- Bolkan H. A. [Where there are no surgeons: Increasing the access to surgery by task-sharing], **IKOMM, Norwegian University of Science and Technology, Trondheim, Norway**, September 2017 – Oral presentation
- Bolkan H. A. [CapaCare's Surgical Training Programme], **Launch Meeting of Leeds NIHR Global Health Research Group in Surgical Technologies, Leeds, UK**, September 2017 - Oral presentation.
- Waalewijn B., van Duinen A., Bolkan H.A. [Learning curve characteristics for caesarean section among associate clinicians: A prospective study from Sierra Leone.]. **European Congress on Tropical Medicine and International Health, Antwerp, Belgium**., October 2017 – Oral presentation
- van Duinen A. [Maternal and perinatal outcomes after Caesarean Section in Sierra Leone - Personal experience with global health research]. **Global Health Day, Norwegian University of Science and Technology. Trondheim Norway**, October 2017 – Oral presentation
- Bolkan H. A. [Where there are no surgeons: Increasing the access to surgery by task-sharing], **Faculty of Nursing, Norwegian University of Science and Technology, Trondheim, Norway**, October 2017 – Oral presentation
- Bolkan H. A. [Where there are no surgeons: Increasing the access to surgery by task-sharing], **Clinic of Surgery, St. Olavs Hospital, Trondheim, Norway**, October 2017 – Oral presentation
- Bolkan H. A. [Task-sharing in surgery in low and middle-income countries.] **University of Linköping, Linköping, Sweden**, November 2017 – Oral presentation
- van Duinen A. [Tasks-sharing in Surgery & Obstetrics in Sierra Leone] **German Doctors Strategic Meeting, Bonn, Germany**, November 2017 – Oral presentation
- Bolkan H. A. [Public health and emergency surgery – where do we invest our efforts?] **Surgical and Anaesthesia Day, Medicines Sans Frontiers (MSF), Paris, France**, December 2017 – Oral presentation
- van Duinen A. [Improving Access to Emergency Obstetric Care in Sierra Leone by Implementation of a Task-Sharing Program.] **Julius Center University of Utrecht, the Netherlands, Utrecht**, December 2017 – Oral presentation



Alex van Duinen presenting during the Global Health Day in Trondheim



Left: Professor B-Lynch during the training in Masanga, student Mohamed Kpaka. Right: Students practicing on models (from left to right: Hindowa Lavally, Anthony Kamara, Emmanuel Tamba)

Potential expansion – Advanced Obstetrics for Midwives

In March 2016, the Ministry of Health Sanitation (MoHS) inquired if CapaCare could start training **midwives in advanced obstetrics**, in addition to the existing program to train CHOs and MDs.

In 2017, a **qualitative study was conducted**, questioning the Sierra Leonean midwives about their perceptions on advanced obstetrics. In addition, several meetings with important stakeholders took place. With the information gathered from those meetings, CapaCare has decided to **delay the implementation phase** of the advanced obstetrics program until the preparation has been fully completed. CapaCare has collected significant experience over the last years with regard to the STP and some on-going challenges concerning regulation, licensing and remuneration of the SACHOs still have not been addressed. Therefore, we have demanded these potential challenges to be tackled before continuing with the preparation phase. At the end of 2017, the MoHS is **working on creating a career-path** and a joint regulatory board with the Medical and Dental Council for this potentially new cadre.

Potential expansion – Surgical Training Program in Liberia

During the 11th biannual conference of the **Liberian national physician assistants** association held in Kakata in May 2017, CapaCare was invited to share experience from the STP in Sierra Leone. Experiences in task-sharing from both countries were exchanged and we believe that this can be a good basis for further cooperation in training and research.



Left: the CapaCare team among the Liberian colleagues during the conference. Right: banner presenting the conference theme

Partners

CapaCare's **main financial partners** are the **United Nation People Fund (UNFPA)**, **Torun and Ole's Stiftelse, Norwegian Agency for Development Cooperation (NORAD)** and the **Lions Club**. All main sponsors **continued to support CapaCare in 2017**. Norwegian University of Science and Technology (NTNU) and Trondheim University Hospital, St. Olav has contributed with funds for evaluation the initiative via **two PhD scholarships** and by allowing employees paid leave to take part in the training.

As an **Implementing Partner of UNFPA** CapaCare has been able to **strengthen relations to the Ministry of Health and Sanitation** in 2017. By developing CapaCare Sierra Leone as a legal entity, all major aspects of CapaCare's work has been strengthened and there is more local involvement also on the management side. Furthermore, annual and quarterly plans and budgets are submitted to the UN-FPA, and all the **spending in Sierra Leone are revised** by an international accounting firm.

Masanga.dk, that runs Masanga Hospital continue to be the main partner in Sierra Leone together with the Sierra Leonean Ministry of Health and Sanitation (MoHS). The MoHS continues to **grant three-year paid study leave** for the Community Health Officers enrolled from the governmental sector. The Ministry also takes part in interviewing new candidates and as exam invigilators. Finally, it is the Ministry that oversees the internship - the last part of the training. To date, there has been **good cooperation** with the Ministry to ensure local ownership. CapaCare has also received substantial support from **private donors**.



We want to thank everybody that has contributed to the program for the support that we have received!



CapaCare Board

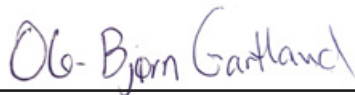
Trondheim, Norway

Masanga, Sierra Leone

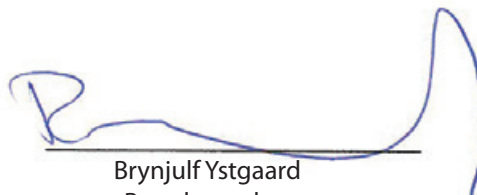
April, 2018



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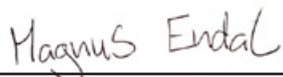
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*Pictures are taken by Magnus Endal, KopiSusu Fotografie / Susan Huider (page 13), CapaCare trainers and local team.
All patients have consented in the use of the photos.*

Front picture: Graduation ceremony in Masanga with:

(from right to left) Augsta Fasia Palmer, Seibatu Sia Komeh and Alimamy Bangura

Back picture: Ibrahim M. Sesay closing after a caesarean section with mobile phone and day light in Kenema Hospital



Sei Coleman and trainer Lesley Hunt



Mohamed Alieu and his family



Group picture during the 2017 graduation ceremony.



Alpha Samura receiving his diploma



the high table with (from left to right) Dr Peter Bo, Dr Anders Nordström, Dr Ibrahim Bundu, Dr AP Koroma, Dr Håkon Bolkan and Chief CHO Abud Conteh



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Medical education and training to increase the number of skilled staff at district hospitals.

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