



Surgical Training Programme

March 2019

Annual Activity Report
2018

 **NTNU**
Norwegian University of
Science and Technology



Summary

For the Surgical Training Programme, 2018 was both an exciting and challenging year. Since we are a small, but closely connected group of trainees, graduates and trainers, we have no one to spare. It was therefore very painful on the 30th of August when we lost a student, friend and colleague in Christopher Sandi who sadly passed away in Masanga Hospital. He was only a month short of becoming a graduate. His passing means a big loss for his family, but also for the Programme and the friends in the CapaCare family he left behind. May his soul rest in peace.

The year has also been exciting as we have introduced new courses. We have offered two-week intensive courses in surgery and obstetrics for medical doctors respectively. The feedback has been very good, and we believe further training is key for any health professional. Along the same lines we started offering Continuous Professional Development (CPD) courses where both MDs and SACHOs are invited.

In CapaCare we believe research and thorough evaluations are a key component of what we do. Task-sharing in surgery and obstetrics is new, and many are sceptical about what kind of quality and what kind of impact such an initiative may deliver. At the end of the year CapaCare board member Alex van Duinen published a study in the British Journal of Surgery, where he followed 1,276 women undergoing a caesarean section for 12 months.

The study documents low post-operative morbidity and mortality of operations performed by the SACHOs and that the outcomes are similar to medical doctors. He also documented 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. 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.

In 2018, we revisited all hospitals offering surgery in Sierra Leone. The good news is since 2012, there has been an increase of almost 40% in volume of surgery. The majority of those additional operations are due to the SACHOs activity. Non-specialist medical doctors are performing the same volume of operations in 2017 as in 2012. For the coming year we will continue to work towards formal recognition of SACHOs and inclusion in the upcoming scheme of service and systems that ensures increased quality of surgical care.

Welcome to this graduation ceremony, congratulations to the trainees, their families, trainers, supervisors and colleagues at hospitals across Sierra Leone. We hope the graduates will be welcomed in their new work places and that they will continue to receive guidance, mentoring and encouragement to take on the challenge of offering high quality surgical care across Sierra Leone.

Trondheim, Norway,
March, 2019



Håkon Angell Bolkan
Chairperson CapaCare

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STP-graduate Mohamed Kamara with nursing staff at Kambia Government Hospital

About CapaCare

CapaCare is a **member-based** non-governmental organisation registered with the Norwegian Central Coordinating Register for Legal Entities, "Brønnøysundsregistret", organisation 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 consultants for finance management. All positions on the Board are voluntary and there are no paid honorariums for Board work. The Board was strengthened with one new member in 2018.

Since 2015, a local organisation, **CapaCare Sierra Leone** (CapaCare SL) is currently registered at the Ministry of Finance and Economic Development under registration number NNGO/634/2018-19. 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.

In 2018, an organisational restructuring of CapaCare was initiated and presented for the Annual General Meeting, which gave the mandate to develop a model where the organisation is divided into three different entities; a "donor" chapter in donor countries (CapaCare donor), an "executive" chapter in countries receiving assistance (CapaCare executive) and an international supervisory body overseeing and guiding the activity (CapaCare International). The relationship between these entities has to be defined, but there has to be room for flexibility. Relations between donor and executive chapters should not always have to go through the international body, even though the nature of the activity should adhere to the general principles laid down by the international body. Thus, the organisation would consist of an international body based on national chapters. The organisation of these national chapters would be based on their main activity. We hope to come back next year with more detailed information on the structure.



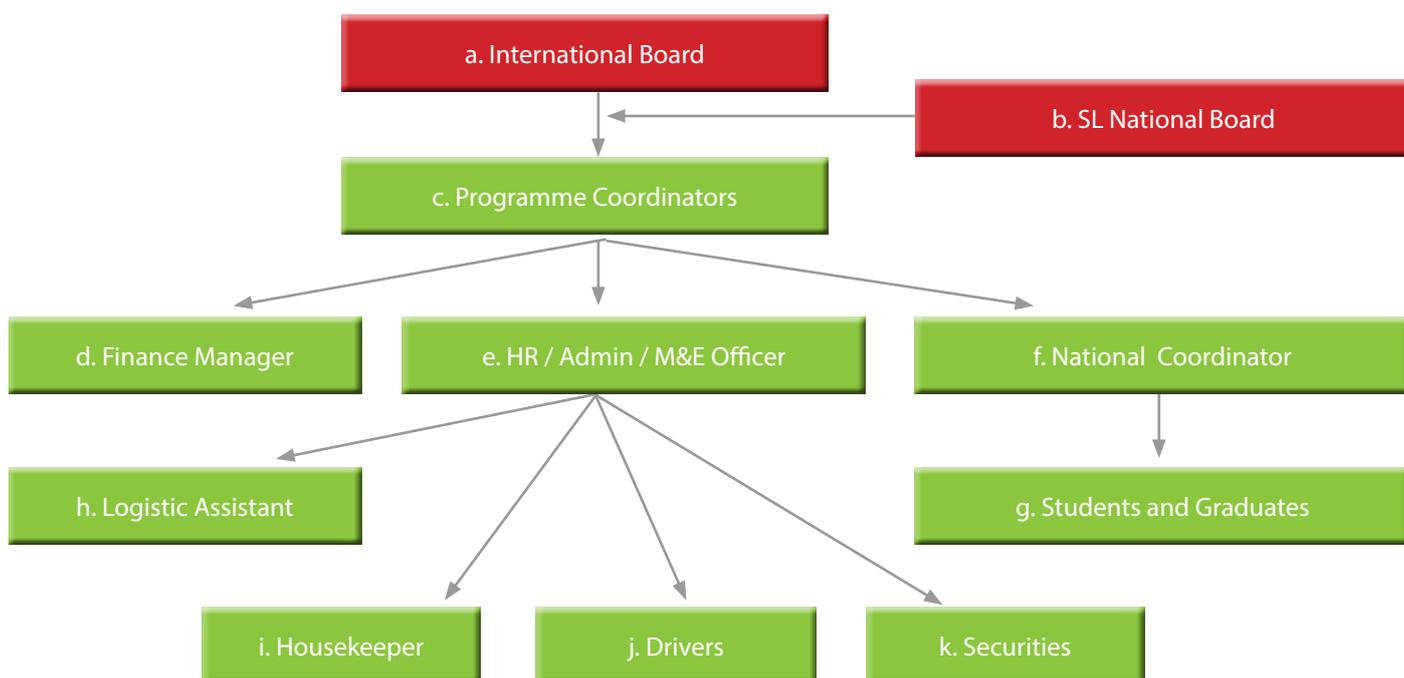
Organisation

For 2018, the following organogram depicts the organisation in Sierra Leone (Figure 1). Management capacity remained stable.

The Programme 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 Ministry of Health and

Sanitation (MoHS) and United Nations Population Fund (UNFPA). In addition, training of medical doctors and Continuous Professional Development of the SACHOs will be prioritised. Therefore, it is necessary to further strengthen the capacity of the local management in Sierra Leone in 2019.

Figure 1. CapaCare organogram 2018



- a. Håkon A. Bolkan (chair)
- b. Oversees CapaCare Sierra Leone
- c. Daniel Van Leerdam, Martelien Grootjans, Wouter Nolet
- d. Mohammed John Turay
- e. Francis S. Vandy
- f. Samuel M. Sankoh

- g. Trainees/housemanship/graduates
- h. Alpha Kargbo
- i. Osman Conthe, Francis Kargbo
- j. Rugiatu Koroma
- k. Usifu Kamara, Idrissa Bangura, Foday Jokai

Surgical Training Programme

Background

Sierra Leone is a republic in West Africa, bordering Guinea, Liberia and the Atlantic Ocean. It is categorised 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 1,360 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 particularly 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, newborn, Child and adolescent health strategy 2017-2021'⁵, which is a priority area for the Government of Sierra Leone. The strategy states the importance 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 needed 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. In 2018 we visited the same hospitals as in 2012 and found a 36% increase in volume of surgery offered. This growth was particularly strong for operations related to emergency obstetric care. The majority of the additional operations performed in the country over this 5-year period were performed by graduates of this Programme. As

Sierra Leone is currently experiencing a considerable population growth, the downside is that the number of operations per inhabitant per year has only increased to 407 surgeries per 100,000 inhabitants. Although volume of surgery increases, the number each Sierra Leonean has access to has not changed much since 2012. This tells us there will be a large need for surgical health care workers going in to the future.

Research conducted together with renown international collaborators has demonstrated that the quality of care and the outcomes of the operations have not become worse after the introduction of this Programme. In 2018 we finalised multi-centre non-inferiority studies at all nine hospitals in Sierra Leone where both graduates of this Programme and medical doctors performed caesarean sections. Patients undergoing caesarean section were followed for 30 days and there were no differences in maternal mortality, perinatal events and maternal morbidity between graduates and medical doctors. This allowed us to conclude that caesarean sections⁸ performed by non-doctors are not inferior to those undertaken by doctors. Task-sharing can be a safe strategy to improve access to emergency surgical care in areas where there is a shortage of doctors.

Vision

The aim of the Surgical Training Programme is to **increase the level of surgically-skilled health staff at district hospitals** in Sierra Leone. The goal of the Programme is to train a total of 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 Programme **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 Programme (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, outpatient 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.

1. Central Intelligence Agency. The World Factbook – Sierra Leone, 2019.
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. Van Duinen et al, British Journal of Surgery, 2019

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 organised 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 Programme in 2018** (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 Programme, ensuring that each candidate is exposed to the most highly-skilled tutors presently available in the country.



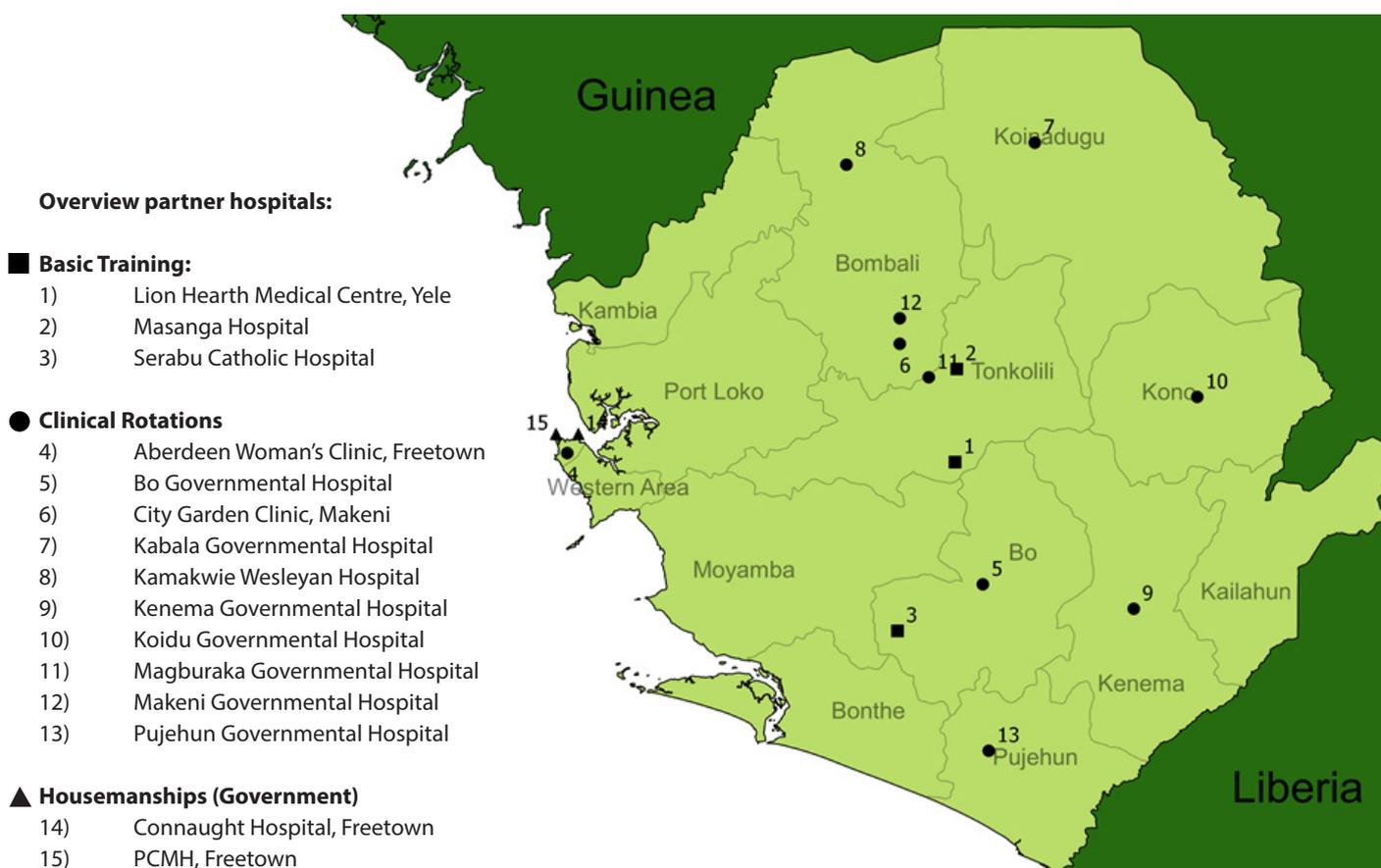


Figure 2. Training hospitals in 2018

Output – Students and Graduates

At the beginning of 2018, thirty-four students were partaking in the STP and since the start of the Programme 20 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, nine students graduated while two students dropped out of the Programme. By the end of 2018, twenty-five students were still in basic training (first two years of the Programme), and nine were conducting their internships in Freetown (housemanship students).

Of the thirty-one graduates, nineteen SACHOs are posted to governmental hospitals. Nine are currently working in private nonprofit hospitals. In addition, two medical doctors (MDs) completed the STP. One is specialising in surgery in the UK and is planning to come back to Sierra Leone as a surgeon. 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 three of the graduates are posted in hospitals outside of Western Area.

	January 2018		December 2018	
	Male	Female	Male	Female
Basic training (2 years)	21	1	23	0
Housemanship (3rd year)	7	1	8	1
Graduates (SACHO/MD)	12/1	21/0	12/8	1/0

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

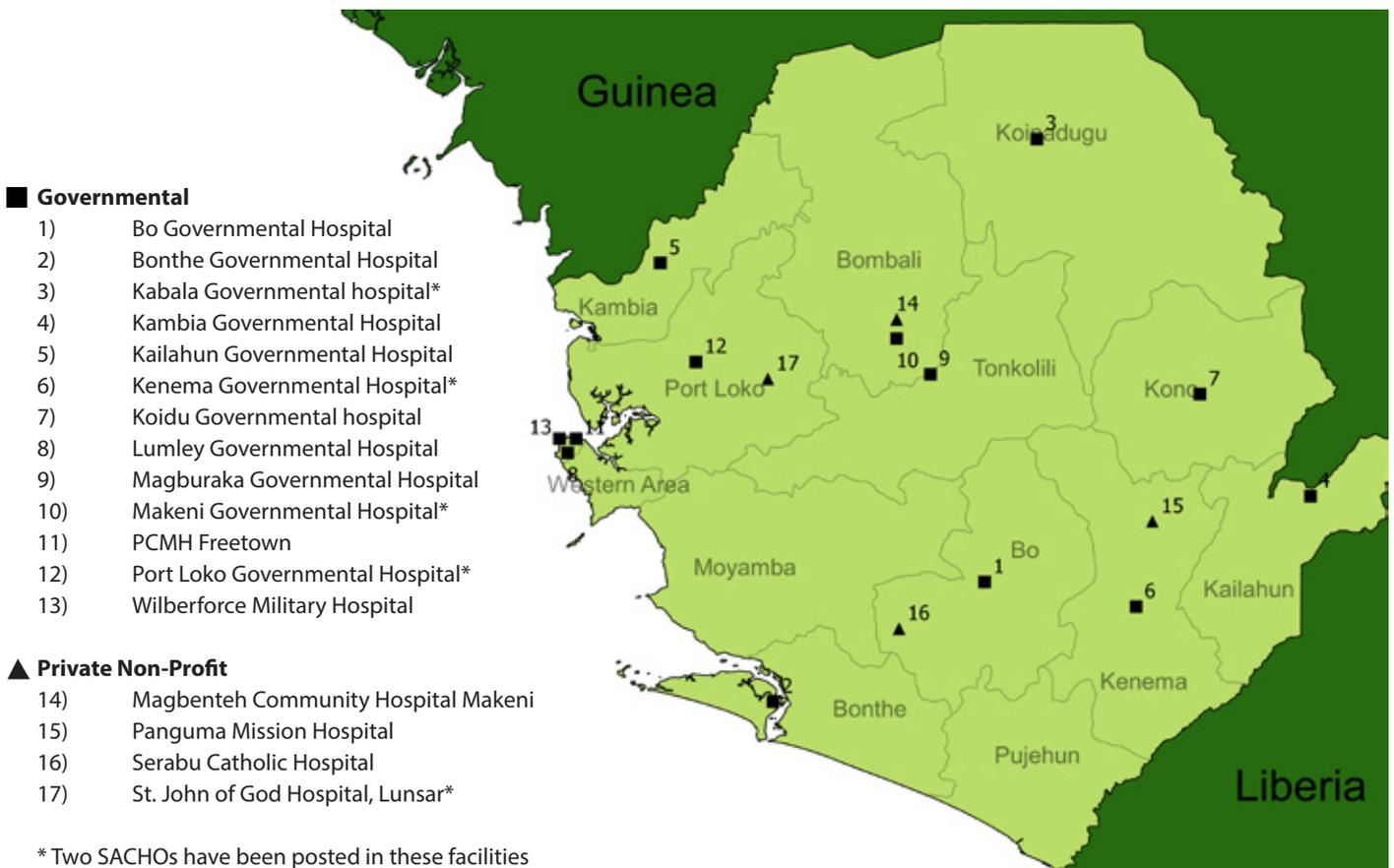


Figure 3. Locations of the graduates (SACHOs) on 31-12-2018

Output - Surgical activity

Since the start of the Programme in 2011, the students and graduates combined have participated in and performed more than **47,000** surgeries. The total **number operations for 2018 alone was 8,321**. Students within the initial two years of training performed 4,646, those in housemanship 780, while the graduates performed 2,895.

2,456 (84.8%) of the 2,895 surgeries performed by CapaCare graduates were performed outside of Western Area. 685 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 Programme and annual volume of surgical activity (right) since the start of the Programme in 2011.

The number of reported entries from 2018 is slightly reduced compared to 2016 results. This is most likely due to missing reports from a combined total of 81 months of activity, i.e. approximately 12 % of all CapaCare activity from 2018.

Role and Procedures

The most common procedure for both the students and graduates in 2018 was caesarean section. The students participated in most procedures as surgeon supervised while the graduates performed over 80% of their surgeries fully independent.

Students (incl. housemanship)				Graduates		
No	Procedure	n	%	Procedure	n	%
1	Caesarean section	1,886	34.8	Caesarean section	1035	35.8
2	Inguinal hernia repair	1,068	19.7	Inguinal hernia repair	678	23.4
3	Laparotomy	352	6.5	Appendectomy	228	7.9
4	Appendectomy	273	5.0	Laparotomy	197	6.8
5	Dilatation & curettage	151	2.8	Strangulated hernia repair	74	2.6
6	Hysterectomy	122	2.2	Hydrocele	67	2.3
7	Hydrocele	118	2.2	Hysterectomy	66	2.3
8	Other soft tissue surgery	108	2.0	Incision & drainage	52	1.8
9	Incision & drainage	98	1.8	Umbilical hernia repair	42	1.5
10	Strangulated hernia repair	83	1.5	Myomectomy	35	1.2
	Total	4259	78.5	Total	2474	85.5

Table 2. Top 10 procedures for students and graduates in 2018.

Students (incl. housemanship)				Graduates		
No	Role	n	%	Role	n	%
1	Surgeon supervised	2,075	38.2	Surgeon independent	2,426	83.9
2	Assisting	1,623	29.9	Assisting	233	8.1
3	Surgeon independent	1,401	23.1	Surgeon supervised	222	7.7
4	Observing	321	5.9	Observing	12	0.4
	Total	5,420	100.0	Total	2,893	100.0

Table 3. Role during operation for students and graduates in 2018.



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 2018, the international trainers came from Germany, Gambia, the Netherlands, Norway, and the United Kingdom. All international tutors are engaged on a voluntary basis.

CapaCare provide support for transportation, accommodation, visa and vaccines.

In 2018, 24 training modules were conducted, compared to 7, 10, 6, 7, 13 and 13 in the previous six years. In addition to this, **local trainers are engaged** for theoretical modules. The local tutors receive an honorarium for the training they provide.

Module	Trainees	From	To	Tutor
Surgery & the abdomen	STP	22 Jan	9 Feb	Lesley Hunt (S), Dag Halvorsen (S)
Emergency obstetrics	STP	12 Feb	2 Mrt	Gunvor Eikeland (G), Adam Forrest (G)
Basic Surgical Skills	STP	9 Apr	27 Apr	Lesley Hunt (S), Andrew Deytrikh (S), Downie Bailey (OT)
Pig course & resuscitation	STP	30 Apr	4 May	Herman Lonnee (A), Markus Walsø (A), Lesley Hunt (S)
Basic Obstetrics	STP	15 May	17 May	Ennet Chipungu (G)
Advanced Emergency Obstetrics	MD	17 May	2 June	Alice Clack (G), Arfang Faye (M)
Surgery & the abdomen	STP	1 July	20 July	Katja Maschuw (S), Katharina Grass (S)
Surgical skills & the abdomen	MD	16 July	27 July	Lesley Hunt (S)
Emergency obstetrics	STP	3 Sept	19 Sept	Risa Lonnee Hoffmann (G)
Basic Surgical Skills	STP	8 Oct	26 oct	Lesley Hunt (S), Astrid Rydning (S), Hjørdis Havdahl (OT), Astrid Rydning (S)
Pig course & resuscitation	STP, MD	29 Oct	2 Nov	Åsmund Øpstad (A), Elaine Yip (A), Lesley Hunt (S), Hindowa Lavally (SPT), Anthony Abbot Kamara (STP)
CPD Emergency Medicine	SACHO, MD	23 Oct	1 Nov	Elizabeth Wood (EM), Aatish Patel (EM)
CPD Orthopaedics	SACHO, MD	29 Oct	& 15 Nov	Fritjof Schmidt-Hoensdorf (O), Wolfgang Haller (O)
Anaesthesia & Emergency Medicine	STP	5 Nov	16 Nov	Elaine Yip (A), Aatish Patel (EM)
Basic Obstetrics	STP	26 Nov	30 Nov	Patricia Tutelaer van Ham (MW)
Ultrasound training	STP, MD	12 Nov	30 Nov	Taymoor Asghar (R), Thomas Peachey (R), Emmauel Sahr Musa Tamba (SACHO)
Trauma & Orthopaedics	STP, SACHO	3 Dec	21Dec	Pim van Rutte (O), Erik Manning (PS)
Distant Learning Obstetrics	STP	One session a week since beginning of December		Alice Clack (G)

Anaesthesiologist (A), Emergency Medical Doctor (EM), Gynaecologist (G), Medical Doctor (MD), Midwife (MW), Orthopaedic surgeon (O), Scrub nurse (OT), Plaster cast specialist (PS), Radiologist (R), Surgeon (S), Surgical Assistant Community Health Officer (SACHO), Surgical Training Programme students (STP), Tropical Doctor (T)

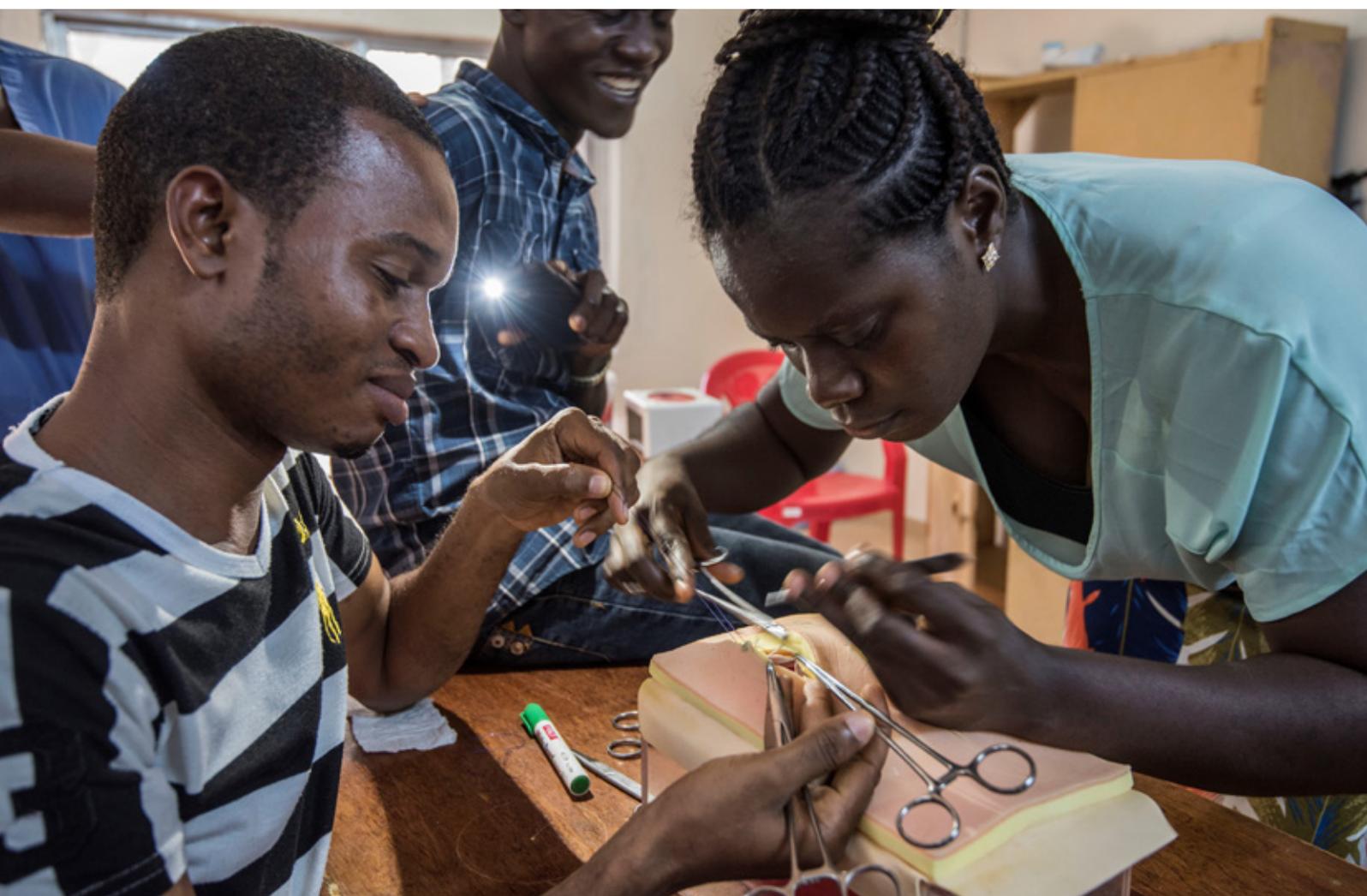
Table 4: Rotations of tutors in 2018.

Apart from the trainers, there were also several support visits in 2018, 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 and Project support	21-Feb	3-Mar	Alex van Duinen (NTNU,B)*
Medical bachelor's degree	Feb	March	Andreas GjØra and Barbro Lindheim-Minde (NTNU)*
Project support	27-Apr	4-May	Håkon Bolkan (B)
Medical master's degree	Sept	Oct	Marit Svinndal and Nana Aanderaa (NTNU)*
Production PR materials	9-Oct	23-Oct	Magnus Endal (B)
Finance and Project support	20-Oct	26-Oct	Annemarie van Duinen (C)
PhD and Project support	17-Oct	24-Oct	Alex van Duinen (NTNU,B)*

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

Table 5: Rotations of support staff and research personnel in 2018.



STP-student Daffline Khadijah Kanu practising in the Masanga Skillslab

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 Programme and its preliminary results at several international medical conferences (see Publication List).

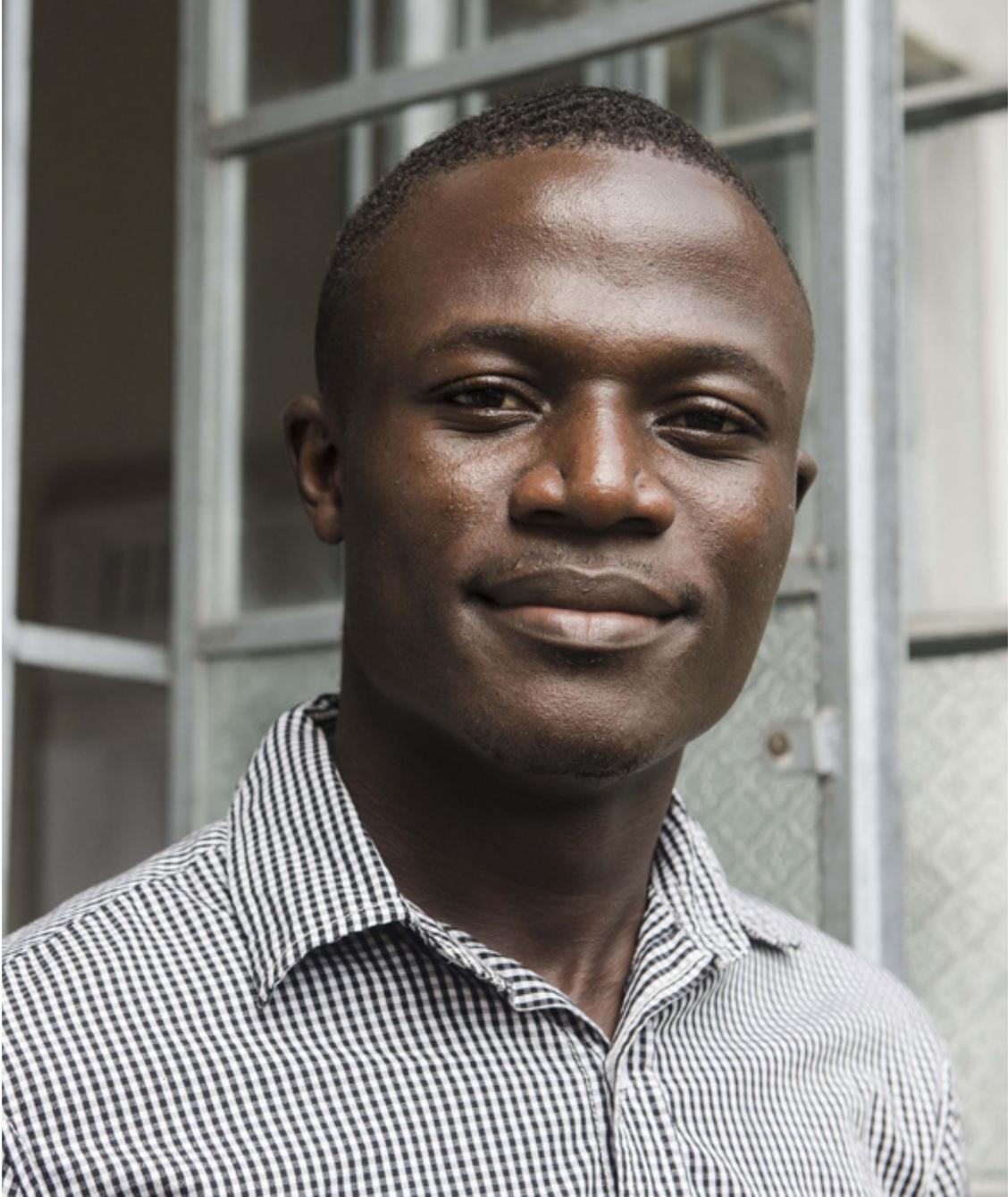
Website

Online, CapaCare is available through our website www.capacare.org and through our social media accounts on Facebook and Instagram. In 2018 the website was updated monthly with news, videos and articles. According to Google analytics the website was viewed more than 4,800 times by more than 3,600 individual users. Our Facebook page currently has 984 followers and our most popular posts in 2018 reached more than 5,500 people.



Dr. Alex Van Duinen with former patients in Tonkolili District

In Memoriam



In memory of STP-student Christopher Sandi (1982–2018)



Publications

Bold – Contributions from CapaCare Board members, trainers, trainees and graduates.

Scientific peer-review publications:

1. **van Duinen A. J, Kamara M. M**, Hagander L, Ashley T, Koroma A. P, Leather A, Elhassein M, Darj E, Salvesen Ø, Wibe A, **Bolkan HA**. Comparing caesarean sections performed by medical doctors and associate clinicians in Sierra Leone – A prospective observational multicentre non-inferiority study of maternal and perinatal outcome. *British Journal of Surgery*, 2019;106(2): e129-e37
2. Liu B, **Hunt LM**, Lonsdale RJ, Narula HS, **Mansaray AF, Bundu I, Bolkan HA**. Comparison of surgical skill acquisition by UK surgical trainees and Sierra Leonean Associate Clinicians in a task sharing program – an experimental study. *British Journal of Surgery Open*, 2019
3. **Bolkan HA, 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. *BMC Health Services Research*, 2018;18:846
4. Grimes CE, Quaife M, Kamara TB, Lavy CBD, Leather AM, **Bolkan HA**. The Macro-economic Costs of the Unmet Burden of Surgical Disease in Sierra Leone: A retrospective economic analysis. *British Medical Journal Open*, 2018;8:e017824.
5. Tracy L, **Bolkan HA**, Sagbakken M. Distance, accessibility and costs. Decision- making during childbirth in rural Sierra Leone: A qualitative study. *PLoS ONE*, 2018;13(2): e0188280.
6. **Bolkan HA, van Duinen A, Waalewijn B, Elhassein M, Kamara TB, Deen G.F, Bundu I, Ystgaard B, von Schreeb J, Wibe A**. [Safety, productivity and contributions to national volume from a surgical task-sharing programme in Sierra Leone.] **58 Annual Conference of the West African College of Surgeons, Banjul, The Gambia**, February 2018 – *Oral Presentation*
7. **Bolkan HA**. [Addressing Surgical Needs Where There Are No Surgeons - and the role of task-sharing] **Symposium; From turmoil to sustainability, Copenhagen, Denmark**, March 2018 – *Oral Presentation*
8. **Bolkan HA**. [CapaCare - Capacity building for a better future] **Health Innovation and Entrepreneurship, NTNU, Trondheim, Norway**, March 2018 – *Oral Presentation*
9. Bakke E, Øseth E, Fofonah T, Sesay I, **Bolkan HA, van Duinen A, Lonnée-Hoffmann RAM**. [Vacuum Deliveries in Sierra Leone an Governmental Hospitals: A register and questionnaire based study.] **Norwegian Global Health Conference, Oslo, Norway**, April 2018 – *Poster*
10. **Bolkan HA, 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.] **Norwegian Global Health Conference , Oslo, Norway**, April 2018 – *Poster*
11. **van Duinen A, Koroma AP, Bolkan HA**. [Number of caesarean section in Sierra Leone before, during and after the Ebola outbreak.] **Norwegian Global Health Conference , Oslo, Norway**, April 2018 – *Poster*
12. **van Duinen A, Hagander L, Kamara MM, Ashley T, Koroma AP, Leather A, Elhassein M, Darj E, Salvesen Ø, Wibe A, Bolkan HA**. [Maternal and perinatal outcome after caesarean section in Sierra Leone – A prospective multicentre study comparing medical doctors and associate clinicians.] **Norwegian Global Health Conference , Oslo, Norway**, April 2018 – *Poster*
13. **Bolkan HA**. [Where there are no surgeons: Increasing the access to emergency obstetric care by task-sharing], **Clinic of Obstetrics and Gynecology, St. Olavs Hospital, Trondheim, Norway**, April 2018 – *Oral presentation*
14. **Van Duinen AJ**, [Task-sharing, the solution for the unmet surgical need?], **Dutch Surgical Society, Veldhoven, the Netherlands**, May 2018 – *Oral presentation*

Scientific presentations/invited speakers from CapaCare:

1. van Duinen A, Koroma AP, Bolkan HA, [Number of caesarean section in Sierra Leone before, during and after the Ebola outbreak.] **58 Annual Conference of the West African College of Surgeons, Banjul, The Gambia**, February 2018 – *Oral Presentation*
2. van Duinen A, Hagander L, Kamara MM, Ashley T, Koroma AP, Leather A, Elhassein M, Darj E, Salvesen Ø, Wibe A, Bolkan HA, [Maternal and perinatal outcome after caesarean section in Sierra Leone – A prospective multicentre study comparing medical doctors and associate clinicians.] **58 Annual Conference of the West African College of Surgeons, Banjul, The Gambia**, February 2018 – *Oral Presentation*

- 12 Van Duinen AJ. [How to improve surgical care after the Ebola epidemic?], **Symposium Health in Emergencies Course, Copenhagen, Denmark**, May 2018 – *Oral Presentation*
- 13 Bolkan HA. [Global surgery and CapaCare's Surgical Training Programme.] **Summer school International health, University of Copenhagen, Copenhagen, Denmark**, August 2018 – *Oral presentation*
- 14 Bolkan HA. [Foreign doctors used for 'on the job' training of health workers in low resources settings] **Global Surgery Amsterdam, Amsterdam, The Netherlands**, September 2018 – *Oral presentation*
- 15 Bolkan HA. [Surgical capacity building in West africa] **Global Surgery Stockholm, Stockholm, Sweden**, October 2018 – *Oral presentation*
- 16 Lindheim-Minde B, Gjora A, van Leerdam D, Smalle I, Bundu I, Bolkan HA. [Surgical activity and surgical workforce in Sierra Leone in 2017.] **9th Annual Research Symposium of the Sierra Leone Health and Biomedical Research Group, Freetown, Sierra Leone**, October 2018 – *Oral Presentation*
- 17 Adde H, van Duinen A, Rijken M, Kamara M, Bolkan HA. [Uterine atony as cause of post-partum hemorrhage after cesarean section in Sierra Leone.] **9th Annual Research Symposium of the Sierra Leone Health and Biomedical Research Group, Freetown, Sierra Leone**, October 2018 – *Oral Presentation*
- 18 Bolkan HA. [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 2018 – *Oral presentation*
- 19 Van Duinen AJ. [Maternal and perinatal outcome after caesarean section in Sierra Leone.] **Internundervisning thorax-kirurgisk avdeling St Olav University Hospital, Trondheim, Norway**, November 2018 – *Oral presentation*
- 20 Bolkan HA. [Task-sharing in emergency obstetric surgery], **31. Perinataldagene, The Norwegian Society of Perinatal Medicine, Stavanger, Norway**, November 2018 – *Oral presentation*
- 21 Van Duinen AJ. [Global Surgery], **Midt-Norsk Gastroenterologisk foreign høstmøte, Trondheim, Norway**, November 2018 – *Oral presentation*
- 22 Bolkan HA. [Task-sharing in surgery – experiences from Sierra Leone], **University of Lund, Lund, Sweden**, December 2018 – *Oral presentation*



View of West Point from Ducor Hotel in Monrovia, Liberia.

Research

One of the core activities of CapaCare is evaluation and research activities to assess the impact and quality of the Programme activities we are delivering. Together with the Norwegian University of Science and Technology we have now one postdoctoral position and two PhD positions attached to our activities in Sierra Leone. The research initiatives are important not only for documenting results and lessons learned, but also to explore new ways of surgical training, and how the health system in Sierra Leone accepts task-sharing. Research has in the past allowed us to draw attention towards the surgical health care system in the country, as reflected by high impact scientific papers^{9,10}, opinions pieces^{11,12}, editorials.^{13,14}

CapaCare are collaborating with several leading academic institutions on global surgery. Together with Karolinska Institute in Sweden and NTNU we have conducted the first ever blind randomised trial evaluating the efficacy and safety of task-sharing in mesh hernia repair. Part one was completed in 2017, where 230 men were randomised for surgery by a Medical Doctor or a SACHO. The primary outcome is hernia recurrence at one year and postoperative complications at two weeks. Preliminary analysis after two-weeks revealed no significant difference in postoperative complication or patient satisfaction between the study arms. The one-year follow-up has just been completed with more than a 90% follow up rate.

In 2018 we also revisited (first time visited in 2013) all health care facilities offering surgical care in Sierra Leone. Although the volume of surgery has increased more than 35%, the number of operations per inhabitant per year is the same as in 2012. This is due to a considerable population growth in the same time period. It will require immense efforts to upscale the surgical capacity to such an extent that those targets can be reached.



Michael Kamara at the HBIOMED in Freetown

Potential expansion – Surgical Training Programme in Liberia

Surgical mapping of Liberia

From September to November 2018 representatives from CapaCare were present in Liberia to conduct a mapping of the country's surgical activity, infrastructure and workforce. The data collection was a joint operation between researchers from CapaCare and the Liberian Ministry of Health. The research team travelled to all parts of the country, and a total of 51 surgical facilities were included in the study.

At each facility surgical logbooks were investigated and key personnel were interviewed to collect information on surgical infrastructure. The study is meant to inform both local and international stakeholders and decision makers on the surgical situation in Liberia. The results will provide numbers on the amount of surgical procedures, density and productivity of surgical providers, and the cost of the unmet need for surgery. The research team will present the findings for key stakeholders in Liberia, and the study will provide a solid foundation for further discussion on how to best reduce the burden of surgical disease in Liberia.



Håvard Adde and Theophilus C. Hampaye of the Liberian Physician's Assistant Association alongside staff at Richard & Helen Devos Medical Center

9 Bolkan HA, van Duinen A, Waalewijn B, et al. Safety, productivity and predicted contribution of a surgical task-sharing programme in Sierra Leone. *Br J Surg* 2017; 104(10): 1315-26.

10 Waalewijn BP, van Duinen A, Koroma AP, Rijken MJ, Elhassein M, Bolkan HA. Learning Curve Characteristics for Caesarean Section Among Associate Clinicians: A Prospective Study from Sierra Leone. *World J Surg* 2017; 41(12): 2998-3005.

11 Milland M, Bolkan HA. Enhancing access to emergency obstetric care through surgical task shifting in Sierra Leone: confrontation with Ebola during recovery from civil war. *Acta Obstet Gynecol Scand* 2015; 94(1): 5-7

12 Milland M, Bolkan H. Surgical task shifting in Sierra Leone: a controversial attempt to reduce maternal mortality. *BJOG* 2015; 122(2): 155.

13 Stewart BT. Editorial Commentary on Bolkan et al. "The Surgical Workforce and Surgical Provider Productivity in Sierra Leone: A Countrywide Inventory". *World J Surg* 2016; 40(6): 1352-4.

14 Fatal fallout. *Nature* 2015; 519(7541): 5-6.

Partners

CapaCare’s main financial partners are the United Nations Population Fund (UNFPA), Torun and Ole’s Stiftelse, Norwegian Agency for Development Cooperation (NORAD). All main sponsors continued to support CapaCare in 2018. Norwegian University of Science and Technology (NTNU) and Trondheim University Hospital, St. Olav have contributed with funds for evaluating 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 2018. Annual and quarterly plans and budgets are submitted to the UNFPA, and all the spending in Sierra Leone is 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.

Finance – key figures

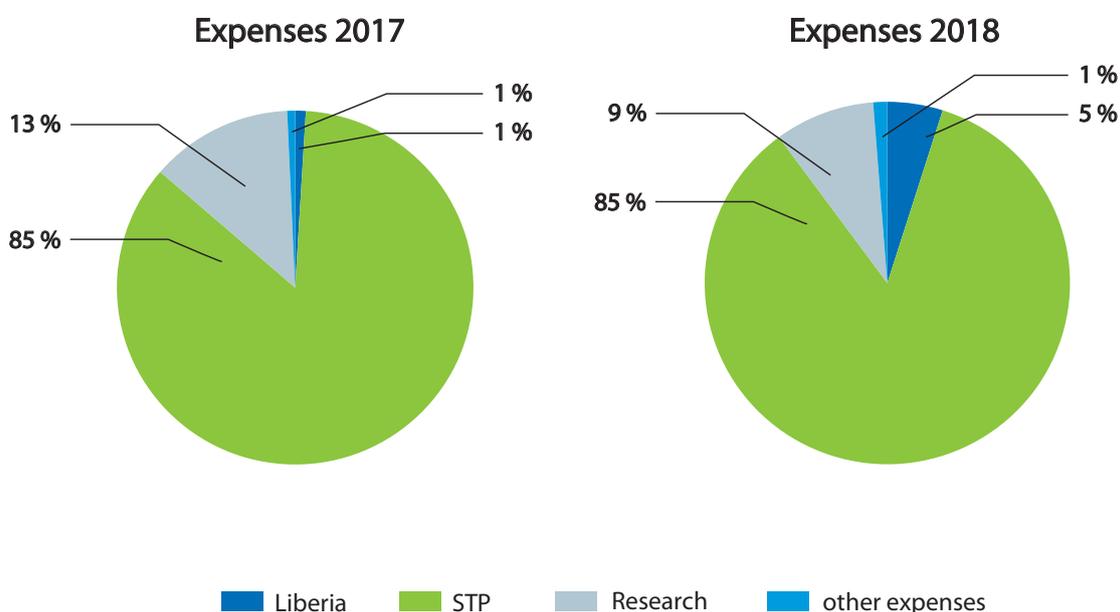
Both the financial report of CapaCare Norway and CapaCare Sierra Leone were not finalised as this report went to print. These financial reports will be made available online at www.capacare.org in due course.

Income

Income in 2018 was 4.5 million NOK, an increase of 20% compared to 3.7 million NOK in 2017. This income was donated by several major donors, Norad and UNFPA for our operations in Sierra Leone and Turinn & Oles Stiftelse for Liberia. Total income in Sierra Leone was 1.5 million NOK both in 2017 and 2018, so the increase in income was from funds raised in Norway.

Expenses

Expenditure in 2018 was 4.2 million NOK compared to 3.7 million in 2017, an increase of 14%. In both years the majority of the expenses (85%) were spent on the Surgical Training Programme in Sierra Leone.

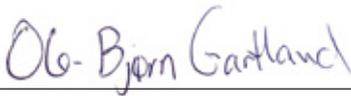


We want to thank everybody that has contributed to the Programme for the support that we have received!

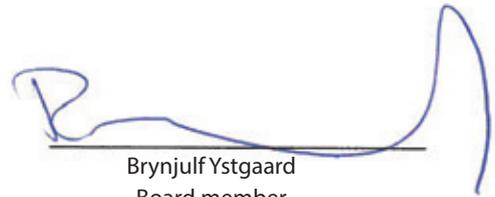
CapaCare Board
Trondheim, Norway
Masanga, Sierra Leone
March, 2019



Håkon Angell Bolkan
Chair



Ole-Bjørn Gartland
Treasurer



Brynjulf Ystgaard
Board member



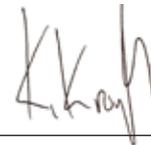
Anne Husby
Board member



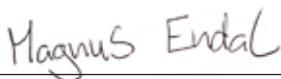
Peter Bo Jørgensen
Board member



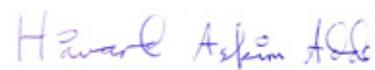
Alex Van Duinen
Board member



Kurt Østhus Krogh
Board member



Magnus Endal
Board member



Håvard Askim Adde
Board member



Øyvind Veel Svendsen
Board member



Bart Waalewijn
Board Member

*Pictures are taken by Magnus Endal, CapaCare trainers and local team.
All patients have consented in the use of the photos.*

Front picture: STP-student Julius Justin Kaipumoh Class of April 2017

Back picture: STP-student Hindowa Sao Lavally performing surgery with CapaCare trainer Dr. Lesley Hunt at Masanga Hospital



www.capacare.org

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

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