PROSTHETICS & ORTHOTICS IMPACT ASSESSMENT

West Africa: Togo and Benin

Masse Niang from the study team checks the quality of a Knee Ankle Foot Orthosis.

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Edited by Sandra Sexton and Angie Weatherhead.

Together we will continue moving beyond physical disability

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Contents:

Section 1: Executive Summary

There is an increasing number of people with disabilities worldwide and according to the World Report on Disability[1], between 110 and 190 million adults experience significant difficulties in functioning. People with disabilities often need prosthetic and orthotic services to gain mobility. Restoring mobility is the first step towards enjoying basic rights such as access to food, shelter and education; finding a job and earning an income; and generally having the same opportunities as other members of society. These outcomes are important indicators of human development. Assistive devices may also prevent falls, injuries and other impairments. Consequently, investment in the provision of assistive devices can reduce health-care costs and economic vulnerability, increase productivity and improve quality of life. The World Report on Disability also highlights barriers faced by people with disabilities wishing to access appropriate physical rehabilitation services. These include the absence of a national plan or strategy; non-existent or inadequate services (where services exist, they are often only located in major cities); a lack of trained professionals; and insufficient finances to cover the cost of services, including transport to places providing them.

In Africa, as for other less-resourced countries, access to appropriate prosthetic and orthotic services is hampered by different factors, including a lack of trained professionals. In addition to training new professionals to meet demand, it is also important to provide continuing education opportunities for professionals who have been practicing for many years. This is to ensure that their skills and knowledge are kept up to date with best practice. The Ecole Nationale des Auxiliaires Médicaux of Lomé (ENAM), the only French-speaking prosthetics and orthotics training institution in Africa (and one of the few around the world), was established in 1977. Since then more than 234 individuals have graduated and are now working in most of the French speaking countries in Africa and in Portuguese speaking countries like Guinea Bissau. ENAM has been recognised since 2004 as having an International Society for Prosthetics and Orthotics (ISPO) Category II level training program.

As part of ISPO's United States Agency for International Development (USAID) funded program '*Rehabilitation of physically disabled people in developing countries'* and building on past work, the study evaluated the impact of training personnel to the minimum standards of ISPO Category II and conducted a partial audit of ENAM graduate clinical skills and competencies. The study also determined the professional development needs of graduates in two West African countries, namely Benin and Togo.

In short, we found the impact of ENAM graduates on clients, their families and communities was positive. They had positively impacted on the availability of prosthetic and orthotic services and more globally on the development of rehabilitation services, despite the challenging economic and social context of Togo and Benin. The most significant impact is that most people with disabilities using their services have regained their mobility and are able to achieve their own goals. In addition, directors of centres have also highlighted the impact on the quality of services by having trained professionals in their centres. Government authorities highlighted the positive impact of having trained professionals on the decentalization of services, although all recognized that much remained to be done to further strengthen and/or consolidate the development of prosthetic and orthotic services in their countries.

Our observations and analysis of the situation in Benin and Togo led us to make a number of recommendations to provide guidance to graduate personnel, prosthetic and orthotic services, national authorities, ENAM and the wider rehabilitation sector.

Section 2: Introduction and context

ISPO certifies prosthetists/orthotists (ISPO Category I) or orthopaedic technologists (ISPO Category II) graduating from ISPO evaluated courses of study[2]. ISPO has a program of activity grant: '*Rehabilitation of physically disabled people in developing countries*' funded by USAID. One of the objectives of the grant is to assess the impact of ISPO recognized Category I and II training.

There is a tremendous need for personnel to develop prosthetic and orthotic services in Africa to meet the needs of people with disabilities. The Ecole Nationale des Auxiliaires Medicaux (ENAM) is located in Lomé, Togo, and has a training program recognized at ISPO Category II level. Since the training began in 1977, 234 individuals have graduated and are now working in most French speaking countries in Africa and in some cases, in Portuguese speaking countries (e.g. Guinea Bissau). Some of these graduates were sponsored in their professional education with scholarship funding from either USAID directly or via an ISPO collaborative agreement with USAID, or through agreements with other organizations.

We considered various ways to measure impact from published literature. We used the USAID Impact Assessment Primer Series as guidance[3] and developed a causal model and analysis framework (see Appendices for further information).

Our hypothesis was that ***Training personnel to ISPO Category I and II standards provides basic knowledge, skills and experience to enable them to provide and/or improve prosthetic and orthotic services for persons with physical disabilities.***

In association with ISPO's current USAID funded program "Rehabilitation of physically disabled people in developing countries", field visits were conducted in Togo and Benin. We interviewed Ministry officials, Heads of Hospital Services and Heads of Prosthetic and Orthotic Departments. We carried out a partial audit of graduate clinical skills and competencies whilst determining the professional development needs of graduates in the two West African countries. We also listened to service users hearing their stories of how services had directly impacted upon their lives.

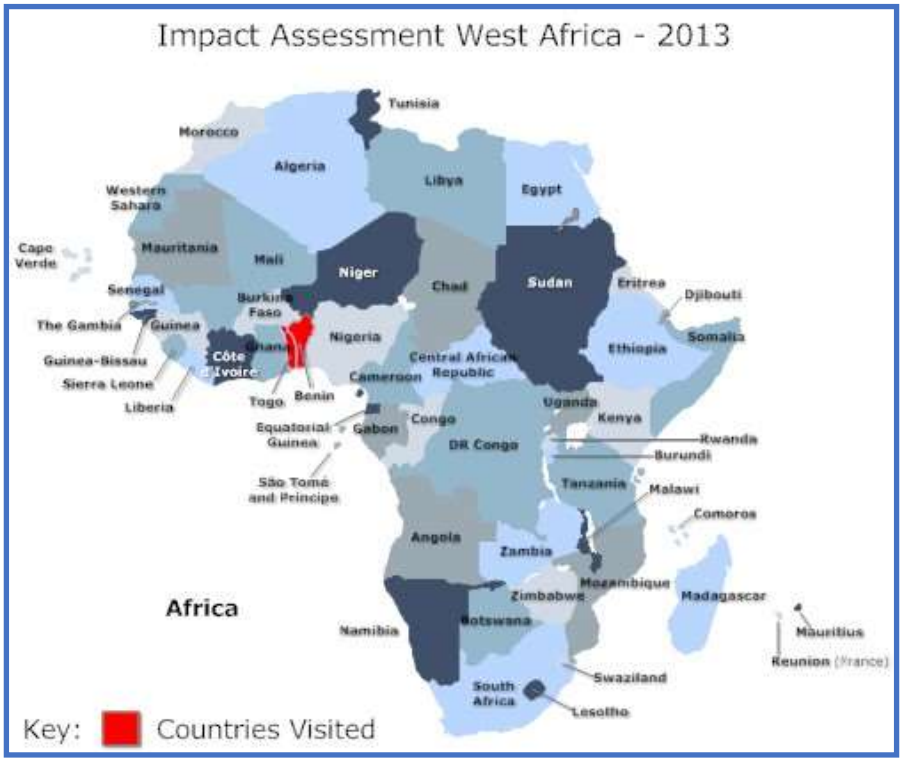


Figure 1. Map of Africa highlighting West African countries visited

Section 3: Methodology

This impact assessment focussed on completing a partial audit within 2 countries where graduates of an ISPO recognized program were working. Each national follow up of graduates reported on:

1. **Country context and rehabilitation, prosthetics and orthotics services.**
2. **Discussions with government officials, head of services, prosthetics and orthotics service managers.**
3. **Interviews with graduates together with their clients.**

The assessment was conducted in French by the authors during site visits to the countries from 3rd to 12th June 2013.

1. Country context and rehabilitation, prosthetics and orthotics services

Desk based research was augmented by tours of national, regional and local prosthetics and orthotics facilities.

2. Discussions with government officials, head of services, prosthetics and orthotics service managers

Letters of invitation were sent to government officials and heads of services with email or telephone recruitment of prosthetics and orthotics services managers. Discussion guides were used in the following meetings:

A. Courtesy visits with government ministries involved with the delivery of prosthetics and orthotics services: This helped determine the commitment of Governments to develop services for persons with physical disabilities.
B. Meetings with directors of hospital services: This helped determine the history and development of services and facilities, in addition to how prosthetics and orthotics fitted into the overall scheme of services. The service structure and the user population were also explored.
C. Meetings with prosthetic/orthotic services managers: This helped determine the staff profile and established the impact of having graduate personnel working in a prosthetic/orthotic service. Furthermore, leadership, national recognition and service development were discussed.

3. Interviews with graduates together with their clients

This part of the study had a specific methodology which involved one hour interviews with graduates.

Title: A study of professional skills and development needs of clinical personnel in prosthetics and orthotics in lower income countries.

Investigators: Study investigators led a structured interview with study participants. In each study, investigators were selected from the formal list of ISPO evaluators, regional program heads and/or key senior personnel who have extensive postgraduate experience. In this study the investigators were physiotherapist Claude Tardif, and prosthetists/orthotists Masse Niang and Adama Amah. Adama Amah is also an instructor at ENAM.

Location: The study was conducted in the workplace; in one or more prosthetic/orthotic clinics in Benin and Togo.

Objectives of investigation: The study addressed the wider program objective to assess the impact of ISPO Category I or II training on:

- the end user of prosthetic and orthotic devices
- the quality of prosthetic/orthotic treatment

This West Africa graduate audit survey specifically aimed to:

- determine the scope and level of professional practice
- audit ENAM graduate skills
- determine the professional development needs of the graduate

ISPO Category I and II training aligns with ISPO published professional profiles for prosthetist /orthotists (ISPO Category I) and orthopaedic technologists (ISPO Category II) [2].

Nature of the participants: ISPO certified graduates of ENAM working in Benin and Togo with at least 1 year post-graduate experience and having a scope of practice in lower limb prosthetics and/or lower limb orthotics patient management.

Consents: Written consent was sought from graduate participants following the provision of a Participant Information Sheet. Clients/patients were asked to verbally consent to their involvement following a clear verbal explanation in their local language by their participating clinician.

Recruitment of participants: Potential participants were identified from the graduate lists supplied by ENAM and verified through the ISPO list of certified professionals. Following study recruitment by letter, email or telephone invitation from the program head, visits to graduates in the clinical settings were arranged in Togo (Lomé, Kara and Atakpamé) and Benin (Coutonou, Porto Novo and Calavi). A convenience sample was selected depending on where graduates worked, the available time and budget for each field visit and travel itineraries. The graduates selected client participants.

Structured interview: A structured interview was developed, building on past graduate follow-up work conducted by the ISPO over the last decade and funded by USAID. The protocol was re-developed following a 2010 graduate audit field trip to Vietnam and then validity testing with two experienced clinicians in Ethiopia and Tanzania. Following this the structured interview data collection forms were redesigned to enable improved ease of use. The method was then applied in an East Africa impact assessment. The most recent methodology was presented here.

Prior to entering the interview, the graduates were given a 2 page form to complete regarding demographic data about themselves and their client. They also answered questions about professional practice. Each participating graduate was then interviewed about lower limb clinical care at the end of a client review appointment both with their client (part A) and then without their client present (part B). A data collection form was used and this also acted as an aide memoir to prompt areas for further discussion during the interview.

PART A: With the client present, the interviewer asked the graduate to present their client case. The interviewer took notes on the data collection form during the interview which covered the competencies expected of an ISPO certified professional. This part of the interview took about 30 minutes to complete.

PART B: Once the client had left, the interviewer reviewed the interview form with the graduate and identified at least 3 areas for clinical practice development that the graduate could work on alone. It was estimated that this part of the interview took about 30 minutes to complete.

Where graduates demonstrated consistent good practice, other development needs were discussed. At the end of the interview participants were given a note of feedback and a personal development plan.

Independent scrutiny: The methodology was reviewed by Dr Angus K McFadyen, Statistical Consultant from AKM-STATS, Glasgow, Scotland, UK, with a request for advice about the questionnaire design and the intent to perform exploratory data analysis. The methodology was then improved prior to use.

Data collection, storage and security: Data collection was undertaken by the investigators using the structured interview process and hard copy data collection form. Data was made anonymous when electronically processed. Both raw data and electronic data are securely held by the ISPO program manager, and remain the property of USAID until at least 3 years after the last date of the program (3 years after 31 December 2015). At this point the data will be destroyed.

Potential risks or hazards: No risks were identified.

Ethical issues: Participation was voluntary. All forms were coded and no identifying information has been provided in any study report.

Any payment to be made: Participant travel and subsistence expenses were provided for people away from home for over 2 hours.

Participant debriefing: Participants were immediately given their feedback and a personal development plan. Once available, participants will be sent a copy of this final study report.

Outcomes dissemination: The outcomes of the study will be widely published on the ISPO website, presented at conferences and submitted to peer reviewed journals.

Section 4: ISPO certified graduates in Benin and Togo

Since 1977, 234 individuals have graduated from ENAM, Togo. ENAM was recognized as an ISPO Category II level training institution in 2004. Among the 89 Togolese who graduated from ENAM, ISPO has certified 50 students as ISPO Category II level professionals. All 7 ENAM graduates from Benin are certified as ISPO Category II level professionals.

Graduate participants in this impact study

A sample of 22 ISPO certified graduates working in Benin (5) and Togo (17) participated in this study. This comprised of 21 ISPO Category II level professionals and 1 ISPO Category I level professional. The latter, after completing training at ENAM and a few years of work, continued training at the Institut de Technologie Supérieure Montplaisir (ISTM) in Valence (France). The average age of the graduates was 41 years old with a range from 30 to 60.5 years. We saw 34% of all ISPO certified Togolese personnel and 71% of all ISPO certified Beninese personnel. 20% of the sample were female.

Graduates Interviewed (n=)		ISPO Category I	ISPO Category II
Togo	17	1	16
Benin	5		5
Total	22	1	21

Table 1: Graduate participant information

	Average age	Age range		Average yrs graduated
		low	high	
Togo	40	32	55	14
Benin	42	28	66	11
Overall	41	30	60.5	12.5

Table 2: Graduate ages and years graduated

Of the 22 graduates who participated in the study, 14 were involved in the entire study (i.e. an assessment with clients). 8 graduates were interviewed without the presence of clients, but participated in the section relating to education and training and the scope of their professional practice. The reasons for this were: 3 graduates had clients who did not attend the assessment; 4 graduates were met outside their workplaces while participating in a seminar in Lomé; and 1 graduate was in a centre which had not commenced services.

Professional Practice

Scope of practice:

41% of graduates in the sample practiced all levels of prosthetics and orthotics, including upper limb prosthetics and orthotics and spinal orthotics. One graduate reported that he was also involved in wheelchair service provision. 45% of graduates in the sample reported working exclusively in lower limb orthotics and prosthetics and spinal orthotics. In the vast majority of cases, only one technology was used; polypropylene technology (supplied by CR Equipements SA). In very few cases other technology was used, mainly that supplied by Otto Bock.

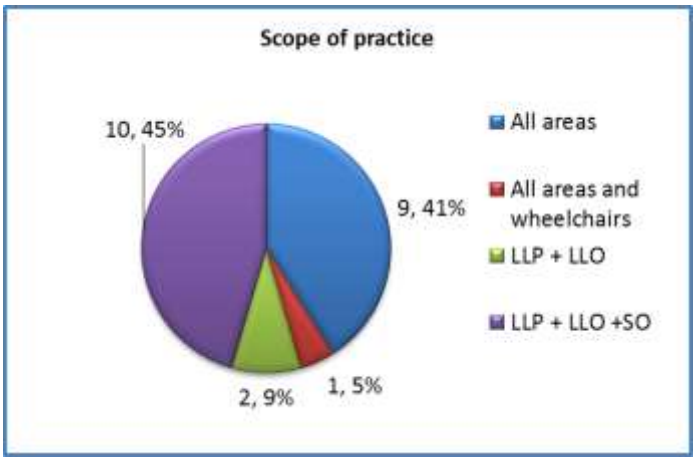


Figure 2

Specialist care: 86% of graduates did not specialise in any area, but worked as generalists. 14% of graduates specialised in wheelchairs (n=1) or orthotics (n=1); or in particular a condition (n=1) such as Congenital Talipes Equino Varus (Clubfoot).

Activities: On average, graduates reported that they spend 89% of their time in service provision (either in providing direct client care or supervising other professionals while they provide care) and 11% of their time in administrative tasks.

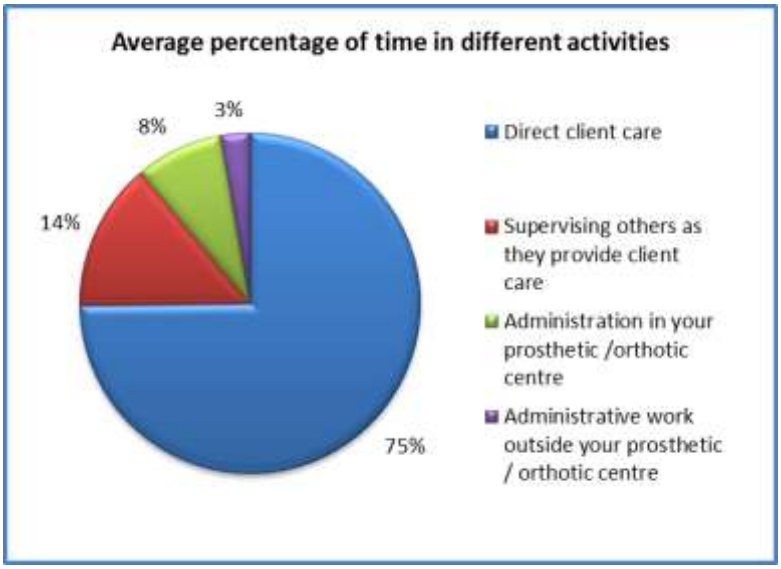
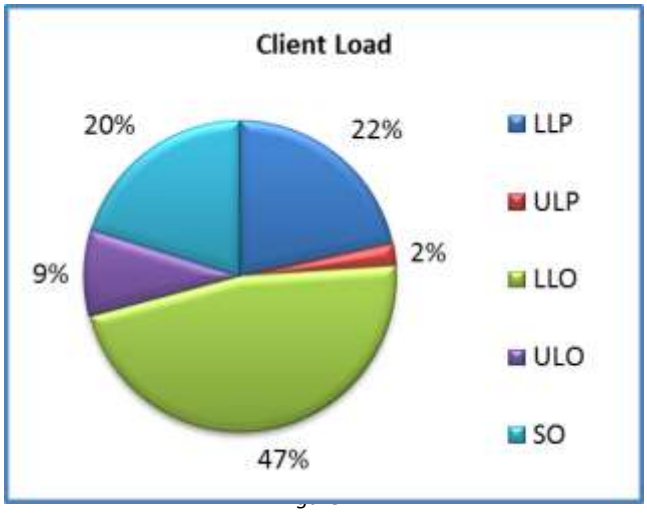


Figure 3

Caseload mix:
The greatest client load was lower limb orthotics (47%), followed by lower limb prosthetics (22%), spinal orthotics (20%), upper limb orthotics (9%) and finally upper limb prosthetics (2%).



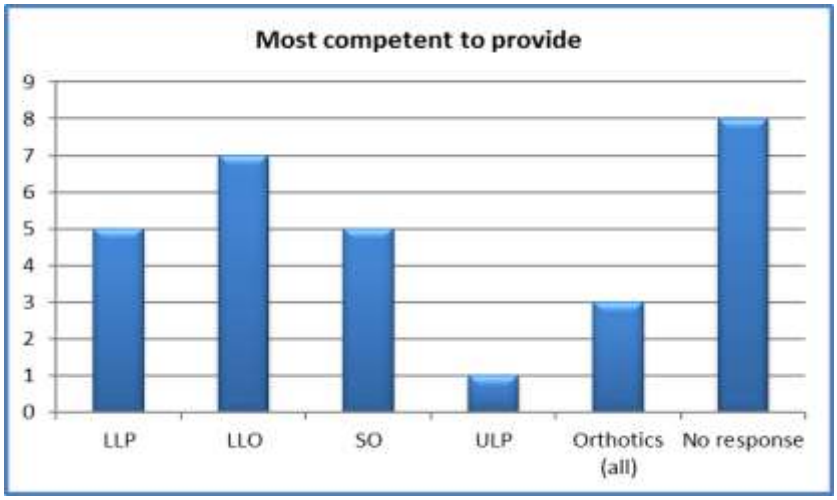


Figure 5

Level of competence:
Most graduates reported that they felt competent in practicing lower limb prosthetics, lower limb orthotics and spinal orthotics, which aligned with the average scope of practice. 8 graduates declined to answer this question.

FIGURES 5 & 6 SHOW NUMBER OF TIMES REPORTED

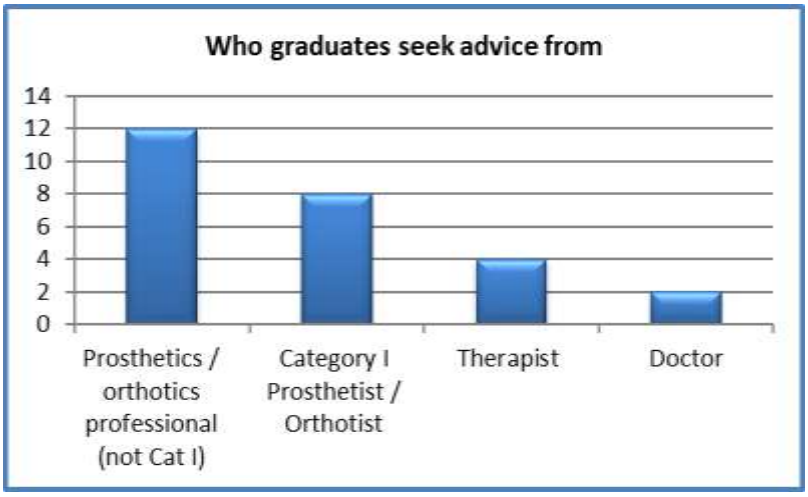


Figure 6

Seeking advice for complex cases:
89% of graduates sought advice from other professionals for complex cases. This was most frequently from their colleagues who are normally Category II certified (46%), followed by ISPO Category I colleagues (31%), therapists (15%) and physicians (8%).

Keeping up to date with information:
Most of the graduates reported they have access to the internet in various ways at work or at home and, along with participation in workshops, seminars or short courses, these were the most used methods by the graduates to keep themselves up to date. 36% of the graduates reported that they read articles from professional journals.

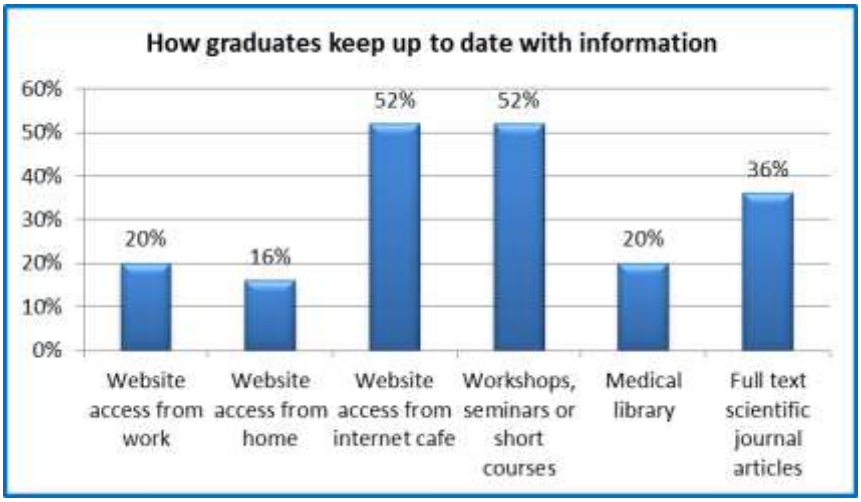


Figure 7

Membership of professional bodies and clinical interest groups: 87% of graduates reported being a member of a national professional association, namely: Association des Techniciens Orthoprothésistes du Togo (ASTOP); and Association des Professionnels de l'Orthopédie au Bénin (AOPB).

Clinical practice

Fourteen graduates completed this section.

Ten orthotic clients were presented. Eight of them were using Knee Ankle Foot Orthoses (KAFO) and two were using lumbo-sacral spinal orthotics. While the study was originally focussed to concentrate on lower limb devices, it was decided by the evaluators to also include these in the study.

Ten prosthetic clients were presented, including seven trans-tibial amputees (including two bilateral amputees) and three trans-femoral amputees.

Referral prescriptions: A referral prescription was available for only 10% of the sample.

Clinical records: An adequate assessment was viewed to have been recorded in 50% of the sample. In most cases though this assessment was by a physical therapist in the presence of the orthopaedic technologist. A client file was available for

55% of the sample, but in a majority of cases, files were not complete and did not provide an historical overview of the services received. Among all centres visited, only 3 had a formal client records filing system.

History taking: All graduates took an adequate medical history, however only 25% of graduates assessed beyond the client's medical history (i.e. social and environmental history). The other 75% did not seek information about the physical environment (home, work and leisure), independence and mobility for daily living.

Description of physical disability: Most of the graduates reported disability clearly, but in 60% of the cases reporting was not complete. In these cases, graduates reported general descriptions without reporting on detailed functional limitations specifically for their clients.

Prosthetic/orthotic history: Most of the graduates were able to determine prosthetic and/or orthotic history, but missed details of specification and dates when presenting their clients.

Physical examination: The majority of graduates reported an adequate physical examination, even if in many cases, information was only provided following being prompted by the interviewer. However, graduates did not use professional terminology and had weaknesses in muscles testing. In addition, only a very low number of graduates performed a complete physical examination (i.e. evaluating the whole person and not only the affected limb).

Functional rating of user: 45% of graduates described the functional activity of the client. None of the graduates used a functional rating scale.

Devices meeting client's needs: All graduates, except one, reported that where devices were used by clients, they generally met the client's needs given the limitations of their service. This was without much knowledge about the work and living environment of their clients.

Appropriateness of device: Only 35% of the interviewer responses evaluated that the devices were appropriate. 45% were considered partially appropriate and 20% were viewed as not appropriate.

Prosthetic and orthotic prescription and specification: A limited range of prosthetic and orthotic designs were in evidence.

All prostheses, except one (manufactured with Otto Bock technology), were manufactured with polypropylene technology, distributed by CR Equipements, SA. Among the trans-tibial prostheses, 6 were patella tendon bearing (PTB) with Ethylene Vinyl Acetate (EVA) liners, supracondylar suspension and Solid Ankle Cushioned Heel (SACH) foot. The remaining 2 trans-tibial prosthesis were patellar tendon supracondylar (PTS), with Ethylene Vinyl Acetate (EVA) liners, supracondylar suspension and SACH foot for one prosthesis and one single-axis foot.

All trans-femoral prostheses had quadrilateral sockets, uni-axial knee joints completed with SACH feet. Two of them had vacuum suspension and one had waist belt suspension.

All KAFOs (8) were manufactured with polypropylene. 6 KAFOs had side bars with drop-lock knee joints and 2 had side bars with "Swiss lock" knee joints, and for all of them the strapping was either leather or webbing. Most of the KAFOs had movements at the level of the ankle (ankle joints with limited dorsi and plantar flexion).

Durability of device: The vast majority of the devices were in good condition. Clients were wearing devices that were on average 10 months old, with an overall range from 1 to 36 months old.

Devices: 95% of devices seen were manufactured by the graduate interviewed and all clients were using their most recent device.

Follow up since delivery: 75% of the clients had been followed up since delivery of their devices either as a normal procedure (one month after delivery) or if the device needed some basic repairs (i.e. change straps, prosthetic foot, etc.).

Treatment goals identified and noted: Even if it was not written in the client file, graduates were able to identify treatment goals.

Improvements for devices seen: Almost all graduates reported that they would improve on the client's device to better meet the client's needs and function. Figure 8 shows the various areas identified for improvement. However, for most graduates, the identification on how the devices could be improved came only following prompting from the evaluators. There was only one case where both the graduate and the evaluators agreed that no improvement was needed.

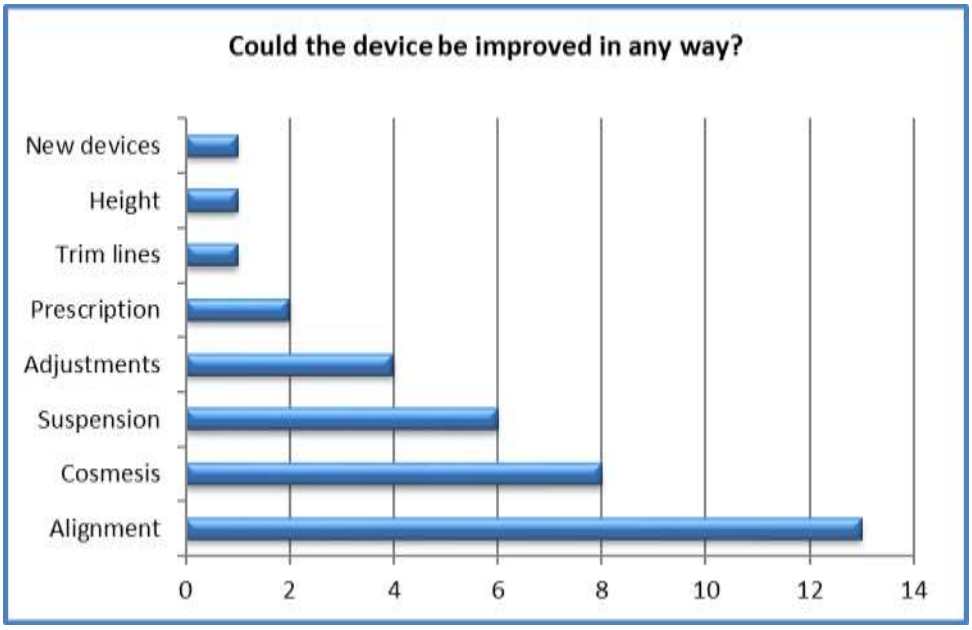


Figure 8

FIGURES 8 - 12 SHOW NUMBER OF TIMES REPORTED BY PARTICIPANTS

Training and Education

22 graduate participants completed this section.

Most beneficial part of professional training: Graduates most frequently rated courses related to prosthetics and orthotics technology, biomechanics, anatomy & pathology, and material technology as being the greatest benefit to them.

Figure 9

Topics which could have been better covered in course: Upper limb prosthetics was the most frequently reported topic that graduates wished to have learned more about in their training. However, upper limb orthotics and spinal orthotics were also identified as key topics that graduates wished to have learned more about.

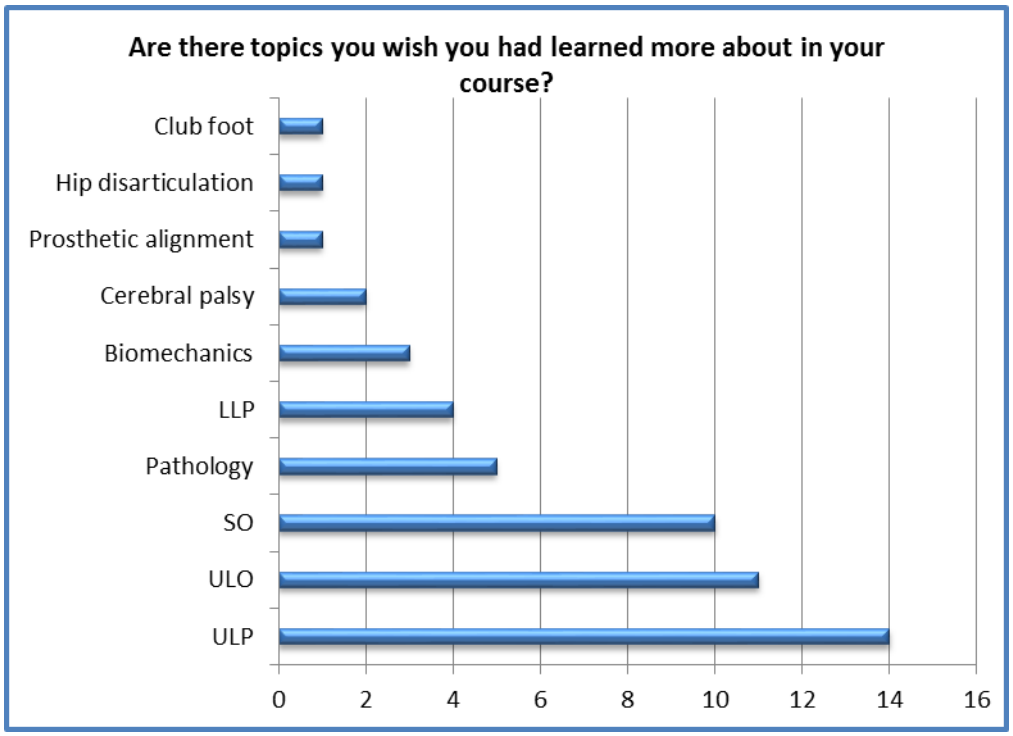


Figure 10

Desire for continuing education courses: All graduates mentioned the limited number of possibilities to attend continuing education courses. Aligning with the topics graduates wished to have learned more about during their training, upper limb prosthetics and orthotics and spinal orthotics were also reported as being the most desired subjects for continuing education courses.

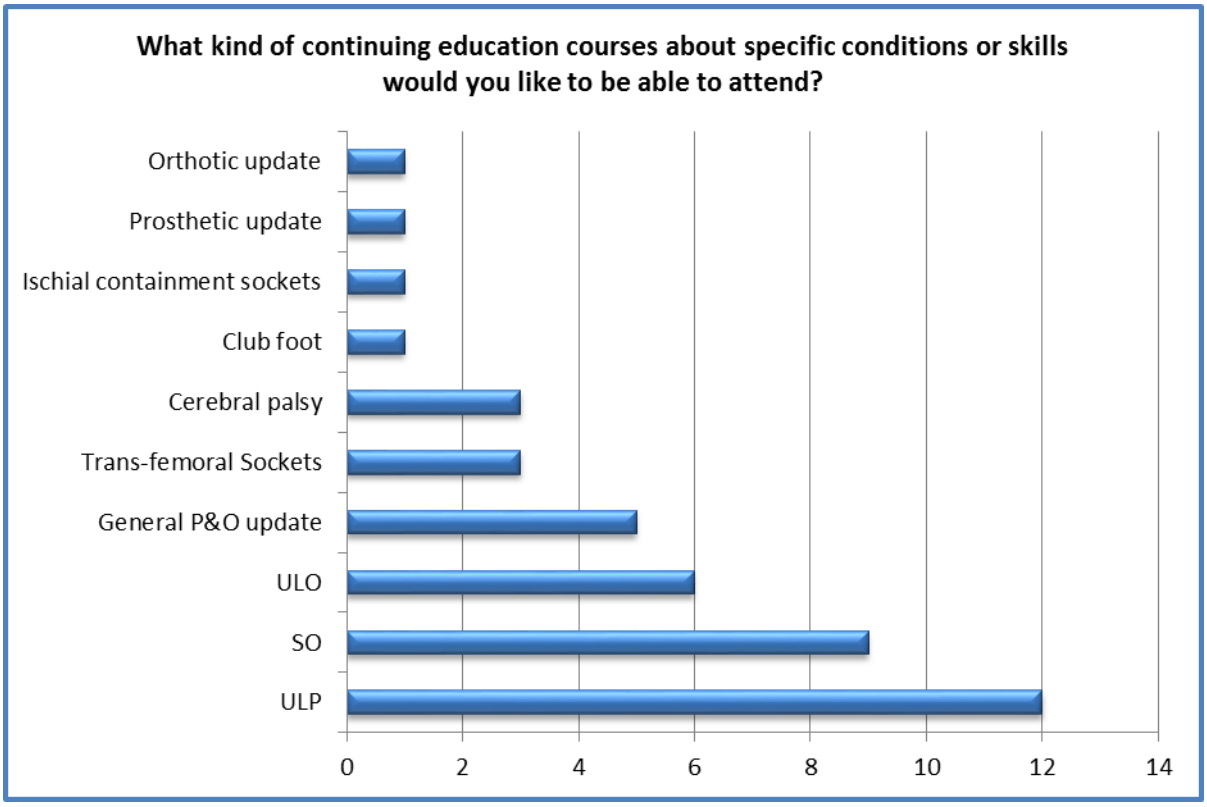


Figure 11

Desire to introduce new technologies: The most frequently reported technologies that graduates wished to introduce were plastic manufacturing techniques (all kinds including lamination, wrapping, etc.). Modular prosthetic systems and trans-femoral sockets (ischial containment sockets) were the next most frequently reported topics.

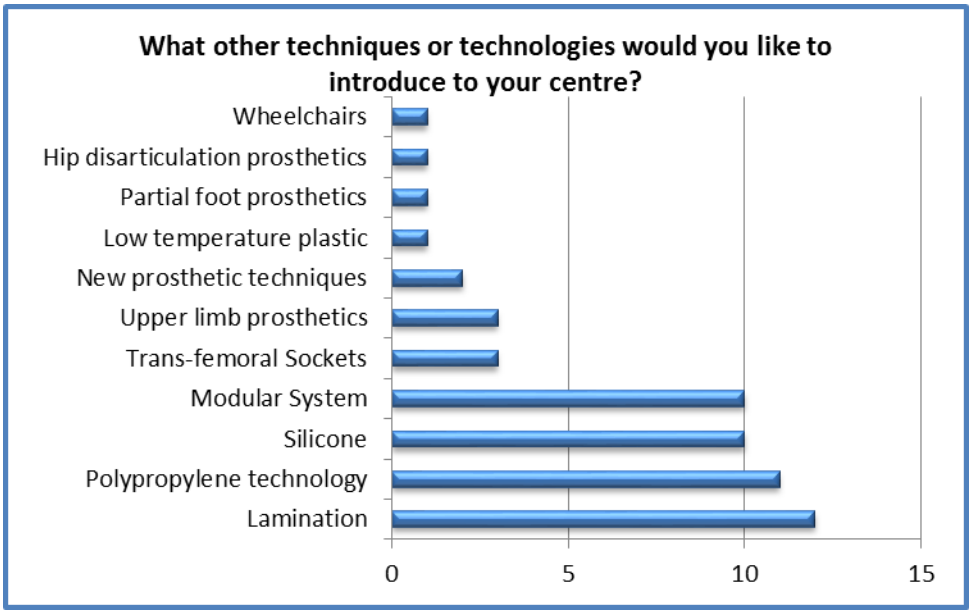


Figure 12

Personal development planning

The data collection form was reviewed by the investigator and graduate without the client present and three development needs were identified for each candidate. The following table shows a summary of those development needs. Where needs were identified due to the client presentations these were prioritized first. Where graduates demonstrated consistently good practice and there were no further issues with their client presentations, other professional development needs were identified through discussion.

The greatest development need identified was for graduates to improve their prosthetics and orthotics clinical and technical skills. This was followed by their client assessment skills.

Development needs summary		
Continuing professional development need ranked by number of times identified		**Number of times identified**
Clinical skills updates	Client assessment	15
	Functional grading	5
	Gait analysis	4
Conditions/ pathologies	Cerebral palsy	3
	Club foot (Congenital Talipes Equino Varus)	1
	Scoliosis	1
Prosthetics & orthotics clinical & technical skills	Prosthetic socket (all levels)	7
	Spinal orthotics	6
	Upper limb prosthetics	6
	Lower limb prosthetic technologies	5
	Manufacturing techniques lower limb prosthetics and orthotics	2
	Lower limb prosthetic alignment	2
	Lower limb prosthetic biomechanics	2
	Wheelchair and seating devices	1
	Ankle foot orthoses	1
	Polypropylene knee ankle foot orthotics	1

Table 3

Section 5: How services impact on lives

Service users gave important insights into the way that prosthetic and orthotic services had impacted upon their lives.

Here we share the feedback that twenty clients gave to their graduate clinicians. We asked

"What difference has the orthotic/prosthetic service made to the user's life?"

Client participants

20 clients (10 prosthetic and 10 orthotic) were seen in total by 14 graduate participants. All clients had received services directly from the graduates. For 6 graduates, two clients were seen. The average age of the client participants was 33 years old, with a range from 12 to 64 years. There were 13 male and 7 female client participants.

Prosthetic clients		**Orthotic clients**	
Conditions	n =	Conditions	n =
Diabetes	1	Infection	1
Vascular (non-diabetes)	1	Trauma	2
Trauma	6	Poliomyelitis	7
Congenital	1		
Infection	1		
TOTAL	**10**		**10**

Table 4

All clients reported that having access to prosthetic and/or orthotic services improved their mobility and that their devices had been important for allowing them to interact with their community. The services had helped them feel more comfortable with their disability.

The three participants of school age (12 and 13 years old) were at school. One adult stated they were a student.

Seventeen adult client participants explained their employment status as follows: teachers (2); housewives (2); office workers (2); weaver (1); police officer (sedentary work) (1); seamstress (1); breeder (1); shoemaker (1); hairdresser (1); security guard (1). One person said they were actively retired and two people stated they were unemployed.

A client with a trans-tibial prosthesis with study investigators Masse Niang and Claude Tardif

Client participant responses

We asked "What difference has the orthotic/prosthetic service made to the user's life?"…

"With my device I was able to study and now I have a job that I love." Client 281 (Orthotic)

"Since I have my orthosis, I can do what I want." Client 282 (Orthotic)

"I can walk without a crutch." Client 285 (Prosthetic)

"The orthosis gave me access to education. Nevertheless, due to my disability, I was not given the work I wanted." Client 285 (Orthotic)

"It allows me to be mobile and go to school." Client 286 (Prosthetic)

"I was not able to take up my chauffeur work after the amputation, but the prosthesis meant I can work the fields." Client 286 (Prosthetic)

"No changes." Client 287 (Orthotic)

"Relief of the pain." Client 288 (Orthotic)

"With my prostheses, I was able to return at school." Client 289 (Prosthetic)

"The prosthesis means I remain active." Client 290 (Prosthetic)

"It allows me to walk without a crutch." Client 290 (Orthotic)

"Since I wear my prostheses, I do not need crutches anymore and it is easier to move around." Client 291 (Prosthetic)

"It allows me to walk more easily." Client 291 (Orthotic)

"I can walk more easily and have my hands free." Client 292 (Orthotic)

"More stability." Client 293 (Orthotic)

"It lets me be mobile and maintain my activities." Client 293 (Prosthetic)

"I regained mobility." Client 294 (Prosthetic)

"The device allows me to walk and practice my profession." Client 296 (Orthotic)

"It helps me to move." Client 296 (Prosthetic)

"It allowed me to find a new job." Client 297 (Prosthetic)

Section 6: Services in Togo

COUNTRY CONTEXT:

Population = 7.115 million (2014)[4]
World Bank Country Classification = Low income[4]
Life expectancy = 59 years (2013)[4]
Official name: Republic of Togo

Togo ratified the UN Convention on the Rights of Persons with Disabilities in 2011. Since 1977 the country has had a national rehabilitation policy, which was updated in 2006. In 2004, Togo was one of the first countries in West Africa to pass a law to protect the rights of persons with disabilities, however this law has never been enforced by legislative degrees. The country also has an Advisory Committee on Disability which is composed of representatives from seven key ministries on the issue of disability, including lawyers and representatives of disability organizations.

The Ministry of Health (MoH) has responsibility for rehabilitation services (including prosthetics and orthotics services) in Togo. The vast majority of prosthetics and orthotics services provided within the country, are through centres under the MoH management aligned with a national decentralisation policy. The rehabilitation sector is divided in three levels: National (national referral centre), Regional (regional referral centre), and Peripheral (district hospital and CBR programme in certain areas). While most of the prosthetics and orthotics services are provided through centres managed by the MoH, there are no national prosthetics and orthotics service provision statistics. In addition, the lack of regulations and standards for prosthetics and orthotics (and rehabilitation in general) hamper the development of the sector. At the time of the visit, the network of prosthetics and orthotics centres included a total of 10 facilities: 1 national referral centre (National Prosthetics and Orthotics Centre - CNAO located in Lomé); 4 regional governmental prosthetic and orthotic centres (CRAO located in Dapong, Kara, Sokodé and Atakpamé); 4 non-governmental organization managed centres (located in Bombouaka, Sokodé, Bassar and Afagnan); and 1 private provider located in Kpalimé.

Prosthetic and Orthotic Services in Togo

Key:
- National Referral Centre
- Other Orthopaedic Technology Clinics/Workshops

1	Centre National d'Appareillage Orthopédique, Lomé
2	Centre Régional d'Appareillage Orthopédique, Dapaong
3	Centre Régional d'Appareillage Orthopédique, Kara
4	Centre Régional d'Appareillage Orthopédique, Sokodé
5	Centre Régional d'Appareilage Orthopédique, Atakpamé
6	Centre Don Orion, Bombouaka
7	Orthopédique CERFAO-NDA, Sokodé
8	Fondation Gadel, Bassar
9	Hopital Saint Jean de Dieu, Afagnan
10	Actions pour la promotion de la santé (APROSA), Kpalimé

Figure 13

Togo has three rehabilitation professional associations: the Togolese Association of Physiotherapists (AMKITO); the Togolese Association of Ortho-Prosthetists (ASTOP); and the Togolese Association of Speech Therapists (ASSEPOT). In addition, organizations of persons with disabilities are mostly under one umbrella organization: the Togolese Federation of Association of Persons with Disabilities (FETAH).

Established in 1945 ENAM is the primary and largest centre of normative and academic training of paramedical personnel in Togo. It has grown over the years by adding new programmes to the original Togolese Nursing School. ENAM is under the auspices of four ministries: the Ministry of Health, the Ministry of Higher Education and Research, the Ministry of Public Service and Administrative Reform and the Ministry of Technical Education and Vocational Training. ENAM's mission is to train paramedics capable of providing care to the individual, family and community to help them achieve a healthy, socially and economically productive life. ENAML has five departments, three of which are directly related to the field of rehabilitation: physical therapy, speech therapy and prosthetics and orthotics. Since its inception, more than 5,600 professionals have been trained by ENAM. The training program duration is three years in all departments and results in students obtaining a state diploma. The Prosthetics and Orthotics Department of ENAM was established in 1974 as part of a German-Togolese Cooperation.

PROSTHETICS AND ORTHOTICS SERVICES WITHIN THE WIDER REHABILITATION SERVICES:

Prosthetic and orthotic services are generally associated with regional hospitals and/or regional health departments. In most cases they offer these services alongside physiotherapy services. However, the national centre CNAO in Lomé, has a different status and is not associated with a hospital. The CNAO offers a full range of services (which is detailed below). Denominational private centres are under the responsibility of religious communities and offer a range of smaller services than the public sector.

REFLECTIONS ON THE IMPACT OF ENAM GRADUATES ON THE DEVELOPMENT OF THE P&O SECTOR IN TOGO:

Togo has benefited from ENAM prosthetics and orthotics graduates from different perspectives. As the school is located in Togo, the number of professionals within the country is high and the graduates have permitted the decentralization of services in all regions of the country. However not all of the graduates are working, as the main employer (the Ministry of Health) did not allow recruitment of new professionals for several years. For this reason, some of the graduates left to work as prosthetists and orthotists in other countries or have left the profession.

Services visited

Our sample audit of graduates took us to three departments offering prosthetic and orthotic services:

- The National Prosthetics and Orthotics Centre (Centre National d'Appareillage Orthopédique) – CNAO located in Lomé
- The Kara Regional Prosthetics and Orthotics Centre (Centre Régional d'Appareillage Orthopédique) – CRAO Kara, located in Kara (Kara Region)
- The Atakpamé Regional Prosthetics and Orthotics Centre (Centre Régional d'Appareillage Orthopédique) – CRAO Atakpamé, located in Atakpamé (Plateaux Region)

National Prosthetics and Orthotics Centre (Centre National d'Appareillage Orthopédique) - CNAO

This National Centre was established in 1974 through cooperation between Germany and Togo and at that time, the centre was under the MoH. The CNAO is intended to provide preventive, curative and rehabilitation services to persons with disabilities. Outside of regular consultations in the centre, the CNAO organizes regular field consultations to bring services closer to the population. CNAO obtained management autonomy in 2008. The centre operates through state subsidy and with the support of development partners namely: the ICRC Special Fund for the Disabled (FSH); Handicap International (HI); Christoffel Blinden Mission (CBM) and the Programme of Disability and Injury Prevention and Rehabilitation (RTID). This support has enabled the CNAO to develop its capacities and to increase the number and types of services provided.

CNAO's budget in 2012 was just under US$ 250,000. CNAO is divided into five departments: Administration and Finance, Devices (sub-divided into three sections: prosthetics, orthotics and wheelchairs), Physiotherapy, Speech Therapy and Social Services.

Staff profile: CNAO had 51 staff, including 12 orthopaedic technologists (ISPO Category II), 13 physical therapists, 1 speech therapist, and 3 social workers.

Populations served: The population served by the CNAO is hard to define as the centre covers not only the municipality of Lomé but also the periphery (Maritime and Plateaux Regions). The Centre also received clients from all over the country and from several countries within the West African sub region (Niger, Burkina Faso, Ghana, Benin, Nigeria, Cameroon, etc.).

Funding: CNAO funding sources were multiple and included: state subsidies, payment for services by clients and the support of development partners. State subsidies primarily covered the operating budget (wages, electricity, etc.) and represented approximately 30% of revenues. Payment for services represented approximately 32% of revenues, and the support of partners in development was approximately 38 %.

Statistics: In 2012, 2,317 clients were seen and referred to the different CNAO departments, an increase from 2,208 in 2011. Of the 2,317 clients, 1,135 were referred to the Prosthetics and Orthotics Department in 2012. The most marked year on year increase in activity is in the number of orthotics devices delivered reflecting the increasing demand for orthotics.

Number of devices delivered - Centre National d'Appareillage Orthopédique, Lomé			
	2010	2011	2012
Prostheses	86	119	99
Orthoses	729	1,050	1,264
Walking aids	25	22	20
Wheelchairs	3	143	20

Table 5

The vast majority of prostheses and orthoses delivered in 2012, were lower limb devices and there was a relatively high number of spinal orthoses.

General comments: Overall, CNAO seemed to be in a better condition and situation than the other prosthetics and orthotics centres visited in Togo. However, as in other centres the same problems were shown which particularly related to service quality and continuous staff training. This was despite the CNAO's proximity to ENAM. Most of the equipment and the electrical installation required renewal to improve the safety and quality of care.

Kara Regional Prosthetics and Orthotics Centre (Centre Regional d'Appareillage Orthopédique) – CRAO Kara

The Kara Regional Centre (CRAO Kara), was established in 1978 through cooperation between Germany and Togo. It has benefited from technical assistance and equipment from GTZ until 1988. CRAO Kara served as a satellite of the National Centre CNAO Lomé, depending on central material and financial resources, until the implementation of the national decentralization policy. CRAO Kara is now under the Regional Directorate of Health of Kara Region. Like the CNAO, the CRAO Kara's mission is to provide preventive, curative and rehabilitation care for people with disabilities in the northern region of Togo. At the beginning, the centre was only providing prostheses and orthoses and then physiotherapy was added and since 2012, speech therapy is also available. CRAO receives ENAM students for clinical placement.

The study team visit the Regional Prosthetics and Orthotics Centre in Kara

Staff profile: Kara CRAO has 23 staff, including 1 Prosthetist/Orthotist (ISPO Category I), 6 Orthopaedic Technologists (ISPO Category II), 2 orthopaedic shoemakers, 6 physical therapists, 1 speech therapist, and 1 social worker.

Populations served: Theoretically the Kara CRAO should normally cover the 7 districts of the region (population of approximately 750,000). However because of the lack of funds its mission to visit all districts each year is not achieved. In average, only 1 district of the 7 is visited per year.

Funding: Kara CRAO funding sources are multiple and include: state subsidies, payment for services by clients and the support of development partners. State subsidies primarily cover the operating budget (wages, electricity, etc.) and represent approximately 97% of revenues, payment for services represents approximately 3% of revenues, and the support of partners in development represents approximately 0.1% of total revenue.

Statistics: In 2012, 512 clients were seen and referred to the different Kara CRAO departments, against 398 in 2011. Of the 512 clients, 238 were referred to the Prosthetics and Orthotics Department in 2012.

Number of devices delivered - Centre Regional d'Appareillage Orthopédique, Kara			
	2010	2011	2012
Prostheses	17	5	4
Orthoses	208	164	157
Walking aids	34	28	29
Wheelchairs	1	56	2

Table 6

All prostheses delivered in 2012, were lower limb. Orthotic provision was mainly lower limb or spinal orthoses.

General comments: The centre was relatively small and somewhat dilapidated. The building was divided into several parts and the premises were cramped and inadequate in terms of the available workspace. According to the centre's

director, 40% of the equipment was in poor condition and 17% out of use. In addition, the centre faced chronic difficulties in the supply of consumables.

Atakpamé Regional Prosthetics and Orthotics Centre (Centre Regional d'Appareillage Orthopédique) – CRAO Atakpamé

The Atakpamé Regional Centre (CRAO Atakpamé), was established in 2005 and started activity in 2006. Like CRAO Kara, the Atakpamé CRAO mission is to provide preventive, curative and rehabilitation care for people with disabilities in the Plateaux region of Togo. In reality, the Centre has had a low impact on the provision of prosthetics and orthotics services to persons with disabilities in the area. This was due to: institutional linkages not being clearly defined; a lack of equipment, tools and consumables; unsuitable premises; and insufficient continuing education for professionals. Located within the compound of the Regional Referral Hospital, CRAO did enjoy the benefits of all the hospital services, but administratively depended on the Regional Health Directorate. This was partly responsible for the difficulties faced by the centre and by professionals to ensure appropriate service provision.

Staff profile: Atakpamé CRAO had 8 staff, including 4 Orthopaedic Technologists (ISPO Category II), 1 orthopaedic shoemaker, 2 physical therapists, and 1 nurse.

Populations served: Theoretically according to its mission the Atakpamé CRAO should cover the 12 districts of the Plateaux region with a population of approximately 1,447,000 people. But due to the lack of funding its mission to visit to all districts each year was not achieved.

Funding: CRAO Atakpamé had no proper funding stream, except for a small budget from the Regional Referral Hospital This was inadequate as it was very low compared to the needs of the centre.

Statistics: In 2012, 425 clients were seen and referred to the different Kara CRAO departments, against 207 in 2011. Of the 425 clients, 117 were referred to the Prosthetics and Orthotics Department in 2012.

Number of devices delivered - Centre Regional d'Appareillage Orthopédique, Atakpamé			
	2010	2011	2012
Prostheses	3	2	7
Orthoses	67	61	110
Walking aids	8	22	31
Wheelchairs delivered	16	49	0

Table 7

All prostheses delivered in 2012 were lower limb prostheses. Most orthoses were lower limb with a relatively high number of spinal orthoses.

General comments: CRAO Atakpamé consists of a main building divided into eight rooms. The premises were cramped and inadequate in terms of the available workspace. Equipment was rudimentary and largely in a poor operating condition which negatively impacted on the quality of care. CRAO had a low impact on the provision of prosthetics and orthotics services to persons with disabilities in the region.

Impact of graduates in Togo services

All directors of centres and the National Director of the Ministry of Health and Social Action when interviewed felt that the availability of prosthetics and orthotics professionals had a positive impact on the care of people with disabilities in Togo. This was from both the quality of care side and from access to services. However, all recognized that affordability remained a major concern and a barrier to services for many people with disabilities. In addition, the lack of proper regulation of the sector (including the legal status of the regional centres), the deficiencies in funding and the paucity of appropriate continuing education for prosthetics and orthotics professionals did not allow for a proper development of the sector in Togo.

During the meeting with the Minister of Health, it was mentioned that there was political willingness to remedy the situation which existed. This included clarifying the legal status of the regional centres, setting up an institutional consistency between regional and national reference centres and by revising the regulation of the sector.

Barriers in accessing P&O services for persons with disabilities

- In Togo clients must pay for their devices and prices range from around US$ 270 for a polypropylene trans-femoral prosthesis to US$ 770 for a modular/resin trans-femoral. This is an astronomical sum for most persons with disabilities and considering the Gross National Income per capita is USD$ 570[4]. As a result the cost of services for the vast majority of persons with disabilities who need orthoses or prostheses is an important limiting factor. While assistance programs exist through governmental and development partners, this is insufficient to meet need.

- The relatively small amount of information on the existence of services was an additional significant limiting factor. Few persons with disabilities who need orthotic and prosthetic services are informed of the availability of services.

- The limited financial resources of the centres severely limited the accessibility of services. All the centres visited faced significant shortages of raw materials and components which impacted on their ability to provide services. Moreover, the restricted financial resources did not allow the centres to develop services.

Section 7: Services in Benin

COUNTRY CONTEXT[3]:

Population = 10.6 million (2014)[5]
World Bank Country Classification = Low income[5]
Life expectancy at birth = 59 years (2013)[5]

Benin ratified the UN Convention on the Rights of Persons with Disabilities in 2012. The main ministries responsible for disabilities issues are the Ministry of Family, Social Affairs National Solidarity, the Disabled and People of the Third Age (responsible for the protection of persons with disabilities) and the Ministry of Health, who are responsible for rehabilitation services. The National Policy for the Protection and Integration of People with Disabilities (PNPIPH) in Benin (2007-2016), was prepared in July 2006. At the time of the visit it was waiting to be adopted by the Council of Ministers. This policy had been designed for the multi-sectoral management of disability and considered people with disabilities as full citizens.

The rehabilitation sector is divided in three levels: National (national referral centre), Regional (regional referral centre), and Peripheral (district hospital and community based rehabilitation program in several districts). Most of the prosthetics and orthotic services are provided through non-governmental centres. There are no national prosthetics and orthotics service provision statistics. In addition, with only six trained professionals (ISPO Category II level) in Benin and a lack of regulations and standards the development of the sector is severely restricted. At the time of the visit, the network of prosthetics and orthotics centres included a total of 9 facilities: 1 national referral centre (Centre National Hospitalier Universitaire) located in Cotonou; 8 regional prosthetics and orthotics centres including 2 governmental-managed centres (Porto Novo and Parakou); and 6 non-governmental managed centres (Porto Novo, Calavi, Tangieta, Pobé, Lokassa and Borgou).

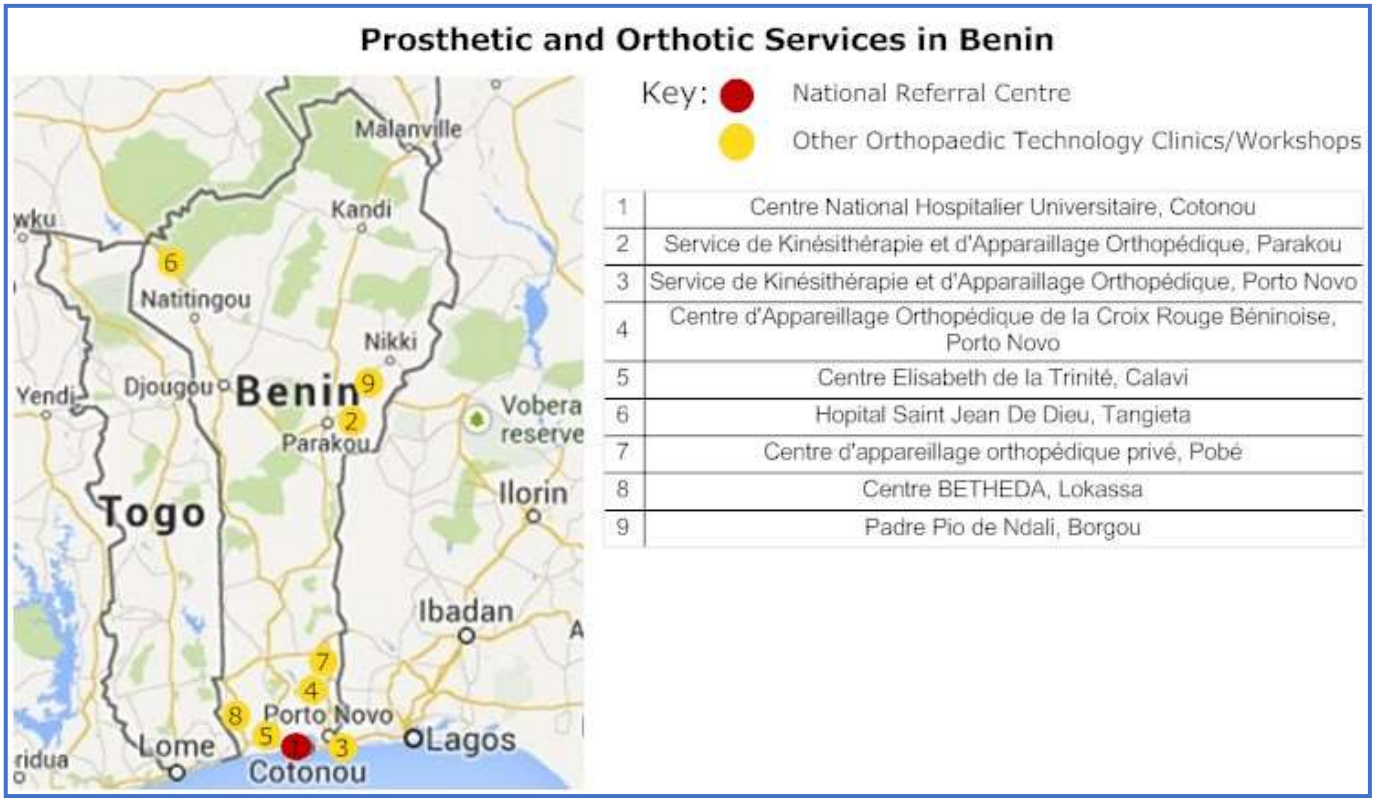


Figure 14

The two mains professional organizations are the: Benin Association of Orthoprosthetists (AOPB) and the Benin Association of Physical Therapists (AKEKIR). The AOPB include all graduates from ENAM (6), 12 prosthetic and orthotic assistants and 2 orthopaedic shoemakers.

PROSTHETICS AND ORTHOTICS SERVICES WITHIN THE WIDER REHABILITATION SERVICES:

Prosthetic and orthotic services were generally weak compared to physical therapy services. Benin had a specific three year plan to support the development of rehabilitation services. However it mainly focused on physical therapy with very little account for the growth or progression of prosthetics and orthotics services.

REFLECTIONS ON THE IMPACT OF ENAM GRADUATES ON THE DEVELOPMENT OF THE P&O SECTOR IN BENIN:

Benin has benefited from ENAM prosthetics and orthotics graduates from different perspectives, mainly relating to the decentralization of services and improvements in the quality of services to clients. At the time of the visit Benin was expecting to have seven new graduates in July 2013. This would double the number of prosthetics and orthotics trained professionals in the country.

Services visited

Our sample audit of graduates took place in three departments offering prosthetic and orthotic services:

- The Prosthetics and Orthotics Department of the National University Hospital (Centre National Hospitalier Universitaire) located in Cotonou
- The Porto Novo Regional Prosthetics and Orthotics Centre (Centre Régional d'Appareillage Orthopédique) – CRAO Porto Novo, located in Porto Novo
- The Benin Red Cross Prosthetics and Orthotics Centre, located in Porto Novo

The Prosthetics and Orthotics Department of the Sainte Elisabeth de la Trinité Centre, located in Calavi was not yet open when visited. We also interviewed graduates from the Parakou Regional Prosthetics and Orthotics Centre, who were attending training in Lomé (Togo).

Prosthetics and Orthotics Department of the National University Hospital in Cotonou (CNHU)

The Prosthetics and Orthotics Department of the National University Hospital was established in 2002. The department received students from ENAM and from the Ecole Supérieur de Kinésithérapie (ESK) for clinical placement. Compared to the Physiotherapy Department, the Prosthetics and Orthotics Department was smaller, less well equipped and with more limited staffing. This could have been explained by different factors, including the support provided by the Belgium Cooperation for the development of physiotherapy in Benin and as the department was not under the management of the Functional Rehabilitation Unit, but the management of Pediatric Surgery. However, plans existed to transfer the management of the department to be under the Functional Rehabilitation Unit, to enlarge the facilities and to recruit two additional graduates from ENAM.

Staff profile: The Prosthetics and Orthotics Department of CNHU had 7 staff, including 1 orthopaedic technologist (ISPO Category II) and 1 orthopaedic shoemaker. Physical therapy services are provided by the hospital's Physiotherapy Department.

Populations served: The population served by department included those from the southern part of the country (Atlantique, Littoral, Ouémé and Plateau regions), representing a total population of approximately 3.8 million.

Funding: Funding sources were mainly the hospital, payment for services by clients and through the support of development partners.

Statistics: In 2012, a total of 288 prostheses and orthoses were provided.

Number of devices delivered - Prosthetics and Orthotics Department of, National University Hospital, Cotonou			
	2010	2011	2012
Prostheses	21	28	13
Orthoses	272	334	275
Walking Aids	7	8	16
Wheelchairs	N/A	N/A	N/A

Table 8

General comments: The department suffered from the same weakness seen in other centres visited in Benin. Indeed, the Prosthetics and Orthotics Department compared to physiotherapy service was weak in terms of human resources, equipment and quality of service provided for people with disabilities. The surface area of the Physiotherapy Department was around 900m^2. It received 120 to 150 patients per day in excellent conditions and provided a good quality of care with a team of twelve physiotherapists and two rehabilitation physicians. In comparison the Prosthetics and Orthotics Department represented only 10% of the Physiotherapy Department in terms of space, human resources, equipment, client attendance and quality of care.

Porto Novo Regional Prosthetics and Orthotics Centre (Centre Regional d'Appareillage Orthopédique" (CRAO Porto Novo)

The CRAO Porto Novo is located within the compound of the regional hospital in Porto Novo, neighboring the Physiotherapy and Social Services departments. The centre was not functional and did not produce any devices for a year. We were not able to obtain statistics or documents from the centre. The management of the hospital who were met during the visit, stated that this situation is related to governmental rules for supply, as goods were required to be delivered before payment which caused issues.

Staff profile: The CRAO Porto Novo staff includes 1 Orthopaedic Technologist (ISPO Category II) and 1 assistant.

Populations served: The population served by the CRAO Porto Novo includes two regions: Ouémé and Plateau, representing a total population of approximately 1.2 million.

Funding: CRAO Porto Novo funding exclusively comes from the hospital.

Statistics: In 2012, no prosthetic and orthotic devices were provided by the CRAO Porto Novo.

Number of devices delivered - Centre Regional d'Appareillage Orthopédique, Porto Novo			
	2010	2011	2012
Prostheses	3	5	0
Orthoses	2	7	0

Table 9

General comments: The CRAO Porto Novo facilities were small and did not allow for the professional provision of prosthetics and orthotics services. There was not enough human resources and equipment was outdated. From the clients seen during the visit the quality of service was not at the level expected. This was in contrast to the well-equipped and well-staffed Physiotherapy Department.

Benin Red Cross Prosthetics and Orthotics Centre

Located within the compound of the Benin Red Cross facilities, the Prosthetics and Orthotics Department was established in 1984. It went through several operational phases:

- 1984: Opening of the centre by the Benin Red Cross to ensure access to services for victims of polio and injection sequelae
- 1984 – 2001 : The Benin Red Cross run and manage the centre
- 2001 – 2010 : The centre continued its activities, but under the management of the Ministry of Social Affairs
- 2010 – 2011 : The centre is closed
- 2012: Renovation of the facilities and re-opening of the centre under the management of the Benin Red Cross

The study team visit the Red Cross Centre in Benin

At the time of the visit renovations were completed, staff were recruited and activities had resumed.

Staff profile: The Benin Red Cross Centre has 4 staff, including 2 Orthopaedic Technologists (ISPO Category II) and 1 bench worker.

Populations served: The population served by the Benin Red Cross Prosthetics and Orthotics Centre included two regions: Ouémé and Plateau, which represented a total population of approximately 1.2 million people.

Funding: Funding sources came from either the Benin Red Cross (55%) or from payments of services by clients (45%).

Statistics: In 2012, a total of 53 devices were provided.

Number of devices delivered - Benin Red Cross Prosthetics and Orthotics Centre			
	2010	2011	2012
Prostheses	Closed	Closed	3
Orthoses	Closed	Closed	50

Table 10

General comments: The Benin Red Cross Prosthetics and Orthotics Centre was in a better situation than CNHU and the regional hospital in Porto Novo. Particularly in terms of organization, infrastructure, equipment and the quality of care provided. It is managed by a prosthetist at the level of retirement who trained at ENAM and assisted by an orthopedic technologist. He plans to recruit seven orthopedic technologists at the end of training at ENAM and establish a rehabilitation service. The quality of the equipment was better than observed in the other two centres visited.

Section 8: Summary and Recommendations

The World Report on Disability also highlights barriers faced by people with disabilities wishing to access appropriate physical rehabilitation services. These include the absence of a national plan or strategy; non-existent or inadequate services (where services exist, they are often only located in major cities); a lack of trained professionals; and insufficient finances to cover the cost of services, including transport to places providing them.

The impact of ISPO certified graduates of ENAM, Togo was studied in Togo and Benin. The graduates were found to have had a positive impact and had made services more accessible to people with disabilities in the two countries by supporting the decentralization of services. Given the economic and social context of Togo and Benin, there is a case for improvement. Many of the findings in this report echo the content of the World Report on Disability[1] about barriers faced by people with disabilities which are access to services out with major cities, a lack of trained personnel and insufficient financial budget allocation to cover the cost of services.

The following recommendations are made in relation to the situation in both Togo and Benin.

RECOMMENDATION 1: Specific national strategies should be created with the purpose of developing and strengthening the prosthetics and orthotics sector, and to some extent the wider rehabilitation sector. This should be done in parallel with establishing national regulations to frame the sector i.e. standards and norms for the provision of services and prosthetics and orthotics recognition.

RECOMMENDATION 2: National authorities should provide adequate funding to improve the quality and appropriateness of service provision. They should:

- **Improve the working conditions, facilities and environment in prosthetics and orthotics services.**
- **Ensure equipment is updated.**
- **Ensure better availability of consumables and components.**
- **Increase the number of prosthetics and orthotics professionals.**

RECOMMENDATION 3: Solutions should be found to overcome the main barrier faced by people with disabilities in accessing prosthetics and orthotics services: the financial barrier.

RECOMMENDATION 4: National prosthetics and orthotics professional associations should be more active in the promotion of the profession, in providing support to their members and in meeting their members' expectations.

RECOMMENDATION 5: Prosthetists, orthotists and orthopaedic technologists should adopt a more pro-active approach to maintaining and continuously updating their knowledge and skills.

RECOMMENDATION 6: Prosthetists, orthotists and orthopaedic technologists should adopt a more professional attitude in the provision of services i.e. client compliance, client records and ethics.

RECOMMENDATION 7: A quality improvement initiative should be implemented to obtain service user feedback. This should take the form of a client satisfaction questionnaire and using the results for an associated improvement plan.

RECOMMENDATION 8: ENAM should play a more active role in the promotion of the prosthetics and orthotics profession in the region. ENAM should also develop continuing education programmes for its graduates and promote within the training programme professional attitudes and the need to adopt a lifelong learning approach.

Section 9: Glossary of acronyms

AFO	Ankle Foot Orthosis
CNAO	National Prosthetics & Orthotics Centre
CNHU	National University Hospital in Cotonou
CRAO	Regional Prosthetics & Orthotics Centre
ENAM	Ecole Nationale des Auxiliaires Medicaux
EVA	Ethylene Vinyl Acetate
ICRC	International Committee of the Red Cross
ISPO	International Society for Prosthetics and Orthotics
ISTM	Institut de Technologie Supérieure Montplaisir
KAFO	Knee Ankle Foot Orthosis
KD	Knee Disarticulation
LLP	Lower Limb Prosthetics
LLO	Lower Limb Orthotics
P & O	Prosthetics and Orthotics
PTB	Patella Tendon Bearing
SACH	Solid-Ankle Cushion-Heel
SO	Spinal Orthotics
TF	Trans-femoral
TT	Trans-tibial
ULO	Upper Limb Orthotics
ULP	Upper Limb Prosthetics
USAID	United States Agency for International Development
WHO	World Health Organization

Section 10: References

1. WHO and the World Bank. (2011) World Report on Disability. Geneva, Switzerland: WHO.

2. WHO/ISPO. (2005) Guidelines for training personnel in developing countries for prosthetics and orthotics services. Geneva, Switzerland: WHO/ISPO.

3. USAID (2006) Impact Assessment Primer Series.

4. World Development Indicators [Online]. World Bank Group 2016 (cited 17/01/2016) Available from: http://data.worldbank.org/country/togo

5. World Development Indicators [Online]. World Bank Group 2016 (cited 17/01/2016) Available from: http://data.worldbank.org/country/benin

Appendices

The following appendices are available separately and via the ISPO website at:

http://www.ispoint.org/guidelines-and-resources

Appendix 1	Causal model
Appendix 2	Framework for studying impact
Appendix 3	Discussion guides
Appendix 4	Graduate interview form pages 1-2
Appendix 5	Graduate interview form pages 3-6: lower limb prosthetics
Appendix 6	Graduate interview form pages 3-6: lower limb orthotics
Appendix 7	Graduate interview form page 7
Appendix 8	Participant information sheet
Appendix 9	Client participant information sheet
Appendix 10	Consent form