Leahy War Victims Fund

Survey of Prosthetic/Orthotic Needs Assessment in Conflict-Affected, Less-Resourced Settings

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ACRONYMS

DRG	Center of Excellence on Democracy, Human Rights, and Governance
ICRC	International Committee of the Red Cross
ISPO	International Society for Prosthetics and Orthotics
KAFO	Knee Ankle Foot Orthosis
LWVF	Leahy War Victims Fund
NGO	Non-Governmental Organization
PM&R	Physical Medicine and Rehabilitation
POF	Prosthetic Outreach Foundation
P&O	Prosthetics and Orthotics
TATCOT	Tanzania Training Center for Orthopaedic Technologists
UDB	University of Don Bosco
US	United States
USAID	U.S. Agency for International Development
WHO	World Health Organization

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EXECUTIVE SUMMARY

From December 2012 through June 2013, the U.S. Agency for International Development (USAID) Leahy War Victims Fund (LWVF) commissioned an assessment to *identify key needs related prosthetic/orthotic (P&O) product, training, and service in conflict-affected, less-resourced settings*. The Scope of Work is found in Appendix 1.

The assessment was conducted by consultant, Allen Ingersoll, and comprised four key steps:

- Conduct In-depth interviews (Jan–Feb 2013)
- Develop Survey Instrument (Feb 2013)
- Administer Survey (March–April 2013)
- Analyze results/complete report (May/June 2013)

There were 15 in-depth interviews conducted. The interviews were free-flowing and were used primarily to inform the content of the survey questionnaire. A summary of all interviews was provided to the LWVF Manager.

Three key informant groups[1] were targeted for the survey: Industry leaders, P&O practitioners, and P&O graduates from schools accredited by the International Society for Prosthetics and Orthotics (ISPO). The content included questions on demographics, product, service, and training. The survey format and structure were approved by the USAID Center of Excellence on Democracy, Human Rights and Governance's (DRG) Learning team. Each informant group had their own survey (roughly 15–20 questions); these are in Appendices 2, 3, and 4.

Survey Monkey (www.surveymonkey.com) was selected to host the Internet-based survey instrument based on recommendations of the DRG Learning team. A list of potential respondents was generated through industry networks, ISPO school administrators, the LWVF projects database, and prosthetic and orthotic service providers. Mr. Ingersoll estimates[2] that 350-400 people received the survey. There were 171 respondents (40 Industry Leaders, 79 P&O Practitioners, and 52 Graduates). A summary of responses for each group is found in Appendices 7, 8, and 9.

The key survey findings across all three areas of product, service, and training are:

- Product - need for better prosthetic knees and knee ankle foot orthotics (KAFO);
- Service - need to raise awareness about P&O through recognition and integration within governments and ministries of health, and add more ISPO Category II personnel;
- Training - need for broader training in physical medicine and rehabilitation to help build clinical assessment and prescription skills.

A more detailed analysis and description of results is found in Section 4 of this report. A summary table providing demographics is in Appendix 5 and a summary table of gaps in the sector is found in Appendix 6.

[1] The original survey instrument was to include persons with disabilities, but in consultation with the Learning Team (located within USAID's Center of Excellence on Democracy Human Rights and Governance), it was concluded that surveys for people with disability would require different approaches and involve more complexity, so this target group was removed.

[2] Based on contact lists and email correspondence.

BACKGROUND

The Patrick Leahy War Victims Fund has been the foundation of the U.S. Agency for International Development efforts to respond to the needs of civilian victims of war in conflict-affected countries.

Since its creation in 1989, the LWVF has provided over $170 million dollars for P&O activities and training, in addition to other core activities (physical therapy, mobility devices, economic support, etc.).

During this time, nearly 160,000 people have received an artificial limb or leg brace and over 1,000 people have been proficiently trained to provide rehabilitation services. USAID is committed to expanding the Fund's breadth and depth as it seeks to make the dollars go farther and to have increasingly more accountability and efficiency.

Over the past 20 years, there have been a variety of lessons learned and there are challenges that face providers, trainers, and people who receive the devices. In addition, with the high number of returning US war veterans with disabilities, there have also been advances in technologies (or technologies have become more affordable) that merit consideration for incorporation in USAID's work in less-resourced environments.

The purpose of the survey was to elicit responses to questions targeting potential needs (focused on product, service, and training) in prosthetic and orthotic service provision in conflict-affected countries. The LWVF would look to these responses to help determine potential priority areas of investment in the coming years.

METHODOLOGY

Prepare Timelines/Actions

The project began in December 2012 by drafting an action plan and timeline. These were presented to and approved by USAID's LWVF team.

The consultant's initial activities were to review past and present LWVF projects to gain and understanding of the scope and breadth of activities that have been supported.

Conduct In-Depth Interviews

In January–February 2013, the consultant conducted in-depth interviews with a cross section of industry leaders with expertise and experience in prosthetics and orthotics product, service, and training in less-resourced countries. A total of 15 people participated in these initial interviews and informants including representatives from the following organizations: Handicap International (HI), International Committee of the Red Cross (ICRC), Prosthetic Outreach Foundation (POF), Otto Bock, Evolution Industries (an Ossur company), Becker Orthopedic, The Cambodia Trust, International Society of Prosthetists and Orthotists, Tamarack Habilitation Technologies, and LWVF managers and technical staff.

The interviews were free-flowing and varied according to the specific area of interviewee expertise. The discussions were designed to encourage the experts to identify gaps and/or needs in impact areas

without leading them in a specific direction. Bulleted summaries of these interviews were provided to LWVF.

Develop Survey Instrument

As a result of in-depth interviews and document review, a survey format and structure was developed with guidance from the USAID Center of Excellence on Democracy, Human Rights and Governance's Learning team. Questions were written to identify demographic details and gain respondent opinions of the biggest gaps within the areas of product, service, and training.

Three survey respondent groups (recent graduates of ISPO accredited P&O schools in less-resourced countries, P&O industry leaders including decisionmakers, managers, thought leaders, educators, manufacturers, and field-based practitioners) were selected to provide a well-rounded pool of responses.

Initially, beneficiaries of P&O devices were to be targeted, but the challenge of reaching this group proved too great for this scope and was removed.

The surveys all had collection of demographic information. The question format was similar across the three surveyed groups with specific questions added for each. The practitioners' survey contained additional questions due to their perceived field experience and perspective across multiple countries. The survey format and structure were approved by the USAID Center of Excellence on Democracy, Human Rights and Governance's Learning team. The full set of questions and answer choices can be found in Appendices 2, 3, and 4.

Administer Survey

Survey Monkey (www.surveymonkey.com) was selected to host the Internet-based survey instrument based on recommendations from the DRG Learning team.

A list of potential respondents was generated through industry networks, ISPO school administrators, the LWVF projects database, and prosthetic and orthotic service providers. Targeted respondents were not required to have had a previous relationship with USAID LWVF. As indicated in the Executive Summary, the author estimates, based on the contacts list and e-mail correspondence, that 350 – 400 people received a request to complete the survey.

The first group of surveys was sent on March 12, 2013. Weekly reminders were sent to those who had not responded. The survey closed on April 15, 2013.

A total of 170 people received the survey via e-mail (99 completed) and an additional 72 completed via a web link. Only three P&O schools (UDB, TATCOT, and Mobility India) responded to the request to send the survey. They reported 233 graduates were sent the survey. Those that responded are included in the 72 completed via a web link. Survey Monkey reported 2 opt out requests and 2 e-mails bounced. Not known is how many sent via P&O schools bounced.

Upon closing, the survey raw data results were downloaded. The author completed processing of data with assistance from USAID's DRG Learning team.

Based on the estimated number of people who received the survey, a statistically relevant number of responses were obtained. A very low question skip rate occurred and all surveys started were completed.

SURVEY RESULTS

The aim of the assessment was to gain an overview of needs and/or gaps within prosthetic and orthotic product, service, and training in less-resourced countries. A statistically relevant number of results were obtained from a cross section of people around the globe.

Demographics

The table below summarizes the demographic data collected from respondents:

	Graduates	Industry Leaders	Practitioners
Total questions	15	19	22
Surveys completed	52	40	79
Category of Employer	Private company 29%	NGO 61%	International Organization 42%
Sex of respondents	90% Male	65% Male	85% Male

Traditionally P&O has been a male dominated profession and this is evident in the high percentages of male graduate (90 percent) and practitioner (85 percent) respondents. The Industry leader survey had 35 percent of responses from women.

The majority of practitioners (42 percent) work for an international organization; 61 percent of industry leaders work for a non-governmental organization, and 29 percent of graduates for a private company.

Industry leaders were asked where their headquarters is located and the highest number (48 percent) reported Western Europe.

Practitioners and graduates were both asked the geographic region they work in. The majority of practitioners (41 percent) reported Africa as the top response. Graduates (31 percent) reported Latin America/Caribbean as the top response and Asia (29 percent) is a very close second.

Eighty percent (80 percent) of industry leaders state their place of work has been operational 10 + years, and 67 percent report they also have worked 10+ years in less-resourced countries.

A more complete table of demographics is found in Appendix 5.

Product

The top survey result within the prosthetic product area indicates the need for better prosthetic knees. The author reviewed to two documents,[3] [4] both published in 2010 (one from USAID/ISPO),

[3]Jensen S. & Sexton S. Appropriate Prosthetic and Orthotic Technologies in Low Income Countries (2000 - 2010). Available from www.ispoint.org.

[4] Andrysek J. Lower-limb prosthetic technologies in the developing world: a review of literature from 1994 to 2010. *Prosth Orth Int* 34(4): 378-98, 2010.

which provide information about the types and functional limitations of prosthetic knee products available in less-resourced countries. One of these documents (Andrysek) adds information about prosthetic knees in development—these knees may help provide safe and affordable options. To provide further information about the lack of appropriate prosthetic knees in less-resourced settings, the author reviewed many P&O trade publications and journals that attempt to justify how over the last decade battery-powered microprocessor-controlled prosthetic knees have become the standard of care in the developed world. The author was not able to find published information about attempts to adapt this technology for prosthetic devices in less-resourced countries. The author suggests the 2015 ISPO World Congress meeting could provide an ideal venue to focus on the limitations, current situation, and potential new developments to find better prosthetic knees.

The top survey result within the orthotic product area indicates the need for better knee ankle foot orthotics. The author reviewed the most recent (2006) ISPO report of a Consensus Conference on Appropriate Lower Limb Orthotics for Developing Countries that detailed numerous approaches to try and improve KAFO products. Reported in more recent documents is that many of the 2006 report recommendations to improve KAFOs are underway and details are available on the ISPO website. Convening a consensus conference at the 2017 ISPO World Congress meeting should allow enough time to update information specifically about KAFOs and is recommended.

Moreover "diabetes" was mentioned often in relation to product and service gaps/needs. Additional detail is provided in the summary table in Appendix 6.

Service

The top survey results within the service area indicate the need to **raise awareness about P&O through recognition and integration within governments and ministries of health, and for more ISPO Category II personnel.**

The options to raise awareness about P&O through recognitions and integration with governments and ministries of health are complex and wide ranging, some of which may include: identifying country specific needs, building stakeholder consensus, finding and financing implementation, monitoring progress and evaluating results, etc. The author notes reference in the ISPO 2012 annual report to a request made to the World Health Organization (WHO) and USAID to update previous guidelines.

The survey result for more ISPO Category II personnel is consistent with other research. WHO estimates the need for approximately 40,000 Category I and II personnel.[5] ISPO reports that more than 2,500 graduates of ISPO-recognized training programs have received an ISPO Category I or II certificate.[6] With a gap of 37,500 trained personnel, the author recommends evaluation of training programs that can bridge this service gap through rapid entry of personnel. There are a number of existing initiatives that may be referenced:

- The Cambodia Trust project introduces high school students to the prosthetics and orthotics profession. The students complete elements of the ISPO school curriculum during high school that shortens the time needed in the actual ISPO training program.
- The Physicians for Peace administered training program in the Dominican Republic uses an approach that blends theory and practice through an internet-based curriculum delivered from El Salvador's University of Don Bosco at existing in-country service delivery centers.

[5] Guidelines for Training Personnel in Prosthetics and Orthotics for Developing Countries. Available from http://whqlibdoc.who.int/publications/2005/9241592672.pdf.
[6] ISPO Triennium report 2010 – 2013. Available from www.ispoint.org.

- Handicap International (USAID funded) P&O training project in Haiti (similar to Physicians for Peace), but what differentiates this program from other blended training approaches is the addition of an in-country ISPO Category I or II mentor/tutor to teach students, liaise with UDB, and support participating clinical sites.

Please see Appendix 6 for additional details.

Training

The top training survey result indicates need for **broader training in physical medicine and rehabilitation to help build clinical assessment and prescription skills.**

To try and validate this finding the author reviewed many reports that establish the benefits of working and training in a multi-disciplinary rehabilitation team setting. Specific recommendations are difficult to make because of the multitude of options available to build training programs structured around this result.

The top survey results indicating need for more technical training in P&O had an exact tie in mean consensus between **spinal orthotics and lower extremity prosthetics** and nearly identical results to the tie for **lower extremity orthotics and upper extremity prosthetics**. In other words, all four are statistically the same. The only statistically different result was that upper extremity orthotics was ranked to have the least need by all three groups of respondents. To further evaluate whether these four results will remain tied or similar the author suggests a larger group of relevant medical and rehabilitation professionals be surveyed. Those results may then help provide clarity of need. Additional clarification may be gained through discussion with P&O training program leaders and/or instructors, service delivery providers, and researchers, etc.

Only graduates were asked to select the P&O training topic that is most needed. **Pedorthics** was selected as the top result.

Please see Appendix 6 for additional details.

Other

When industry leaders and practitioners were asked what limits sustainability, the overwhelming majority indicated Finance/Funding as the top result.

These two groups were also asked questions about P&O human resource needs, data collection, and research priorities. Top results identify the need for more ISPO Category II P&O personnel and better data about number of people with disabilities. The key research priority consensus is to study the impact of education.

Only practitioners were asked to identify the key factors affecting access to P&O services. The top result is cost of service. Practitioners were also asked to identify the greatest coordination challenge related to P&O services. The top result is finding skilled local staff.

Please see Appendix 6 for additional details.

Survey Limitations

A number of areas for consideration for interpreting survey findings and possible future surveys have been identified:

- Graduates were particularly difficult to identify because ISPO schools in less-resourced countries do not maintain regular contact with former students.
- With an English language survey only persons with sufficient English language skills responded. This may have limited the response, particularly from South America, despite multiple attempts to be inclusive in all regions.
- Numerous respondents fit into more than one of the three categories, making it difficult to properly identify which set of questions should be provided. As an example, many people have overlapping and diverse ranges of education and work experience, which blurred the lines between graduate and practitioner.
- To respect privacy concerns of its staff one international non-governmental organization requested to send the surveys via internal e-mail and the anonymous web link option was provided.
- The survey was not made available via public listserves, because it was felt this may elicit a majority of responses from resourced countries.
- If another survey is undertaken it is suggested that one survey be built with redirect questions based on specific answers. As an example, if a respondent answers that s/he has one year work experience in one less-resourced country, the number of questions might be limited. On the other hand, someone who has 10+ year's work experience in multiple countries would access more questions.
- Using "other" as an answer in multiple choice questions complicated the processing of responses because judgment of each answer must be applied. A separate text box could be provided at the end of the survey to gain details when "other" was given as an answer. Note: Survey Monkey does not allow Ranking Average questions to have "other" answers; only Rating Average questions.

CONCLUSION

USAID's interest in gaining feedback from those most directly engaged in prosthetics and orthotics in less-resourced countries drove this assessment. In-depth interviews were a useful tool to help gather input on biggest gaps/needs in products, service, and training.
The internet-based survey instrument proved an effective method to reach a global audience. USAID's DRG Learning Team provided valuable guidance and review during the project.
The survey findings indicate that a cross-section of individuals most directly engaged in prosthetic and orthotic actions in conflict-affected, less-resourced countries have weighed in to inform USAID LWVF about needs in product, service, and training. Furthermore, the lessons learned and survey results set a baseline to build on with future studies using internet-based or similar information

gathering tools. Finally, some key results have been identified and recommendations made that may be useful in future decision-making.

Recommendations

Based on survey results, the LWVF may wish to prioritize:

- Raising awareness through support to governments for recognition and integration of products, services, and training;
- In addition to existing efforts, consider additional options for increasing the number of ISPO Category II trained personnel;
- Evaluate curriculum and teaching methodology (clinical assessment and prescription skills). This may be a more appropriate role for the ISPO Education committee or other standard setting organizations.

APPENDICES

Appendix 1: Scope of Work

1. Background

Since its creation in 1989, USAID's Patrick Leahy War Victims Fund (LWVF) has focused on responding to the need of civilian victims of conflict in war-affected developing countries. In the past twenty years, the Fund has provided over $170 million dollars for P&O activities and training, in addition to other core activities (physical therapy, mobility devices, economic support, etc.). During this time, nearly 160,000 people have received an artificial limb or leg brace and over 1,000 people have been proficiently trained to provide rehabilitation services.

USAID is committed to expanding the Fund's breadth and depth as we seek to make the dollars go farther and to have increasingly more accountability and efficiency.

Over the past twenty years there have been a variety of lessons learned and there are challenges that face providers, trainers, and people who receive the devices. In addition, with the high number of returning US war veterans with disabilities, there have also been advances in technologies (or technologies have become more affordable) that merit consideration for incorporation in USAID's work in less-resourced environments.

USAID is invested in learning from those most directly engaged in prosthetic and orthotic actions. Key informant groups include industry leaders, P&O practitioners (who have worked internationally for at least five years), P&O graduates from schools accredited by the international society for prosthetics and orthotics, and people with disability who have received prosthetics or orthotics from USAID supported centers.

2. Purpose of the Needs Assessment

The overall purpose of the assessment is to inform USAID Leahy War Victims Fund on the needs related prosthetic/orthotic product, training and service in conflict-affected, less resourced settings.

The specific activities to be included in this assessment include:

A. Develop plan of action to conduct the needs assessment.
B. Develop (4) standard survey instruments on perceived needs in the field of prosthetics and orthotics – product, training, and service. USAID review prior to utilization.
C. Administer the instrument to a statistically relevant number of industry leaders, P&O graduates, P&O practitioners, and people who have received prosthetics and orthotics in conflict affected or less resourced settings.
D. Draft report findings and resultant recommendations for perceived top-priority areas that are currently underserved in prosthetics and orthotics.

3. Preparation, Process, and Methodology of the Assessment

The assessment will be initiated in accordance with the agreed Scope of Work. The Consultant's tasks include:

Draft plan of action to conduct the assessment.

A. Conduct desk review of existing survey instruments relevant to P&O service.
B. Meet with USAID/DRG Learning Team to discuss relevant instruments.

C. Draft instrument(s) and present to USAID LWVF for consideration.
D. Administer the instrument with the four stakeholder groups.
E. Brief USAID (LWVF, DRG/Learning Team) on the findings.
F. Complete summary report with findings and clear recommendations for 3-4priority areas of intervention in each of the three topic areas (product, training, and service).

The Consultant will provide bi-monthly updates on progress made during the various stages of the consultancy to USAID**.**

4. Reports/Deliverables

A. Written plan of action (all reports and deliverables will be provided in English).
B. Survey instrument(s) that will drive the data collection process from industry leaders, P&O practitioners, P&O graduates and people with disability (as described in the background).
C. All raw data from the instruments (hard copy of e-copy only?)
D. A summary of findings from the questionnaires and 3-4 key recommendations stemming from gaps identified in the three content areas.
E. Final summary report.

Appendix 2: Survey Questions - Industry Leaders

Q1: Which category best describes the company or institution where you currently work? (Select one or describe in Other)
- Non-Governmental Organization / Not for Profit
- International Organization
- Private Company
- Education facility
- Other (please specify)

Q2: Where is the headquarters located? (Select one)
- North America
- Latin America and Caribbean
- South America
- Eastern Europe
- Western Europe
- Middle East
- Asia
- Southeast Asia
- Africa
- Australia and New Zealand

Q3: How many years has your place of work been operational in less resourced settings?
- Less than 1 year
- 1 – 5 years
- 5 – 10 years
- 10+ years

Q4: In what capacity has your place of work been involved in P&O in less resourced countries? (select all that apply)
- Emergency response
- Establish service center
- Training
- Product supply
- Policy
- Other (please specify)

Q5: What is your professional education? (select all that apply)
- Prosthetics
- Orthotics
- Physical Therapy
- Medical Doctor
- Other (please specify)

Q6: How many years have you worked in P&O in less resourced countries?
- Less than 1 year
- 1 – 5 years
- 5 – 10 years
- 10+ years

Q7: In the last five years how much time have you spent working in less resourced countries?
- Less than 1 year
- 1 – 2 years
- 3 – 4 years
- 5 years

Q8: What is your sex?
- Female
- Male

Q9: In your experience, what are the priority areas priority areas that need further attention in less resourced countries? Please rate from 1-9; #1 is the highest priority and #9 lowest priority.
- Product
- Training
- Profession recognition
- Service
- Human Resources
- Sustainability
- Data collection
- Research
- Other (Please describe below)

Q10: In your experience, what are the biggest gaps/needs in less resourced countries with regard to prosthetic products? Please rate from 1-7; #1 is the biggest need and #7 is the least needed.
- Feet
- Knees
- Socket
- Suspension
- Hands
- Elbows
- Other (Please describe below)

Q11: In your experience, what are the biggest gaps/needs in less resourced countries with regard to orthotic products? Please rank from 1-7; #1 is the biggest need and #7 is least needed.
- Pedorthics (Footwear)
- Ankle Foot Orthotics (Ankle joint)
- Knee Ankle Foot Orthotics (Knee joint)
- Hip Knee Ankle Foot Orthotics (Hip joint)
- Spinal Orthotics
- Upper Extremity Orthotics
- Other (Please describe below)

Q12: In your experience, what are the biggest gaps/needs in less resourced countries with regard to technical P&O training? Please rank 1-5, #1 is the biggest need and #5 is least needed.
- Lower Extremity Prosthetics
- Upper Extremity Prosthetics
- Spinal Orthotics
- Upper Extremity Orthotics
- Lower Extremity Orthotics

Q13: In your experience, what are the biggest gaps/needs in less resourced countries with regard to broader training in physical medicine and rehabilitation? Please rate 1-7; #1 is the biggest need and #7 is least needed.
- Physical Therapy
- Clinical assessment and prescription skills
- Data collection and documentation
- Evidence based practice skills
- Business operation skills
- Management (all aspects)
- Other (Please describe below)

Q14: In your experience, what level of credentialed P&O personnel are most needed in less resourced countries? Please rate 1-7; #1 is the biggest need and #7 is the least needed.

- ISPO Category I Prosthetist & Orthotist
- ISPO Category I Prosthetist only
- ISPO Category I Orthotist only
- ISPO Category II Prosthetist & Orthotist
- ISPO Category II Prosthetist only
- ISPO Category II Orthotist only
- ISPO Category III

Q15: In your experience, what is needed to raise awareness and/or recognize the P&O professional in less resourced countries? Please rate 1-5; #1 is the highest priority and #5 is lowest priority.

- Integration of P&O within Government and/or Ministry.
- Physical Medicine & Rehabilitation team availability.
- National P&O Society development
- P&O recognized as basic health service
- Other (Please describe below)

Q16: In your experience, what are the biggest human resource needs in less resourced countries P&O services? Please rate 1-8; #1 is the biggest need and #8 is least needed.

- P&O Mentors
- P&O Trainers
- ISPO Category I
- ISPO Category II
- ISPO Category III
- Management
- Physical Therapy
- Other (Please describe below)

Q17: In your experience, what are the most important factors that limit P&O service sustainability in less resourced countries? Please rate 1-6; #1 is the most important and #6 is least important.

- Product availability
- Trained Personnel
- Management skills
- Finance (funding)
- P&O profession recognition
- Other (Please describe below)

Q18: In less resourced countries, what are the priorities for data collection in less resourced countries? Please rate 1-6; #1 is the highest priority and #6 is lowest priority.

- Number of Person with Disabilities
- Cause of Disability
- Impact of Service
- Management status / functionality
- Service received
- Other (Please describe below)

Q19: In your experience, what are the key research questions to be addressed with regard to P&O in less resourced countries? Please rate 1-7; #1 is the highest priority and 7 is lowest priority.

- Impact of education models (i.e., seated, distance, blended programs)
- Role of government vs. Private Enterprise
- Emergency response role in P&O
- P&O componentry
- Effective M&E instruments
- School accreditation standards
- Other (Please describe below)

Appendix 3: Survey Questions – Practitioners

Q1: What category best describes the company or institution where you currently work? (Select one or describe in Other)
- Non-Governmental Organization / Not for Profit
- International Organization
- Private Company
- Education facility
- Other (fill in the box)

Q2: In what geographic region do you currently work? (Select one)
- North America
- Latin America and Caribbean
- South America
- Eastern Europe
- Western Europe
- Middle East
- Asia
- South East Asia
- Africa
- Australia and New Zealand

Q3: How many years has your place of work been operational in less resourced settings?
- Less than 1 year
- 1 – 5 years
- 5 – 10 years
- 10+ years

Q4: In what capacity has your place of work been involved in P&O in less resourced countries? (Please select all that apply and/or describe in Other)
- Emergency response
- Establish service center
- Training
- Product supply
- Policy
- Other (fill in the box)

Q5: What P&O device is provided most at the center where you currently work? Please rank 1 – 5; 1 is provided most and 5 provided least.
- Lower Extremity Prosthesis
- Upper Extremity Prosthesis
- Lower Extremity Orthosis
- Upper Extremity Orthosis
- Spinal Orthosis

Q6: What is your professional education? (Please select all that apply.)
- Prosthetics
- Orthotics
- Physical Therapy
- Medical Doctor
- Other (fill in the box)

Q7: How many less resourced countries have you worked in for more than 6 months?
- 0
- 1 – 2
- 3 – 4
- 5+

Q8: How long have you worked at your current post?

- Less than 1 year
- 1 – 2 years
- 3 – 4 years
- 5+ years

Q9: What is your sex?

- Female
- Male

Q10: In your experience, what are the priority areas that need further attention in less resourced countries? Please rate from 1 – 9; #1 is the highest priority and #9 is the lowest priority.

- Product
- Professional Training
- Profession recognition
- Service
- Human Resources
- Sustainability
- Data collection
- Research
- Other (Please describe below)

Q11: In your experience, what are the biggest gaps/needs in less resourced countries with regard to prosthetic products? Please rate from 1-7; #1 is the biggest need and #7 is the least needed.

- Feet
- Knees
- Socket
- Suspension
- Hands
- Elbows
- Other (Please describe below)

Q12: In your experience, what are the biggest gaps/needs in less resourced countries with regard to orthotic products? Please rank from 1-7; #1 is the biggest need and #7 is the least needed.

- Pedorthics (footwear)
- Ankle Foot Orthotics (Ankle joint)
- Knee Ankle Foot Orthotics (Knee joint)
- Hip Knee Ankle Foot Orthotics (Hip joint)
- Spinal Orthotics
- Upper Extremity Orthotics
- Other (Please describe below)

Q13: In your experience, what are the biggest gaps/needs in less resourced countries with regard to technical P&O training? Please rank 1 -5; #1 is the biggest need and #5 is the least needed.

- Upper Extremity Prosthetics
- Upper Extremity Orthotics
- Lower Extremity Prosthetics
- Lower Extremity Orthotics
- Spinal Orthotics

Q14: In your experience, what are the biggest gaps/needs in less resourced countries with regard to broader training in physical medicine and rehabilitation? Please rate from 1– 7; #1 is the biggest need and #7 is the least needed.

- Physical Therapy
- Management - all aspects
- Clinical assessment and prescription skills
- Data collection and documentation
- Evidence based practice skills
- Business operation skills
- Other (Please describe below)

Q15: In your experience, what level of credentialed P&O personnel are most needed in less resourced countries? Please rank 1-7; #1 is the biggest need and #7 is the least needed.

- ISPO Category I Prosthetist & Orthotist
- ISPO Category I Prosthetist only
- ISPO Category I Orthotist only
- ISPO Category II Prosthetist & Orthotist
- ISPO Category II Prosthetist only
- ISPO Category II Orthotist only
- ISPO Category III

Q16: In your experience, what is needed to raise awareness and/or recognize the P&O professional in less resourced countries? Please rate 1-5; #1 is the highest priority and #5 is lowest priority.

- Integration of P&O within Government and/or Ministry
- Physical Medicine & Rehabilitation team availability
- National P&O Society development
- P&O recognized as basic health service
- Other (fill in the blank)

Q17: In your experience, what are the biggest human resource needs in less resourced countries P&O services? Please rate 1-8; #1 is the biggest need and #8 is the least needed.

- P&O Mentors
- P&O Trainers
- ISPO Category I
- ISPO Category II
- ISPO Category III
- Management
- Physical Therapy
- Other (Please describe below)

Q18: In your experience, what are the most important factors that limit P&O service sustainability in less resourced countries? Please rate 1-6; #1 is the most important and #6 is the least important.

- Management skills
- P&O profession recognition
- Trained Personnel
- Finance (funding)
- Product availability
- Other (Please describe below)

Q19: In your experience, what are the priorities for data collection in less resourced countries? Please rate 1-6; #1 is the highest priority and #6 is the lowest priority.

- Number of Person with Disabilities
- Cause of Disability
- Impact of Service
- Management status / functionality
- Service received
- Other (Please describe below)

Q20: In your opinion, what are the key research questions to be addressed with regard to P&O in less resourced countries? Please rate 1-7; #1 is the highest priority and #7 lowest priority.

- Impact of education models (i.e., seated, distance, blended programs)
- Role of government vs. Private Enterprise
- Emergency response role in P&O
- P&O componentry
- Impact of M&E instruments
- School accreditation standards
- Other (Please describe below)

Q21: In less resourced countries, what are the key factors affecting access to P&O services? Please rate 1-6; #1 is the most important factor and #6 least important factor.

- No service available
- Distance
- Cost of Service
- No product
- No trained personnel
- Lack of awareness
- Other (Please describe below)

Q22: In less resourced countries, what is the greatest coordination challenge related to P&O services? Please rate 1-5; #1 is the biggest challenge and #5 is the smallest challenge.

- Systematic communication
- Componentry / technology
- Geographic coverage
- Finding skilled local staff
- Other (Please describe below)

Appendix 4: Survey Questions – Graduates

Q1: What category best describes where you currently work? (Select one or describe in Other)
- Government facility
- Non-Governmental Organization / Not for Profit
- International Organization
- Private Company
- Education facility
- Other (please specify)

Q2: Which category best describes your P&O education level? (Select one)
- ISPO Category I Prosthetist & Orthotist
- ISPO Category I Prosthetist only
- ISPO Category I Orthotist only
- ISPO Category II Prosthetist & Orthotist
- ISPO Category II Prosthetist only
- ISPO Category II Orthotist only
- ISPO Category III

Q3: Which category best describes your current job? (Select one)
- Clinician
- Instructor
- Manager
- Not working in P&O
- Other (please describe)

Q4: In what geographic region do you currently work? (Select one)
- North America
- Latin America and Caribbean
- South America
- Western Europe
- Eastern Europe
- Middle East
- Asia
- Southeast Asia
- Africa
- Australia and New Zealand

Q5: How many years have you worked in your current role? (Select one)
- Less than 1 year
- 1 – 2 years
- 3 – 4 years
- 5+ years

Q6: How many years since you graduated from P&O training? (Select one)
- Less than 1 year
- 1 – 2 years
- 3 – 4 years
- 5+ years

Q7: What P&O device is provided most at the center where you currently work? Please rank 1 – 5; #1 is provided most and #5 provided least.

- Upper Extremity Prosthesis
- Lower Extremity Orthosis
- Lower Extremity Prosthesis
- Upper Extremity Orthosis
- Spinal Orthosis

Q8: What is your sex?

- Female
- Male

Q9: In your experience, what are the biggest gaps/needs in less resourced countries with regard to prosthetic products? Please rate from 1-7; #1 is the biggest need and #7 is least needed.

- Feet
- Knees
- Socket
- Suspension
- Hands
- Elbows
- Other (Please describe below)

Q10: In your experience, what are the biggest gaps/needs in less resourced countries with regard to orthotic products? Please rate from 1-7; #1 is the biggest need and #7 is the least needed.

- Pedorthics (Footwear)
- Ankle Foot Orthotics (Ankle joint)
- Knee Ankle Foot Orthotics (Knee joint)
- Hip Knee Ankle Foot Orthotics (Hip joint)
- Spinal Orthotics
- Upper Extremity Orthotics
- Other (Please describe below)

Q11: In your experience, what are the biggest gaps/needs in less resourced countries with regard to technical P&O training? Please rank 1-5; #1 is the biggest need and #5 is least needed.

- Lower Extremity Prosthetics
- Upper Extremity Prosthetics
- Spinal Orthotics
- Lower Extremity Orthotics
- Upper Extremity Orthotics

Q12: In your experience, what are the biggest gaps/needs in less resourced countries with regard to broader training in physical medicine and rehabilitation? Please rate 1-7; #1 is the biggest need and #7 is the least needed.

- Physical Therapy
- Clinical assessment and prescription skills
- Data collection and documentation
- Evidence based practice skills
- Business operation skills
- Management (all aspects)
- Other (fill in the box)

Q13: In your experience, what level of credentialed P&O personnel is most needed in less resourced countries? Please rate 1-7; #1 is the biggest need and #7 is the least needed.

- ISPO Category I Prosthetist & Orthotist
- ISPO Category I Prosthetist only
- ISPO Category I Orthotist only
- ISPO Category II Prosthetist & Orthotist
- ISPO Category II Prosthetist only
- ISPO Category II Orthotist only
- ISPO Category III Prosthetics & Orthotics

Q14: In your experience, what is needed to raise awareness and/or recognize the P&O professional in less resourced countries? Please rate 1-5; #1 is the highest priority and #5 is lowest priority.

- Integration within Government and/or Ministry by P&O staff
- Physical Medicine & Rehabilitation team inclusion
- National P&O Society development
- P&O recognized as basic health service
- Other (Please describe below)

Q15: In your experience, what key challenges face P&O school graduates in less resourced countries when entering the workforce? Please rank 1-7; #1 is the biggest challenge and #7 is the smallest challenge.

- Lack of mentoring
- Inadequate salary and benefits
- P&O school curriculum not adequate to meet job requirements
- Technology does not match job market needs
- No local job availability
- Unrealistic expectations of the work place
- Other (Please describe below)

Q16: In your experience, what training topics should be added or improved to help P&O work performance in less resourced countries? Please rate 1-6; #1 is the highest priority and #6 is the lowest priority.

- Spinal orthotics
- Transfemoral prosthetics
- Upper Extremity Orthotics
- Management
- Pedorthics
- Other (Please describe below)

Appendix 5: Survey Results Summary Table – Demographics

DEMOGRAPHICS				
Question:	**Graduate Responses:** Top Response with % and #	**Industry Leader Responses:** Top Response with % and #	**Practitioner Responses:** Top Response with % and #	Please reference each survey response documents for more detail
Total number of survey responses	**52**	**40**	**79**	**171**
Sex	Male = 90% / 46	Male = 65% / 26	Male = 85% / 66	M = 138 / F = 31, 2 skipped
Professional education		Prosthetics = 76% / 22	Prosthetics = 92% / 73	
P&O education category	ISPO Cat II P&O = 65% / 33			
Years since P&O graduation	5+ years = 50% / 24			
Category of employer	Private Company = 29% / 15	Non-Governmental Organization = 61% / 23	International Organization = 42% / 33	
Headquarters location		Western Europe = 48% / 19		
Geographic region of work	Latin America / Caribbean = 31% / 16		Africa = 41% / 32	
Years in operation for place of work		10+ years = 80% / 31	10+ years = 61% / 48	
Years you worked in place of work		10+ years = 67% / 26		
# of years worked in Less Resourced Countries in last 5		5 years = 67% / 26		
# of Less Resourced Countries worked in for more than 6 months			5+ years = 37% / 29	
Current job category	Clinician = 45% / 23			
Years in current role	5+ years = 41% / 21		5+ years = 35% / 28	
Capacity performed at your place of work		Training = 87% / 34	Training = 86% / 68	

Appendix 6: Survey Results Summary Table – Gaps/Ratings/Consensus

BIGGEST GAPS / NEEDS and TOP OVERALL RATINGS / RANKINGS and THREE GROUPS CONSENSUS							
Question: *Note different question format (ranking)	**Graduates** Responses: 52 Choice with biggest gap, % and # of responses	**Graduates** Top overall Ratings / Rankings, score and # of responses	**Industry Leaders** Responses: 40 Choice with biggest gap, % and # of responses	**Industry Leaders** Top overall Ratings/Rankings, score and # of responses	**Practitioner** Responses: 79 Choice with biggest gap, % and # of responses	**Practitioner** Top overall Ratings / Rankings, score and # of responses	**Groups Consensus** Mean based on Average Rating or Ranking
*P&O Device provided most at place of work	LE Orthosis = 45% / 23	LE Orthosis highest rank			LE Prosthesis = 61% / 47	LE Pros. highest rank	Consensus is LE Prosthesis
P&O priority areas of need			Sustainability = 35% / 13	Sustainability = 3.00 / 37	Professional Training = 35% / 28	Professional Training = 2.48 / 79	Professional Training
Prosthetic product gap / need	Prosthetic Socket = 29% / 14	Prosthetic Knees = 2.91 / 47	Prosthetic Socket = 52% / 16	Prosthetic Socket = 2.10 / 31	Prosthetic Feet = 32% / 24	Prosthetic Knees = 2.37 / 75	Prosthetic Knees
Orthotic product gap / need	KAFO = 30% / 14	KAFO = 2.66 / 47	Ankle Foot Orthotics = 31% / 10	Ankle Foot Orthotics = 2.41 / 32	KAFO = 37% / 27	KAFO = 2.48 / 73	Knee Ankle Foot Orthotics (KAFO)
*P&O technical training gap	Upper Extremity Prosthetics = 39% / 19	UE Prosthetics highest rank	Lower Extremity Prosthetics = 30% / 11	LE Orthotics highest rank	Lower Extremity Prosthetics = 38% / 29	Spinal Orthotics highest rank	Tie - LE Pros & Spinal Orthotics
PM&R training gap / need	Clinical… = 36% / 17	Clinical… = 2.47 / 47	Clinical… = 50% / 18	Clinical… = 1.83 / 36	Clinical… = 56% / 42	Clinical… = 1.89 / 75	Clinical Assessment / Rx Skills
Level of P&O personnel most needed	ISPO Cat. I P&O = 66% / 31	ISPO Cat. I P&O = 1.81 / 47	ISPO Cat. II P&O = 49% / 17	ISPO Cat. II = 1.83 / 35	ISPO Cat. II P&O = 60% / 46	ISPO Cat. II = 1.71 / 77	ISPO Category II P&O personnel
How to raise Awareness of P&O	Government Integration = 42% / 19	P&O recognition = 2.26 / 46	Government Integration = 41% / 15	Government Integration = 2.00 / 37	Government Integration = 45% / 33	Government Integration = 2.04 / 74	Government Integration
Biggest P&O services HR needs			ISPO Cat. II = 28% / 10	ISPO Cat. II = 2.64 / 36	P&O Trainers = 33% / 24	P&O Trainers = 2.86 / 72	ISPO Cat. II P&O Personnel
Key challenges graduates face	Inadequate salary = 34% / 15	Inadequate salary = 2.45 / 44					Inadequate salary/ Benefits
P&O training topic most needed	Pedorthics = 24% / 11	Pedorthics = 2.82 / 45					Pedorthics
What limits sustainability			Finance = 45% / 17	Finance = 2.03 / 38	Finance = 60% / 43	Finance = 1.81 / 72	Finance (Funding)
Data collection Priority			# of People with Disability = 42% / 16	# of People with Disability = 2.26 / 38	Service Impact = 36% / 26	# of People with Disability = 2.41 / 71	Number of People w/Disability
Key research priority			Education Impact = 23% /8	P&O componentry. = 2.94 / 34	Government vs. Private = 25% / 16	Ed. Impact = 2.81 / 68	Impact of Education
Access to service factors					Cost of Service = 34% / 24	Cost of Service. = 2.58 / 71	Cost of Service
Greatest coordination challenge					Skilled local staff = 35% / 25	Skilled local staff = 2.24 / 72	Finding skilled local staff

It is important to remember when reviewing the survey results that the questions and associated choices correlate across all three areas. It is also important to remember that highest priority and mean consensus must be looked at separately, together, as well as across two or all three groups (graduates, industry leaders and practitioners). See Methodology section for more information.