The Role of Plastic Surgeons in Advancing Development Global

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ABSTRACT

In September 2015, the international community came together to agree on the 2030 Agenda for Sustainable Development, a plan of action for people, the planet, and prosperity. Ambitious and far-reaching as they are, they are built on three keystones: the elimination of extreme poverty, fighting climate change, and a commitment to fighting injustice and inequality. Critical to the achievement of the Agenda is the global realization of access to safe, affordable surgical and anesthesia care when needed. The landmark report by the Lancet Commission on Global Surgery estimated that between 28 and 32 percent of the global burden of disease is amenable to surgical treatment. However, as many as five billion people lack access to safe, timely, and affordable surgical care, a burden felt most severely in low- and middle-income countries (LMICs). Surgery, and specifically plastic surgery, should be incorporated into the international development and humanitarian agenda. As a community of care providers dedicated to the restoration of the form and function of the human body, plastics surgeons have a collective opportunity to contribute to global development, making the world more equitable and helping to reduce extreme poverty. As surgical disease comprises a significant burden of disease and surgery can be delivered in a cost-effective manner, surgery must be considered a public health priority.

KEYWORDS
Plastic surgery; Global burden of disease; Global surgery; Sustainable development; Capacity development

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INTRODUCTION

In September 2015, the international community came together to agree on the Sustainable Development Goals (SDGs). These 17 goals are part of the 2030 Agenda for Sustainable Development, a plan of action for people, the planet, and prosperity. Ambitious and far-reaching as they are, they are built on three keystones: the elimination of extreme poverty, fighting climate change, and a commitment to fighting injustice and inequality.[1] In that context,

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there is increasing need to acknowledge the linkage between universal delivery of and access to safe and affordable surgical care, global health and development. Critical to the achievement of the SDGs is the global realization of access to safe, affordable surgical and anesthesia care when needed. As a community of care providers dedicated to the restoration of the form and function of the human body, plastics surgeons have a collective opportunity to contribute to global development, making the world more equitable and helping to reduce extreme poverty.[1]

In 2008, Drs. Paul Farmer and Jim Kim identified surgery as the "neglected stepchild of global health"[2] referring to the relative underfunding and lack of priority accorded surgical care.[3,4] The landmark report by the Lancet Commission on Global Surgery "Global Surgery 2030: Evidence and Solutions for Achieving Health, Welfare and Economic Development" estimated that between 28 and 32 percent of the global burden of disease is amenable to surgical treatment.[5] However, as many as five billion people of a total world population of 7.4 billion lack access to safe, timely, and affordable surgical care, a burden felt most severely in low- and middle-income countries (LMICs). Untreated, these conditions cause premature mortality and are a source of lifetime disability[3]—surgical conditions claim an estimated 16.9 million lives per year.[6] The Lancet Commission estimates that an additional 143 million surgeries would be necessary every year to save lives and prevent disability from surgical conditions.[5] Building surgical capacity is not just important for preventing morbidity and mortality—lack of access to surgery impedes human freedoms and impacts global development and economic growth. Without the growth of surgical systems, LMICs are estimated to sacrifice up to 2% of annual gross domestic product (GDP) growth by 2030.[7] These losses correspond to 12.3 trillion US Dollars (USD) of lost economic output in LMICs alone.[5] Even when surgical care is available, however, it may not be financially accessible to the entire population: 33 million individuals face catastrophic expenditure due to the direct medical costs of surgery and anesthesia each year, with an additional 48 million facing catastrophic expenditure due to nonmedical costs such as travel. This burden falls most heavily on the poorest people in LMICs.[8]

The myth of surgery as a luxury for the rich has been dispelled: it is a right for all, and a cost-effective means of treating disease. As a treatment modality, surgery demonstrates cost-effectiveness on par with other interventions such as vaccinations and bed nets for malaria prevention.[9,10] This holds true for plastic surgery, and, in particular, cleft lip and palate repair: the cost-effectiveness of this intervention is a mere USD 47.74 (2012 USD) per disability-adjusted life year (DALY) averted.[9]

The Burden of Plastic Surgical Disease

If surgical systems do not provide universal access to plastic surgery, they are incomplete. The surgical volume of the World Bank's Disease Control Priorities publication identified 44 procedures that are essential for population health: among these were plastic surgical procedures for the treatment of injuries, burns, and congenital malformations.[11] The scope of disease requiring plastic surgical skills is even broader and includes the growing burden of non-communicable diseases such as diabetes and cancer,[12-14] as well as injuries sustained during humanitarian disasters and conflict.[15] As plastic surgery has advanced as a field, plastic surgeons have become even better positioned to address these conditions. Burn treatment has advanced, allowing for the treatment of larger and more complicated burns. Advancements in microsurgery have now made free-flap transfers and replantation of amputated parts possible.[16] However, LMICs with low capacity to provide surgical treatment also carry the primary burden of injuries resulting from war and conflict.[17] This makes those most likely to be both impoverished and affected by violent conflict also the least likely to access treatment due to the paucity of surgical resources.[17]

Plastic surgery does not just have an important role in global surgery development, but an indispensable and irreplaceable one. Consider for example the case of a two-year-old boy with a massive, deforming, posterior auricular mass presenting for care at one of the few tertiary surgical care centers in Haiti. Although the facility's capacity for general surgery has grown significantly, without plastic surgery, there is no safe way to both resect the mass without injuring nearby head and neck structures and cover the defect. Repairing congenital malformations, providing burn care, using flaps

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for oncologic coverage, surgically managing pressure ulcers—the list of interventions that require plastic surgery expertise is extensive.[15] Even regions with some existing capacity to provide basic plastic surgical care may not be able to meet demand or practitioners may not be sufficiently trained in the myriad techniques employed to manage the wide range of plastic surgical conditions, making continuing education by skilled plastic surgeons a crucial part of capacity-building.[15]

The unique challenges of performing surgery in low-resource settings appeal to the creative drive central to the practice of plastic surgery. Discovering ways to manage surgical problems with limited resources requires both strong technical skill and a sense of innovation and creativity. Plastic surgeons must recognize that their unique skills come with a responsibility to the world's most marginalized people who lack access to such care. Universal access to surgical care is a multidimensional vision, implying timeliness, safety, and affordability. Improving surgical systems is, therefore, a multidimensional undertaking, requiring the development of physical infrastructure, consistent access to the necessary biomedical equipment to safely carry out procedures, mechanisms for financial risk protection, and a sufficient workforce for the delivery of care. We now focus on the role of high-income country plastic surgeons in supplementing or growing the LMIC workforce to meet the global need for care.[15]

Models of Surgical Capacity-Building

Plastic surgeons can become involved in global surgery through myriad organizations and care delivery models. Two main models of involvement are short-term surgical missions, in which surgeons travel to a low-resource setting to perform surgeries for a short period, and longitudinal efforts to sustainably increase capacity through teaching, operative training, and infrastructure development. The former focuses primarily on the immediate provision of much-needed care, whereas longitudinal capacity building efforts often involve dedicating the majority of resources to education, training, and facilities enhancement.[18]

Surgical missions, although brief in length, can enable surgeons to demonstrate the local burden of surgical disease through preoperative screening exercises and perform life-changing surgeries. Increasing awareness of the burden of disease can engender support from policymakers and donors. In addition, missions exposing surgeons to the need for surgical care in LMICs may cultivate a lifelong commitment to alleviating this burden. Surgical missions can enable those with full-time clinical commitments to become involved in global surgery; repeat visits to the same LMIC hospitals can then foster permanent working relationships. These relationships, as well as advances in communication, enable remote pre- and post-operative follow-up. Surgical missions have been demonstrated to be cost-effective when no other existing infrastructure can provide this care.[18]

However, surgical missions can displace the work of local surgeons and have been strongly criticized by some, particularly when a poorly planned imposed approach is used.[19] Short-term missions cannot by themselves offer sustainable access to safe surgery. Therefore, a concurrent or alternative focus on long-term capacity building is critical.[19] Many organizations engage in longitudinal efforts for surgical capacity building. In countries in which plastic surgery care exists but the workforce is inadequate to meet the need, it is particularly important to leverage local expertise in all efforts.[20] One organization, SmileTrain, uses a partnership model to increase surgeons' abilities to provide cleft lip and palate surgical care. In addition to providing financial, technological, and technical support, this organization enables skilled surgeons in LMICs to travel to resource-poor areas of their countries to teach cleft lip and palate repair techniques. By having surgeons from within the same country transfer skills and technologies to staff in lower-resource areas, the existing capacity for plastic surgery is recognized, utilized, and enhanced. Recognizing and empowering LMIC surgeons enables fruitful relationships and promises faster growth of surgical capacity.[20]

Regardless of the delivery model, any effort to increase plastic surgery provision in LMICs depends on collaborative partnerships between surgeons, local and national governments, non-governmental organizations (NGOs), and industry. These relationships can be North-South (between a developed country and a developing country), South-South (between two developing countries), or triangular (between two developing countries and a third party organization), all of

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which are important in ensuring growth. These partnerships are beneficial in their potential to garner credibility from national governments and gain potential donors for further investment. Furthermore, by incorporating and mobilizing all relevant stakeholders in LMICs, plastic surgeons can effectively grow surgical capacity, improve local infrastructure, and build long-term sustainability.[20]

Importance of Academic Engagement

Academic institutions can help catalyze transformative change in access to plastic surgery. This transformation is best achieved through collaborative partnerships at all levels, including trainees, faculty, training programs, academic medical centers, universities, and professional colleges. Collaboration ensures that research and advocacy efforts are relevant to local practice, and it magnifies the voices of all parties. Many training programs have implemented protected time during residency training to enable young physicians to learn the research, advocacy, and clinical skills required to contribute to global surgery. By providing young physicians with these opportunities early in their careers, training programs facilitate career-long engagement in global health equity. These opportunities can arise through NGO-Academic partnerships: *Operation Smile* and *Interplast,* among others, collaborate with surgical programs at Harvard and Yale to facilitate trainee engagement.[21] Programs can offer similar exchange opportunities to trainees in LMICs to promote an equal exchange of ideas and expertise.[21]

In addition to advocacy and training, academic plastic surgeons can also contribute to the conduct of innovative, interdisciplinary scientific research. Limited data are currently available to make reliable estimates of the burden of surgical disease, determine the cost-effectiveness of many surgical procedures, and monitor patient outcomes in LMICs. For example, multiple studies have been published on the cost-effectiveness of cleft lip and palate repair, but few studies examine other plastic surgery interventions in low-resource settings. Academic plastic surgeons can help bridge this gap, collaborating with epidemiologists and economists to identify clinically relevant and cost-effective strategies for addressing the burden of plastic surgical disease. To increase the utility of these studies, research should be conducted in full collaboration with local stakeholders using locally available data and knowledge to address context-specific priorities. A first step might be to invest in the strengthening of health information management systems. By making data collection a consistent part of clinical practice, these systems can provide policymakers with the information they need to appropriately allocate resources and can greatly facilitate the conduct of research.[21] The burgeoning nature of the field of global surgery renders it especially open to new adaptations in technology and clinical practice. In this context, plastic surgeons will have a major role to play in monitoring and evaluating global surgical care and fostering innovation.[21]

CONCLUSION

Plastic surgeons play a crucial role in reducing the global burden of surgical disease, preventing death and disability by restoring form and function. As surgical disease comprises a significant burden of disease and surgery can be delivered in a cost-effective manner, surgery must be considered a public health priority. Surgery, and specifically plastic surgery, should be incorporated into the international development and humanitarian agenda. By establishing global collaborative partnerships, mobilizing plastic surgeons early in their training, and participating in locally driven research, surgeons can optimize resource allocation to provide plastic surgical care and sustainably scale up surgical infrastructure in LMICs. Most importantly, however, plastic surgeons should recognize the call to reduce the significant burden of surgical disease in LMICs, which they are uniquely suited to treat.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

1 United Nations. Sustainable Development Goals (SDGs). Secondary Sustainable Development Goals (SDGs) 2015. http://www.undp.org/content/undp/en/home/mdgoverview/post-2015-development-agenda.html.

[Downloaded from wjps.ir on 2026-11-24]

2 Farmer PE, Kim JY. Surgery and global health: a view from beyond the OR. *World J Surg* 2008;**32**:533-6.
3 Huber B. Finding surgery's place on the global health agenda. *Lancet* 2015;**385**:1821-2.
4 Shawar YR, Shiffman J, Spiegel DA. Generation of political priority for global surgery: a qualitative policy analysis. *Lancet Glob Health* 2015;**3**:e487-e95.
5 Meara JG, Leather AJM, Hagander L, et al. Global Surgery 2030: evidence and solutions for achieving health, welfare, and economic development. *Lancet* 2015;**386**:569-624.
6 Shrime MG, Bickler SW, Alkire BC, Mock C. Global burden of surgical disease: an estimation from the provider perspective. *Lancet Glob Health* 2015;**3 Suppl 2**:S8-9.
7 Alkire BC, Shrime MG, Dare AJ, Vincent JR, Meara JG. Global economic consequences of selected surgical diseases: a modelling study. *Lancet Glob Health* 2015;**3**:S21-S7.
8 Shrime MG, Dare AJ, Alkire BC, O'Neill K, Meara JG. Catastrophic expenditure to pay for surgery worldwide: a modelling study. Lancet Glob Health 2015;**3**:S38-S44.
9 Chao TE, Sharma K, Mandigo M, Hagander L, Resch SC, Weiser TG, Meara JG. Cost-effectiveness of surgery and its policy implications for global health: a systematic review and analysis. *Lancet Glob Health* 2014;**2**:e334-e45.
10 Verguet S, Olson ZD, Babigumira JB, Desalegn D, Johansson KA, Kruk ME, Levin CE, Nugent RA, Pecenka C, Shrime MG, Memirie ST, Watkins DA, Jamison DT. Health gains and financial risk protection afforded by public financing of selected interventions in Ethiopia: an extended cost-effectiveness analysis. *Lancet Glob Health* 2015;**3**:e288-e96.
11 Mock CN, Donkor P, Gawande A, Jamison DT, Kruk ME, Debas HT; DCP3 Essential Surgery Author Group. Essential surgery: key messages from Disease Control Priorities, 3rd edition. *Lancet* 2015;**385**:2209-19.
12 Daar AS, Singer PA, Persad DL, Pramming SK, Matthews DR, Beaglehole R, Bernstein A, Borysiewicz LK, Colagiuri S, Ganguly N, Glass RI, Finegood DT, Koplan J, Nabel EG, Sarna G, Sarrafzadegan N, Smith R, Yach D, Bell J. Grand challenges in chronic non-communicable diseases. *Nature* 2007;**450**:494-6.
13 Costas-Chavarri A, Gillies R. Surgery for diabetes in low and middle-income countries. *Lancet Diabete Endocrinol* 2014;**2**:534-5.
14 Munshi A, Gupta S, Anderson B, Yarnold J, Parmar V, Jalali R, Sharma SC, Desai S, Thakur M, Baijal G, Sarin R, Mittra I, Ghosh J, Badwe R; other Locoregional Panel Members. Guidelines for locoregional therapy in primary breast cancer in developing countries: The results of an expert panel at the 8(th) Annual Women's Cancer Initiative - Tata Memorial Hospital (WCI-TMH) Conference. *Indian J Med Paediatr Oncol* 2012;**33**:112-22.
15 Semer NB, Sullivan SR, Meara JG. Plastic surgery and global health: how plastic surgery impacts the global burden of surgical disease. *J Plast Reconstr Aesthet Surg* 2010;**63**:1244-8.
16 McDonald HD, Vasconez LO. Advances in plastic surgery. *WestJ Med* 1982;**136**:23-8
17 Kouo-Ngamby M, Dissak-Delon FN, Feldhaus I, Juillard C, Stevens KA, Ekeke-Monono M. A cross-sectional survey of emergency and essential surgical care capacity among hospitals with high trauma burden in a Central African country. *BMC Health Serv Res* 2015;**15**:478.
18 Shrime MG, Sleemi A, Ravilla TD. Charitable platforms in global surgery: a systematic review of their effectiveness, cost-effectiveness, sustainability, and role training. *World J Surg* 2015;**39**:10-20.
19 Dupuis CC. Humanitarian missions in the third world: a polite dissent. J *Plast Reconstr Surg* 2004;**113**:433-5 d.
20 Patel PB, Hoyler M, Maine R, Hughes CD, Hagander L, Meara JG. An opportunity for diagonal development in global surgery: cleft lip and palate care in resource-limited settings. Plast Surg Int 2012;**2012**:892437.
21 United Nations Secretary-General's Independent Expert Advisory Group on a Data Revolution for Sustainable Development. A World that Counts: Mobilising the data revolution for sustainable development. 2014

[Downloaded from wjps.ir on 2026-11-24]