



Policy Document

The role of Surgery in beating NCDs

InciSioN - Simon Erridge (UK), José Chen (Portugal)

25th May 2018

Introduction

The **International Student Surgical Network (InciSioN)** affirms that the safe, affordable, and timely access to surgical care is an important priority for the global health community, especially in low- and middle-income countries (LMICs). Non-communicable diseases (NCDs) represent a large proportion of the global surgical workload and represent a cause of significant personal, political, and economic burden to populations worldwide. For that reason establishing clear priorities and goals for promoting the role of surgery in tackling NCDs is essential in alleviating these burdens.

InciSioN position

The International Student Surgical Network (InciSioN) strongly believes that surgical care plays an indispensable role in the fight against NCDs. Thus, there is a need to reshape how we manage and treat NCDs.

Call for Action

Therefore, InciSioN calls for:

Governments to:

- Recognize NCDs as a major public health threat;
- Reduce inequalities in society to prevent NCDs;
- Provide targeted funding to reduce the lack of access to safe, timely and affordable surgery;



- Encourage the formation of regional and/or national networks and pathways which increase access to multidisciplinary care for NCDs, for which safe surgery and anaesthesia is just one component.

Medical faculties and teaching institutions to:

- Recognize NCDs as a major public health threat;
- Develop medical curricula which highlight the burden of NCDs;
- Empower students with essential surgical skills, obstetrics and anaesthesia care as tools in beating NCDs;
- Develop collaborative partnerships with other institutions to allow local surgeons to learn from the global community.

International institutions and Non-governmental organisations to:

- Provide essential human, physical, organisational and financial resources to tackle NCDs;
- Advocate for the importance of surgery in beating NCDs;
- Collaborate with governments to provide more effective and needs-oriented surgical services;
- Seek to reduce stigma associated with obesity and metabolic surgery.

Healthcare sector to:

- Practice multidisciplinary care in the prevention and treatment of NCDs;
- Learn lessons from successes in tackling NCDs globally and adapt these to fit local population's needs;
- Advocate for the improvement of surgical skills in the NCDs framework.

InciSioN National Working Groups to:

- Raise awareness, especially among peers, and advocate towards the reduction of NCDs;
- Develop strategies to reach out to medical schools, healthcare institutions and governments and advocate for the importance of surgery in beating NCDs.

Background

The term 'non-communicable disease' is a universal term for diseases which cannot be transferred from one human to another.

The Global Burden of Disease study group highlighted that annual mortality from NCDs is expected to reach 49.1 million in 2020, with deaths from injury and trauma also projected to



rise to 8.4 million(1). In addition to death, NCDs are estimated to account for 66.5% of disability affected years in LMICs(2).

The World Health Organisation's Global Status report identified the following leading causes of NCD mortality in 2012 as being cardiovascular disease, cancer, respiratory disease and diabetes(3). In addition to these, congenital abnormalities pose an enormous burden on LMICs, where 90% of congenital abnormalities occur, affecting approximately 12 in 1000 live births(4)

Global Surgery has enjoyed something of a renaissance since the publication of the Lancet Global Surgery 2030 Commission(5), the 'neglected stepchild of global health' had previously struggled to enforce meaningful, sustainable changes on a global scale. Even though five billion lack access to safe, affordable, and timely surgical and anaesthetic care(5), improvement of global surgery provisions does not feature in the World Health Organisation's most recent global NCDs targets(3). This is despite evidence demonstrating that many surgical interventions have similar cost-effectiveness to vaccinations and malaria prevention, fundamentals of healthcare provision(6).

Whilst it is arguable that each NCD could necessitate its own position paper and policy statement, this paper shall focus on those which require the most attention from the global surgery community and InciSioN itself; namely cancer, trauma and injuries, congenital abnormalities and metabolic health.

Global Surgery & Cancer

Surgery, along with chemotherapy and radiotherapy, is a cornerstone of cancer treatment. Its role is multifaceted and not only covers curative procedures, but diagnosis, palliation and reconstruction(7).

As touched upon, cancer is a leading cause of NCD morbidity and mortality globally. Currently there are thought to be 15.2 million cancer cases annually worldwide, with 8.8 million cancer deaths, with mortality rates greatest in LMICs (75%)(7). Up to 80% of these cases will require at least one surgical intervention(7).

Data models provided as part of the Lancet Global Cancer Surgery commission show that cancer surgical needs are largely met in high-income countries (HICs)(7). However, in low-income (<5%) and middle-income countries (22%) an unacceptable proportion are able to access appropriate quality surgical care(7). In solid organ cancers, such as breast and colorectal, surgery may contribute up to 55% in aiding prevention of cancer mortality(7). In addition to the burden that lack of access to cancer surgery places on individual patients and



their families, it also represents a huge financial loss to governments. Annual losses of 0.5-1.0% and 1.0-1.5% of GDP are projected for both LMICs and HICs respectively by 2030 due to surgically treatable cancers(7).

There are a number of barriers that prevent access to cancer surgery globally. These can be framed in terms of social, political and economic factors. It should be a priority for each individual country to reframe and restructure its surgical systems to optimise treatment of cancer. The approaches should be guided by local research into specific barriers present in a region and evaluation of current cancer pathways.

Global Surgery, Trauma & Injury

Injuries are thought to cost 300 million disability-adjusted life years (DALYs) each year globally, accounting for 11.2% of DALYs(8). Trauma is thought to account for up to 10% of annual mortality, disproportionately affecting those from LMICs(9,10).

Road traffic injuries are the number one cause of death from injury, killing 1.25 million people in 2013. A further 50 million people acquired non-fatal injuries as a result of traffic collisions highlighting the high global mortality and morbidity from traffic collisions(11). Suicide is the second highest cause of mortality from injury with 800,000 deaths in 2015. In comparison homicide was responsible for 468,000 deaths in 2015, and there has been a 19% reduction in homicide rates since 2000(11). Deaths from injury disproportionately affect young male adults across all countries(11).

A number of challenges face the global health community in reducing the impact of trauma and injury internationally. These include a paucity of political support, inadequate resources and a view that surgery is not a cost-effective medical intervention in LMICs.

It is well recognised that prehospital care is important in driving improved outcomes in trauma. Whilst there is conflicting evidence to support the 'golden hour rule' it is clear that LMICs have higher prehospital death rates in trauma(10). Evidence from HICs such as Australia, Germany and the United States support the implementation of specialised trauma networks (12). However, it is important for countries to adapt trauma networks for their local environment. An example of where this has shown success is in London, United Kingdom, where a large population is confined within a small geographical area and is serviced by 4 main hubs. This allows for patients who have suffered major traumatic injuries to be directed to specialist services as quick as possible (12). In India, recent policy change has improved access to emergency medical services and helped empower laypersons in providing 'Good Samaritan' care (13).



In addition to improving prehospital care, in-hospital care is an important component of trauma provisions. Barriers to higher quality care, particularly in LMICs, are a result of the scarcity of physical, human and organisational resources. Whilst there is a paucity of evidence describing the economic impact of trauma, the limited evidence available indicates that the burden of providing trauma care is high both for the individual and the health care system (14). Moreover, there is a dearth of healthcare professionals available to provide trauma care in LMICs. Whilst LMICs carry the highest burden of disease they are typically supported by the smallest healthcare systems (9). A number of factors are responsible for this, including insufficient training, low salaries and the so-called 'brain-drain' to HICs (9). A number of efforts have been initiated to improve these. Most notably, the WHO 'Guidelines for Essential Trauma Care' has outlined a list of essential services that should be provided depending on the size of the care centre (15). Adoption of these guidelines will help bolster trauma care in LMICs, but this shall require significant economic investment and political advocacy.

Global Surgery and Congenital Abnormalities

Congenital abnormalities are the cause of significant morbidity and mortality globally, accounting for more than 25 million disability adjusted life years (DALYs) (8). However, this burden is mostly borne by LMICs. Over 90% of congenital abnormalities are estimated to occur in LMICs (16). Not only is the prevalence of disease greater, but LMICs also have poorer outcomes. Whilst HICs have mortality rates below 10% for most common anomalies, in LMICs the rates can vary from 20% all the way up to 85% (17).

Global Surgery has oft been known as the 'neglected stepchild of global health', Global Paediatric Surgery is the comparative 'child not yet born' (17). The management of congenital abnormalities in LMICs, much like cancer and injuries suffers from similar issues regarding human, physical and organisational restraints. Despite limited data being available, the prevailing evidence indicates that surgery is a cost-effective strategy for treating congenital abnormalities (4).

There is a known lack of access to safe affordable and timely surgical care for millions worldwide (5), this problem is exacerbated in the paediatric population (4). In some countries it is not uncommon for one paediatric surgeon to be the only provider of care within the entire country (4). Unfortunately, due to a paucity of previous advocacy and research little is known about the required infrastructure for the development of paediatric surgery in LMICs (17).



Metabolic Disease

Obesity is a growing epidemic globally, with between 10.1% to 19.7% of the global population projected to be obese by 2030 (18). Unlike the conditions previously discussed the burden more heavily falls on HICs, with over 55% of the population of established market economies projected to be either overweight or obese by 2030 (18).

Obesity is associated with multiple metabolic sequelae, most notably diabetes, hypertension and dyslipidaemia (19). Rising obesity levels in HICs are consequently associated with a rise in both cardiovascular disease and diabetes (20), two of the four leading causes of global mortality identified by the World Health Organisation's Global Status report (3).

Surgical management of obesity, commonly known as bariatric or metabolic surgery, has consistently shown to provide metabolic health benefits in a cost-effective manner, helping in some cases to cure or at least reduce the severity of diabetes, hypertension and the myriad of other diseases associated with obesity (21,22). Furthermore, metabolic surgery has been shown to prolong life expectancy in appropriately selected patients as opposed to traditional diet based approaches to weight loss which evidence suggest do not (23,24).

Access to metabolic surgery, however, is commonly found to be poor and is restricted by a combination of factors (24-26). Obese patients are subject to immense stigma, engrained by an outdated model of obesity that seeks to blame patients who struggle to maintain a caloric balance. However, it is now well known that a combination of biological, psychological and social factors interact with one another to affect the maintenance of body habitus (27). Consequently this stigma can lead to policy makers, insurance providers and healthcare workers restricting access to metabolic surgery via lack of funding and inappropriate care models, with patients themselves also avoiding health-seeking behaviours (24,25,28,29).

Conclusion

It is clear that unfortunately provision of Global Surgery for the treatment of NCDs still has a long way to go. However, 2015 may yet prove to be the tipping point in improving access to surgical care worldwide with the publication of the Lancet Commission on Global Surgery and the adoption of resolution WHA68.15 'Strengthening Emergency and Essential Surgical and Anaesthesia Care as a Component of Universal Health Coverage' at the 68th World Health Assembly. By building on these strong foundations and striving through advocacy, policy and research to tackle the specific issues faced in NCDs we can help promote equitable healthcare globally.



References

- (1) Murray CJ, Lopez AD. Alternative projections of mortality and disability by cause 1990–2020: Global Burden of Disease Study. *The Lancet*. 1997;349(9064): 1498-1504.
- (2) World Health Organization. World report on disability 2011. 2011.
- (3) World Health Organization. Global status report on noncommunicable diseases 2014. Geneva: WHO; 2014. Google Scholar. 2016.
- (4) Sitkin NA, Farmer DL. Congenital anomalies in the context of global surgery. *Seminars in pediatric surgery*. 2016;25(1): 15-18.
- (5) Meara JG, Leather AJ, Hagander L, Alkire BC, Alonso N, Ameh EA, et al. Global Surgery 2030: evidence and solutions for achieving health, welfare, and economic development. *The Lancet*. 2015;386(9993): 569-624.
- (6) Chao TE, Sharma K, Mandigo M, Hagander L, Resch SC, Weiser TG, et al. Cost-effectiveness of surgery and its policy implications for global health: a systematic review and analysis. *The Lancet Global Health*. 2014;2(6): e334-e345.
- (7) Sullivan R, Alatise OI, Anderson BO, Audisio R, Autier P, Aggarwal A, et al. Global cancer surgery: delivering safe, affordable, and timely cancer surgery. *The lancet oncology*. 2015;16(11): 1193-1224.
- (8) Murray CJ, Vos T, Lozano R, Naghavi M, Flaxman AD, Michaud C, et al. Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. *The lancet*. 2012;380(9859): 2197-2223.
- (9) Sakran JV, Greer SE, Werlin E, McCunn M. Care of the injured worldwide: trauma still the neglected disease of modern society. *Scandinavian journal of trauma, resuscitation and emergency medicine*. 2012;20(1): 64.
- (10) Mock CN, Jurkovich GJ, Arreola-Risa C, Maier RV. Trauma mortality patterns in three nations at different economic levels: implications for global trauma system development. *Journal of Trauma and Acute Care Surgery*. 1998;44(5): 804-814.
- (11) World Health Organization. World health statistics 2017: Monitoring health for the SDGs. Geneva, 2017. 2017.
- (12) McCullough A, Haycock J, Forward D, Moran C. II. Major trauma networks in England. 2014.
- (13) Das S, Desai R. Emergence of EMS in India. *Sat*. 2017.
- (14) Wesson HK, Boikhutso N, Bachani AM, Hofman KJ, Hyder AA. The cost of injury and trauma care in low-and middle-income countries: a review of economic evidence. *Health policy and planning*. 2013;29(6): 795-808.
- (15) Mock C. Guidelines for essential trauma care. : World Health Organization; 2004.
- (16) World Health Organization. Congenital anomalies: fact sheet. Available from: <http://www.who.int/en/news-room/fact-sheets/detail/congenital-anomalies> [Accessed May 1st 2018].



- (17) Sitkin NA, Ozgediz D, Donkor P, Farmer DL. Congenital anomalies in low-and middle-income countries: the unborn child of global surgery. *World journal of surgery*. 2015;39(1): 36-40.
- (18) Kelly T, Yang W, Chen C, Reynolds K, He J. Global burden of obesity in 2005 and projections to 2030. *International journal of obesity*. 2008;32(9): 1431.
- (19) Gordon T, Castelli WP, Hjortland MC, Kannel WB, Dawber TR. Diabetes, blood lipids, and the role of obesity in coronary heart disease risk for women: the Framingham Study. *Annals of Internal Medicine*. 1977;87(4): 393-397.
- (20) Wang YC, McPherson K, Marsh T, Gortmaker SL, Brown M. Health and economic burden of the projected obesity trends in the USA and the UK. *Lancet (London, England)*. 2011;378(9793): 815-825.
- (21) Sjöström L. Review of the key results from the Swedish Obese Subjects (SOS) trial—a prospective controlled intervention study of bariatric surgery. *Journal of internal medicine*. 2013;273(3): 219-234.
- (22) Picot J, Jones J, Colquitt J, Gospodarevskaya E, Loveman E, Baxter L, et al. The clinical effectiveness and cost-effectiveness of bariatric (weight loss) surgery for obesity: a systematic review and economic evaluation. *Health technology assessment (Winchester, England)*. 2009;13(41): 1-190.
- (23) Reges O, Greenland P, Dicker D, Leibowitz M, Hoshen M, Gofer I, et al. Association of Bariatric Surgery Using Laparoscopic Banding, Roux-en-Y Gastric Bypass, or Laparoscopic Sleeve Gastrectomy vs Usual Care Obesity Management With All-Cause Mortality. *Jama*. 2018;319(3): 279-290.
- (24) Moussa OM, Erridge S, Chidambaram S, Ziprin P, Darzi A, Purkayastha S. Mortality of the Severely Obese: A Population Study. *Annals of Surgery*. 2018.
- (25) Royal College of Surgeons (Eng.), and British Obesity and Metabolic Surgery Society. Patient access to bariatric surgery. 2017.
- (26) Buchwald H, Oien DM. Metabolic/bariatric surgery worldwide 2008. *Obesity Surgery*. 2009;19(12): 1605.
- (27) Grundy SM. Multifactorial causation of obesity: implications for prevention. *The American Journal of Clinical Nutrition*. 1998;67(3): 563S-572S.
- (28) Kim JJ, Rogers AM, Ballem N, Schirmer B, American Society for Metabolic and Bariatric Surgery Clinical Issues Committee. ASMBS updated position statement on insurance mandated preoperative weight loss requirements. *Surgery for obesity and related diseases : official journal of the American Society for Bariatric Surgery*. 2016;12(5): 955-959.
- (29) Tol J, Swinkels IC, De Bakker DH, Veenhof C, Seidell JC. Overweight and obese adults have low intentions of seeking weight-related care: a cross-sectional survey. *BMC public health*. 2014;14(1): 582.