

Health priorities post 2015:

Surgery must feature on the priority health agenda for the 15 years after 2015

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It has been six years since Paul Farmer described surgery as “the neglected stepchild of global health” (1) and, sadly, not much has changed in that time. Millions of lives are still laid to waste and lost each year because they lack access to surgical care (2).

When the Millennium Development Goals (MDGs) were set in 2000, surgery was bundled with the “other diseases” of MDG 6, despite evidence confirming that it is a major public health issue (3). Since then we have seen significant gains in the three health-related targets: reducing child mortality, improving maternal health, and combating HIV/AIDS, malaria and other diseases (4), while the neglect of surgery has led to the epidemic that we see today. Up to 56 million people are in need of surgery in Africa alone (5).

Traditionally surgery has been overlooked as a health priority due to the inaccurate perception as of it being a high cost intervention benefitting only a limited proportion of the population. However, recent years have challenged this concept prompted by the publication of a number of studies emphasizing the opposite.

We know that approximately 234 million surgeries are performed annually (6). At one operation for every 25 people this figure is more than twice the number of yearly births and seven times the 33 million people infected with HIV (7). Surgical conditions are thought to account for 11% of the total global burden of disease and 25 million disability-adjusted life years (DALYs) in Africa (8). Yet only 3.5% of operations occur in the poorest third of the world’s population (6), signifying a large unaddressed surgical disease burden in these settings.

In addition to addressing this unmet need, improved access to surgery is also essential to meet the global health targets that are already stated. Improving maternal health is an

MDG priority, and surgery is an essential component of safe delivery. However, comparing Caesarean section rates in different settings again demonstrates serious lack of surgical capacity. The recommended C-section rate is 5-15% (9) of deliveries but rates from developing countries are orders of magnitude lower than this (0.6% in Ethiopia, for example) (10). This correlation between limited surgical capacity and the high levels of maternal and neonatal mortality seen in these countries cannot be ignored.

Trauma is another area where vast need and limited surgical capacity result in devastating consequences, overwhelmingly in low and middle-income settings. Over 90% of deaths from injuries occur in these settings (11), with one third of injury-related mortalities affecting those aged 15–44 years (12). This age group is the most economically productive segment of the population and without access to essential surgery, they are confined to a life of poverty and disability. This is also true of many conditions of childhood that require surgery. It has been estimated that 85% of children in low-income countries are likely to require treatment for a surgical condition by the age of 15 years (13). Many of these conditions are amenable to simple surgical intervention - but if left untreated, may result in complications, lifelong disability or death.

Surgical care is in crisis and must be afforded priority in the post 2015 health agenda.

Challenges to providing safe surgical care in low-income countries are complex and often systemic. Addressing them is essential for improving surgical outcomes, but will also have a positive impact on social mobility and global development. Broadly speaking, the challenges include inadequate infrastructure (leading to shortages of even the most basic drugs and equipment necessary for safe surgery), restricted education (resulting in low-numbers of

under-skilled staff) and social and economic barriers (preventing patient populations from accessing care).

Human resources are a particularly critical issue. It has been estimated that there is a shortage of 1 million health care workers in sub-Saharan Africa alone, and in rural Africa there can be as few as one fully trained surgeon per 2.5 million people (14) – compared with 55 surgeons per million people in the USA (15). Complicating this global imbalance is a local one too: the role and responsibilities of the surgical provider differs dramatically according to location. Specialist surgeons are common in urban referral centres, but the surgeon in a rural hospital (where most populations reside) must be a generalist attending to all minor, major and obstetric cases. It is not uncommon for qualified surgeons to sub-specialise in urban areas, be enticed there by the higher salaries, or even seek improved working conditions overseas, contributing to the “brain drain” phenomenon that has exacerbated the crisis these countries face today.

The situation in a rural hospital is further complicated by the significant lack of essential items for safe surgery. The WHO proposed standardized metrics for global surgical surveillance (16) but a number of surveys confirm that essential resources are not in place in rural hospitals in low-income countries (17). This is symptomatic of years of financial underinvestment, disorganized procurement systems and poor allocation of resources.

A number of initiatives have been commenced in the last few years in an attempt to halt the surgical crisis.

The emergence of surgery and anaesthesia as medical specialties, and the formation of surgical training colleges e.g. COSECSA (College of Surgeons of East, Central and Southern

Africa) have helped to train skilled surgeons in their country of origin and goes some way to addressing the long-term human resource problems (18).

Alongside this, a more immediate solution to the human resource crisis has been the evolution of task shifting, a delegation process whereby procedures are moved, where appropriate, to less specialized health workers (e.g. clinical officers and general practitioners) (19). This is now practiced widely throughout Africa and other low-income countries. In Tanzania and Mozambique, 84% and 92% (respectively) of Caesarean sections, obstetric hysterectomies, and laparotomies for ectopic pregnancy are performed by non-physician 'medical officers' trained in surgery (20,21) and in Malawi, 90% of Caesarean sections at district hospital level are performed by non-physician 'surgical officers', with reported acceptable morbidity and mortality (22). Task shifting seems to work well when the trainer is appropriately skilled and practice is supervised. However, this does not always occur, leading to dangers when inexperienced and inadequately trained healthcare workers are expected to deal with emergency patients.

Some external agencies have focused on delivering surgical care through specially organized camps (23), enabling sophisticated surgery to be carried out by expert surgeons in a high-volume and cost-effective manner, even in temporary settings. Due to the neglect of surgery for so many years, there will inevitably be a backlog of patients who are in need of some sort of surgical service. These people may represent a social and economic burden on their families and should be offered treatment. Service trips may play an important role by addressing the backlog of cases that exists but, if not combined with coaching and training, do little to build local capacity.

Global partnerships between high and low income countries have also led to the significant

improvement in health services and play a part in strengthening health systems (24). In addition, donor funding has seen increasing commitment from bilateral funders to support anaesthetic and surgical capacity building programmes in Africa and elsewhere (25).

Recent cost-effectiveness studies show that basic surgical care at the district hospital compares favourably (US\$11-33/DALY averted) with other public health interventions such as measles immunization (\$US30/DALY averted) and antiretroviral therapy (US\$300-500/DALY averted) (26). Since many of the populations requiring surgery live in rural pockets of developing countries and will seek surgical care in the districts, these findings demonstrate exceptionally good value for money and support the argument that investment should be considered at this level.

To build capacity at the district hospital, the World Health Organization (WHO) launched the Emergency and Essential Surgical Care (EESC) Project in 2004 (27). This consists of the Integrated Management of Emergency and Essential Surgical (IMEESC) toolkit and the textbook "Surgical Care at the District Hospital". The aim was to strengthen the delivery of surgical and anaesthetic services at the primary health level and define the types of essential and emergency surgery that should be undertaken including required surgical staff, infrastructure and supplies. This initiative has involved delivery of a training package to district hospitals based on WHO's minimum standards and technologies for emergency and essential surgical care. As of June 2009, EESC workshops have been held in 32 countries, including 9 sub-Saharan African countries (28).

Although these activities are impressive, they need to be aligned and in concert with the local partner's needs to encourage sustainability. Surveys continue to be conducted highlighting gaps in equipment and resources. Significant investment now needs to be made

in hospital facilities, supplies of drugs and disposable items, focusing initially on the district hospitals where these gaps are palpable and the burden of surgical disease is likely to be greatest. There also needs to be an up scaling of postgraduate training opportunities to reverse the after effects of the brain drain that we have witnessed to date and to retain the current and future workforce. Lessons could be learned from other global health campaigns (e.g. HIV, TB) to improve access to surgical care with the focus being on strengthening horizontal programmes rather than vertical. Increased collaboration between surgical organisations and training colleges is a powerful advocacy tool and should be encouraged, as should the continued commitment from international donors.

In the last five years alone there have been over 200 papers published that recognize surgery as an urgent public health issue that needs investment and scale up, both in policy and financing. The problems have been identified, and while initiating solutions can be complex, the path is well signposted. Sidelining surgery in the post 2015 health agenda will have significant repercussions for millions of patients and they cannot afford to wait another 15 years.

References

1. Farmer P, Kim JY. Surgery and Global Health: A View from Beyond the OR. *World J Surg.* 2008 April; 32(4): 533–536
2. Chirdan LB, Ameh EA. Untreated surgical conditions: a time for global action. *Lancet.* 2012 Sep 22;380(9847):1040-1
3. Ozgediz D, Jamison D, Cherian M, McQueen K. The burden of surgical conditions and access to surgical care in low-and middle-income countries. *Bull World Health Organ* 2008; 86: 646–47.
4. The Millennium Development Goals Report 2012. <http://www.un.org/millenniumgoals/pdf/MDG%20Report%202012.pdf> (Accessed 15 December 2012)
5. Groen RS, Samai M, Stewart KA, Cassidy LD, Kamara TB, et al. Untreated surgical conditions in Sierra Leone: a cluster randomised, cross-sectional, countrywide survey. *Lancet.* 2012 Sep 22;380(9847):1082-7
6. Weiser TG, Regenbogen SE, Thompson KD, et al. An estimation of the global volume of surgery: a modeling strategy based on available data. *Lancet* 2008; 372: 139–44
7. Global surgery--defining a research agenda. Bickler SW, Spiegel DA. *Lancet.* 2008 Jul 12;372(9633):90-2
8. Debas H, Gosselin R, McCord C, Thind A (2006) Surgery. In: Jamison D, editor. *Disease control priorities in developing countries.* 2nd edition. Available: <http://www.dcp2.org/pubs/DCP/67/FullText>. (Accessed 15 December 2012)
9. Luboga S, Macfarlane SB, von Schreeb J, Kruk ME, Cherian MN, et al. (2009) Increasing access to surgical services in sub-saharan Africa: priorities for national and international agencies recommended by the Bellagio Essential Surgery Group. *PLoS Med.* 2009 Dec;6(12):e1000200
10. Reshamwalla S, Gobeze A, Ghosh S et al. A snapshot of surgical activity in rural

- Ethiopia – is enough being done? *World Journal of Surgery* 2012; May;36(5):1049-55.
11. Peden M, McGee K, Krug E. Injury: a leading cause of the global burden of disease. Geneva: World Health Organization; 2002.
 12. McQueen KA, Parmar P, Kene M, Broaddus S, Casey K et al. Burden of surgical disease: strategies to manage an existing public health emergency. *Prehosp Disaster Med.* 2009 Jul-Aug;24 Suppl 2:s228-31.
 13. Bickler SW, Telfer ML, Sanno-Duanda B. Need for paediatric surgery care in an urban area of The Gambia. *Trop Doct* 2003;33:91–4.
 14. Pollock JD, Love TP, Steffes BC, Thompson DC et al. Is it Possible to Train Surgeons for Rural Africa? A Report of a Successful International Program *World J Surg* (2011) 35:493–499
 15. Chang DC, Eastman B, Talamini MA, Osen HB, Tran Cao HS, Coimbra R. Density of surgeons is significantly associated with reduced risk of deaths from motor vehicle crashes in US counties. *J Am Coll Surg.* 2011 May;212(5):862-6. Epub 2011 Mar 29.
 16. Weiser TG, Makary MA, Haynes AB, Dziekan G, Berry WR, Gawande AA; Safe Surgery Saves Lives Measurement and Study Groups. Standardised metrics for global surgical surveillance. *Lancet* 2009;374:1113–7.
 17. Kushner AL, Cherian MN, Noel L, Spiegel DA, Groth S, Etienne C. Addressing the Millennium Development Goals from a surgical perspective: essential surgery and anesthesia in 8 low- and middle-income countries. *Arch Surg.* 2010 Feb;145(2):154-9
 18. College of Surgeons of East, Central and Southern Africa. <http://www.cosecsa.org>. (Accessed 15 December 2012)
 19. Chu K, Rosseel P, Gielis P, Ford N. Surgical task shifting in Sub-Saharan Africa. *PLoS Med.* 2009 May 19;6(5):e1000078. Epub 2009 May 19.
 20. McCord, C., Mbaruku, G., et al. The quality of emergency obstetrical surgery by

- assistant medical officers in Tanzanian district hospitals. *Health Affairs* 28(5): w876-885, (2009).
21. Pereira C, Cumbi A, Malalane R, Vaz F, McCord C, et al. Meeting the need for emergency obstetric care in Mozambique: Work performance and histories of medical doctors and assistant medical officers trained for surgery. *BJOG*. 2007;114:1530–1533.
 22. Chilopora G, Pereira C, Kamwendo F, Chimbiri A, Malunga E, et al. Postoperative outcome of caesarean sections and other major emergency obstetric surgery by clinical officers and medical officers in Malawi. *Hum Resour Health*. 2007;5:17.
 23. Atiyeh BS, Gunn SW, Hayek SN. Provision of essential surgery in remote and rural areas of developed as well as low and middle income countries. *Int J Surg*. 2010;8(8):581-5. Epub 2010 Jul 24.
 24. The Crisp Report. Available at http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_065359.pdf (Accessed 15 December 2012)
 25. UK Aid grant to improve maternal and neonatal survival in Liberia. http://www.mcai.org.uk/assets/content/THET_UKAID_grant_press_release_final.pdf (Accessed 15 December 2012)
 26. Ozgediz D, Riviello R. The "other" neglected diseases in global public health: surgical conditions in sub-Saharan Africa. *PLoS Med*. 2008 Jun 3;5(6):e121.
 27. World Health Organization. Global initiative for emergency and essential surgical care [Internet site]. Geneva: WHO. Available from: <http://www.who.int/surgery/globalinitiative/en/> (Accessed 15 December 2012)
 28. Bickler S, Spiegel D. Improving Surgical Care in Low- and Middle-Income Countries: A Pivotal Role for the World Health Organization. *World J Surg* (2010) 34:386–390