Policy Document

Surgery, Rural Health and Primary Healthcare

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July 22nd, 2018

Introduction

The main issue in rural health is the access to healthcare. In this context, providing primary healthcare (PHC) is seen as a solution. However, surgical care is a high-demand need in LMICs, especially in rural areas, and essential emergency and surgical skills must be part of PHC and provided to all. Therefore, there is a need for a structured national surgical, Obstetric and Anaesthesia Plan that takes into account rural areas and the inclusion of rural surgery early on in medical training.

InciSioN's position

The **International Student Surgical Network (InciSioN)** affirms that access to healthcare, especially, emergency and essential surgical care, should be accessible to all, regardless of economic and geographic factors. This should be achieved through Primary Healthcare in rural areas, as well as rural hospitals, which should be able to provide essential surgical care and be integrated in a National Surgical, Obstetric and Anaesthesia Plan, and included in medical curricula.

Call for Action

Therefore, InciSioN calls for:

Governments to:

- Develop and implement National Surgical, Obstetric and Anaesthesia Plans.
- Increase funding allocated to surgical, anaesthesia and obstetric care (SAO).

- Define human resources strategies to allocate doctors in rural areas;
- Set up a program of medical practice in remote areas as mandatory in applications for specialties.
- Improve data collection and registry on access to essential surgical care.
- Promote minimum-invasive procedures which lead to less complication rates;
- Implement telemedicine to provide immediate health care, which overcomes the geographic factor.
- Educate and raise awareness within the community
- Set up centers in rural areas to cultivate medical practitioners.
- Implement rules and laws to guarantee the quality of consumable products.

Medical faculties and teaching institutions to:

- Promote rural service as a essential component to the medical curricula.
- Set up a global education program to provide the opportunity to medical students and young doctors to experience different healthcare systems and different pathologies.
- Stimulate junior doctors and nurses to develop and perform surgical skills.
- Promote research and data collection on global surgery in rural areas, to assess needs and build a strategic and integrated action.
- Develop basic training to biomedical technicians

The World Health Organisation to:

- Take measures to provide access to essential surgical care in rural areas.
- Implement a strategy to achieve Universal Health Coverage by including Surgery in its package.

International institutions and Non-governmental organisations to:

- Advocate and raise awareness on this issue through campaigns;
- Develop medical supply programs for rural areas;
- Implement public private partnerships to improve access to surgery;
- Improve capacity of nurses and surgeons

Healthcare sector to:

- Promote task shifting and task sharing strategies within their practices in rural area, if applicable.

Private Sector and Local Providers to:

- Speed up examination process of consumable products.
- Provide an amount of their products to rural areas. These products can have a quicker process by having them examined prior to others.

InciSioN National Working Groups to:

- Organize the NWG on regional structures to propose collective solutions applied to different contexts.
- Advocate on access to surgical care in rural areas and as part of primary healthcare;
- Raise awareness on this matter in the community.

Background

Introduction

Social determinants of health in rural areas

The goal of health for all is not attained. It is especially evident in remote areas. The main issue which rural health faces is the access to healthcare [1]. Nevertheless, simply increasing the number of health industry can not solve what is being tackled. Health in rural areas, how health practitioners there work and the nature of practice, is immensely different from the urban counterpart of a country [2]. These differences are due to geography, demography, rural culture, rural morbidity, rural mortality patterns, resource limitations, and workforce shortages [3]. For example, many rural communities have a high dependency ratio, with large portion of elders and children with relatively few people of working age; rural people tend to have lower socioeconomic level because of limited job opportunities and occupations available are often farming, manufacturing, logging, and mining; risk factors endangering health condition including exposure to agriculture chemicals, noise pollution, and harsh work environments [1].

Rural health practitioners carry a heavier workload, providing a wider range of services and take on a higher level of clinical responsibility with underserved profession support. Insufficient resources induce different treatment been adopted compare to metropolitan. In the case of spinal fracture, usage of wire as back bracing can be found. Also, they have a significant public health role ranging from issues such as sanitation to health education. Flexible mindset, knowledge of rural culture, and spontaneous response are requested for workforce paying service in remote areas [4], and education on these matters should start as early as possible.

Human Resources

According to the World Health Report 2006, human resources in health refer to all people engaged in actions whose primary intent is to enhance health [5]. Human resources are in general terms the people who enter, remain and participate in an organization or institution, whatever their hierarchical level or their task [6]. Specifically in this setting, health workforce can be defined as those involved in the delivery of surgical and anaesthesia care, which consists of an interdependent network of clinical and non-clinical professionals involved in health-care delivery, management, training, and monitoring. [7] Gaps in human resources should be considered a broader issue that goes beyond to the lack of SAO. Global Surgery has become a multidisciplinary field that involves, in addition to surgeons, community outreach, biomedical skills and nursery care.

In low income settings the surgical workforce is limited, forcing us to look for low-cost solutions and in a short term. For decades in LMIC task shifting and task sharing represented a quickly and inexpensively way to expand access to care and as mentioned by the Lancet report in 2015: "Most published work has reported that task shifting does not increase mortality or morbidity when a small set of obstetric, general, and pediatric procedures are performed" [7], becoming a viable option for highly rural contexts.

These important concepts that we come across when talking about human resources in surgery are task shifting and task sharing. Task shifting is the allocation of surgical responsibility to non-specialist healthcare professionals. The task to be shifted is defined and described, and funding is moved to the new individual assigned to the task. By reorganizing the workforce in this way, task shifting can make more efficient use of existing human resources and ease bottlenecks in service delivery. [8]

Task sharing represents a process whereby specific tasks are moved, where appropriate, to health workers with shorter training and fewer qualifications and involve health professionals working together in teams to deliver a task or service that they may not have carried out before. It can be summarised as the sharing of joint surgical responsibility between specialists and non-specialists, under the oversight of specialists [9].

Most health systems are comprised by primary and hospital care levels (outpatients and inpatients service) in their most basic form, but regardless of the level of care, the patient is confronted by various barriers, which includes lack of geographic access to health services. At this level lies the importance of channelling community-oriented nursing training in order to

guide, identify and provide appropriate follow-up through new technologies and improving quality of care at the same time, as evidenced before [10]. On the other hand, it should also be oriented to monitoring outcomes tackling the lack of post-discharge monitoring, concealing information about surgical outcomes and patient reporting, having been demonstrated to be an effective method of monitoring post-discharge outcomes [11,12,13].

In case of hospital care, the training of less qualified professionals on basic procedures demonstrate the need for a high impact strategy for expanding the workforce coverage [7] Task sharing is another strategy that has a significant positive impact on healthcare delivery, having also been demonstrated to be cost-effective [14]. Another example is the Sierra Leone Experience, which Sierra Leone's Community Health Officers (SACHOs) rapidly and safely achieved substantial increases in surgical volume [15].

Medical Resources

Medical facilities

In rural areas, it is not unusual to have small primary care centers with only a few or no doctors - as in Zambia, where over half of the primary care institutions in rural areas are managed by nurses and midwives [16] - , but in some countries there are rural hospitals. These hospitals may serve to attend the emergency needs of the population, to provide small surgical procedures or to follow up.

One example is the decentralised, integrated care model created to provide longitudinal care for patients with advanced rheumatic heart disease at district hospitals in rural Rwanda before and after heart surgery, which showed good outcomes [17].

In Germany, a trauma network with centralized and local health care structures has been shown to be efficient and may achieve equivalent results with regard to mortality rates to those obtained in the main centers of the district [18].

A cash program in India, which aims at increasing the number of institutionalised births, has showed a great benefit of this program, reflecting the need to focus on increasing the level of emergency obstetric care functionality in public obstetric care facilities located in rural areas, which will allow more optimal utilisation of facilities for childbirth under the program thereby leading to better outcomes for mothers [19].

Another example from Bangladesh showed that rural health facilities can be utilised for surgical procedures, where they were able to perform surgery in more than 400 children, mainly inguinal hernia repairs, being a good way to provide curative care to the grass-roots

population [20]. The challenge might be having permanent surgical workforce for these procedures.
From these examples, the conclusion taken is that there is a need to improve rural healthcare facilities to provide integrated surgical, anaesthesia and obstetric care.

Material resources
There is lack of material resources in rural areas. Despite not being the main priority when talking about health in rural areas, as they are consumable resources [21], which expire and can be lost, they are needed for a great number of procedures.
Local markets successfully produce most consumables and unskilled labour. However, in many cases, as in Cambodia, there is a gap between resource allocation and need, which should be addressed through clear policies to prioritize remote areas and to allocate resources based on needs. [22] Government intervention is needed to ensure that quality and safety standards are met, that reliable information is available about the products, and that a fair competitive environment exists [21].
Manufactured pharmaceuticals and specialized medical equipment also face barriers, which are overarching in healthcare, such as patenting and licensing requirements, manufacturing standards, large initial investment costs, expensive research, and long development periods. Manufacturers of these inputs hold considerable market power, manipulating prices and demand. Strong policy measures are needed to tackle these issues, to grant access to safe medication for surgery and anaesthetic care [21].
Some strategies to tackle the inefficiency of healthcare in rural areas comprise the following:
a) Access to hand hygiene materials is one of the limitations in rural areas of LMICs. A study has shown that the integration of Alcohol-based hand rub was associated with a significant reduction in healthcare associated infections and Systemic Inflammatory Response Syndrome on the pediatric and surgical departments [23].
b) The ESM-Ketamine is a package for emergency and essential procedures when no anesthetist is available. It has been utilised for thousands of procedures, it appears to be safe and feasible and it is capable of expanding access to emergency and essential surgeries in rural Kenya when no anesthetist is available [24].
An organised NSOAP should be put forward to take into account access to surgery rural areas.

Telemedicine

Telemedicine is an expanded term in health information technology comprising procedures for transmitting medical information electronically to improve patients' health status [25]. Telemedicine has the potential to i) reduce inefficiencies in the delivery of healthcare, ii) diminish patient travel and waiting lists, and iii) increase access to specialists for patients in rural settings [26]. More specifically, it is used in the perioperative phase of care for pediatric surgical patients, their caregivers, and surgical providers, including pre-operative assessments, and post-operative follow-up.

In paediatric surgery, the Australasian telehealth system is used for diagnostic purposes, through videoconference. It has been shown to be accurate for most conditions seen, except for cryptorchidism [27].

As for obstetrics and gynecology, there are two different examples: in the US, the usage of an pregnancy application in smartphones by pregnant women was associated with improvements in prenatal visit completion and reduced incidence of low-birth weight delivery [28]; in Rwanda, a study is being developed on using mobile health technology and community health workers to identify and refer caesarean-related surgical site infections in rural areas [29].

In the case of plastic and reconstructive surgery, telemedicine can increase efficiency of postoperative care for microsurgical procedures, improving care coordination and management of burn wounds, facilitating interprofessional collaboration across time and space, thus eliminating a significant number of unnecessary referrals, and connecting patients located far from major medical centers with professional expertise without impinging on-and in some cases improving the quality or accuracy of care provided [30]. In Australia, telehealth provides access to Specialist Plastic Surgery service across the state, being for a wide scope of functions, such as patient management in their homes and follow up, reducing financial and psychosocial burden [31].

Telemedicine consultations to regional centers with neurosurgery housestaff have potential for increased timely diagnosis, improved time to surgery, and reductions in unnecessary transfers in remote areas [32].

Other applications of information technology comprise software solutions for digitalisation, data storage and innovative approaches in diagnostics, as well as to provide access to information for patients, medical appointments scheduling and reminders of these, which have been used in Germany [33].

An important application of technologies is in learning opportunities - it can increase access to medical education, improve quality of education and facilitate collaborations, despite all the barriers and limitations inherent to rural areas. [34]
Therefore, technology should make education, communication and medical interventions more readily available, regardless of location.

Education: Rural Health in medical curricula

A major problem that we have been facing throughout the times is related to the recruitment and retention of physicians in rural areas [3], which in turn is related to the sustainability of human resources for health. The uneven distribution of medical workforce is an international problem, which pushes us away from Universal Health Coverage [35].
Medical education has a great role in educating future physicians for the rural health specificities, and how to tackle them, with hands-on work with patients and learning from skilled role models. Studies have shown that the three factors most strongly associated with entering rural practice are:
(i) a rural background: rural medical schools have been proven to attach more physicians to these areas [4] - as in Australia, the US and Canada [35];
(ii) positive clinical and educational experiences in rural settings as part of undergraduate medical education; [4]
(iii) targeted training for rural practice at the postgraduate level [4].
Moreover, governments and medical schools must operate with responsibility and include rural practice in medical curriculum, under a social accountability framework [3]. The recognition of the diversity of geographic backgrounds and experiences is an important step towards bridging the gap in their health, education and economic status. This is relevant especially in populations like indigenous people, whose health is worse than the average rural populations [36].
Medical schools are in a relevant position to contribute to the improvement of health in rural areas. They are in direct control of Rural student recruitment, admissions policies, rural-oriented medical curriculum, rural practice learning experiences, faculty values and attitudes, and advanced procedural skills training. These have been shown to influence the likelihood of medical students entering rural primary care practice [37].
An integrated and sustainable healthcare workforce plan should be carried out, which should also consider the pipeline to practice concept, which all intervening parts should work together to ultimately improve health in the area [3].

Thus, curriculum content and practice programs upon rural health in medical institutes are necessary and efforts should be carried out by all stakeholders to implement rural health programs.

Surgery in Primary Healthcare

Primary healthcare has long been recognized as a critical factor in improving rural healthcare and thus serves as a great area to incorporate much needed surgical services to rural populations. Surgical care is needed, just as primary health care is needed at all stages of life, from birth, through the reproductive years, and to the grave. [38]

"Historically, the primary barrier to developing surgical services has been the (mis)perception that surgery is overly expensive for the majority of low- and middle-income countries. However, the World Bank published the 2nd edition of Disease Control Priorities in Developing Countries, which provided the first clear economic evidence that surgical care could be a cost-effective strategy under certain circumstances when compared with other types of care, such as antiretroviral medications, vaccinations, and other primary treatments." [39] Surgery has been increasingly mentioned as a critical factor in improving primary healthcare services, making one of its earliest mentions in the 2008 World Health Report, Primary Health Care, Now More Than Ever. The report includes primary healthcare as a hub or mediator of coordination among various specialized health care services, including surgical services, helping patients navigate the healthcare system and get the care they need. [40]

The necessity for surgical services is increasingly evident in rural areas, with one of the most needed surgical specialties being obstetrics. A study done by the University of Minnesota's Rural Health Research Center analyzed the burden of obstetric hospital closures in rural counties across the United States. Over 18 million women of reproductive age live in these rural counties. The study concluded that between 2004 and 2014 the percent of rural U.S counties that lacked hospital obstetric services increased from 45% to 54% due to obstetric unit or hospital closures. [41]

In rural areas in the U.S., obstetric services are commonly provided for by a family medicine boarded physician, who also provides primary health care services for the whole family. One study analyzed the economic impact of rural family physicians in Alabama practicing obstetrics. The study found that a rural community in Alabama already gains economic benefit from family physicians practicing primary care already of $1,000,000. With the inclusion of obstetric services in addition to primary health care services, communities gain an additional $488,560. [42]

Thus these two studies mentioned are prime examples of the importance of surgery in rural areas, as well as the importance of integrating surgery into primary health care, how they can be incorporated with primary health care services, and the economic benefit of pursuing this. This also stresses out the importance of an integrated National Surgical, Obstetric and Anaesthesia Plan that accounts for access to surgical care nationwide.

Surgery, Rural health and Primary Healthcare in achieving Universal Health Coverage

One of the aims of strengthening primary health care is to provide an affordable approach to achieving universal health coverage. Finance and human resource considerations are vital components that should be integrated into an overarching framework such as primary health care, which lays the foundation for an effective health care system that improves health, reduces growth in costs, and lowers inequality for all. [43] Strengthening primary health care to achieve universal health coverage stresses the importance of planning for sustainability and feasibility. The Lancet Commission is currently working on implementation (http://www.lancetglobalsurgery.org/implementation-tools) in multiple countries to develop National Surgical, Obstetric, and Anesthesia plans. The Lancet Commission guidelines indicate the five main areas to develop these plans, which include Infrastructure, Workforce, Service Delivery, Financing, and Information Management. [44] This works comes as progress towards achieving the goal of strengthening health systems and universal health coverage.

Other solutions

Rural areas are highly productive territories becoming a key to economic growth in developing countries [45], combined with the economic burden of surgical disease in terms of losses in GDP due to depletion of the labour supply and capital stock [7]. These are enough reasons for the government to include in their agenda the implementation of low-invasive procedure in rural settings, which are more cost-effective for hospitals than open surgery, mainly because it represents a minimal use of analgesics, antibiotics and other medical supplies. Another reason is the early discharge, which is in many cases a better option for patients, due to lower complications, lower economic costs of the procedure and quicker recovery, reflecting on a faster return to work (particularly important given unequal distribution of labor) [46].

Another solution is the mobilisation of surgical mobile units to rural areas, such as Cinterandes, which is one of the only mobile surgical units in LMICs, having provided in the last 20 years thousands of surgeries in Ecuador [47].

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