Tackling the challenges of providing surgical services in low resource LMICs: Shortcomings in surgical healthcare in Nepal

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ABSTRACT

Province-2 is small but densely populated area in the plains of Nepal with 20% of the population on 3% of the land. It is one of the two poorest provinces, with the lowest human and logistic resources. Therefore, there is an enormous and urgent need for improvement of appropriate health care facilities, accessible for all the people. The rural population remains desperately impoverished and to date the provincial and federal governments have lacked the funds to support these needy people.

Our work aimed to create a small working model to address the existing problems by establishing the Janakpur Trauma and Orthopaedic Hospital, and ultimately in collaboration with Future Faces, the Craniofacial Centre Nepal, to provide appropriate care at an affordable price to the people in Province-2. This model has been successful, but one of the main challenge remains payments to the health care providers. It is difficult to balance the income and expenditure of hospital services in order to sustain these works and so regular external financial input is required for maintaining continuity of care.

It is expected that government agencies and universities such as Madhesh Institute of Health Sciences (MIHS) should be able to educate and assist in the provision of standard care for common illnesses and create suitable human resources to face these challenges.

1. The challenges

Nepal is a small country located in between two big developing countries, India and China, in the South East Asia, but it is still a low middle income country (LMIC) with limited resources and limited capacity. Province-2 in Nepal, with a population of approximately 6 million, is one of the two poorest provinces in Nepal and this is very well reflected in the status of health care facilities for the population at large.¹ The distribution of extreme poverty of province-2 in Nepal is shown in Fig. 1 and Fig. 2(A and B).

The distribution of extreme poverty of province-2 in Nepal is shown in Figs. 1 and 2(A and B). In terms of poverty trends, results show strong and equalizing progress in MPI since 2014. Using the new MPI, the incidence of multidimensional poverty nationally fell from 30.1% in 2014 to 17.4%, and MPI dropped from 0.133 to 0.074, nearing being cut by nearly half in a mere five years. This is a remarkable result, given that the SDG aim is to cut multidimensional poverty by half in fifteen years. In human terms, it means that 3.1 million people left poverty in a mere

five years, with only 5 million left to exit. The intensity of multidimensional poverty also significantly decreased from 44.2% to 42.5%.

Traumatic Injury is a common scenario globally, especially in LMICs. It is a special area of concern because of the lack of adequate trauma care resulting in high mortality and disability rates. Hence, improvement of trauma care facilities and prevention measures is essential. The economic burden of injury and trauma care is high in LMICs, suggesting significant potential for cost savings through injury prevention. A standardized approach to economic evaluation of injury in LMICs is needed to further prioritize investing in injury prevention and appropriate management.²

In the entire Province 2, there is not a single trauma centre nor appropriately trained health care provider to handle trauma cases in the existing hospitals or health centres. There is a lack of infrastructure, skilled manpower, logistics and system of working especially in this Province.³

In 2020, data about road traffic injury (RTI) in Province 2 (Fig. 3) show that out of 3983 RTI, 523 people died, and a further 5811 people

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Fig. 1. Distribution of percent of individuals living in the global “poorest billion” within Nepal. (Source: Oxford Poverty & Health Development Initiative, Distribution of Multidimensional Poverty Index (MPI) Map by Province, 2014).

Fig. 2a. A: Multidimensional Poverty Index (MPI) Map by Province (Source: Nepal’s Multidimensional Poverty Index: Analysis Towards Action 2014, Nepal Planning Commission, Government of Nepal).

Fig. 2b. B: Multidimensional Poverty Index (MPI) map by province (Source: Nepal’s multidimensional poverty Index:Analysis towards action 2021, Nepal planning commission, GoN).

Province	Population Million	No RTI	No Death	Mortality %
1	4.5	3131	423	13.51
2	5.4	3983	523	13.13
3	5.5	1512	335	22.17
4	2.4	405	220	54.32
5	4.5	1211	526	43.44
6	1.6	285	110	38.60
7	2.6	562	187	33.27
Kathmandu Valley	2.5	9545	167	01.75

Fig. 3. Road traffic Injury in Nepal 2020–2021, Source: Kantipur Daily Newspaper, 02 Aug. 2021.

Fig. 4. Share of burden of disease from NCDs and injuries 1990–2015, Source: Global burden of disease Study 2017 (GBD 2017) results.

were injured. The RTI number (3983) and the death (523) is the highest of all provinces in Nepal.⁴

Globally, in 2018, deaths from injuries, amounting to 4.6 million annually, exceeded the combined annual deaths from communicable diseases such as HIV/AIDS, malaria and tuberculosis—and continues to grow year upon year. For every death, at least 10 survivors end up with a permanent disability—75% of which are due to musculoskeletal injuries receiving either no attention, or late and/or inadequate treatment. The 90% of global deaths and disabilities from injury occur in LMICs and 70% of these injuries affect employment, mainly in the male population aged 15–40 years.⁵

The value of lost production is estimated to be USD 180 billion annually in LMICs. Current inequalities of care mean that patients with life-threatening but survivable injuries are three times more likely to die in LMICs than in the high-income countries. Improving the quality of, and access to, trauma care has proven to be highly effective in saving lives and improving clinical outcomes. It is estimated that addressing inequalities in trauma care in LMICs could potentially reduce mortality by 40%, saving more than 2 million lives each year let alone reducing the economic burden. The lack of full awareness of this grossly underfunded problem makes it a silent and neglected one, of epidemic proportions. While 36% of health-related development aid goes to communicable diseases, only 1% is attributed to trauma care. Whichever yardstick is applied to the global burden of disease— either through

mortality or disability-adjusted life years (DALYs) for injuries—funding is disproportionately allocated to other health conditions.⁶

Nepal being a low income country has limited resources to cope with these problems and consequently, this adversely affects the GDP and increases poverty. Furthermore, Province-2 is most affected due to already existing extreme poverty, ignorance and shortage of essential infrastructure and resources. The increasing burden of injury due to RTI further aggravates the existing situation due to communicable & non-communicable diseases which strains any available services and resources as shown in Fig. 4.²

The current status of health care delivery systems in Province 2 can be identified by the following:

- Lack of suitable transport/ambulance, medical supplies and equipment needed to provide appropriate and timely trauma care.
- Shortage of skilled health care providers (doctors and paramedics not trained in appropriate trauma care)
- Security concerns for health care providers while handling trauma cases that include road traffic injuries, physical abuse and violence against them.
- Health services being a low priority for the local/national government, with low allocation of resources and budget.
- Improper management of trauma cases due to lack of proper management protocols in the existing hospitals and health centres.
- Lack of motivation among health care providers towards training and skill development
- Inadequate training opportunities for health care providers.
- The commercialisation of the health system has further worsened the situation and consequently poor people are unable to afford the rising costs of the health service.

For all these reasons and circumstantial evidence, working for AO Alliance from Kathmandu as a Regional Director for Asia, I (first author) have visited most LMICs in Asia and Africa in the past 15 years and gathered much useful information for improving trauma/injury care in the LMICs and re-assessed my personal mission & vision for improving fracture care in Province-2, as well as for the needy and deprived people of LMICs in other parts of Asia and Africa.

Due to a lack of government prioritisation and focus, targeted support by these authorities was absent.³ The need for a trauma centre in Province-2 was identified, one that would specifically care for all trauma patients and provide proper trauma care. These observations and experiences led me to begin my work voluntarily and on a non-profit basis

through a NGO, the Janakpur Trauma and Orthopaedic Foundation, which subsequently established the Janakpur Trauma and Orthopaedic Hospital in Janakpurdham. This hospital was established to meet the demand, entirely through my personal efforts, in terms of finance and planning. The objectives were to provide appropriate and accessible care for all patients and suitable training for all the health care providers. To ensure proper trauma management, protocols were established and implemented and expert opinion was taken online through video conferencing for case management as required. The centre gradually developed, with skilled manpower, modern equipment and technology. Since 2017, it also accommodated the newly established Craniofacial Centre Nepal, funded by a UK NGO, Future Faces. Working closely together, providing services, with appropriate training, for craniomaxillofacial trauma and correction of craniofacial deformities, the trauma hospital and the centre both developed further to provide a unique service to this part of Nepal.

Janakpurdham is the Provincial capital and a relatively a small town, famous for its many magnificent temples, including the Sita Temple. It is quite densely populated and in an easily assessable location. However, the problems of local transportation and non-availability of funds to support the treatment of poor people remain big obstacles. Due to poverty, the local needy people are barely able to afford the cost of proper care. The Provincial authorities and agencies had seen no need to prioritize support. Thus, trauma care by and large is dependent on minimal personal funding by the patients themselves supported by funds raised from a variety of non-governmental agencies. This hospital addressed this problem by charging full costs to those who could afford it but subsidised the cost or provided care free of charge for the poor, while maintaining the same standard of care for all. The main motto was to provide appropriate trauma care at affordable cost.

2. Future developments: achieving the aims of the Sustainable Development Goals 2030

Of the WHO Sustainable Development Goals 2030, SDG3^{7,8} refers to good health and well-being and is the most relevant to the work in Province-2. With the development of infrastructure, manpower and financial support, and more recently with a change of both Federal and Provincial governments, the burden of trauma has begun to reduce significantly. Increased numbers of patients will have access to affordable, accessible, and quality healthcare. Increasing numbers of essential surgical procedures for needy patients will be performed and the wider population will benefit. The improvement in local health care delivery system extending to the peripheral health centres and district hospitals will have an increasing impact on reducing mortality and morbidity related to common injuries, in particular road traffic injuries, whether orthopaedic or craniomaxillofacial. This will also have a positive impact on alleviation of poverty and improvement in quality of life. The key factor is timely appropriate health care accessible to all needy people.⁹

Investing in scaling up surgical care in LMICs will dramatically improve public health by reducing death and disability. In addition, there is a powerful economic case for such investments. Increasing access to safe, timely, and affordable surgical and anaesthesia care would produce substantial economic and welfare gains. 28–32% of the global burden of disease can be attributed to surgically treatable conditions. Therefore, delivery of surgical services and essential procedures must be embedded within targets for the SDGs and UHC.^{6–10}

3. Implementing better medical education in Nepal

The tools for delivery of better services are local capacity development and suitable education and training for all health care providers.

The recent (2020) establishment of Madhesh Institute of Health Sciences (MIHS) by the Government of Province-2, has been influenced by the facts that the province has a high population density, high poverty rate and lack of appropriate health care facilities. The main

mission & vision of MIHS has been defined as providing timely and appropriate health care accessible to everyone and reducing suffering, disability and poverty in Province-2 by enhancing specialized health care, research & education.

Appointed as Vice-Chancellor of MIHS, the duties and responsibilities assigned by the authority will enable me (first author) to act as a leader in terms of healthcare enhancement. The goal and vision need to be well defined in order for this to be achieved. The Lancet Commission of Global Surgery- 2015, identified the need for provision of surgery and raised concerns regarding affordability, poor accessibility and low or negligible availability of surgical services. Due to lack of infrastructure/logistics and manpower, surgical care is heavily affected especially in LMICs.⁷

In order to implement better medical education and training for the local population, and overcome some of these problems, our proposed steps will be:

- To establish and develop proper surgical training, in terms of residency and fellowships, with collaboration with international organisations and authorities, so providing enhanced training for the aspiring local surgeons and allied healthcare professionals.
- In terms of logistics, simulation labs can be developed in order to hone surgical skills, possibly in association with high-end training facilities in high income countries. Use of current and developing online or web-based services should form an important component of developing these aims
- For safe surgical services, specialized anaesthetic care is essential to provide not only safe intra-operative care but also for pre-operative and post-operative care. Anaesthetists should be capable of providing local, regional and general anaesthesia along with intensive care and as with the surgeons, require access to appropriate training.
- Committed long term support from the government authority is essential so that surgical services can become both affordable and accessible.
- Networking between the district health care system with the nodal provincial hospital for service and training must be developed. This will help build up local capacity and enhance referral systems for better health care in good time⁹.
- Needs based training programmes, supervision & monitoring will enhance the quality health care.
- Research activities and programmes will be conducted for formulation, implementation and supervision of health systems and services in Province-2.
- Mutual collaboration with different agencies and universities to achieve these goals as outlined in the mission/vision documents.

4. Conclusion

Province-2 is small but densely populated area in the plains of Nepal with 20% of the population on 3% of the land. It is one of the two poorest provinces, with the lowest human and logistic resources. Therefore, there is an enormous and urgent need for improvement of appropriate health care facilities, accessible for all the people. The rural population remains desperately impoverished and to date the provincial and federal governments have lacked the funds to support these needy people.

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