

Assessing access to surgical care in Nepal via a cross-sectional, countrywide survey



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Background. Adequate surgical care is lacking in many low- and middle-income countries because of diverse barriers preventing patients from reaching providers. We sought to assess perceived difficulties to accessing surgical care in Nepal using the Surgeons OverSeas Assessment of Surgical Need tool.

Methods. Fifteen of 75 Nepali districts were selected proportionate to the population, with 1,350 households surveyed. Household heads answered questions regarding access to health facilities, and 2 household members were interviewed for medical history. Continuous and categorical variables were analyzed via Wilcoxon rank sum test and Pearson χ^2 test. Multivariable logistic regressions for independent predictors of care access were performed controlling for age, sex, location, and literacy.

Results. Of respondents with a surgical condition ($n = 1,342$), 650 (48.4%) accessed care and 237 (17.7%) did not. Unadjusted analyses showed greater median travel times to all facilities ($P < .001$) and median transport costs to secondary and tertiary centers ($P < .001$) for those who did not access care versus those who did. Literate respondents were more likely to access care across all facilities and access variables in adjusted models (odds ratio 1.66–1.80, $P < .01$). Those without transport money were less likely to access care at any facility in all analyses ($P < .01$).

Conclusion. The data project that at least 2.4 million individuals lack access to needed surgical care in Nepal during their lifetimes, with those not accessing health facilities having lower literacy rates and fewer transport resources. Promoting education, outreach programs, and transportation access could lessen barriers but will require further exploration. (*Surgery* 2016;160:501-8.)

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AN ESTIMATED 10% OF DEATHS IN LOW- AND MIDDLE-INCOME COUNTRIES (LMICs) are due to conditions amenable to surgical intervention,¹ with nearly 5 billion people lacking access to basic surgical and anesthesia care. This disparity is more pronounced when we recognize that a mere 6% of the

approximately 313 million operations performed annually worldwide are for the poorest third of the world's population.²

Investigators have searched for possible explanations for this gap, with identified barriers at each level of the health system (patients, physicians, institutions, and structures) falling into the broad categories of affordability, availability, acceptability, and accessibility.³ There is increasing consensus that global surgical care is an achievable, cost-effective goal that hinges on collaborations from multiple stakeholders from the beginning, ensuring contextual relevance of the interventions.^{1,3,4}

Community-level patterns of access to health care, defined as the appropriate use of services based on realized need,⁵ likely differ across countries due to inherently distinct characteristics, cultures, and challenges. No studies specifically address surgical care access issues in Nepal.

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With a population of nearly 28 million,⁶ the Federal Democratic Republic of Nepal has immense diversity as evidenced by its 125 separate caste or ethnic groups spread over 5 development regions; 14 zones; 75 districts; 58 municipalities; 3,915 village development committees; and almost 36,000 wards.^{7,8} In concert with a demanding landscape, this decentralization of power raises challenges for addressing health issues in a unified, culturally relevant way.

Nepal is considered one of the poorest and least developed countries globally,⁸ ranking 145th out of 187 countries on the Human Development Index.⁹ A low-income country by World Bank standards, Nepal's Gross Domestic Product (GDP) is US \$19.29 billion, well below the US \$2 trillion average in South Asia; moreover, nearly 25% of the Nepali population lives below the poverty line. Approximately 6% of the GDP, US \$39 per capita, is allocated for health care spending, 30% below the regional average of US \$56 per capita.⁶

Under the auspices of the Ministry of Health and Population (MoHP), the Nepal Department of Health Services oversees 102 hospitals and employs over 51,000 female community health workers (Table I). This hierarchic design attempts to provide the majority of the population with accessible and affordable public health services, as well as treatment of minor injuries/disorders.^{10,11}

Surgical care, however, is only available typically at the zonal hospital level or above.¹² The private sector adds additional facilities (Table I),^{13,14} translating into approximately 0.4 hospitals and 50 hospital beds per 10,000 people,¹⁵ yet overall physician density is estimated at only 1.7 per 10,000 population across the public and private sectors, well below the regional average of 5.9 per 10,000 population,^{8,16} with trained surgeons being even more scarce.

The objective of this study was to evaluate associated demographic characteristics and barriers to accessing surgical care in Nepal based on a countrywide administration of the Surgeons Overseas Assessment of Surgical Need (SOSAS) tool. We hypothesized differences in access characteristics, such as travel mode, time, and cost, as well as possible disparities in demographic variables between those who accessed care and those who did not. These results will provide targets for future strategies and interventions to improve access to health care facilities in Nepal.

METHODS

This study took place in Nepal from May 25 to June 12, 2014. Both the Nepal Health Research

Table I. Census of the Nepalese health care facilities

Type	Level	Number of facilities	
Public			
Tertiary	Central	8	
	Secondary		
Secondary	Regional	3	
	Subregional	3	
	Zonal	10	
	District	78	
	Primary	208	
Primary	Primary health care center/ Health center		
	Health post	1,559	
	Subhealth post	2,247	
	Private		
	Hospitals	301	
	Clinics	>2,000	
Total		6,417	

Sources: Nepal Department of Health Services,¹⁰ Nepal Ministry of Health and Population,¹³ Nepal Central Bureau of Statistics.¹⁴

Council in Kathmandu, Nepal, and the Nationwide Children's Hospital in Columbus, Ohio, provided Institutional Review Board approval.

Sample selection. Sites for the SOSAS survey were chosen based on 2-stage cluster sampling, with 15 districts and 45 village development committees chosen randomly (Fig). Further details are discussed elsewhere.¹⁷

Study location. Nepal, a land-locked, South Asian country, is internationally renowned for its diverse topography, from the flat river plains in the south to the central hill area and weathered Himalayas in the north which contain 8 of the world's 10 highest peaks.⁸ Yet, the geography is frequently a barrier to its citizens, with only 19.3% of the population residing in an urban setting.¹⁸

Exacerbating this barrier of geographic spread is Nepal's vulnerability to natural disasters, including floods, landslides, thunderstorms, droughts, famines, and earthquakes.⁸ One such disaster occurred in April 2015 when a massive tremor shook Nepal causing over 8,600 deaths and nearly 22,000 injuries. Partial or complete damage to 1,085 health care facilities, including 25 hospitals,¹⁹ added further stress to a persistently overworked, under resourced, and underperforming health system.

Survey design. The SOSAS survey is a household-based, cluster-randomized, cross-sectional assessment tool available on the Internet,²⁰ described in detail previously.²¹ The first section focuses on household demographics, including access to primary, secondary, and tertiary facilities based on mode of transport, time, cost, and money availability.

The second part chooses randomly 2 household members to participate in a verbal head-to-toe exam

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