A Proposed Matrix for Planning Global Surgery Interventions

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Abstract The concept of surgery and global health is gaining acceptance; however, a great deal of confusion still exists as to what constitutes global surgery. To facilitate the overall view of how surgical care in a low resource setting can be integrated into a health system, a matrix for planning global surgery interventions has been developed. The key components of this tool are treatment locations and disease time course. The matrix also allows for the inclusion of information on surgical capacity for personnel, infrastructure, procedure, equipment, and supplies. This simple tool can assist researchers, program implementers, policy makers, and donors understand how to improve the delivery of surgical care to the billions of people around the world in need.

In high-income countries, surgical care is an essential part of health systems. Yet, when looking at low and middle income countries (LMICs) this is not always the case [1]. Although interest in global surgery is growing [2], and information is emerging about the size of the problem, including the limited number of operations in LMICs [3]; the dearth of functioning operating rooms [4] in low resource areas; and the large unmet need worldwide [5], there is still disagreement about what global surgery truly encompasses. In addition, it is not always clear what interventions are needed or how they fit into an overall plan.

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Just as the injury community has used the Haddon Matrix to assist with developing injury strategies [6], members of the global surgery community feel that the development of a similar matrix might be of value for the provision of surgical healthcare. Unlike other global health programs, global surgery is not linked to a single disease or technique. Therefore, instead of creating a new silo for global surgery, a method is needed to integrate surgical care into all aspects of a health system.

The locations where surgical care can be delivered range from the pre-hospital or community setting to hospitals or health facilities; surgical care continues after a patient has been discharged from a health facility back to the community, to a rehabilitation center, or to a hospice. Surgical conditions can potentially be described along a time continuum from preventable to treatable to incurable. Previous work has also looked at surgical capacity in LMICs and categorized the needs using the acronym PIPES: personnel, infrastructure, procedures, equipment, and supplies [7].

In developing a suitable matrix, a table (Table 1) has been created that shows the intervention locations along the top and the disease time course on the side. The PIPES categories were then included in each of the 9 resulting boxes. The resulting matrix can be completed for a specific surgical intervention or surgically treatable disease or

Table 1 Matrix for planning global surgery interventions

Disease time course	Intervention location		
	Pre-hospital (community)	Hospital (health facility)	Outside facility (community, rehab hospital, hospice)
Preventable	P ₁ :	P ₁ :	P ₁ :
	I:	I:	I:
	P ₂ :	P ₂ :	P ₂ :
	E:	E:	E:
	S:	S:	S:
Treatable	P ₁ :	P ₁ :	P ₁ :
	I:	I:	I:
	P ₂ :	P ₂ :	P ₂ :
	E:	E:	E:
	S:	S:	S:
Incurable	P ₁ :	P ₁ :	P ₁ :
	I:	I:	I:
	P ₂ :	P ₂ :	P ₂ :
	E:	E:	E:
	S:	S:	S:

P₁ personnel; *I* infrastructure; *P₂* procedures; *E* equipment; *S* supplies

condition, and the needs can be easily seen throughout the various locations and along the disease time course.

Though simplistic, it is hoped that this matrix for planning global surgery interventions will assist researchers, aid and development workers, policy makers, and

donors. In light of the growing interest in surgery and global health, and with the formation of an upcoming Lancet Commission on Global Surgery [2], tools are needed to highlight the problem and assist in interventions, advocacy, and research efforts.

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