

LETTER TO THE EDITORS

# The higher impact of the COVID-19 pandemic on resident/fellow training in low- and middle-income countries

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Dear editors,

Among the many detrimental consequences of the COVID-19 pandemic to transplantation, the impact on the training experiences of residents/fellows has not been explored. Trainees in other specialities and medical students have expressed concerns about adequately developing their skills during the pandemic [1,2]. A few re-assignments in a 1- or 2-year transplant training program may lead to significant loss of key training experiences and the ability to meet practice-specific milestones [3]. We intended to explore this in a multi-national survey that we conducted on transplant practices during the pandemic.

From June to September 2020, we contacted 1267 transplant physicians to take the survey; 513 physicians from 71 different countries participated. Of these, 417 stated that their programs trained transplant residents or fellows. We asked them to rate on a Likert scale (1 being unlikely and 5 being very likely), whether they thought the pandemic would decrease their trainees' experiences. The mean (SD) score was 3.28 (1.39). We then examined differences across income-level, cumulative COVID-19 incidence, and characteristics of the respondents and their programs (Table 1). Bartlett's test of homogeneity of variances was used to examine variances across survey responses. Transplant physicians from low- and middle-income countries rated the impact of the pandemic significantly greater than those from high-income countries. Also, less years practicing transplantation was associated with a higher mean score, perhaps because many in teaching roles tend to

**Table 1.** Likelihood of decline in transplant resident/fellow training experience during the pandemic rated on a scale of 1 to 5 (1 being unlikely and 5 being very likely) by transplant physicians.

Characteristic ( <i>n</i> for each sub-category)	Mean score (standard deviation)
Country's cumulative COVID-19 incidence*	<i>P</i> = 0.9
Low (137)	3.27 (1.38)
Medium (160)	3.25 (1.37)
High (118)	3.35 (1.46)
Income level of the country <sup>†</sup>	<i>P</i> < 0.001
Low and middle (146)	3.71 (1.26)
High (269)	3.05 (1.40)
Speciality of the respondent	<i>P</i> = 0.5
Surgical (113)	3.34 (1.46)
Non-surgical (302)	3.27 (1.37)
Years practicing medicine	<i>P</i> = 0.05
<5 (16)	4.13 (1.03)
5–10 (57)	3.40 (1.31)
11–20 (148)	3.51 (1.35)
>20 (194)	3.01 (1.42)
Type of organ transplant program	<i>P</i> = 1.0
Kidney/pancreas (234)	3.38 (1.38)
Liver (83)	3.11 (1.41)
Heart (37)	3.32 (1.33)
Lung (31)	3.19 (1.49)
Multiple (30)	3.10 (1.47)
Age group of patients	<i>P</i> = 0.2
Adult (267)	3.35 (1.33)
Pediatric (44)	3.23 (1.54)
Both (104)	3.15 (1.50)
Baseline transplant volume <sup>‡</sup>	<i>P</i> = 0.4
Low (91)	3.36 (1.47)
Moderate (195)	3.34 (1.33)
High (128)	3.12 (1.43)

\*Calculated from March 13 to July 15, 2020 as reported by the Johns Hopkins COVID Map, supplemented by covidindia.org. Calculated in person per million population, we divided this variable into tertiles for the entire cohort of 513 participants: Low: <2031, Medium: 2032–5400, High: >5400.

<sup>†</sup>As defined by the World Bank at <https://www.worldbank.org/>.

<sup>‡</sup>Defined as the number of transplants performed per year. Low: ≤20, Moderate: 20–100, High: >100. One response excluded as participant picked "do not know".

be younger faculty. Responses did not vary by the COVID-19 burden of the region or whether the respondents were surgeons.

During the pandemic, trainees have experienced significant disruption in conventional education methods, near total focus on service rather than learning, re-assignment to COVID-related activities that may be outside usual specialties, and a switch to virtual methods of teaching [3–5]. These changes have significantly decreased the clinical, teaching, and research experience of subspecialty training programs, such as transplantation. In addition, there was a decline in transplant activity across several centers, which further affected learning and education. A bigger impact on trainees in low- and middle-income countries has been speculated [4]. We now objectively demonstrate that the pandemic is identifying, or perhaps magnifying, the challenges transplant training programs in lower-income countries may be facing. In these trying times, it may be prudent for transplant leadership to embrace competency-based

assessment, advance E-learning in transplant education, and perhaps foster more robust international partnerships [1,5–7]. The latter two may be of particular relevance as virtual solutions have been positively embraced by training programs, which can be shared globally. Addressing the changes in the training experience of future transplant physicians and leaders is essential to sustaining the workforce during these trying times without a clear endpoint.

Sincerely,

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