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Impact of early COVID-19-related challenges on pediatric researchers: an exploratory analysis

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The onset of the COVID pandemic in the spring of 2020 created personal and professional challenges for both new and established physician scientists. COVID-19-related policies aimed at curtailing disease spread burdened researchers (e.g., stay-at-home advisories) and created greater clinical responsibilities. Additional barriers for scientists included suspension of research activities and increased personal demands to provide childcare[1,2] during school closings, and other family responsibilities.[3–5] While federal measures have been proposed to help restore research productivity across all sectors to pre-pandemic levels, there remains limited primary-source data on the impact of the COVID pandemic on pediatric research.[6–9]

To better understand how the pandemic affected pediatric scientists, the Society for Pediatric Research (SPR) Advocacy Committee conducted an online survey of all 4490 United States-based Active, Junior and Emeritus members (dues and non-dues paying) in July 2021. The survey was sent via an email link twice to members using the Survey Monkey web program. The survey was also advertised in the society's newsletter four times. Questions focused on how the pandemic influenced the researchers' personal and professional responsibilities from March 2020 through June 2021. Demographic data included questions about type of research conducted (i.e., basic science, clinical, translational, population health), funding sources, changes in research staff, protected time and other challenges to conducting academic work. Respondents could also include narrative comments focused to their personal and professional experiences related to pediatric research. Preliminary findings are described. Comparative analyses were conducted using the chi-square statistic. This study was deemed exempt for review by the Institutional Review Board.

DEMOGRAPHIC DATA

Of 165 total respondents, (3.6% response rate) 61% were female and 78% self-identified as Non-Hispanic White (Table 1). Respondents were mostly between 41 and 50 years (39%) and held the faculty rank of "Professor" (41%). Of 149 researchers who completed demographic data, 14 pediatric subspecialties were represented, with Neonatal-Perinatal Medicine constituting the largest group (38%). Fifty-four percent (86/160) of respondents classified their work as clinical research. The federal government was the primary research sponsor for 61% of respondents.

RESEARCH IMPACT

Over 80% of 162 respondents reported issues due to the pandemic. Barriers to conducting research during the pandemic included: 1) having to delay or stop hiring research staff (49%); 2) delays in purchasing supplies and/or capital equipment (28%); and 3) loss of research assets (e.g., reagents, cell lines) (26%). More than 1/3 (37%) shifted their work to COVID-19-related research. Fifteen percent lost research funding. Of the 165 pediatric researchers who reported impediments to work, 68% encountered difficulties in patient recruitment, 55% faced issues with data collection or patient follow-up, 42% experienced delays in institutional review board approval of new projects and one-third had difficulties in the use of core facilities. Almost one-quarter (24%) incurred additional costs during this period.

The pandemic also changed the amount of time investigators spent on research-related activities. Of 164 who answered, 29% experienced a reduction in time allotted for research by up to 25% due to changes in either professional or personal responsibilities. Demographic characteristics, type of research or funding source were significantly correlated with the amount of protected research time lost.

Among the 92 respondents (56%,) reporting decreased time conducting research, female researchers reported increased childcare/homeschooling/elder care responsibilities compared to males (57% vs 30%, $p < 0.02$, Table 2). Childcare/Home-Schooling and other related activities increased for Trainees/Clinical Instructors and Assistant Professors compared with a composite of Associate and Full Professors (67.9% vs. 35.5%, $p < 0.01$). Associate and Full Professors spent more time on administrative activities compared to trainees/clinical instructors/assistant professors (77.4% vs. 49.1%, $p < 0.01$). Those conducting clinical research experienced increased clinical care responsibilities compared to investigators in other areas (71% vs. 45%, $p < 0.02$). Approximately one-third (29%) of respondents estimated the time required to return to pre-pandemic research activities would be between 6 and 12 months and 16% projecting between 12 and 18 months. No demographic or research characteristics had a statistically significant association with an increased time to recovery. Narrative comments are excerpted below.

GENERAL THEMES AND SAMPLE QUALITATIVE COMMENTS FROM SURVEY RESPONSES (ABBREVIATED)

Impact on early career physicians

> *"My research focuses on the clinical entity of pneumonia, which nearly disappeared as a clinical entity over the past year … my research agenda (final Aim of K award) proved impossible to do. So I'm behind… in terms of pursuing further research funding at this late stage of my K award and entering the critical K-R transition with less data and experience etc. than I would have hoped."*
>
> -Female, Associate Professor

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Table 1. Demographic characteristics of SPR survey respondents ($N = 165$).

		N	Percentage
Sex	Male	64	39%
$N = 165$	Female	101	61%
Race/Ethnicity	Non-Hispanic White	124	78%
$N = 159$	Asian	20	12.6%
	Multi-Racial	4	2.5%
	Non-Hispanic Black	2	1.3%
	Alaskan Native or Native American	1	0.6%
	Prefer Not to Answer	8	5%
Faculty Rank	Trainee/Clinic Instructor	11	7%
$N = 165$	Asst. Prof.	30	18%
	Assoc. Prof	56	34%
	Prof.	68	41%
Clinical Field	Neonatology	56	38%
$N = 149$	Infectious Disease	18	12%
	Endocrinology	15	10%
	Emergency Medicine	12	8%
	General Pediatrics	12	8%
	Critical Care	7	5%
	Other	29	19%
Research	Clinical	86	54%
$N = 160$	Basic Science	34	21%
	Translational	27	17%
	Population Health/ Data Science	13	8%
Funding Source	Federal Govt	100	61%
$N = 164$	Institutional	36	22%
	Private Foundation	12	7%
	State Govt	5	3%
	None	11	7%

Respondents to the survey were majority female (61%), non-Hispanic White (78%), between 41 and 50 years (39%) and held the faculty rank of "Professor" (41%).

"As a pediatric infectious diseases physician-scientist, I spent time working with schools and community organizations on their respective COVID-19 policies which decreased attention towards my own research activities. Given I have the expertise for these essential community activities, it was the right thing to do (although could be detrimental to my career in the long run)."

-Male, Assistant Professor

Stressors related to child care, virtual school

"The hiring freeze meant we were unable to hire staff for funded projects, placing more burden on the PI and existing staff. The need to change all data collection from in-person to virtual placed additional burden. My clinical work continued, so, unlike other investigators, I have been unable to catch up on papers or grants. Additionally, COVID related stressors at home with children (virtual school, increased anxiety and mental health issues for youth) have meant that I cannot spend as much weekend or evening time as in the past."

-Female, Full Professor

"I oversee my own research area plus have administrative responsibility. COVID has had a significant impact on the flow of our research in the following ways, adjustment to reaching study participants, adapting to a digital health approach to maintain contact with participants, down time with staff, reduced number of study participants, research staff relocating… causing loss of staff, emotional impact on research staff, adjustments in research plans to take on COVID related studies, and fatigue of staff in recovering from a very trying time."

-Male, Full Professor

Concerns about funding

"My research activities essentially shut down for 4 months, I had to pay my team during that time (institution did not allow furlough etc) but was not making progress, I am very worried I will run out of money for grant funded projects before they are completed."

-Female, Associate Professor

CONCLUSIONS

In this exploratory paper, we report novel self-reported data on the impact of the COVID shutdown on pediatric researchers. This pilot data suggest the pandemic was associated with reduced research time for more than half of those who responded, along with increased clinical care responsibilities for earlier career researchers (who may be more likely to have school-age children) and more hospital administrative work among more senior physician-scientists.

Among our respondents, the results suggest early career, as well as female researchers, may have been more severely impacted. General conclusions regarding the impact of COVID on the conduct of pediatric research cannot be drawn due to the low response rate. Noteworthy that—across SPR membership, 25% of members are between 40 and 50 years old, however, the percentage of those who completed the survey was 39%. We speculate COVID's impact may have disproportionately impacted researchers in this age range, which may have rendered them more likely to complete the survey. As the narrative comments suggest, researchers in this age group frequently had to balance both childcare and eldercare issues, as well as changes in research practice.

Further, while 61% of the respondents were female, women constitute 46% of membership. Throughout the public health response to the COVID-19 pandemic, trainees and early career faculty have been frequently redeployed to clinical roles, compromising time on academic pursuits.[10] For female researchers, these preliminary results indicate increased child/home-schooling/elder care responsibilities may have compromised time conducting research. These findings are consistent with other studies examining the impact of the pandemic on physicians in other specialties.[1,11–13] Though the response rate in this paper preclude wide-ranging understanding of the impact of COVID on pediatric research, factors associated with research setbacks during this time should be examined in the future with the aim of better identifying remedial means of supporting researchers and sustaining the physician-researcher pipeline.

Though limited, the narrative comments voice difficulties encountered by the subset of researchers who completed the survey. The comments personalize struggles faced by responding researchers, lend insight into mechanisms to restore pre-pandemic productivity and illustrate the crucial role institutions play in supporting researchers funded by non-governmental sources.

Table 2. Activities associated with increased time demands among respondents reporting decreased research time ($N = 92$).

	N	Childcare/Home Schooling/Elder Care/Household Responsibilities	Clinical Workload	Administration Activities	Medical Education Activities
Male	33	30%	55%	64%	12%
Female	54	57%*	67%	59%	22%
$N = 87$					
Non-Hispanic White	72	35%	57%	57%	19%
Other	20	75%	60%	60%	90%
$N = 92$					
Trainee/Clinic Instructor	10	70%	60%	20%*	10%
Asst. Prof.	18	67%#	61%	56%	11%
Assoc. Prof	31	42%	71%	55%	23%
Prof.	31	29%**	45%	77%***	16%
$N = 90$					
Clinical	48	44%	71%****	58%	13%
Non-Clinical	40	43%	45%	60%	20
$N = 88$					
Neonatology	35	34%	60%	51%	11%
Other	52	48%	46%	60%	19%
$N = 87$					
Inpatient Med (NICU, ER, Hospital Med, Crit. Care)	44	36%	57%	55%	16%
Outpatient Med (Other)	43	49%	47%	58%	19%
$N = 87$					
Federal Govt	51	55%	49%	65%	24%
Institutional	24	46%	67%	67%	4%
Private Foundation	3	33%	67%	33%	0%
State Govt	4	25%	75%	50%	25%
None	7	43%	57%	14%	14%
$N = 89$					

Among those reporting decreased research time, female investigators reported increased childcare/homeschooling/elder care responsibilities compared to males (57% vs 30%, $p < 0.02$). Childcare/Home-Schooling and other related activities increased for Trainees/Clinical Instructors and Assistant Professors compared to Associate/Full Professors (67.9% vs. 35.5%, $p < 0.01$). Clinical researchers experienced increased clinical work than other investigators (71% vs. 45%, $p < 0.02$).

*$p < 0.02$, Female Respondents reported more childcare/eldercare responsibilities. Trainees and Clinical Instructors did significantly less administrative work than all other activities when compared to Asst, Assoc, and Professor ranks combined.

**$p < 0.05$ for Professor compared to all other ranks for childcare.

#$p < 0.01$ for Assistant + Trainee + Clinical Instructor had more childcare responsibilities vs Associate and Full Professor Combined.

***$p < 0.01$ (Full Professors had more administrative work compared to Assistant + Trainee + Clinical Instructor + Associate Professor).

****Those performing clinical research significantly increased time spent on clinical workload compared to non-clinical researchers ($p < 0.02$).

Responses to the survey came from SPR members, the majority of whom work exclusively in the United States, limiting generalizability to other countries. As noted the survey response rate was low at 3.6% (162/4490) and may not comprehensively reflect the issues COVID posed for the conduct of child health research, describing experiences only of researchers most passionate about the pandemic's impact on their work. Further, survey responses may have been blocked via institutional firewalls against outside electronic mail messages. Limited research exists regarding how COVID impacted research outside the U.S. on children. The few studies published showed COVID-19 resulted in widespread use of telemedicine and the internet to improve recruitment, conduct consent and data collection as well as unprecedented levels of international collaboration.[14,15]

The medical research and clinical communities lost a great deal both personally and professionally during the COVID pandemic. While much has been learned about COVID-19, other aspects of pediatric science may have fallen behind due to the reasons researchers outlined in this survey.

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DATA AVAILABILITY

The datasets generated during and/or analyzed during the current study are not publicly available. Data was created and curated by the Society for Pediatric Research via its list of members for this work undertaken by the Society for Pediatric Research Advocacy Committee. Data may be available from the Society for Pediatric Research on reasonable request.

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AUTHOR CONTRIBUTIONS

SS helped draft the survey, conceptualized the paper, drafted the initial manuscript, created the tables used in the manuscript and revised the manuscript. JRJ helped draft the survey, conceptualized the paper, and revised the manuscript. LKL helped draft the survey, conceptualized the paper, and revised the manuscript All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

COMPETING INTERESTS

The authors declare no competing interests.

ADDITIONAL INFORMATION

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