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# Letters

## Effects of the COVID-19 Pandemic on Active Non-COVID Clinical Trials



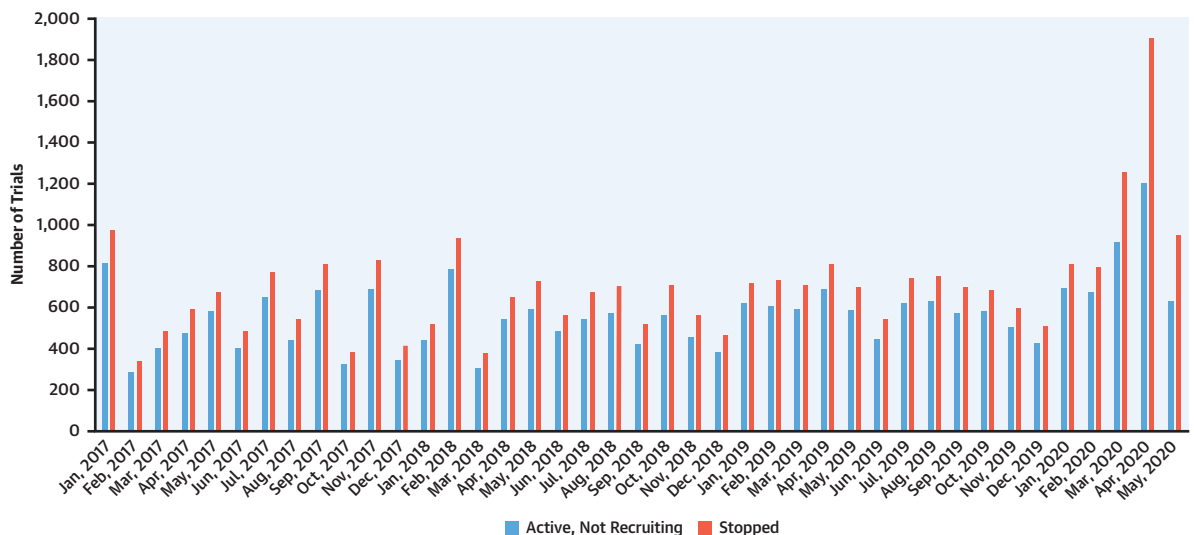
The coronavirus disease-2019 (COVID-19) pandemic has created unprecedented challenges in clinical research activities; its effects on ongoing clinical trials has not been yet quantified (1,2). In this report, we provide a description of the effect of the COVID-19 pandemic on ongoing clinical trials.

Historical metadata of all trials reported on ClinicalTrials.gov from January 1, 2017, to May 31, 2020, were queried by using Python (Python Software Foundation, Beaverton, Oregon). The months from January 1 to May 31, 2020, were defined as the COVID-19 pandemic period. Non-COVID-19-related trials were identified by excluding “COVID,” “coronavirus,” and “SARS-CoV-2” in trial titles. Stopping a trial was defined as a switch in trial status from “recruiting” to “active and not recruiting,” “completed,” “suspended,” “terminated,” or “withdrawn.” COVID-19 infection counts by country were obtained from the Johns Hopkins Coronavirus

Resource Center. The number of infections was adjusted by population size and reported as the number of cases per million inhabitants. Correlations between the number of COVID-19 cases per million inhabitants and the number of trials were calculated by using Pearson correlation coefficients. Categorical variables are reported as counts and percentages and compared with the chi-square test. Poisson models were used to compare trends over time.

A total of 321,218 non-COVID-19-related trials were queried, of which 28,672 (8.9%) were reported as stopped. Of these, 22,934 trials were stopped from January 1, 2017, to December 31, 2019, at an average rate of 638 trials/month, and 5,758 were stopped from January 1, 2020, to May 31, 2020 (period of the COVID-19 global spread) at an average rate of 1,147 trials/month. During the period of the COVID-19 pandemic, the number of stopped trials increased significantly over time (p for trend <0.001) (Figure 1). The majority of the trials that were stopped during the COVID-19 pandemic had nongovernmental funding (95.4%). During the pandemic, the cumulative proportion of trials stopped by country ranged from 1.0% to 17.1%, weakly correlating with the national population-adjusted numbers of COVID-19 cases through the end of May 2020 (r = 0.21).

**FIGURE 1** Temporal Trends for Active But Not Recruiting and Stopped Trials on Clinicaltrials.gov From January 2017 to May 2020



We found that during the initial months of the COVID-19 pandemic, the rate of clinical trials that were stopped increased significantly compared with the pre-pandemic era. Of concern, the number of trials stopped per month increased significantly with time during the pandemic, suggesting that the consequences of the crisis may be worse than suggested by our data.

The COVID-19 pandemic has led to unprecedented challenges for clinical research activity. Mitigation efforts and social distancing as well as resource redeployment have disrupted essential aspects of clinical trial activity, including accrual and randomization, intervention delivery, and outcome collection (1).

A survey of 61 cardiac surgery units on 4 continents reported substantial modifications of research activity in almost one-quarter of them (3). One adult Cancer Center Network in the United States reported a decrease from 20% to 46% in enrollment during the pandemic (4), and a survey of the American Society of Clinical Oncology showed that during the crisis, nearly 60% of the units suspended research activity (5).

A key limitation of the present report is the possibility of a delay in the update of trial status on ClinicalTrials.gov; thus, these findings likely represent an underestimate of the true impact of the pandemic. In conclusion, the COVID-19 pandemic has had profound effects on active non-COVID-19 clinical trials. Long-term data will determine the full extent of the disruption the pandemic imposes on clinical research.

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## Our Perspective on Recovery of Left Ventricular Systolic Function in Young Adults With Myocardial Infarction



We read the paper by Wu et al. (1) with great interest. The authors conducted a study that evaluated the prevalence of left ventricular systolic dysfunction in