Supplementary Online Content

Ahmed A, Li X. Labor unionization among physicians-in-training. *JAMA*. Published online October 26, 2023. doi:10.1001/jama.2023.17494

eAppendix. Supplemental Methods

This supplementary material has been provided by the authors to give readers additional information about their work.

eAppendix. Supplemental Methods

Web Harvesting for Existing Physician-in-training Unions

To determine the prevalence of unionization among physicians-in-training, among both private and public employers in the US, we web scraped all ACGME (Accreditation Council for Graduate Medical Education)-accredited Internal Medicine, Family Medicine, Pediatrics, and Psychiatry programs, and identified if any physicians-in-training unions are associated with these programs and institutions. We chose those specialties because they contain the most physicians-in-training, cover all patient age ranges, and capture institutions that may be standalone. This allowed us to capture the majority of US institution with training programs.

The list of programs was obtained from the ACGME Accreditation Data System. We identified unionized groups through harvesting institutional websites, press releases, news reports, and union contracts. Our approach was intentionally expansive, to identify any evidence of the existence of a physicians-in-training union. For groups thought to be potentially unionized, we performed further web search to identify their physicians-in-training union website, union contract, or acknowledgement by the employer that the labor organization represented physicians-in-training in contract negotiations, to confirm the existence of the union. Because labor unions are organized such that union represents a bargaining unit in negotiations with an employer, whereas a bargaining unit may include physicians-in-training from different programs, we further identified the *unique* labor unions through examining the specific union contracts and identifying the employer and the bargaining unit.

We characterized location, employer ownership, presence of Right-to-Work laws (prohibiting union security agreements, which labor unions use to require all individuals of the bargaining unit to pay union dues), and representing labor organizations. To categorize the employer ownership (i.e., whether an employer as government or private), we first identified the employer through the union contract, and then identified the information in two ways. If the employer was a hospital, we extracted the employer ownership information using the Centers for Medicare and Medicaid Services Hospital General Information database, a comprehensive dataset of all hospitals registered with Medicare. If the employer represented a university or school of medicine, or if the employer was an independent organization, we obtained the ownership information of that institution through online search.

To investigate completeness of capture by web harvesting, we compared the list of physicians-in-training unions we identified via web harvesting that are represented by the Committee of Interns and Residents, Service Employees International Union (CIR/SEIU)—the largest physicians-in-training labor organization—to the publicly published list by CIR/SEIU. We captured 47 out of 48 (97.9%) of unique labor unions that CIR/SEIU published as of July 14, 2023. The one labor union not captured by web harvesting contained only orthopedic surgery and physical medicine and rehabilitation trainees, which were not part of the training programs we intended to include in our search strategy.

Identifying New Unionization Activities Pertaining to Physicians-in-training and Other Healthcare Workers

We classified union elections from January 2011 through June 2023 using National Labor Relation Boards' union election reports and identified elections pertaining to physicians-in-training in two steps: (1) selecting election cases containing relevant keywords ("intern", "resident", "resident physician", "fellow", "housestaff", or "house staff"); (2) manual evaluation of

all election cases to identify any missed elections. Elections pertaining to nurses were identified by using the keyword "nurs", this way it could capture different permutations of the word (ex. nurse, nurse's, nursing, nurses'). Elections pertaining to other healthcare workers were identified using the key words "health care" or "healthcare". Each case was individually reviewed to ensure accuracy. Nurses and physicians-in-training were excluded from the "other healthcare workers" group. Characteristics of union elections extracted include: location of election, date of election, number of eligible voters (bargaining size), total number of voters, votes for the union, votes against the union, union election result, and representing labor organization.