

## Simulating the Impact of Workforce Configurations on Quality in Community Health Centers: A Feasibility Study to Develop a Simulation Tool

Qian Luo, Patricia Pittman, and Nicholas Chong

### ISSUE

Under a fee-for-service payment system, the logic of human resource planning is based mainly on labor costs and the ability of a clinician to bill. However, there are trends toward more health care organizations, including community health centers (CHCs), engaging in alternative payment models in which providers are reimbursed based on achieving specific quality outcomes. Though this has the potential to change the way CHC leadership thinks about workforce planning fundamentally, evidence on the effect of workforce configurations on quality outcomes is still sparse. This project aims to develop tools for CHCs to use simulated data as they make decisions about staffing.

### METHODS

We used the Uniform Data System (UDS) and IRS Form 990 Nonprofit Tax Return Data 2014-2016 from our initial production function analysis (Luo, et al., 2020). Using the production function regressions, we developed a simulation model that accounts for both the baseline configuration in CHCs and the marginal contributions of labor and capital to quality, volume, and revenue. In collaboration with HealthLandscape, we developed a JavaScript-based web app. The app is prepopulated with national average CHC characteristics. We also offered four staffing scenarios from Ku et al. (2015) for users to explore the functionality of the app. Users can enter in CHC's baseline information, including salary and staffing levels for various staffing categories, as well as baseline visits, revenue, and quality information. We used percent of patients with hypertension and diabetes who had their respective chronic condition well-managed as the quality outcome. The optimization algorithm, by default, maximizes the investment strategy that best improves quality measures. Also, the users have the option to change relative weights of quality, visits, and revenues in the optimization algorithm to plan for priorities other than improving the quality of care and/or to compare results from different planned priorities. The JavaScript is designed to be executed entirely on a client's computer so that the information entered by the app user will not be stored in any format.

### APP DEPLOYMENT AND MAINTENANCE

The simulation tool will be online on our website, starting on September 1<sup>st</sup>, 2020. We will update the regression parameters as new IRS Form 990 and UDS data become available.

### REFLECTION

This project is our first attempt to convert a rigorous study into a public-facing tool/app that the end-user can use directly without reading through a scientific report. We will track the utilization of the simulation tool and gather feedback from the users so that we can evaluate whether this kind of effort is worth pursuing.