

## INTRODUCTION

- Community factors play a key role in shaping health outcomes
- Health centers serve vulnerable populations where community factors likely have significant impact on outcomes
- There is a lack of research on methods for incorporating community factors when evaluating health center clinical performance

## PURPOSE

- To illustrate an approach for evaluating the impact of service area-level social deprivation on health center clinical quality and performance

## DATA SOURCE

- HRSA's 2017 Uniform Data System (UDS) provides demographic and clinical data from almost 1,400 health centers across 50 states, 8 territories, and the District of Columbia.
- The American Community Survey (ACS) conducted by the Census bureau in 2010 provides ZIP code level data across the United States. These ZIP codes can be translated into geographical regions called ZIP Code Tabulation Areas (ZCTAs).
- SDI Scores are calculated from ACS measures (below) by the Robert Graham Center<sup>5</sup>

## UNIT OF ANALYSIS & MEASURES

- 1,051 HRSA Health Center Program (HCP) Awardees with Adjusted Quartile Rankings.
- Dependent Variables (7 clinical screenings and 2 clinical outcomes):
  - Adolescent and adult weight screening & follow-up, tobacco screening & cessation, colorectal and cervical cancer screening, depression screening & follow-up, cholesterol treatment, blood pressure control, and diabetes control.
- Control Variables:
  - Uninsured, racial/ethnic minorities, homeless, agricultural workers, size of health center, patient-centered medical home (PCMH) status
- Social Deprivation Index (SDI) variables:
  - includes poverty, education, race, nonemployment, lack of transportation, crowding, single-parent households, and age.
- Higher SDI scores signify higher deprivation and are in the lower performing quartile (Q4) and lower SDI scores signify lower deprivation in the better performing quartile (Q1).

## METHODS

- Calculate weighted service area SDI scores for Health Center Program Awardees (Figure 1)
- Stratify HCP Awardees into quartiles based on weighted service area (SA) SDI Scores, and analyze patient level characteristics by quartile.
- Conduct HCP Awardee-level regressions for nine UDS clinical quality & performance measures to compare across quartiles
- Performance in clinical quality measures were adjusted for risk factors associated with clinical quality performance including insurance status, racial/ethnic minorities, homelessness, size of health center, agricultural workers, and Patient-Centered Medical Home (PCMH) status.
- Apply control variables to HCP Awardees regression and compare adjusted vs. unadjusted clinical quality & performance measures by SA SDI quartile

**Community-level social deprivation significantly impacts health center clinical performance.**

This research illustrates a method for incorporating service area community characteristics when evaluating health center clinical outcomes & performance.

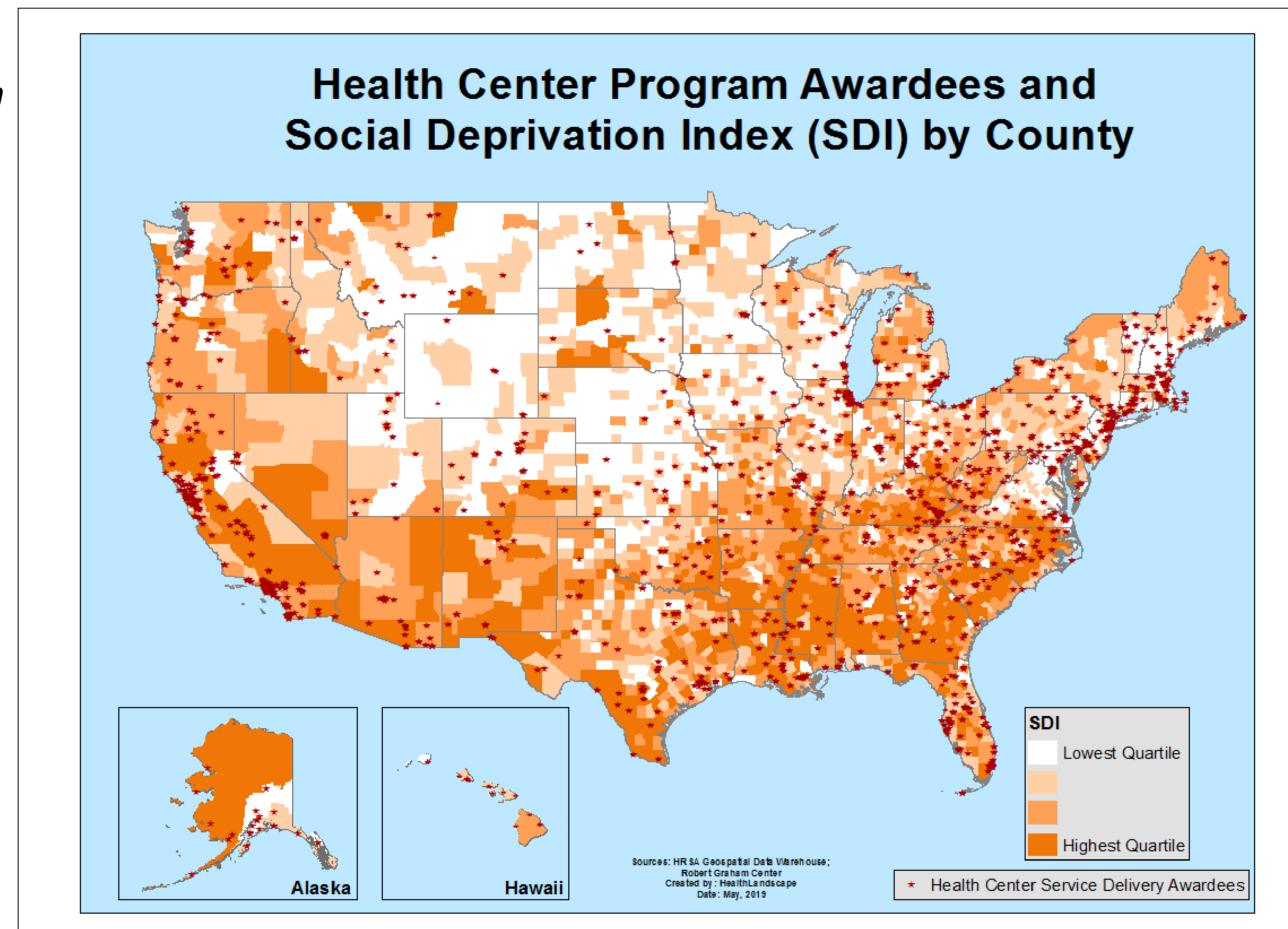
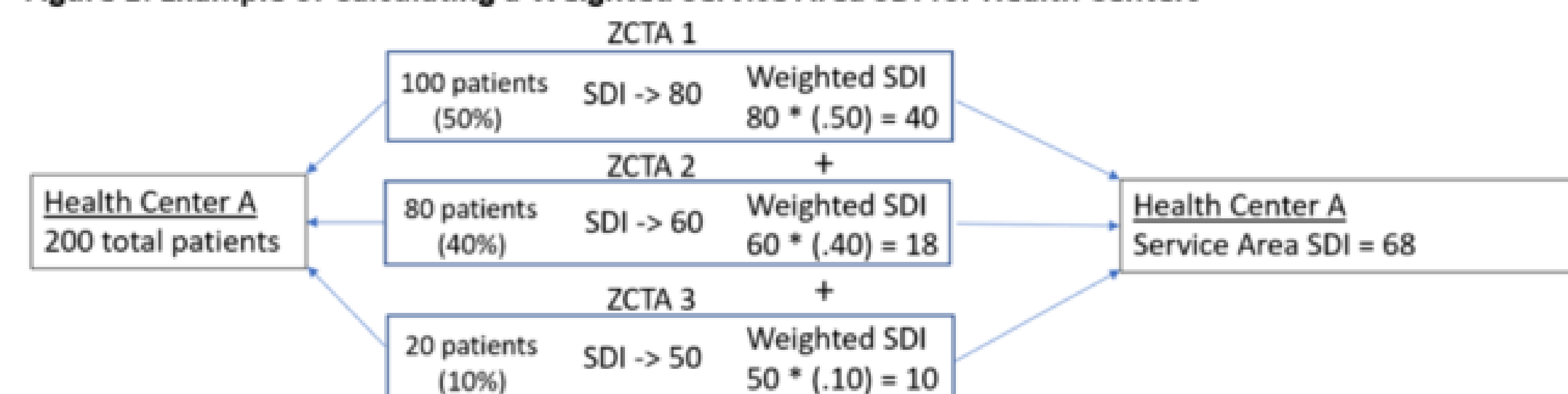


Figure 1: Example of Calculating a Weighted Service Area SDI for Health Centers



## RESULTS

- Health centers serving an area with higher social deprivation have larger patient populations, more patients below the federal poverty guidelines, larger proportion of racial/ethnic minorities, and homeless patients. (Table 1)
- Total costs per patient are associated with significantly ( $p < 0.001$ ) worse clinical quality outcomes (Table 2).
- When adjusting for patient-factors, higher SDI scores were associated with lower colorectal cancer screenings, depression screening/follow-up, and worse hypertension and diabetes outcomes (Table 3).

Table 1: Selected Health Center Patient Characteristics by SDI Quartile

|                                   | Q1     | Q2     | Q3     | Q4      | Overall |
|-----------------------------------|--------|--------|--------|---------|---------|
| Average Number of Patients        | 13,644 | 21,867 | 22,018 | 25,538  | 20,768  |
| % Patients below 100% FPL         | 52.3   | 64.1   | 71.3   | 76.8    | 66.1    |
| % Patients below 200% FPL         | 83.5   | 89.5   | 92.2   | 94.6    | 89.9    |
| % Medicaid Patients               | 35.9   | 40.2   | 43.9   | 53.6    | 43.5    |
| % Patients Ethnic/Racial Minority | 27.2   | 44.2   | 64.3   | 84.5    | 54.5    |
| % Homeless                        | 3.5    | 4.7    | 8.5    | 14.2    | 7.7     |
| % Mental Health Patients          | 7.6    | 7.7    | 7.9    | 10.3    | 8.4     |
| Costs per Patients                | \$917  | \$877  | \$932  | \$1,160 | \$971   |
| % in Rural Areas                  | 20.6   | 13.9   | 73.8   | 55.1    | 43.8    |

Table 2: Unadjusted Measures by Health Center SDI Quartile

| Measures (%)                               | Q1    | Q2    | Q3    | Q4    | Overall | Q4 - Q1 |
|--|-------|-------|-------|-------|---------|---------|
| Adolescent Weight Screening and Counseling | 57.81 | 60.78 | 61.45 | 63.48 | 60.84   | 5.63*   |
| Cholesterol Lipid Therapy                  | 79.98 | 79.82 | 80.41 | 80.68 | 80.21   | 0.70    |
| Colorectal Cancer Screening                | 42.95 | 38.54 | 35.23 | 37.89 | 38.66   | -5.08** |
| Cervical Cancer Screening                  | 50.63 | 50.39 | 48.72 | 53.36 | 50.75   | 2.73    |
| Depression Screening and Follow-up         | 65.96 | 66.54 | 65.97 | 63.91 | 65.62   | -2.05   |
| Tobacco Screening and Cessation Counseling | 88.10 | 87.51 | 84.67 | 85.58 | 86.47   | -2.52*  |
| Adult BMI Screening and Follow-up          | 60.19 | 64.55 | 63.35 | 62.80 | 62.71   | 2.69    |
| Hemoglobin A1c Poor Control (A1c > 9)      | 29.90 | 33.04 | 35.61 | 35.29 | 33.45   | 5.38**  |
| Blood Pressure Control (BP < 140/90 mmHg)  | 65.51 | 62.42 | 60.18 | 60.15 | 62.08   | -5.36** |

\* $p < .02$ ; \*\* $p < .000$

Table 3: Adjusted Measures by Health Center SDI Quartile

| Measures (%)                               | Q1    | Q2    | Q3    | Q4    | Overall | Q4 - Q1 |
|--|-------|-------|-------|-------|---------|---------|
| Adolescent Weight Screening and Counseling | 59.96 | 61.33 | 61.44 | 60.61 | 60.84   | 0.65    |
| Cholesterol Lipid Therapy                  | 80.16 | 80.45 | 80.26 | 79.97 | 80.21   | -0.20   |
| Colorectal Cancer Screening                | 38.81 | 39.30 | 38.70 | 37.76 | 38.66   | -1.05*  |
| Cervical Cancer Screening                  | 50.09 | 51.45 | 51.06 | 50.36 | 50.75   | 0.26    |
| Depression Screening and Follow-up         | 66.15 | 65.90 | 65.46 | 64.92 | 65.62   | -1.24** |
| Tobacco Screening and Cessation Counseling | 86.40 | 86.69 | 86.51 | 86.29 | 86.47   | -0.10   |
| Adult BMI Screening and Follow-up          | 62.53 | 63.00 | 62.76 | 62.54 | 62.71   | 0.01    |
| Hemoglobin A1c Poor Control (A1c > 9)      | 33.06 | 33.05 | 33.53 | 34.18 | 33.45   | 1.12**  |
| Blood Pressure Control (BP < 140/90 mmHg)  | 62.30 | 62.37 | 62.04 | 61.60 | 62.08   | -0.70** |

\* $p < .02$ ; \*\* $p < .000$

## DISCUSSION

- In general, health center clinical performance is poorer for health centers with high service area SDI, even after controlling for health center patient characteristics
- This research illustrates a method and a need to systematically incorporate social determinants and service area community characteristics when evaluating health center clinical performance.
- Differences in magnitude but not in direction of clinical quality outcome measures between the adjusted and unadjusted tables shows the control variables account for some of the variation between HRSA health centers, but not all.

## REFERENCES

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## Links to Data Sources



UDS Mapper



Health Center Data