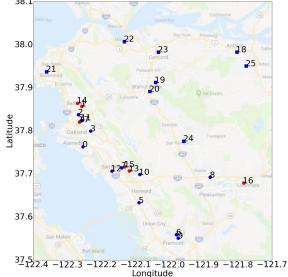
# Report: Alta Bates closure would critically impact poor, people of color

https://www.eastbaytimes.com/2019/01/01/report-alta-bates-closure-would-critically-impact-poor-people-of-color/





https://www.berkeleyside.com/2018/12/12/save-it-or-sell-it-berkeley-asks-sutter-for-a-concrete-plan-for-alta-bates

ERs in the area surrounding Alta Bates. Red = Candidate, Blue = Currently Open

## **Facility Location Composite Objective Function**

$$\min_{z} D(z) + \lambda F(E_1, ..., E_{|\mathcal{L}|}) + \eta R(z)$$

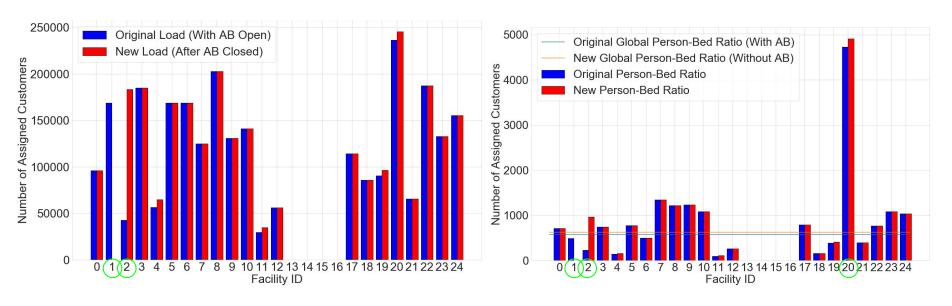
 $\lambda$ : Equity Weight

 $\eta$ : Capacity cost weight

 $E_i$ : Group effects

- Which equity metric? 24+
   options (Marsh & Schilling '93)
- Which demographic grouping? (Race? Income? Insured?)
- How much weight to assign to equity/capacity term?

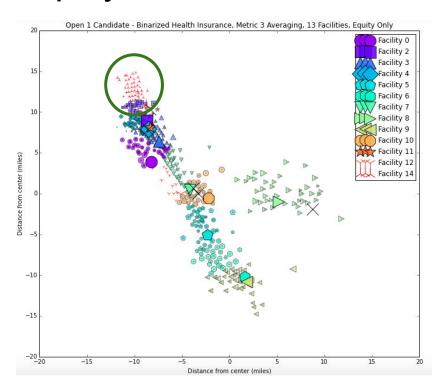
## Impact of Alta Bates Closure with no replacement



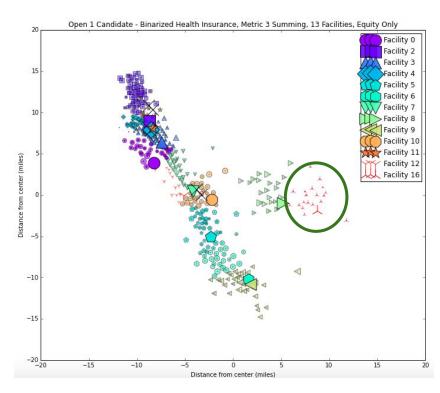
**Left:** Increase in users of each ER when Alta Bates is closed. Notice the >200% increase in usage for Facility #2, Children's Hospital and Research Center at Oakland.

**Right:** Increase in ER usage as a function of capacity. Notice facility #2 goes from underutilized to overutilized, and facility #20 (Kaiser Richmond) is even more overused.

### **Equity Measurement Matters**



**Left**: Replacement facility for Alta Bates, Metric 3, <u>Averaging</u>, with Health Insurance grouping



**Right**: Replacement facility for Alta Bates, Metric 3, <u>Summing</u>, with Health Insurance grouping

#### Approximately optimal solutions

Scale factors of optima with respect to all composite objectives

```
1.0 1.0 1.0 1.0 1.3 2.7 2.7 2.3 1.1 1.1 2.1 2.9
   1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.4 2.1 2.6 2.0 1.1 1.1 2.2 2.2 3.9 2.6
 2 1.0 1.0 1.0 1.0 1.1 1.0 1.1 1.0 1.0 1.3 3.5 2.2 3.0 1.1 1.1 1.9 3.1 3.2 4.1
 3 1.0 1.1 1.0 1.0 1.2 1.0 1.1 1.0 1.0 1.2 4.2 2.3 3.2 1.1 1.1 1.9 3.8 3.3 4.4
                                  1.2 1.1 1.6 1.6 2.8 1.0 1.1 1.1 2.5 1.8 4
 5 1.0 1.0 1.0 1.1 1.1 1.0 1.1 1.0 1.3 3.5 2.2 3.0 1.1 1.1 1.9 3.1 3.2 4.1
        1.1 1.1 1.1 1.0 1.1 1.0 1.2 1.1 1.6 1.6 2.8 1.0 1.1 1.1 2.5 1.8 4.1
        1.0 1.0 1.0 1.1 1.0 1.1 1.0 1.0 1.3 3.5 2.2 3.0 1.1 1.1 1.9 3.1 3.2 4.
                                 1.0 1.0 1.3 3.5 2.2 3.0 1.1 1.1 1.9 3.1 3.2 4.1
 9 1.2 1.3 1.2 1.1 1.7 1.2 1.6 1.3 1.2 1.0 9.0 2.2 7.7 1.2 1.1 1.1 6.7 2.6 <mark>8.8</mark>
10 1.1 1.1 1.1 1.2 1.1 1.1 1.0 1.2 1.1 1.7 <u>1.0 2.3 1.1 1.1 1.1 2.5 1.2 3.1</u>
        1.2 1.1 1.2 1.3 1.1 1.2 1.1 1.1 1.5 3.8 1.0 3.0 1.1 1.1 2.0 3.1 1.0 3.7
                                  1.2 1.3 1.8 3.9 3.0 3.2 1.0 1.0 2.1 2.8 3.3
14 1.8 1.7 1.7 1.8 2.2 2.0 1.9
                                  1.6 1.6 2.3 5.4 4.6 4.6 1.0 1.0 2.0 3.3 4.1
<mark>15</mark> 1.3 1.5 1.3 1.2 1.9 1.3 1.7 1.4 1.3 1.0 <mark>10.5</mark> 2.3 <mark>8.7</mark> 1.2 <u>1.1 1.0 <mark>7.3</mark> 2.6 <mark>9.3</mark></u>
```

Bottom row: Approximate optimum. Notice maximal scale factor is only 2.3

## Classes of Equity Metrics and Objective Functions

10	Class	Minimizes	Metric
			Numbers
-8	MIN-MAX	$\max\{E_A, E_B\}$	M1-M6
	Abs-Diff	$ E_A - E_B $	M7-M12
	Rel-Diff	$\frac{ E_A - E_B }{ E_A + E_B }$	M13-M18

3 equity metric classes (table) which capture 16 equity metrics

3 grouping types (Race, Income, Health Insurance)

2 Aggregation Types (Population averaging/summing)

= 18 composite objectives

(M0 = vanilla objective, no equity)