

## Background

- Breastfeeding is beneficial for both mother and child, including reduced risk of sudden infant death syndrome, type 2 diabetes, and youth overweight or obesity
- The American Academy of Pediatrics recommends infants receive breastmilk exclusively for the first 6 months of life
- We used measures from a state-level maternal and child health scorecard to explore the association between breastfeeding, hospital practices promoting breastfeeding, and infant and maternal health outcomes and how these measures vary across states

## Methods

We analyzed 6 measures:

- Breastfed: percent of infants breastfed exclusively for 6 months
- mPINC: average Maternity Practices in Infant Nutrition and Care score
- Baby-friendly facility: percent of live births occurring at hospitals designated baby-friendly by Baby Friendly USA
- Infant mortality: deaths before age 1 per 1,000 live births
- Diabetes: percent of women aged 15 to 44 with diabetes
- Youth overweight/obesity: percent of children aged 0 to 17 with overweight/obesity

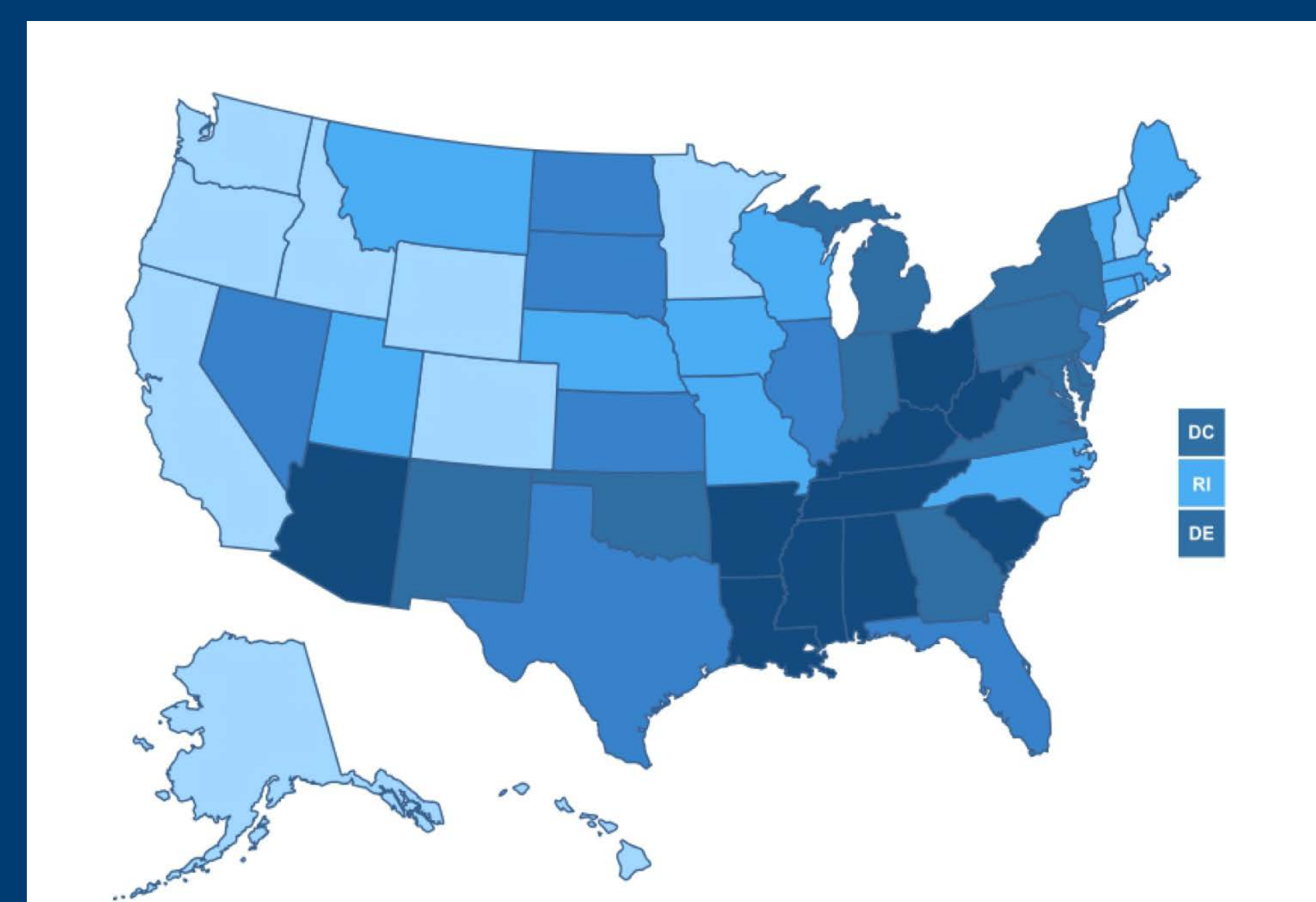
We calculated Spearman rank-order correlation coefficients ( $r_s$ ) and significance using Excel

## Results

### Variation across states

- Breastfed varied 3.5-fold across states, from 38.3% in Oregon to 11.1% in Mississippi
- All states varied across measures with the exception of Mississippi and Arkansas, two states in the same quintile (bottom) across all 6 measures
- Among states in the bottom 10 for breastfed, South Carolina had a strong presence of hospitals with the Baby-Friendly designation, compared with Idaho and Wyoming, two states in the top 10 for breastfed

U.S. map of breastfed shaded by quintile



Correlation with breastfed

Health outcomes	Correlation coefficient ( $r_s$ )
Infant mortality	-0.70*
Youth-Overweight/Obesity	-0.69
Diabetes-Women	-0.22
<b>Hospital practices</b>	
mPINC	0.49*
Baby-friendly facilities	0.12

\*Statistically significant at p-value <0.05

### Correlations

- Correlation coefficients for each of the five measures and breastfed ranged from -0.70 to 0.49
- Infant mortality and youth-overweight/obesity were highly inversely correlated with breastfed
- Average mPINC score was moderately positively correlated with breastfed
- mPINC was moderately positively correlated ( $r_s=0.55$ ,  $p<0.05$ ) with Baby Friendly facilities and moderately negatively correlated with infant mortality ( $r_s=-0.55$ ;  $p<0.05$ )

Quintile-based heatmap by state and measure, sorted by breastfed

Quintile	Breastfed (%)	Baby-Friendly facility (%)	mPINC (score)	Infant mortality (rate)	Youth-overweight /obesity (%)	Diabetes-women (%)
1	38.3	32.4	86	5.1	20.3	3.2
2	36.2	50.0	90	4.2	23.8	2.4
3	35.3	13.0	85	4.7	27.2	1.5
4	33.9	6.6	78	5.0	26.0	2.9
5	33.1	29.3	82	6.8	26.3	2.4
	33.1	38.9	85	4.4	31.2	2.8
	32.0	2.0	77	5.6	27.1	2.3
	31.6	11.5	83	4.7	25.5	2.8
	30.2	19.5	80	5.1	25.5	3.4
	30.2	20.1	82	5.1	27.7	2.0
	29.7	9.1	82	5.8	23.2	2.3
	29.6	13.2	87	4.3	26.6	2.3
	28.4	6.0	75	6.3	29.4	4.3
	28.4	10.9	71	5.4	29.2	2.5
	27.7	10.8	88	4.6	22.2	2.8
	27.7	15.7	82	5.8	29.5	1.9
	26.8	7.9	75	5.0	19.2	1.6
	26.6	98.2	96	5.2	36.3	2.0
	26.5	19.4	84	6.6	28.2	3.2
	26.4	47.0	83	5.2	30.2	2.7
	26.1	3.1	75	4.5	29.9	2.0
	26.1	28.7	78	7.3	30.9	3.5
	25.9	1.7	73	6.1	37.1	2.5
	25.8	7.8	81	6.3	27.0	2.7
	25.6	6.0	74	6.5	31.4	2.1
	25.0	14.1	75	5.4	30.5	4.2
	24.8	13.6	83	4.5	31.7	2.1
	24.6	14.8	77	5.8	33.3	3.2
	24.5	15.7	76	6.1	30.9	2.6
	24.3	10.4	80	6.2	36.6	3.1
	24.0	33.8	81	5.2	24.9	4.1
	23.7	12.4	78	6.0	31.7	2.2
	23.1	23.1	80	7.2	33.9	3.5
	23.0	13.8	82	6.5	33.6	3.0
	22.8	12.9	82	4.6	31.8	2.8
	22.6	26.2	78	6.5	32.0	3.4
	21.7	12.9	80	5.8	27.2	3.0
	21.3	10.9	78	7.8	33.8	3.2
	20.7	12.4	75	7.7	32.2	2.3
	20.5	85.8	90	8.0	30.9	1.6
	19.1	6.9	67	7.5	33.9	4.5
	19.0	0.0	73	7.0	35.1	4.7
	18.6	33.4	78	6.7	32.9	4.1
	18.5	20.3	73	6.9	33.5	4.4
	17.1	11.2	72	6.9	37.7	4.1
	16.7	18.1	80	7.0	33.1	2.6
	16.1	12.7	76	7.5	34.0	3.8
	15.6	2.2	79	5.8	26.9	2.3
	13.0	13.6	72	8.5	35.5	5.5
	11.1	6.1	60	8.8	37.0	4.6

## Conclusions

- Breastfed varies widely by state
- Only two states were in the same quintile across all 6 measures analyzed
- Infants exclusively breastfed for 6 months correlated most closely with infant mortality (-), youth overweight/obesity (-) and mPINC (+)
- mPINC was strongly correlated with Baby-Friendly facilities (+) and infant mortality (-)

## Discussion

- 25 states have yet to meet the Healthy People 2020 goal of 25.5% of infants breastfed exclusively for 6 months
- The variation in breastfeeding and health outcome measures reveals bright spots and areas for improvement across all states

## Limitations

- Spearman rank correlation indicates only whether two variables are monotonically related
- Data included in this analysis are from different data sources/years and are aggregated to the state level; inferences at the individual level cannot be made
- The measures in this analysis carry their own limitations; for example, hospitals may implement part or all of the Ten Steps to Successful Breastfeeding without receiving the Baby-Friendly designation

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