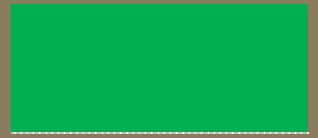
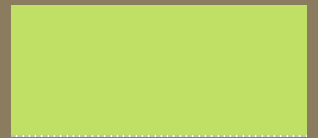
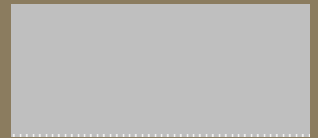


## The Utah Health Improvement Index



A practical and data-driven tool to measure social determinants of health, advance health equity, and improve health outcomes in Utah



December 2018

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## SUMMARY

It is known that health outcomes are impacted by inequities linked to economic, socio-cultural, racial/ethnic, and geographic disadvantage. At the same time, it is challenging to measure those associations. In order to link health outcomes to health disparities, the Utah Department of Health (UDOH) sought to create a composite measure of social determinants of health by geographic area, the Health Improvement Index (HII). The HII is grounded on methods used by Singh for the Area Deprivation Index<sup>1</sup> (ADI).

The HII was computed for each geographic area and standardized to a mean of 100 and a standard deviation of 20. The HII ranged from 72 to 160. Five HII categories were created: very high, high, average, low, very low. The higher index indicates more improvement may be needed in that area. Thirty-six of the ninety-nine geographic areas were classified as high or very high. This classification can be used as a guide to determine the type of intervention to implement in order to advance health equity and reduce, in an efficient and effective way, the burden of health disparities in our state.

This report is the first of a series of documents and tools that UDOH will create/compile to educate and guide health professionals and other experts, elected officials, and community leaders on how to advance health equity and reduce health disparities in our state.

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<sup>1</sup> Singh, GK. Area deprivation and widening inequalities in US mortality, 1969-1998. *American Journal of Public Health*. 2003; 93(7); 1137-1143.

## DEFINITIONS AND METHODOLOGY

- **The Utah Health Improvement Index (HII)**
  - Developed by the Utah Department of Health, the HII is a composite measure of social determinants of health by geographic area.
  
- **HII Methodology**
  - The HII is grounded on methods used by Singh for the Area Deprivation Index (ADI). The ADI is based on 17 US Census Data markers.
  - The HII is based on geographic areas (Utah Small Areas<sup>2</sup>) and surveillance data (BRFSS<sup>3</sup>).
  - Using BRFSS and small areas data allowed us the opportunity to look directly at associations between risk factors and health outcomes by geography.
  - We derived nine of 17 Census data markers (indicators) used for the ADI from BRFSS and computed values for each of Utah's 99 small areas.
  - Three years of data were combined (2015-2017) to have sufficient sample in each area.
  - A factor analysis was performed on the nine indicators and a single factor solution accounted for 57% of the variance of the matrix.
  - In Singh's paper, his single factor solution accounted for 52% of the variance of the matrix.
  - The rotated factors were used as coefficients and they compared favorably with published Singh coefficients.
  - The composite HII measure was computed for each small area and standardized to a mean of 100 and a standard deviation of 20.
  - A similar measure was computed for each small area using published Singh 2000 coefficients to construct an approximation of the ADI.
  - All small areas HIIs were within 1% of the approximate ADI values, confirming our use of BRFSS and nine indicators.
  - We found the HII to be a very robust measure that classified small areas identically to the ADI.

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<sup>2</sup> More information about Utah Small Areas can be found at <https://ibis.health.utah.gov/pdf/resource/UtahSmallAreaInfo.pdf>

<sup>3</sup> The Behavioral Risk Factor Surveillance System (BRFSS) is the nation's premier system of health-related telephone surveys that collect state data about U.S. residents regarding their health-related risk behaviors, chronic health conditions, and use of preventive services. Retrieved from <https://www.cdc.gov/brfss/index.html> on December 17, 2018.

\*Measuring what works to achieve health equity. Prevention Institute. June 2015. [www.preventioninstitute.org](http://www.preventioninstitute.org)

- The nine indicators included in the HII describe important determinants of health information such as demographics, socio-economic deprivation, economic inequality, resource availability, and opportunity structure.

- Those indicators are:

1. Population aged  $\geq 25$  years with  $< 9$  years of education, %
2. Population aged  $\geq 25$  years with at least a high school diploma, %
3. Median family income, \$
4. Income disparity
5. Owner-occupied housing units, % (home ownership rate)
6. Civilian labor force population aged  $\geq 16$  years unemployed, % (unemployment rate)
7. Families below poverty level, %
8. Population below 150% of the poverty threshold, %
9. Single-parent households with children aged  $< 18$  years, %

Metrics that measure and track progress on determinants of health can help set priorities and inform necessary actions to keep all Americans healthy, lower the cost of healthcare, increase productivity, improve quality of life, and ensure that everyone has an equal opportunity to prosper and achieve his or her full potential\*.

- **Utah Small Areas**

- First defined in 1997 by the Utah Department of Health.
- Reassessed in 2017-18, and released in October 2018.
- Based on ZIP codes, local health district, county boundaries, and input from local community representatives.
- Refers to a set of geographic areas in Utah with population sizes ranging from approximately 8,000 to 86,000 persons. These geographic areas are especially useful for doing public health assessments in communities and for developing tailored policies and interventions to improve the health and quality of life of Utah residents.
- There are 99 small areas.

- **Health Disparities<sup>4</sup>**
  - Differences in health outcomes closely linked to economic, socio-cultural, and environmental/geographic disadvantage.
  - Health disparities are the metrics by which health equity is assessed.
  
- **Health Equity<sup>3</sup>**
  - Principle behind the commitment to pursue the highest possible standard of health for all while focusing on those with the greatest obstacles.
  
- **The Social Determinants of Health<sup>3</sup>**
  - The range of personal, social, economic and environmental factors that influence the health status of individuals and populations.
  - Determinants of health reach beyond the boundaries of traditional health care and public health sectors including other sectors such as education, transportation, housing, environment, urban development, economic development, etc.

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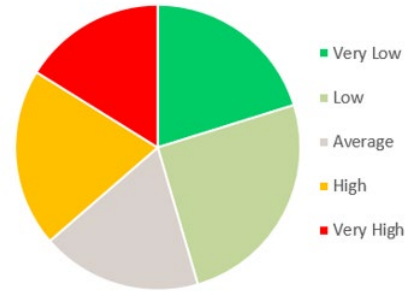
<sup>4</sup> Health People 2020 definitions <https://www.healthypeople.gov/2020>

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## CLASSIFICATION OF SMALL AREAS IN HII GROUPS

- The HII ranges from 71.89 to 160.87
- The 99 small areas are classified in five HII groups:
  1. Very low HII (20 areas)
  2. Low HII (25 areas)
  3. Average HII (18 areas)
  4. High HII (20 areas)
  5. Very high HII (16 areas)
- The higher the index, the more improvement the area needs.

MORE THAN 1/3 OF THE AREAS ARE CONSIDERED HIGH OR VERY HIGH



## HOW TO USE THIS CLASSIFICATION\*

**Very high HII >120**; geographically, this is a **very high health disparities area**; SUBSTANTIAL IMPROVEMENTS are needed to advance health equity and reduce health disparities in the area.

**High HII >105 and ≤ 120**; geographically, this is a **health disparities area**; IMPROVEMENTS are needed to advance health equity in the area and reduce health disparities.

**Average HII >94 and ≤105**; geographically, **this is NOT a health disparities area**<sup>5</sup>; adverse health outcomes CANNOT be considered health disparities.

**Low HII >80 and <94**; geographically, **this is NOT a health disparities area**<sup>4</sup>. In terms of health equity, this area is doing BETTER than average; adverse health outcomes in this area cannot be considered health disparities.

**Very low HII <80**; geographically, **this is NOT a health disparities area**<sup>4</sup>. In terms of health equity, this area is doing MUCH BETTER than average; adverse health outcomes in this area cannot be considered health disparities.

THE HIGHER THE INDEX, THE MORE IMPROVEMENT THE AREA NEEDS

- Very high HII >120**
- High HII >105 and ≤ 120**
- Average HII >94 and ≤105**
- Low HII >80 and ≤94**
- Very low HII <80**

<sup>5</sup> See Limitations (page 20)

\*See Appendix for color coding (page 21)

### HII BY INDIVIDUAL SCORE (Lowest to Highest)

	Categories	Small Area	HII	% Racial/Ethnic Minorities
1	Very Low HII	Daybreak	71.89	*6
2		Saratoga Springs	72.12	11.0%
3		Farmington	72.34	8.6%
4		Sandy (Northeast)	72.53	10.8%
5		Sandy (Southeast)	74.24	11.85%
6		Mapleton	74.96	10.7%
7		Weber County (East)	74.97	9.5%
8		Morgan County	75.35	4.7%
9		Millcreek (East)	75.67	10.6%
10		Syracuse	76.15	11.1%
11		Alpine	76.66	5/5%
12		Centerville	76.72	7.6%
13		Riverton/Bluffdale	76.83	8.8%
14		South Jordan V2	77.65	12.6%
15		Salem City	77.77	6.8%
16		Draper	77.93	15.0%
17		Lehi	78.18	12.5%
18		Kaysville/Fruit Heights	78.56	6.8%
19		Sandy (Center) V2	78.80	15.1%
20		Millcreek (South)	79.14	12.6%

<sup>6</sup> New zip code. Data not available.



	Categories	Small Area	HII	% Racial/Ethnic Minorities
21	<b>Low HII</b>	Herriman	80.09	15.8%
22		Cottonwood	80.31	12.9%
23		Ivins/Santa Clara	82.04	6.2%
24		Holladay V2	83.29	13.4%
25		Salt Lake City (Foothill/East Bench)	83.53	17.3%
26		American Fork	83.90	10.6%
27		Eagle Mountain/Cedar Valley	85.08	12.9%
28		Woods Cross/West Bountiful	85.91	12.3%
29		West Jordan (West)/Copperton	86.82	25.7%
30		Layton/South Weber	86.84	20.1%
31		Salt Lake City (Avenues)	87.18	15.6%
32		Pleasant Grove/Lindon	87.97	11.8%
33		Summit County (East)	88.67	15.2%
34		Roy/Hooper	89.07	20.9%
35		Salt Lake City (Southeast Liberty)	90.01	13.5%
36		Wasatch County	90.67	15.6%
37		Spanish Fork	91.21	14.1%
38		Park City	91.28	15.8%
39		Box Elder County (Other) V2	91.71	15.0%
40		Cache County (Other)/Rich County (All) V2	92.25	9.4%
41		Smithfield	92.55	9.0%
42		Orem (East)	92.92	15.5%
43		Tremonton	93.35	15.0%
44		North Salt Lake	93.54	26.2%
45		Clearfield Area/Hooper	94.74	22.0%

	Categories	Small Area	HII	% Racial/Ethnic Minorities
46	<b>Average HII</b>	Bountiful	95.57	11.1%
47		West Valley (West) V2	95.78	46.2%
48		Duchesne County	96.05	16.3%
49		Springville	96.36	19.8%
50		Brigham City	96.54	13.7%
51		Emery County	96.64	8.6%
52		West Jordan (Northeast) V2	97.35	29.4%
53		Tooele Valley	97.62	16.1%
54		St. George	99.59	18.8%
55		Riverdale	100.86	15.3%
56		Taylorsville (West)	101.26	*
57		West Jordan (Southeast)	101.36	28.5%
58		Daggett and Uintah County	101.46	16.9%
59		Washington City	101.52	12.0%
60		Salt Lake City (Sugar House)	101.57	18.3%
61		Richfield/Monroe/Salina	101.61	6.8%
62		Southwest LHD (Other)	104.07	9.8%
63		Murray	105.90	24,5%

	Categories	Small Area	HII	% Racial/Ethnic Minorities
64	<b>High HII</b>	South Ogden	106.17	25.9%
65		Hyrum	106.79	20.4%
66		Ben Lomond	106.80	28.9%
67		Payson	106.92	13.6%
68		Utah County (South) V2	107.80	16.3%
69		Hurricane/La Verkin	108.13	15.2%
70		Nephi/Mona	109.12	6.4%
71		Carbon County	109.61	16.7%
72		Central (Other)	110.92	12.0%
73		Blanding/Monticello	112.98	26.3%
74		Sandy (West)	113.53	21.6%
75		Taylorsville (East)/Murray (West)	114.47	30.8%
76		Orem (North)	114.93	29.2%
77		Tooele County (Other)	116.23	18.7%
78		Orem (West)	117.34	24.7%
79		Salt Lake City (Downtown) V2	117.85	28.2%
80		Sanpete Valley	118.73	12.7%
81		Magna	118.99	36.4%
82		Logan V2	119.08	18.8%
83		North Logan	120.00	18.8%

	Categories	Small Area	HII	% Racial/Ethnic Minorities
84	<b>Very High HII</b>	Midvale	120.10	34.2%
85		Cedar City <sup>7</sup>	121.34	15.2%
86		Provo (West City Center)	121.53	37.6%
87		Ogden (Downtown)	123.12	32.3%
88		Kearns V <sub>2</sub>	124.89	40.4%
89		Provo/BYU <sup>7</sup>	125.07	15.2%
90		Delta/Fillmore	127.63	18.9%
91		West Valley (Center)	128.72	51.8%
92		Salt Lake City (Rose Park)	130.70	64.4%
93		Grand County	132.53	11.4%
94		Washington County (Other) V <sub>2</sub>	132.66	4.8%
95		South Salt Lake	137.64	44.3%
96		West Valley (East) V <sub>2</sub>	142.82	55.5%
97		Provo (East City Center)	148.80	22.7%
98		Salt Lake City (Glendale) V <sub>2</sub>	150.66	65.4%
99		San Juan County (Other)	160.87	85.2%

<sup>7</sup> Some small areas might have a high HII because of their high and transient college student population (See limitations. Page 20)

## HII BY LOCAL HEALTH DISTRICT

	Utah Small Area	HII Group	Population <sup>8</sup> (2017)	% Racial/Ethnic Minority <sup>9</sup>
State of Utah	99 Small Areas	N/A	3,101,989	21.0%
Local Health District	Utah Small Area	HII Group	Population (2017)	% Racial/Ethnic Minority
<b>Bear River LHD</b>	Brigham City	Average	25,384	13.7%
	Box Elder County (other) V2	Low	11,858	7.05
	Tremonton	Low	16,839	15.0%
	Logan V2	Very high	57,055	18.8%
	North Logan	High	23,477	18.8%
	Cache County (Other)/Rich County (All) V2	Low	24,191	9.4%
	Hyrum	High	8,998	20.4%
	Smithfield	Low	13,225	9.0%
<b>Weber-Morgan LHD</b>	Ben Lomond	High	62,407	28.9%
	Weber County (East)	Very low	35,519	9.5%
	Morgan County	Very low	11,871	4.7%
	Ogden (Downtown)	Very high	39,706	32.3%
	South Ogden	High	37,963	25.9%
	Roy/Hooper	Low	47,911	20.9%
	Riverdale	Average	28,279	15.3%
<b>Davis County LHD</b>	Clearfield Area/Hooper	Low	72,508	22.0%
	Layton/South Weber	Low	83,944	20.1%
	Kaysville/Fruit Heights	Very low	38,946	6.8%
	Syracuse	Very low	29,230	11.1%
	Centerville	Very low	16,927	7.6%
	Farmington	Very low	22,414	8.6%
	North Salt Lake	Low	19,980	26.2%

<sup>8</sup> Utah Department of Health, Center for Health Data and Informatics, IBIS version 2017

<sup>9</sup> American Community Survey (ACS) 2013-2017

	Utah Small Area	HII Group	Population <sup>8</sup> (2017)	% Racial/Ethnic Minority <sup>9</sup>
State of Utah	99 Small Areas	N/A	3,101,989	21.0%
Local Health District	Utah Small Area	HII Group	Population (2017)	% Racial/Ethnic Minority
Davis County LHD (cont.)	Woods Cross/West Bountiful	Low	15,631	12.3%
	Bountiful	Average	48,259	11.1%
Salt Lake County LHD	Salt Lake City (Rose Park)	Very high	36,676	64.4%
	Salt Lake City (Avenues)	Low	22,944	15.6%
	Salt Lake City (Foothill/East Bench)	Low	22,369	17.3%
	Magna	High	28,303	36.4%
	Salt Lake City (Glendale) V2	Very high	25,631	65.4%
	West Valley (Center)	Very high	52,999	51.8%
	West Valley (West) V2	Average	31,406	46.2%
	West Valley (East) V2	Very high	53,253	55.5%
	Salt Lake City (Downtown) V2	High	39,037	28.2%
	Salt Lake City (Southeast Liberty)	Low	23,793	13.5%
	South Salt Lake	Very high	27,420	44.3%
	Salt Lake City (Sugar House)	Average	33,933	18.3%
	Millcreek (South)	Very low	22,755	12.6%
	Millcreek (East)	Very low	25,138	10.6%
	Holladay V2	Low	25,388	13.4%
	Cottonwood	Low	42,156	12.9%
	Kearns V2	Very high	41,292	40.4%
	Taylorsville (East)/Murray (West)	High	38,345	30.8%
	Taylorsville (West)	Average	40,584	*10
	Murray	Low	35,173	24.5%
Midvale	Very high	31,669	34.2%	
West Jordan (Northeast) V2	Average	32,061	29.4%	

<sup>10</sup> New ZIP code. Data not available.

	Utah Small Area	HII Group	Population <sup>8</sup> (2017)	% Racial/Ethnic Minority <sup>9</sup>
State of Utah	99 Small Areas	N/A	3,101,989	21.0%
Local Health District	Utah Small Area	HII Group	Population (2017)	% Racial/Ethnic Minority
<b>Salt Lake County LHD</b> (cont.)	West Jordan (Southeast)	Average	38,901	28.2%
	West Jordan (West)/Copperton	Low	47,502	25.7%
	South Jordan V2	Very low	36,412	12.6%
	Daybreak	Very low	32,320	* <sup>11</sup>
	Sandy (West)	High	27,577	21.6%
	Sandy (Center) V2	Very low	29,731	15.1%
	Sandy (Northeast)	Very low	25,288	10.8%
	Sandy (Southeast)	Very low	30,624	11.85
	Draper	Very low	45,782	15.0%
	Riverton/Bluffdale	Very low	42,867	8.8%
	Herriman	Low	46,212	15.8%
<b>Tooele County LHD</b>	Tooele County (Other)	High	16,470	18.7%
	Tooele Valley	Average	50,977	16.1%
<b>Utah County LHD</b>	Eagle Mountain/Cedar Valley	Low	32,736	12.9%
	Lehi	Very low	67,193	12.5%
	Saratoga Springs	Very low	27,058	11.0%
	American Fork	Low	48,865	10.6%
	Alpine	Very low	10,938	5.5%
	Pleasant Grove/Lindon	Low	60,088	11.8%
	Orem (North)	High	39,647	29.2%
	Orem (West)	High	35,265	24.7%
Orem (East)	Low	23,128	15.5%	

<sup>11</sup> New ZIP code. Data not available.

	Utah Small Area	HII Group	Population <sup>8</sup> (2017)	% Racial/Ethnic Minority <sup>9</sup>
State of Utah	99 Small Areas	N/A	3,101,989	21.0%
Local Health District	Utah Small Area	HII Group	Population (2017)	% Racial/Ethnic Minority
Utah County LHD (cont.)	Provo/BYU	Very high <sup>12</sup>	53,657	15.2%
	Provo (West City Center)	Very high	34,403	37.6%
	Provo (East City Center)	Very high	34,967	22.7%
	Salem City	Very low	9,812	6.8%
	Spanish Fork	Low	43,194	14.1%
	Springville	Average	34,240	19.8%
	Mapleton	Very low	9,889	10.7%
	Utah County (South) V2	High	13,900	16.3%
	Payson	High	27,286	13.6%
Summit County LHD	Park City	Low	29,437	15.8%
	Summit County (East)	Low	11,676	15.2%
Wasatch County LHD	Wasatch County	Low	32,105	15.6%
TriCounty LHD	Daggett and Uintah County	Average	36,220	16.9%
	Duchesne County	Average	20,031	16.3%
Central LHD	Nephi/Mona	High	9,432	6.4%
	Delta/Fillmore	Very high	10,074	18.9%
	Sanpete Valley	High	22,136	12.7%
	Central (Other)	High	22,911	12.0%
	Richfield/Monroe/Salina	Average	15,078	6.8%
Southeast LHD	Carbon County	High	20,290	16.7%
	Emery County	Average	10,077	8.6%
	Grand County	Very high	9,677	11.4%

<sup>12</sup> Some small areas might have a high HII because of their high and transient college student population (See limitations. Page 20)

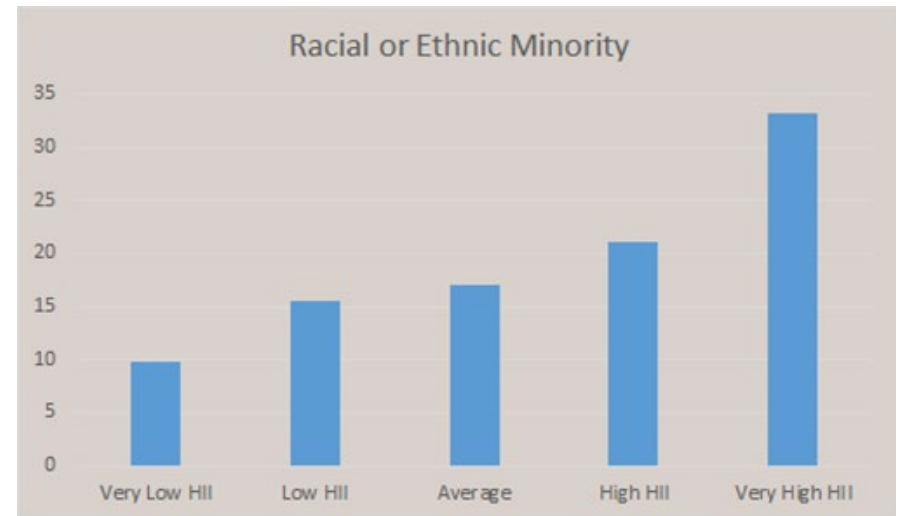


	Utah Small Area	HII Group	Population <sup>8</sup> (2017)	% Racial/Ethnic Minority <sup>9</sup>
State of Utah	99 Small Areas	N/A	3,101,989	21.0%
Local Health District	Utah Small Area	HII Group	Population (2017)	% Racial/Ethnic Minority
<b>San Juan LHD</b>	Blanding/Monticello	High	7,947	26.3%
	San Juan County (Other)	Very high	7,401	85.2%
<b>Southwest LHD</b>	St. George	Average	89,133	18.8%
	Washington County (Other) V2	Very high	10,443	4.8%
	Washington City	Average	24,937	12.0%
	Hurricane/La Verkin	High	25,783	15.2%
	Ivins/Santa Clara	Low	15,378	6.2%
	Cedar City	Very high <sup>13</sup>	45,309	15.2%
	Southwest LHD (Other)	Average	24,714	9.8%

<sup>13</sup> Some small areas might have a high HII because of their high and transient college student population (See limitations. Page 20)

### KEY POINTS

- More than half of the “very high HII” areas have a percentage of racial/ethnic (R/E) minorities greater than 30%.
- The area with the highest HII has a percentage of R/E minorities of 85.2%; the second highest has 65.4%.
- Nine out of thirteen local health districts have “high” or “very high HII” areas.
- Most of the “very high HII” areas are urban. The highest one is frontier.
- More than half of the “high HII” areas are rural.
- All the “very low HII” areas are located along the Wasatch Front.

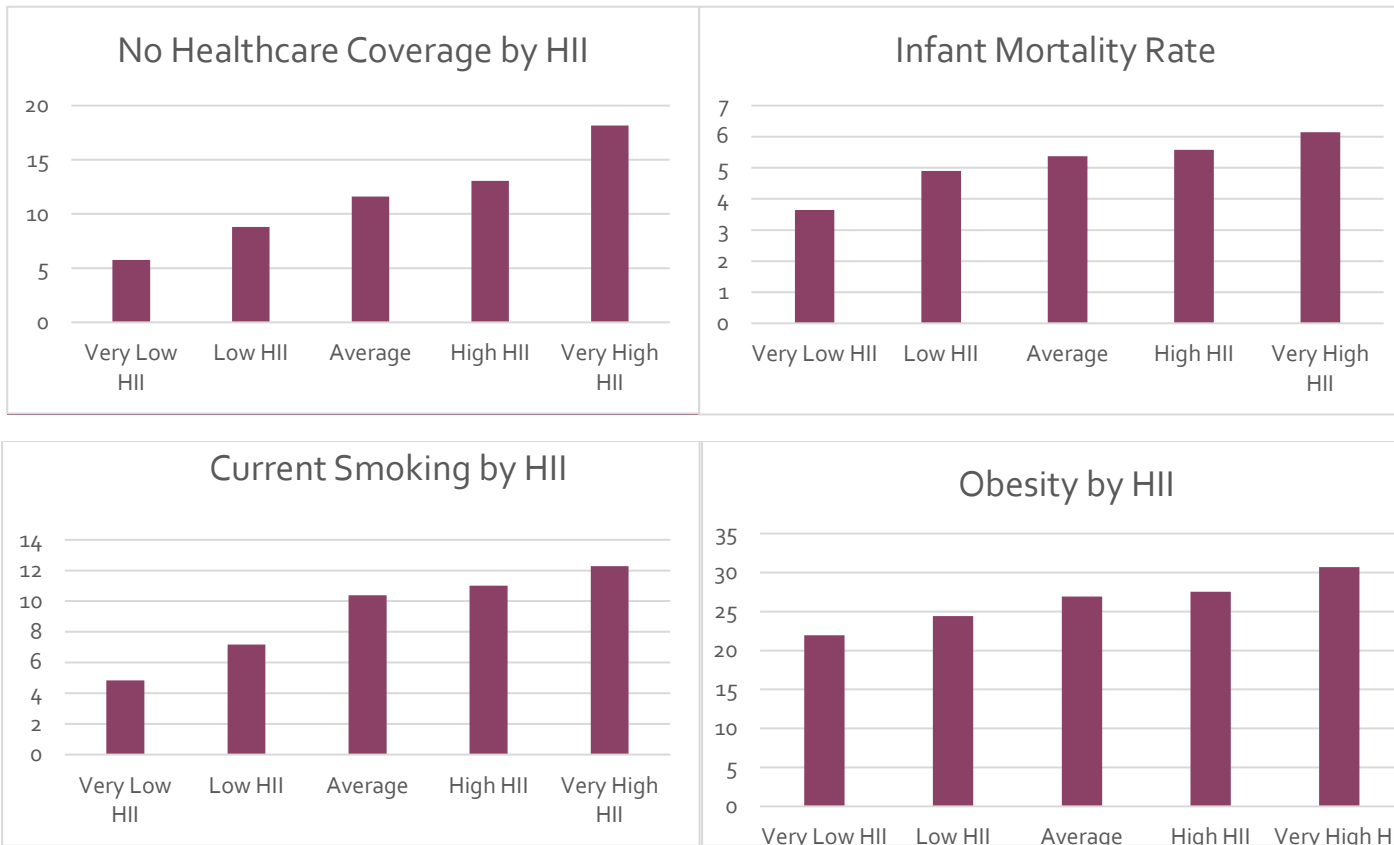


### HEALTH DISPARITIES VS. ADVERSE HEALTH OUTCOMES

- Health disparities are more than differences in health outcomes.
- The fact that some individuals die sooner, or experience a disease more severely than others is a necessary and yet insufficient condition to establish a disparity.
- All health disparities are adverse health outcomes.
- Not all the adverse health outcomes are health disparities.
- A disparity implies the difference is avoidable, unfair, and unjust.
- Knowing the difference will allow us to establish the best approach to improve the health status of the affected population.

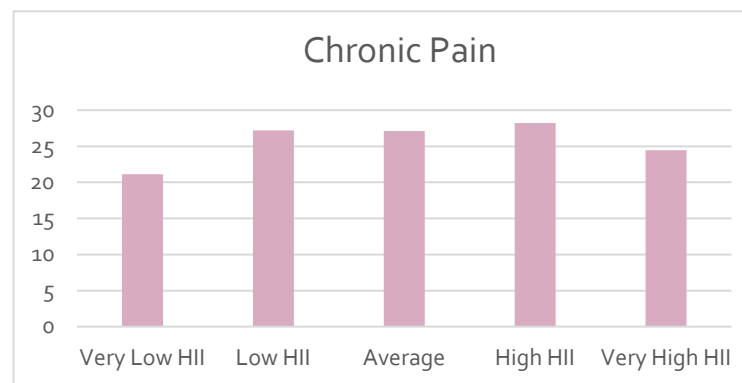
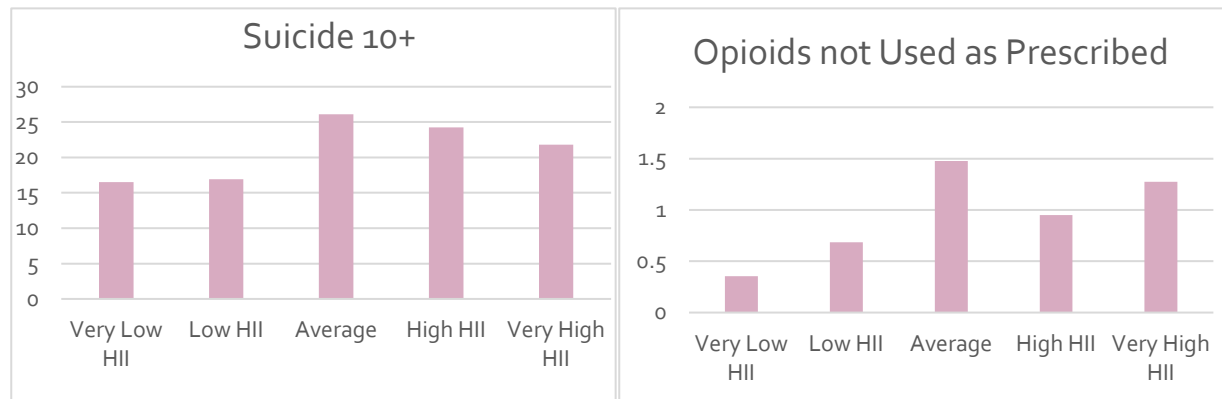
## EXAMPLES OF HEALTH DISPARITIES (Utah Data)

- The following are examples of health indicators that correlate positively with health inequities.
- The higher the HII, the worse the health outcome.
- In this context, these health indicators can be considered health disparities.
- The affected groups are disadvantaged in opportunities and/or resources when compared with Utah's overall population.
- In these cases, a health equity approach is recommended.



## EXAMPLES OF ADVERSE HEALTH OUTCOMES THAT ARE NOT HEALTH DISPARITIES (Utah Data)

- The following are examples of health indicators that DO NOT correlate positively with health inequities.
- The higher the HII DOES NOT imply a worse health outcome.
- The most affected groups ARE NOT disadvantaged in opportunities and/or resources when compared with Utah's overall population.
- In this context, these indicators can be considered adverse health outcomes but not health disparities.
- In these cases, other types of approaches may be more effective.



## PRACTICAL APPLICATIONS OF THE HII

**Programs:** HII as criteria for planning and evaluating interventions.

- In “very high” and “high” HII areas, interventions with a health equity approach will be more effective.
- In “very low,” “low,” and “average” HII areas, interventions with a traditional approach will be effective.

**Measurement:** HII as a measure of social determinants of health by geography.

**Policy:** HII as a benchmark to address health disparities by geography.

**Infrastructure:** Integrate public health with community-development strategies that influence the determinants of health (e.g., housing, safety, education, transportation, access to health care, civic engagement, etc.)

## LIMITATIONS OF THE HII

1. Some small areas might have a high HII because of their high and transient college student population.
2. Within the “average” and “low HII” areas, there might be small clusters (hot spots) of underserved communities such as American Indian Tribes or other underserved groups.

## HOW TO ADDRESS THESE LIMITATIONS

1. Identify areas with high and transient college student population.
2. Justify, with data, the “needs” of those small clusters by:
  - A. Using secondary data from reliable sources if available.
  - B. Collaborating with local authorities, tribal leaders, and local community leaders to collect primary data using reliable methodologies.



## ACKNOWLEDGMENTS

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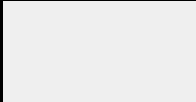


December 2018



Utah Department of Health

Suggested citation: Utah Department of Health (2018). The Utah Health Improvement Index.  
<https://health.utah.gov/disparities/data/ohd/UtahHII.pdf>

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**APPENDIX (Color Coding)**

RGB	HEX	CMYK	Color	Label	Use
26,150,65	#1a9641	90,0,90,0		Very low	Very low
166,217,106	#a6d96a	35,0,60,0		Low	Low
239,239,239	#efefef	0,0,0,6		Average	Average
253,174,97	#fdae61	0,35,55,0		High	High
215,25,2	#d7191c	15,90,80,0		Very high	Very high

RGB	HEX	CMYK	Color	Label	Use
116,27,71	#741b47	0,77,39,55		Health disparity	Text
213,166,189	#d5a6bd	0,22,1,16		Adverse health outcome	Text