2017 Indiana Health and Wellness Summit

OCTOBER 3-4, 2017

Presenter: Belinda Coleman,
President and CEO
The Coleman Group, Inc.

The Coleman Group, Inc.
Inspired Thinking...Intelligent Solutions

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Integrating Data Into Your Wellness Story
How does it work?

How to build your story

Collect and prepare your Data

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- Employ data from individuals exhibiting over an extended period of time
- Generate a multiparameter metric for wellness
- Reflect both the psychological and physiological aspects of wellness
- Quantifying wellness
- Define terms in clear ways

Data Collection

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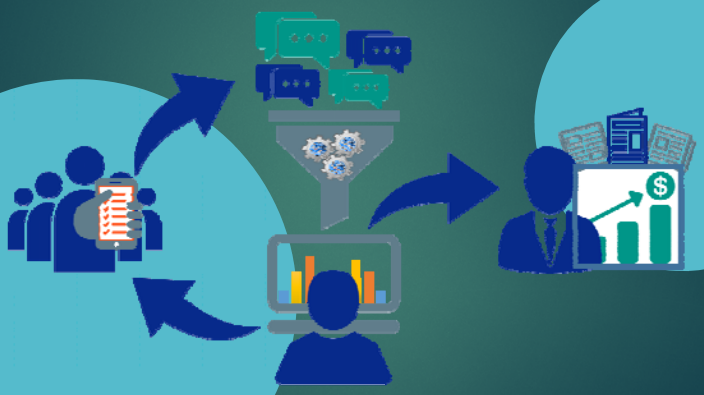

Many sources, many topics

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Health data come in many sources

- Biometrics
- Demographics
- Scientific
- Social media
- and others…

Health data is not easily understood…

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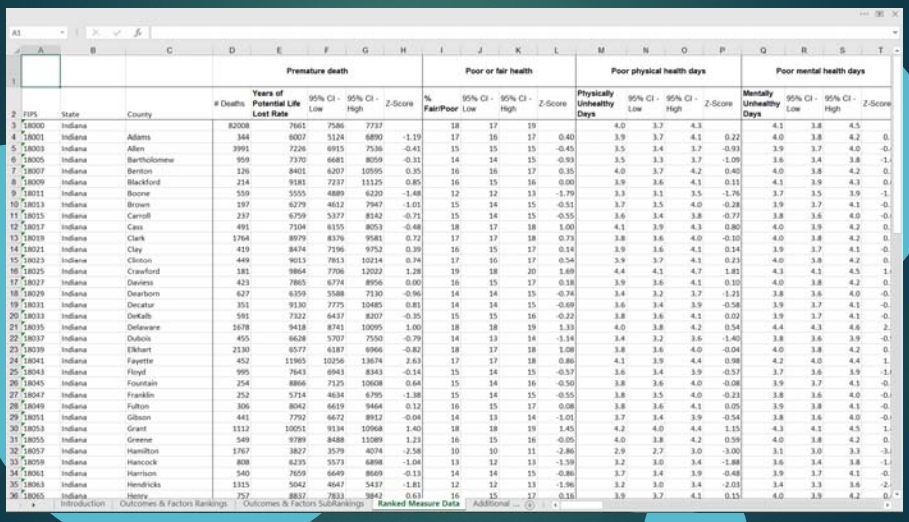

				Premature death					Poor or fair health				Poor physical health days				Poor mental health days			
FIPS	State	County	# Deaths	Years of Potential Life Lost Rate	95% CI - Low	95% CI - High	Z-Score	% Fair/Poor	95% CI - Low	95% CI - High	Z-Score	Physically Unhealthy Days	95% CI - Low	95% CI - High	Z-Score	Mentally Unhealthy Days	95% CI - Low	95% CI - High	Z-Score
18000	Indiana		82008	7661	7586	7737		18	17	19		4.0	3.7	4.3		4.1	3.8	4.5	
18001	Indiana	Adams	344	6007	5124	6890	-1.19	17	16	17	0.40	3.9	3.7	4.1	0.22	4.0	3.8	4.2	0.
18003	Indiana	Allen	3991	7226	6915	7536	-0.41	15	15	15	-0.45	3.5	3.4	3.7	-0.93	3.9	3.7	4.0	-0.
18005	Indiana	Bartholomew	959	7370	6681	8059	-0.31	14	14	15	-0.93	3.5	3.3	3.7	-1.09	3.6	3.4	3.8	-1.
18007	Indiana	Benton	126	8401	6207	10595	0.35	16	16	17	0.35	4.0	3.7	4.2	0.40	4.0	3.8	4.2	0.
18009	Indiana	Blackford	214	9181	7237	11125	0.85	16	15	16	0.00	3.9	3.6	4.1	0.11	4.1	3.9	4.3	0.
18011	Indiana	Boone	559	5555	4889	6220	-1.48	12	12	13	-1.79	3.3	3.1	3.5	-1.76	3.7	3.5	3.9	-1.
18013	Indiana	Brown	197	6279	4612	7947	-1.01	15	14	15	-0.51	3.7	3.5	4.0	-0.28	3.9	3.7	4.1	-0.
18015	Indiana	Carroll	237	6759	5377	8142	-0.71	15	14	15	-0.55	3.6	3.4	3.8	-0.77	3.8	3.6	4.0	-0.
18017	Indiana	Cass	491	7104	6155	8053	-0.48	18	17	18	1.00	4.1	3.9	4.3	0.80	4.0	3.9	4.2	0.
18019	Indiana	Clark	1764	8979	8376	9581	0.72	17	17	18	0.73	3.8	3.6	4.0	-0.10	4.0	3.8	4.2	0.
18021	Indiana	Clay	419	8474	7196	9752	0.39	16	15	17	0.14	3.9	3.6	4.1	0.14	3.9	3.7	4.1	-0.
18023	Indiana	Clinton	449	9013	7813	10214	0.74	17	16	17	0.54	3.9	3.7	4.1	0.23	4.0	3.8	4.2	0.
18025	Indiana	Crawford	181	9864	7706	12022	1.28	19	18	20	1.69	4.4	4.1	4.7	1.81	4.3	4.1	4.5	1.
18027	Indiana	Daviess	423	7865	6774	8956	0.00	16	15	17	0.18	3.9	3.6	4.1	0.10	4.0	3.8	4.2	0.
18029	Indiana	Dearborn	627	6359	5588	7130	-0.96	14	14	15	-0.74	3.4	3.2	3.7	-1.21	3.8	3.6	4.0	-0.
18031	Indiana	Decatur	351	9130	7775	10485	0.81	14	14	15	-0.69	3.6	3.4	3.9	-0.58	3.9	3.7	4.1	-0.
18033	Indiana	DeKalb	591	7322	6437	8207	-0.35	15	15	16	-0.22	3.8	3.6	4.1	0.02	3.9	3.7	4.1	-0.
18035	Indiana	Delaware	1678	9418	8741	10095	1.00	18	18	19	1.33	4.0	3.8	4.2	0.54	4.4	4.3	4.6	2.
18037	Indiana	Dubois	455	6628	5707	7550	-0.79	14	13	14	-1.14	3.4	3.2	3.6	-1.40	3.8	3.6	3.9	-0.
18039	Indiana	Elkhart	2130	6577	6187	6966	-0.82	18	17	18	1.08	3.8	3.6	4.0	-0.04	4.0	3.8	4.2	0.
18041	Indiana	Fayette	452	11965	10256	13674	2.63	17	17	18	0.86	4.1	3.9	4.4	0.98	4.2	4.0	4.4	1.
18043	Indiana	Floyd	995	7643	6943	8343	-0.14	15	14	15	-0.57	3.6	3.4	3.9	-0.57	3.7	3.6	3.9	-1.
18045	Indiana	Fountain	254	8866	7125	10608	0.64	15	14	16	-0.50	3.8	3.6	4.0	-0.08	3.9	3.7	4.1	-0.
18047	Indiana	Franklin	252	5714	4634	6795	-1.38	15	14	15	-0.55	3.8	3.5	4.0	-0.23	3.8	3.6	4.0	-0.
18049	Indiana	Fulton	306	8042	6619	9464	0.12	16	15	17	0.08	3.8	3.6	4.1	0.05	3.9	3.8	4.1	-0.
18051	Indiana	Gibson	441	7792	6672	8912	-0.04	14	13	14	-1.01	3.7	3.4	3.9	-0.54	3.8	3.6	4.0	-0.
18053	Indiana	Grant	1112	10051	9134	10968	1.40	18	18	19	1.45	4.2	4.0	4.4	1.15	4.3	4.1	4.5	1.
18055	Indiana	Greene	549	9789	8488	11089	1.23	16	15	16	-0.05	4.0	3.8	4.2	0.59	4.0	3.8	4.2	0.
18057	Indiana	Hamilton	1767	3827	3579	4074	-2.58	10	10	11	-2.86	2.9	2.7	3.0	-3.00	3.1	3.0	3.3	-3.
18059	Indiana	Hancock	808	6235	5573	6898	-1.04	13	12	13	-1.59	3.2	3.0	3.4	-1.88	3.6	3.4	3.8	-1.
18061	Indiana	Harrison	540	7659	6649	8669	-0.13	14	14	15	-0.86	3.7	3.4	3.9	-0.48	3.9	3.7	4.1	-0.
18063	Indiana	Hendricks	1315	5042	4647	5437	-1.81	12	12	13	-1.96	3.2	3.0	3.4	-2.03	3.4	3.3	3.6	-2.
18065	Indiana	Henry	757	8837	7833	9842	0.63	16	15	17	0.16	3.9	3.7	4.1	0.15	4.0	3.9	4.2	0.

…data structure…

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- The Rapid Growth of Unstructured Data
- YouTube users upload 48 hours of new video every minute of the day.[10]
- 571 new websites are created every minute of the day.[11]
- Brands and organizations on Facebook receive 34,722 Likes every minute of the day.[12]
- 100 terabytes of data uploaded daily to Facebook.[13]
- According to Twitter's own research in early 2012, it sees roughly 175 million tweets every day, and has more than 465 million accounts.[14]
- 30 Billion pieces of content shared on Facebook every month.[15]
- Data production will be 44 times greater in 2020 than it was in 2009.[16]
- In late 2011, IDC Digital Universe published a report indicating that some 1.8 zettabytes of data will be created that year.[17]
  In other words, the amount of data in the world today is equal to:
  - Every person in the US tweeting three tweets per minute for 26,976 years.
  - Every person in the world having more than 215m high-resolution MRI scans a day.
  - More than 200bn HD movies – which would take a person 47m years to watch.

…it's complicated

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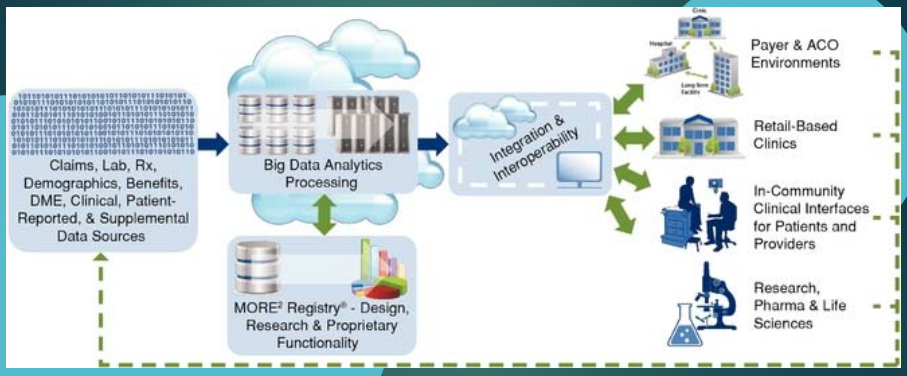

How can you make sense of health data when...

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...it becomes bigger and more complicated = Big Data

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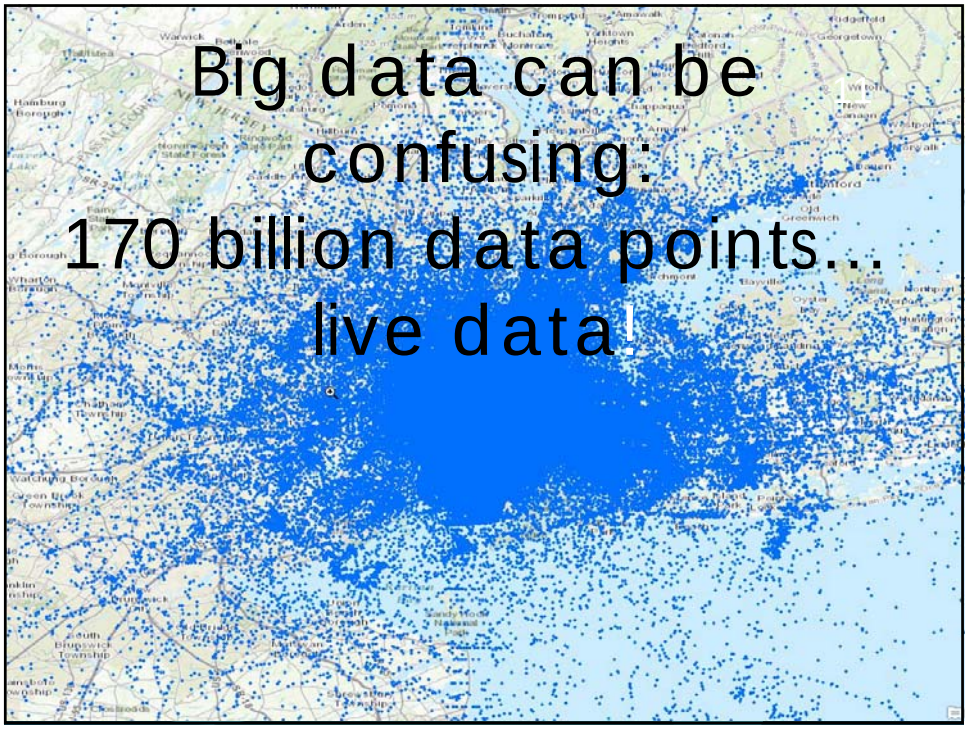
- Big data is a term for data sets that are so large or complex that traditional data processing application software is inadequate to deal with them (Wikipedia, 2017)

- **Volume.** Organizations collect data from a variety of sources, including business transactions, social media and information from sensor or machine-to-machine data. In the past, storing it would've been a problem – but new technologies (such as Hadoop) have eased the burden.
- **Velocity.** Data streams in at an unprecedented speed and must be dealt with in a timely manner. RFID tags, sensors and smart metering are driving the need to deal with torrents of data in near-real time.
- **Variety.** Data comes in all types of formats – from structured, numeric data in traditional databases to unstructured text documents, email, video, audio, stock ticker data and financial transactions.
- **Variability.** In addition to the increasing velocities and varieties of data, data flows can be highly inconsistent with periodic peaks. Is something trending in social media? Daily, seasonal and event-triggered peak data loads can be challenging to manage. Even more so with unstructured data.
- **Complexity.** Today's data comes from multiple sources, which makes it difficult to link, match, cleanse and transform data across systems. However, it's necessary to connect and correlate relationships, hierarchies and multiple data linkages or your data can quickly spiral out of control.



Data Visualization is the Key Drilling down…and finding your…

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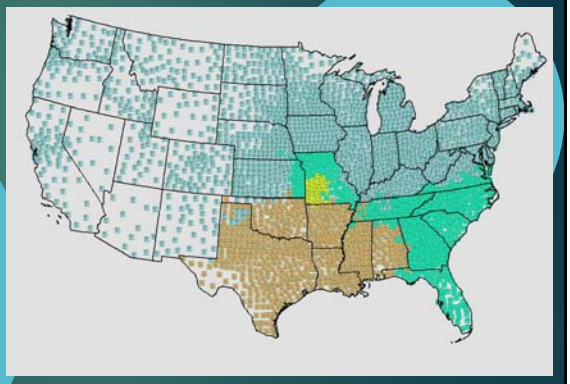
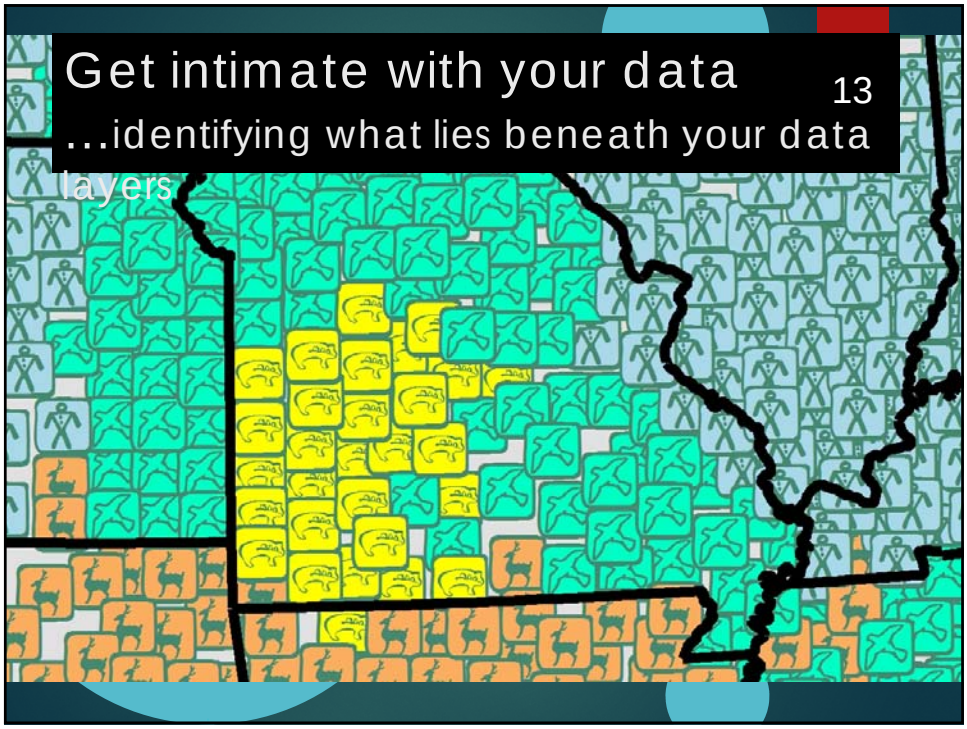
- Mastering the Data Deluge
- Data Dashboard using Geography to make sense of your data…
- How? Data should be patient-centric…wherever the patient goes, data follows…a geocentric healthcare/patientcare system: easy to understand, easy to interpret, and easy to illustrate




Get intimate with your data
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…identifying what lies beneath your data layers


The patterns can be misleading dig deeper!
14
how we make sense of what we see

Visualization is the first step to understanding your data

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Wellness and Big Data: Diabetes and Obesity story - Choosing the right tool for the job

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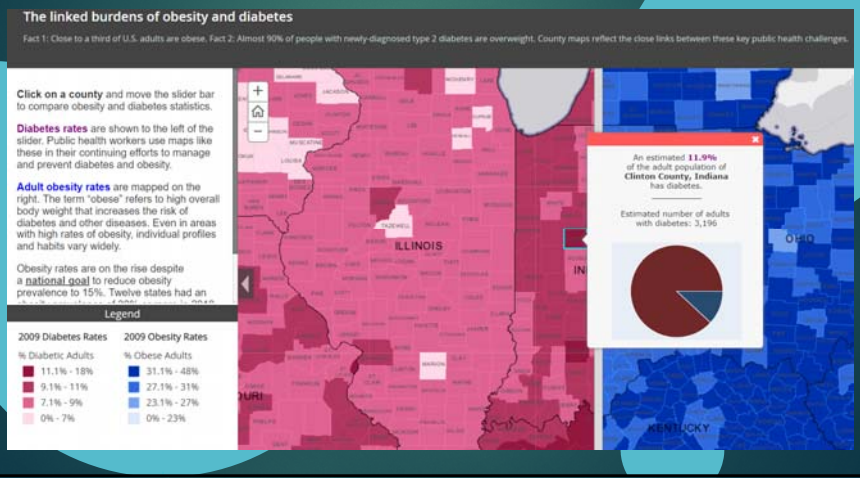

Enter: Real-time Data

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- Big data is not just historic business intelligence

Value of Big Data

- Private: real-time data and the ability to mash together several (big) data sets that makes big data so valuable

Not understanding big data can be costly!

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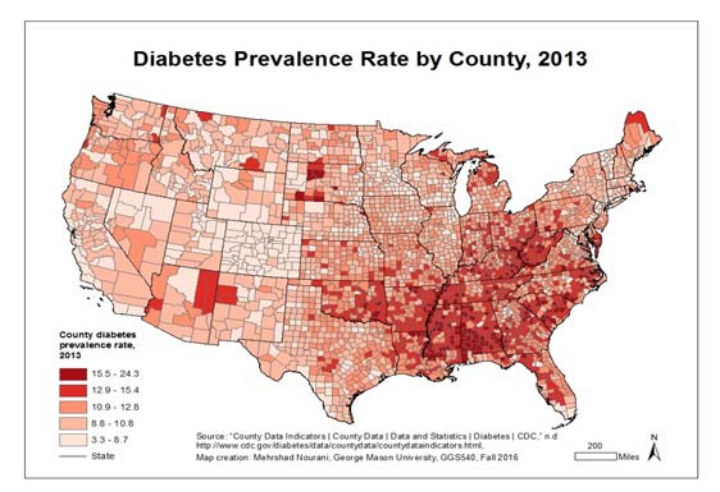

Know what's beneath your data

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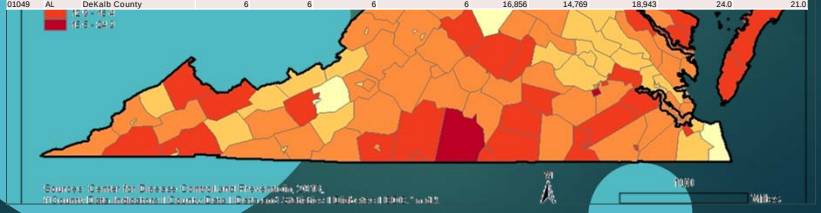
Poverty estimates for the U.S., States, and counties, 2014 (see second tab in this workbook for variable name descriptions)
Source: US Census Bureau, Model-based Small Area Income & Poverty Estimates (SAIPE) - http://www.census.gov/did/www/saipe/

FIPStxt	State	Area_Name	Rural_urban_Continuum_Code_2003	Urban_influence_Code_2003	Rural_urban_Continuum_Code_2013	Urban_Influence_Code_2013	POVALL_2014	CI90LBAll_2014	CI90UBALL_2014	PCTPOVALL_2014	CI90LBALLP_2014
00000	US	United States					48,208,387	47,966,830	48,449,944	15.5	15.4
01000	AL	Alabama					905,682	888,317	923,047	19.2	18.8
01001	AL	Autauga County	2	2	2	2	7,204	5,845	8,563	13.1	10.6
01003	AL	Baldwin County	4	5	3	2	25,696	21,539	29,853	13.0	10.9
01005	AL	Barbour County	6	6	6	6	5,943	4,539	7,347	25.4	19.4
01007	AL	Bibb County	1	1	1	1	3,666	2,752	4,580	18.1	13.6
01009	AL	Blount County	1	1	1	1	10,000	8,513	11,487	17.5	14.9
01011	AL	Bullock County	6	6	6	6	3,179	2,474	3,884	35.1	27.3
01013	AL	Butler County	6	6	6	6	4,988	4,098	5,878	25.0	20.5
01015	AL	Calhoun County	3	2	3	2	23,114	20,246	25,982	20.5	18.0
01017	AL	Chambers County	6	5	6	5	7,170	5,900	8,440	21.3	17.5
01019	AL	Cherokee County	8	6	6	6	4,768	3,840	5,696	18.6	15.0
01021	AL	Chilton County	1	1	1	1	7,874	6,373	9,375	18.1	14.6
01023	AL	Choctaw County	9	10	9	10	3,293	2,686	3,900	25.0	20.4
01025	AL	Clarke County	7	11	7	11	6,137	5,034	7,240	24.9	20.4
01027	AL	Clay County	9	10	9	10	2,592	2,050	3,134	19.5	15.4
01029	AL	Cleburne County	8	4	8	4	2,527	1,961	3,093	17.0	13.2
01031	AL	Coffee County	6	5	4	5	8,407	7,058	9,756	16.8	14.1
01033	AL	Colbert County	3	2	3	2	9,022	7,439	10,605	16.7	13.8
01035	AL	Conecuh County	9	11	7	11	3,846	3,170	4,522	30.6	25.2
01037	AL	Coosa County	8	7	8	3	1,976	1,531	2,421	18.8	14.6
01039	AL	Covington County	7	9	6	6	7,778	6,372	9,184	20.8	17.0
01041	AL	Crenshaw County	8	6	8	6	2,929	2,383	3,475	21.2	17.2
01043	AL	Cullman County	6	3	4	3	13,809	11,622	15,996	17.2	14.5
01045	AL	Dale County	4	5	4	5	10,865	9,474	12,256	22.4	19.5
01047	AL	Dallas County	4	5	4	5	14,470	12,636	16,304	35.2	30.7
01049	AL	DeKalb County	6	6	6	6	16,856	14,769	18,943	24.0	21.0



Reveal what's beneath: some data command more attention than others

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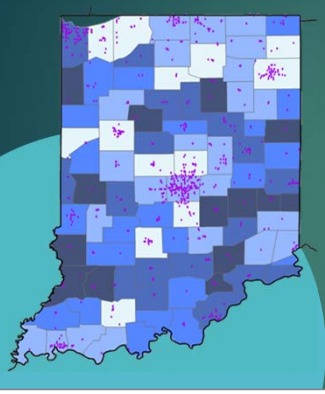

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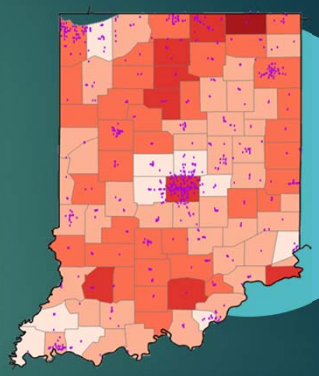
Uninsured in Indiana



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Diabetes prevalence in Indiana

Use a Healthcare Dashboard to make sense of your data

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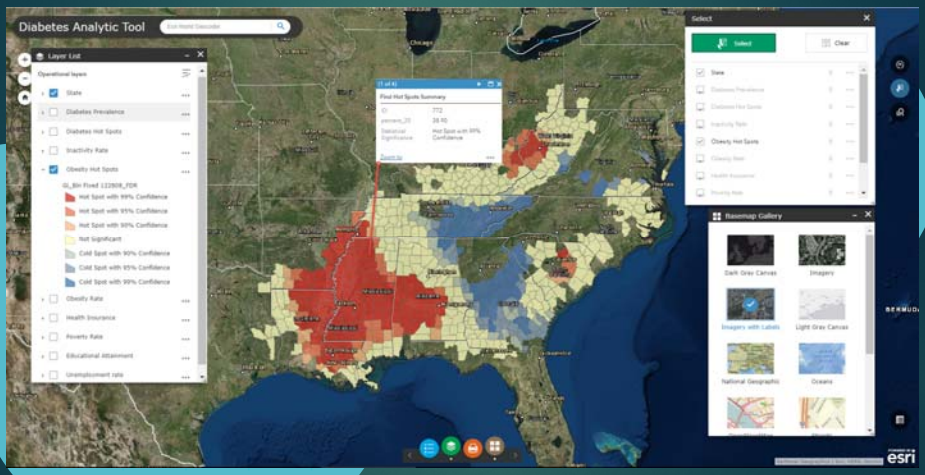

Health Analytic Application, designed and built by the Coleman Group, Inc.

Keep your data safe!

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The first computers came with memories measured in kilobytes, but the latest smartphones can now store 500 GB and many laptops now have one terabyte (1,000GB) hard drives as standard. Storage is not really an issue anymore.

The US National Security Agency has built a huge data centre in Bluffdale, Utah - codenamed Bumblehive - capable of storing a yottabyte of data - that's one thousand trillion gigabytes

Source: Associated Press, 2012


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Know your data.
Know your health.