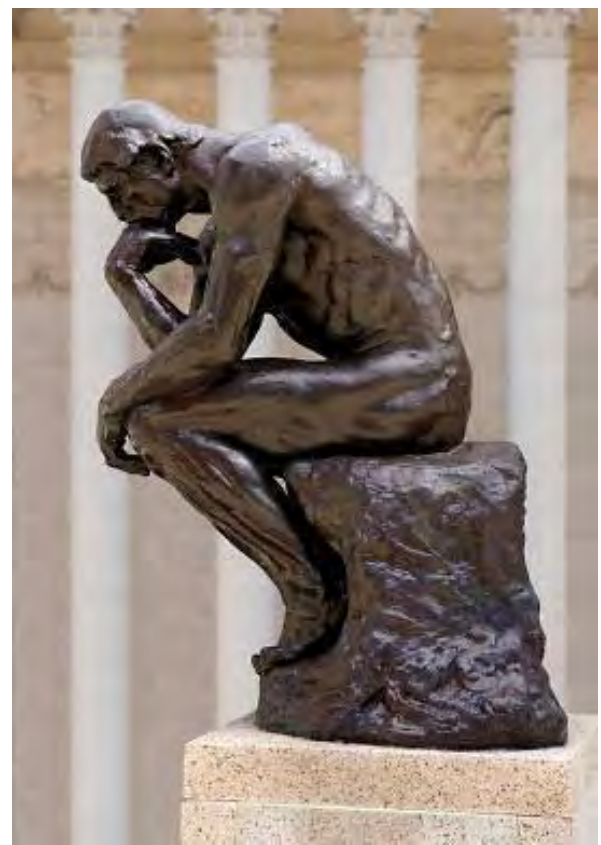


Education Data Visualization: To Sift And Weigh Evidence, To Discern The True From The False...

Prepared For:
Invitational Summit On Education Data Visualization
May 6-7, 2014
The University of Texas at Austin



Prepared By:
Peter Winograd, UNM Center for Education Policy Research
Amy Ballard, UNM Center for Education Policy Research
Jason Timm, UNM Center for Education Policy Research



Data... Insight... Impact

The Purpose of Education

“To save man from the morass of propaganda, in my opinion, is one of the chief aims of education. Education must enable one to sift and weigh evidence, to discern the true from the false, the real from the unreal, and the facts from the fiction.

The function of education, therefore, is to teach one to think intensively and to think critically. But education which stops with efficiency may prove the greatest menace to society. The most dangerous criminal may be the man gifted with reason, but with no morals.

We must remember that intelligence is not enough. Intelligence plus character-- that is the goal of true education. The complete education gives one not only power of concentration, but worthy objectives upon which to concentrate.”

Martin Luther King

Geospatial Mapping

Geospatial mapping is an approach to applying statistical analyses, data visualization, and other analytic techniques to data that have geographical dimensions.

We have focused on major educational issues around equity, educational achievement and attainment, early childhood, health, juvenile justice, economic development and inter-generational poverty.

- Geospatial Mapping approaches make these variables obvious and easier to understand in the specific context of educational achievement.
- Some authors (e.g. Hoglebe & Tate, 2012) argue that a geospatial perspective is essential in developing a type of ***visual political literacy*** in the areas of education, health and human services.

Mapping Is Powerful

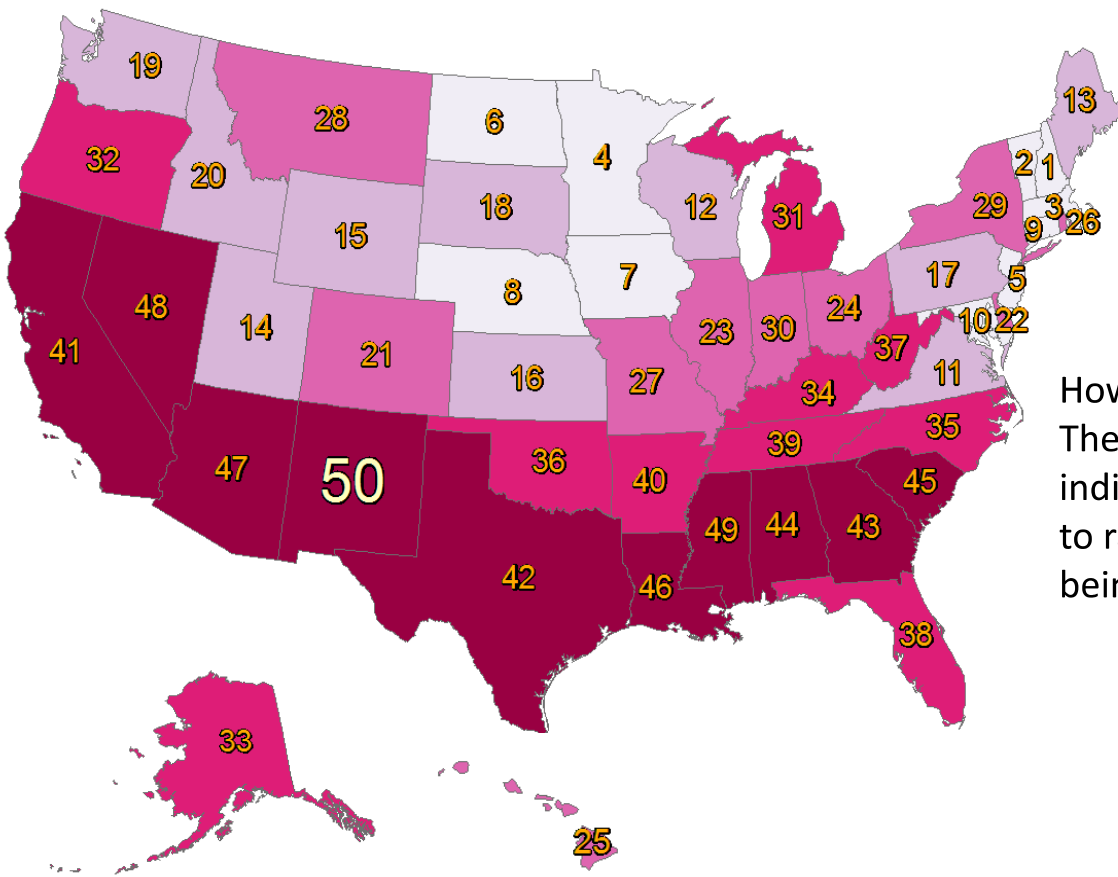
- Geospatial mapping is an important tool for policy development because:
 - images, illustrations, and graphic representations strongly support learning, understanding and other aspects of cognition
 - maps have long been useful in engaging multiple groups in civic debates and other political discussions because they can be used as planning tools.
- Geospatial mapping is used extensively in other fields including health and human services, natural resources, public safety, defense, and urban and regional planning.
- The data in the maps are immediately accessible to a wide range of audiences including policy-makers, community members, educators, students, and parents.
- Maps are powerful conversation starters. Everybody sees something different in the maps based on their perspectives and experiences.
- Maps equalize the conversations among different groups at the table. People want to know what others think!

The Power Of Data Visualization

- **Description:** Making the data accessible to all audiences
 - Painting the picture of urgency
 - Identifying risk, needs, and assets
- **Analysis:** Making sense of the data
 - Identifying gaps in resources
 - Setting priorities
 - Measuring impact
- **Action:** Using data for change
 - Providing a basis for advocacy
 - Strengthening public engagement
 - Developing policy

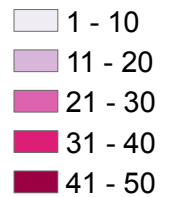
The Issues

2013 Overall KidsCount Child Well-Being Ranking



How do we measure well-being?
The KidsCount Index uses 16 indicators across 4 domains to rank U.S. states on child well-being.

State Rankings



KidsCount Rankings: 2000-2013

State	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Trend	Variance	Total YTD Change (2000-2013)
NH	1	1	1	1	1	2	1	1	1	1	1	1	1	1		0.07	0
NJ	9	5	5	4	7	9	6	9	7	9	7	5	4	5		3.39	4
NM	45	43	47	46	48	47	48	43	46	43	46	46	49	50		4.45	-5
NV	39	31	34	32	36	33	36	39	36	39	36	40	48	48		24.80	-9
NY	24	25	19	22	22	18	20	17	15	17	15	15	29	29		21.82	-5
OH	27	28	26	29	26	28	30	28	29	28	29	29	27	24		2.35	-2
OK	41	40	40	38	40	42	43	44	44	44	44	43	40	36		5.80	-2
OR	23	20	11	18	15	17	17	19	18	19	18	18	33	32		33.12	5
PA	18	17	21	25	16	21	23	23	23	23	23	20	14	17		10.35	-2
RI	15	18	14	20	31	20	21	15	17	15	17	17	25	26		22.80	-2
SC	47	44	46	45	47	46	46	45	45	45	45	45	43	45		1.06	2
SD	16	11	17	19	14	30	25	21	26	21	26	21	17	18		25.41	-5
TN	42	47	42	43	46	43	42	46	41	46	41	39	36	39		9.23	3
TX	36	35	37	37	39	37	37	34	34	34	34	35	44	42		8.74	1
UT	4	4	8	8	6	4	5	3	4	3	4	7	11	14		9.78	-3
VA	19	16	16	13	19	14	15	16	16	16	16	14	12	11		4.88	5
VT	3	9	6	2	2	6	10	8	3	8	3	4	3	2		7.49	-1
WA	13	12	13	14	17	13	11	14	11	14	11	13	18	19		6.03	0
WI	12	14	12	10	13	12	12	10	10	10	10	12	15	12		2.35	0
WV	38	12	13	14	17	13	11	14	11	38	43	44	39	37		179.67	-6
WY	33	24	28	23	28	25	26	32	28	32	28	28	19	15		23.09	5

New Mexico has never moved above #43 in the rankings while other states have moved up. This becomes a deficit narrative for our state.

KidsCount Indicators

Domain	Indicator	Data
Economic Well-Being		
	Child Poverty	Families below 100% FPL (Census)
	Housing Cost Burden	Housing costs over 30% income (Census)
	Idle Teens	16-19 not in workforce not in school (Census)
	Secure Employment	No parent with regular year-round employment (Census)
Health		
	Infant Mortality	Number of deaths of all infants per 1000 (CDC)
	Low Birth Weight	Infants under 2500g (CDC)
	Child Deaths	Deaths to children under 18 from all causes (CDC)
	Health Insurance	No health insurance (Census)
	Teen Deaths	Deaths of teens of all causes (CDC)
Education		
	Preschool Enrollment	% of children 0-5 enrolled in preschool (Census)
	Math Achievement	Proficient as measured by NAEP
	Reading Achievement	Proficient as measured by NAEP
Family and Community		
	High-Poverty Areas	Concentrated poverty, >30% of persons under FPL
	Single-Parent Families	Under 18 living with own single parent
	Parental Education	Under 18 parents less than bachelor's degree
	Teen Births	Per 1,000 females ages 15-19

Indicator Indexes

Pros

1. At a high level, identifies areas for improvement in relation to childhood well-being in an easily-understandable format.
2. Provides a consistent annual measurement.
3. Has been revised recently (2012) to incorporate newly-available data.

Cons

1. Creates a narrative of disadvantage and despair.
2. Using states as the unit of analysis masks nuances visible at the county, city, tract, school district or individual school level.
3. The index does not take improvement into account, and it ignores individual sub-populations.
4. The index does not consider the unique assets within communities.

“N.M. at bottom in child well-being”
Albuquerque Journal, June 24, 2013

“Dropping Out Can Lead To A Hard Life”
Albuquerque Journal, August 4, 2013

“Children fare worse in New Mexico”
Albuquerque Journal, April 12, 2014

“N.M.’s Child Death Rate Increase”
Albuquerque Journal, July 26, 2006

The Narrative Of Disadvantage & Despair

“New Mexico in bottom five in child well-being”
El Defensor Chieftain, July 31, 2010

“N.M. Still Battling Teen Pregnancy”
Albuquerque Journal, December 16, 2012

“More Children in Poverty Near Mexico Border”
Albuquerque Journal, February 10, 2005

“Severe child-abuse cases pile up in Albuquerque”
Albuquerque Journal, April 18, 2014

“Hunger, poverty need public policies”
Albuquerque Journal, October 21, 2013

What Can We Do With Data?

- Change the geographic unit of analysis to show a more nuanced picture.
- Focus on New Mexico's specific concern.
- Create a new narrative focusing on areas of success and opportunity.
- Develop the tools to strengthen the civic debates.

Changing the Geographic Unit of Analysis

*“To save man from the morass of propaganda, in my opinion,
is one of the chief aims of education.”*

Census Tract-based Opportunity-Based Index

The CDC has identified several factors related to high risk for child maltreatment. The following maps show areas where risks for these factors are lower and higher in Bernalillo County. The goal is to introduce a possible technique for identifying neighborhoods that may benefit from resources.

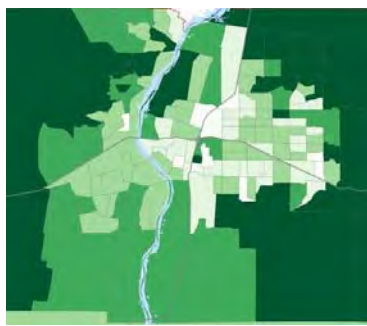
- The best opportunity for children to grow up without becoming victims of maltreatment include:
 - Having parents with higher education levels;
 - Living in a household with 2 parents;
 - Living in a household with income above poverty level;
 - Living in a household with fewer dependent children;
 - Living in neighborhoods with low unemployment;
 - Living in neighborhoods where people have lived at least a year in the same house;
 - Living in neighborhoods with a lower density of alcohol outlets.

Where are these areas in Bernalillo County?

Individual Child Maltreatment Risk Mitigation Factors



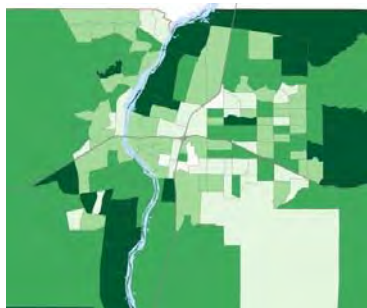
Education Greater Than AA Degree



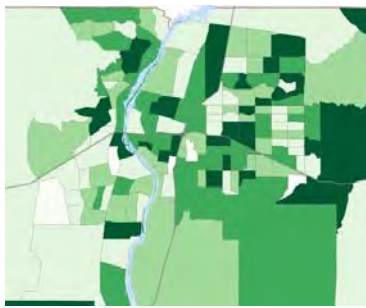
Few Single Parent Households



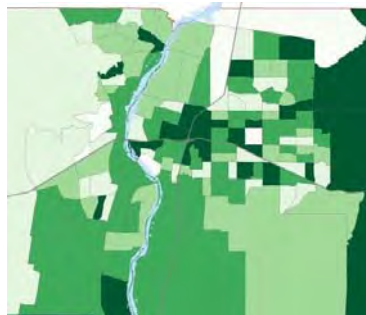
Few Families Living Under Poverty Level



Low Residential Mobility



Low Unemployment

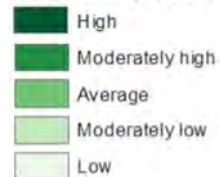


Smaller Family Size



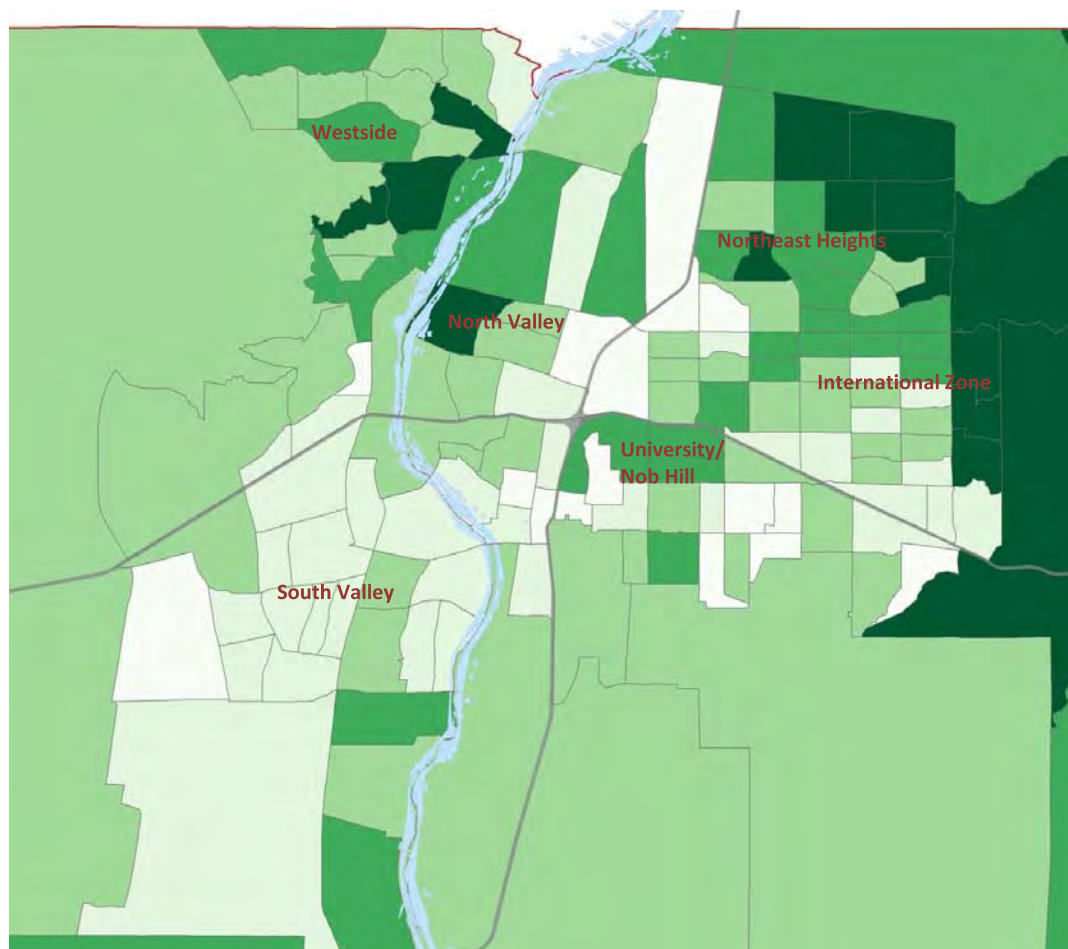
Few Alcohol Licenses

Opportunity Score



Source: Unemployment, family size, single parent household, household mobility, family poverty model input layers from the U.S. Census Bureau, 2010 Decennial Census, census tract level. Alcohol license data from New Mexico Community Data Collaborative, compiled by New Mexico Department of Health.

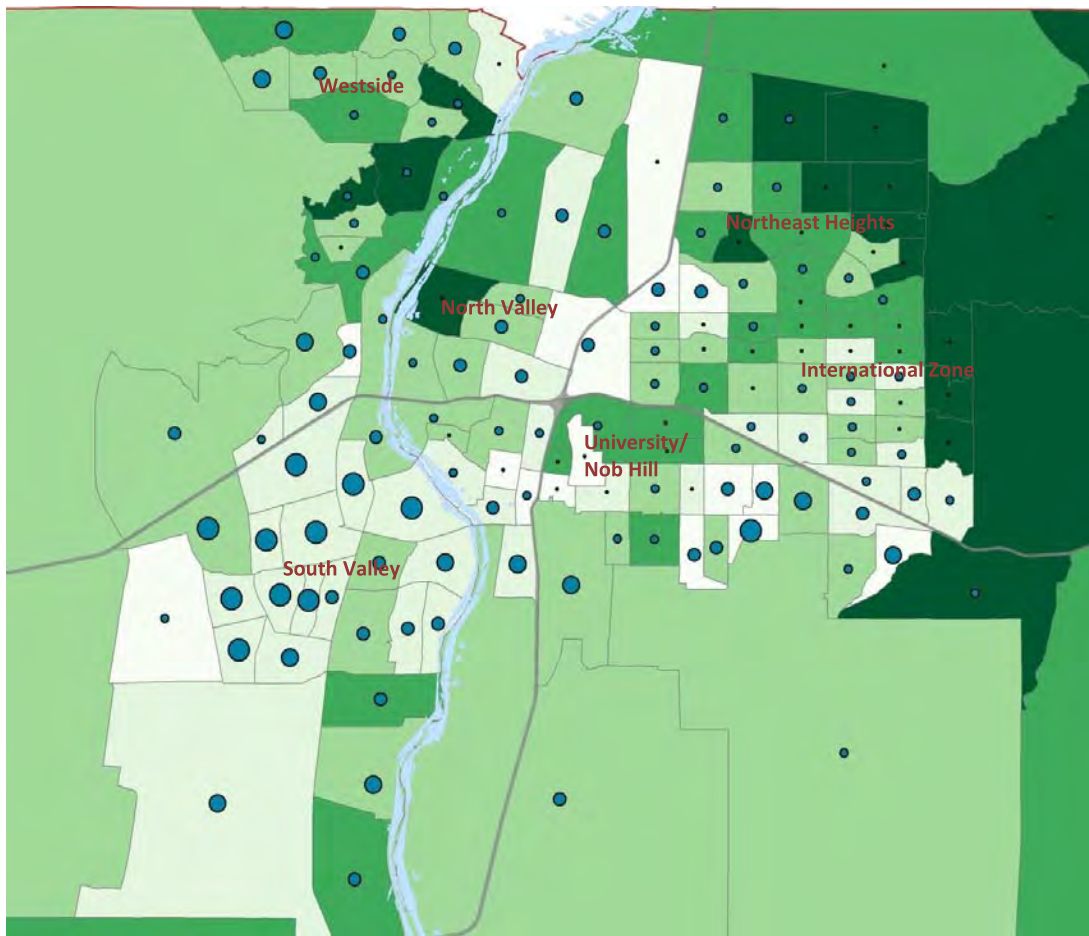
Opportunity For A Safe Childhood



Based on the CDC factors, tracts with a higher score have lower values for child maltreatment indicators.

Source: Unemployment, family size, single parent household, household mobility, family poverty model input layers from the U.S. Census Bureau, 2010 Decennial Census, census tract level. Alcohol license data from New Mexico Community Data Collaborative, compiled by New Mexico Department of Health.

Using The Maps To Address Issues Of Community Equity: Where Are The Hispanic Children In Relation To Opportunity?



This map clearly shows the concentration of Hispanic children under the age of 5 in lower opportunity areas.

Opportunity Score

- High
- Moderately high
- Average
- Moderately low
- Low

Number of Hispanic Children Under Age 5

- 4 - 85
- 86 - 185
- 186 - 325
- 326 - 525
- 526 - 761

Source: Unemployment, family size, single parent household, household mobility, family poverty model input layers from the U.S. Census Bureau, 2010 Decennial Census, census tract level. Alcohol license data from New Mexico Community Data Collaborative, compiled by New Mexico Department of Health.

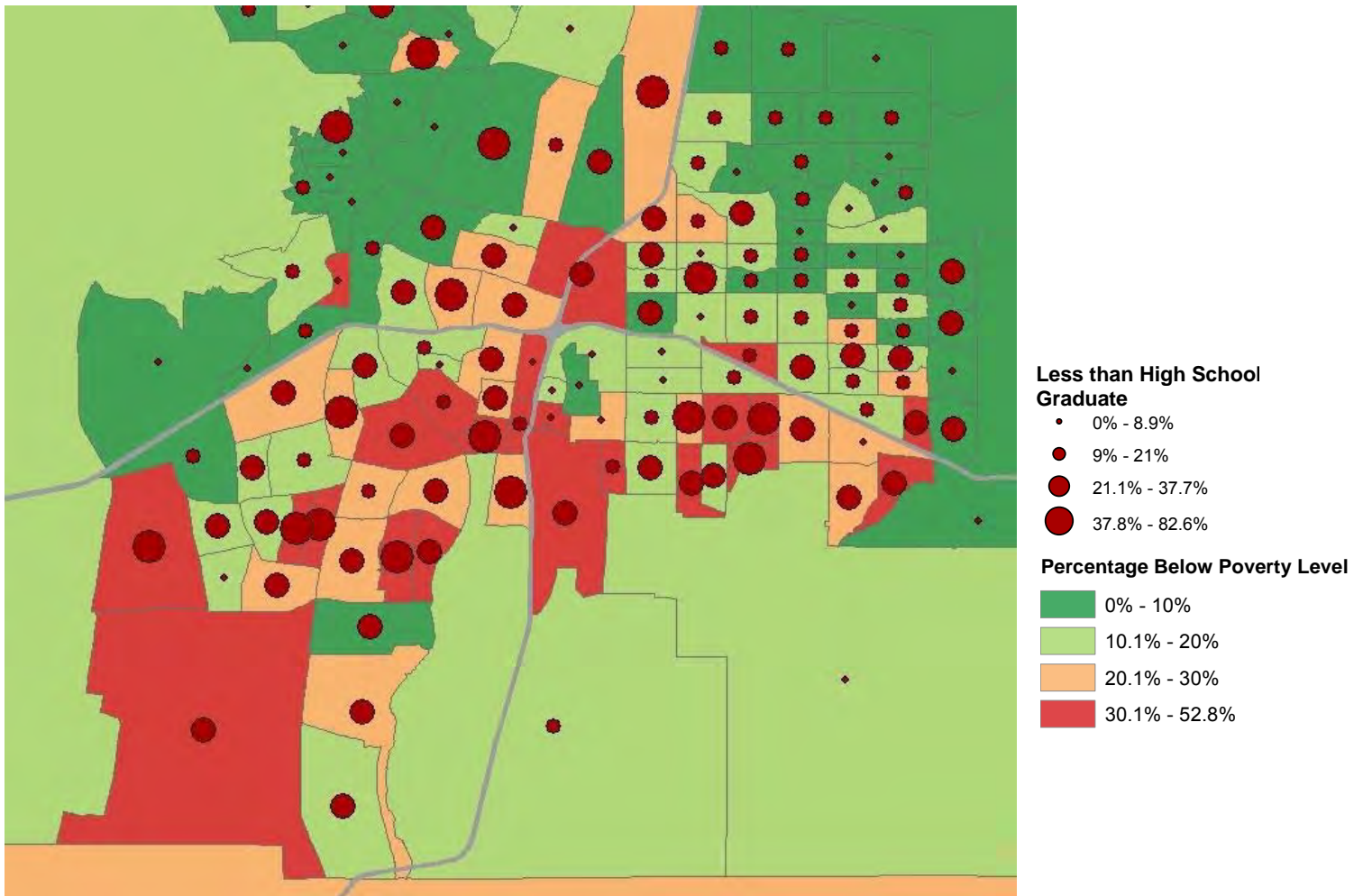
Focusing on New Mexico's Critical Areas of Concern

“The complete education gives one not only power of concentration, but worthy objectives upon which to concentrate.”

CEPR's Approach For Using Data To Help Our Communities Address Their **“Worthy Objectives”**

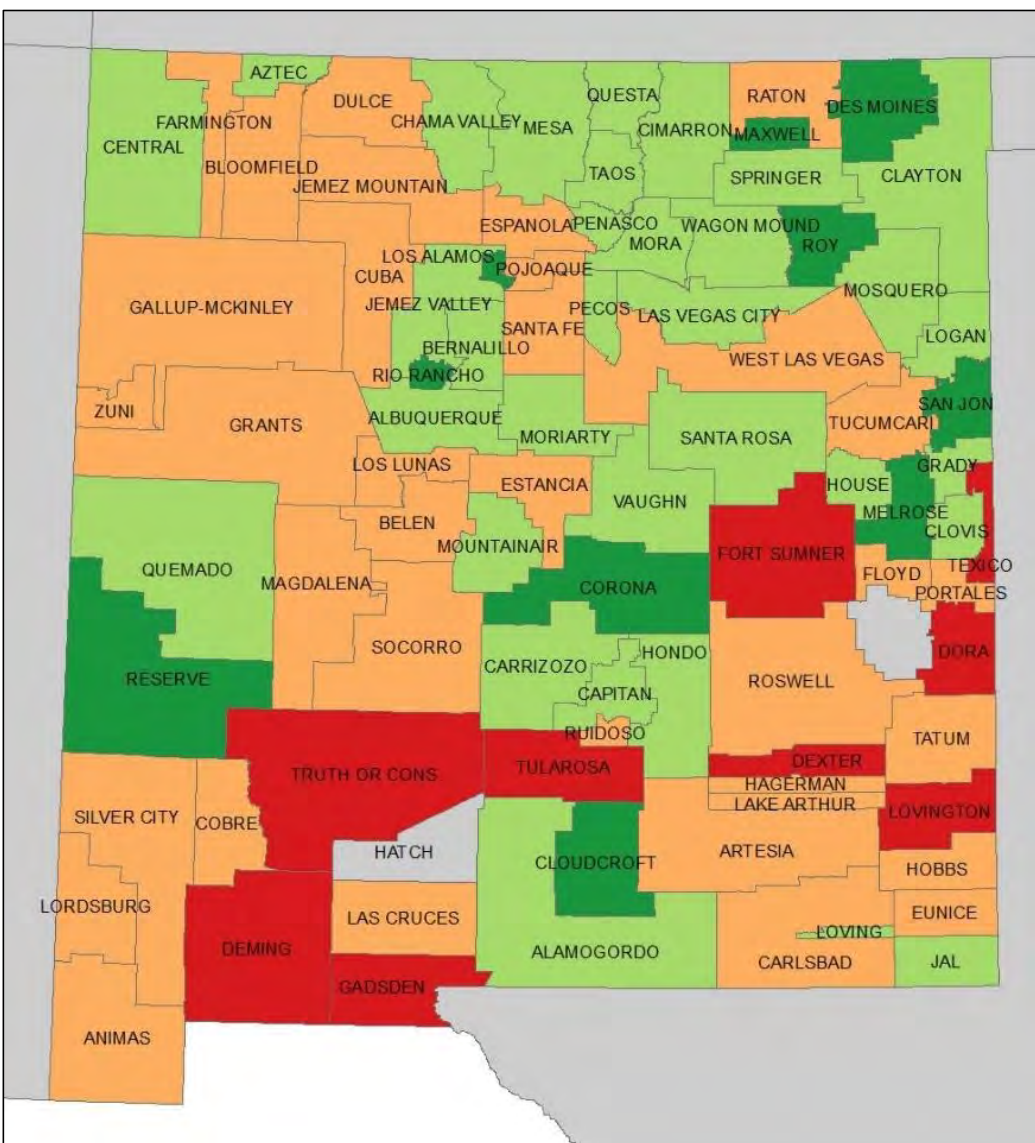
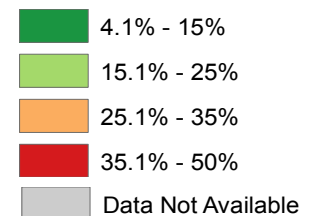
1. What are the most important issues facing our communities?
2. What local, state, and national help us address these issues?
3. How can we display the data in ways that enhance people's understanding of the issues and bring them to the table to solve them together?
4. How can we analyze the data to highlight priorities, deploy resources, and monitor impact?
5. How can we work with people to help strengthen advocacy and accountability?

Percentage of Individuals Living Below Poverty Level with Less than High School Education



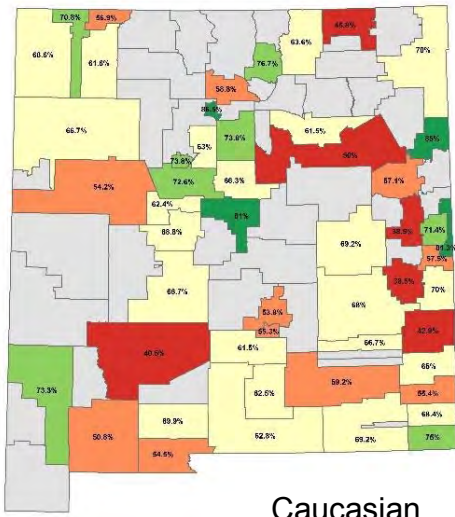
Percentage of Birth Mothers Without a High School Diploma, by New Mexico School District

Research has shown a link between parental education levels and child outcomes such as educational achievement and attainment.

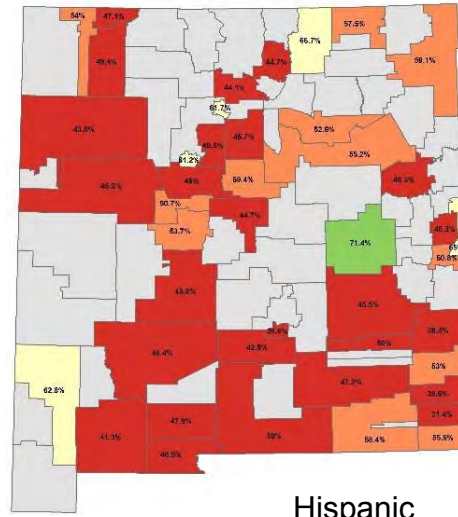


Source: New Mexico Birth Certificate Database, Bureau of Vital Records and Health Statistics, New Mexico Department of Health. Taken from New Mexico Community Data Collaborative. 2012.

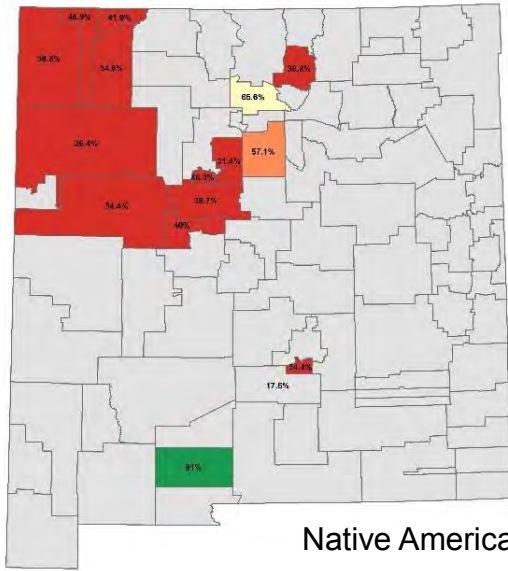
3rd Grade Reading Proficiency, by Ethnic Group



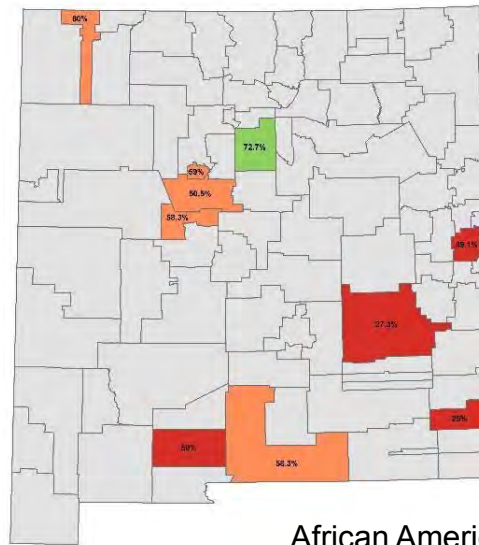
Caucasian



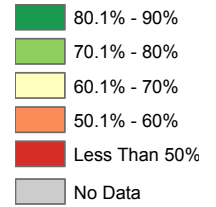
Hispanic



Native American



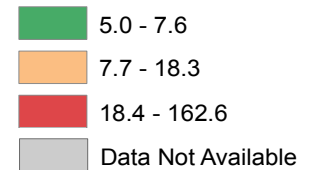
African American



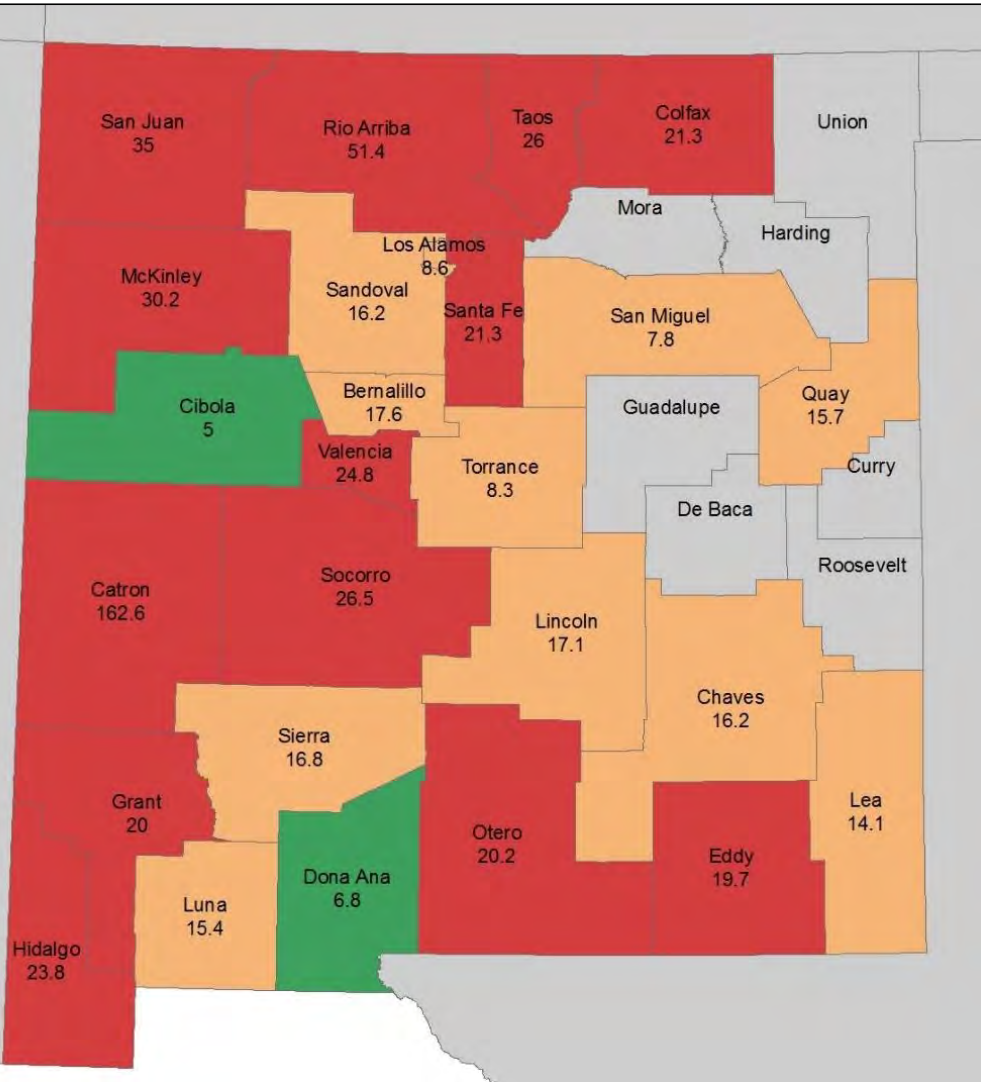
Source: New Mexico Public Education Department, NMSBA Proficiencies By Grade, All Students, School Year 2011-2012.

Youth Suicide Rate, 15-19 Years of Age, by County

Suicide Deaths Per 100,000
Population Ages 15-19



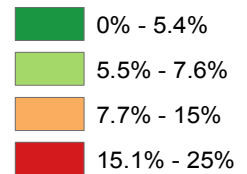
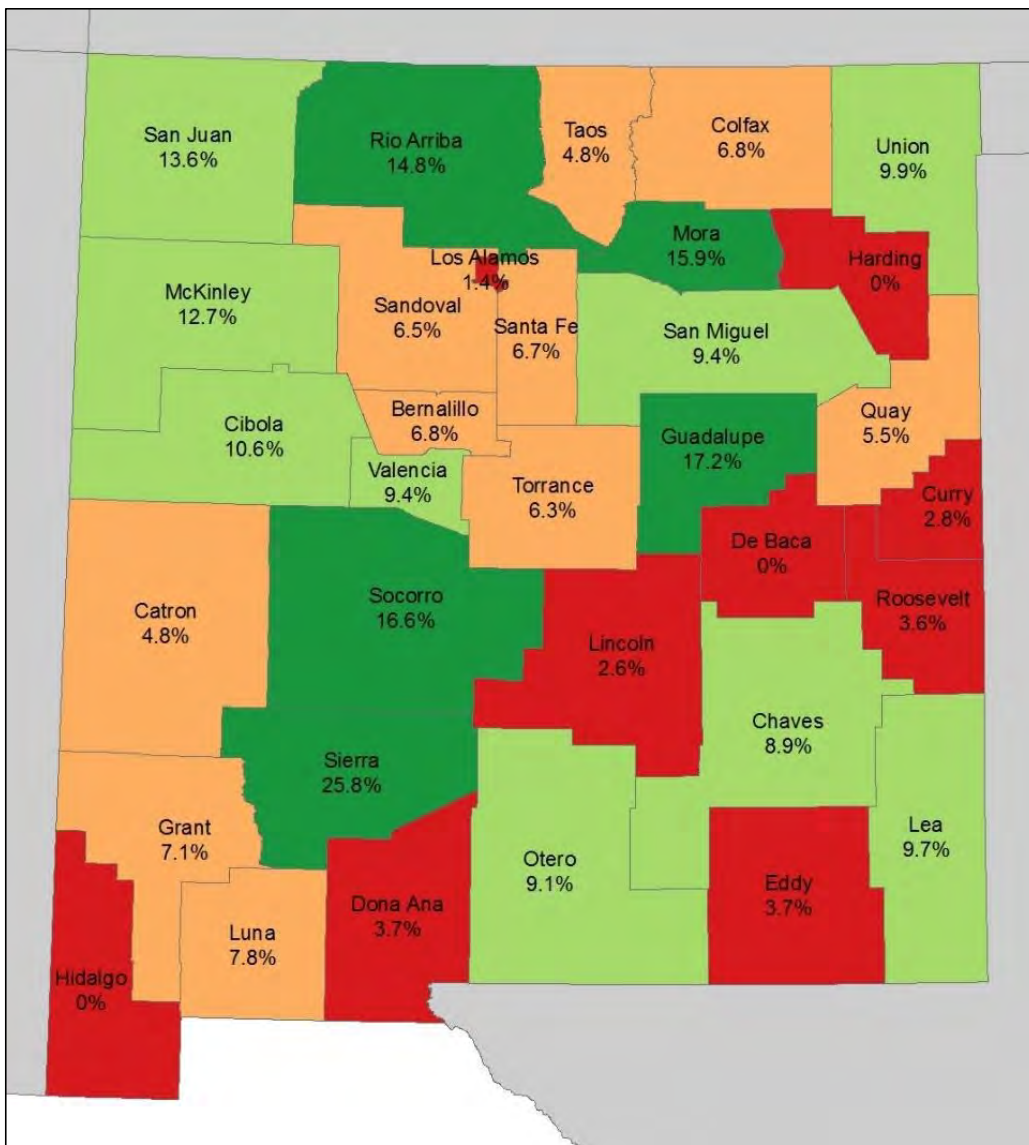
Counties shaded **green** have rates below the national average of 7.6. Counties shaded **orange** have rates above the national average but below the state average of 18.3. Counties shaded **red** have rates above both the state and national averages.



Source: New Death Certificate Database, Bureau of Vital Records and Health Statistics, New Mexico Department of Health. The suicide rate for each county is averaged over the time period 2003 to 2012 and includes all New Mexico residents, ages 15-19. The national average is based on data from the Centers for Disease Control and Prevention over the time period 1999 to 2007 and includes all youth, ages 15-19.

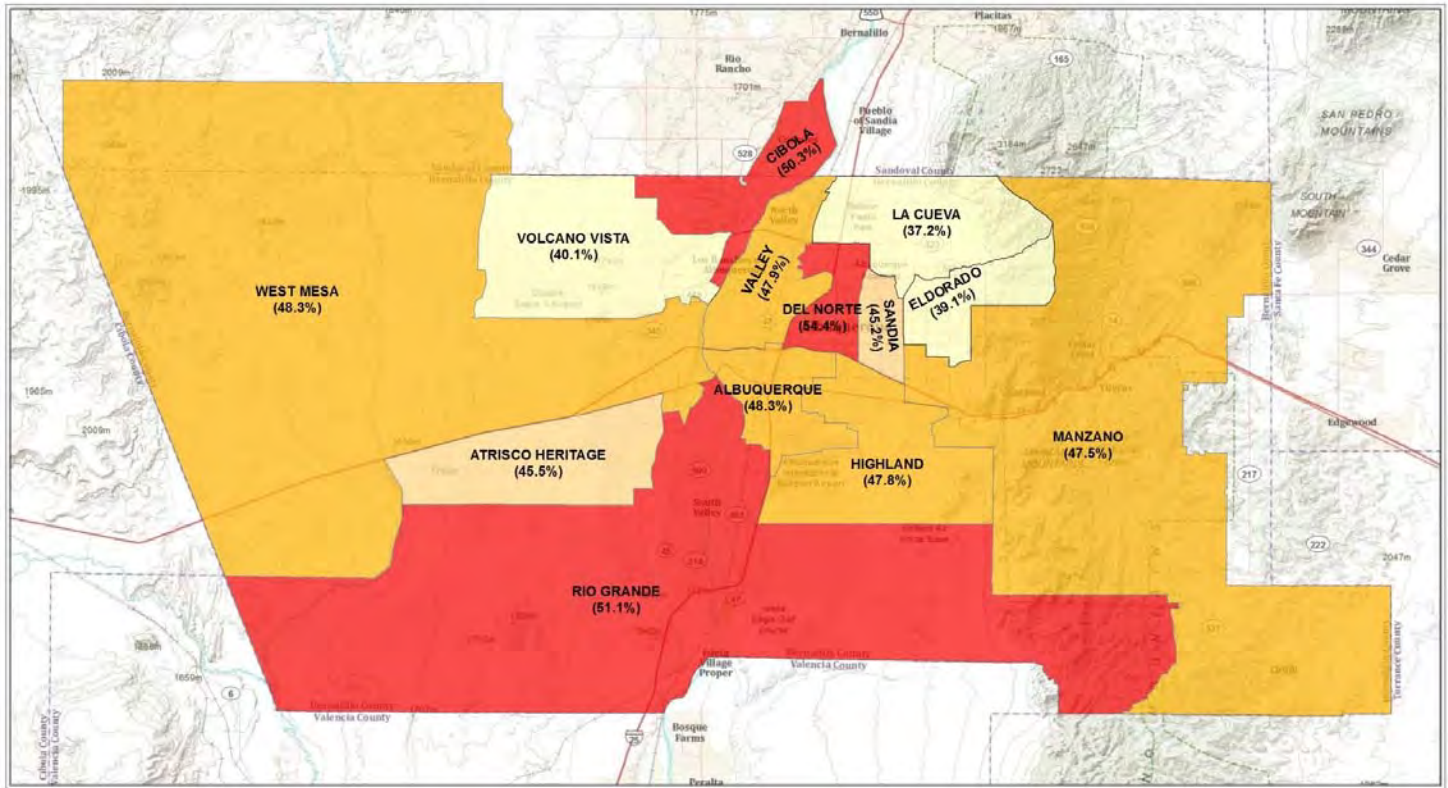
Percentage of 16-19 Year Olds Not in School or Labor Force, By County

National average = 5.4%
State Average = 7.6%



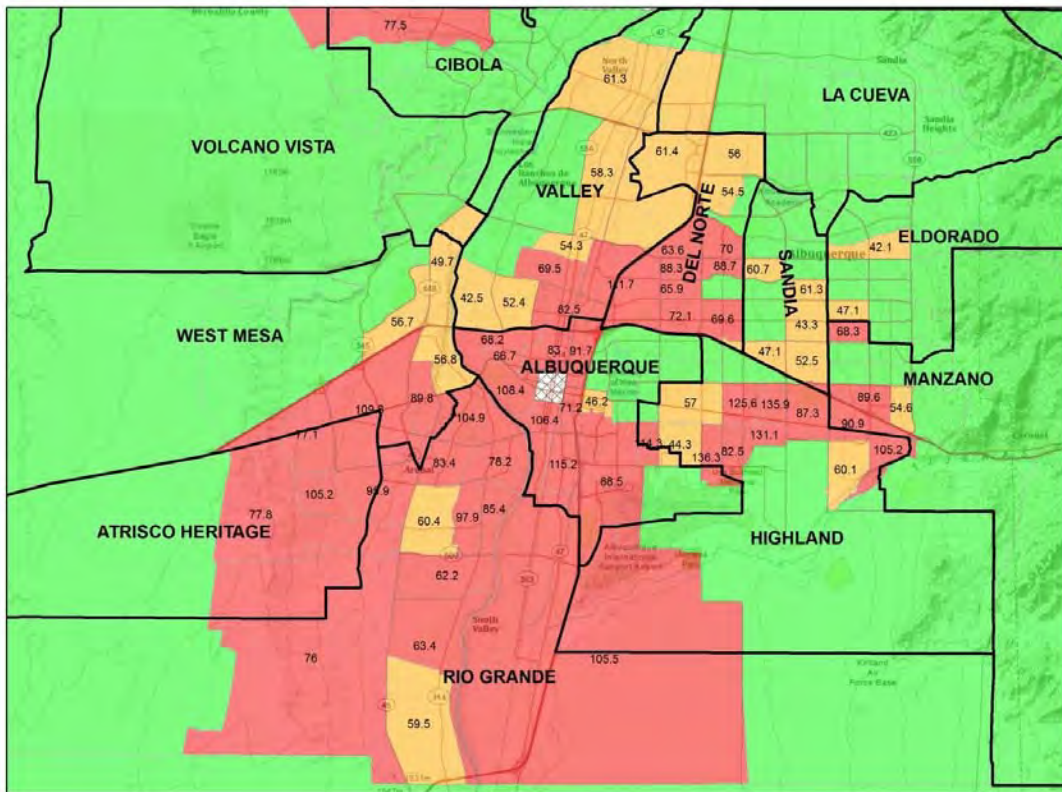
Source: U.S. Census, American Community Survey 2008- 2012, 5-Year Estimates. Table B14005. SEX BY SCHOOL ENROLLMENT BY EDUCATIONAL ATTAINMENT BY EMPLOYMENT STATUS FOR THE POPULATION 16 TO 19 YEARS

Percentage Of Albuquerque High School Students Who Have Had Sexual Intercourse



Source: New Mexico Youth Risk and Resiliency Survey, 2009, New Mexico Departments of Health and Public Education and U.S. Centers for Disease Control and Prevention (CDC). Students were asked, "During your life, with how many people have you had sexual intercourse?" The percentage reported here reflects respondents who answered one or more people.

Teen Birth Rate In Albuquerque, Ages 15-19



■ Less than 40 per 1000 (below nat'l avg.)
 ■ 40 - 62 per 1000 (above nat'l avg.)
 ■ Greater than 62 per 1000 (above state & nat'l avg.)

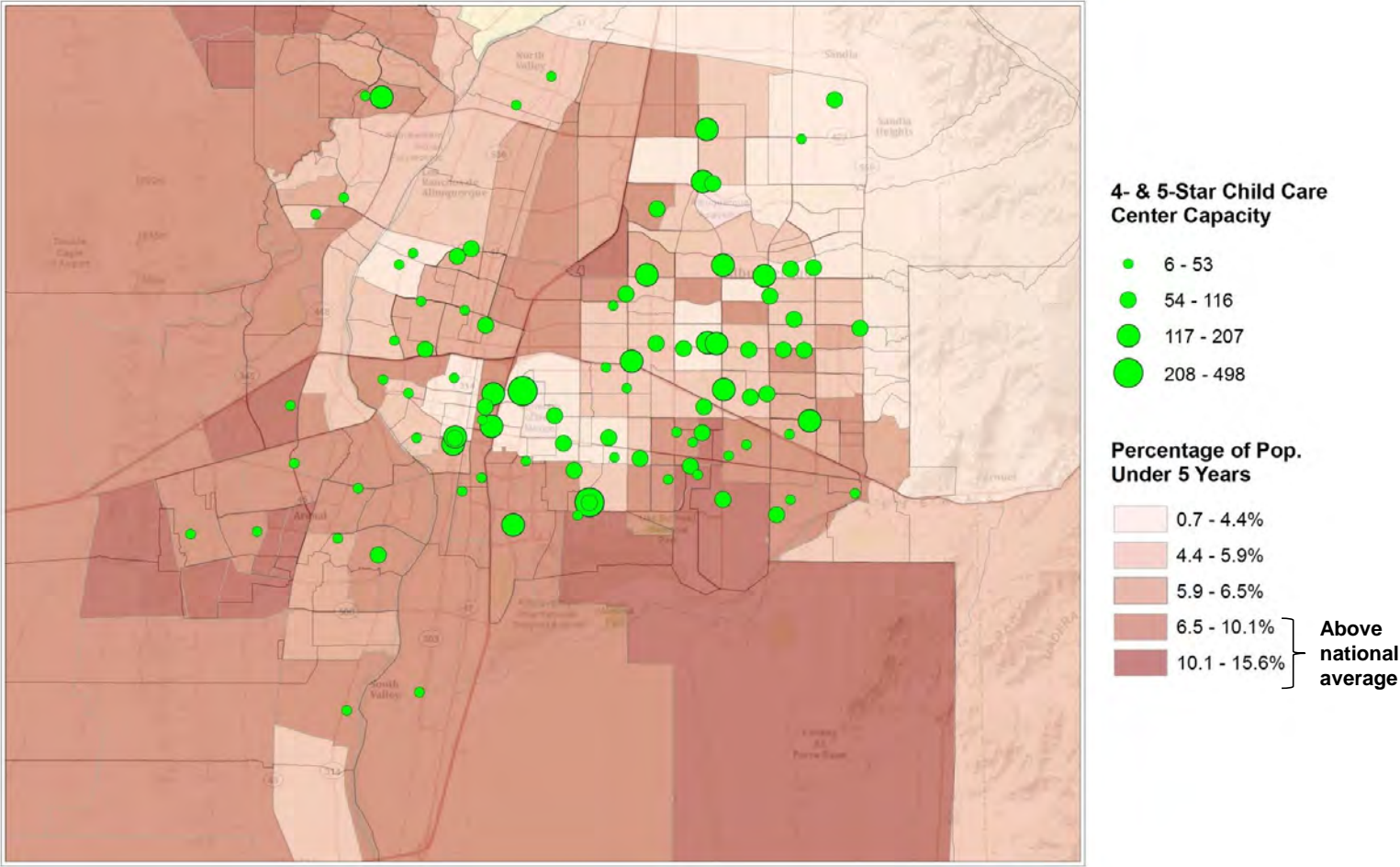
Poor Data Quality

The data point in each census tract represents the number of live births to teen women per 1000 teen women, over the period 2001-2005.

For example, the census tract in the center with a teen birth rate of 106.4 means that there were 106 live births to teen women for every 1000 teen women who live in the census tract.

Source: New Mexico Community Data Collaborative. The rates shown here reflects the average number of children per 1000 women born to teen mothers (ages 15-19) between 2001 and 2005. Rates are reported by census tract; high school boundaries are overlaid to provide perspective. In 2005, the statewide teen birth rate was 62 per 1000, and the nationwide rate was 40 per 1000 (Kids Count Data Center, <http://datacenter.kidscount.org>).

Capacity Of 4- And 5-Star Licensed Child Care Centers In Albuquerque

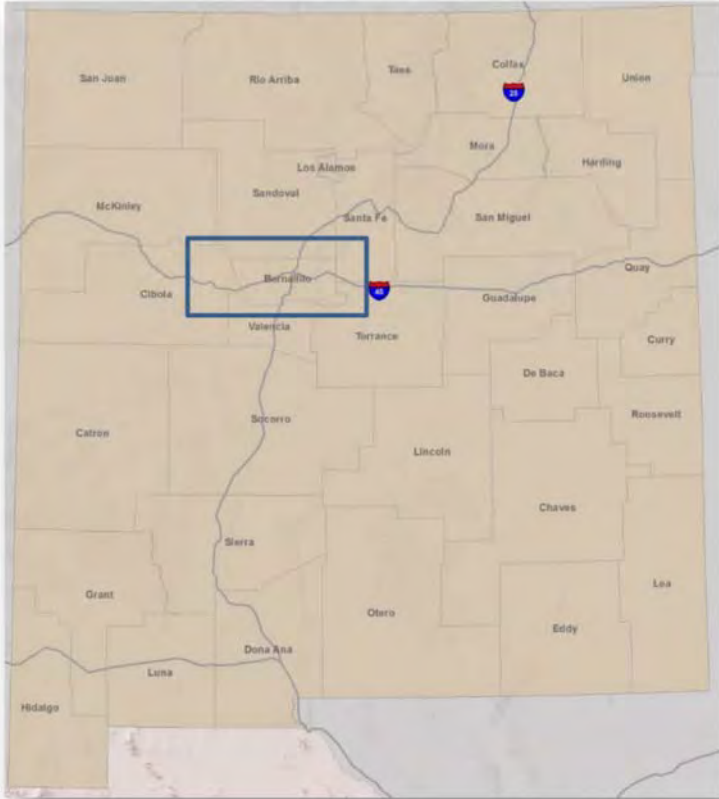


Source: New Mexico Community Data Collaborative, December 2010. Enrollment data are reported by program site. Elementary school boundaries are overlaid to provide perspective.

Changing the Narrative

*“Education must enable one to sift and weigh evidence,
to discern the true from the false,
the real from the unreal, and the facts from the fiction.”*

Our State



Our City



Our Neighborhoods



Disparities between Enrollment and AP Enrollment, By Subgroup

APS High Schools

2009-10 & 2011-12 School Years

Survey_Year

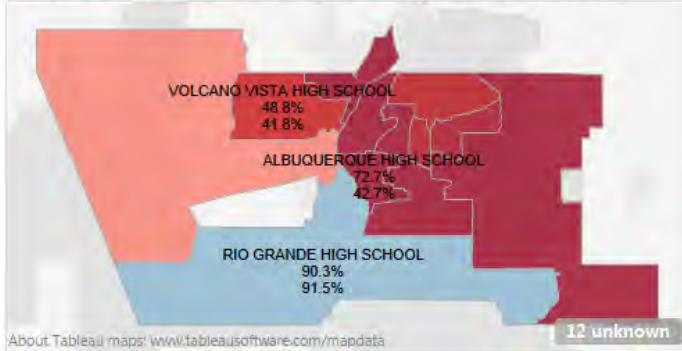
2009

Subgroup

Hispanic

2009 - Hispanic

Percentage AP Enrollment vs. Percentage Total Enrollment



Percent Disparity



School_Name

RIO GRANDE HIGH SCHOOL

WEST MESA HIGH SCHOOL

VOLCANO VISTA HIGH SCHOOL

LA CUEVA HIGH SCHOOL

ATRISCO HERITAGE ACADEMY

SANDIA HIGH SCHOOL

ELDORADO HIGH SCHOOL

DEL NORTE HIGH SCHOOL

CIBOLA HIGH SCHOOL

VALLEY HIGH SCHOOL

HIGHLAND HIGH SCHOOL

MANZANO HIGH SCHOOL

-20.0% -15.0% -10.0% -5.0% 0.0%

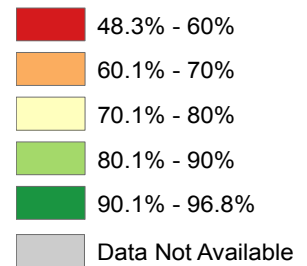
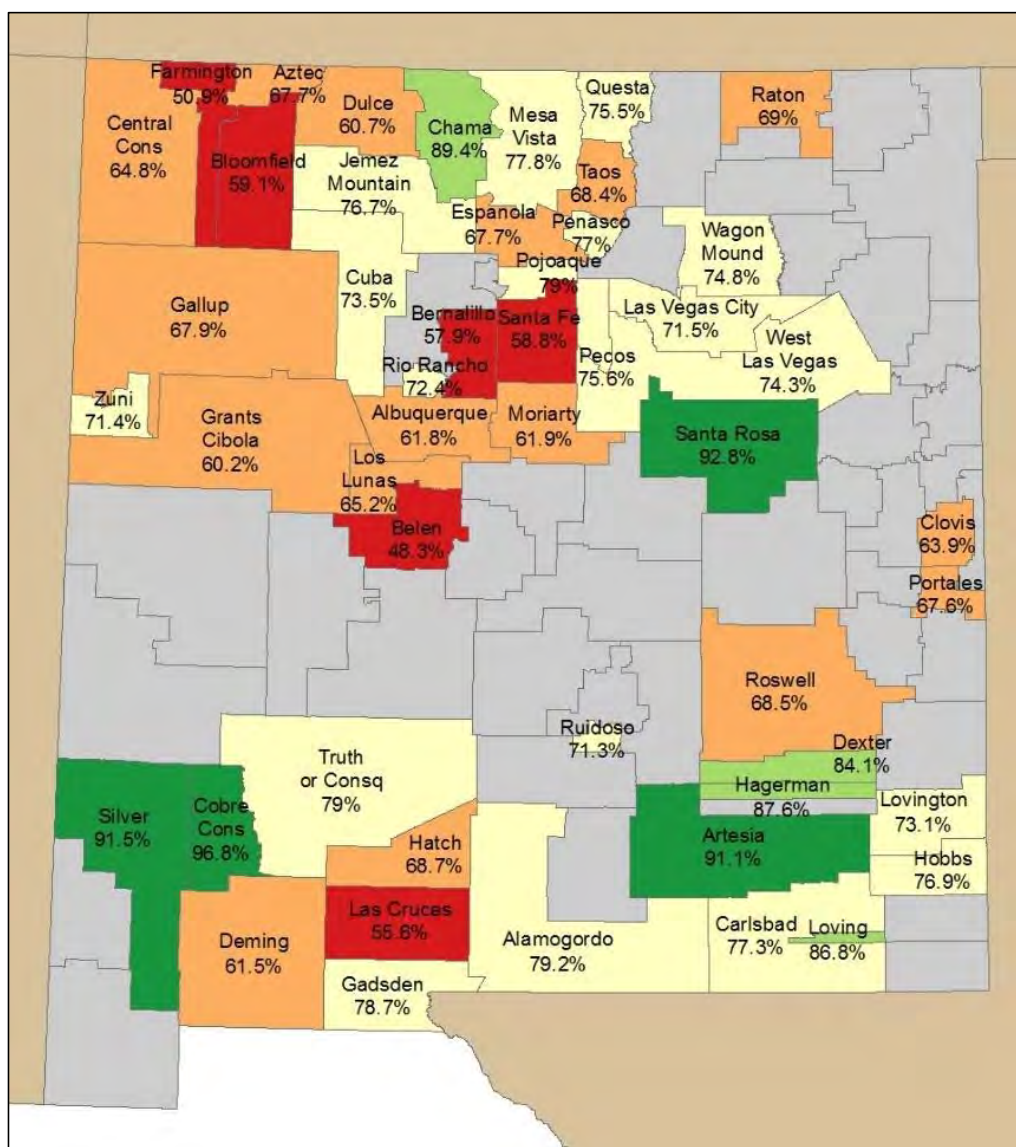
Percent Disparity

VOLCANO VISTA HIGH SCHOOL: 2009



Four-Year High School Graduation Rate, English Language Learners (ELLs), Class of 2013, By School District

Statewide ELL = 54.4%
Statewide All Students = 70.3%



One Of The Most Important Disparities In Doña Ana Are The Differences Between The Academic Proficiency Levels Of Students Who Are English Language Learners (ELL) And Other Students. The Ability To Speak Dual Languages Is A Unique New Mexican Asset To Be Cultivated.

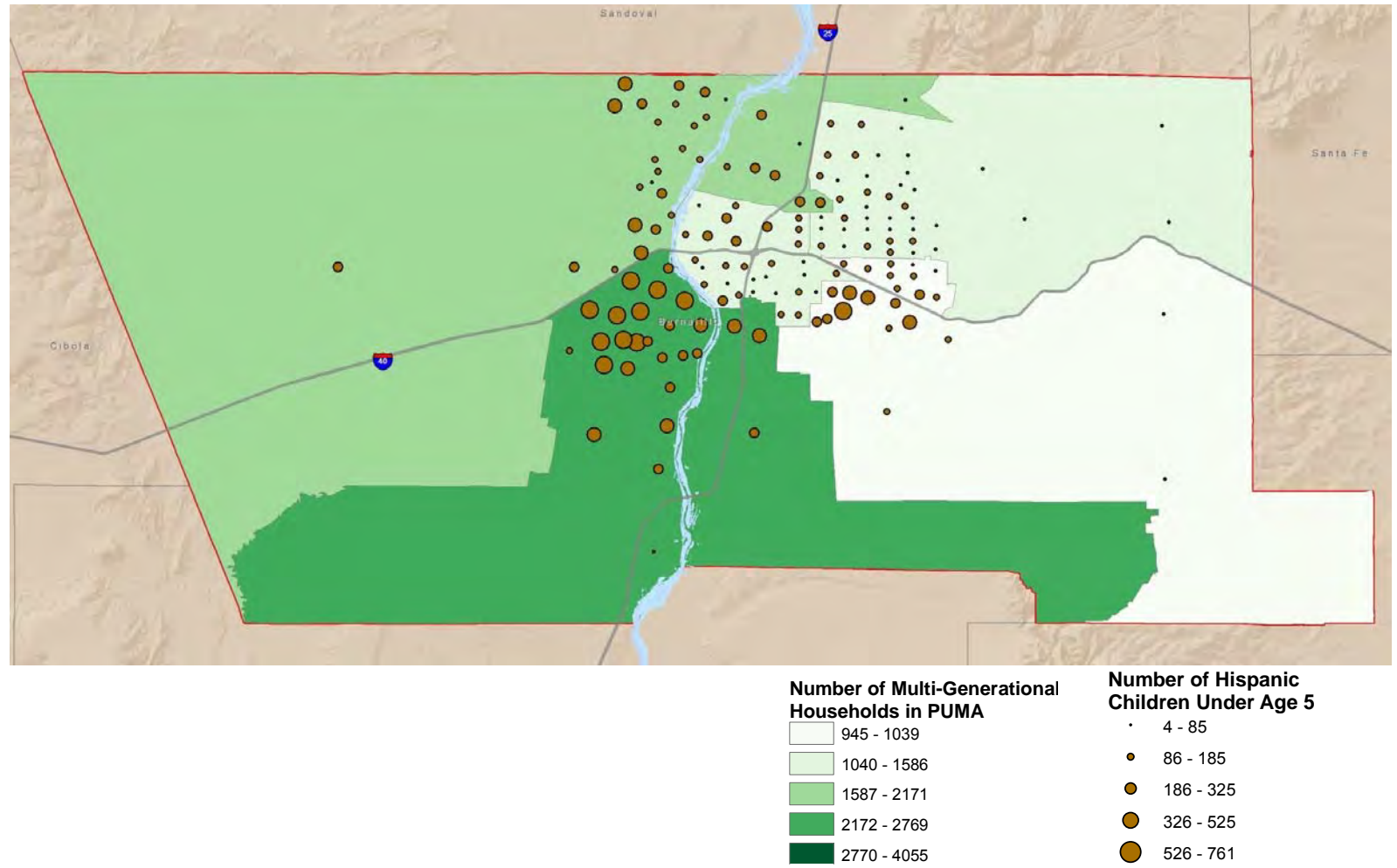
Human Capital Development In The Paso del Norte Region

“The ability to fuel local growth by cultivating relevant skills is the best guarantee that the region will thrive in the future. A region that wants to be globally competitive needs to have a highly skilled workforce and knowledge-based economy In order to break out of the low wage equilibrium. The Paso del Norte Region needs to improve the educational attainment levels and widen access to higher education ...” (p. 17, The Paso Del Norte Region, Mexico and the United States. OECD, 2010).

The Paso del Norte Region

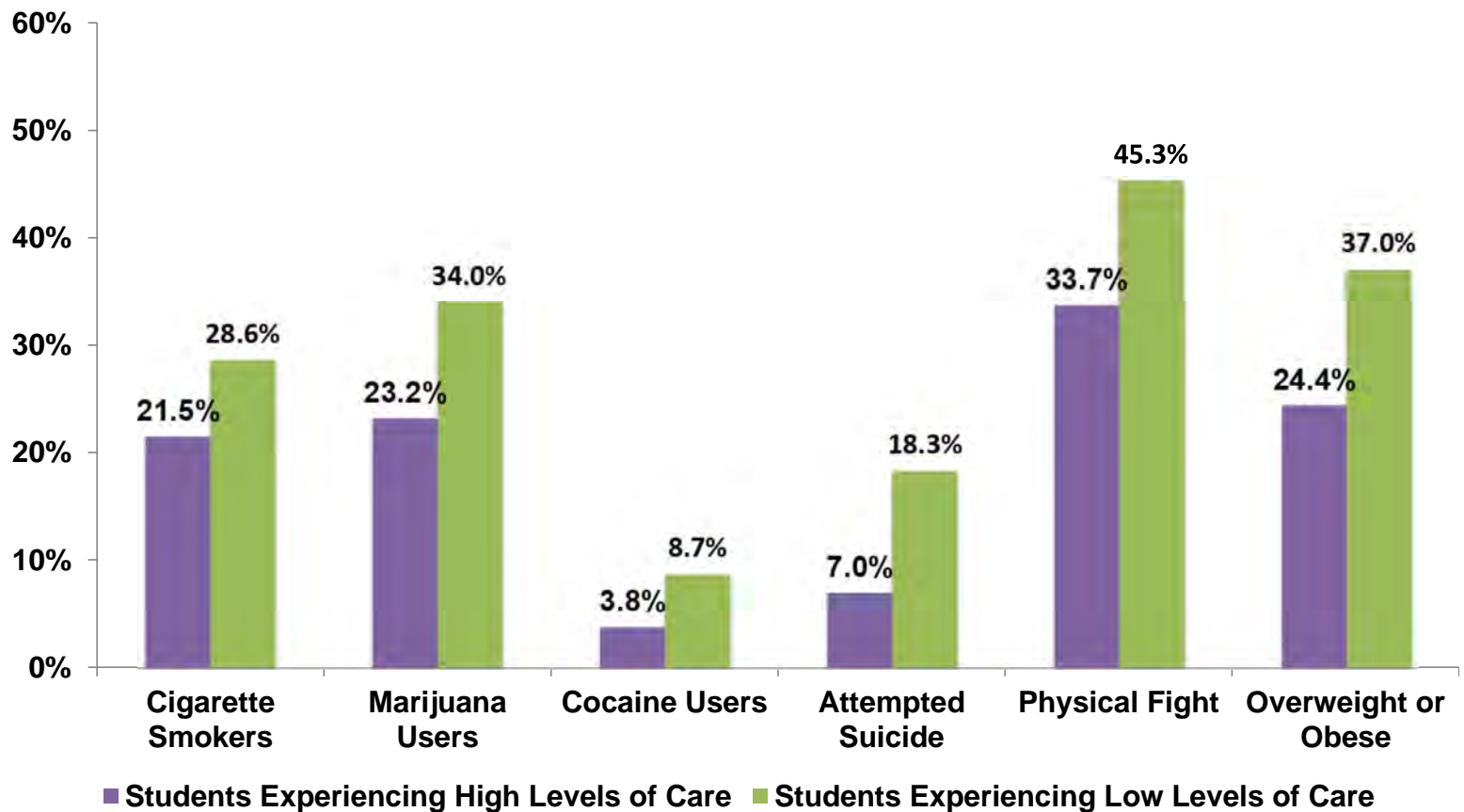


Community Assets: Multi-Generational Households

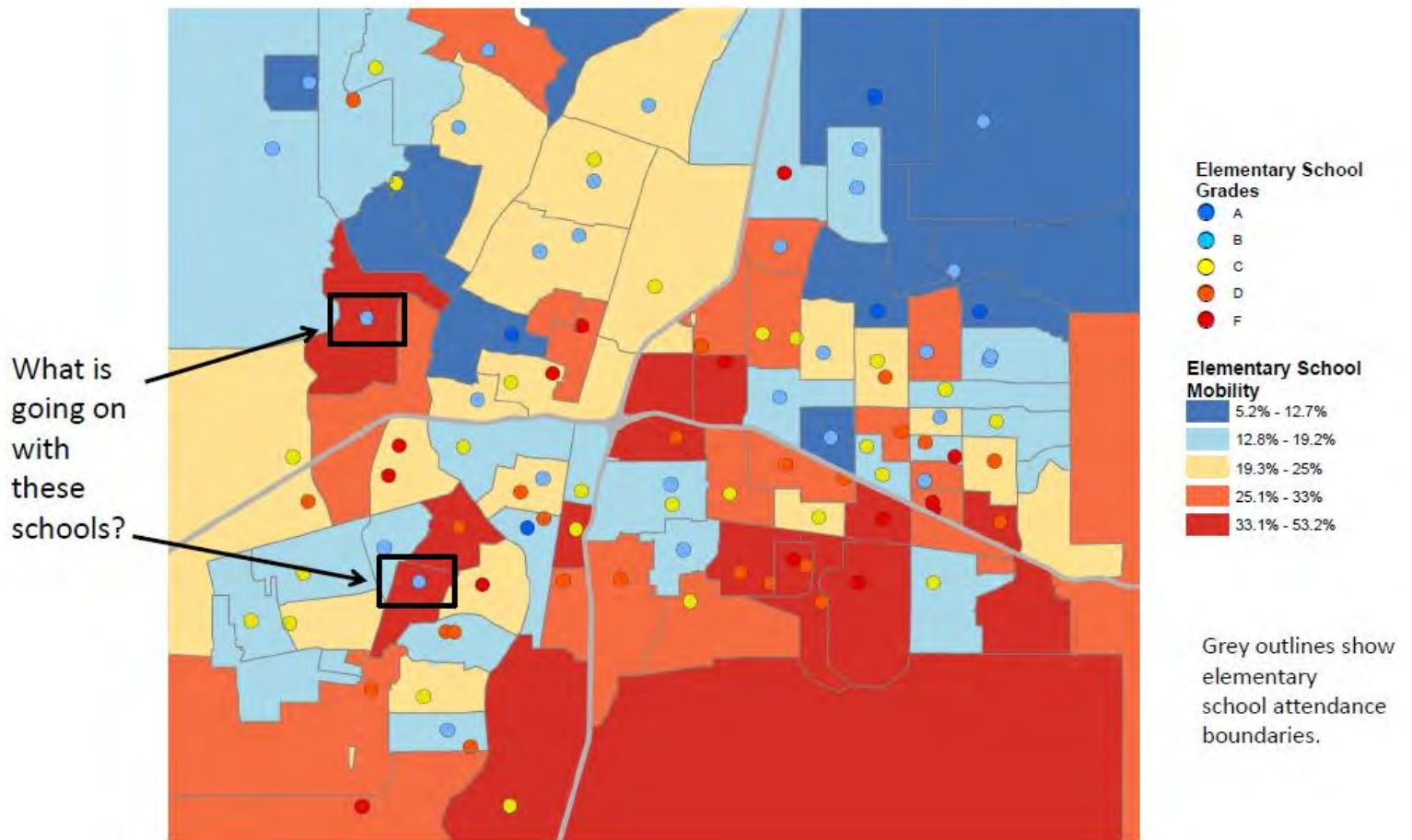


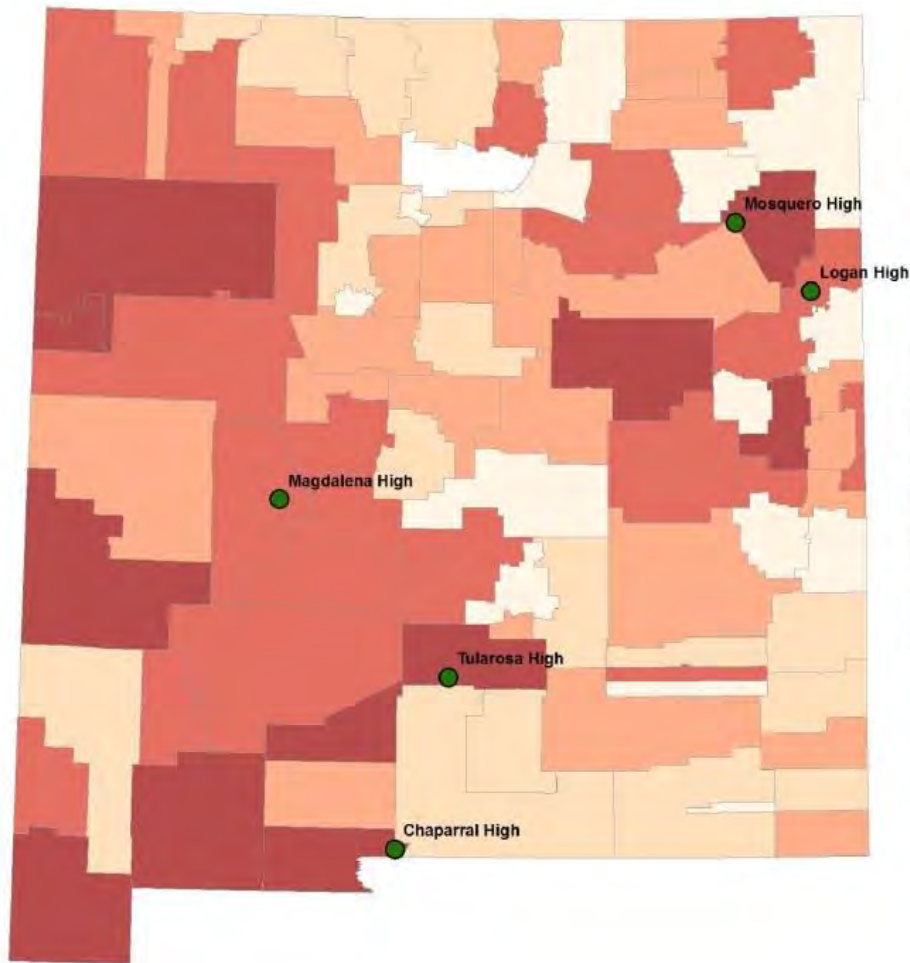
Source: American Community Survey Public Use Microdata Sample, 2011. Multi-generational households include households with at least 3 generations living in the same dwelling.

Key Outcomes of High School Students Experiencing High & Low Levels of Caring and Supportive Relationships With Adults in the Community, New Mexico, 2009



Relationship Between Elementary Grades And Elementary Student Mobility





Are These Schools Beating the Odds?

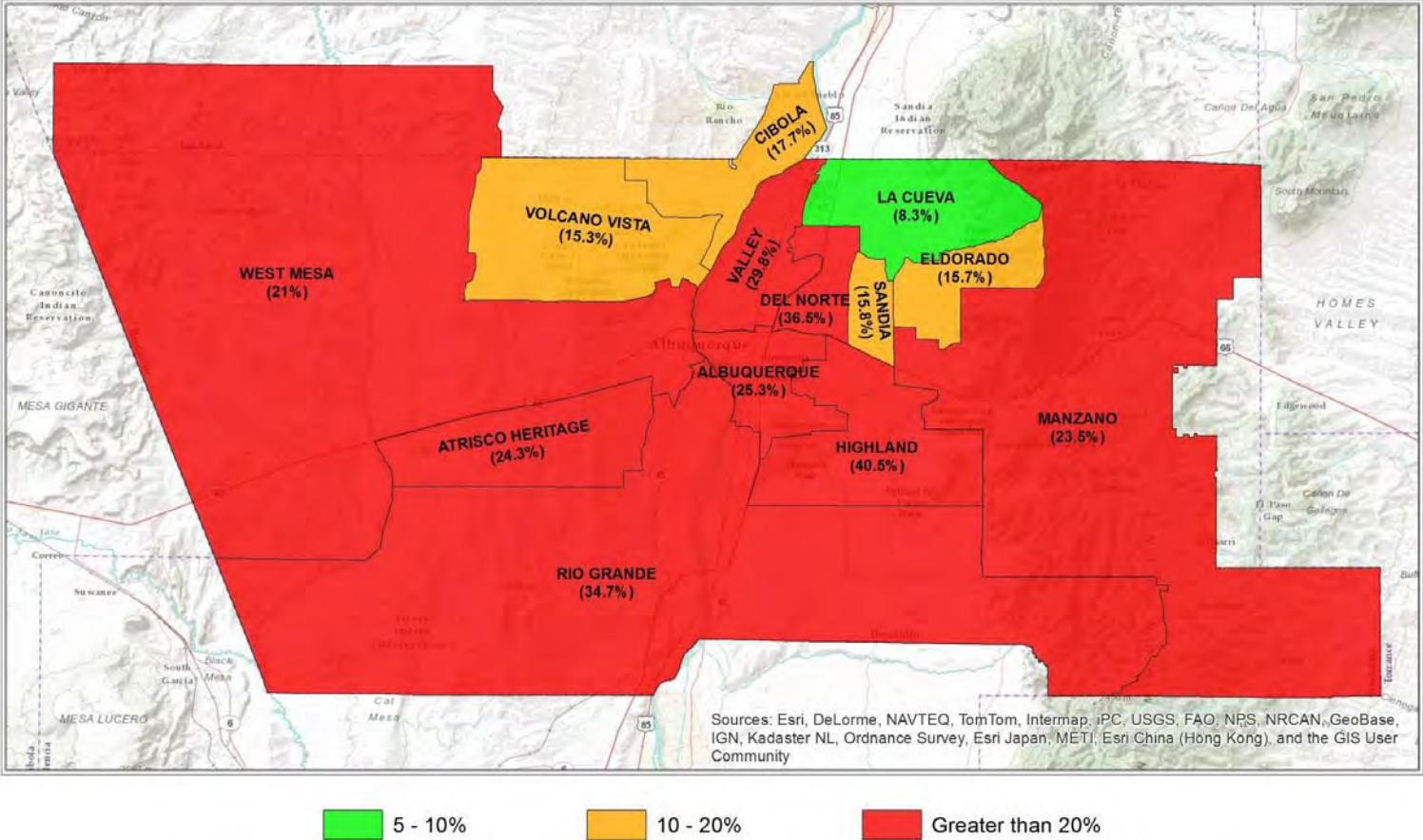
**Graduation Rate > 70%,
Remediation Rate At UNM < 30%,
Child Poverty > 30%**

High School	Total School Enrollment (2011-2012)	Graduation Rate	Remediation Rate
Chaparral High	1,080	77.8%	25.0%
Logan High	127	86.6%	16.7%
Magdalena High	127	72.9%	28.6%
Mosquero High	27	98.0%	0.0%
Tularosa High	273	86.5%	14.3%

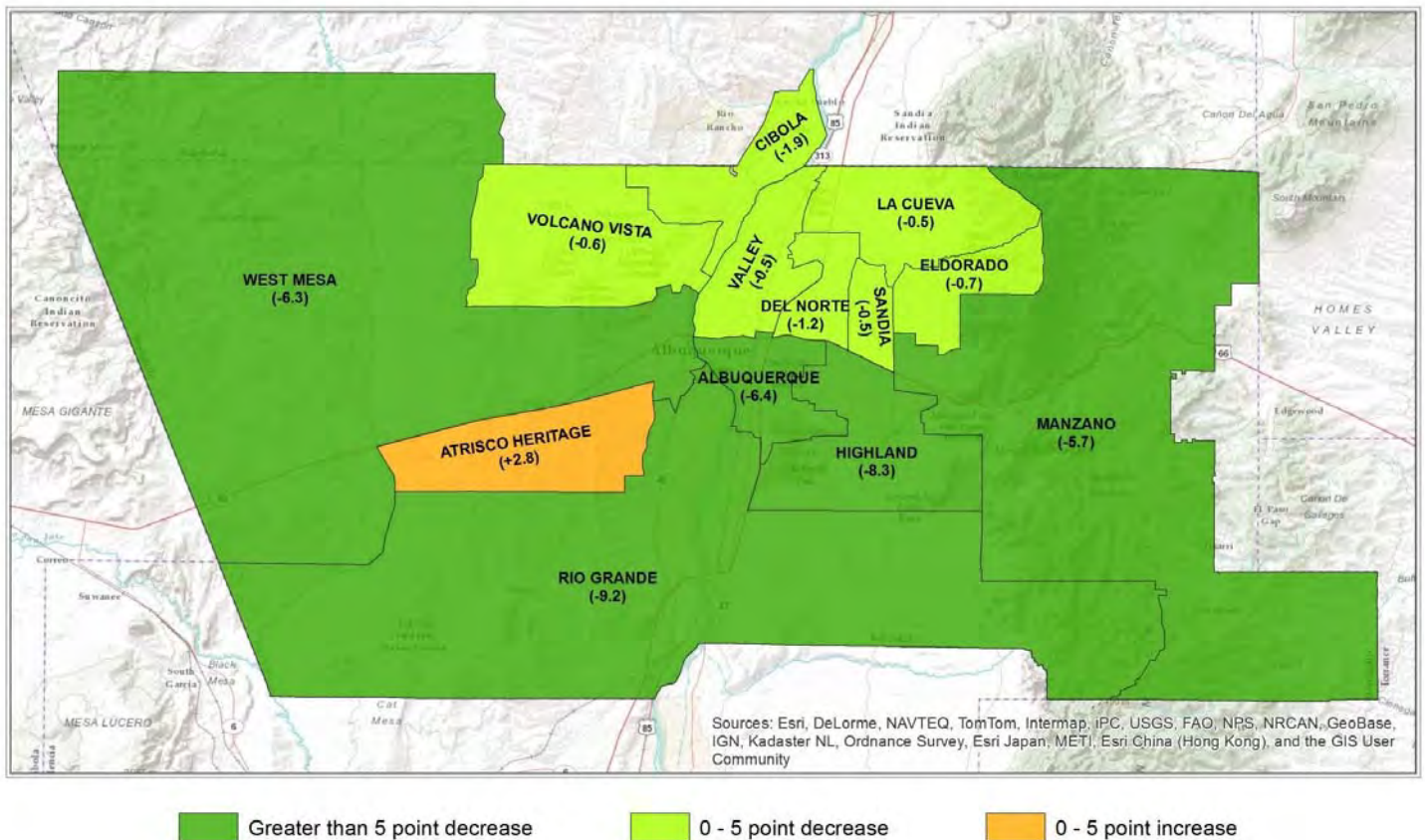
Percent of Children in Poverty in District

- 0% - 10%
- 11% - 21%
- 22% - 30%
- 31% - 39%
- 40% - 51%

High School Habitual Truancy Rates: 2011-2012



High School Habitual Truancy Rates: Improvement from 2010-2011 to 2011-2012



Develop The Data Tools To Strengthen The Civic Debates

“The function of education, therefore, is to teach one to think intensively and to think critically.”

What are the Advantages?

- All kinds of visualizations in one place
 - Maps
 - Charts
 - Tables
- Ingests all kinds of data sources and can update on the fly
 - Text files
 - Spreadsheets
 - Relational databases
- Interactive
 - Empowers your audience with the ability to exercise their own critical thinking skills

New Mexico School District Demographic and Educational Data Dashboard

District

CAPITAN

Population	3,896.0
Median Income \$	42,385.0
Percentage Unemployed	5.9
Percentage Below FPL	7.4
Percentage Insured	85.7
Percentage HS Grad or Higher	92.5
Percentage Bachelors or Higher	24.6
Births to 15-19 per...	0.0
Percentage of Births to Unmarried Women	0.0
Percentage Foreign Born	3.2
Percentage Spanish Spoken in Home	13.7

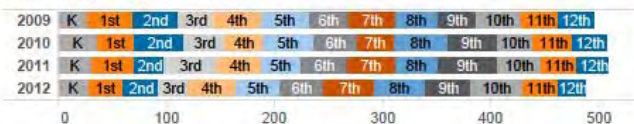
Enrollment By Race

2008 2009 2010 2011

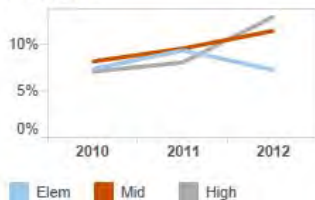


African Am. American In. Asian Caucasian Hispanic

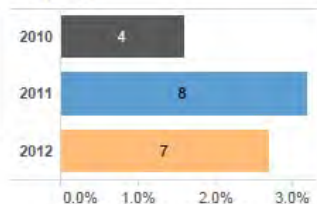
Enrollment By Grade



Truancy

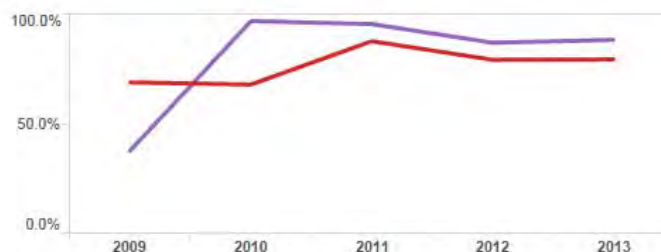


Dropout



Graduation Rates (Select 4-Year or 5-Year)

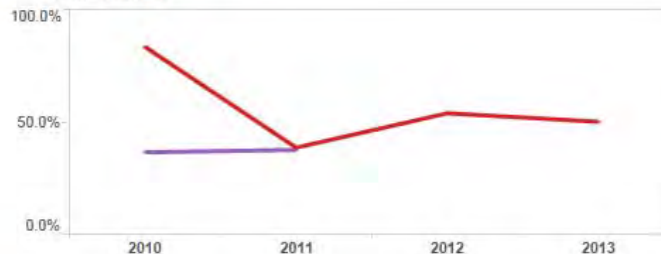
4YGrad



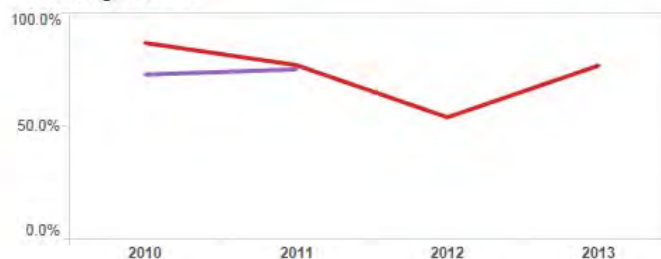
SBA Performance (Select Grade-Level)

3

Math: Grade 3



Reading: Grade 3

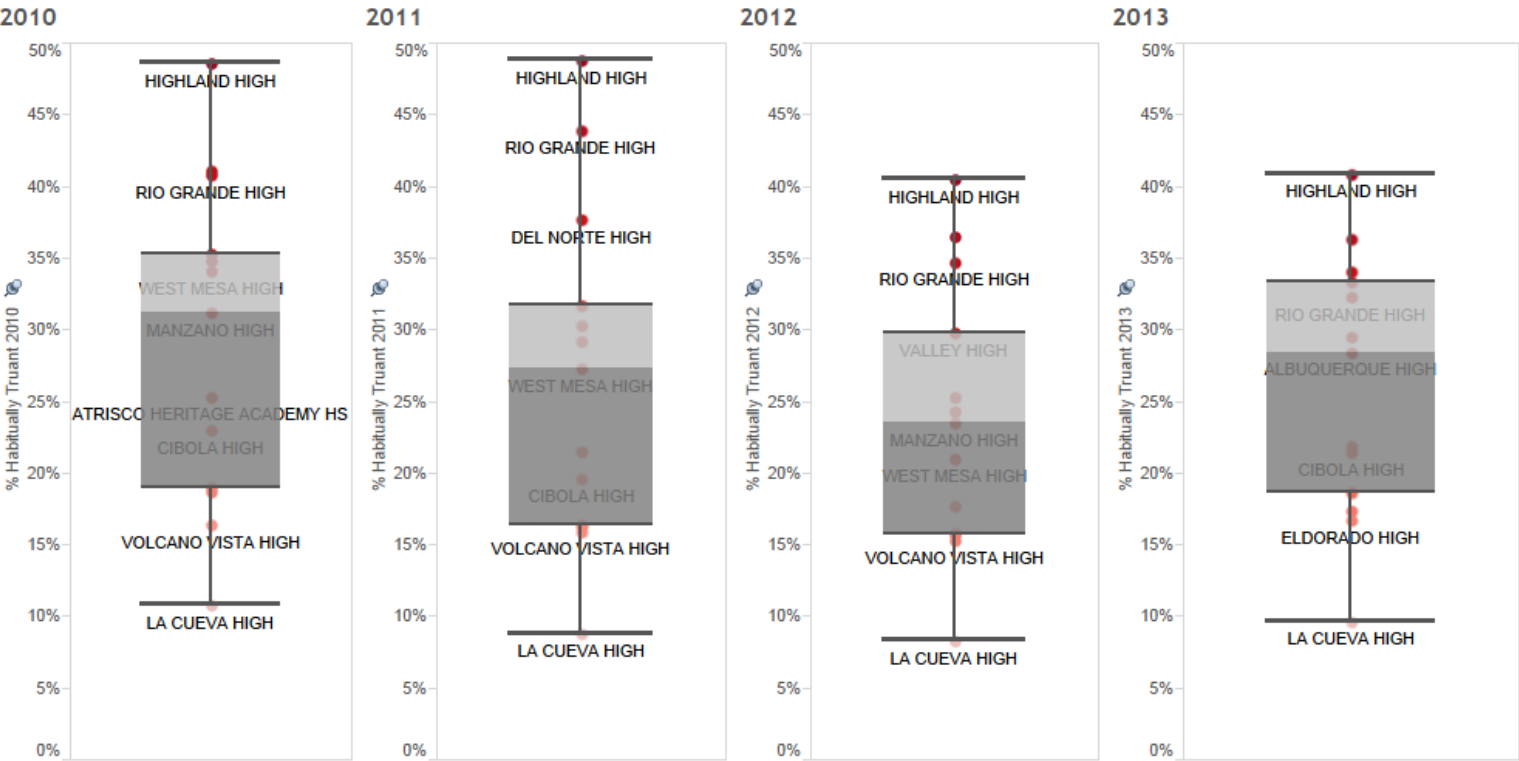


APS Habitual Truancy: 2010-2013

Box and Whisker plots graphically show data in relation to sample quartiles. Points represent APS schools. The top of the box shows the third quartile, the bottom of the box shows the first quartile, and the line in the box shows the median value. The upper and lower whiskers show all schools within 1.5 times the interquartile range. Only APS elementary schools show outliers.

Select a Level to View

High School



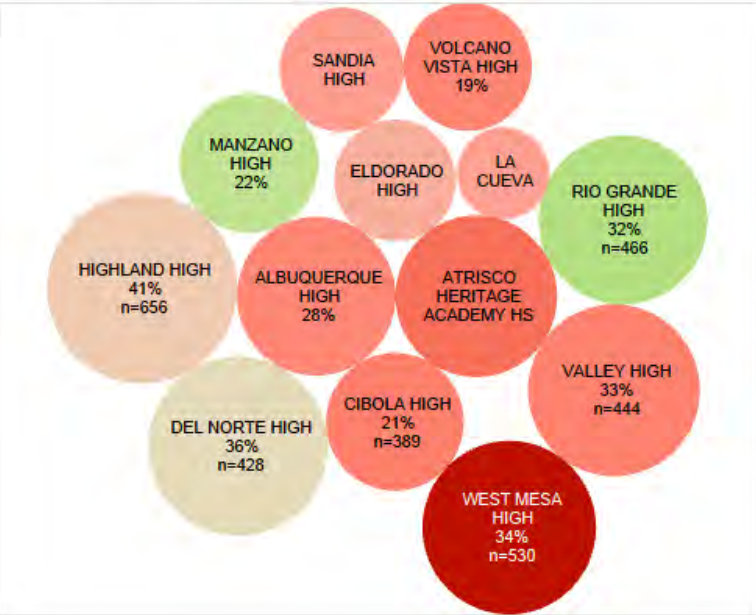
APS Habitual Truancy: 2010-2013

Select a Level

High School

APS High Schools

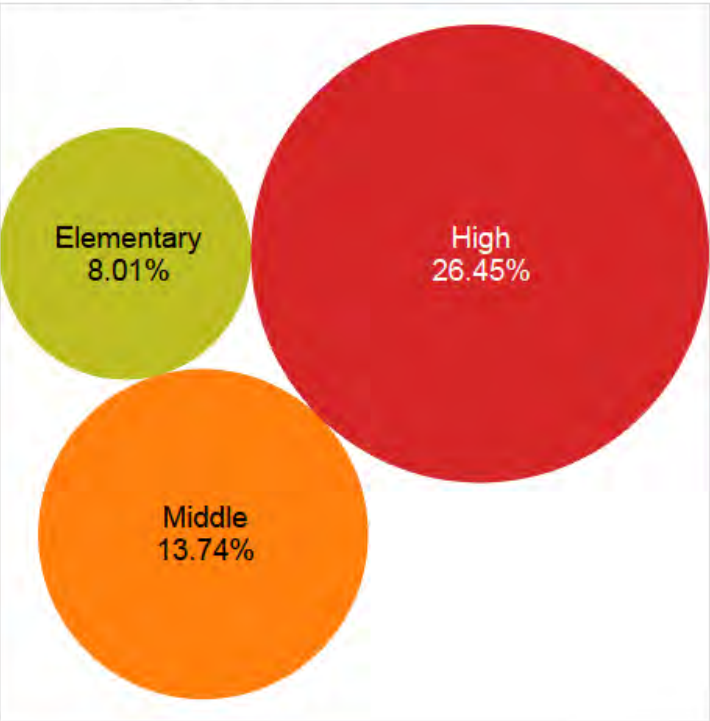
Label: % Habitually Truant in **2013**, # Habitually Truant in **2013**
Dot Color Shows Change from **2012 to 2013** (Red = Increase; Green = Decrease)
Dot Size Reflects Percentage Truant in **2013**



Select a Year (Selecting Multiple Years Will Show Average)

(All)

Average Habitual Truancy Rates, APS Elementary, Middle and High Schools: All



[Table of Contents](#)[Map: County, Grade, Gender](#)[Map: Composite](#)[Variable Comparison](#)[Gender Disparities](#)[Age Disparities](#)

New Mexico Counties Youth Risk & Resiliency Survey, 2011 High School Data Analysis Tool

View YRRS data by County, Grade Level, and Gender

View Multiple Indicators simultaneously by County - Create Composite Z-Scores

Compare Two Indicators by County

View Gender Disparities for Risk and Resiliency at the State Level

View Age Disparities for Risk and Resiliency at the State Level

Source: Green D, Peñaloza L, and FitzGerald C. 2012. New Mexico Youth Risk & Resiliency Survey: High School Survey Results 2011. Epidemiology and Response Division, New Mexico Department of Health, School and Family Support Bureau, New Mexico Public Education Department, and University of New Mexico Prevention Research Center.

Note: Not all YRRS indicators are included in the analyses presented here.

Visualization created by the University of New Mexico
Center for Education Policy Research

For more information, visit www.youthrisk.org

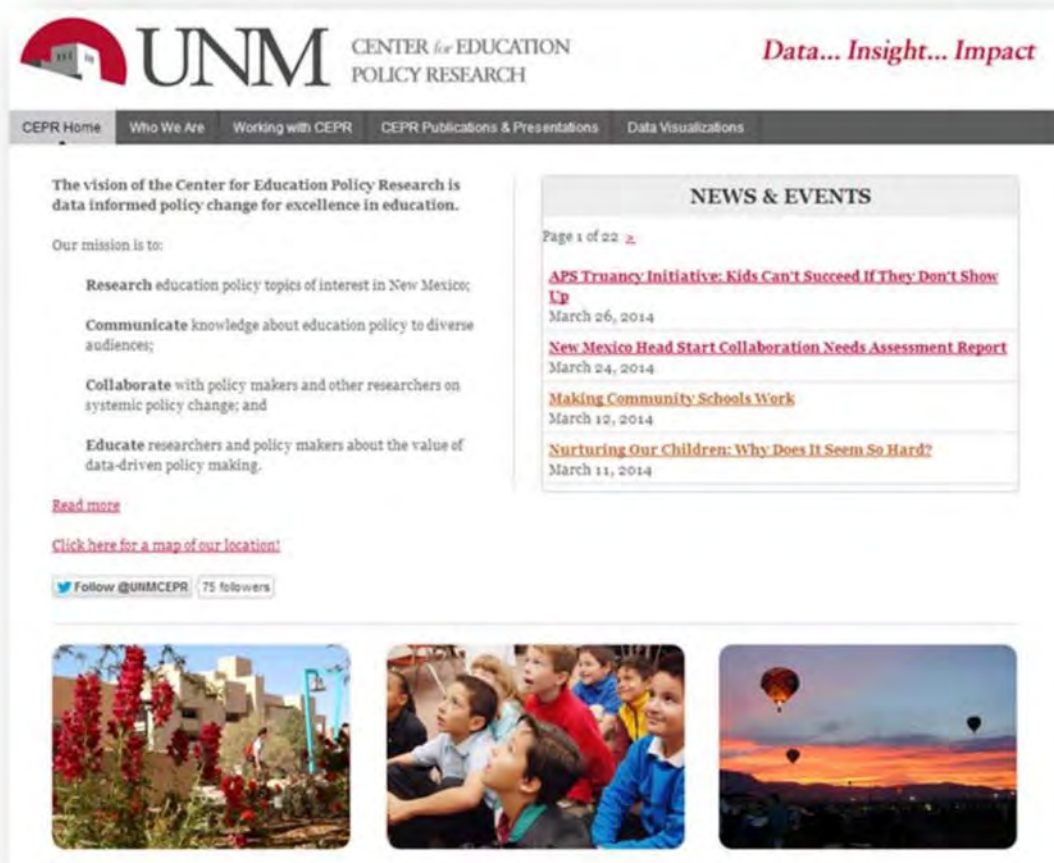


<http://cepr.unm.edu/data-stories/new-mexico-yrrs.html>

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