August, 2010

children's optimal health

Young Children

By Physical and Social Environment

What does the physical and social environment look like for Austin's youngest children and their families?

ACCESS
Austin Community Collaboration to Enhance Student Success

This material was printed by the Safe Schools/Healthy Students Grant for community use.

Young Children Series
Volume 1

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Project Overview

Children's Optimal Health (COH) is a collective leadership initiative to ensure that every child in Central Texas becomes a healthy, productive adult engaged in his or her community. COH works with partner organizations throughout the community to map disparate data sets to help illuminate issues impacting Central Texas children. This project seeks to highlight the geographic distribution of assets and issues of concern for families with very young children.

As part of the Safe Schools/Healthy Students - Austin Community Collaboration to Enhance Student Success (ACCESS) grant, and in keeping with the mission of Children's Optimal Health, it is our hope that the enclosed maps and related analyses be used to help raise community awareness and action to help assure our youngest children have a healthy and safe start in life. The maps presented here are only a starting point. We hope that they will encourage conversation, stimulate brainstorming of solutions and result in a collaborative commitment to action to positively affect the early physical, social and emotional development of young children, and their school readiness by age six.

All of COH's completed mapping initiatives can be found online at www.childrensoptimalhealth.org.

Background

Parents, education and business leaders, and the general public increasingly recognize the importance of the early years in the life of a child for promoting healthy physical, emotional, social, and intellectual development. Despite wide interest, a large number of children between the ages of 0 - 5 years do not have the early experiences they need to develop to their fullest potential.[1]

Why is this an issue in Central Texas?

- Currently, there are approximately 135,000 children under the age of five in Central Texas, a 20% increase from 2000. Nearly half of these children are at risk for poor school outcomes. This trend isn't likely to change. Texas has the fastest growing child population in the country, and the Central Texas child population is growing at twice the state rate.

Growth in Population by Age, 2000 - 2008		
0 - 18 Year Olds		
USA	Texas	Central Texas
2%	15%	31%

Source Data: 2008 American Community Survey 1-Year Estimates

- Furthermore, the low-income student population is growing at twice the rate of the overall Central Texas student population, and English Language Learners are growing at three times the rate.
- Today, between 40% and 60% of kindergarteners in Central Texas score well below expected norms on the Texas Primary Reading Inventory (TPRI) state assessments upon school entry.

Compelling data suggest that children who start behind tend to stay behind, so these overwhelming numbers raise concerns about the future health, productivity, and economic viability of Central Texas

Child development is a result of the interplay between genetic gifts and environmental conditions. The first few years of life are an especially sensitive period for brain development affecting cognition, social, emotional and physical health. A variety of factors can either promote or impede optimal development. Factors that promote development include the access to adequate nutrition and health care; close, nurturing relationships with primary caregivers; and safe and stimulating learning environments. Conversely, the lack of these factors can have profound and long-lasting effects.

Key risk factors for developmental delay accrue from living in poverty, having a single parent, and having a mother with less than a high school education.[2] Other factors which are often associated with poverty, such as high neighborhood crime rates, food insecurity, and lack of high quality educational and support services, add to the stressors that compromise healthy development. Some children are resilient in the face of the most devastating circumstances, but most children are not so fortunate.

The maps included in this packet illustrate the current interplay, at a geographic level, of the community assets (food, child care, health care resources, and educational successes) and challenges (safety issues, poverty, educational struggles) occurring in the Austin area.. They show this for the community at large and then focus more closely on two communities with identified needs for families with young children.

A range of early interventions, including high quality Head Start, home visiting, parent education, and high quality Pre-Kindergarten programs, have been demonstrated to be effective in improving child outcomes. In the Austin metro area, a cadre of nonprofit, health and educational organizations are delivering a mix of early intervention services tailored to our community. Gaps in services remain, however. Although funding for educational, social, and health services is limited, through community collaboration and a unified focus we can maximize the number of youngsters who receive an optimal start to a happy, healthy, productive life

Children are born to learn. Understanding our community's assets and needs will help us identify opportunities to shape conditions for our youngest, most vulnerable residents.

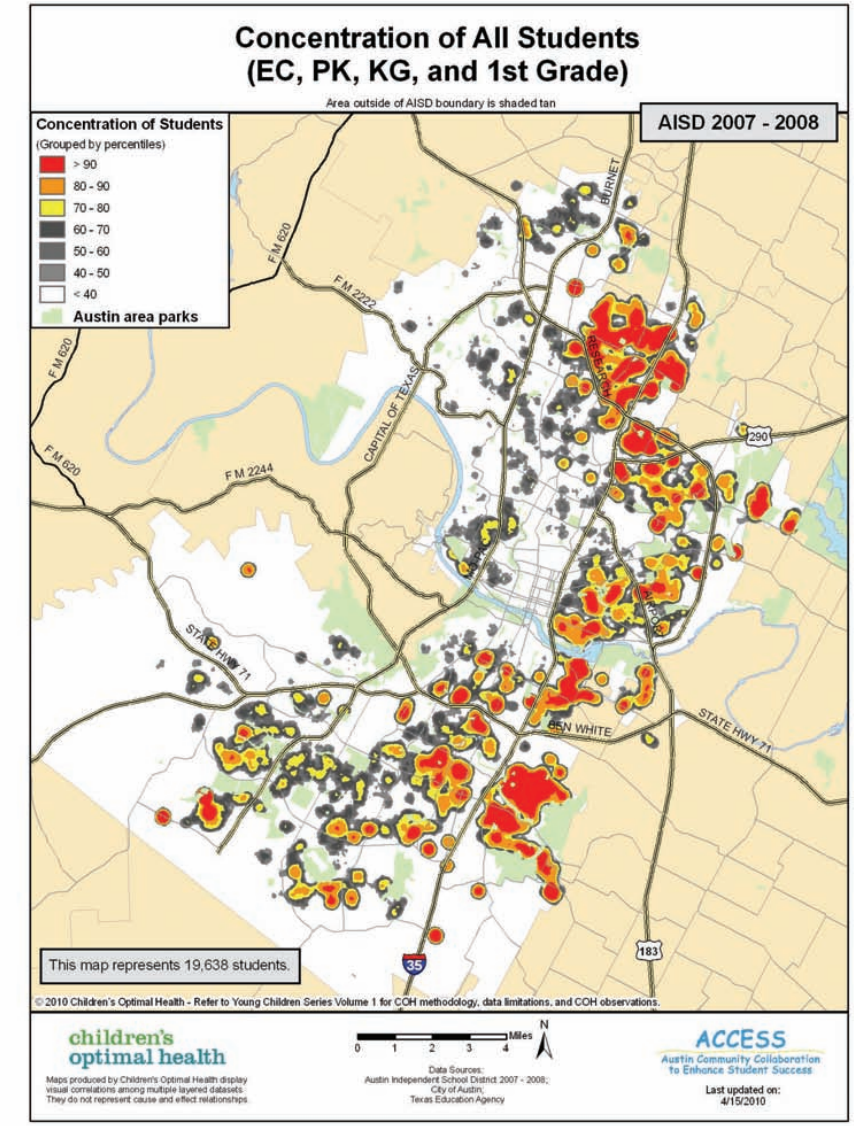
References

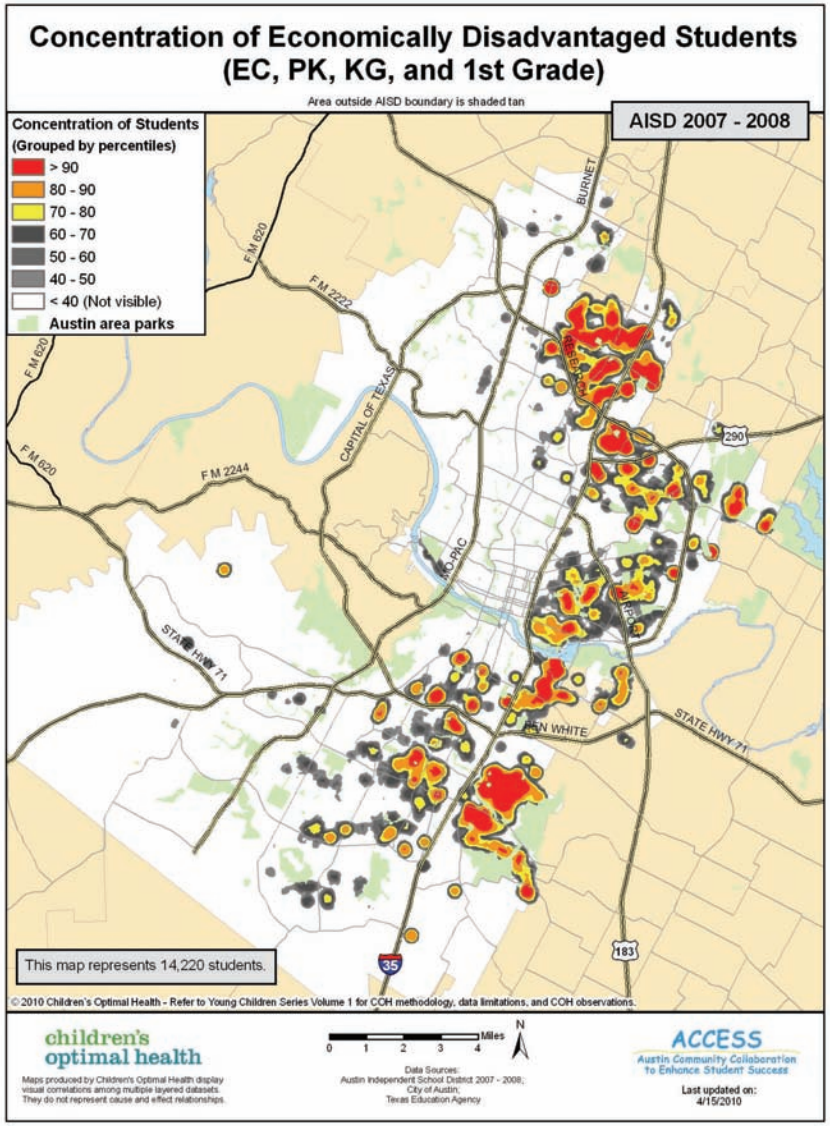
[1] Karoly, Lynn A., Kilburn, M. Rebecca, and Cannon, Jill. Early Childhood Interventions – Proven Results, Future Promise. 2005. Rand Corporation.

[2] Smith, J. R., Brooks-Gunn, J., & Klebanov, P.K., (1997). Consequences of living in poverty for young children's cognitive and verbal ability and early school achievement. In G. J. Duncan & J. Brooks-Gunn (Eds.), *Consequences of growing up poor*. New York: Russell Sage Foundation.

[3] Heckman, James J., *The Productivity Argument for Investing in Young Children*, Working Paper 5, Invest in Kids Working Group, Washington, D.C.: Committee for Economic Development, October 2004.

[4] Shonkoff, Jack P. *From Neurons to Neighborhoods: The Science of Early Child Development,* Washington, D.C.: National Academy Press, 2000.



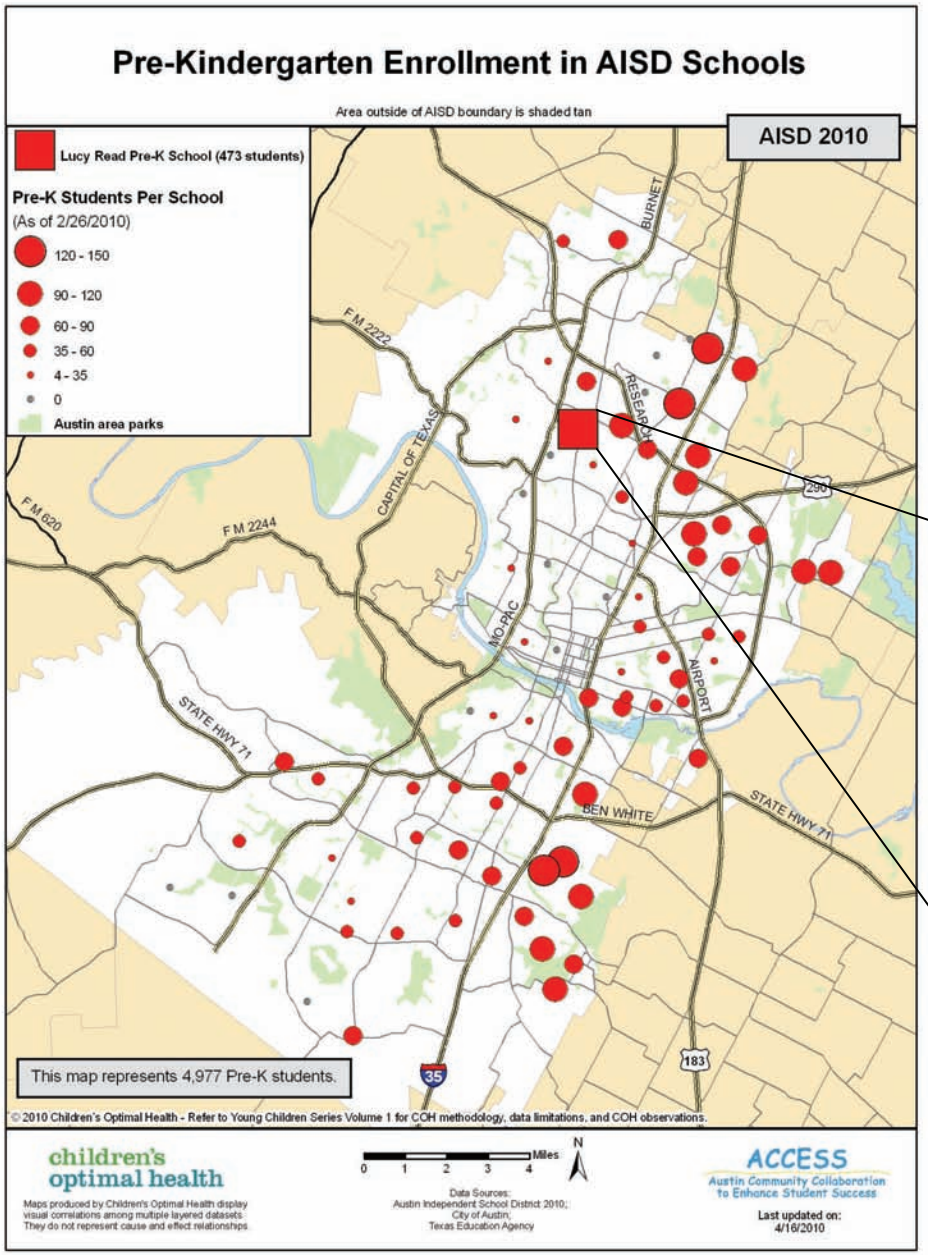


Notes

1. A density map shows concentrations of persons with a given characteristic (such as young students or economically disadvantaged students). These concentrations are influenced by the type of housing people live in; students living in multi-family housing will be more concentrated. The number of persons represented in a map depends on the characteristic being mapped. Each density map shows the neighborhoods of residence of those in the top 10th percentile colored as red, though the actual number of persons in each red concentration will differ by characteristic.
2. EC is the Early Childhood program for students age 3 with developmental delays.
3. PK is the pre-Kinder program for economically disadvantaged 4 year olds.
4. AISD offers full day PK. Based on Kindergarten enrollment, about 98% of eligible students are enrolled in PK.

Observations

1. Young students are concentrated along the eastern part of the city, reflecting a concentration of multifamily housing in that area.
2. Young economically disadvantaged students are concentrated along the eastern part of the city.
3. Based upon these two maps, in school year 2007—08, 72.4% of the students enrolled in EC, Pre-K, Kindergarten, and 1st grade are economically disadvantaged (quality for free/reduced lunch) while the percent of economically disadvantaged students overall for school year 2007-08 as reported by AISD as a whole, was 61%.



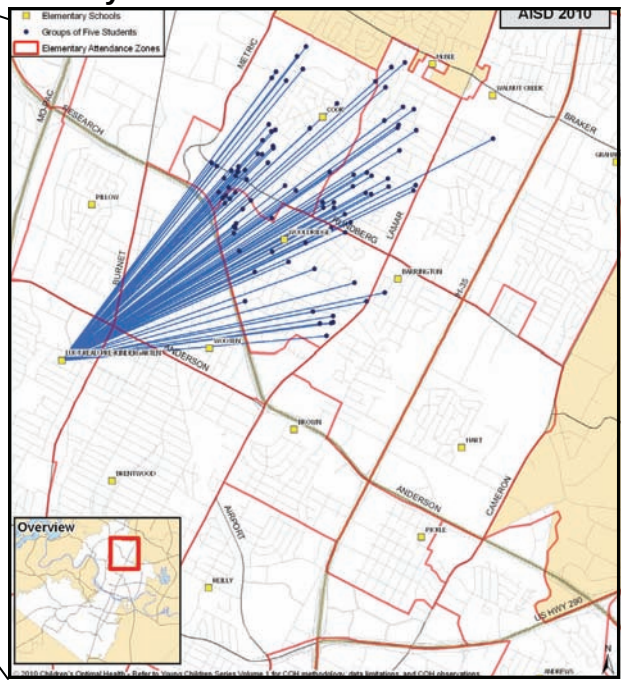
Notes

1. This map shows the AISD campuses that had Pre-K programs during the 2009 - 10 school year.
2. The relative size of enrollment in the Pre-K classes is reflected by the size of the circle.
3. Lucy Read Pre-K Center (square) is the only AISD campus that is dedicated as Pre-K only. Its enrollment for school year 2009-10 was 473 students.
4. Based on Kindergarten enrollment, approximately 98% of eligible Pre-K students in AISD are enrolled in Pre-K programs.
5. Unlike other surrounding districts, AISD offers full day Pre-K. This may help explain why AISD has higher rates of enrollment than other districts.

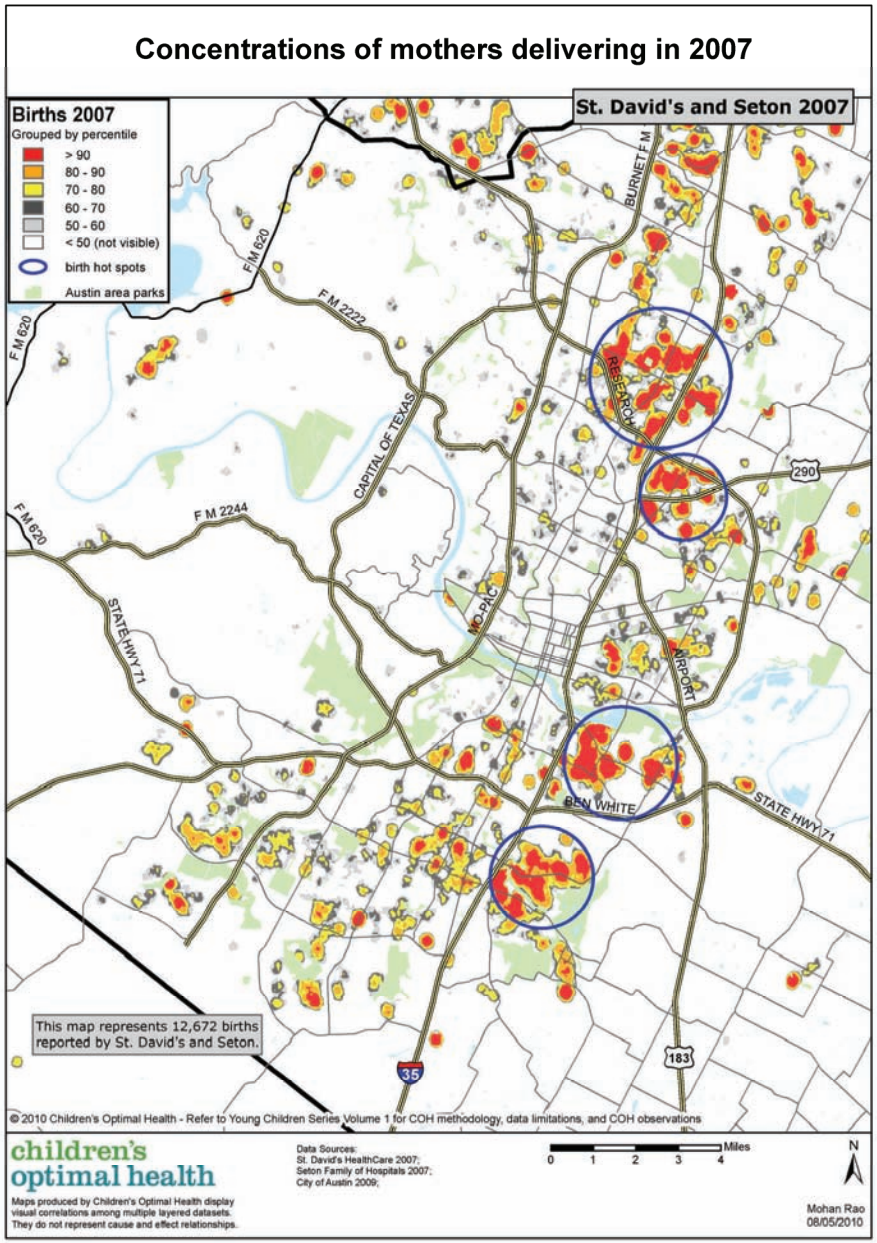
Observations

1. The inset map below reflects the neighborhood of residence for students attending Lucy Read Pre-K. The site was designated to accept students from three elementary attendance zones: Cook, McBee, and Wooldridge. It is apparent that nearly all students come from the intended neighborhoods.
2. Campuses serving Pre-K populations exist throughout the District. Campuses with larger enrollments coincide with neighborhoods where there are high concentrations of young children.

Lucy Read Pre-K Student Distribution



Each point on the above map **does not** represent an individual student's residence. The points represent the geographic average of a cluster of 5 students.

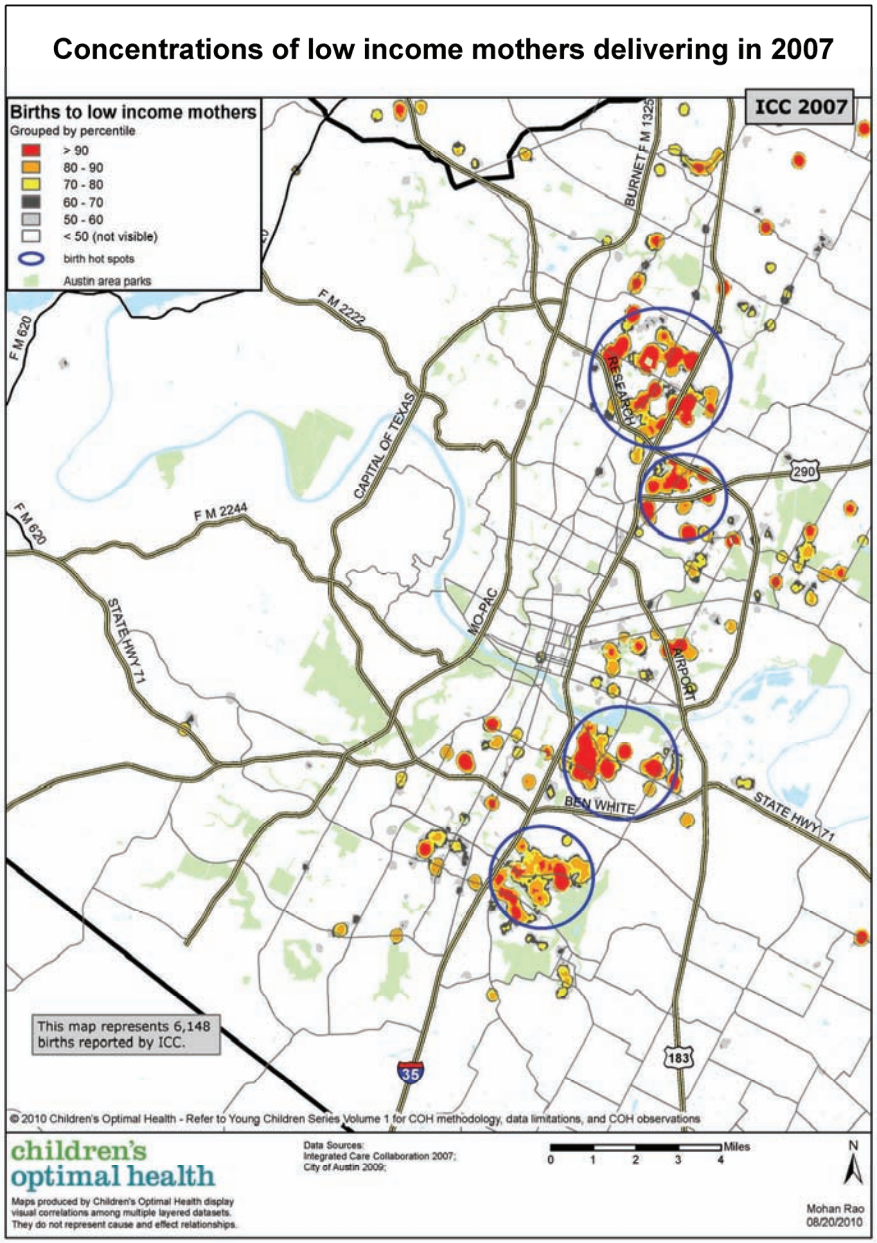


Notes

1. This is a density map showing the concentrations, by neighborhood of residence, of mothers who gave birth in 2007 at either a Seton Family of Hospitals or a St. David's Healthcare facility. For Travis County, the health system datasets indicate there were 13,809 births in 2007.
2. Birth record data reported for Travis County by Kids Count indicate there were 16,152 total live births for Travis County in 2006, the most recent year for which data is available. Official Birth record data from Travis County for 2007 was not available. If the births for 2007 are comparable to those of 2006, the birth data from Seton and St. David's accounts for about 85% of all births in Travis County in 2007.
3. The map shows a portion of Travis County and reflects 12,672 births in 2007 to patients in Seton and St. David's facilities.
4. A density map helps locate neighborhoods where there are high concentrations of persons with a particular characteristic, in this case, mothers giving birth.

Observations

1. There are concentrations of mothers who delivered infants in neighborhoods throughout the community.
2. Four areas of the city appear to have particularly large dense clusters of mothers who delivered, as indicated by the blue circles.
3. These birth clusters appear to be in the same neighborhoods where there are concentrations of young students, and concentrations of economically disadvantaged students, as represented on page 4 of this document.



Notes

1. This is a density map showing the concentrations, by neighborhood of residence, of low income mothers who gave birth in 2007 at a Safety Net provider. For Travis County, the ICC dataset indicates there were 6,512 low income births in 2007.
2. The map on page 6 represents 12,672 births. When we compare that to the map on page 7, we see that of those 12,672 births represented, 6,148 of them (48.5%) were to low income mothers.
3. The map shows a portion of the births to low income mothers in Travis County and reflects 6,148 births in 2007 to patients in safety net provider facilities.
4. A density map helps locate neighborhoods where there are high concentrations of persons with a particular characteristic, in this case, low income mothers giving birth.
5. A density map does *not* imply that the majority of persons in that concentration have a given characteristic.

Observations

1. There are concentrations of low income mothers who delivered infants in neighborhoods throughout the community.
2. Four areas of the city appear to have particularly large dense clusters of low income mothers who delivered, as indicated by the blue circles.
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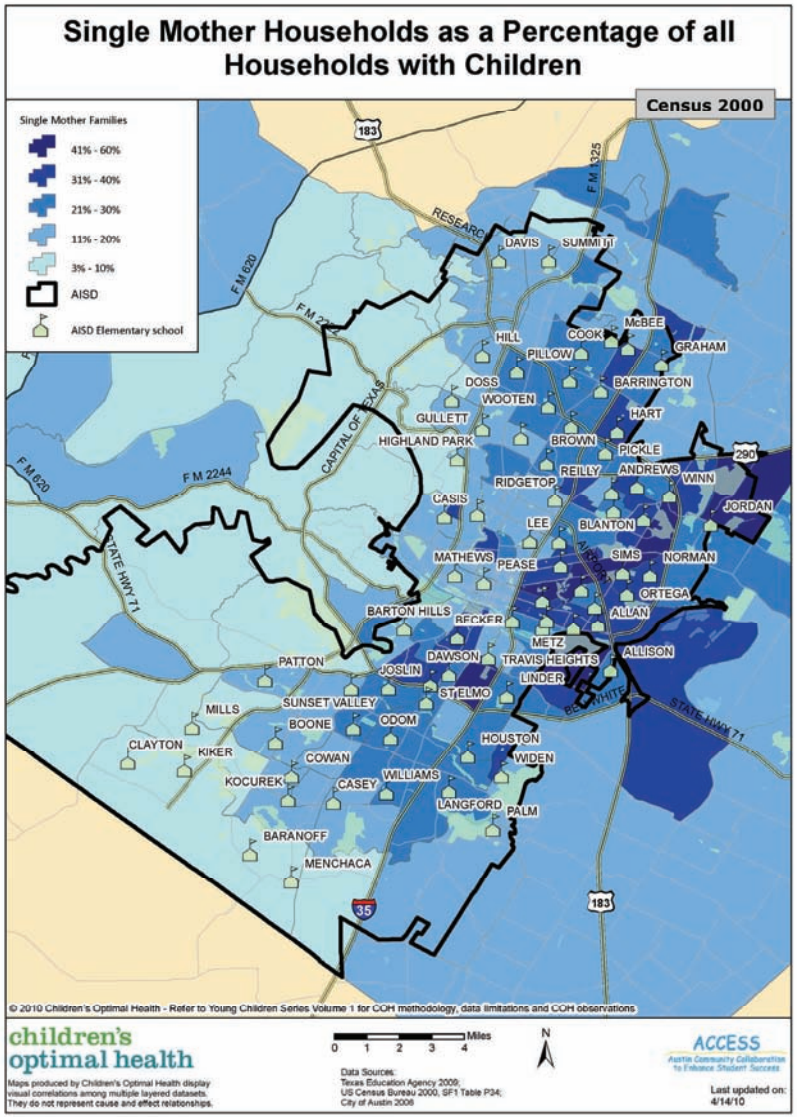
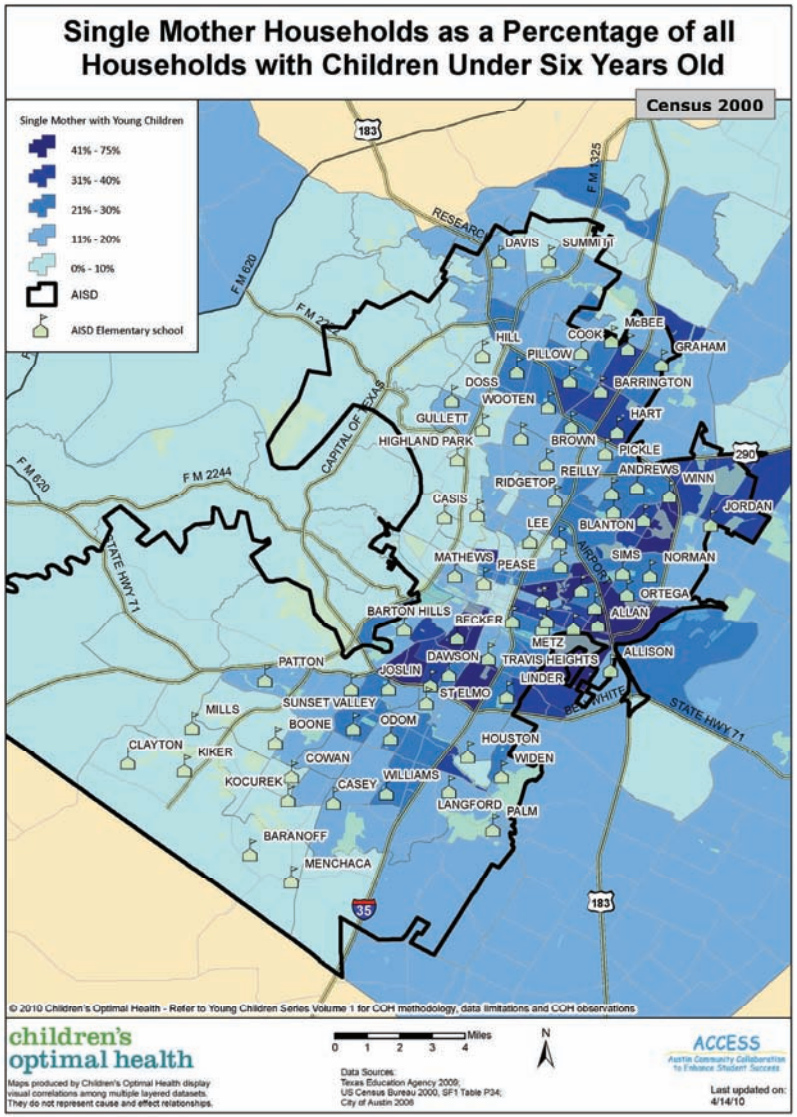


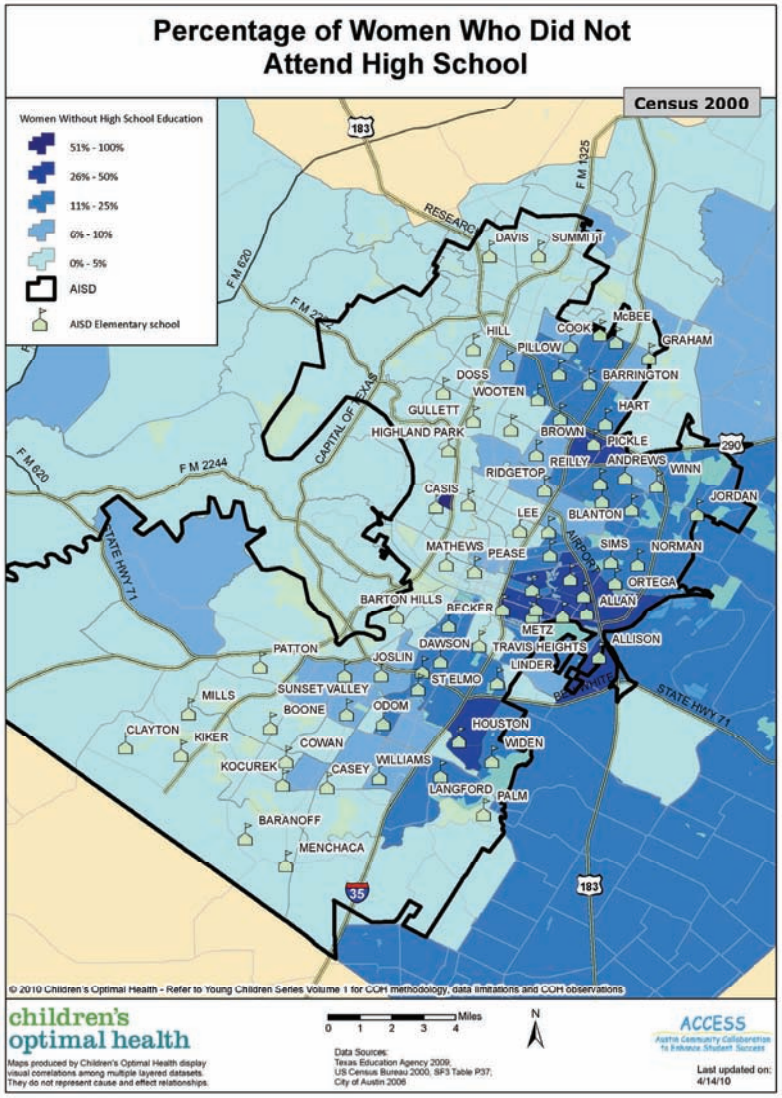


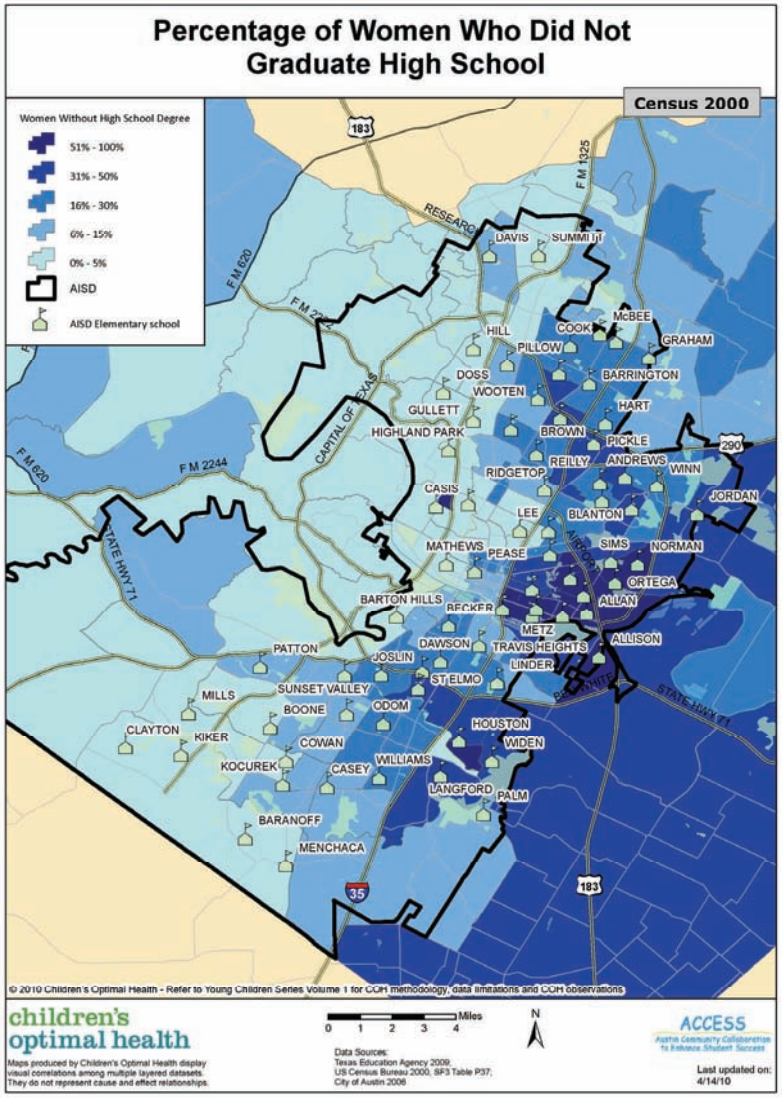
Notes

1. Research indicates that the strongest predictors for a healthy start for a young child are the educational status of the mother, family constellation, and economic status of the family (poverty). Single parent households, and those with less educated adults are more likely to be households of lower income.
2. These maps are based on Census 2000 data. Though helpful, the data is dated. This becomes particularly problematic in a community such as ours, where rapid demographic change is occurring. Nonetheless, the data and maps provide a starting place for understanding young children and their families in the community.
3. Data in these maps is represented at the census tract level. AISD elementary schools are included to provide a point of reference.

Observations

1. Single mother-headed households are more highly concentrated east of IH 35. South Austin also shows concentrations in the neighborhoods surrounding Becker, Joslin, Dawson and St. Elmo schools.
2. There are a number of census tracts where more than 31% of households with children are headed by a single mother.
3. Single mother-headed households with very young children are similarly concentrated.
4. There are neighborhoods where 41-75% of the households with very young children are headed by a single mother.
5. Knowing where these neighborhoods are and what area schools they are near can facilitate early outreach to these families to assure a healthy start for vulnerable children.





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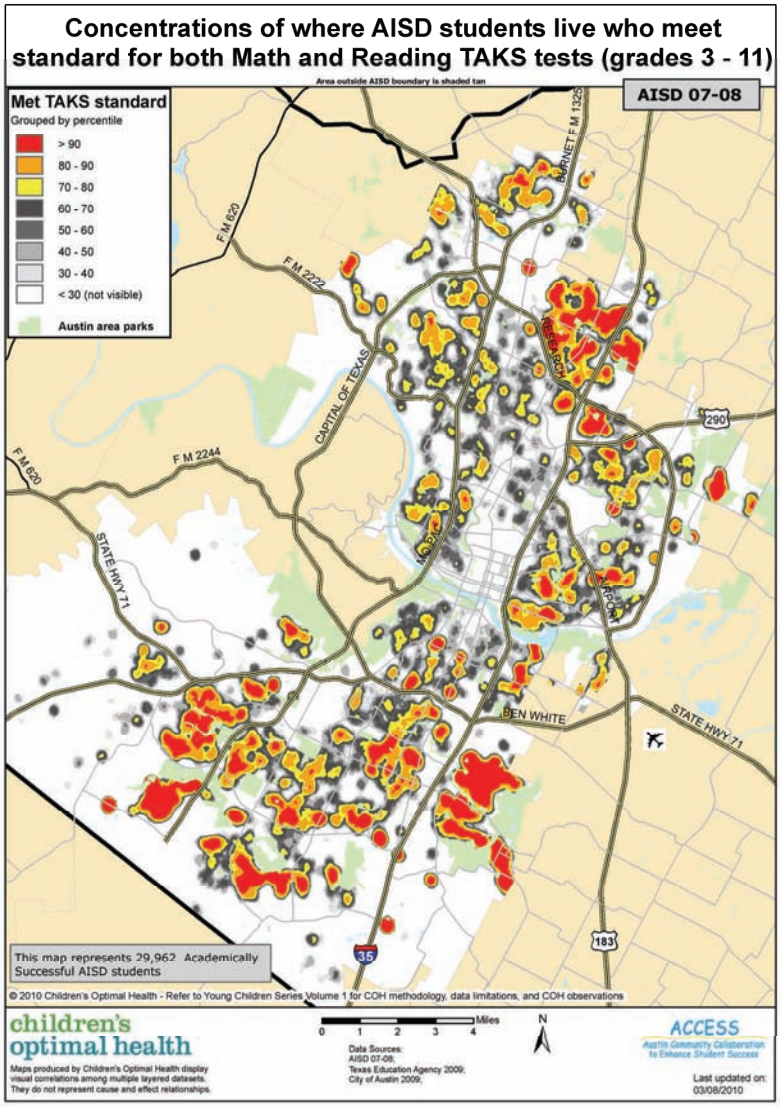
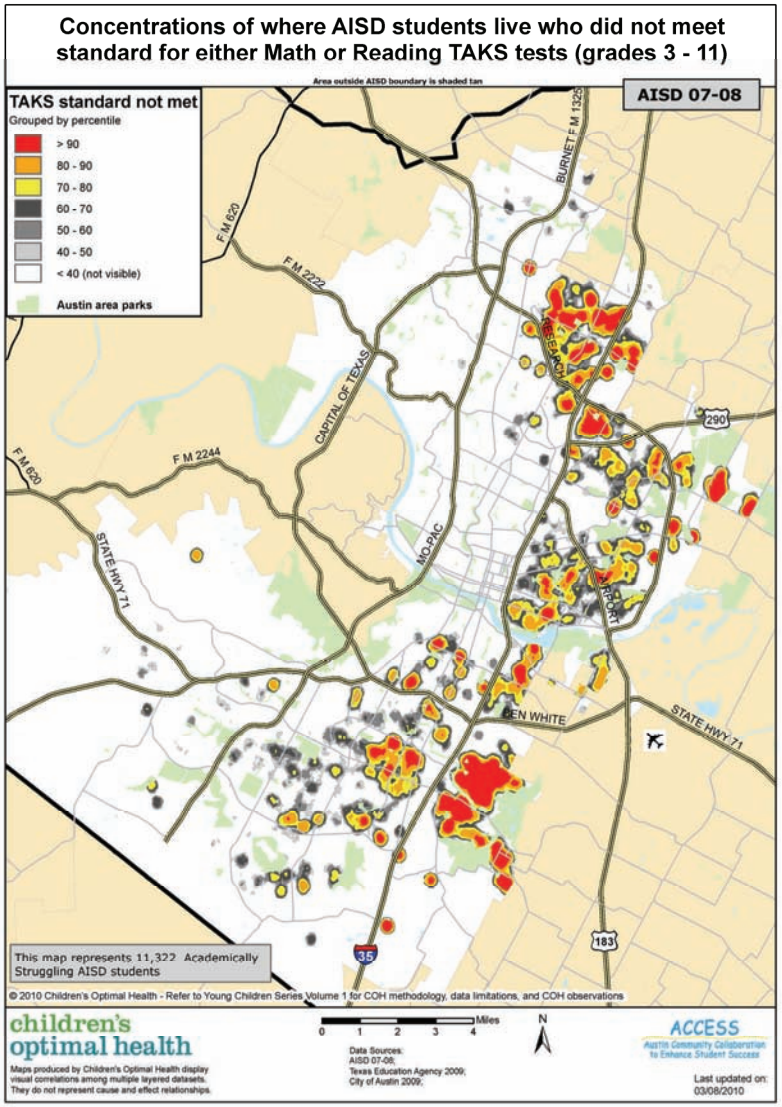
3. Data in these maps is represented at the census tract level. AISD elementary schools are included to provide a point of reference.
4. These maps represent the educational status of women over age 25. These women may or may not be mothers of children under 18.

Observations

1. There are neighborhoods of concentration for women over 25 who have less than a 9th grade education.
2. In 2000, these neighborhoods were clustered in central east Austin and in Dove Springs in south Austin.
3. Given family migration patterns since 2000, these concentrations may well have shifted. The maps provide a starting place for understanding our community of interest for the purpose of effective intervention.
4. There are neighborhoods where >25% of women had less than a 9th grade education.
5. The neighborhoods of concentration for women with less than a high school education are similar to those with less than a 9th grade education. There are many neighborhoods with >30% of women having less than a high school education.



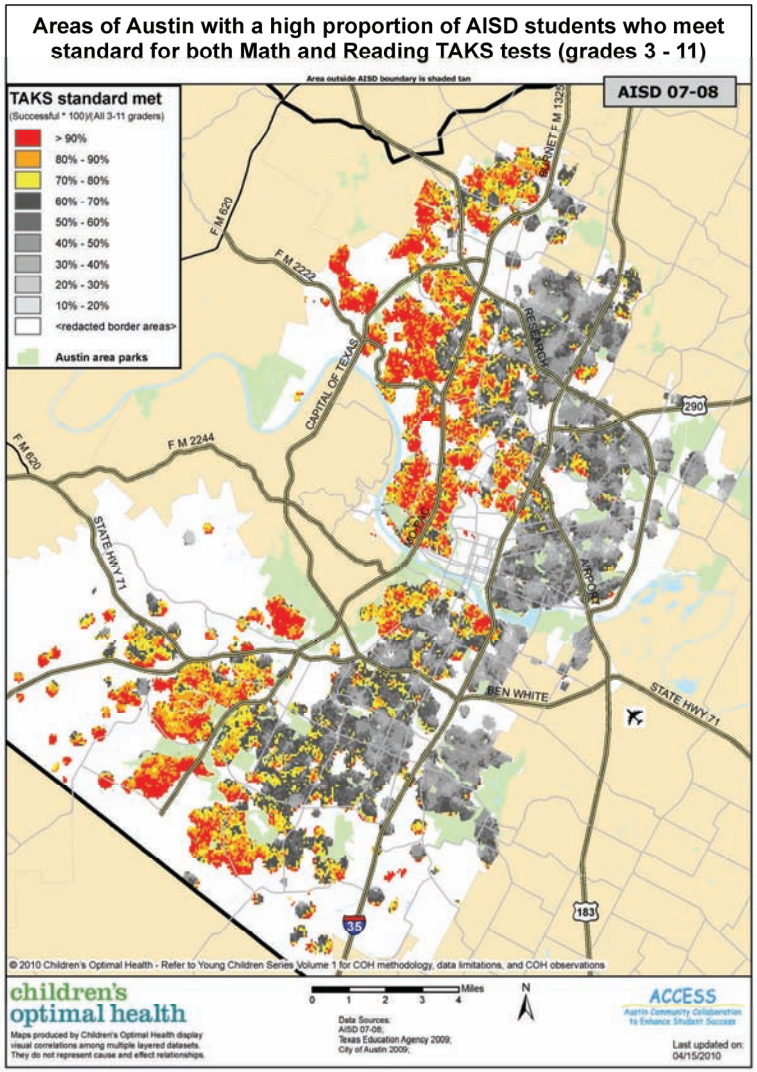


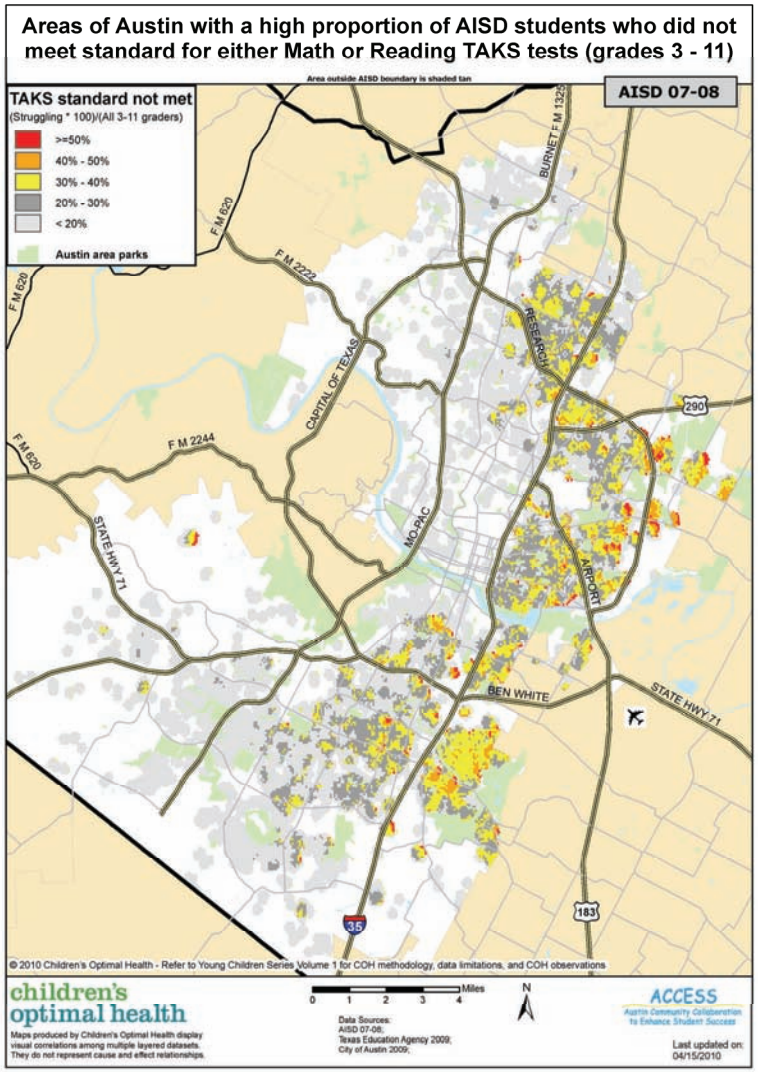
Notes

1. Using AISD TAKS scores for reading and math as one indicator of child school success, these maps identify where older children are concentrated who are meeting or not meeting the TAKS standard for their grade level.
2. Density maps identify where persons with a characteristic are concentrated. They are affected by the type of housing people live in. They help us understand where large counts of people reside.
3. Two neighborhood concentrations, one north and one south are particularly prominent in both maps. It is possible for these neighborhoods to have high concentrations of students who met the TAKS standard as well as students who did not meet the standard, because these neighborhoods have high concentrations of school aged children.
4. Proportion maps (following) control for the density of people living in a neighborhood. They reflect the rate of a characteristic within a neighborhood.

Observations

1. There are concentrations of students across the district who are meeting the standard for TAKS math and reading.
2. There are concentrations of students in neighborhoods who are not meeting the TAKS standard for math, reading or both.
3. The concentrations of students who are not meeting the standard are predominantly east of IH 35, with additional students clustered in south Austin.



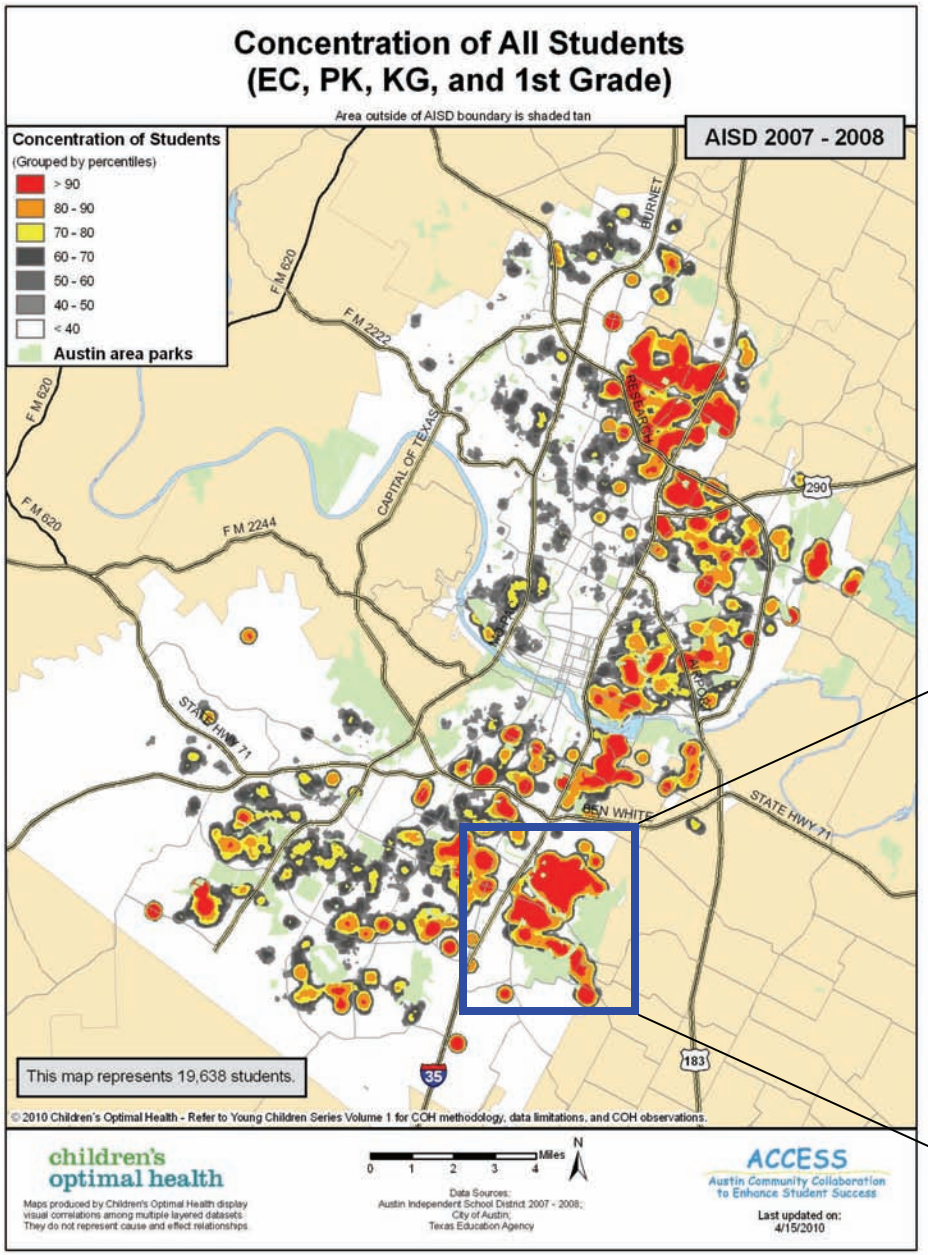


Notes

1. Using AISD TAKS scores for reading and math as one indicator of child success, these maps identify where children grades 3 - 11 are concentrated, by proportion, who are meeting or not meeting the TAKS standard for their grade level.
2. Proportion maps control for the density of people living in a neighborhood. They reflect the rate of a characteristic within a neighborhood.
3. In the map above, if one were to randomly select 10 students in a red colored neighborhood, the expectation is that at least 9 of 10 students would have met the standard for their grade level in both reading and math. This same logic applies to other colors in the gradient.

Observations

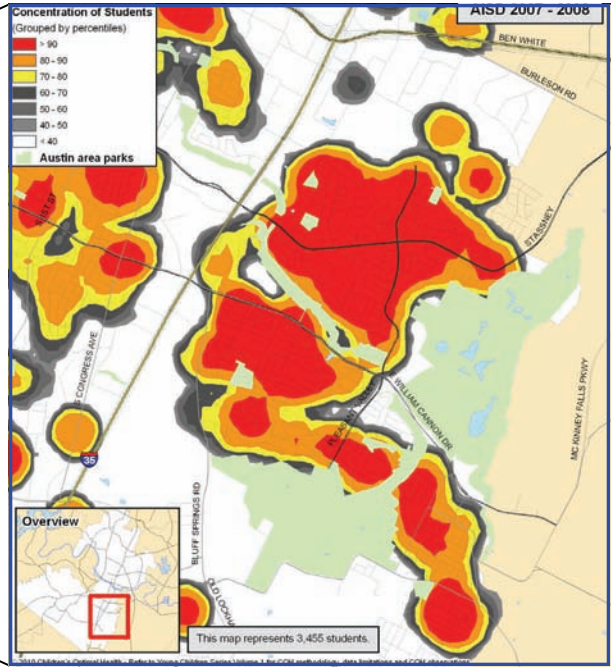
1. There are concentrations of students across the district who are meeting the standard for TAKS math and reading. Neighborhoods with the highest rates of students meeting the standard are predominantly west of IH 35.
2. In east Austin there are some pockets where over 90% of students in the neighborhood are meeting the standard.
3. There are concentrations of students in neighborhoods who are not meeting the TAKS standard for math, reading or both. Neighborhoods with the highest rates of students not meeting the TAKS standard are east of IH 35, with additional clusters in south and north Austin.
4. These proportion maps do not reflect whether individual students are making progress over time. TAKS scores are based on an external standard, not individual student progress.

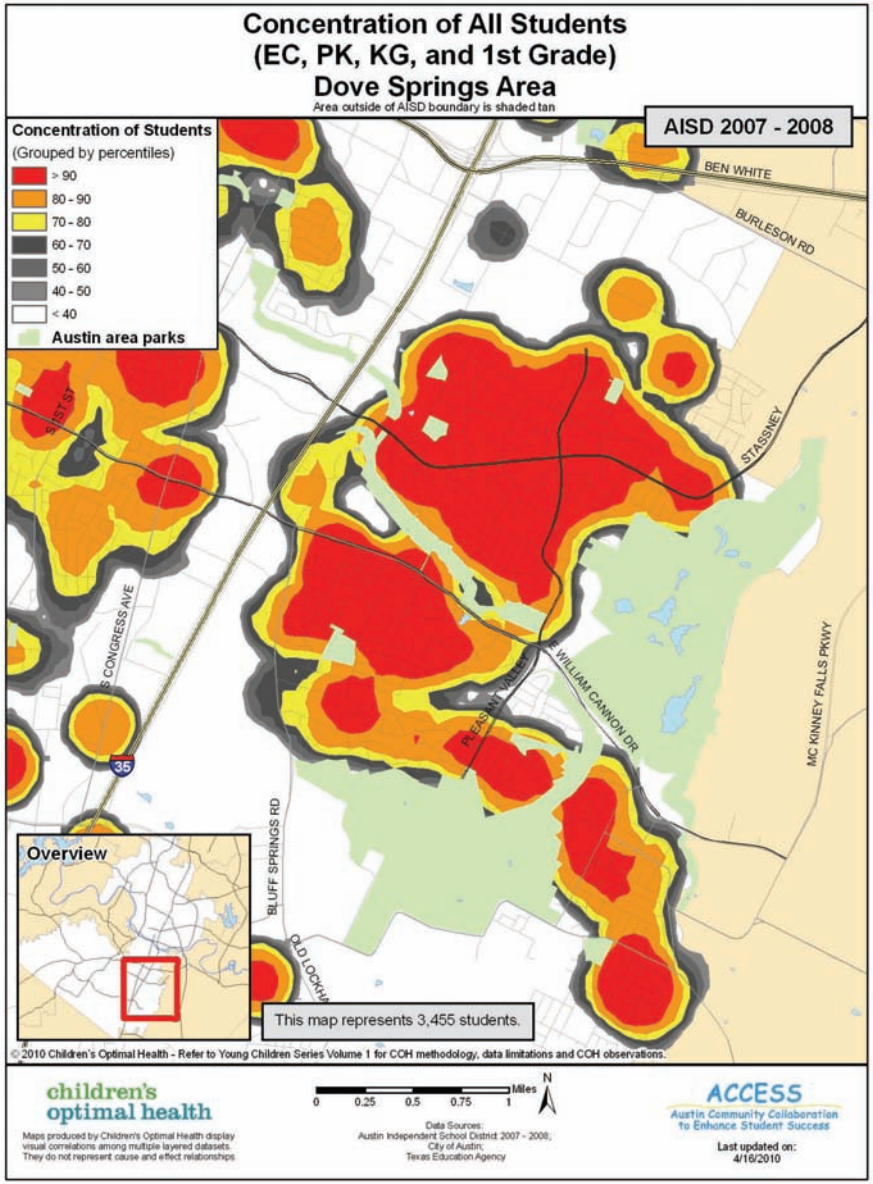


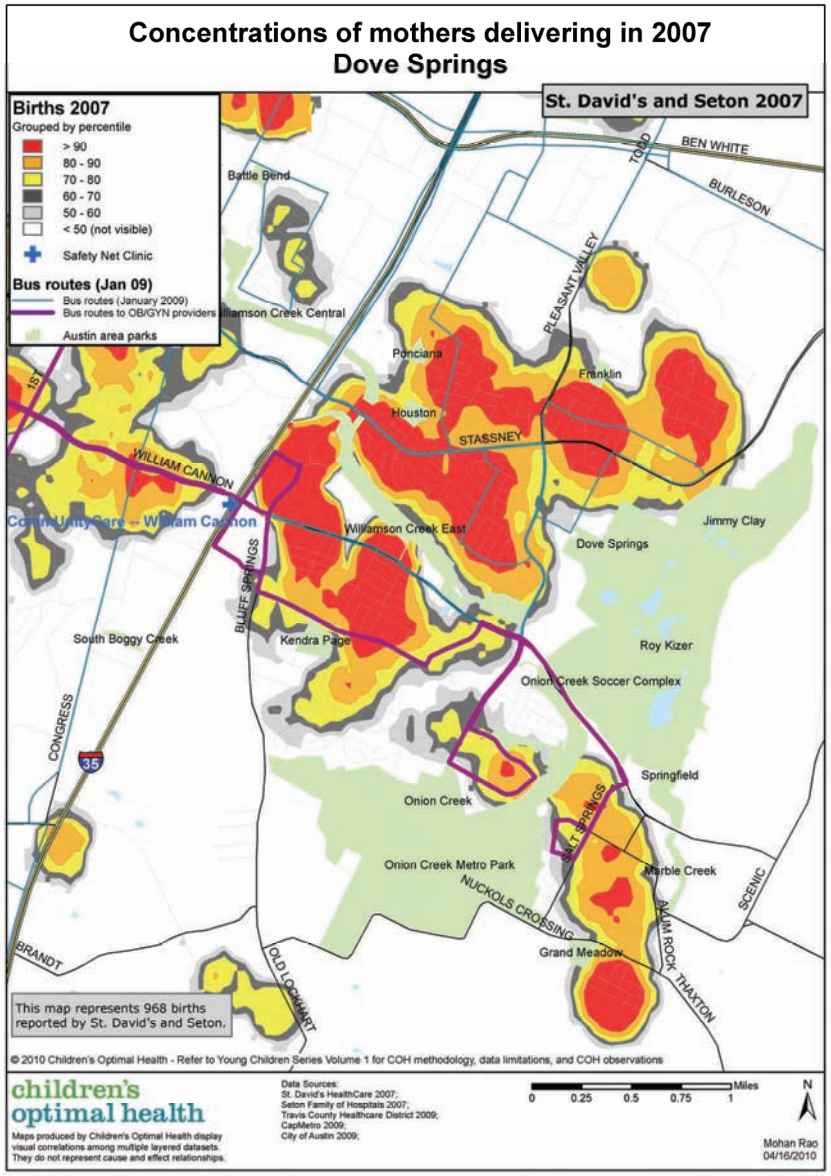
Dove Springs Neighborhood View For Families with Young Children

Notes:

1. Many of our observations showed concentrations of low income young children, and births in this neighborhood, making it an area of interest.
2. All neighborhoods have assets as well as needs. The following maps provide an understanding of the assets in this neighborhood, particularly as they pertain to families with very young children.
3. The observations we can make are based on the data to which we have access.
4. While the maps can help us understand the neighborhood, we really need to understand the story from the perspective of people in the neighborhood. Because neighborhoods are dynamic, their stories evolve. Participation of those who live and work in the neighborhoods creates a tapestry that enriches our understanding of neighborhoods and ways to insure that all children are healthy and successful.





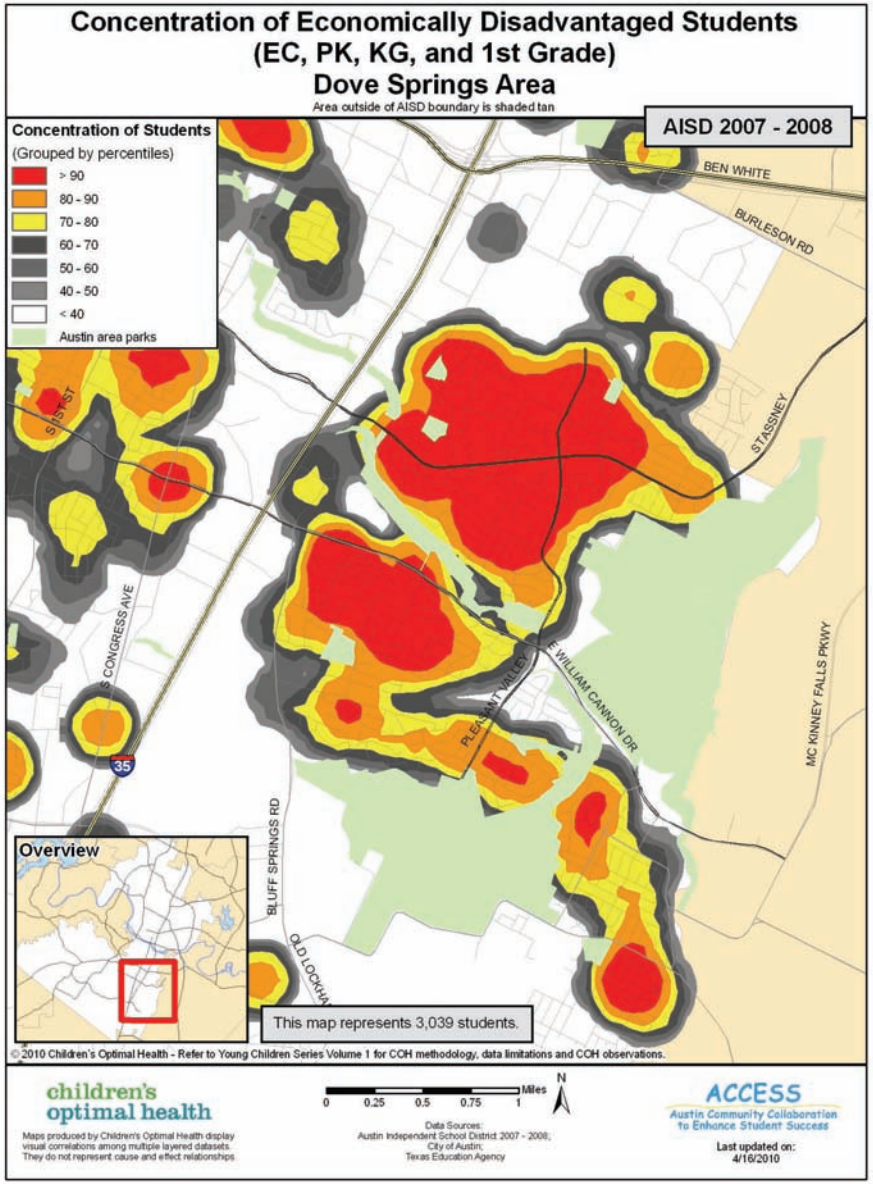


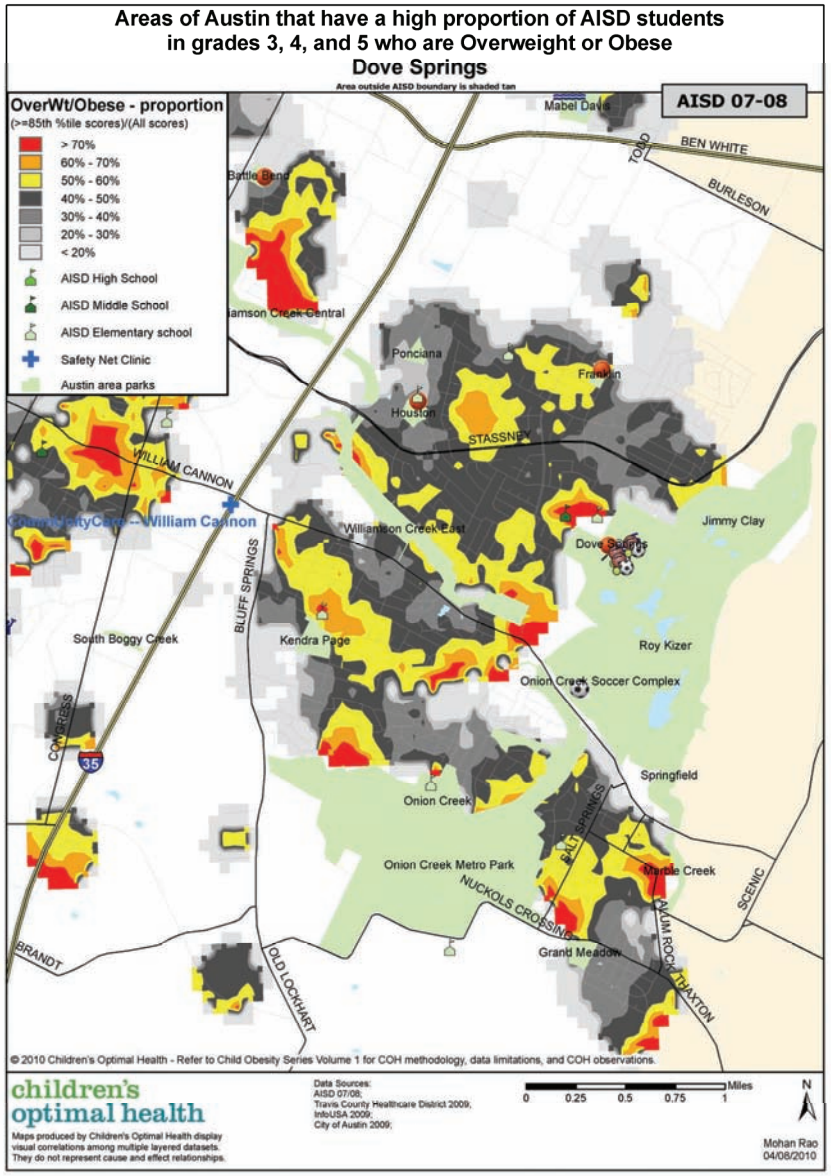
Observations

1. There were 3,455 students enrolled in EC, Pre-K, Kinder and 1st grades in school year 2007-08.
2. There were 968 births for this neighborhood in 2007.

Observations

1. There are no hospitals, and only one safety net clinic in the neighborhood. This clinic is designed as a walk in care clinic but does offer family medicine services with an appointment.
2. Bus transportation is available. There is some bus transportation to clinics that offer Obstetrics and Gynecology services.



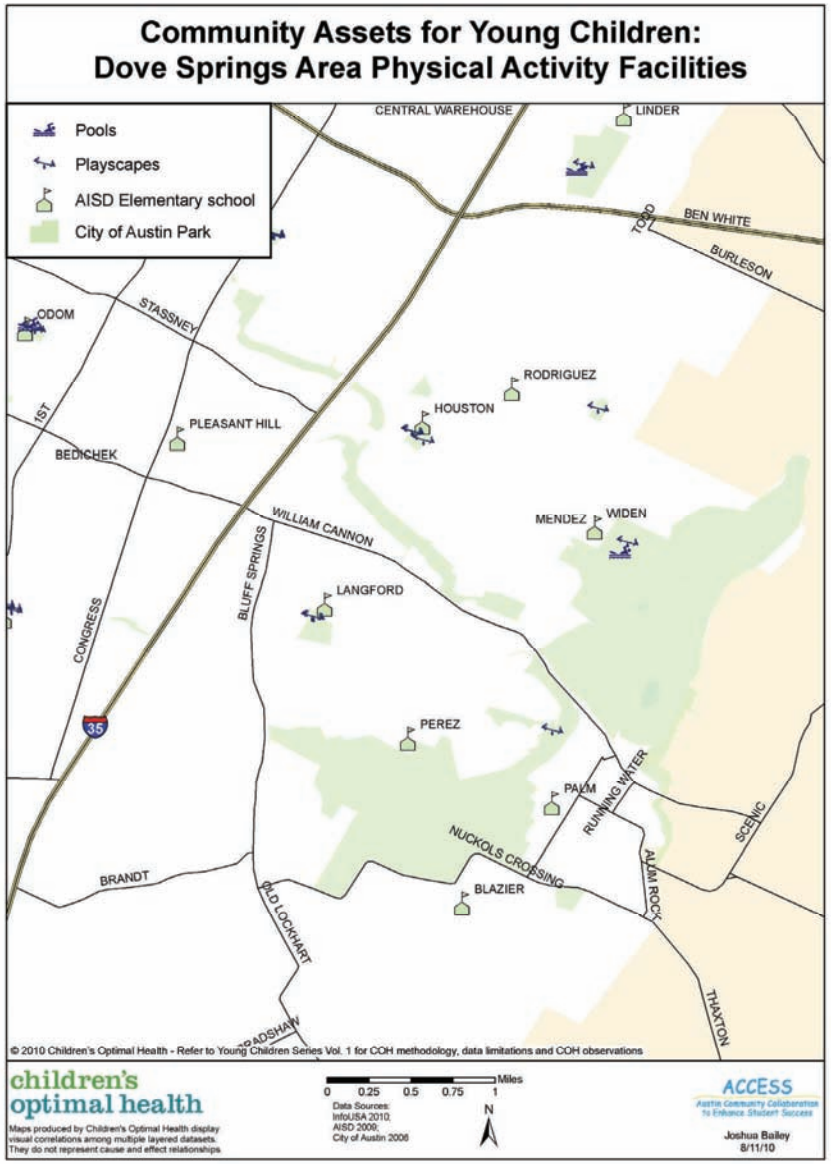


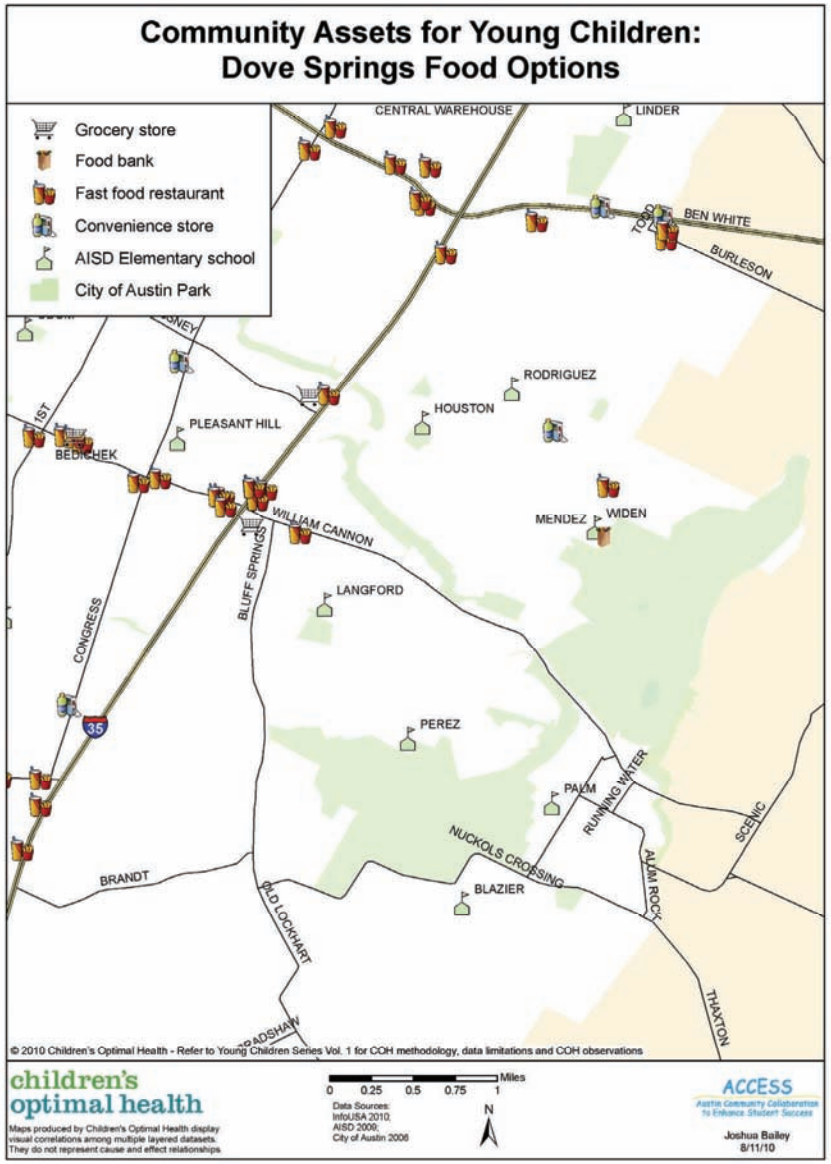
Observations

1. There were 3,039 economically disadvantaged students enrolled in EC, Pre-K, Kinder and 1st grades in school year 2007-08.
2. Greater than 80% of all students enrolled in the neighborhood elementary schools were economically disadvantaged.

Observations

1. There are no hospitals, and only one health clinic in the neighborhood.
2. There are high proportions (>40%) of students in grades 3, 4, and 5 throughout much of the neighborhood, who are overweight/obese based on BMI measurement.
3. There is considerable greenspace in the neighborhood, though it may not be accessible for play.



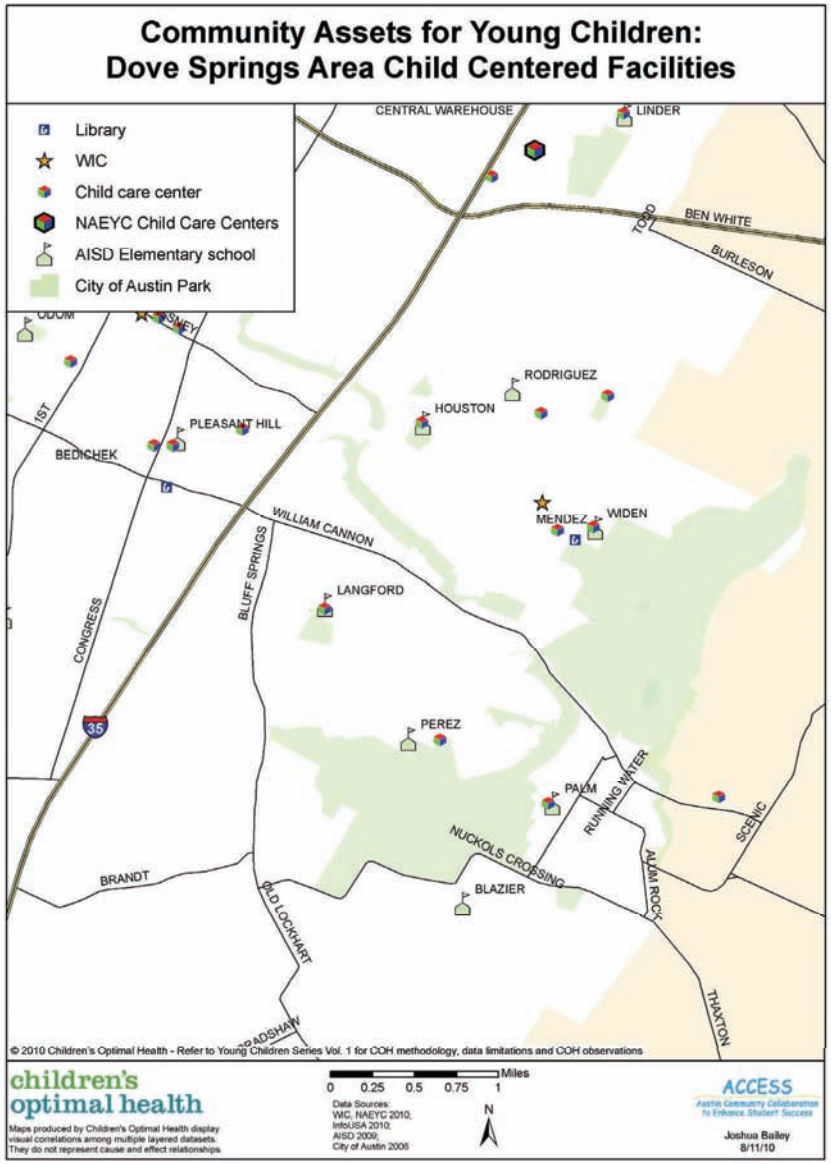


Observations

1. There were 3,455 students enrolled in EC, Pre-K, Kindergarten and 1st grades in school year 2007-08.
2. There were 968 births for this neighborhood in 2007.
3. There are 7 elementary campuses serving the neighborhood in 2007-08. Total enrollment for these schools in 2007-08 was 5,388. Four of these elementary schools serve populations where >90% of the students are economically disadvantaged.
4. The schools have playgrounds available. There are two additional park areas with playscapes.

Observations

1. There is limited access to food outlets in this community
2. The majority of the food outlets are not located where people live.
3. In this community there is limited access to healthy food outlets with only one grocery store located east of Interstate 35.

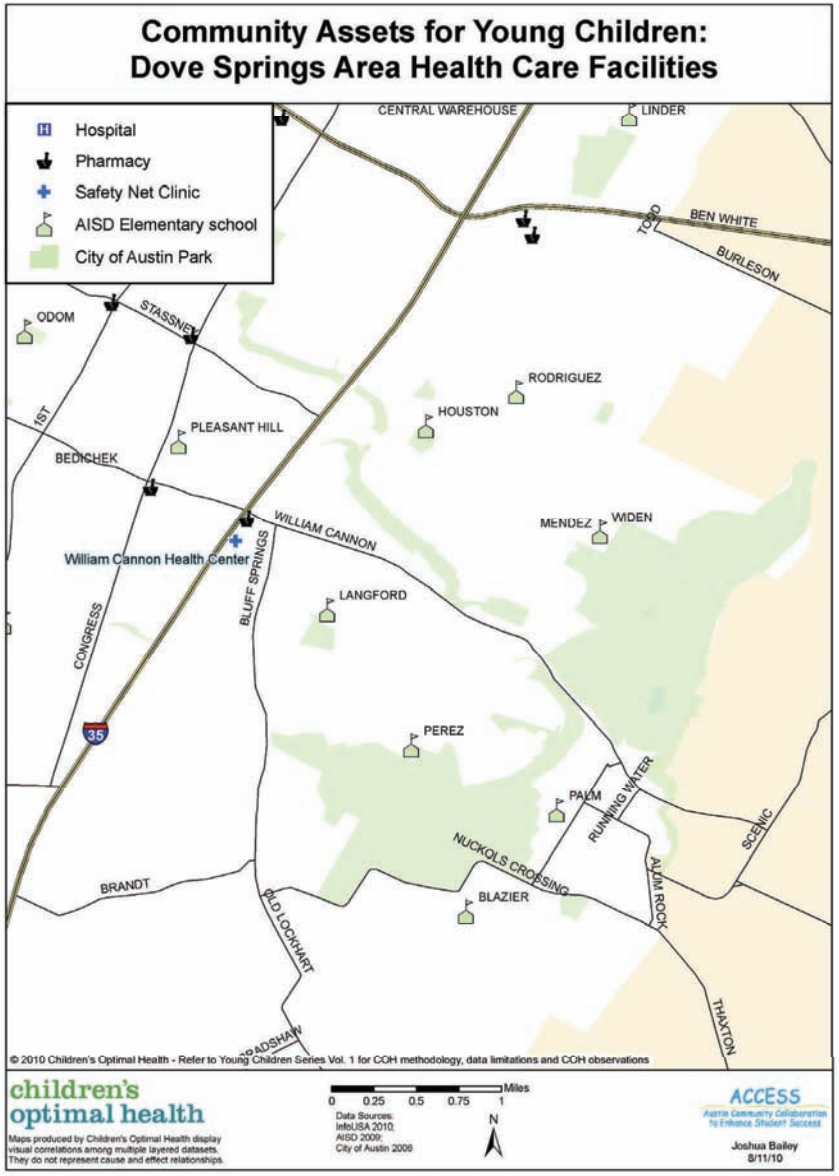


Observations

1. There were 3,455 students enrolled in EC, Pre-K, Kinder and 1st grades in school year 2007-08.
2. There were 968 births for this neighborhood in 2007.
3. Two Women, Infants, and Children (WIC) Clinics serve this population. WIC is a nutrition program that helps provide food, nutrition education and counseling and help accessing healthcare for low income pregnant women, new mothers, and young children.

Observations

1. Three spiritual organizations are known to serve the Dove Springs community. The community assets represent a snapshot in time. They are dynamic and constantly changing, and because of this, the assets seen here may not represent the current assets in the neighborhood.



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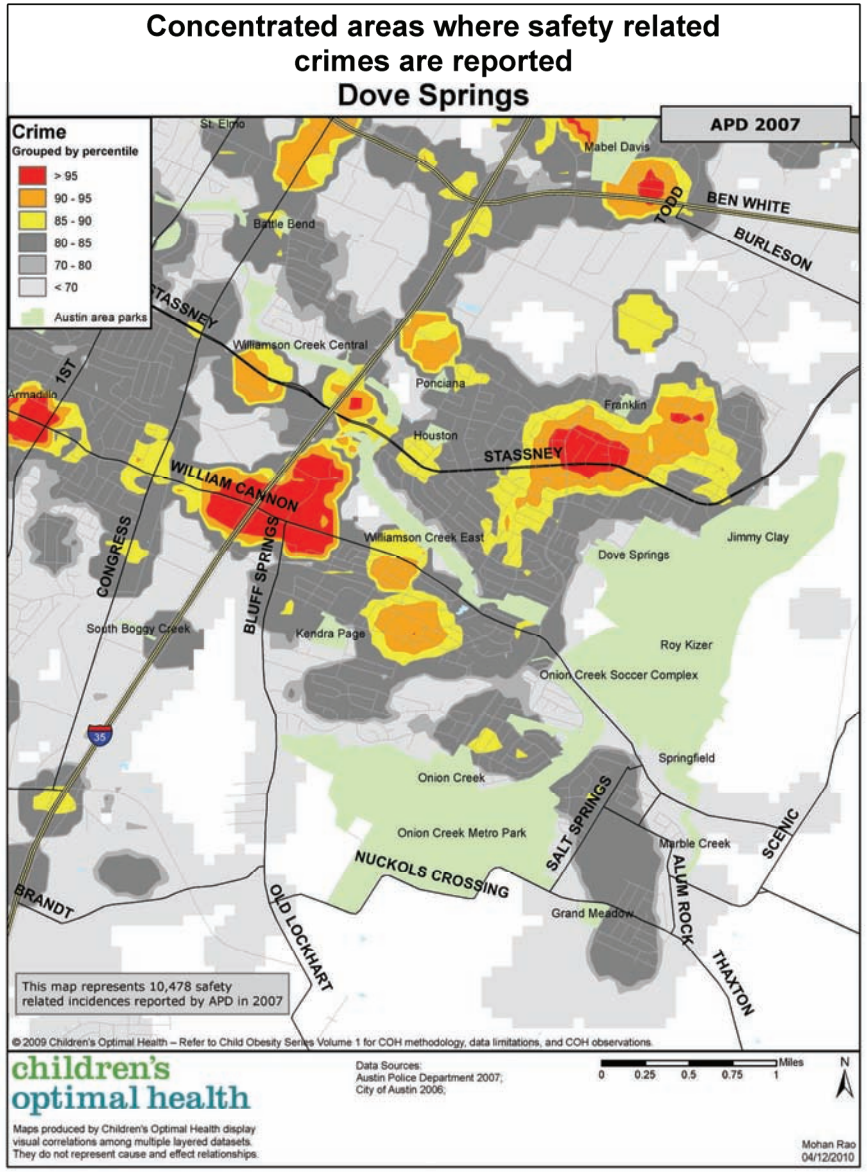
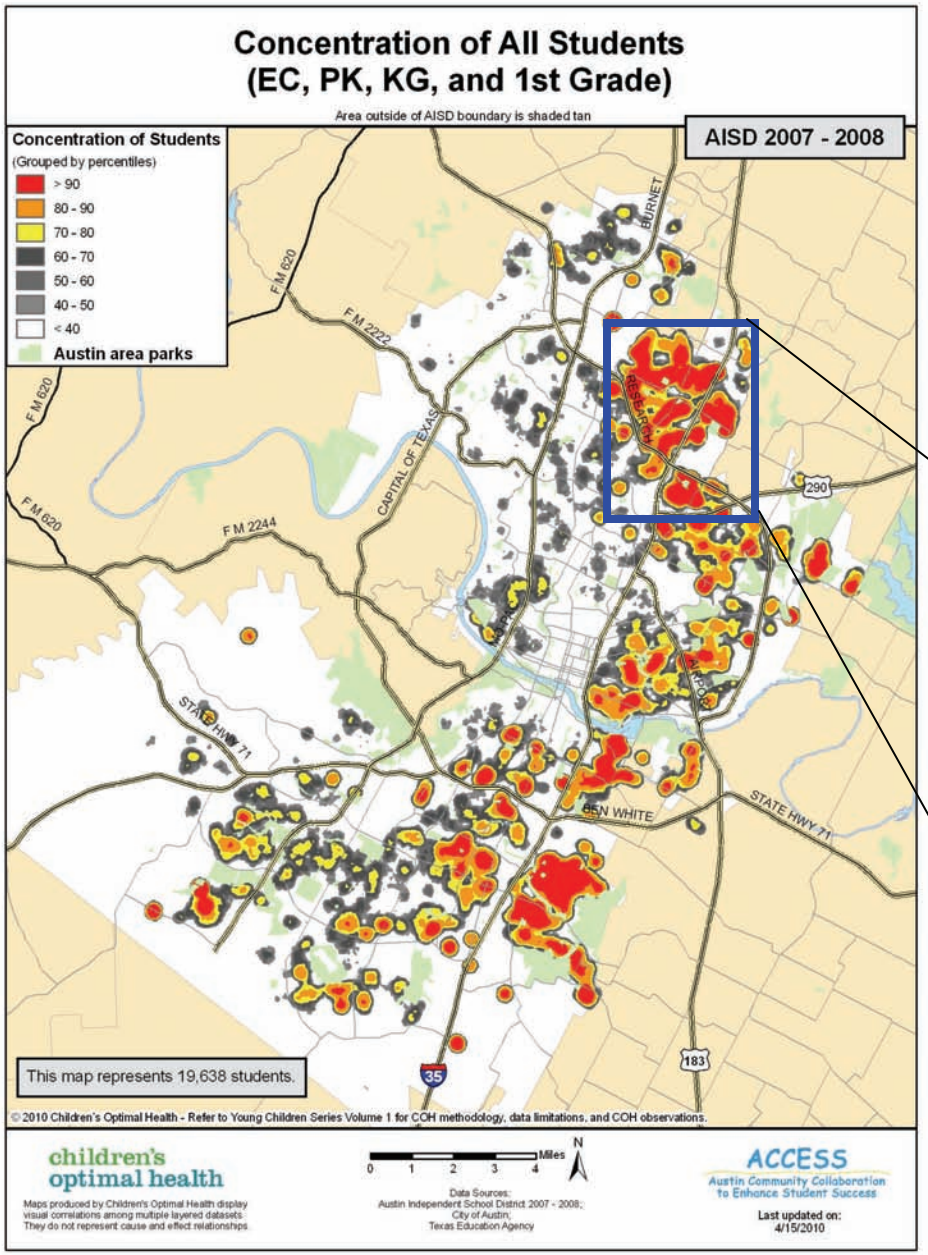


Observations

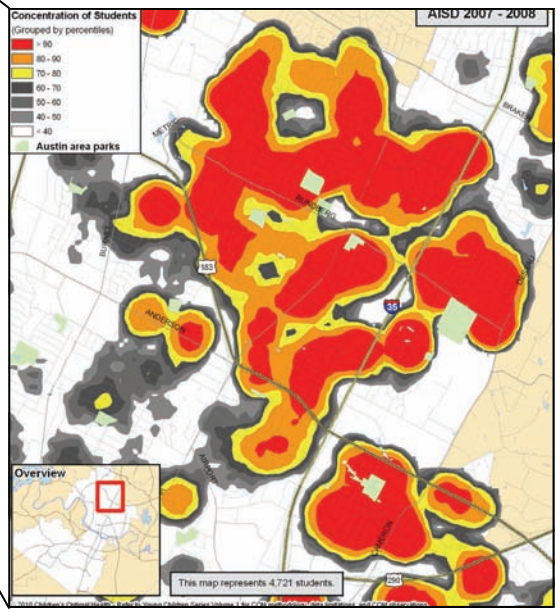
1. There were 104,932 safety related incidents (reported by APD in 2007 for the entire APD area. 10,478 (10.0%) of those incidents are found in this drill down area.
2. Two clusters are identified in the Dove Springs neighborhood, one along Stassney, the other near the intersection of William Cannon and IH-35.
3. Another area south of William Cannon appears to be an area of concern for child safety.
4. Safety related incidents were identified by APD as any crime that might make a child feel unsafe i.e. violence, domestic disputes, alcohol/drugs, etc. Excluded crimes include identity theft, online hacking, etc.

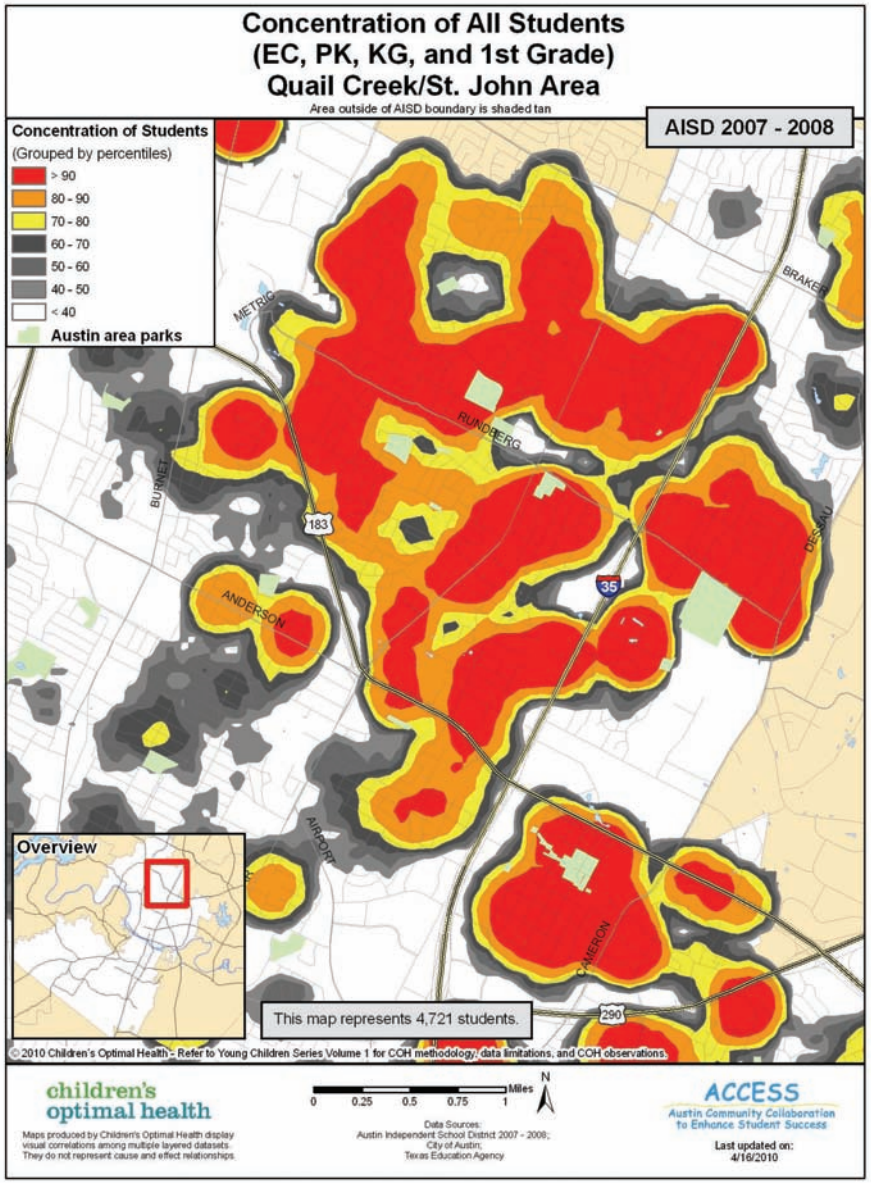


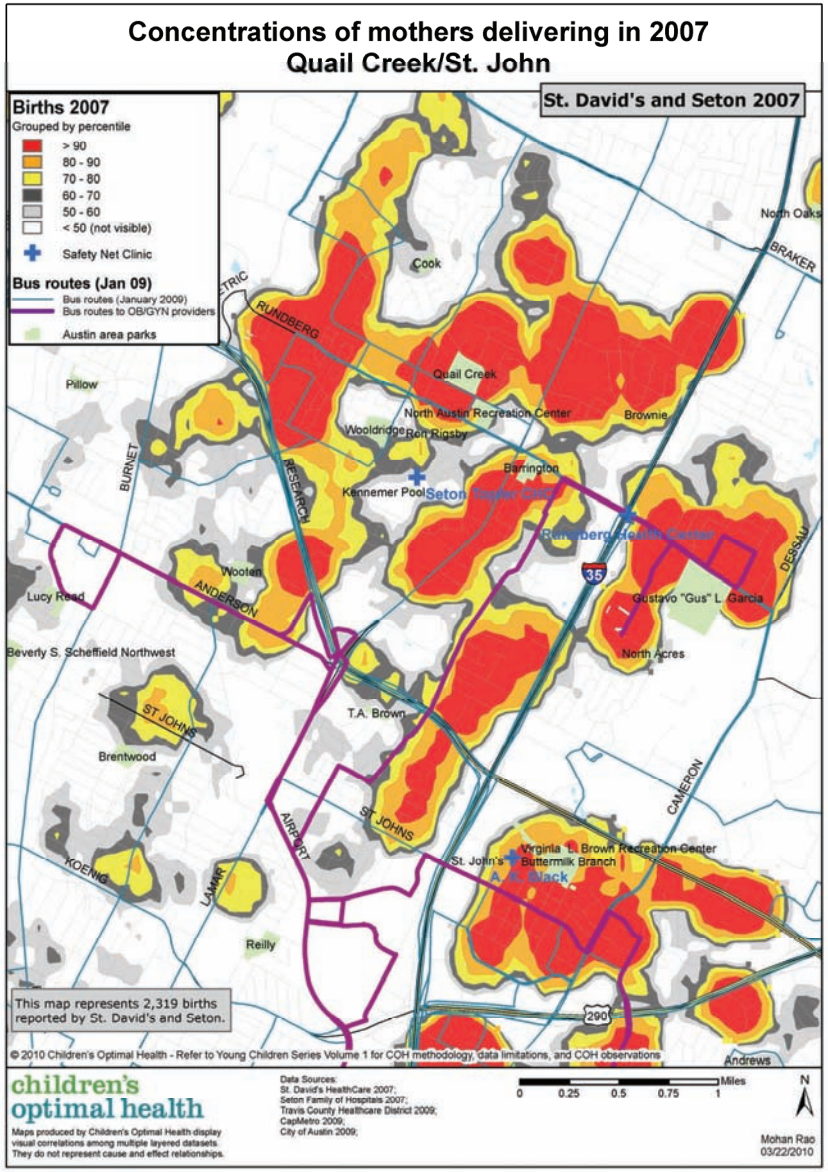
Quail Creek/St John Neighborhood View For Families with Young Children

Notes:

1. Many of our observations showed concentrations in this neighborhood, making it an area of interest.
2. All neighborhoods have assets as well as needs. The following maps provide an understanding of the assets in this neighborhood, particularly as they pertain to families with very young children
3. The observations we can make are based on the data to which we have access.
4. While the maps can help us understand the neighborhood, we really need to understand the story from the perspective of people in the neighborhood.
5. Because neighborhoods are dynamic, their stories evolve. Participation of those who live and work in the neighborhoods creates a tapestry that enriches our understanding of neighborhoods and ways to insure that all children are healthy and successful.





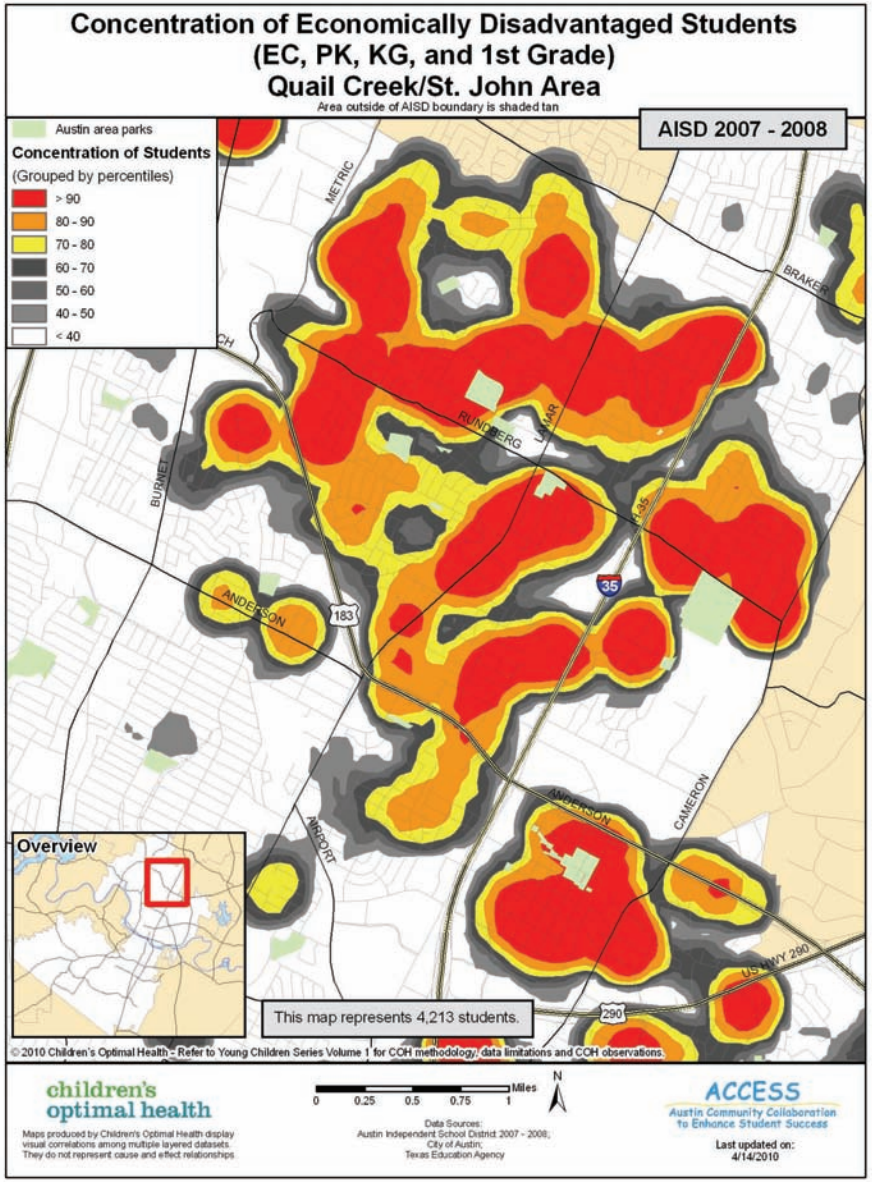


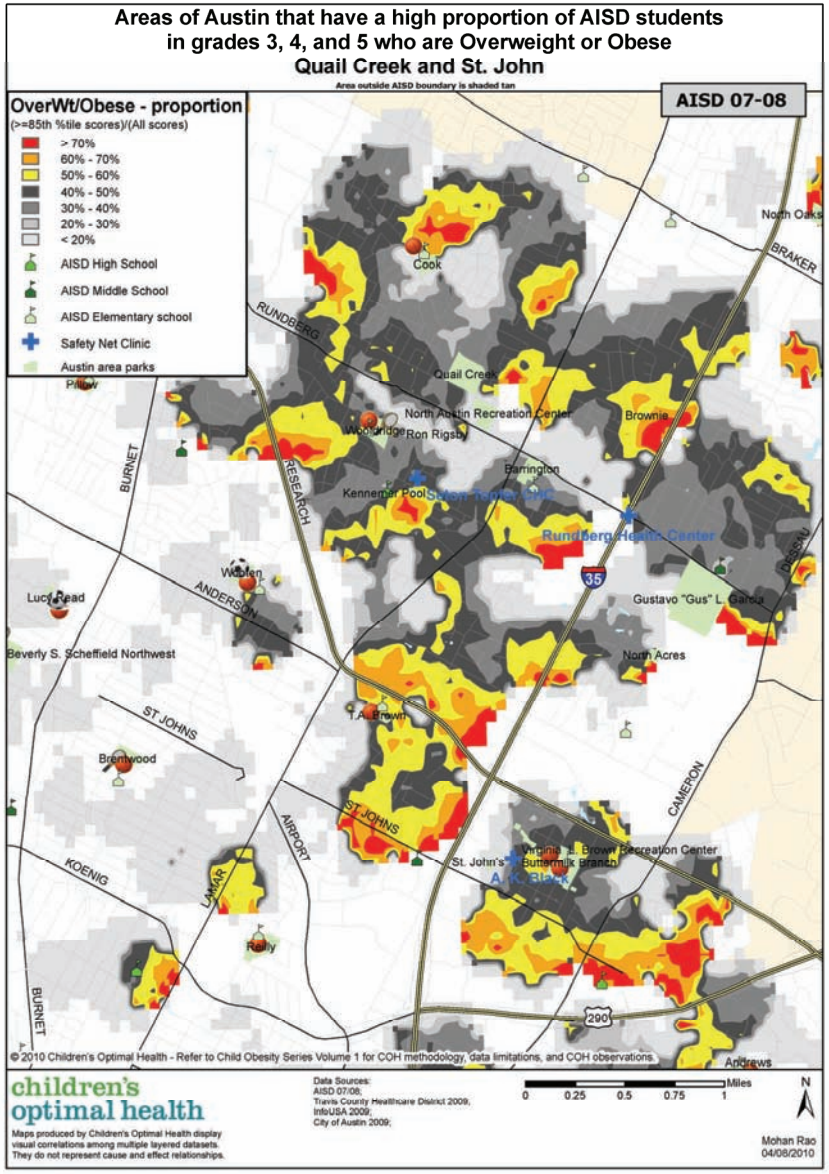
Observations

1. There were 4,721 students enrolled in EC, Pre-K, Kinder and 1st grades in school year 2007-08.
2. There were 2,319 births for this neighborhood in 2007.
3. The number of births compared to the number of students enrolled suggests a possibly increasing birth rate in this neighborhood. Further investigation may be needed.

Observations

1. There are no hospitals in the neighborhood.
2. There are three safety net health clinics in this community.
3. Bus transportation is available. There is bus transportation to Obstetrics and Gynecology services (at A. K. Black) and Pediatric care (at Rundberg, A. K. Black, and Seton Topfer)





Observations

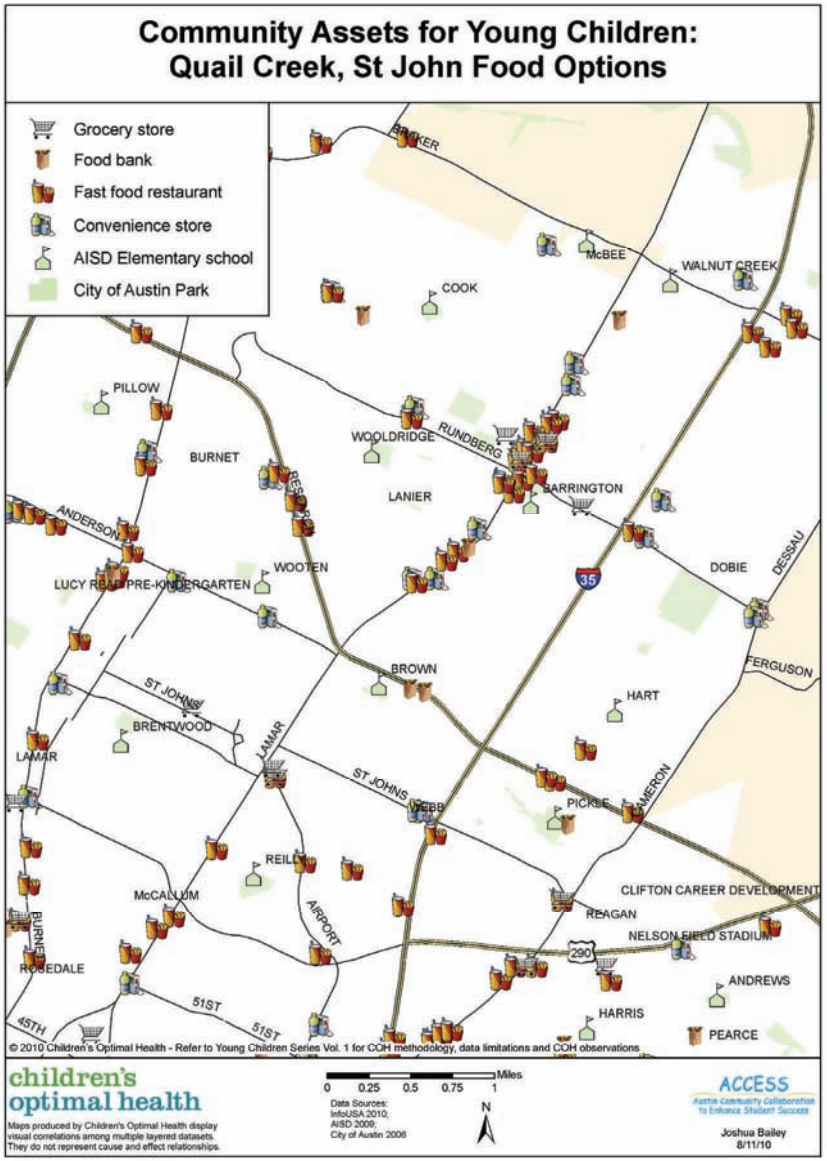
1. There were 4,721 students enrolled in EC, Pre-K, Kinder and 1st grades in school year 2007-08. Of the 4,721 EC, Pre-K, Kinder, and 1st grade students living in this area, 4,213 (89.2%) of them are economically disadvantaged (qualify for free/reduced lunch).
2. There were 2,319 births for this neighborhood in 2007.
3. The concentration of economically disadvantaged students in this neighborhood is quite similar to the concentration of students overall in grades EC, PK, Kinder and 1st.

Observations

1. There are no hospitals, but there are three safety net clinics in the neighborhood.
2. There are a number of areas where >50% of students in grades 3, 4, and 5 are overweight/obese based on BMI measures.
3. Greenspace appears to be limited in this neighborhood.
4. There is limited access to recreational fields in areas where elementary students are concentrated.

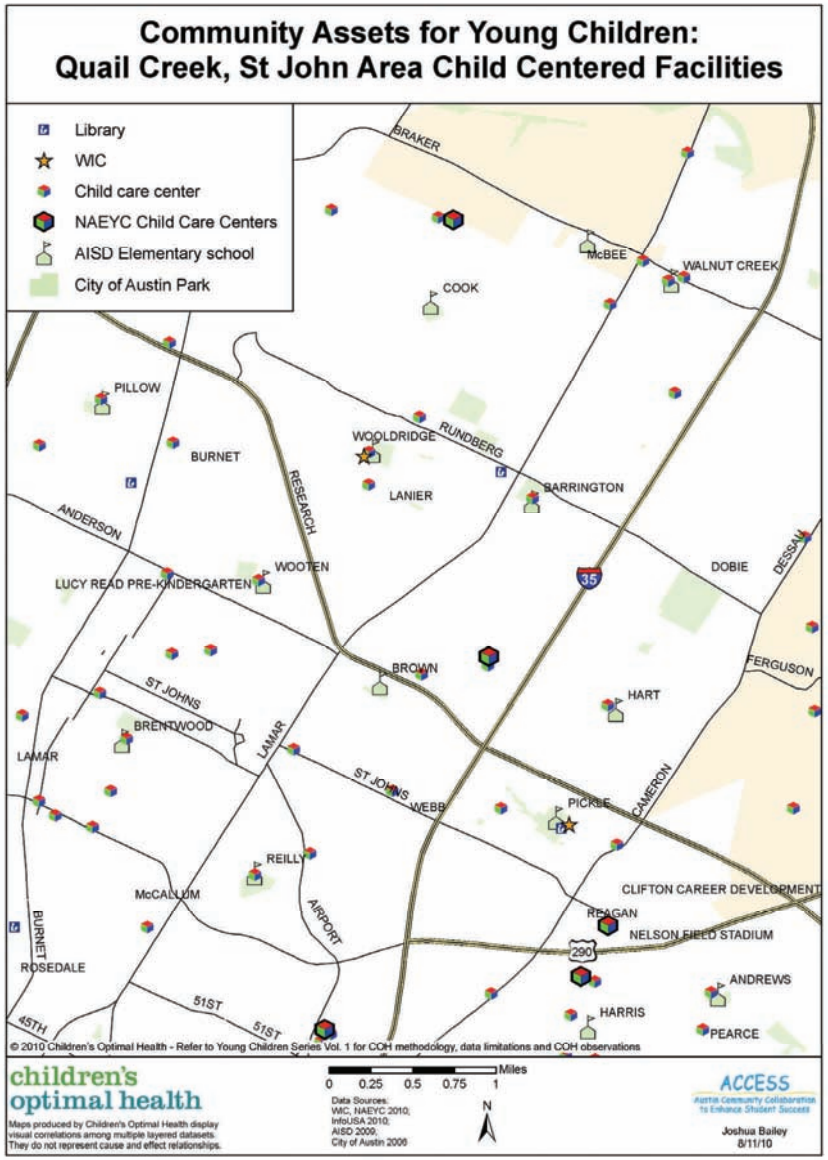
Observations

1. There are playscapes and swimming pools available in the area.
2. It is unclear whether these play spaces are within a safe walking distance for children and families.



Observations

1. The food environment appears to be densely populated with fast food and convenience stores.
2. There is access to grocery stores and food pantries.
3. Easy access to fast food/convenience stores may compete with healthier food options for children and families.
4. Food pantries also serve the neighborhood.

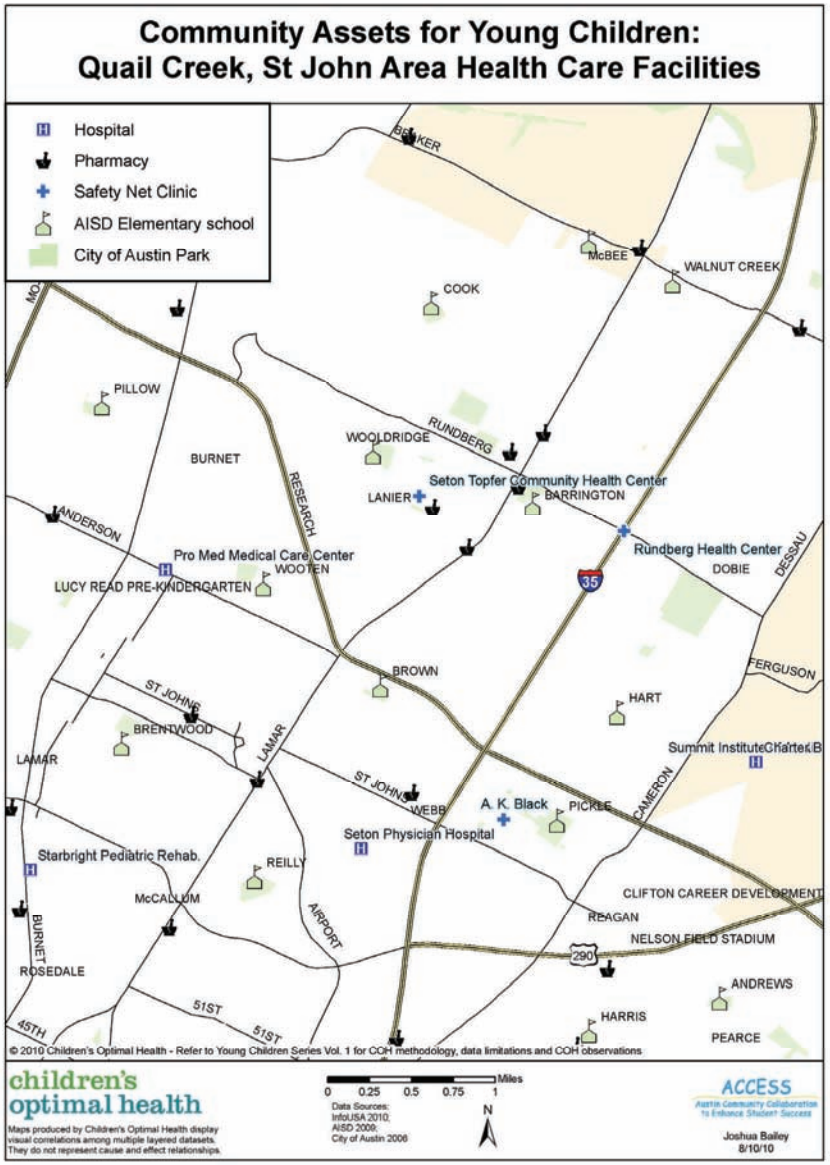


Observations

1. Two WIC clinics serve the community. They are associated with Pickle Elementary and Wooldridge Elementary schools.
2. There are four libraries throughout the area.
3. There are a number of child care centers.
4. Geographic access to child care does not mean that child care is economically accessible.

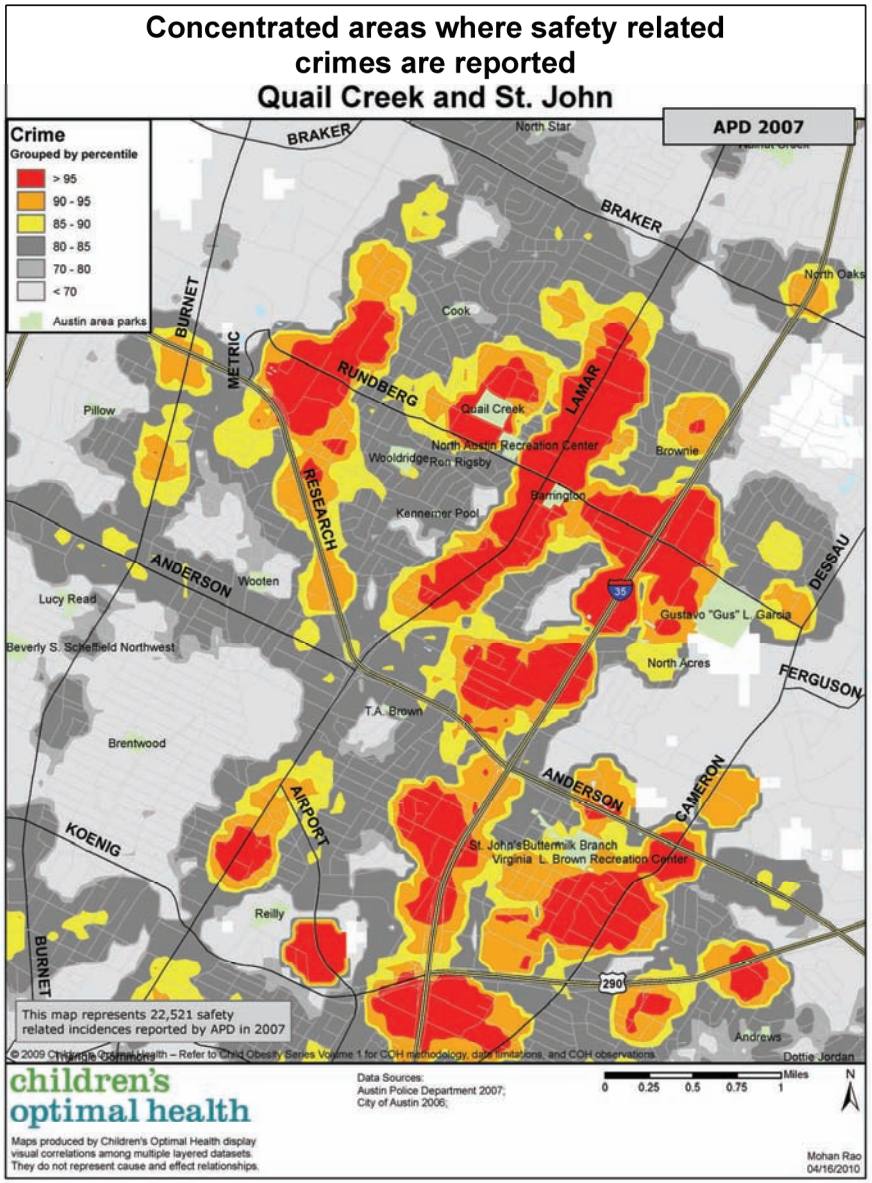
Observations

1. There are a number of faith-based organizations located in this community. The community assets represent a snapshot in time. They are dynamic and constantly changing and because of this, the assets seen here may not represent the current assets in the neighborhood.



Observations

1. There are three safety net health clinics serving this community.
2. There are four hospitals in the community, however they may not be accessible to low income families.
3. There are a number of pharmacies in the area.
4. Obstetrics and Gynecology services are offered at A. K. Black, and Pediatric care is offered at the Rundberg Health Center A. K. Black, and the Seton Topfer Clinic.



Observations

1. There were 104,932 safety related incidents reported by APD in 2007. 22,521 (21.4%) of them were in this area.
2. The Quail Creek/St. John area appears to have a high concentration of safety-related incidents.
3. Safety may be a concern for families with young children living in this area.
4. Concern about safety may inhibit physical activity of children and families.
5. Safety incidents within parks are recorded by nearby street address, thus incidents within parks may be shifted to the boundary of a park.

Project Data Sources

AISD Student Population and Demographics, School Year 2007-08:

Student demographic data was based upon the Public Education Information Management System (PEIMS) 1 Submission of 2007. This data pull is used by AISD to report annual enrollment statistics to the Texas Education Agency. For this mapping project, only students enrolled in grades EC, PK, K and 1 were used.

Seton Family of Hospitals and St. David's Healthcare Network Birth data, 2007:

Data sets for hospital births for both Seton Family of Hospitals and St. David's Healthcare Network have been combined for 2007. Comparing the number of births from these two healthcare systems to total births registered for Travis County in 2006 (closest year available), we estimate about 85% of all births in the county are represented in the hospital data. The map is generated based on the neighborhood of residence identified by the mother at the time of birth.

Austin Police Department Incident Data, 2007:

The data set encompasses all crime incidents in which a citation was written by APD. The mapped location is based upon the address recorded for the incident. This data was collected from 1/1/07 to 12/31/07, so the timeframe may not be directly comparable to the AISD datasets.

The safety related maps show the density of crimes reported to APD during 2007. Only the reports for crimes that are likely to diminish a child's or parent's sense of safety are mapped. For example, reported burglary of residence, public intoxication, and assault by threat are mapped. However, reports of identity theft, theft of service, and counterfeiting are not mapped. Out of the 193,066 crime reports across 459 offense codes received by APD during 2007, 104,932 reports (54%) across 213 offense codes were selected for mapping.

ntegrated Care Collaboration (ICC) Birth Data, 2007

This data set provided by the ICC encompasses all of the uninsured or underinsured mothers who delivered at a safety net provider in the ICC system. Although multiple years of data are available, COH only mapped the 2007 ICC births in order to match with the time period of other datasets.

ESRI, Select Business Data, 2008:

Business data, including child care centers and other assets were based on data collected by InfoUSA, then compiled and distributed by ESRI. The Standard Industrial Classification (SIC) codes were used to identify fast food restaurants, grocery stores, child care centers, places of worship and other community assets.

InfoUSA is a commercial dataset that serves as a baseline for community business data. It has been enhanced at the more granular neighborhood level with locally available data, such as that on location of food pantries. The InfoUSA dataset was released in January 2009, representing 2008 information. It might not be directly comparable with other datasets due to the shifted timeframe.

Project Limitations

This is the first attempt to map the social environment for Austin's families with very young children. It marks a beginning, and if community interest and support persists, will develop over time. The limitations of each dataset may affect the way an individual map can be interpreted, as well as the story the map appears to tell. For additional questions regarding specific datasets and limitations, please contact COH or the ACCESS project.

Birth data represents the vast majority, but not all births in the county during 2007. For instance, home births were not included. If there are neighborhood clusters where high numbers of women deliver at home, the map could be inaccurate in that those births would not appear.

Student enrollment and demographic data was obtained only from AISD, and not from the other surrounding school districts. That data represents those students within AISD, rather than the Austin community as a whole. The AISD boundary is represented as white (unshaded). The surrounding area is shaded yellow representing areas covered by other local school districts from which no data was available. Inferences about student enrollment cannot be drawn for areas outside the AISD geography. A lack of representation on a map does not necessarily imply a lack of need.

Though AISD serves students in grades EC through 12th grade, not all grade levels are represented. Those maps representing the youngest students include those students enrolled in grades EC, PK, K, and 1. Though the intent of the mapping project was to understand the landscape for families with children prior to school age, data were pooled across these grades for two reasons. Both the EC and PK populations represent special populations. EC children are those who have been identified with developmental delays of sufficient significance to qualify them for this program. Children in the AISD Pre-K programs are those who meet economic disadvantage guidelines or other triggers that qualify them for enrollment in this program. To control for this skewing of the young student population, and to enhance the number of students geographically represented, Kindergarten and 1st grade students are included.

for one or both of these two tests were considered "struggling". These maps In addition to the young student population, maps of middle school students are included. These maps are used to reflect the general health characteristics, based on Fitnessgram measures of body mass index (BMI). These maps reflect the health status of older children living in the same neighborhoods as our youngest children, and may indicate health vulnerability for young children living in the same neighborhood environment.

Similarly, maps of academically successful and struggling students are included. These maps are based on student achievement for those in grades 3 through 11. Students who took and passed both reading and math TAKS tests were considered "successful". Students who did not meet the standard

represent the school success of older children living in the same neighborhoods as our youngest children, and may point to academic vulnerability for the youngest children as they mature in these neighborhoods.

COH Methodology

Density Maps

Many Children's Optimal Health (COH) maps display *density* distribution of some particular population of interest. Density maps show where high concentrations of the mapped population live. All COH density maps are rendered from raster datasets. Our GIS tool, ESRI's ArcMap 9.3.1, supports a variety of ways to calculate and display density maps. We chose a methodology that we believe strikes a proper balance between accuracy and ease of interpretation while at the same time being HIPAA and FERPA compliant and does compromise individual privacy.

Spatial Analyst's *Neighborhood Statistics* tool was used to create the population density maps. The density maps' grid cells are squares representing an area equal to 100 yards by 100 yards. Neighborhood settings were set to a circle with a radius of 3 cells. The above parameters smoothed out the distribution of cell values to make the interpretation of hotspots easier to interpret visually, but retained enough locality to be meaningful at the neighborhood level. All density maps were categorized into deciles[1] with the top 3 deciles symbolized as red, orange, and yellow (in descending order). The remaining deciles were symbolized in a grayscale with lighter shades representing lower deciles. The symbolization of deciles forms the consistent thread across all density maps. Thus, although density values may vary greatly from map to map, the red areas on a density map always represent the top decile's density values. All pixels with values less than or equal to 5 were symbolized to "no color" to protect individual privacy.

[1] Decile: any one of nine numbers that divide a frequency distribution into 10 classes such that each contains the same number of individuals; **also: any one of these 10 classes** (source: Merriam-Webster).

To meet privacy-protection requirements of individuals' data, residence location latitude and longitude values were randomly shifted anywhere from 100 to 300 feet. This shifting can introduce significant errors for density values at the cell level. But at the neighborhood level, for example for a one mile by one mile zone, a shift of up to 300 feet does not significantly alter the overall distribution of the population within the zone. However, it is important to remember that the density value of a specific cell can vary substantially from the cell's true value due to the shifting algorithm used to protect privacy. Therefore, it is **not** appropriate to use density maps at a city block level.

Proportion Maps

Another kind of COH map that describes a population's distribution is a *proportion* map. The COH proportion maps display the distribution of ratios of a specific population's subset compared to the full set.

Each proportion map was derived from two or more density maps. Since proportion maps display ratios, the calculation of a proportion map's cell value involves dividing cell values from one set of density maps by the cell values of another set of density maps. For example, an obesity proportion map is derived by dividing the density map of overweight and obese students by the density map of *all* students with a BMI score, so that each individual cell's count of students with high BMI is divided by its corresponding count of all students.

All density maps underwent a reclassification process before they were used to derive proportions. Density cell values less than or equal to 5 were reclassified to 0 (zero) in order to remove them from the calculus and thus protect confidentiality. Since this reclassification occurred before proportion values were calculated, there was no need to hide any cells in the proportion maps to protect privacy.

For further information regarding the COH mapping methodology, contact Mohan Rao at (512) 324 – 1000 x 85980.

How to Get Involved

The Austin community has many individuals and organizations who work cooperatively to assure that young children have a healthy start to life, and enter kindergarten ready to learn. Still, our rapid demographic changes indicate that large numbers of children are vulnerable to having a poor start in life, and more effort is needed to assure their healthy early start. If you are interested in gaining more information about the partners working to address these issues, please visit www.childrensoptimalhealth.org or you can contact COH at (512) 324 – 5980.

About COH

Children's Optimal Health is a collective leadership initiative that unites the efforts of Central Texas organizations in promoting community change to help our children reach a brighter future.

COH strives to give agencies and communities access to formerly proprietary data by using GIS mapping to illuminate issues involving Central Texas children. By layering data from multiple sources, COH can help communities visualize the health of their neighborhoods, identify assets and needs, and unearth opportunities for collaborative change.

Through a commitment to shared data, collaboration, and ongoing communication, Children's Optimal Health is a collective leadership initiative to ensure that every child in Central Texas becomes a healthy, productive adult engaged in his or her community.

The goal of COH is to use visual images to inform policy, improve operations, promote research, and mobilize the community to better the lives of our children and youth.

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COH would like to extend special recognition and thanks to the Technical Advisory Committee for the time and effort they have dedicated to ensure the integrity of this project.

Co-Chairs:

Dr. Stephen Pont, Medical Director, Texas Center for the Prevention and Treatment of Childhood Obesity, Dell Children's Medical Center, Medical Director Austin ISD Student Health Services, UT Southwestern, UT-Austin Department of Advertising

Dr. Steve Kelder, Professor, Division of Epidemiology, Co-Director, Michael & Susan Dell Center for Advancement of Healthy Living, UT School of Public Health Austin Campus

Participants: Dr. Anjum Khurshid, Beth Peck, Dr. Bill Sage, Brenda Hummel, Dr. David Warner, Ellen Balthazar, Dr. Philip von Hippel, Dr. Simon Tidd, Sue Carpenter

COH would also like to recognize ACCESS and Success by 6 for their time and contributions to this project.