FRESNO STATE
Central Valley Health Policy Institute

# SOCIAL AND ENVIRONMENTAL DETERMINANTS OF POPULATION HEALTH IN THE SAN JOAQUIN VALLEY

## Preventable Childhood Illness: Individual and Neighborhood Characteristics

### Context

Reducing rates of childhood illness is a key public health objective, given that many of the conditions developed in childhood will negatively impact the individual well into adulthood. This report uses data on emergency department (ED) visits, hospitalizations and pediatric mortality to examine how families and communities in California's San Joaquin Valley (SJV) are impacted by child morbidity and mortality. The relatively rare and costly health events explored here are associated with more negative self-reported health: they are indicative of the burden of disease faced by children and their families in the region.

The report has a primary focus on ***preventable*** and ***non-preventable*** emergency department (ED) and in-patient hospital admissions. Admissions characterized as preventable are for ambulatory care—sensitive conditions (ACSC), diagnoses for which timely and effective community health services reduce the likelihood of hospitalizations. Asthma and pneumonia are the two health conditions for which children most often have preventable hospitalization. Non-preventable conditions are also examined because a growing literature indicates that families and communities with higher rates of preventable pediatric acute events also face greater risk for non-preventable admissions.[9]

Health and appropriate development of children are shaped by multiple factors including family, home, peer group, and neighborhood influence. Communities shaped by segregation and poverty often lack key resources for child health. In the San Joaquin Valley, land use patterns and neighborhood formation were shaped by explicit segregation policies and as a result the Valley's relatively small African American populations are most concentrated in specific older urban core and isolated rural communities with few amenities and multiple environmental challenges. These same locales also serve as the first places of residence for immigrants from Latin America and Southeast Asia. More affluent, resource and amenity dense communities have typically been developed more recently and have higher proportions of whites and lower proportions of low income persons. By describing how rates of adverse childhood health events are linked to racial/ethnic and poverty rate composition provide a lens for describing how children are influenced by a broader set of social and environmental factors.

### Pediatric Illness and Health Departments

The link between childhood illness, neighborhood poverty, race/ethnicity and other factors has implications for San Joaquin Valley Public Health Consortium (SJVPHC) member local health departments because of their extensive maternal and child health programming. To some extent these local public health initiatives are shaped by state and federal policies and funding priorities.[22] Notable

reductions in funding for public health maternal and child health initiatives in California have also influenced the range and scope of initiatives. Despite these factors, Figure 1 shows diverse examples from the San Joaquin Valley county local health departments of ongoing initiatives and activities to promote child health and wellness. These efforts are directed to families, children, care providers and the broader community. These initiatives reflect the range of public health roles, including monitoring, public education, targeted community prevention programs, increasing access to health care, coordination of health and social services for at-risk groups, coordination of clinical care improvement collaborations, and broader collaborative efforts to promote health-friendly policies, facilities, and communities. By examining variations across the Valley in adverse pediatric outcomes, this analysis can help local health departments and their partners identify additional avenues to improve child health.

**Table 1. Selected SJV Public Health Initiatives to Improve Childhood Outcomes**

| County | Examples of Current Initiatives |
|---|---|
| Kings | • Providing Childhood Immunizations<br>• Participating as leading partners in a number of county coalitions to promote prevention and care<br>• Leveraging current programs to educate families on childhood/pediatric illness |
| Fresno | • Ongoing Needs Assessment on access to care, infant mortality, maternal health, pre-term birth, breastfeeding etc.<br>• Ongoing support of current interventions including Nurse Family Partnership, Babies First, Perinatal Early Intervention, Nurse Liaison, High Risk Infant Program and Black Infant Health |
| Madera | • Medi-Cal and Covered California outreach, enrollment and retention services to underserved and unserved communities.<br>• Preserve high vaccination rates through robust clinical services that are culturally competent and easily accessible<br>• Home Visitation Program that improves the health outcomes for children and families |
| Merced | • Targeted programs to improve health and wellbeing of girls and women, promote exclusive breastfeeding to six months of age, promote preconception health, positive youth development strategies, and improved access to services<br>• Linkage to care and case management to at-risk populations.<br>• Coordination and technical assistance to improve overall immunization rates in Merced County. |
| San Joaquin | • Monitor health status, needs, and services available to mothers, and children with a focus on low-income populations<br>• Coordinate outreach that improves access to early and continuous prenatal care, and child health care |

| | |
|---|---|
| | • Provide community health promotion to reduce domestic violence, tobacco use, substance abuse, injuries, childhood obesity, teenage pregnancy, dental caries, and higher death rates among African-American infants. |
| Stanislaus | • Outreach to enroll individuals and families in insurance plans and link individuals to a medical home or other source of care<br>• Support women and families support through WIC, Healthy Birth Outcomes, High Risk Maternal/Child Health, Nurse Family Partnership, Adolescent Family Life and CalLEARN programs<br>• Coordinate health coalitions (HEART Coalition, TOPS Coalition, etc.) that encourage all sectors to adopt health-friendly policies and improve the physical infrastructure for healthy living |
| Tulare | • Tulare County Public Health Department hopes to be able to expand all the childhood and perinatal initiatives and be able to reach more families<br>• We will also be conducting a community health assessment and developing a community health improvement plan which will guide any new initiatives |

**Data Sources and Approach**

Data from a variety of statewide governmental agencies. All variables were measured at the zip code-level. The Death Statistical Master Files for the years 2009-2010 were obtained from the California Department of Public Health (CDPH). Emergency department visits and hospital admissions were gathered from the Office of Statewide Health Planning and Development (OSHPD), 2009-2011. All data files provided information on place of residence (zip code), age, sex, and other non-identifiable demographics. All rates and population estimates were based on 2010 Census files. The majority of indicators were acquired from the American Community Survey (2010) including population estimates of age groups, race/ethnicity, individuals living below 125% of the Federal Poverty Line (FPL), education, home ownership and employment.

**Estimating the Cost of Preventable Childhood Morbidity**

Analysis of expenditures was conducted for both preventable emergency department visits and hospital admissions for the three years (2009-2011). The average cost of an event was stipulated to be $600.00 per emergency department visit and $6,583 for that of hospital based on estimates of average payment for these services in other California studies. The weighted average was adjusted for the relative racial/ethnic population differences between communities. The additional costs of pediatric care associated with racial/ethnic and neighborhood poverty differences are expressed as the potential cost savings if children of color, children living in poor communities, or children of color in poor communities had similar utilization rates to whites and those living in less impoverished communities.

**Rates of Childhood Morbidity and Mortality in the SJV**

Children under age 15 in the SJV are more likely to be hospitalized for preventable illnesses than

children from other regions in California (54.3 vs. 43.4 per 10.000). Table 2 presents childhood morbidity and mortality stratified by race/ethnicity in the SJV. In general, preventable ED rates are higher than non-preventable and the opposite is true for that of hospital admissions. Regardless of the type of event listed in Table 2, African-Americans are either the highest or the second highest subgroup at risk. Rates of infant mortality are highest among African-Americans (13.3/1,000 live births) and "Others" (14.9/1,000 live births). These two subgroups are at more than double the risk of infant mortality than the next leading race (white at 5.3/1,000 live births).

Across event categories, Hispanic rates tend to be similar or lower than those of whites. For non-preventable hospital admissions, however, there is a 50% increase in the white (273/10,000) rate compared to that of Hispanics (183/10,000).

**Table 2. Rates of Morbidity and Mortality in the SJV by Race/Ethnicity, 2009-2011**

| Indicator | White | Hispanic | African-American | Asian | Other |
|---|---|---|---|---|---|
| Emergency Department[a] | | | | | |
| Preventable | 68 | 69 | 103 | 26 | 25 |
| Non-Preventable | 46 | 38 | 60 | 18 | 15 |
| Hospital Admission[b] | | | | | |
| Preventable | 99 | 69 | 116 | 85 | 23 |
| Non-Preventable | 273 | 181 | 222 | 199 | 61 |
| Infant Mortality[c] | 532 | 530 | 1,347 | 358 | 1,439 |
| Childhood Mortality[d] | 18 | 14 | 24 | 16 | 5 |

a = Emergency department rates are calculated per 1,000 in the population. N is the frequency of events in 2009-2011.
b = Hospital admission rates are calculated per 10,000 in the population. N is the frequency of events in 2009-2011.
c = Infant mortality includes all deaths (N) occurring under one year of age in 2009 and 2010. Rates were calculated per 100,000 live births.
d = Childhood mortality includes all deaths (N) occurring between 1 - 14 years of age in 2009 and 2010. Rates were calculated per 100,000 in the population.

**Costs of Childhood Morbidity in the SJV**

ED and hospital model estimates were developed to evaluate the impact of race and poverty on preventable pediatric illness. Table 3 highlights the reduction in cost that would occur if all children in the SJV had preventable ED visitation rates equal to those of children in low poverty communities, white children and white children living in communities with low poverty. If all children had rates similar to those from low poverty communities, there would be a decrease in total expenditures of $9.2 million per year, or a reduction of 36.4%. If all children had rates similar to those of white children, there would

a savings of $13.8 million, or a 54.3% reduction in costs. If all children experienced rates enjoyed by white children living in communities with low poverty, a substantial $19.2 million would be saved, a total reduction of 75.8% in ED costs.

**Table 3. Emergency Department Cost Projections for Preventable Diagnoses, 2009-2011**

| Adjustment | Event Ratio | % Reduction in Cost | Estimated Savings Per Year |
|---|---|---|---|
| Low Poverty | 1.57 | 36.4 | $9,241,936 |
| White | 2.19 | 54.3 | $13,807,730 |
| Low Poverty and White | 4.13 | 75.8 | $19,269,649 |

Similar findings are evident when considering preventable pediatric hospitalizations. Table 4 highlights the reduction in cost that would occur if all children in the SJV had preventable hospitalization rates equal to those of children in communities of low poverty, white children and white children living in low poverty communities. If all children experienced rates of hospitalization similar to those from white children living in low poverty communities, a substantial $19.1 million would be saved, a total reduction of 62.3% in direct hospitalization costs.

**Table 4. Hospital Admission Cost Adjustment for Preventable Diagnoses, 2009-2011**

| Adjustment | Event Ratio | % Reduction in Cost | Estimated Savings Per Year |
|---|---|---|---|
| Low Poverty | 1.40 | 28.8 | $8,838,453 |
| White | 1.72 | 42.0 | $12,889,520 |
| Low Poverty and White | 2.65 | 62.3 | $19,113,621 |

**Discussion and Recommendations**

As defined by the World Health Organization, social determinants of health are the "conditions in which people are born, grow, live, work and age."[24] These conditions are shaped by the unequal distribution of resources, primarily economic, political and social capital. In the SJV, social determinants of health are limiting the health and economic future of children and perpetuating the struggle of working poor families. Findings indicate that children that are non-white and underserved are likely experiencing less access to preventable care, more stressful and harmful neighborhood environments and have fewer resources to address conditions that develop- earlier in their lives. The ramifications of these disparities extend beyond the individual child and family unit. Racial and economic differences account for a substantial portion of elevated costs for these populations. It should be a public health

priority to participate in efforts to eliminate poverty and focus research on family health status and health care access.

**Potential Initiatives to Improve Childhood Health Outcomes**

County Public Health Departments play a key role in encouraging and providing leadership towards improving Maternal and Child Health equity, particularly in diverse contexts. In particular, there are three specific opportunities that Public Health Departments can champion at the county level:

*Promote high quality and culturally responsive perinatal clinical care in patient-centered systems, informed by scientific consensus and national best practice evidence.*

In the SJV, several counties are engaging in this effort by identifying and fostering opportunities to train and retain physicians and providers in other medical specialties (Nurse Practitioners, Registered Nurses, etc.) that are multi-lingual and culturally sensitive. Public Health Departments are also engaging practitioners to discuss developing new partnerships that will increase access to quality, coordinated and evidence-based care.

*Provide individually oriented education, health promotion, screening and interventions for women and men of reproductive age to reduce risk factors that might early childhood outcomes.*

The “promotora” or community health worker (CHW) model has received significant attention recently as an opportunity to provide social, economic and health support for women. CHWs visit women in home settings to promote preventive measures including breastfeeding, nutrition, homemaker assistance, healthcare system navigation, etc. Ideally, CHWs are members of the communities in which they serve, providing both context and a role model for women in need of support. Developing and funding these programs is a high priority goal for several SJV counties.

*Investigate and increase the responsiveness of policies and programs to social, economic and environmental factors that impact childhood outcomes.*

This multi-level, interdisciplinary goal requires new collaborations and unique partnerships. Some counties in the SJV are coordinating across sectors to consider the built environment and adopt health-friendly policies and improve the physical infrastructure for healthy living. Those invited to engage and frame new policies include government agencies, businesses, employers, developers, and families.

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