

RESEARCH-TO-PRACTICE SUMMARY

Asthma in Head Start Children: Practical Implications for Detection of Some Socio-demographic Risk Factors with Suggestions for Head Start Staff

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The Head Start Bureau has described asthma as a “growing problem” and “top chronic disease among Head Start children” (Rehnquist, 2002). This study examined the racial/ethnic and SES-based contributors to asthma occurrence among children attending three Head Start centers in a multi-ethnic, densely populated city in the U.S. Sample consisted of 1312 families. Findings indicated that poverty -over and above the effects of race/ethnicity- was a primary risk factor for asthma in this population. In addition, Hispanic/Latino ethnicity and Asian race were predictive of very high and very low rates of asthma, respectively. There was a positive relationship between asthma status and caregivers' education level, which may play a role in reporting of asthma cases. These findings are of significant value to inform formulation of effective intervention programs at Head Start centers.

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Asthma is approximately two to four times more common among Head Start children compared to children in the general population (Nelson, Awad, Alexander, & Clark, 2009; McGill et al., 1998; Slezak, Persky, Kviz, Ramakhishan, & Byers, 1998; Vargas et al., 2004). This is a cause for serious concern, given that asthma negatively impacts socio-emotional development, school readiness, school attendance, and primary caregivers' ability to retain full time jobs (Mrazek, Schuman, & Klinnert, 1998; Halterman et al., 2001; Diette et al., 2000; Ladebauche et al., 2001; Moonie, Sterling, Figgs, & Castro, 2006; Taras & Potts-Datema, 2005; Baydar, Joesch, Kieckhefer, Kim, & Greek, 2006). These disruptions in families' work and education routines ultimately interfere with Head Start's primary mission of providing comprehensive social, cognitive and health experience for young, low-income children (Rehnquist, 2002).

Links between Socio-Economic Status and Asthma

Risk factors for asthma in preschool children are strongly linked with economically disadvantaged environments (Federico & Liu, 2003; Currie, 2005; Brooks-Gunn & Duncan, 1997). These income-associated risk factors include exposure to allergens such as mold, cockroaches and mice (Ladenbauche et al. 2001), tobacco smoke (Rotsides et al, 2010; Vergas et al., 2004), frequent respiratory and ear infections (Jacobson et al., 2008a), and obesity (Jacobson, et al., 2008b). We know that preschool children who come from low socio-economic status (SES) are approximately two times more likely to have asthma than high-SES children (Bloom, Cohen, & Freeman, 2011; Seguin, Nikiema, Gauvin, Zunzunegui, & Xu, 2007). In addition, black preschool-aged children are approximately two times more likely than their white peers to develop this illness (American Lung Association, 2012). These differences in asthma occurrence (prevalence) are the largest among younger age groups, i.e., children (Halfon & Newacheck, 1993; Case, Lubotsy, & Paxson, 2002; Chen, Matthews, & Boyce, 2002).

Role of the Head Start

One needs to pinpoint and accurately define the risk factors associated with asthma in order to implement accurate preventive and intervention policies. The link between race/ethnicity and SES among our children poses a considerable challenge to untangling their effects on asthma occurrence. In 2010, approximately one in three Black and Hispanic children, and one in ten non-Hispanic White children suffered from poverty, showing that minority status is still strongly associated with low income (DeNavas-Walt, Proctor, & Smith, 2011).

Head Start agencies are potentially good places to try to understand the linkage among the various risk factors, and implement preventive care policies, because they serve primarily low-income, ethnic/racial minority preschool children, a population with alarmingly high asthma rates.

What this Study Adds

Studies which investigated race- and SES-based disparities in pediatric asthma generated mixed results. In one large, nationally representative sample (N = 20,717), Chen, Martin and Matthews

(2006b) found both race and parental education to be unassociated with asthma occurrence among children younger than 18. Others suggested that poverty is more strongly linked with asthma compared to the effects of race/ethnicity (Claudio, Stingone, & Godbold, 2006; Smith, Hetcher-Rose, Wertheimer, & Kahn, 2005; Federico & Liu, 2003; Currie, 2005; Brooks-Gunn & Duncan, 1997). Still other research has found asthma rates among black children was not as strongly linked with family income when compared with non-black children (Fox-Ray, Thamer, Fadillioglu, & Gergen, 1998; Miller, 2000; Halfon & Newacheck, 1993). Different research findings may stem from the fact that researchers study slightly different age groups, or they group the data from different ages. Grouping the data across ages may be problematic because the link between SES and asthma changes based on the age group that is being studied (Chen, Matthews, & Boyce, 2002). Therefore, in this study, we strictly focused on preschool children in Head Start. We believe that furthering our understanding of the relationship between asthma, race/ethnicity and SES is crucial if we are to design well-informed and cost-effective interventions to reduce the burden of health disparities among Head Start families.

SUMMARY OF RESEARCH METHODS

Data were collected by the Relationships for Growth & Learning Program of the Jewish Board of Family and Children's Services (*RfGL*), an onsite integrated mental health service and consultation program serving at-risk children and their families (Shahmoon-Shanok, Lamb-Parker, Halpern, Grant, Lapidus, & Seagle, 2005; Shahmoon-Shanok, Welton, & Lapidus, 1989). Final sample consisted of 1312 families in three Head Start centers located in different parts of New York City between the years of 1999 and 2004. Children's age ranged between two and five. A 41-item Health Record Questionnaire (HRQ) was completed with all caregivers at the time of registration to the Head Start centers. HRQ included questions about pregnancy/birth history, hospitalizations/illnesses, health problems, and physical/psychological/social development of target children. A positive asthma status was assigned if the primary caregiver answered "yes" to the question "Has your child had asthma?" The primary measure of SES was yearly household income, self-reported by the primary caregiver. Data for education levels of caregivers were available for a subsample of children ($n = 907$) and this variable represented the number of school years that primary female caregivers completed.

MAJOR FINDINGS

Sample Characteristics

Our sample mainly consisted of racial and ethnic minority children: approximately 16% of children were black, 77% were Hispanic/Latino, 5% were Asian, and 2% was categorized as "other". The average yearly income of families was \$11,812, and it ranged from \$1,300 to \$32,942. Approximately 90% of the families had less than \$20,000 annual income. Yearly family income did not significantly differ among racial/ethnic groups.

Race/ethnicity and Asthma

The rate of asthma among Hispanic/Latino children was 11%. This was almost two times higher than the asthma rate among black children, which was around 6%. Further, none of the Asian children were reported to have asthma. Jamaican and Dominican children were reported to have high asthma rates, 16% and 13% respectively.

Links between SES and Asthma

Asthma status was significantly associated with lower yearly family income in the general sample. When racial/ethnic groups were analyzed separately, this relationship between asthma status and income remained significant only among Hispanic/Latino children. Within black race category, family income was still lower among children who had asthma, although the correlation was not statistically significant.

Rate of asthma was reported as 8% among children whose primary female caregivers did not complete the high school, whereas this increased to 12% within children of at least high school educated caregivers.

Those children who were born post- or pre-term had a higher rate of asthma (14.2%) compared to children who were born around the due date (9.9%), although this difference was not statistically significant.

To investigate the unique effects of child and family variables on asthma, logistic regression models were employed. Results indicated that males were 31% more likely to have asthma compared to females, whereas age and pre/post-term birth were not significantly associated with asthma status. Hispanic/Latino children were approximately two times more likely to have asthma compared to black children. The effect of income was significant over and above that of race/ethnicity: one unit increase in family income (approximately \$1000) was associated with a 4.4% decrease in the odds of having asthma among this sample of preschool children, after removing the effects of race/ethnicity. Location of the Head Start center or the education level of the primary caregiver did not yield significant/similar results.

IMPLICATIONS FOR PRACTICE

Overall, our findings indicated that low income is a significant correlate of asthma among children, regardless of the race/ethnicity, age and gender of the child. The link is stronger among Hispanic/Latino children compared to black children. The significant link between asthma and family income in this minority sample highlights the importance of risk factors that are highly associated with family income. Asthma is an inflammatory disease and its onset and frequency are considerably affected by allergens like dust, mold, roaches and pesticides, commonly found in economically disadvantaged neighborhoods (Claudio et al., 2006, Perera et al., 2002). In case of an asthma risk indicated by a physician, improving negative environmental conditions to prevent and manage asthma symptoms (e.g., buying air conditioners, air purifiers, replacing a carpet) proves to be financially challenging for low-income families (Mansour, Lanphear, & DeWitt, 2000). In addition, low-income may generate additional parental stress, which can act as

a risk factor for the onset (Klennert, Kaugars, Strand, & Silveira, 2008) and exacerbation of asthma symptoms through compromised immune systems and increased allergic reactions in infants (Klennert et al, 2001), and poor treatment adherence (Rohan et al.,2010, Celano et al., 2010).

Parental education was found to be positively related with asthma, i.e., more educated parents reported more asthma cases. In no way does this suggest higher education of parents causes asthma, but rather higher education may mean greater awareness of this serious health problem linked to low SES. And as low SES, low levels of schooling among parents may exacerbate the problems related to childhood asthma, specifically through challenges associated with its detection and diagnosis.

It is important to note that children of different ethnic backgrounds were reported to have different rates of asthma occurrence. For example, none of the Asian children were reported to have asthma, whereas Jamaican and Dominican children had very high rates of asthma.

Recommendations:

1. Poverty is a significant risk factor for asthma, probably due to its associations with suboptimal housing conditions and other toxic stresses. Therefore,
 - a. Be aware of potential barriers to healthy practices and conditions at home, and educate parents in sympathetic, informal ways at frequent, regular intervals on how to prevent and on ways to manage the illness.
2. Detection of asthma and administration of asthma treatment can produce anxiety and become a cognitive challenge even to educated parents and, perhaps especially, in some immigrant and lower-educated families.
 - a. Thus, Head Start staff would likely benefit from training on
 - i. How to recognize asthma symptoms in preschool children and on
 - ii. Educating parents on symptom detection plus overall asthma management and compassionate care.

REFERENCES

- American Lung Association. (2012). *Trends in Asthma Morbidity and Mortality*. Retrieved from <http://www.lungusa.org/finding-cures/our-research/trend-reports/asthma-trend-report.pdf>.
- Baydar, N., Joesch, J. M., Kieckhefer, G. M., Kim, H., Greek, A. (2006). Employment behaviors of mothers who have a child with asthma. *Journal of Family and Economic Issues*, 28, 337-355.
- Bloom, B., Cohen, R.A. & Freeman, G. (2011). Summary health statistics for US children: National Health Interview Survey, 2010. National Center for Health Statistics. *Vital Health Statistics*, 10(244), 1-81.
- Brooks-Gunn, J., Duncan, G. J. (1997). The effects of poverty on children. *The Future of Children*, 7(2), 55-71.
- Case, A., Lubotsky, D., & Paxson, C. (2002). Economic status and health in childhood: The origins of the gradient. *American Economic Review*, 92(5), 1308-1334.
- Celano, M. P., Linzer, J. F., Demi, A., Bakeman, R., Smith, C.O., Croft, S., & Kobrynski, L. J.(2010). Treatment adherence among low-income, African American children with persistent asthma. *Journal of Asthma*, 47(3), 317-322
- Chen, E., Martin, A., & Matthews, K. (2006b). Understanding health disparities: The role of race and socioeconomic status in children's health. *American Journal of Public Health*, 96(4), 702-708.
- Chen, E., Matthews, K. A., & Boyce, W. T. (2002). Socioeconomic differences in children's health: How and why do these relationships change with age? *Psychological Bulletin*, 128,295-329.
- Chen, E., Matthews, K. A., & Boyce, W. T. (2002). Socioeconomic differences in children's health: How and why do these relationships change with age? *Psychological Bulletin*, 128,295-329.

- Claudio, L., Stingone, J. A., & Godbold, J. (2006). Prevalence of childhood asthma in urban communities: The impact of ethnicity and income. *Annals of Epidemiology*, 16(5), 332-340.
- Currie, J. (2005). Health Disparities and Gaps in School Readiness. *The Future of Children*, 15(1), 117-138.
- DeNavas-Walt, C., Proctor, B. D., & Smith, J. C. (2011). *Income, Poverty, and Health Insurance Coverage in the United States: 2010* (Current Population Reports, P60: 239). Washington, DC: US Census Bureau. Retrieved from <http://www.census.gov/prod/2011pubs/p60-239.pdf>
- Diette, G. B., Markson, L. E., Skinner, E. A., Algatt-Bergstrom, P., Nguyen, T. T., Algatt-Bergstrom, P., & Wu, A. W. (2000). Nocturnal asthma in children affects school attendance, school performance, and parents' work attendance. *Archives of Pediatrics and Adolescent Medicine*, 154(9), 923-928.
- Federico, M. J., & Liu, A. H. (2003). Overcoming childhood asthma disparities of the inner-city poor. *Pediatric Clinics of North America*, 50, 655-675.
- Federico, M. J., & Liu, A. H. (2003). Overcoming childhood asthma disparities of the inner-city poor. *Pediatric Clinics of North America*, 50, 655-675.
- Fox-Ray, N., Thamer, M., Fadillioglu, B., & Gergen, P. J. (1998). Race, income, urbanicity, and asthma hospitalization in California: A small area analysis. *Chest*, 113(5), 1277-1284.
- Halfon, N., & Newacheck, P. W. (1993). Childhood asthma and poverty: Differential impacts and utilization of health services. *Pediatrics*, 91(1), 56-61.
- Halterman, J.S., Montes, G., Aline, C.A., Hightower, D., Kaczorowski, J.M., & Szilagyi, P. G. (2001). School readiness among urban children with asthma. *Ambulatory Pediatrics*, 1, 210-205.
- Jacobson, J. S., Mellins, R. B., Garfinkel, R., Rundle, A. G., Perzanowski, M.S., Chew, G.L. ... Goldstein, I. F. (2008b). Asthma, body mass, gender, and Hispanic national origin among 517 preschool children in New York City. *Allergy*, 63, 87-94.
- Jacobson, J. S., Goldstein, I. F., Canfield, S. M., Ashby-Thompson, M., Husain, S. A., Chew, G. L., ... Mellins, R. B. (2008a). Early respiratory infections and asthma among New York City Head Start children. *Journal of Asthma*, 45, 301-308.
- Klennert, M. D., Kaugars, A. S., Strand, M., & Silveira, L. (2008). Family psychological factors in relation to children's asthma status and behavioral adjustment at age 4. *Family Process*, 47(1), 41-61.
- Klennert, M. D., Nelson, H. S., Price, M. R., Adinoff, A. D., Leung, D. Y., & Mrazek, D. A. (2001). Onset and persistence of childhood asthma: Predictors from infancy. *Pediatrics*, 108(4), E69.
- Ladebauche, P., Nicolosi, R., Reece, S., Saucedo, K., Volicer, B., & Richards, T. (2001). Asthma in Head Start children: prevalence, risk factors, and health care utilization. *Pediatric Nursing*, 27, 396-399.
- Mansour, M. E., Lanphear, B. P., & DeWitt, T. G. (2000). Barriers to asthma care in urban children: Parental perspectives. *Pediatrics*, 106(3), 512-519.
- McGill, K.A., Sorkness, C.A., Ferguson-Page, C., Gern, J., Havighurst, T. C., Knipfer, B., ... Busse, W.W. (1998). Asthma in non-inner city head start children. *Pediatrics*, 102, 77-83.
- Miller, J. E. (2000). The effects of race/ethnicity and income on early childhood asthma prevalence and health care use. *American Journal of Public Health*, 90(3), 428-430.
- Moonie, S.A., Sterling, D.A., Figs, L., & Castro, M. (2006). Asthma status and severity affects missed school days. *Journal of School Health*, 76(1), 18-24.
- Mrazek, D.A., Schuman, W., & Klennert, M. (1998). Early asthma onset: Risk of emotional and behavioral difficulties. *J Child Psychol Psychiatry*, 39(2), 247-254.
- Nelson, B.W., Awad, D., Alexander J., & Clark, N. (2009). The continuing problem of asthma in very young children: a community based participatory research project. *Journal of School Health*, 79(5), 209-215.
- Perera, F. P., Illman, S. M., Kinney, P. L., Whyatt, R. M., Kelvin, E. A., Shepard, P., ... Rauh, V. A. (2002). The challenge of preventing environmentally related disease in young children: Community-based research in New York City. *Environmental Health Perspectives*, 110, 197-204.
- Rehnquist, J. (2002). *Head Start services for children with asthma*. Washington, DC: Department of Health and Human Services, Office of Inspector General. Retrieved from <http://oig.hhs.gov/oei/reports/oei-09-01-00330.pdf>
- Rohan, J., Drotar, D., McNally, K., Schluchter, M., Riekert, K., Vavrek, P., ... Kerckmar, C. (2010). Adherence to Pediatric Asthma Treatment in Economically Disadvantaged African-American Children and Adolescents: An Application of Growth Curve Analysis. *Journal of Pediatric Psychology*, 35(4), 394-404.
- Rotsides, D. Z., Goldstein, I.F., Canfield, S. M., Perzanowski, M., Mellins, R. B., Hoepner, L., ... Jacobson, J. (2010). Asthma, allergy, and IgE levels in NYC head start children. *Respiratory Medicine*, 104(3), 345-55.

- Séguin, L., Nikiéma, B., Gauvin, L., Zunzunegui, M., & Xu, Q. (2007). Duration of poverty and child health in the Quebec longitudinal study of child development: Longitudinal analysis of a birth cohort. *Pediatrics*, *119*, 1063-1070.
- Shahmoon-Shanok R., Lamb-Parker, F., Halpern, E., Grant, M., Lapidus, C., & Seagle, C. (2005). The Relationships for Growth Project: a transformational collaboration between Head Start, mental health and university systems. In K.M. Finello (Ed.), *Handbook of Training and Practice in Infant & Preschool Mental Health*, (pp. 402-424). San Francisco: Jossey-Bass.
- Shahmoon-Shanok, R.S., Welton, S.J., & Lapidus, C. (1989) Group therapy for preschool children: A transdisciplinary school-based program. *Child and Adolescent Social Work Journal*, *6*, 72-95.
- Slezak J.A., Persky, V.W., Kviz, F.J., Ramakrishnan, V., & Byers C. (1998). Asthma prevalence and risk factors in selected Head Start sites in Chicago. *Journal of Asthma*, *35*, 203-212.
- Smith, L.A., Hatcher-Ross, J. L., Wertheimer, R., & Kahn, R. S. (2005). Rethinking race/ethnicity, income, and childhood asthma: Racial/ethnic disparities concentrated among the very poor. *Public Health Reports*, *120*(2), 109-16.
- Taras, H., & Potts-Datema, W. (2005). Childhood asthma and student performance at school. *Journal of School Health*, *75*(8), 296-312.
- Vargas, P. A., Simpson P. M., Gary Wheeler, J., Goel, R., Field, C. R., Tilform, J. M., & Jones, S. M. (2004). Characteristics of children with asthma who are enrolled in a Head Start program. *Journal of Allergy and Clinical Immunology*, *114*, 499-504.