



Characteristics of Mothers and Infants Living in Homeless Shelters and Public Housing in New York City

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Abstract

Introduction Homelessness can result in poor health. The number of families with children living in NYC homeless shelters increased 55% from 2008 to 2014. Half of children living in shelter in 2014 were younger than 6 years old. We compared demographics and health outcomes of mothers and infants residing in NYC homeless shelters to those residing in public housing in this cross-sectional study. **Methods** Addresses of NYC Department of Homeless Services shelters and NYC Housing Authority (NYCHA) developments were matched to NYC Department of Health birth certificate data for the years 2008–2013. Sociodemographic and health characteristics of newborns residing in shelters were compared to newborns in NYCHA housing using Chi square tests. **Results** Mothers residing in shelters were younger, more likely to be black and less likely to be Hispanic, more likely to have been born outside NYC and reside in the Bronx. Babies born to mothers living in shelter were more likely to have low birth weight (<2500 g), be born preterm (<37 gestational weeks), require assisted ventilation immediately following delivery, have a NICU admission, and use Medicaid. They were less likely to breastfeed within 5 days of delivery and be discharged to their residence. **Discussion** Homeless mothers and infants had poorer health outcomes compared with those living in public housing. Understanding the health disparities of homeless infants can provide guidance for developing future policies and research initiatives, which may be used to inform the development of new policies to improve health outcomes of homeless infants and their mothers.

Keywords Family homelessness · Infants · Poverty

Significance

Health outcomes among the homeless tend to be worse than those among stably housed low income populations. The current study compared outcomes recorded on 2008–2013 birth certificates among NYC homeless shelter residents to public housing development residents. Babies born to homeless mothers were found to have poorer health outcomes

compared with those living in public housing. The information gleaned from this study can inform future studies and program initiatives to address the health needs of homeless and other low-income mothers and children. Evidence-based support services targeted to homeless infants and their mothers have the potential to reduce these health disparities.

Introduction

New York City is currently experiencing a surge in homelessness. The number of families with children living in shelters increased 55% from July 2008 to July 2014 to 11,361 families (New York City Department of Homeless Services 2015a). The heads of household for these homeless families were disproportionately black (58%) and Hispanic (37%) (New York City Department of Homeless Services 2015b). From July 2013 to June 2014, approximately one-third of those living in NYC Department of Homeless Services (DHS) shelters were under the age of 18 and there

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were 18,984 children under the age of 6 who spent at least one night in a DHS shelter during this time (New York City Department of Homeless Services 2015b).

Poverty and housing instability are associated with negative health outcomes among children (Cutts et al. 2011; Gitterman et al. 2016). Studies have shown that homelessness can result in poor physical and mental health, however, physical illness and mental health problems can also be factors that lead to homelessness (National Health Care for the Homeless Council 2011). Compared with the general public, homeless populations have higher rates of morbidity and mortality. Since the homeless are transient and often difficult to reach, accurately describing their health status and needs is challenging (Hwang 2001; Koegel et al. 1996). Previous studies have found that homelessness and housing instability are associated with poor access to health care (Baggett et al. 2010; Reid et al. 2008). Homeless women in particular may experience unique barriers to accessing health care services (Gelberg et al. 2004). Homeless women move more often, are less likely to have lived independently, and are less likely to report supportive adult relationships than other low-income women (Bassuk and Rosenberg 1988). Homeless women are more likely to have preterm births (Little et al. 2005) and children with low birth weight (Cutts et al. 2014; Richards et al. 2011). Although child mortality is rare, a study of families who spent at least one night in a NYC homeless shelter between 2001 and 2003 determined that among children 1–4 years of age, the death rate was higher for children who had lived in a homeless shelter compared with children living in low-income neighborhoods and the general NYC population. This study also found that homeless children were less likely to have a blood lead level (BLL) screening before their third birthday and to have elevated BLLs compared with other children living in NYC (Bainbridge et al. 2011).

Most of the published literature concerning health of homeless populations is from studies that have used convenience rather than population-based sampling or a census. How the health of homeless mothers and infants compares with other low-income families in NYC is not known. The current study aims to evaluate the health disparities that homeless populations experience compared to stably housed low income women.

Methods

The addresses of New York City DHS shelters in existence, their percentage occupancy as of August 2015 and the date they began operating as a shelter were obtained from the DHS; the public housing development addresses were obtained from the New York City Housing Authority (NYCHA). NYCHA residents were selected to compare to

homeless shelter residents because they are also low-income, but, unlike those residing in shelters, are stably housed. The average household income for NYCHA tenants in January 2015 was \$23,455; the average length of time in public housing was 24.7 years (New York City Housing Authority 2015). Approximately 5% of the NYC population lives in NYCHA facilities. These addresses were matched to Bureau of Vital Statistics birth records for the years 2008–2013. Birth certificates provided information on maternal demographics and maternal and infant health. DHS operates single adult shelters (separate facilities for males and females), adult family shelters, and family with children shelters. At the time of the study, family with children shelters included Tier II units (apartment-style units in buildings with extensive on-site services), cluster units (apartment units within market rate buildings with off-site services), and hotels (both converted hotels fully operated as emergency shelters or commercial hotels in which the city books rooms), which are used for emergency shelter. Cluster units could not be differentiated from market unit apartments because unit numbers were not available, thus cluster site addresses were excluded from analyses. Similarly, buildings in which < 75% of units were designated for DHS families were also excluded. Those address matches for which the date of birth preceded the date that the building began operating as a DHS shelter were also excluded.

Variables chosen for analysis focused on negative health outcomes (e.g., gestational diabetes, gestational hypertension, and anemia during pregnancy). Data with unknown values were coded as missing. Missing data for each variable were excluded from analyses. The percentages of each birth characteristic within each housing type (homeless vs. public housing) were calculated; χ^2 tests were used to determine differences between DHS and NYCHA residents for categorical variables. Percentages of all 2008–2013 births for each variable are reported as a reference for the general population. This study was approved by the NYC Department of Health and Mental Hygiene Institutional Review Board and conducted in accordance with ethical standards. The requirement to obtain informed consent was waived in accordance with 45 CFR §46.116 (d).

Results

In the 6-year period, among 8155 births to mothers that matched to homeless shelter addresses, 3228 were excluded because they matched to a cluster site address, 953 were excluded because < 75% of the building's units were designated for DHS families, and 137 were excluded because the date of birth preceded the date that the building began operating as a DHS shelter, leaving 3837 births matched to homeless shelter addresses which were used for analyses.

NYCHA residences were matched to 37,848 births. Percentages of all 2008–2013 births ($n=745,962$) are reported for comparison. The number of missing observations are included in the tables, although missing observations for each variable were excluded from analyses and not considered as a separate category.

Table 1 displays mothers' demographics. Shelter residents were younger, more likely to be black and less likely to be Hispanic, more likely to have been born outside NYC, and more likely to reside in the Bronx compared with NYCHA residents.

Table 2 displays prenatal health indicators. Shelter residents were more likely to use a clinic for their primary prenatal care provider (48.4% vs. 39.9%, $p < 0.0001$ for primary care provider) and experience anemia (8.9% vs. 6.6%, $p < 0.0001$) and asthma or acute lung disease (9.6% vs. 7.2%, $p < 0.0001$) during pregnancy. No difference in participation was found in use of the Special Supplemental Food Program for Women, Infants and Children

(WIC) (82.5% vs. 82.1%, $p = 0.55$). Shelter residents were less likely to work during pregnancy (19.8% vs. 37.3%, $p < 0.0001$), to have experienced gestational diabetes (2.9% vs. 6.6%, $p < 0.0001$), and to have received pre-labor referral for high risk care (6.3% vs. 7.2%, $p = 0.04$) compared to NYCHA residents.

Table 3 displays delivery and infant health indicators. Babies born to mothers living in shelter were more likely to be born with a low birth weight (< 2500 g) (13.3% vs. 12.0%, $p = 0.02$), be born preterm (gestational age < 37 weeks) (14.5% vs. 12.8%, $p = 0.003$), require assisted ventilation immediately following delivery (6.6% vs. 4.8%, $p < 0.0001$), be admitted to the NICU (14.8% vs. 12.6%, $p < 0.0001$), and use Medicaid as payment for delivery (91.4% vs. 83.9%, $p < 0.0001$); they were less likely to breastfeed (exclusively or in combination with formula) following delivery (77.4% vs. 80.8%, $p < 0.0001$) and be discharged home (73.4% vs. 80.1%, $p < 0.0001$ for discharge status) (vs. remained in hospital, transferred, died at hospital, or discharged to foster care/adoption).

Table 1 Mothers' demographics: homeless shelter and NYCHA resident births and the general population (2008–2013)

Variable	Shelter (n=3,837) n (%)	NYCHA (n=37,848) n (%)	χ^2 P-value	NYC overall 2008–2013 births (N=745,962) (%)
Mothers age (age group, in years)			0.0008	
< 25	1830 (47.7%)	17,407 (46.0%)		24.3%
25–34	1628 (42.4%)	15,942 (42.1%)		53.6%
> 34	379 (9.9%)	4499 (11.9%)		22.1%
Missing	n=0	n=0		n=6
Mothers race/ethnicity			<0.0001	
White	175 (4.6%)	1246 (3.3%)		31.1%
Hispanic	1433 (37.5%)	16,987 (45.0%)		30.9%
Black	2120 (55.5%)	18,055 (47.8%)		21.0%
Other/multiracial	92 (2.4%)	1463 (3.9%)		17.0%
Missing	n=17	n=97		n=1114
Mothers birthplace			<0.0001	
NYC	2441 (64.6%)	26,162 (69.8%)		34.4%
New York state	181 (4.8%)	1148 (3.1%)		3.9%
Other US state	355 (9.4%)	1202 (3.2%)		9.3%
US territory	181 (4.8%)	1293 (3.4%)		1.1%
Foreign	618 (16.4%)	7674 (20.5%)		51.2%
Missing	n=61	n=369		n=3404
Mothers borough of residence			<0.0001	
Manhattan	820 (21.4%)	9257 (24.5%)		15.6%
Bronx	1348 (35.1%)	10316 (27.3%)		16.8%
Brooklyn	1233 (32.1%)	13767 (36.4%)		33.3%
Queens	395 (10.3%)	3471 (9.2%)		21.8%
Staten Island	41 (1.1%)	1037 (2.7%)		4.4%
Outside NYC	0 (0.0%)	0 (0.0%)		8.0%
Missing	n=0	n=0		n=36

Table 2 Prenatal health indicators: homeless shelter and NYCHA resident births and the general population (2008–2013)

Variable	Shelter (n = 3,837) n (%)	NYCHA (n = 37,848) n (%)	χ^2 P-value	2008–2013 births (N = 745,962) %
Worked during pregnancy	750 (19.8%)	14,062 (37.3%)	<0.0001	48.7%
Missing	n = 41	n = 164		n = 1707
WIC participation during pregnancy ^a	3104 (82.5%)	30,789 (82.1%)	0.55	53.7%
Missing	n = 74	n = 346		n = 5378
Primary prenatal care provider			<0.0001	
MD/DO	1328 (35.3%)	17,618 (46.9%)		64.9%
Clinic	1820 (48.4%)	14,992 (39.9%)		25.7%
C(N)M/NP/PA/Other midwife	330 (8.8%)	3773 (10.0%)		8.0%
No provider	159 (4.2%)	788 (2.1%)		1.0%
Other	123 (3.3%)	368 (1.0%)		0.5%
Missing	n = 77	n = 309		n = 3,593
Gestational diabetes	113 (2.9%)	1714 (4.5%)	<0.0001	4.9%
Missing	n = 0	n = 0		n = 0
Gestational hypertension	131 (3.4%)	1491 (3.9%)	0.11	2.5%
Missing	n = 0	n = 0		n = 0
Anemia during pregnancy	343 (8.9%)	2490 (6.6%)	<0.0001	3.3%
Missing	n = 0	n = 0		n = 0
Asthma or acute lung disease during pregnancy	367 (9.6%)	2720 (7.2%)	<0.0001	2.7%
Missing	n = 0	n = 0		n = 0
Prelabor referral for high risk care	243 (6.3%)	2735 (7.2%)	0.04	4.2%
Missing	n = 0	n = 0		n = 0

^aFood support through the Special Supplemental Food Program for Women, Infants and Children (WIC)

Discussion

This study is the first to examine differences in birth outcomes for NYC homeless shelter residents compared with public housing residents. For the most part, mothers and infants residing at homeless shelters had poorer health outcomes than mothers and infants residing in public housing. Similar to the findings of other studies, the current study also found that homeless women were more likely to be younger, black, use Medicaid insurance, not initiate breastfeeding at the hospital, have babies with low birth weight, have babies born preterm, and require admission to the neonatal intensive care unit after delivery (Little et al. 2005; Richards et al. 2011). Homeless women were more likely to reside in the Bronx, which may be indicative of the difference in the distribution of homeless shelters and NYCHA developments across the city. The lower percentage of homeless shelter residents who worked during pregnancy may be indicative of lower rates of employment. Homeless infants were also more likely to be discharged to foster care at birth; a 2002 NYC study found that homelessness was a strong, independent predictor for separation of children from mothers (Cawal et al. 2002).

Almost half of all homeless women received their primary prenatal care through a clinic, whereas the largest proportion of NYCHA residents had a physician as their primary prenatal care provider. Homeless women may have had more difficulty finding physicians who are willing to manage their care due to reimbursement difficulties (Aved et al. 1993). Homeless women were more likely to experience anemia during pregnancy, which could be a result of limited access to iron-rich foods during pregnancy (Davis et al. 2008), however, participation in WIC was high in both groups with no significant difference between shelter residents and NYCHA residents.

Asthma or acute lung disease during pregnancy was more common among homeless women compared to women living in NYCHA; asthma has previously been found to be associated with poverty, although the mechanism for this association is not well understood (Akinbami et al. 2012). A smaller percentage of homeless women likely had gestational diabetes because they were somewhat younger than those living in NYCHA (King 1998); other risk factors that were not captured in this study including family and personal health history, may have also contributed to the higher prevalence of gestational diabetes among women living in NYCHA. The percentage of women who had a pre-labor

Table 3 Delivery and infant health indicators: homeless shelter and NYCHA resident births and the general population (2008–2013)

Variable	Shelter (n = 3837) %	NYCHA (n = 37,848) %	χ^2 P-value	2008–2013 births (N = 745,962) (%)
Low birth weight (< 2500 g)	509 (13.3%)	4533 (12.0%)	0.02	8.7%
Missing	n = 0	n = 1		n = 23
Preterm (gestational age < 37 weeks)	556 (14.5%)	4845 (12.8%)	0.003	9.4%
Missing	n = 1	n = 5		n = 148
Assisted ventilation required immediately following delivery	255 (6.6%)	1821 (4.8%)	< 0.0001	2.1%
Missing	n = 0	n = 0		n = 0
NICU admission	568 (14.8%)	4763 (12.6%)	< 0.0001	9.6%
Missing	n = 0	n = 0		n = 0
Antibiotics received by newborn for possible sepsis	84 (2.2%)	889 (2.4%)	0.53	1.6%
Missing	n = 0	n = 0		n = 0
Breastfeeding following delivery	2897 (77.4%)	30,048 (80.8%)	< 0.0001	85.8%
Missing	n = 92	n = 661		n = 11,256
Discharge status			< 0.0001	
Discharged home	2238 (73.4%)	25,773 (80.1%)		84.4%
Infant still in hospital	778 (25.5%)	6173 (19.2%)		15.1%
Infant transferred out	8 (0.3%)	77 (0.2%)		0.2%
Infant died at birth hospital	10 (0.3%)	111 (0.3%)		0.2%
Infant discharged to foster care/adoption	16 (0.5%)	42 (0.1%)		0.0%
Missing	n = 787	n = 5,672		n = 97,866
Infant death within one year	41 (1.1%)	301 (0.8%)	0.07	0.5%
Missing	n = 0	n = 0		n = 0
Medicaid payment for delivery	3506 (91.4%)	31,772 (83.9%)	< 0.0001	57.5%
Missing	n = 0	n = 0		n = 0

referral for high risk care was somewhat higher among homeless women compared with NYCHA residents; this difference may be related to the quality of the prenatal care that homeless women have access to. The majority of homeless women used Medicaid payment at delivery; in 2012 the New York State Department of Health began mandatory Medicaid enrollment for homeless persons (New York State Department of Health Office of Health Insurance Programs 2012).

This study was subject to several limitations. This analysis was exploratory and descriptive and did not control for any confounding or effect modifying variables. The cross-sectional design did not allow for examination of temporal relationships. There may have been some variability in when the birth certificate data were entered, however, as per the New York City health code, hospitals are required to register the birth in the electronic system within five business days from the date of birth. The match relied on address data and may have excluded individuals living in a homeless shelter, but who reported another address at the time of birth. Likewise, it is assumed that those who listed a NYCHA address are tenants, although it is possible that they submitted the address of a friend or family member and they are not NYCHA residents. Also, it was not possible to match cluster site addresses without having information on

the individual apartment or person. By including addresses for buildings in which $\geq 75\%$ of units were designated for DHS, some births may have been misclassified as DHS clients. Approximately one-quarter of homeless families with children reside in cluster sites (New York City Department of Investigation 2015) and in the current analysis 40% of the DHS births were matched to a cluster site address. There may have been selection bias if the type of shelter where families were placed was based on specific family characteristics or needs. A 2015 DOI report found that DHS cluster sites were poorly maintained and monitored and lacked provision of adequate social services to families as compared with other homeless facilities (New York City Department of Investigation 2015); so exclusion of these residents may have underestimated the poor health outcomes of women and infants living in homeless shelters.

As of October 2015, executive budget funds awarded by the Council of the City of New York to the Health Department are being used to target 1600 mothers of infants living in homeless shelters through the Newborn Home Visit Program (NHVP). The NHVP targets low-income mothers and families with a new infant. This program is designed to provide parenting and breastfeeding support, screen for maternal depression, assure a safe living environment, educate on

safe-sleep practices, provide other topic-specific education and identify any health and social issues that require referral to community-based services. The funding will facilitate three visits and a follow-up phone call to these mothers. Future studies should be conducted to evaluate the effect of the NHVP on health outcomes of infants residing in shelters. Matching DHS client data with birth certificate data would avoid the biases inherent in an address match. Additionally, matching of Administration for Children's Services and Human Resources Data could provide further information about foster care utilization, neglect cases, and social service utilization of homeless families compared with other low-income families.

Women and infants living in homeless shelters experienced worse birth-related health outcomes compared with those living in public housing. Understanding the health disparities of homeless infants can provide guidance for developing future programs and policies to improve health outcomes of homeless infants. Evidence-informed support services targeted to homeless infants and their mothers have the potential to reduce these health disparities.

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References

- Akinbami, L. J., Moorman, J. E., Bailey, C., Zahran, H. S., King, M., Johnson, C. A., & Liu, X. (2012). Trends in asthma prevalence, health care use, and mortality in the United States, 2001–2010. *NCHS Data Brief*, 94(94), 1–8.
- Aved, B. M., Irwin, M. M., Cummings, L. S., & Findeisen, N. (1993). Barriers to prenatal care for low-income women. *Western Journal of Medicine*, 158(5), 493–498.
- Baggett, T. P., O'Connell, J. J., Singer, D. E., & Rigotti, N. A. (2010). The unmet health care needs of homeless adults: A national study. *American Journal of Public Health*, 100(7), 1326–1333.
- Bainbridge, J., Bennani, Y., Marder, D., Forgione, L., & Faciano, A. (2011). A population-based assessment of the health of homeless families in New York City, 2001–2003. *American Journal of Public Health*, 101(3), 546–553.
- Bassuk, E. L., & Rosenberg, L. (1988). Why does family homelessness occur? A case-control study. *American Journal of Public Health*, 78(7), 783–788.
- Cowal, K., Shinn, M., Weitzman, B. C., Stojanovic, D., & Labay, L. (2002). Mother–child separations among homeless and housed families receiving public assistance in New York City. *American Journal of Community Psychology*, 30(5), 711–730.
- Cutts, D. B., Coleman, S., Black, M. M., Chilton, M. M., Cook, J. T., de Cuba, S. E., Heeren, T. C., Meyers, A., Sandel, M., & Casey, P. H. (2014). Homelessness during pregnancy: A unique, time-dependent risk factor of birth outcomes. *Maternal and Child Health Journal*, 19(6), 1276–1283.
- Cutts, D. B., Meyers, A. F., Black, M. M., Casey, P. H., Chilton, M., Cook, J. T., Geppert, J., Ettinger de Cuba, S., Heeren, T., & Coleman, S. (2011). US housing insecurity and the health of very young children. *American Journal of Public Health*, 101(8), 1508–1514.
- Davis, L. R., Holleman, W. L., Weller, N. F., & Jadhav, M. (2008). Dietary intake of homeless women residing at a transitional living center. *Journal of Health Care for the Poor and Underserved*, 19(3), 952–962.
- Gelberg, L., Browner, C., Lejano, E., & Arangua, L. (2004). Access to women's health care: A qualitative study of barriers perceived by homeless women. *Women and Health*, 40(2), 87–100.
- Gitterman, B. A., Flanagan, P. J., Cotton, W. H., Dilley, K. J., Duffee, J. H., Green, A. E., Keane, V. A., Krugman, S. D., Linton, J. M., & McKelvey, C. D. (2016). Poverty and child health in the United States. *Pediatrics*, 137(4), e20160339.
- Hwang, S. W. (2001). Homelessness and health. *Canadian Medical Association Journal*, 164(2), 229–233.
- King, H. (1998). Epidemiology of glucose intolerance and gestational diabetes in women of childbearing age. *Diabetes Care*, 21(Suppl 2), B9–B13.
- Koegel, P., Burnam, M. A., & Morton, S. C. (1996). Enumerating homeless people alternative strategies and their consequences. *Evaluation Review*, 20(4), 378–403.
- Little, M., Shah, R., Vermeulen, M. J., Gorman, A., Dzenoletas, D., & Ray, J. G. (2005). Adverse perinatal outcomes associated with homelessness and substance use in pregnancy. *Canadian Medical Association Journal*, 173(6), 615–618.
- National Health Care for the Homeless Council. (2011). *Homelessness & health: What's the connection?*. Retrieved from Nashville, TN.
- New York City Department of Homeless Services. (2015a). Daily report—September 21, 2015. Retrieved September 22, 2015, from <http://www.nyc.gov/html/dhs/downloads/pdf/dailyreport.pdf>.
- New York City Department of Homeless Services. (2015b). DHS data dashboard—fiscal Year 2015. Retrieved August 26, 2016, from http://www1.nyc.gov/assets/dhs/downloads/pdf/dashboard/dhs_data_dashboard_charts_FY-2015.pdf.
- New York City Department of Investigation. (2015). Probe of Department of Homeless Services' Shelters for Families with Children Finds Serious Deficiencies. Retrieved July 8, 2016, from http://www.nyc.gov/html/doi/downloads/pdf/2015/mar15/pr08dhs_31215.pdf.
- New York City Housing Authority. Facts about NYCHA. Retrieved July 8, 2016, from <https://www1.nyc.gov/assets/nycha/downloads/pdf/factsheet.pdf>.
- New York City Housing Authority. (2015). Special tabulation resident characteristics. Retrieved September 28, 2016, from https://www1.nyc.gov/assets/nycha/downloads/pdf/res_data.pdf.
- New York State Department of Health Office of Health Insurance Programs. (2012). Policy and guidance to transition the homeless population into medicaid managed care. Retrieved October 17, 2016, from http://www.health.ny.gov/health_care/medicaid/redesign/guidance_for_homeless_transition.htm.
- Reid, K. W., Vittinghoff, E., & Kushel, M. B. (2008). Association between the level of housing instability, economic standing and health care access: A meta-regression. *Journal of Health Care for the Poor and Underserved*, 19(4), 1212–1228.
- Richards, R., Merrill, R. M., & Baksh, L. (2011). Health behaviors and infant health outcomes in homeless pregnant women in the United States. *Pediatrics*, 128(3), 438–446.

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