

Epi Data Brief

New York City Department of Health and Mental Hygiene

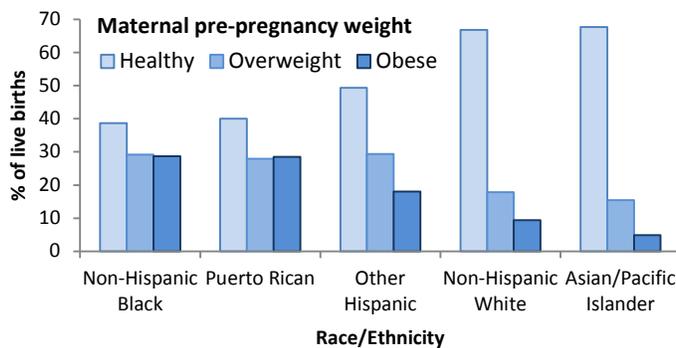
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Pre-pregnancy Weight and Infant Mortality in New York City

Greater than 40% of women who gave birth to a live infant in New York City (NYC) from 2008 to 2010 were overweight or obese before their pregnancy. Maternal pre-pregnancy obesity increases health risks for mothers^{1,2} and is associated with health risks for infants including death (IMR).^{3,4} Maternal obesity adversely impacts pregnancy outcomes primarily through increased rates of hypertensive disease (chronic hypertension and pre-eclampsia), diabetes (before and during pregnancy), cesarean section and infections.²

Pre-pregnancy obesity differed greatly among racial/ethnic groups

Disparities in pre-pregnancy obesity by race/ethnicity, New York City, 2008-2010



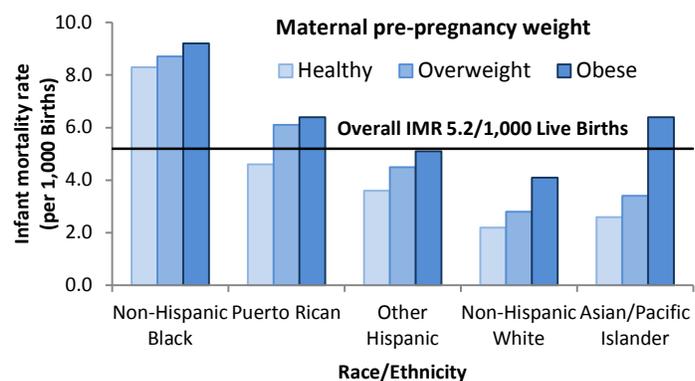
Source: DOHMH Bureau of Vital Statistics, 2008-2010

- From 2008 to 2010, 54.4% of NYC women who gave birth to a live infant were healthy weight prior to their pregnancy, 23.5% were overweight, 16.6% were obese and 5.5% were underweight.
- Non-Hispanic black and Puerto Rican mothers were more likely to be obese (28.7% and 28.5%, respectively) compared with other Hispanic mothers (18%), non-Hispanic white mothers (9.4%) and Asian/Pacific Islander mothers (4.9%).

Infant mortality was higher among infants born to obese or overweight mothers for all racial/ethnic groups

- Infant mortality was highest among infants born to obese mothers, followed by those born to overweight mothers and lowest among those to healthy weight mothers.
- Among infants born to obese mothers, the highest infant mortality rate (IMR) was among non-Hispanic blacks at 9.2 per 1,000 live births, followed by Puerto Ricans and Asian/Pacific Islanders, both at 6.4.
- Infants born to other Hispanic and non-Hispanic white mothers who were obese had an IMR of 5.1 and 4.1 per 1,000 live births, respectively – in both cases, higher than overweight and healthy weight mothers of the same race/ethnicities.
- The absolute difference in IMR between infants born to obese and healthy weight mothers was largest among Asian/Pacific Islanders: 6.4 versus 2.6 per 1,000 live births.

Infant mortality by pre-pregnancy weight and mother's race/ethnicity, New York City, 2008-2010



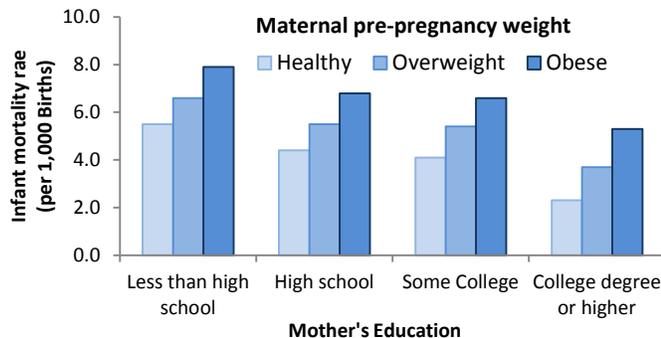
Source: DOHMH Bureau of Vital Statistics, 2008-2010

Methods: Maternal height was added to the NYC birth certificate in 2008, allowing for the calculation of maternal Body Mass Index (BMI) for the first time. Pre-pregnancy BMI was calculated using the following formula: pre-pregnancy weight (lb) x 703 / height (in)². BMI < 18.5 is defined as underweight; 18.5 ≤ BMI < 25 is healthy weight; 25 ≤ BMI < 30 is overweight; and BMI ≥ 30 is obese. 6,429 certificates (1.7%) with invalid or "Not Stated" values for mothers' height or pre-pregnancy weight were excluded from this analysis. IMR was not calculated for births to underweight mothers due to small numbers.

Data Source: Birth and infant death data, 2008-2010, Bureau of Vital Statistics, NYC DOHMH

Across education levels, mortality was higher among infants born to overweight and obese mothers

Infant mortality by pre-pregnancy weight and mother's education, New York City, 2008-2010



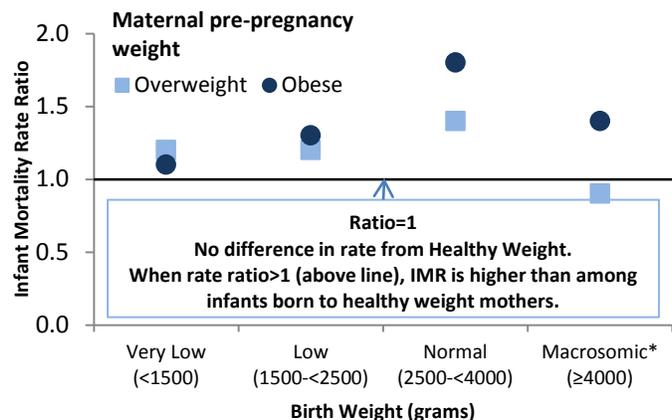
Source: DOHMH Bureau of Vital Statistics, 2008-2010

- Across education levels, the infant mortality rate (IMR) was highest among infants born to obese mothers, followed by infants born to overweight mothers, and was lowest among infants born to healthy weight mothers.
- In addition, IMR is negatively associated with mother's education level, regardless of pre-pregnant weight. For example, among obese mothers, IMR was highest among infants born to mothers with less than a high school degree and lowest among infants born to mothers with a college degree or more education (7.9 vs. 5.3 per 1,000 live births).

Pre-pregnancy obesity increased the risk of infant mortality the most among healthy weight infants

- Although the infant mortality rate (IMR) was highest among infants with very low birth weight, the relative increase in IMR associated with pre-pregnancy obesity was highest among healthy weight infants.
- The infant mortality rate ratio for infants of obese mothers to infants of healthy weight mothers was nearly double among infants with healthy birth weight (1.8), followed by 1.3 among low birth weight infants, and almost no difference among very low birth weight infants (1.1).

Infant mortality rate ratio by pre-pregnancy BMI and birth weight, New York City, 2008-2010



*The number of infant deaths is small and should be interpreted with caution. Macrosomic is defined as birth weight ≥ 4,000 grams.
Source: DOHMH Bureau of Vital Statistics, 2008-2010

Related References:

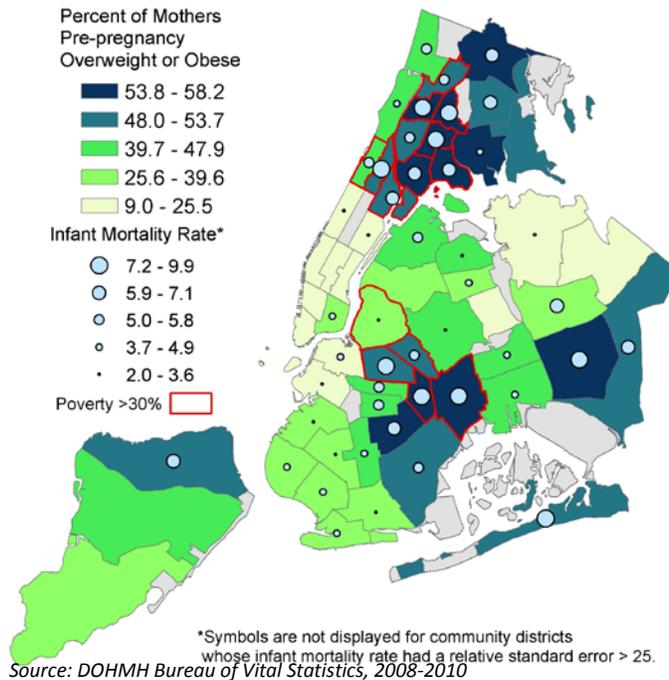
- ¹Persson M, Pasupathy D, Hanson U, et al. BMJ Open 2012; "Pre-pregnancy body mass index and the risk of adverse outcome in type 1 diabetic pregnancies: a population-based cohort study". <http://bmjopen.bmj.com/content/2/1/e000601>
- ²Castro LC, Avina RL; "Maternal obesity and pregnancy outcomes". Curr Opin Obstet Gynecol. 2002 Dec;14(6):601-6
- ³Aimin Chen, Shingairai A. Feresu, Cristina Fernandez, and Walter J. Rogan "Maternal Obesity and Risk of Infant Death in the United States" Epidemiology. January 2009; 20(1): 74-81.
- ⁴Sun Y, Li W, Kennedy J, Zimmerman R, Begier EM. Pre-pregnancy Obesity in New York City – 2008. In: Abstracts of the 9th International Conference on Urban Health; New York City; 2010 Oct 27-29. nyc.gov/html/doh/downloads/pdf/epi/abstract_db16.pdf
- ⁵Department of City Planning "Persons for Whom Poverty Status is Determined by Ratio of Income in 1999 to Poverty Level" nyc.gov/html/dcp/html/census/socio_tables.shtml

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New York City neighborhoods with high percentages of pre-pregnancy overweight and obese mothers also often had high infant mortality and poverty rates

Percent of mothers who were overweight or obese, infant mortality rate, and poverty by NYC Community District, 2008-2010



- High-poverty neighborhoods in New York City face multiple risk factors that contribute to higher IMR, including greater-than-average maternal weight.
- NYC communities known to have the highest poverty levels (>30% of residents living below the federal poverty level)⁵ also tended to have high percentages of pre-pregnant overweight or obese mothers – more than 51% versus 37% in other neighborhoods. Most of those neighborhoods also had high infant mortality rates. Examples include:
 - In the Bronx: Morrisania, University/Morris Heights, and East Tremont.
 - In Brooklyn: East New York and Brownsville in Brooklyn.
 - In Queens: Jamaica and St. Albans.
 All these Community Districts had both a high percentage of overweight/obese mothers (more than half) and IMRs greater than 7.2 deaths per 1,000 live births.

MORE New York City Health Data and Publications

- For complete tables of data presented in this Brief, visit www.nyc.gov/html/doh/downloads/pdf/epi/datatable16.pdf
 - Visit EpiQuery – the Health Department’s online, interactive health data system at www.nyc.gov/health/EpiQuery
- My Community’s Health: Data and Statistics at www.nyc.gov/health/nycommunityhealth.**