

Characteristics of WIC-eligible nonparticipants: A geospatial exploration of Massachusetts 2017 births

Introduction

The Massachusetts Supplemental Nutrition Program for Women, Infants, and Children (WIC) aims to address the public health problem of food insecurity among a particularly vulnerable population by providing healthy foods, nutrition education, and referrals for pregnant women, infants, and children up to the 5th birthday who are at nutritional risk. According to a recent needs assessment, only 56% of total eligible women, infants, and children participated in the Massachusetts WIC program in 2016 (WIC, 2017). Of course, WIC cannot address issues of nutritional risk and food insecurity in eligible people who do not participate, so the Massachusetts WIC program seeks ways of reaching out to eligible nonparticipants.

Enrollment among eligible children is generally highest for infants and drops off as age increases. However, those not enrolled in WIC in infancy are less likely to become enrolled so it is important to the highest possible enrollment of eligible infants. Using WIC system records linked to 2017 Massachusetts birth records, this project examines the geographic distribution of WIC-eligible nonparticipant infants born in MA in 2017 and the distribution of mothers' primary spoken language, mothers' race and ethnicity, and infants' feeding source in the hospital, as infants who are exclusively breastfed may have less need for WIC nutrition assistance. The project takes a thematic approach: rather than answering a specific research question, I compare the geographic distributions of characteristics of WIC-eligible nonparticipating infants with characteristic of infant WIC participants by creating maps of the same characteristic by group and juxtaposing them.

Methods

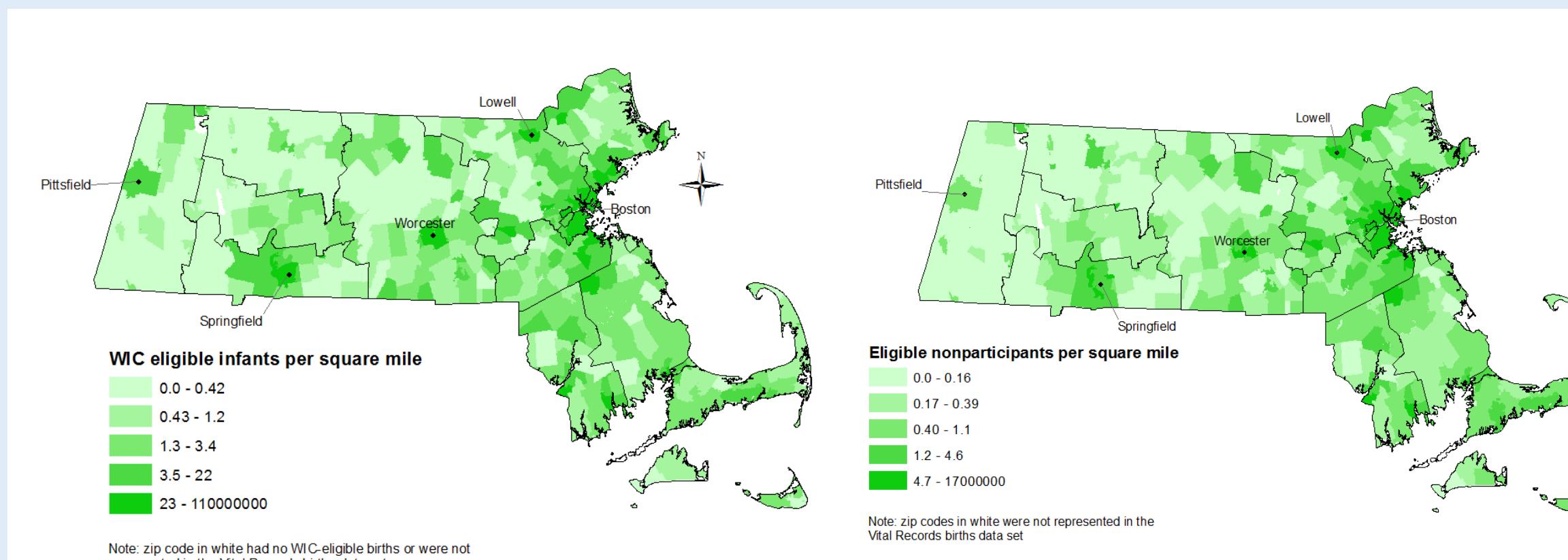
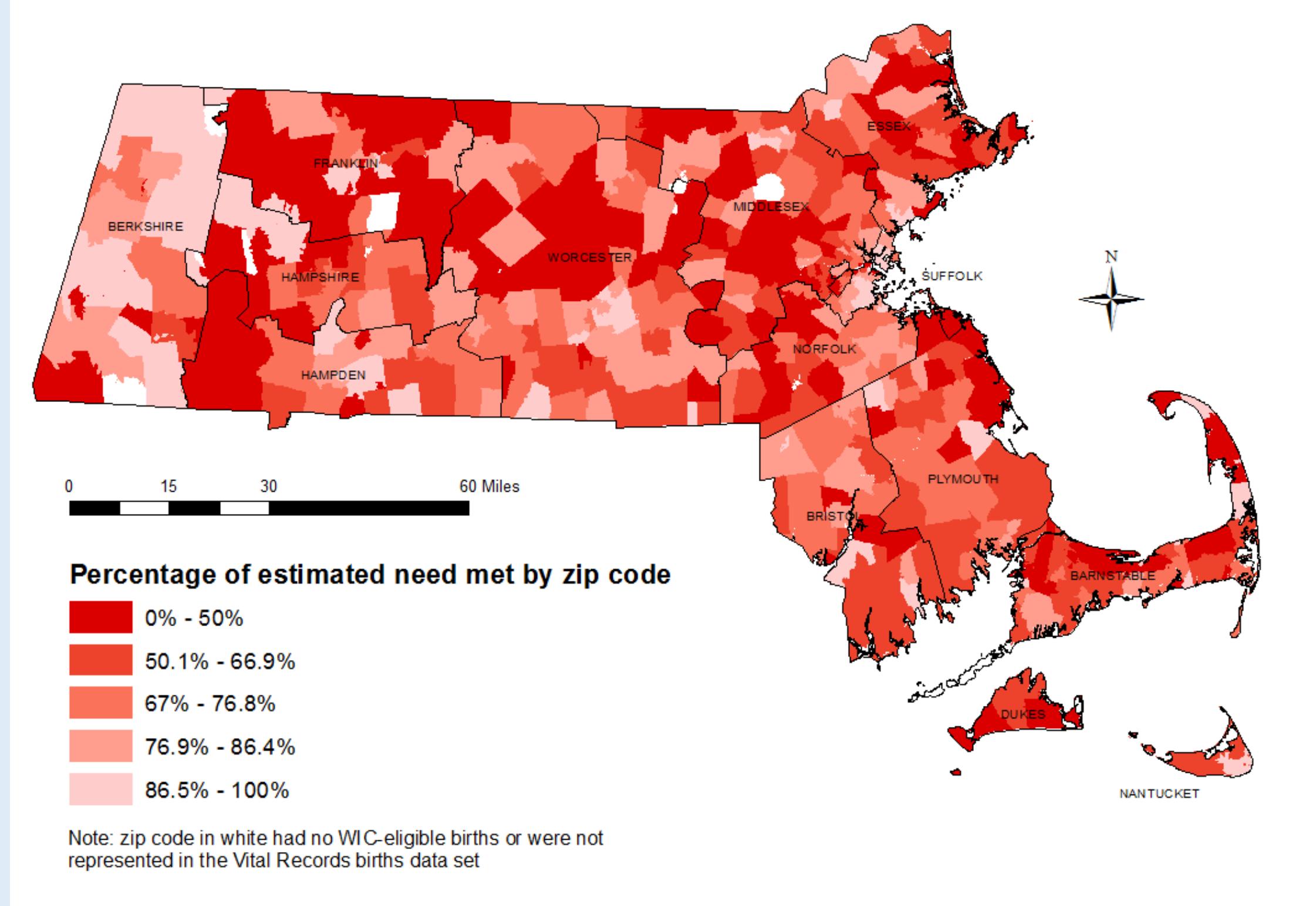
The dataset comes from a linkage of WIC system records with 2017 Massachusetts birth records. WIC-linked birth records are classified as WIC participants. Unlinked birth records that indicate public insurance for either prenatal care or labor & delivery or that the mother was on WIC prenatally are classified as eligible nonparticipants (ENPs). Stopka et al. used similar criteria as a proxy for WIC eligibility in their geospatial analysis of WIC-eligible nonparticipating pregnant women in California (Stopka, Krawczyk, Gradziel, & Geraghty, 2013). All remaining birth records that are neither WIC-linked nor meet the proxy eligibility criteria are classified as WIC-ineligible 2017 births. Births with various characteristics were grouped by zip code and joined to a Massachusetts zip code shapefile. Zip code is the most granular level of data accessible through the birth records data set, and choosing a sufficiently granular level of analysis is crucial to prevent missing distinctions on a larger scale and coming to inappropriate conclusions (Penney T. L., Rainham D. G. C., Dummer T. J. B., & Kirk S. F. L., 2014).

The WIC data contains 545 zip codes (unique) and the MassGIS zip code shapefile used contains 554 zip codes (not all unique). The joining of MassGIS zip codes and WIC zip codes resulted in 508 unique matches and 37 WIC data zip codes that were not present in the MassGIS file. Of the 37 WIC zip codes not represented in the MassGIS file, 35 had fewer than 10 total births. With such small counts, results from these zip codes are less meaningful and they were excluded from analyses.

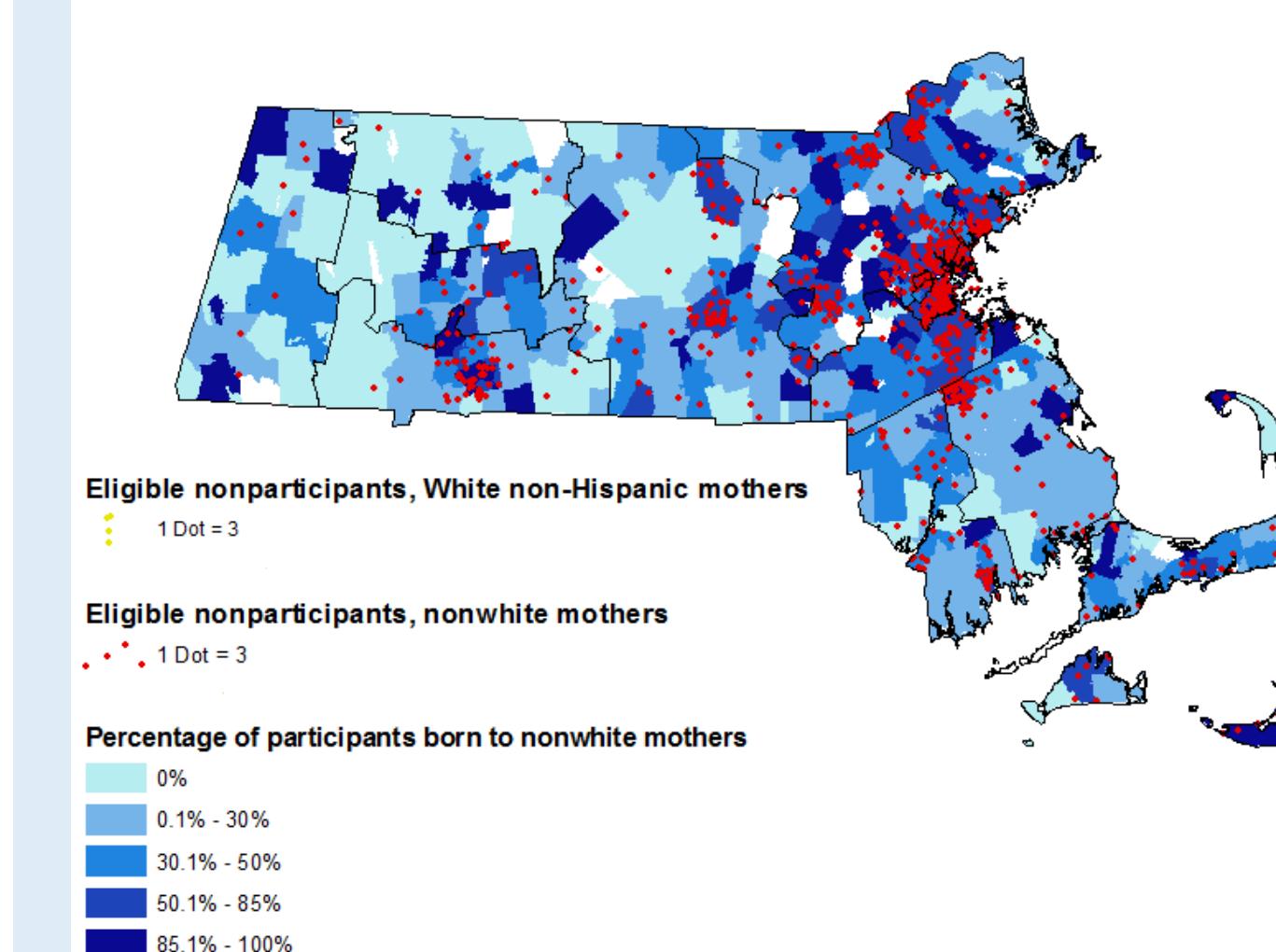
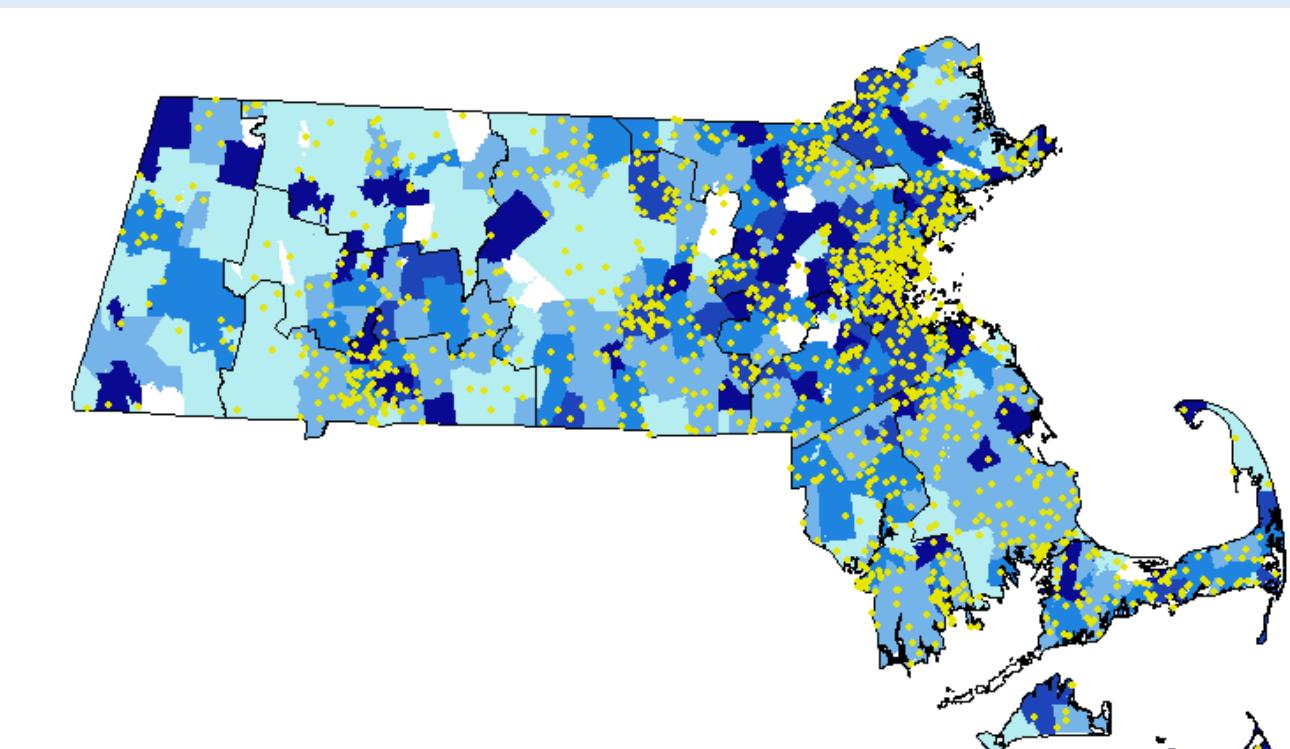
The unit of observation is zip code and each of the remaining 24 columns contains a count of infants in that zip code with a particular demo-

graphic characteristic and WIC status (for example, WIC-eligible nonparticipating infants with English-speaking mothers). Due to the potentially sensitive nature of the data, counts of 1 through 5 have been censored and all replaced with 3, the mean value of 1 through 5.

Results & Discussion



- Overall proportion of need met is high in Boston and the Greater Boston Area, while it is very low in the central part of the state including most of Franklin County and the western portion of Hampden County. Need met appears to be very high through most of Berkshire County, but this may be an artifact of the low counts throughout the area.



to nonwhite mothers are usually near cities, with eligible nonparticipants

born to nonwhite mothers clustering in these same areas. There are also more eligible nonparticipants with white non-Hispanic mothers in cities, but their dots are more spread out.

- The geographic distribution of English-speaking and non-English-speaking mothers appears to be similar for participants and eligible nonparticipants. Eligible nonparticipants with non-English-speaking mothers are concentrated mainly in Boston, while those with English-speaking mothers are spread throughout the state.
- The proportion of infants who were exclusively breastfed in the hospital is higher among WIC-eligible nonparticipants compared to among WIC participants, particularly in the central and southeast portions of the state. These regions also generally correspond to areas where the percentage of need met is in the bottom two quintiles. This could be because mothers who are exclusively breastfeeding their infants do not feel the need to enroll them in WIC. In targeting this population of WIC-eligible nonparticipating breastfed infants, it may be useful to emphasize the breastfeeding support WIC provides.

- While useful for more populous areas, zip code-level data is less meaningful for areas with small counts (especially those with 5 or fewer). Future analyses should examine these data aggregated at a less granular level—perhaps WIC Local Program areas, of which there are 31 in the state—for comparison.

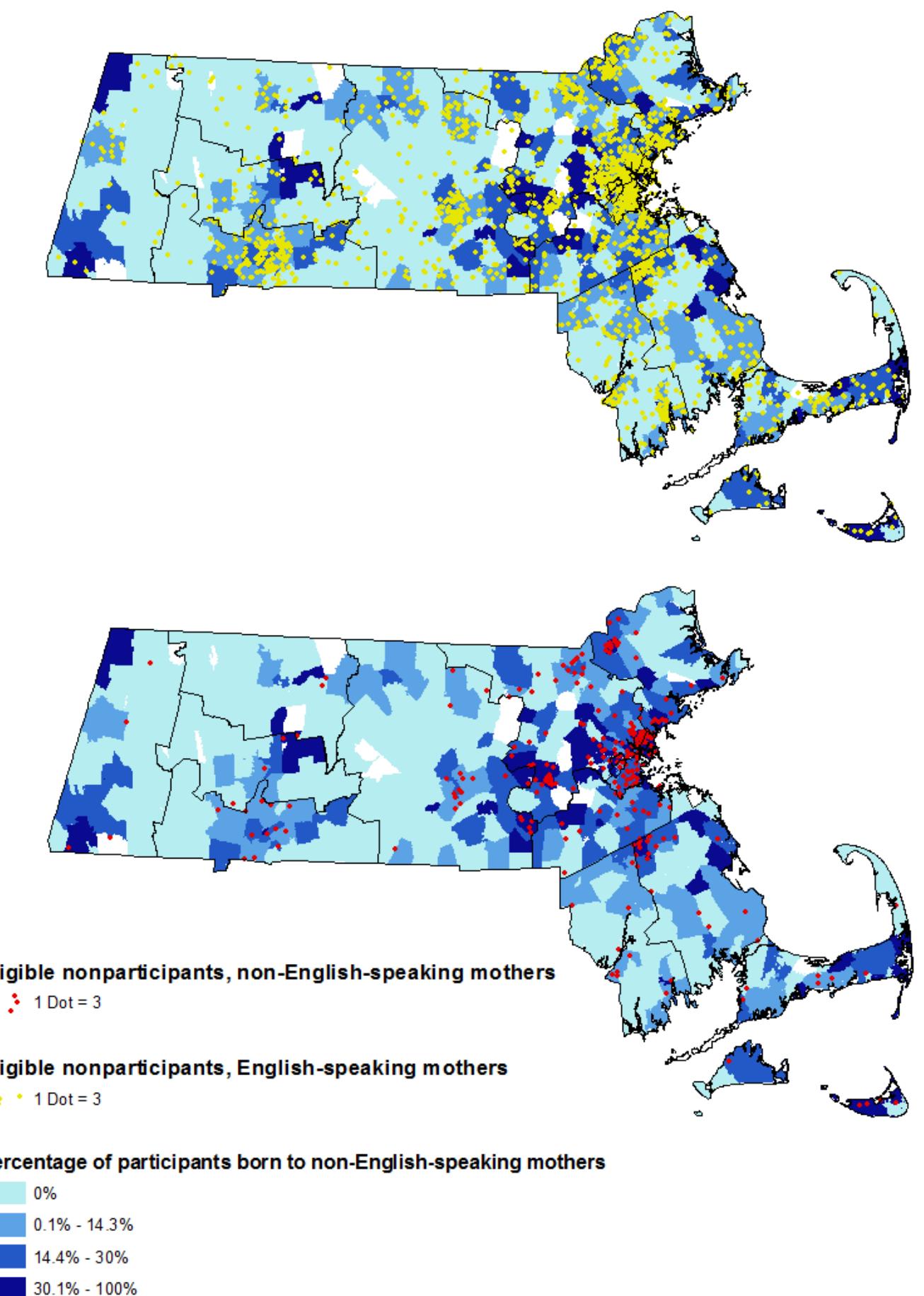
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Resources

Massachusetts Department of Public Health, Nutrition Division, Women, Infants, & Children Nutrition Program; MassGIS.

References

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