

# LOCATION OF WOMEN, INFANTS, AND CHILDREN (WIC) BREASTFEEDING PEER COUNSELOR PROGRAMS AND BREASTFEEDING RATES AMONG WIC PARTICIPANTS IN MASSACHUSETTS

## BACKGROUND

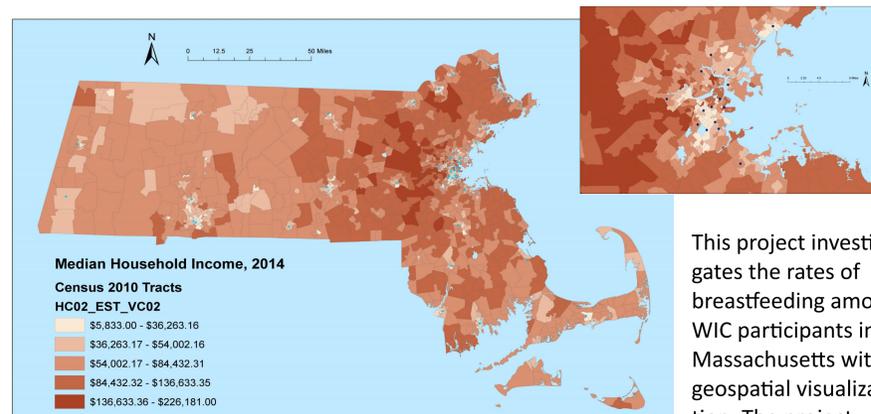
Breastfeeding is widely accepted as the optimal nutrition choice for infants. Mothers and infants who breastfeed experience improved health outcomes, as well as reduced risk of certain diseases and conditions. A large body of research underscores numerous health, economic, and emotional benefits from breastfeeding for both mothers and infants. The Supplemental Nutrition Program for Women, Infants, and Children (WIC) promotes breastfeeding as the healthiest option for women and their children. However, breastfeeding initiation rates are lower among WIC participants as compared to the national average.

Table I. Number of Births by County

County	Births, 2010	Total PC Infants	% PC Infants
Barnstable	1531	679	44.35%
Berkshire	1086	549	50.55%
Bristol	5575	2492	44.70%
Dukes	159	0	0.00%
Essex	8440	3447	40.84%
Franklin	611	481	78.72%
Hampden	5227	3148	60.23%
Hampshire	1063	0	0.00%
Middlesex	17569	3681	20.95%
Nantucket	135	0	0.00%
Norfolk	7317	971	13.27%
Plymouth	5154	1796	34.85%
Suffolk	9381	5584	59.52%
Worcester	8618	3520	40.84%
STATE TOTAL	71867	26357	36.67%

WIC promotes breastfeeding through the Breastfeeding Peer Counselor (BFPC) program, which is one of the organization's strategies to achieve its goal of improving nutritional status of infants. In Massachusetts, the main WIC office is housed within the Massachusetts Department of Public Health. There are over 100 WIC offices across the state, and 35 of these sites offer peer counselor services. These 35 sites are called Local Programs, and WIC participants may be referred to a Breastfeeding Peer Counselor at their nearest Local Program. Any woman who is WIC-eligible may be referred by a member of the nutrition staff to the Peer Counselor program. WIC Peer Counselors are WIC-eligible women who support the initiation and continuation of breastfeeding through educational materials, training, and mentoring.

This project investigates the rates of breastfeeding among WIC participants in Massachusetts with geospatial visualization. The project seeks to analyze the relationship between WIC Peer Counselor locations and breastfeeding outcomes. One question that is raised is: who are WIC eligible individuals and where do they live in relation to WIC services? Additionally, how many infants born in Massachusetts receive BFPC services?

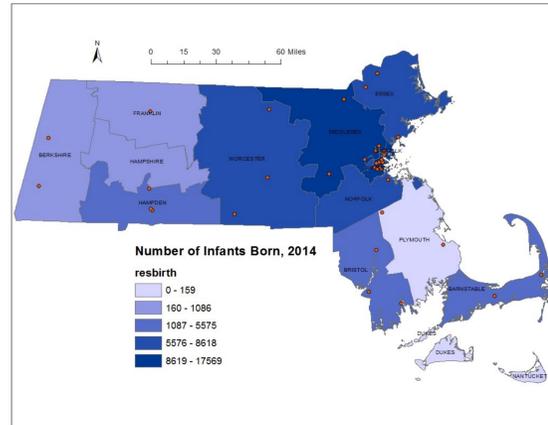


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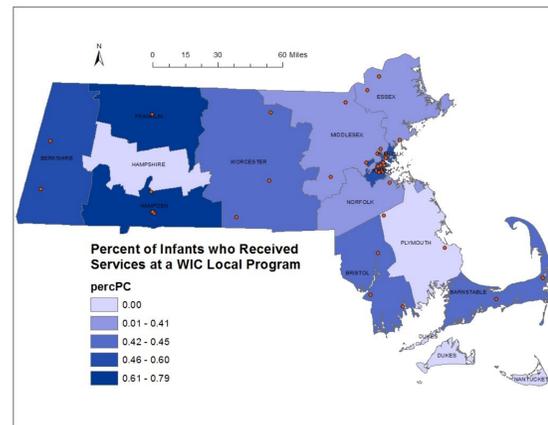
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## METHODS

The 35 Local Programs where BFPC services are provided were geocoded using XY data in ArcGIS. The program addresses are available on the Massachusetts WIC website. Because WIC eligibility is determined by income, a choropleth map of median income was included.



Median income was displayed by census tract using TIGER products and median income data from 2014 from American FactFinder. The 35 geocoded Local Programs were displayed on the median income map to show areas of low income in relation to WIC locations.



Another choropleth map was created using data from the Massachusetts Department of Public Health's Registry of Vital Records and Statistics. Birth data from 2010 was used to display the number of births in each county. A similar choropleth map was created using this data, as well as WIC data from the FY14 WIC Breastfeeding Data Local Agency Report. This second map shows the percentage of infants born in each county who received BFPC services.

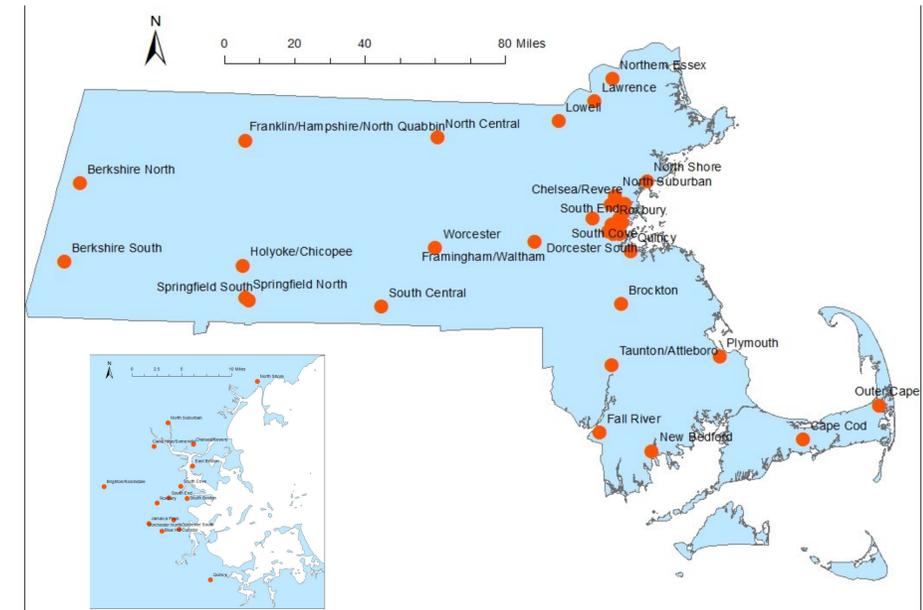
Finally, graduated symbols were used to show relative rates of breastfeeding and infant formula feeding at each Local Program using the data from the FY14 WIC Breastfeeding Data Local Agency Report. The variables include partially breastfed, fully breastfed, fully formula fed, and total breastfed.

## RESULTS

The median income choropleth map indicates that WIC BFPC services are generally located in areas of lower income. The other choropleth maps show that the percentage of infants born who receive BFPC services varies by county. Boston and the surrounding area has a greater concentration of Local Programs. Additional maps were created that zoom in on the concentrated areas. The maps indicate that breastfeeding and formula feeding rates vary greatly at each Local Program.

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The geocoded Local Programs help visualize where BFPC exist in relation to median income and population (number of births). The graduated symbols indicate that there is great variation in breastfeeding practices among the Local Programs. Future investigation of breastfeeding practices and Peer Counselor services may help determine why this variation exists and how to more effectively promote breastfeeding at each location.



## DISCUSSION

The county data is not very granular, which makes geospatial analysis more difficult. Further investigation using census tracts or municipalities, perhaps, may reveal more interesting relationships between Peer Counselor visits and Local Program locations. Additionally, proximity analysis could be used if more data were available to analyze participants' proximity to WIC services. Such analyses could reveal whether areas of need exist, and where they exist.

Cartographer: Caitlin Pohl

Date: May 11, 2016

Course: PH262 GIS for Public Health

Professor: Tom Stopka

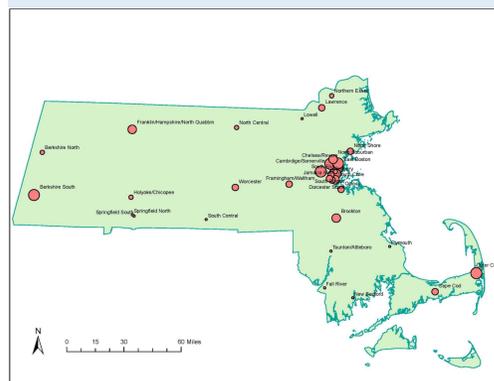
TA: Joel Kruger

Data Sources: Massachusetts WIC, Massachusetts Department of Public Health (mass.gov), US Census Bureau

References: Hedberg, I. (2013). Barriers to Breastfeeding in the WIC Population. *The American Journal of Maternal and Child Nursing*, 38(4), 244-249. American Academy of Pediatrics. (2012). Policy Statement: Breastfeeding and the Use of Human Milk. *Pediatrics*, 129. doi: 10.1542/peds.2011-3552.

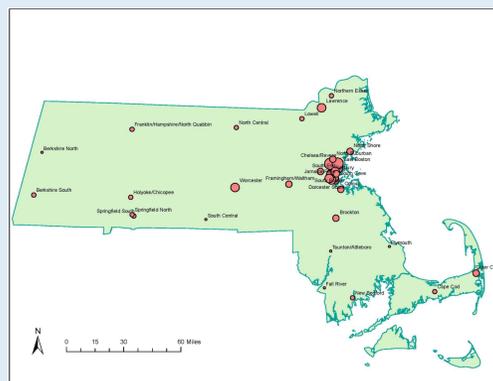


### Total Breastfed



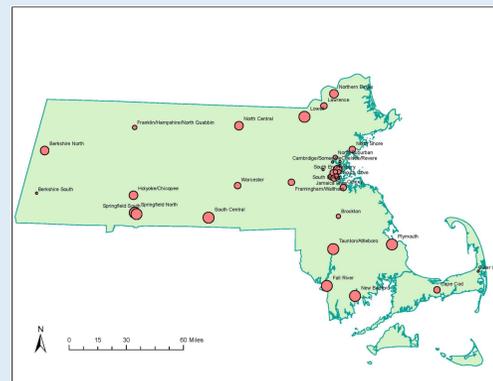
Percent of infants who were ever breastfed, among all infants who received WIC services at the Local Program.

### Partially Breastfed



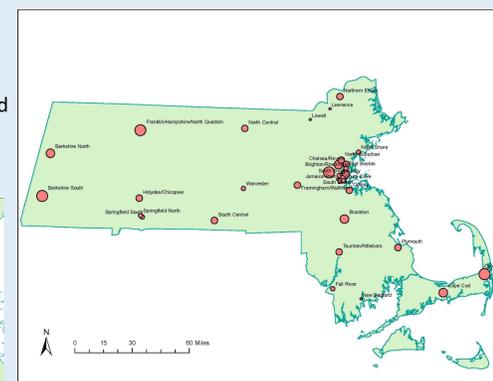
Percent of infants who were fully breastfed, among all infants who received WIC services at the Local Program.

### Fully Formula Fed



Percent of infants who were fully formula fed, among all infants who received WIC services at the Local Program.

### Fully Breastfed



Percent of infants who were fully breastfed, among all infants who received WIC services at the Local Program.