NATIONAL RESEARCH CENTER ON HISPANIC CHILDREN & FAMILIES

Data Visualization Training Webinar

Michael López
Nola du Toit
Ned English

September 10, 2019

Tweet with us!

And follow us @NRCHispanic for discussion on this webinar and other topics important to low-income Hispanic children and families.

Presenters

Michael López, Ph.D.
Vice President, Education and Child Development, NORC at the University of Chicago
Co-Principal Investigator, NRCHCF
Lopez-Michael@NORC.org

Nola du Toit
NORC at the University of Chicago
Dutoit-Nola@NORC.org

Ned English
NORC at the University of Chicago
English-Ned@NORC.org

A special thanks to Rebecca Berger, Ana Leon-Santos, Carina Hoyer & Katarina Yang for their behind the scenes support and contributions.

Who We Are and What We Do

- Conduct research and provide research-based information to inform ACF programs and policies supporting low-income Hispanic children and families around:
  - Poverty and self-sufficiency
  - Healthy marriage and responsible fatherhood
  - Early care and education

- We do this through:
  - Building research capacity
  - Dissemination and outreach

Research Capacity Building

Strengthen the capacity of the research field and expand the pipeline of scholars focused on Hispanic children and families.

- Provide resources to the field
- Support emerging scholars
- Engage key stakeholders

Center partners

Child TRENDS

NORC at the UNIVERSITY of CHICAGO

Duke | SANFORD SCHOOL OF PUBLIC POLICY

UNIVERSITY OF MARYLAND 1856 COLLEGE OF EDUCATION

THE UNIVERSITY of NORTH CAROLINA GREENSBORO

OPRE OFFICE OF PLANNING, RESEARCH & EVALUATION
An Office of the Administration for Children & Families

Disclaimer

The views expressed in this presentation do not necessarily reflect the views or policies of the Office of Planning, Research and Evaluation, the Administration for Children and Families, or the U.S. Department of Health and Human Services.

Goals of Today's Data Visualization Training

- Components of good data visualization
- Storytelling with data
- Maps and Mappable Data
- Q&A

Celebrating 50 illinois action for children 1969–2019

NORC at the UNIVERSITY of CHICAGO

Components of Good Data Visualization

Purpose

Audience

Best Practices

DATA!

Purpose

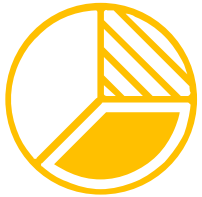
Audience

Best Practices

What is the DATA story?

Comparison of groups 

Distribution 

Composition or proportion 

Over time 

 What does the data look like?

Geographic 

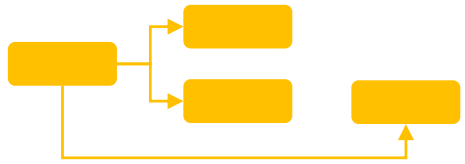
Purpose

Audience

Best Practices

What is the INFORMATION story?

Progress or process



Flowchart

Timeline

Information = Data

List

Purpose

Audience

Best Practices

Policy makers, potential funders, community members, advocacy groups

General public, teenagers, elderly

Journalists

What do I want them to…?

Think… Know… Do…

- **Raise awareness of an issue**
- **Garner support**
- **Attract new funders or increase funding**
- **Prompt a specific action**

How much do they need to know?

Why is this important for them?

What matters to them?

How do they regard the issue?

Purpose

Audience

Best Practices

Tools

Data formatting

Easy, drag-and-drop, good for common graphics, good defaults; expensive licensing fees, easy to make mistakes

Some graphics are easy, everyone has access to it, easy to share, defaults are bad

Free online library of JavaScript code, cool graphics, interactive, programming language

Free, cool graphics, interactive, programming language

Mapping geographic data
MORE

Purpose

Audience

Best Practices

Tools

Accessibility

508 compliance
Disabilities
Font size
Color blindness

Paper

Online

Mobile

Purpose

Audience

Best Practices

Tools

Accessibility

Standards

QC the Data

Checklist

No decimals points

Remove clutter and redundancy

How much information?

Purpose

Audience

Best Practices

Tools

Accessibility

Standards

Feedback

Is the data clear?

Storytelling with Data

Graphic 1

Purpose

Children in Chicago
Compared by Race/Ethnicity

Audience

General public

Data

ACS data 2012-2017

Time Periods

2012: Chicago presents itself as an immigrant friendly city
2016: National immigration context

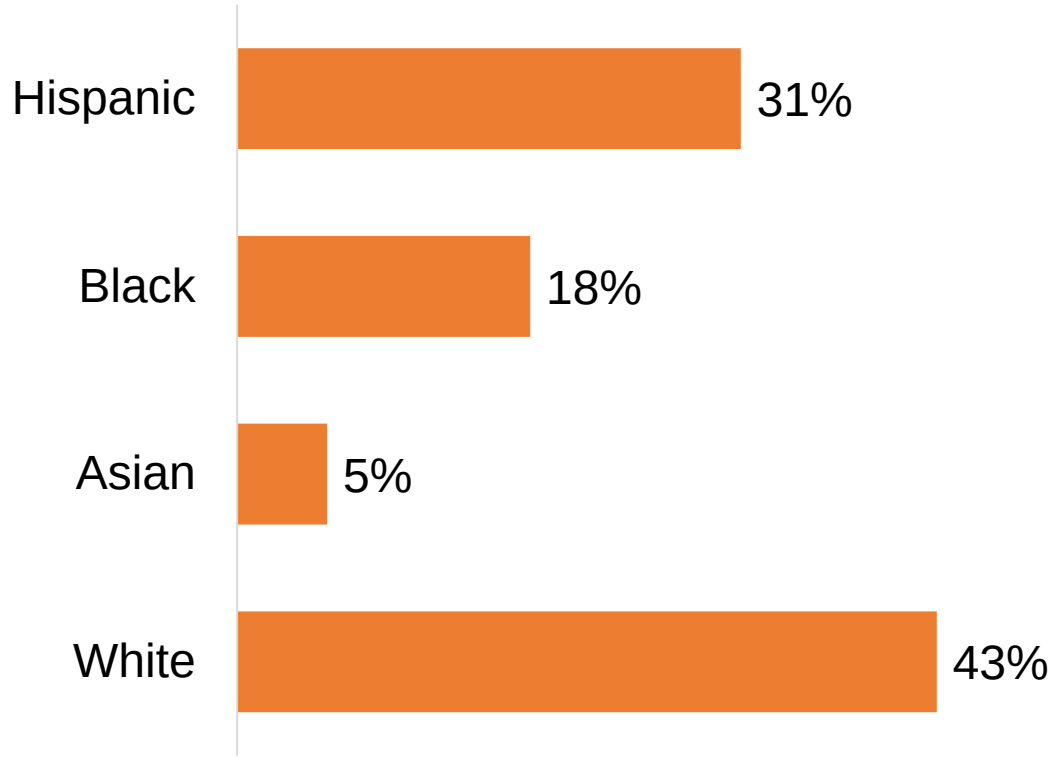
Tool

Excel

One Third of Children in Metro Chicago are Hispanic…

Compare across race groups

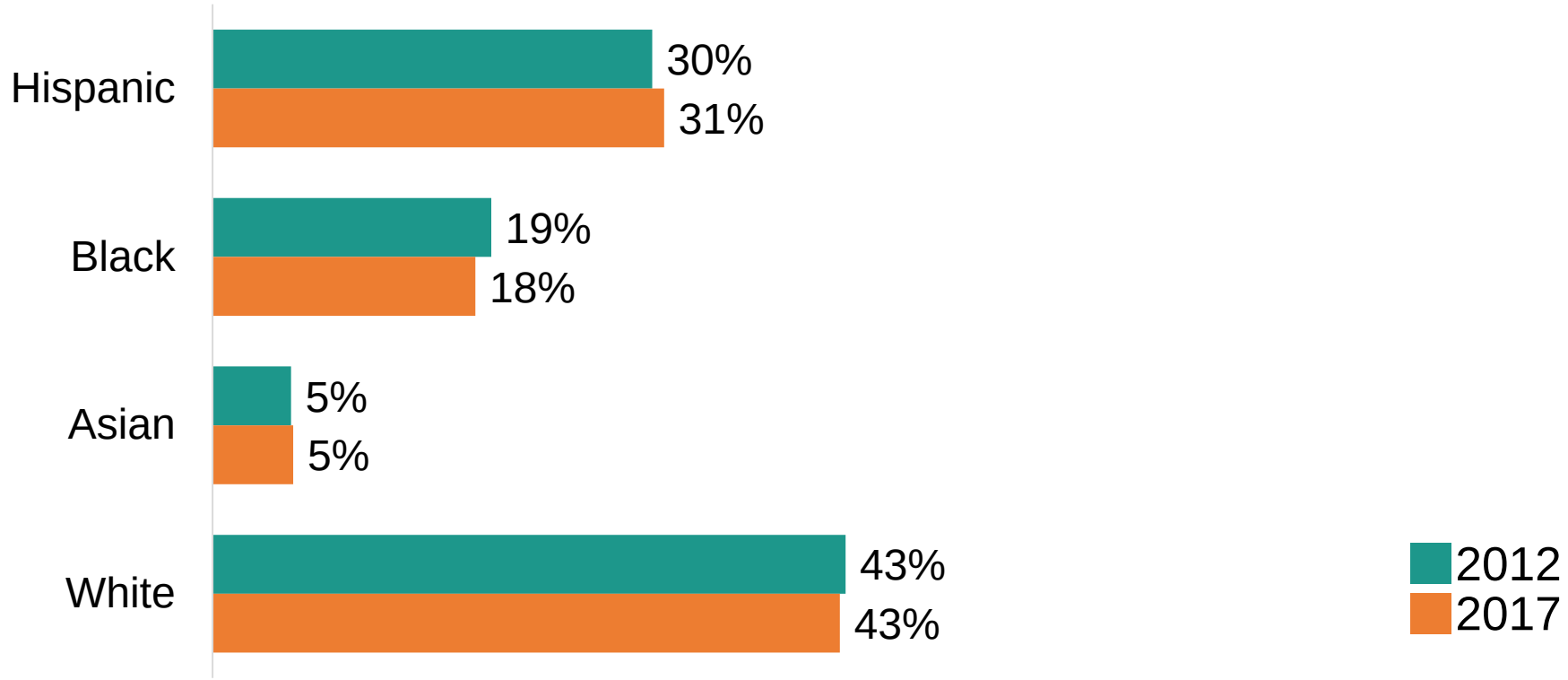
Excel (bar chart)



And the numbers have not changed much over the past few years

Compare across race groups

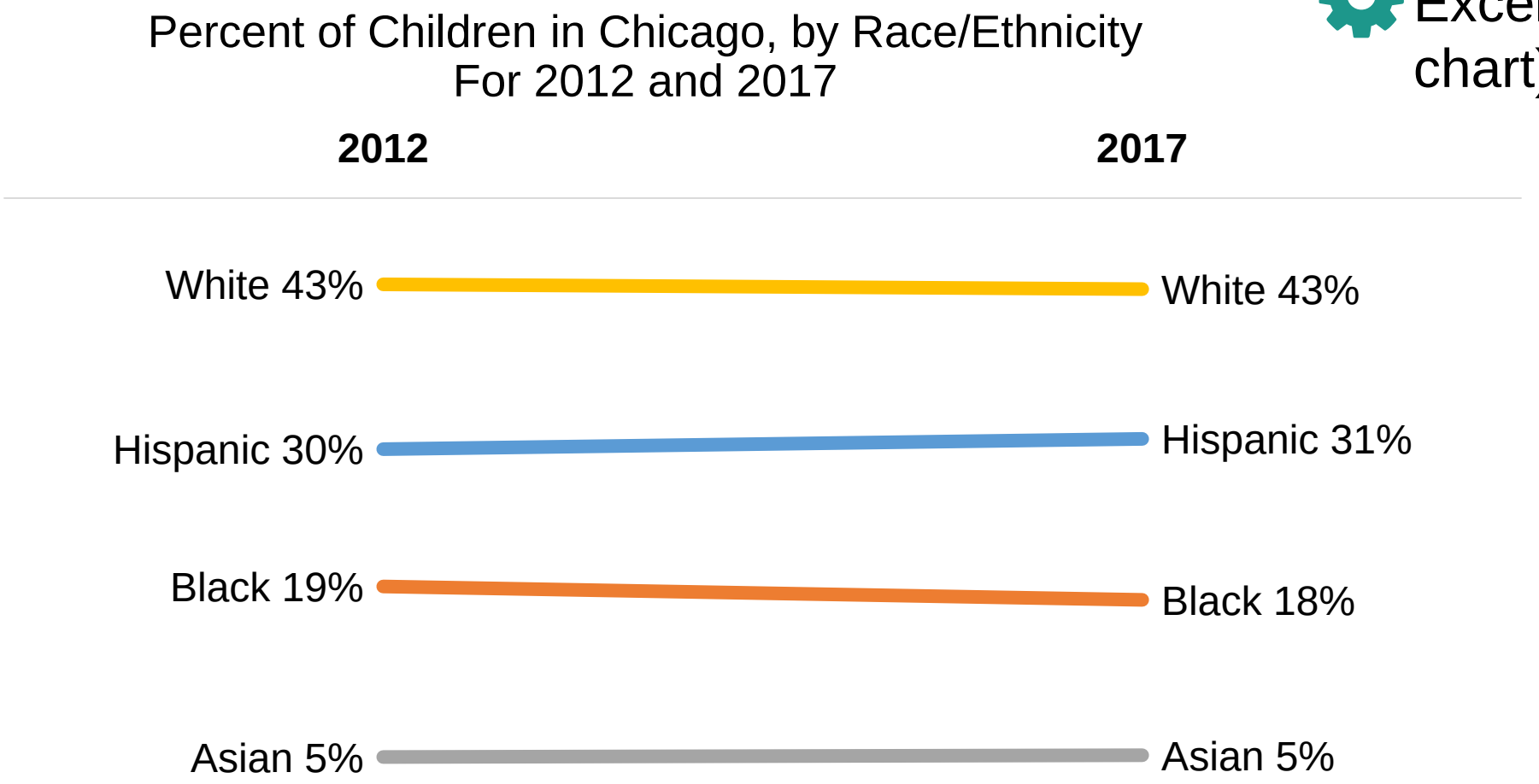
Excel (bar chart)



And the numbers have not changed much over the past few years

Compare across race groups

Excel (slope chart)



Maps and Mappable Data

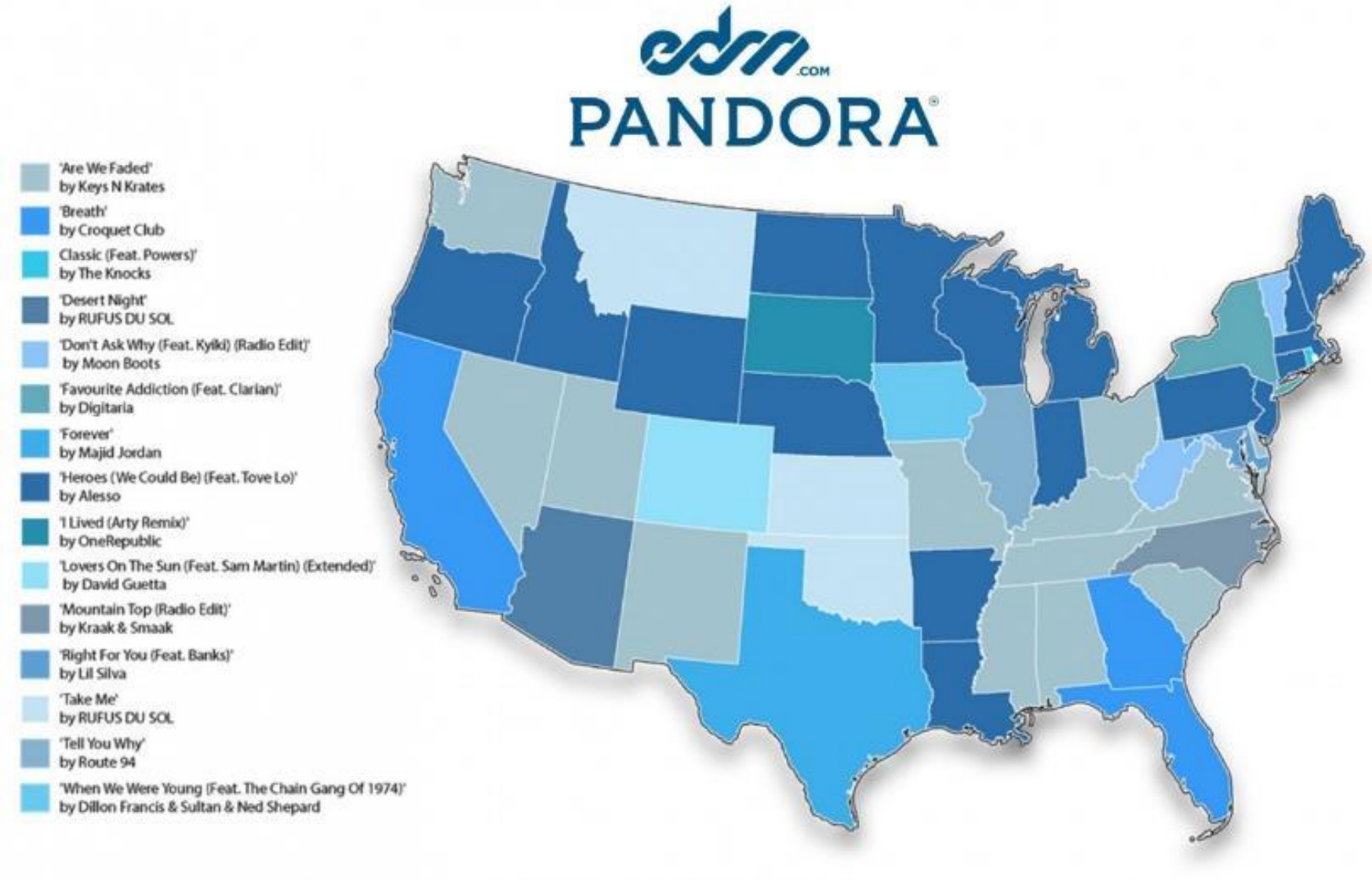
- Want to take advantage of spatial data and so consider geography
    - All things are related but near things more related than far things (Tobler's first law of geography)
    - Lots of data (fractal detail)
- GIS tools, techniques for analysis/management of spatial data
    - Preoccupied with *representation*
- Cartography deals with the presentation of spatial data (make nice maps), visualization
    - Preoccupied with *presentation*

What is Special about GIS?

- Take advantage of spatial relationships
- Permits complex spatial analyses
- Geographic queries added to database
- Consider spatial relationships e.g. distance, proximity, adjacency, topology
- Adds third dimension to statistical problems
- Whole realm of spatial statistics, autocorrelation, interpolation

Snow's Cholera Map: 1864

Lots of Bad Maps...



Common Applications of GIS in Social Sciences

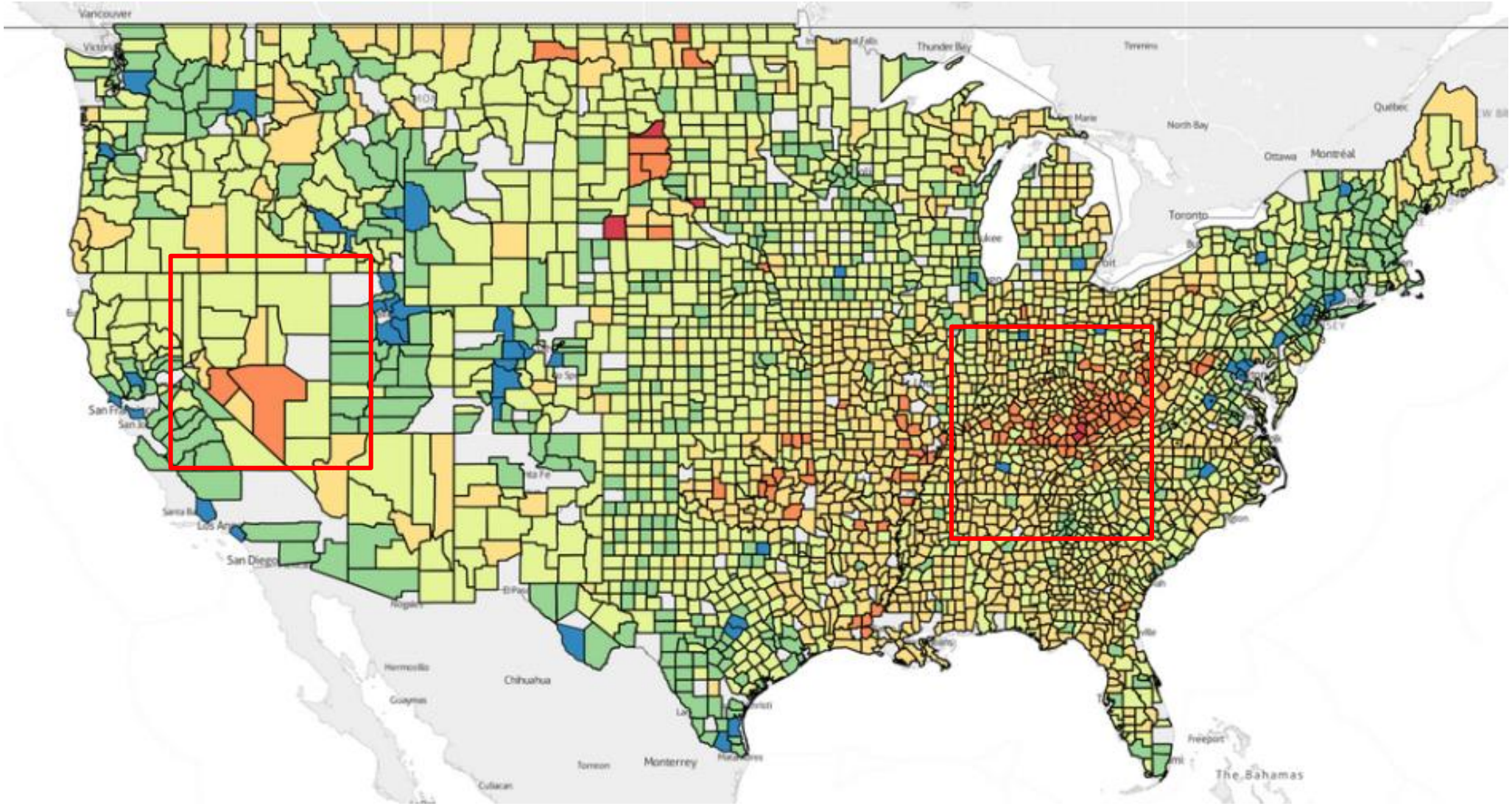
1. Presentation of data, results through maps
    - Often choropleth
2. Creation of new data layers
    - Overlays, spatial joins
    - Geocoding
3. Linking disparate data sets together
    - Without *a priori* key field
4. Spatial data analysis
    - Finding patterns related to geography

Choropleth Maps

- Often want to map statistical surface
  - Quantitative attribute values referenced to areas
  - A “lattice”, type of vector
- Population of Census tracts
- Median household income of counties
- Etc.

- *Choropleth* maps portray a statistical surface with area symbols
  - Data coincide with data collection regions i.e. “lattice data”

We Are Familiar with Uneven Lattices

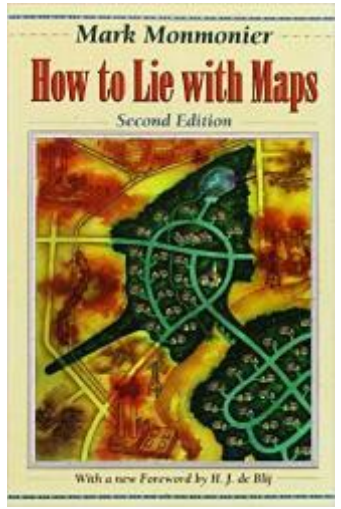


Choropleth Maps: Design Considerations

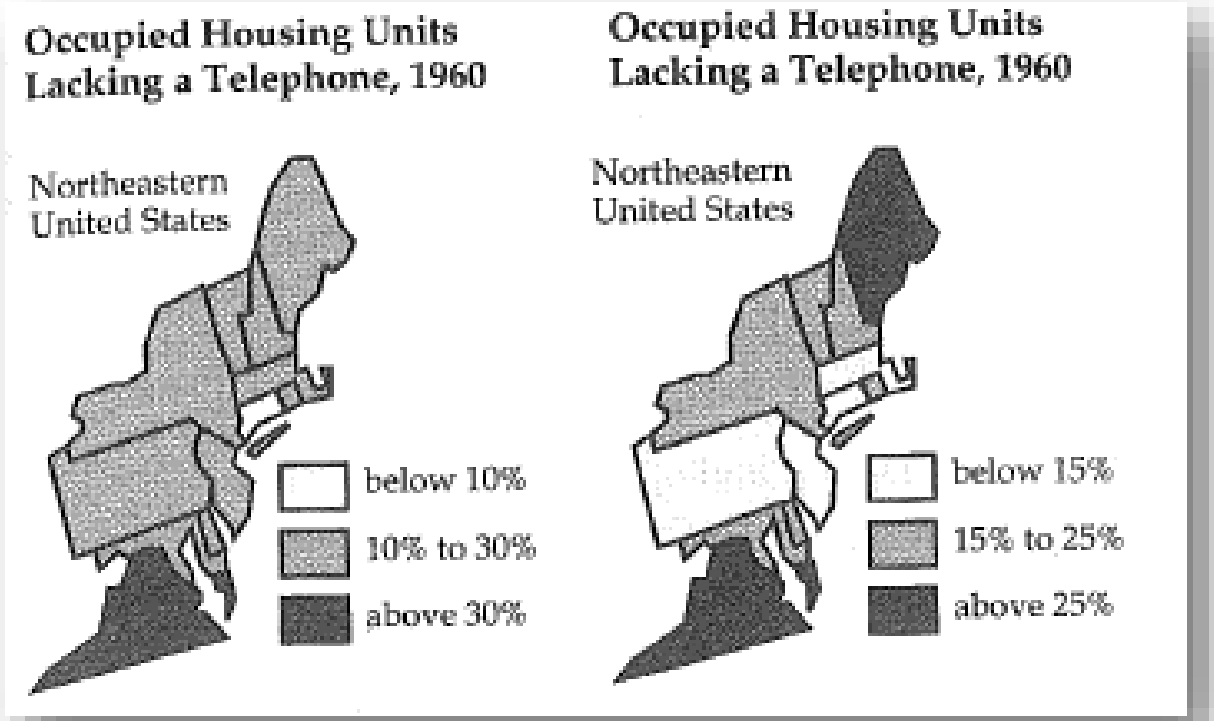
1. Size and shape of unit areas
    - Should be about the same size and shape
    - If too big, too variable, no good

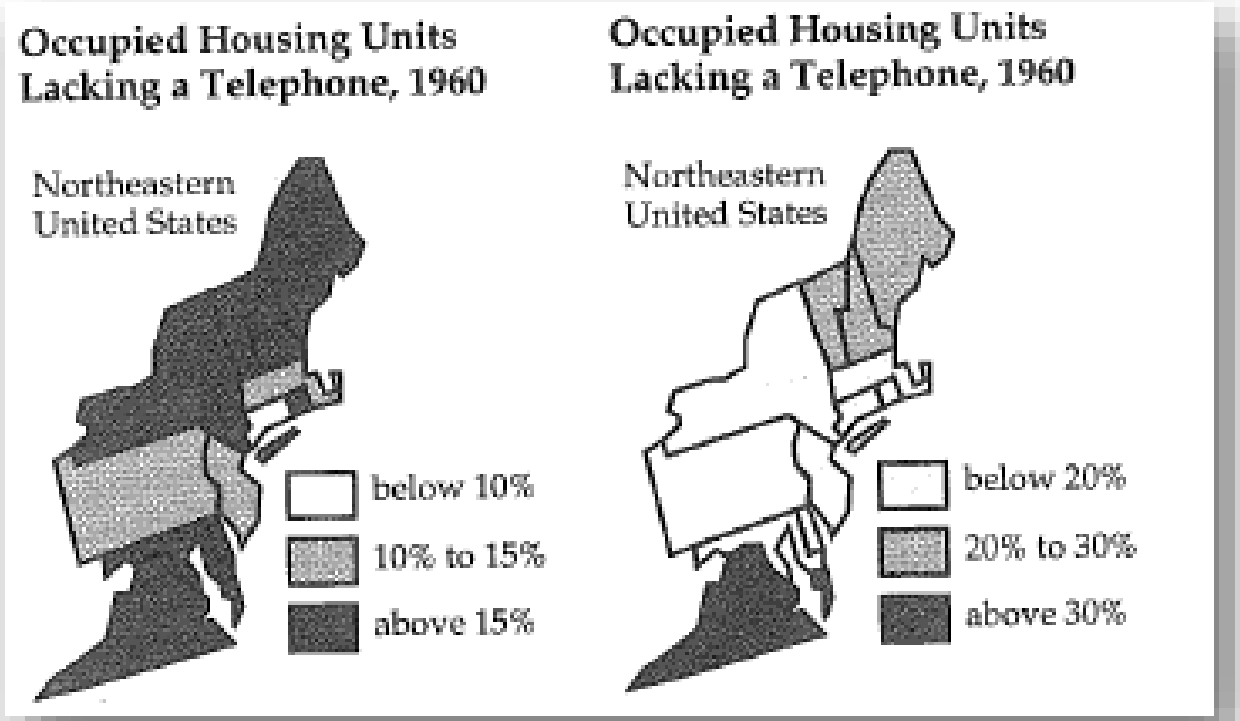
2. Number of classes

3. Class limit determination
    - Can get very different results depending
    - As described in Monmonier (1991) How to Lie with Maps



Manipulating Breaks for Different Looking Maps





From Monmonier 1991

Multi-Variate Maps

- Can be hard to map more than one variable at once
  - And be legible
  - Want to be efficient with information
- How can we accomplish this?

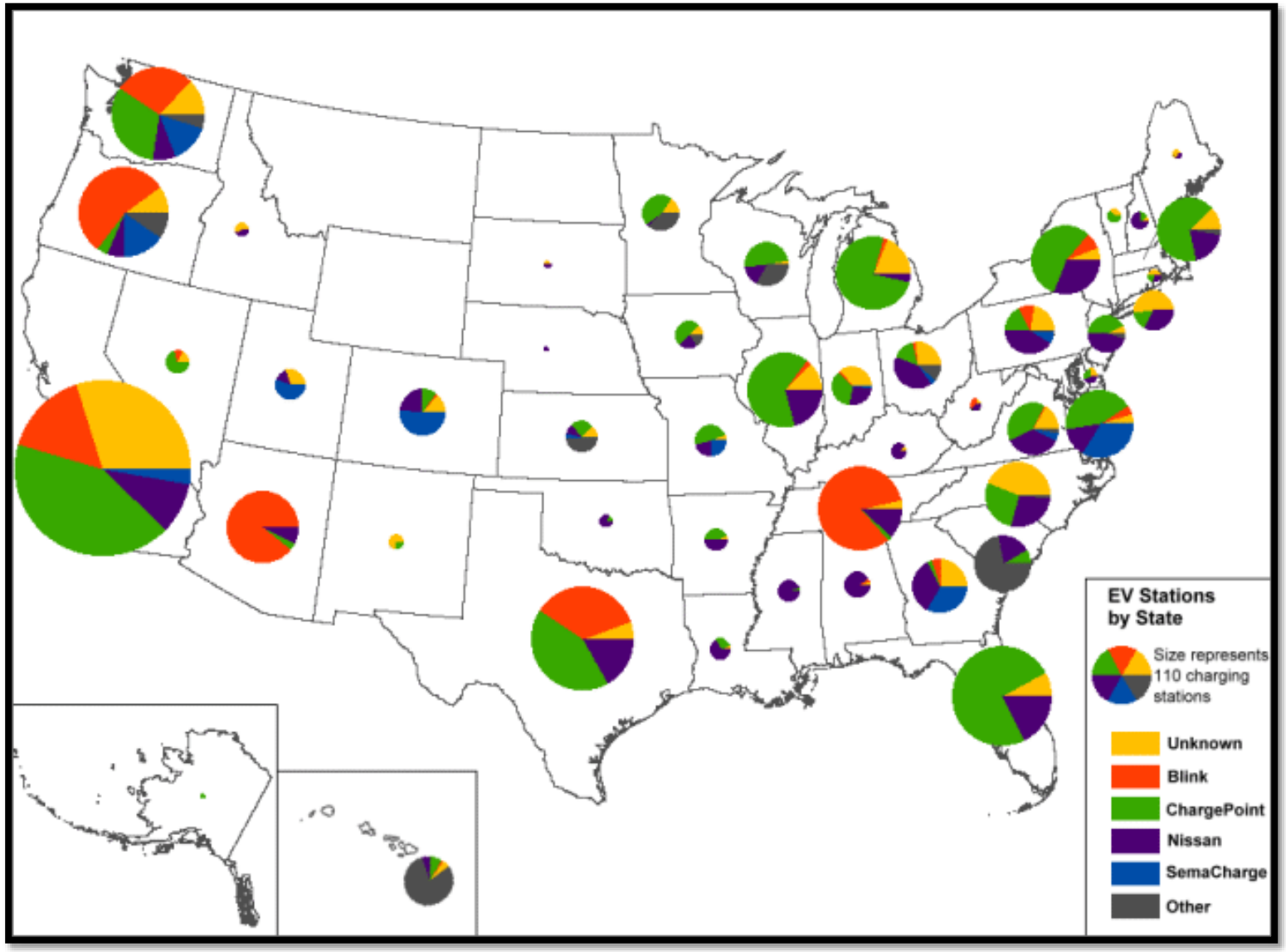
1. Superimpose Features
   - Use symbols that are transparent, but distinct
   - Dots, isolines, proportional-point symbols
   - Advantage: simple to understand, effective with few variables
   - Disadvantage: impractical with more variables, difficult to convey relative importance

Multivariate Maps Contd.

2. Segmented Symbols

- Could divide each symbol so more information
  - E.g. pie chart
- Can show complex relationships, but hard to understand
  - Pie charts difficult to interpret
  - Map users have trouble comparing proportions, parts of symbols

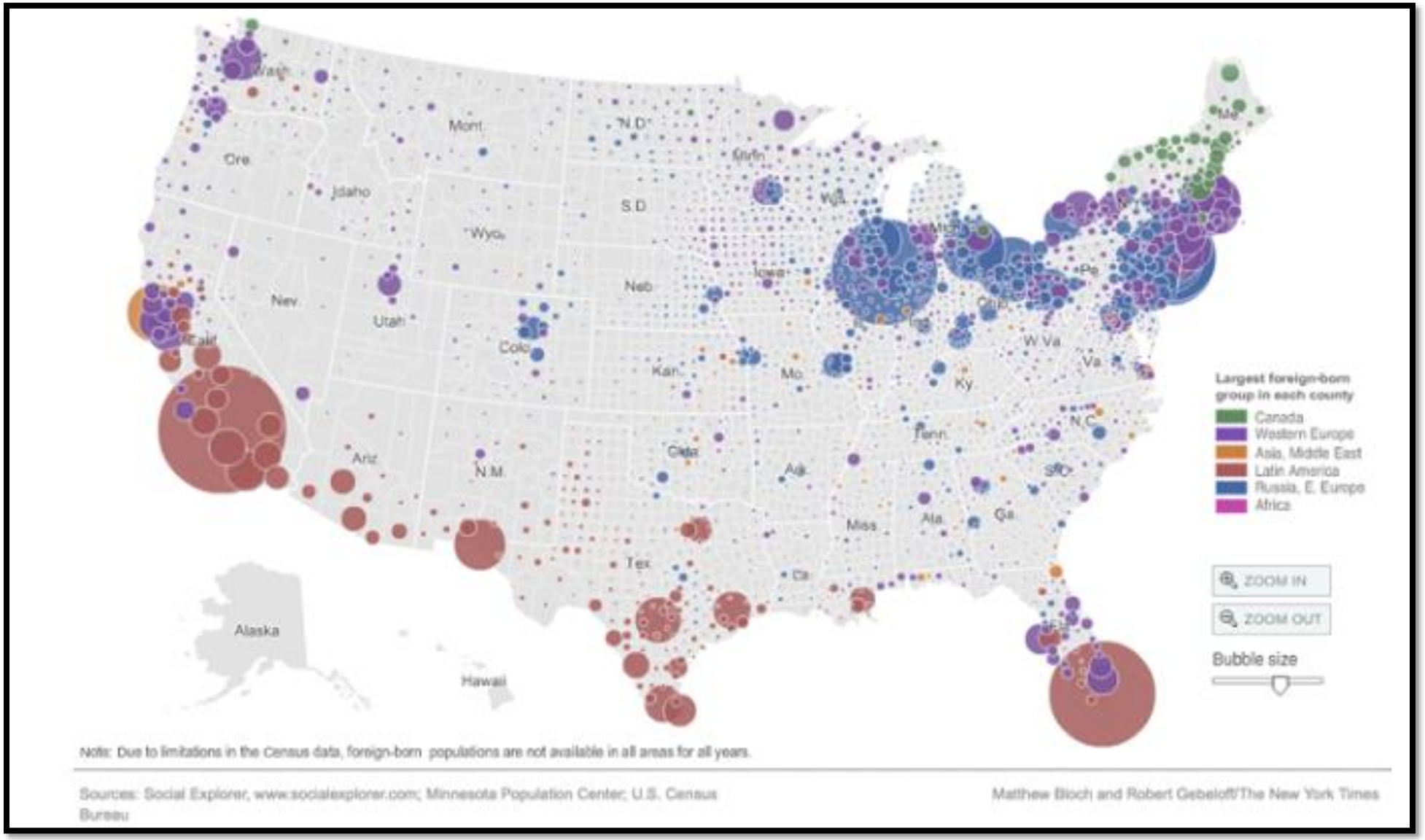
Segmented Symbols



Multivariate Maps Contd.

3. Cross-variable mapping
   - nxn matrix legend
   - Can express a lot of information effectively
   - Hard to understand at >3 classes
   - Should emphasize distinction between classes
   - See a lot in popular media: NY Times, Economist

Cross-variable mapping 1



Map Set 1- Multivariate Choropleth

Purpose

Proportion of children by modal race in Chicago Census tracts

Audience

General public

Data

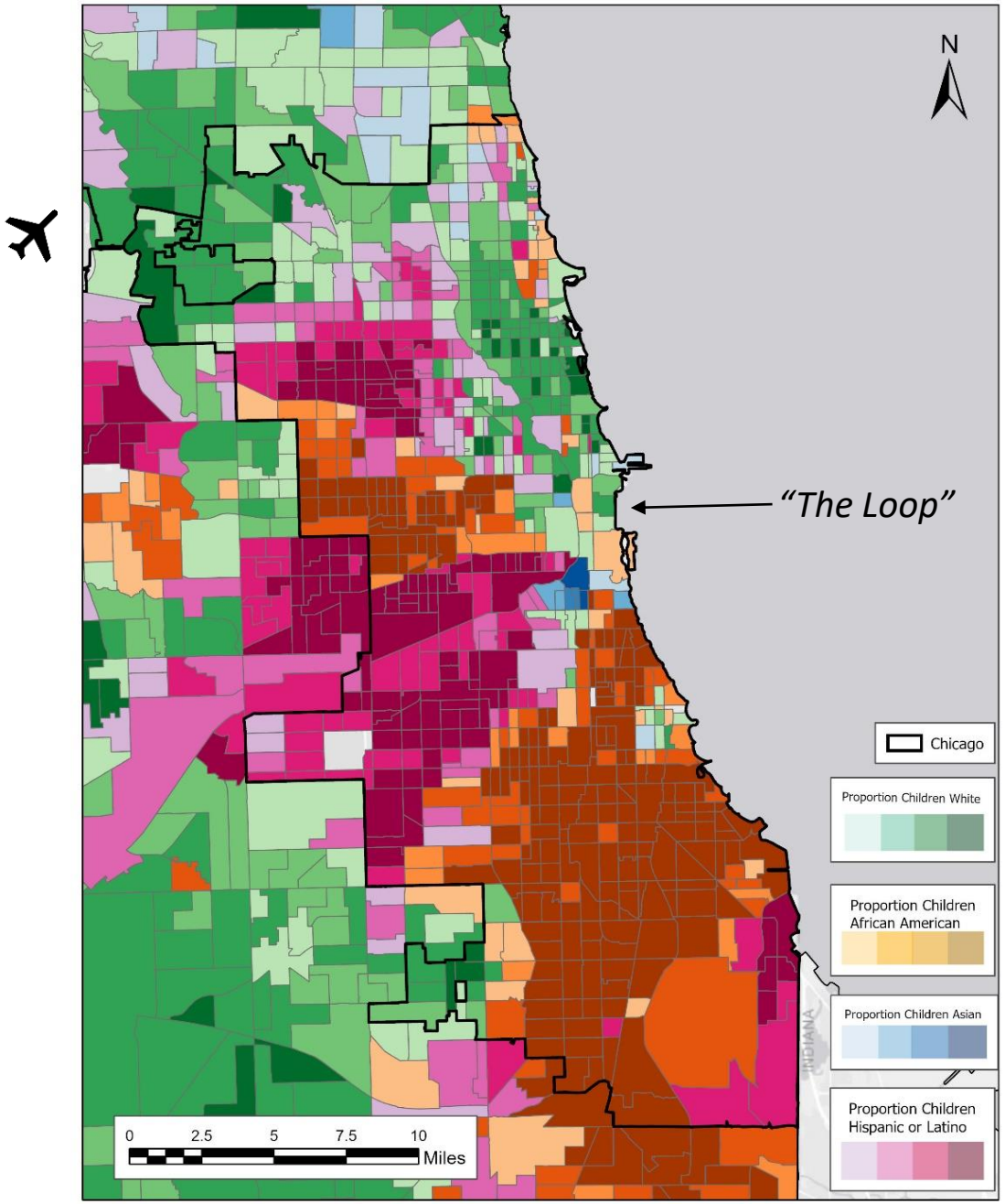
ACS data 2013-2017

Time Periods

2012: Chicago presents itself as an immigrant friendly city
2016: National immigration context

Tool

ArcGIS



- Different hue = different modal race/ethnicity
- Lighter value = more mixed tracts

Map Set 2- Multivariate Choropleth

Purpose

Two maps of the proportion of single parents and non-single parents living in poverty with a related child in the household, by the modal race/ethnicity in Chicago tracts

Audience

General Public

Data

Five Year ACS data 2013-2017

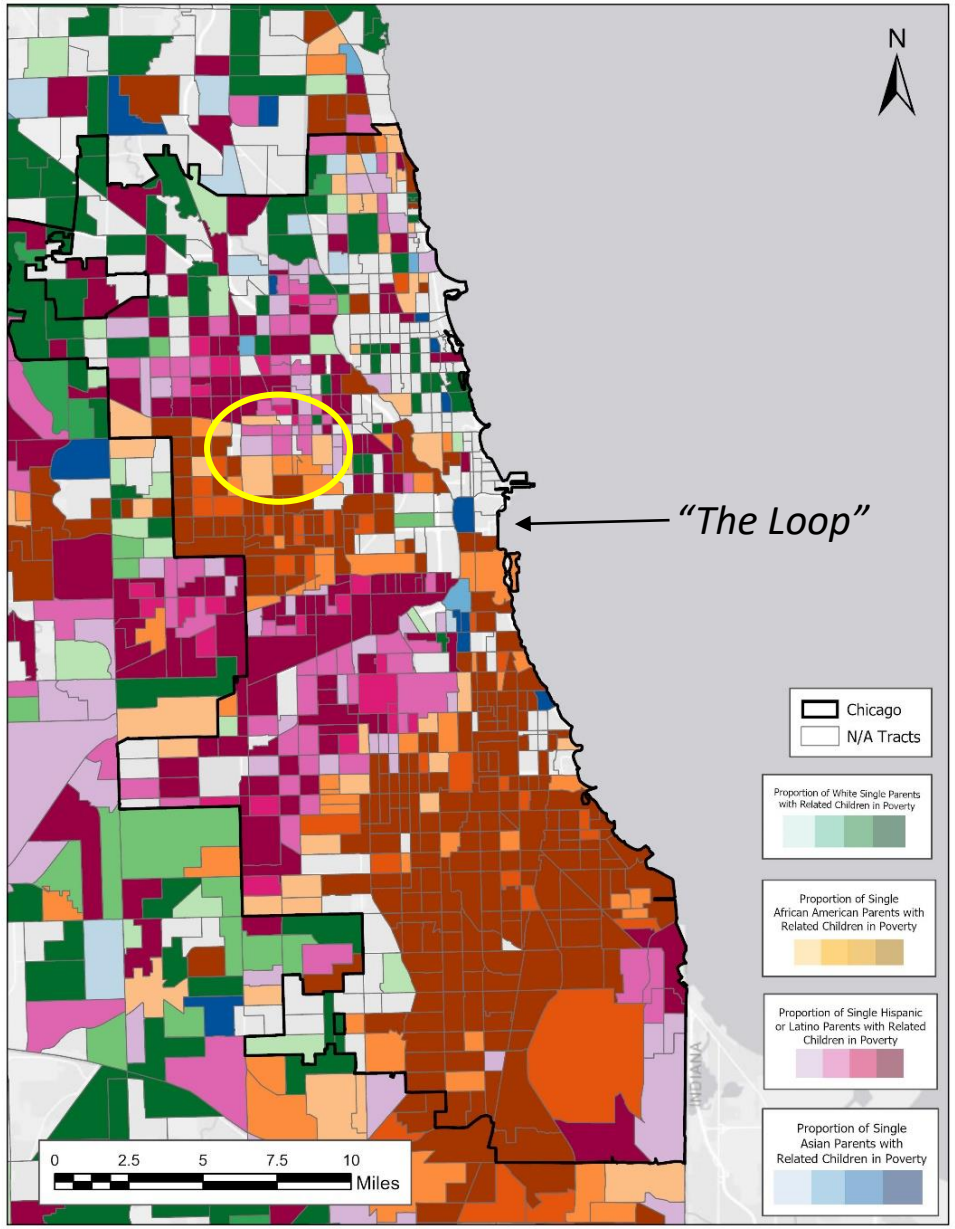
Time Periods

2012: Chicago presents itself as an immigrant friendly city
2016: National immigration context

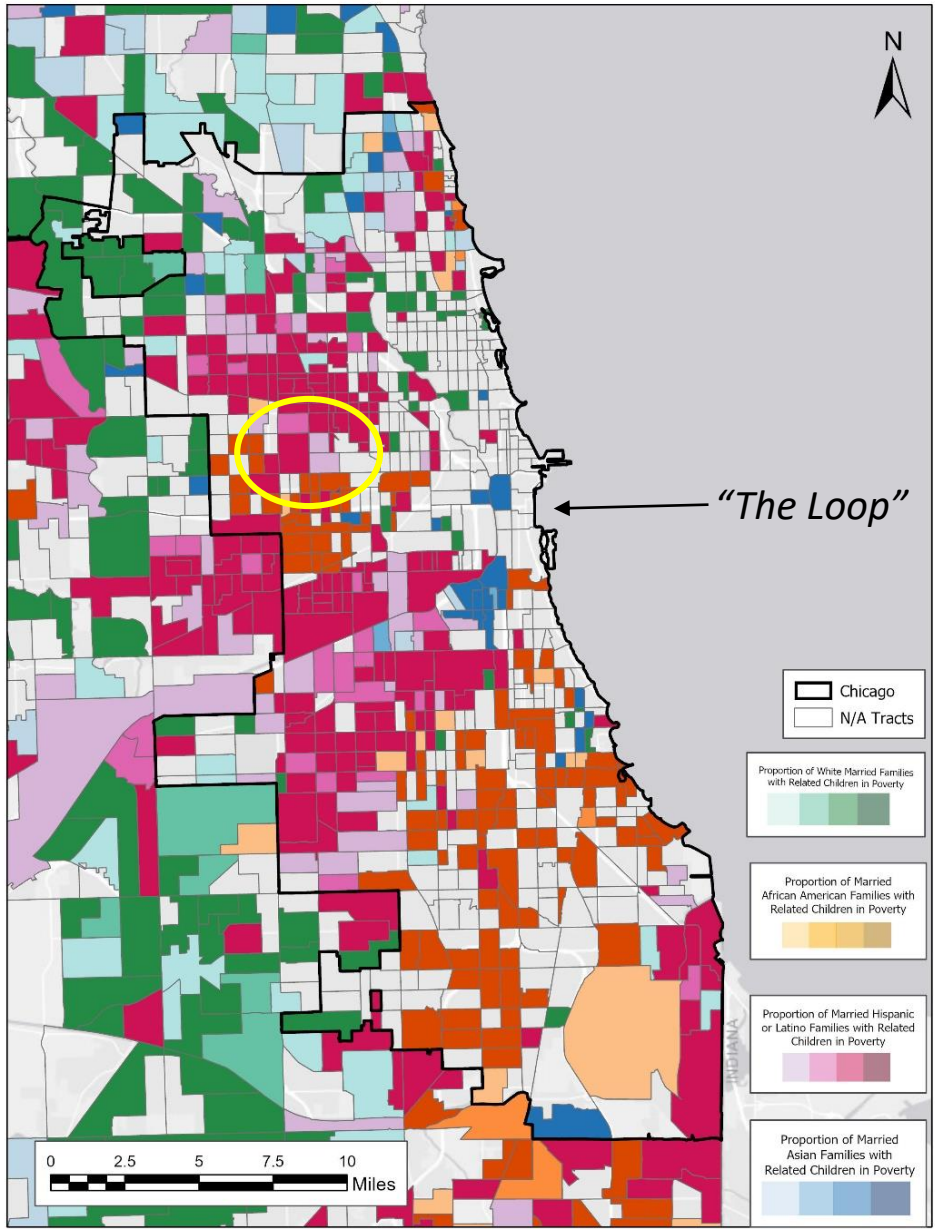
Tool

ArcGIS

Single-Parent Households



Non- Single-Parent Households



Map Set 3- Animated Choropleth

Purpose

Animated map of the proportion of children under 5 who are Hispanic in Chicago tracts, with home-based and center-based childcare locations

Audience

General Public

Data

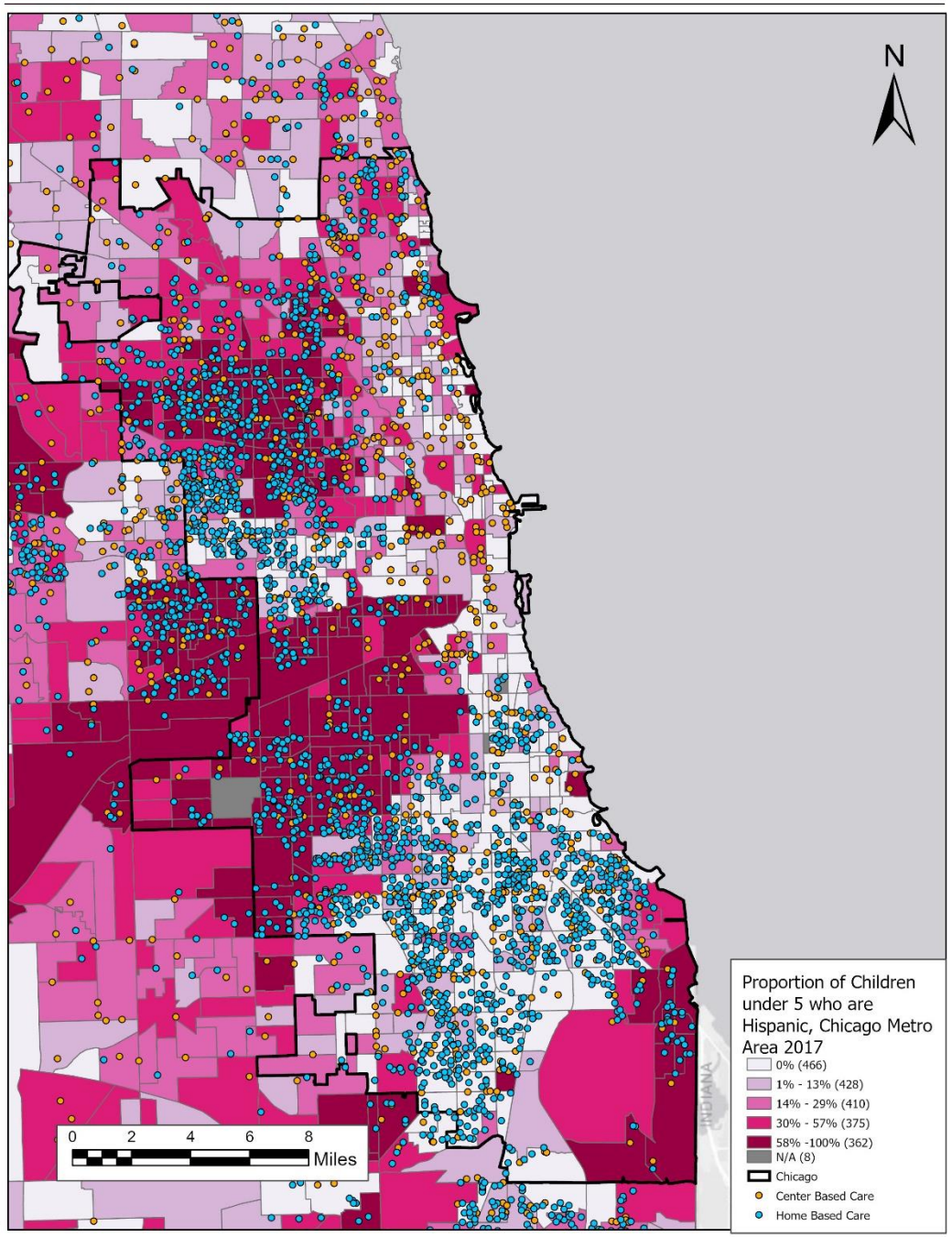
Chicago Child Care Licensing Data and ACS data 2012-2017

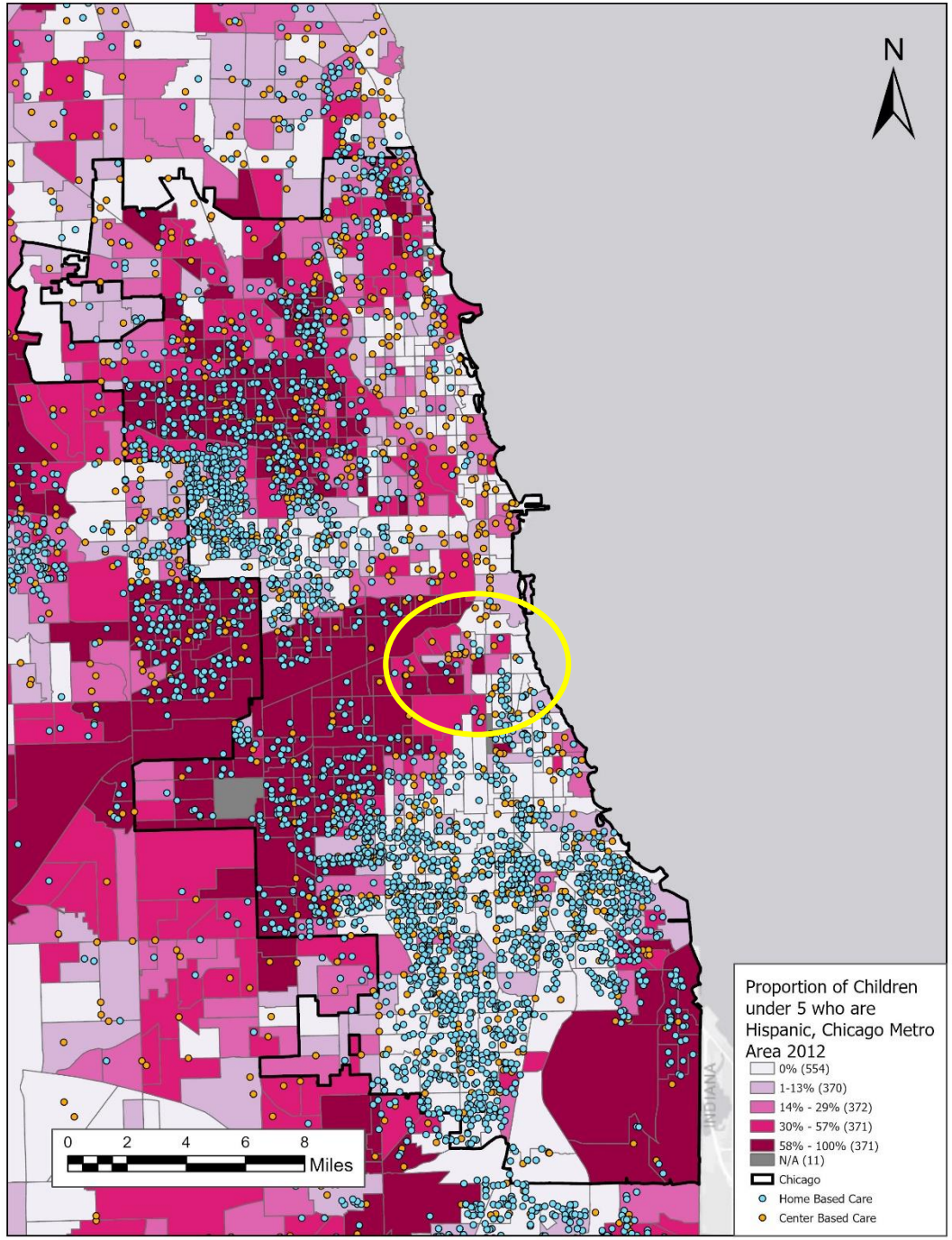
Time Periods

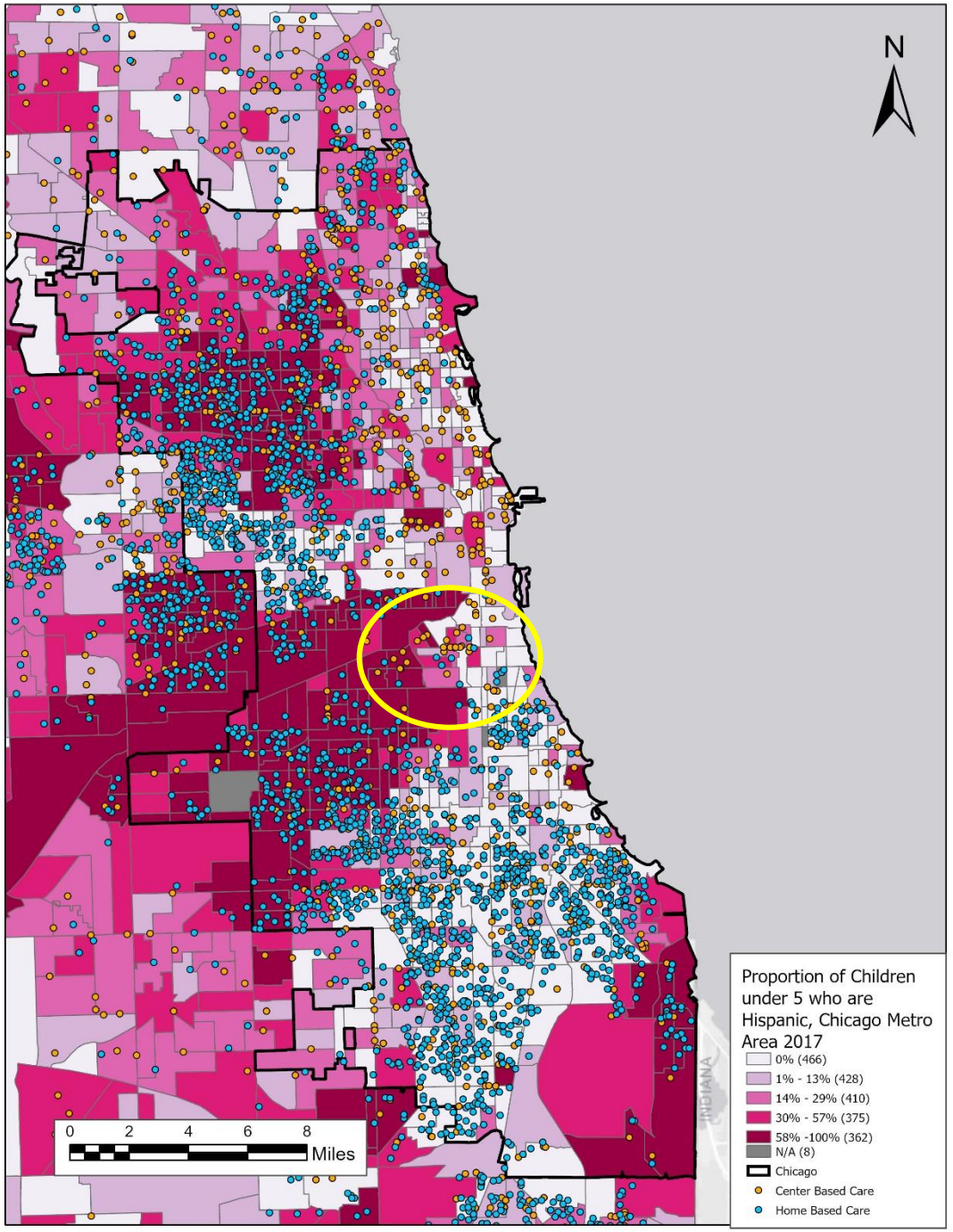
2012: Chicago presents itself as an immigrant friendly city
2016: National immigration context

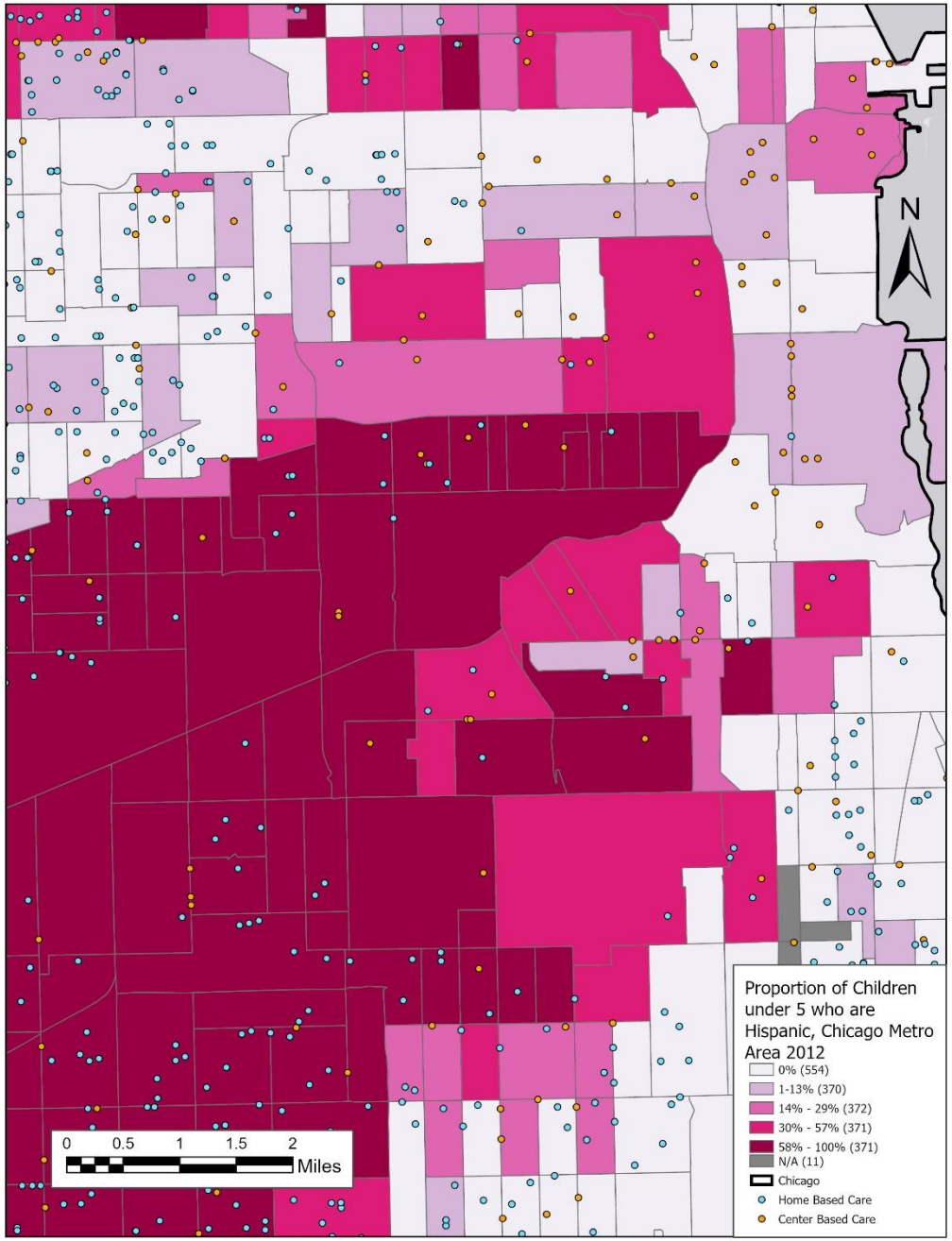
Tool

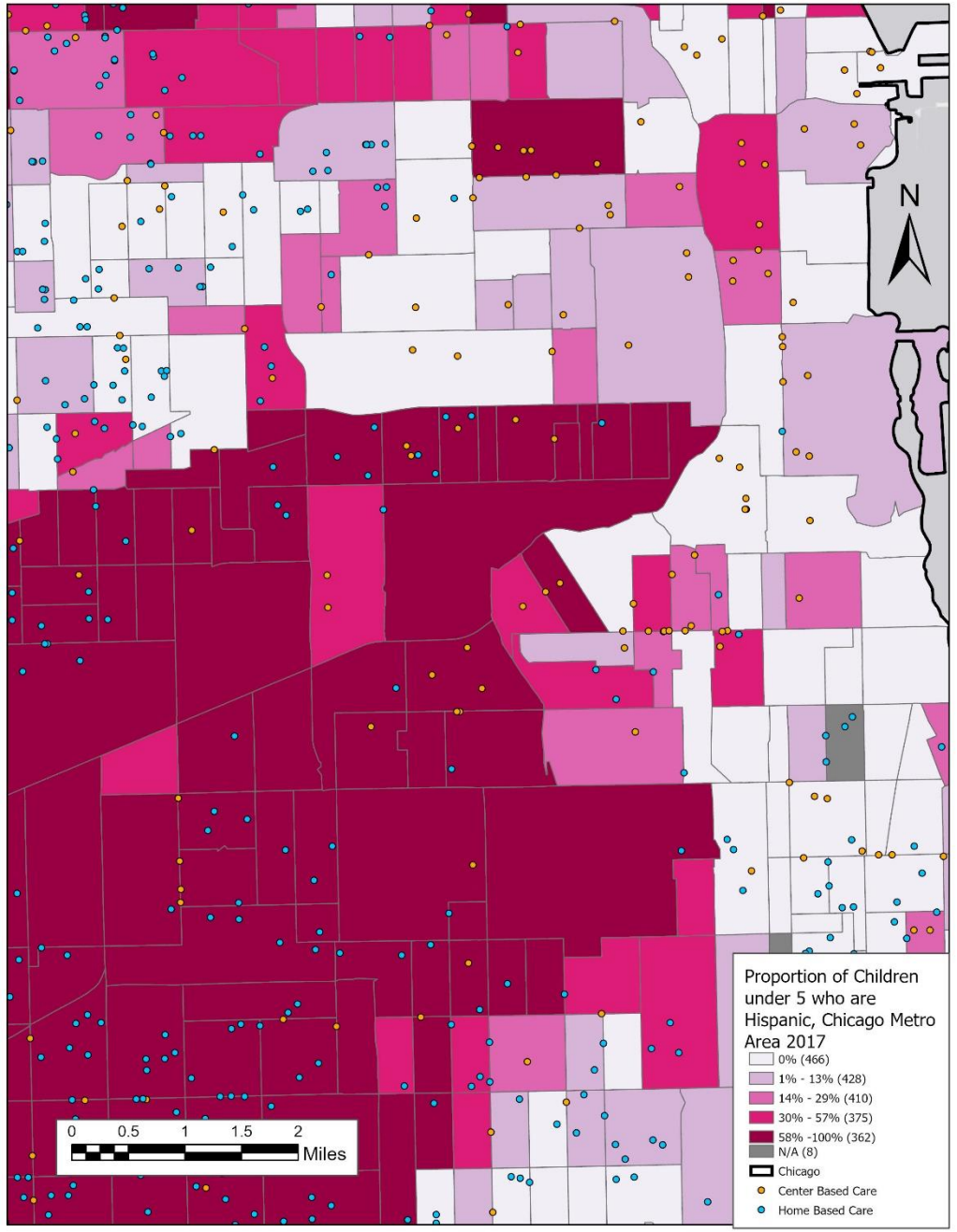
ArcGIS


N
0 2 4 6 8
Miles
INDIANA
Proportion of Children under 5 who are Hispanic, Chicago Metro Area 2017
0% (466)
1% - 13% (428)
14% - 29% (410)
30% - 57% (375)
58% -100% (362)
N/A (8)
Chicago
Center Based Care
Home Based Care


N
0 2 4 6 8
Miles
Proportion of Children under 5 who are Hispanic, Chicago Metro Area 2012
0% (554)
1-13% (370)
14% - 29% (372)
30% - 57% (371)
58% - 100% (371)
N/A (11)
Chicago
Home Based Care
Center Based Care


N
0 2 4 6 8
Miles
Proportion of Children under 5 who are Hispanic, Chicago Metro Area 2017
0% (466)
1% - 13% (428)
14% - 29% (410)
30% - 57% (375)
58% -100% (362)
N/A (8)
Chicago
Center Based Care
Home Based Care


N
0 0.5 1 1.5 2
Miles
Proportion of Children under 5 who are Hispanic, Chicago Metro Area 2012
0% (554)
1-13% (370)
14% - 29% (372)
30% - 57% (371)
58% - 100% (371)
N/A (11)
Chicago
Home Based Care
Center Based Care


N
0 0.5 1 1.5 2
Miles
Proportion of Children under 5 who are Hispanic, Chicago Metro Area 2017
0% (466)
1% - 13% (428)
14% - 29% (410)
30% - 57% (375)
58% -100% (362)
N/A (8)
Chicago
Center Based Care
Home Based Care

Map Set 4- Difference Map

Purpose

Map of the change of Hispanic children in Chicago from 2012 - 2017

Audience

General Public

Data

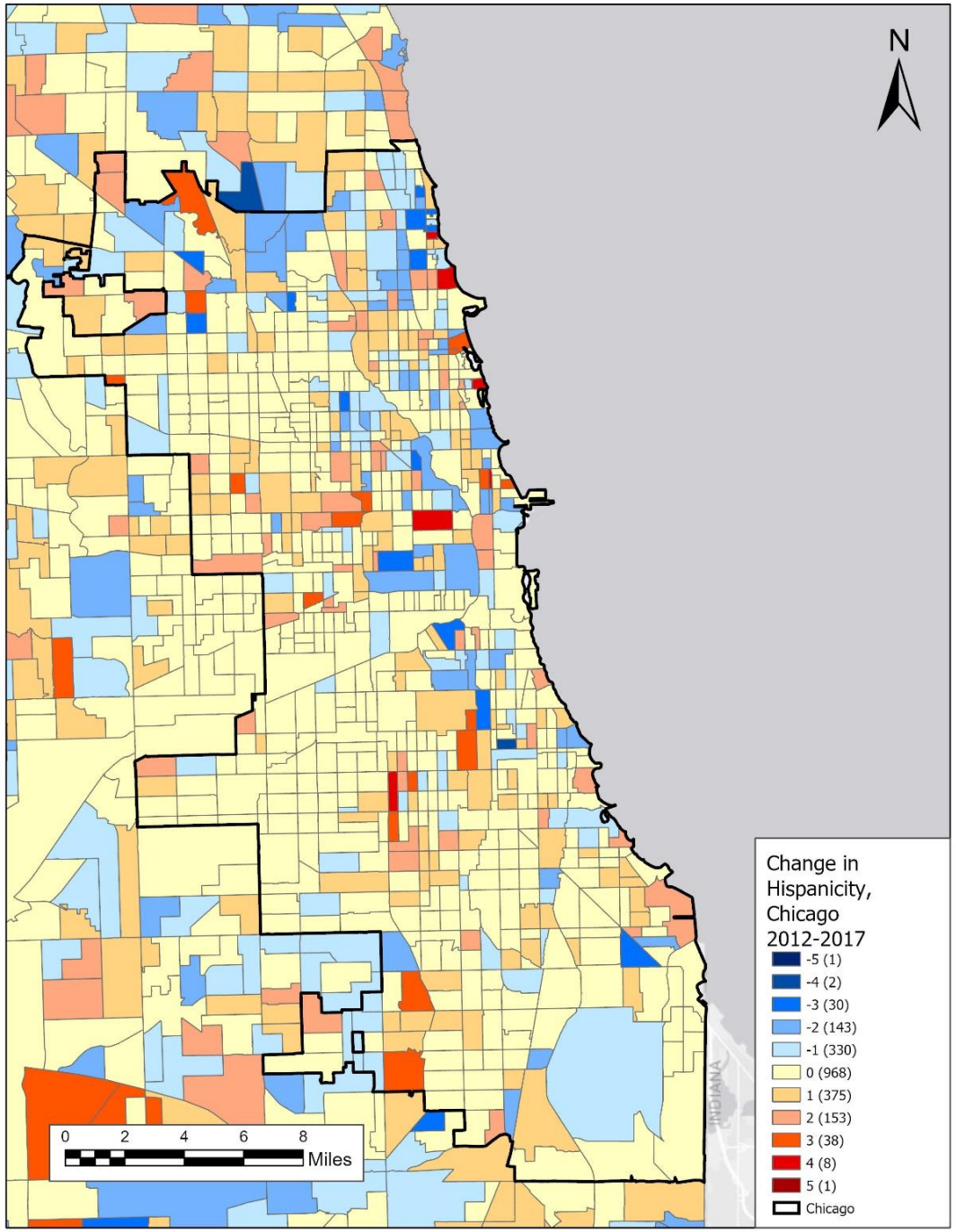
ACS data 2012-2017

Time Periods

2012: Chicago presents itself as an immigrant friendly city
2016: National immigration context

Tool

ArcGIS



- Blue = Loss of Hispanic Children
- Red = Gain in Hispanic Children

Q&A

Thanks to our Funders!

ADMINISTRATION FOR CHILDREN & FAMILIES

OPRE

Thank you!

Michael López – Lopez-Michael@NORC.org

Nola du Toit - Dutoit-Nola@norc.org

Ned English - English-Ned@norc.org

www.HispanicResearchCenter.org

@NRCHispanic

National Research Center on Hispanic Children & Families