

# Examining Chronic Disease Mortality Rates in Cleveland, Ohio through Geographic Information Systems (GIS) Mapping, 2008-2012

David Bruckman, MS, MT, Vinothini Sundaram, MPH, Jana Rush, MPH, MA  
 Brent Styer, MPH, Mone' Whatley, MSHCA, REHS, RS  
 Cleveland Department of Public Health



## BACKGROUND

The Cleveland Department of Public Health (CDPH) recognizes the importance of chronic disease indicators for the City of Cleveland. In particular, CDPH has a strong focus on minority health due to the city's largely minority population. 53.3% of the population in Cleveland is Black/African-American (B/AA)<sup>1</sup>. Based on 2005-2009 Cleveland-Cuyahoga County Behavioral Risk Factor Surveillance System (BRFSS) data for the City of Cleveland, the B/AA population had high prevalence rates of hypertension and obesity. Hypertension prevalence among B/AA was at 40.8%<sup>2</sup> and obesity prevalence was at 42.3%<sup>3</sup>; both rates were significantly higher when compared to rates among Whites. With hypertension and obesity being high risk factors for heart disease and stroke, CDPH did a closer examination of overall mortality, heart disease mortality and stroke mortality data at the neighborhood level in the City of Cleveland.

## METHODS

The CDPH recently participated in the National Association of Chronic Disease Directors (NACDD) Geographic Information Systems (GIS) Training for Surveillance of Heart Disease, Stroke, and Other Chronic Diseases in Local Health Departments, supported by the University of Michigan and the Center for Disease Control and Prevention. Maps were created under the guidance of the training. Data were mapped across 34 statistical planning areas (neighborhoods) in Cleveland. Data was obtained from Ohio Department of Health and CDPH, Office of Biostatistics. SAS (SAS Institute, Cary, NC) and ArcGIS v.10.1 (Esri, Redlands, CA) software were used in calculating rates and mapping the data, respectively. The maps are based on average annual-age adjusted mortality rates over the five year period (2008-2012) in the City of Cleveland's statistical planning areas (SPA) as neighborhoods. Rates were age-adjusted to the 2000 U.S. standard population. Rates are per 100,000 population. Heart disease deaths were defined using the following ICD-10 codes: I00-I09, I11, I13, I20-I51. Stroke deaths were defined using the following ICD-10 codes: I60-69. The maps also include all hospitals in the City of Cleveland in order to provide heart disease and stroke mortality data as it relates to hospital locations.

## RESULTS

The average annual rate of stroke mortality in Cleveland was 46.8 per 100,000. Among Whites, there were no neighborhoods with significantly higher stroke mortality rates than the city's average. However, among B/AA, non-adjacent neighborhoods of Edgewater, Union-Miles, and Glenville had stroke mortality rates that were significantly higher than the city's average. The average rate of heart disease mortality in Cleveland was 268.3 per 100,000, higher than state and national averages. Overall, nine neighborhoods had heart disease mortality rates that were significantly higher than the city's average; one was higher among White and B/AA, four for White only (three adjoining), and four others for B/AA populations (none-adjoining). A key takeaway from the data is that neighborhoods that had relatively lower B/AA populations had among the highest rates of heart disease mortality among Blacks. These neighborhoods include Cudell (34%), Ohio City (35%), Goodrich-Kirtland Pk. (24%), and University (23%). Also, despite the neighborhood of Edgewater having only 21% of its population being B/AA, it also has among the highest rates of stroke mortality among B/AA (165.6). These neighborhoods are seeing a high burden of chronic disease among its B/AA population, and more prevention & education is needed in these communities.

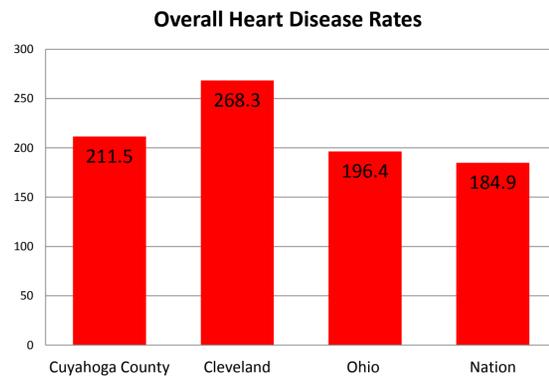
## PUBLIC HEALTH ACTION

These findings are important in helping CDPH identify high priority neighborhoods for chronic disease interventions and education. The use of GIS mapping provides a visual presentation of the findings that appeal to the general public. Through the NACDD grant, CDPH will be working with the local chapter of the American Health Association, the Cuyahoga County Office of the Chief Executive, and Better Health Greater Cleveland at Metro Health Hospital System to create and disseminate culturally sensitive materials based on the maps. CDPH will also be working with its own Office of Minority Health to disseminate maps to the community through social media, flyers, and the Annual Minority Health Report for the City of Cleveland.

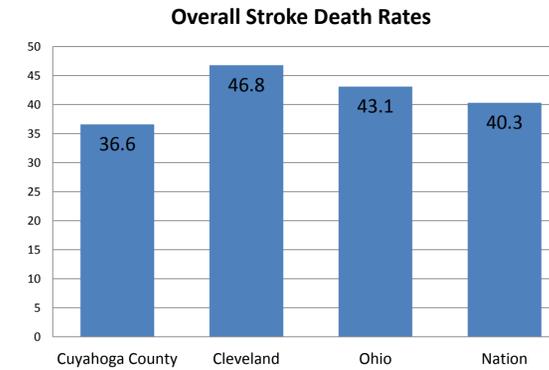
## REFERENCES

<sup>1</sup>United States Census Bureau. (2010). Profile of General Population and Housing Characteristics: Cleveland City. Retrieved from American Fact Finder : <http://factfinder.census.gov/>  
<sup>2</sup>Bruckman D, Jewett-Tennant J & Borawski E. (February 2012). Data Brief: Adult Hypertension in Cleveland Neighborhoods, (2005-2009). Cleveland, OH: Prevention Research Center for (United States Census Bureau, 2010)Healthy Neighborhoods at Case Western Reserve University.  
<sup>3</sup>Bruckman D, Jewett-Tennant J & Borawski E. (February 2012). Data Brief: Adult Obesity in Cleveland Neighborhoods, (2005-2009). Cleveland, OH: Prevention Research Center for Healthy Neighborhoods at Case Western Reserve University.  
<sup>4</sup>Neighborhood Level Population Data was provided by Cleveland City Planning Commission. Data from United States Census Bureau 2010 Decennial Census & American Community Survey 2006 to 2010 5-Year Estimates.

## HEART DISEASE MORTALITY RATES

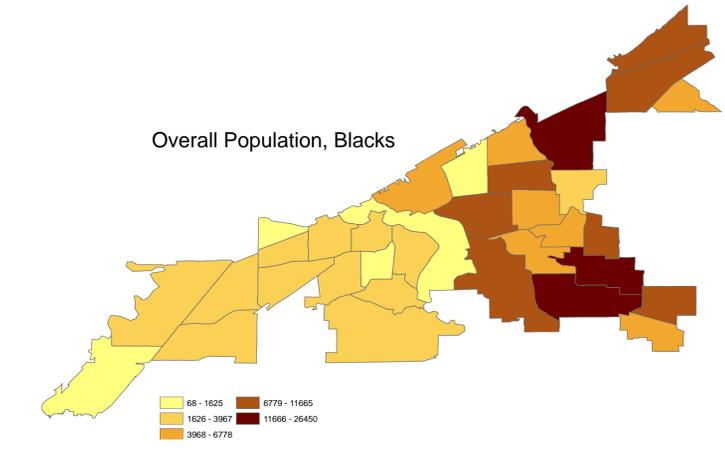
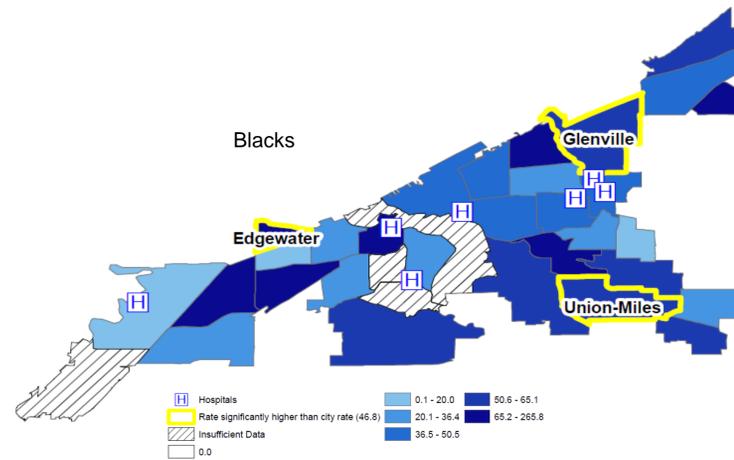
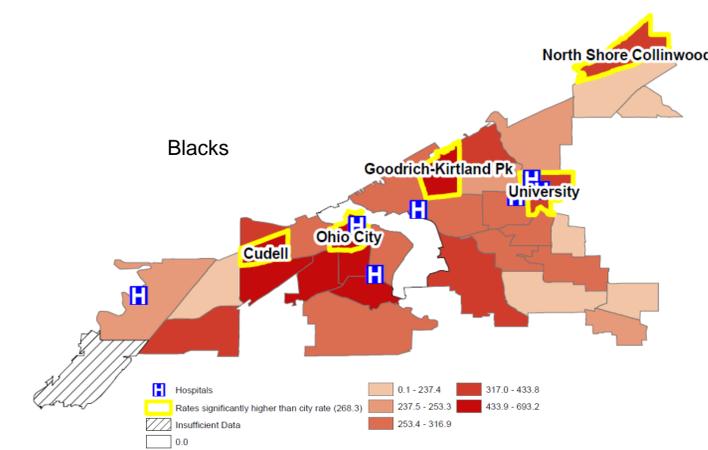
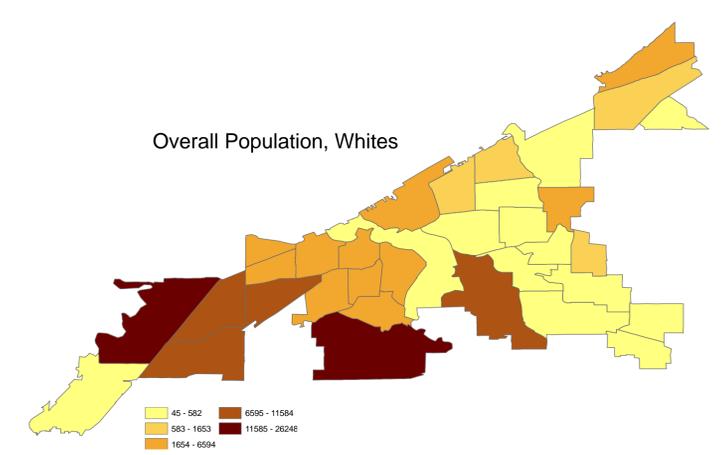
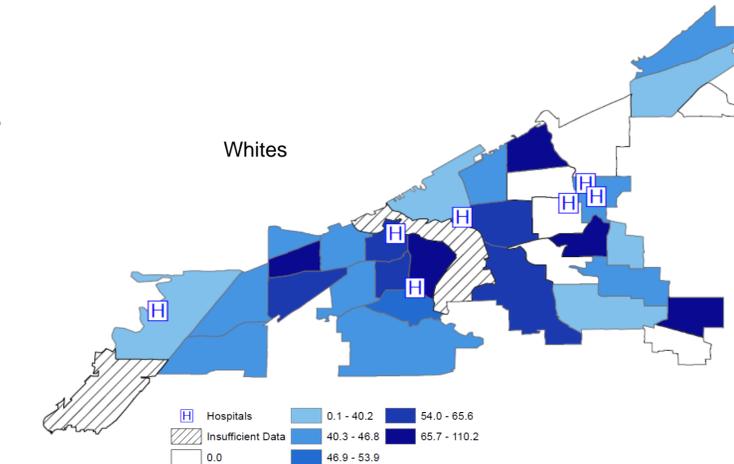
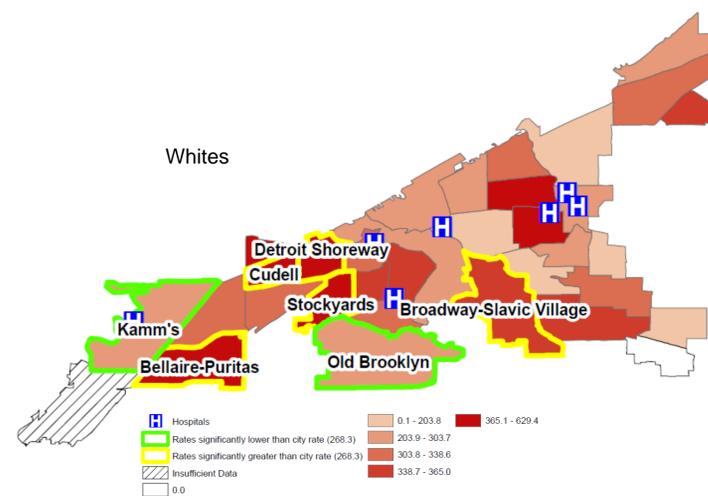


## STROKE MORTALITY RATES



## OVERALL POPULATION, BY NEIGHBORHOOD\*

Neighborhood	Total Pop	Whites Pop (% total pop)	Blacks Pop (% total pop)	Neighborhood	Total Pop	Whites Pop (% total pop)	Blacks Pop (% total pop)
Bellaire-Puritas	13365	8153 (61)	3475 (26)	Hopkins	283	176 (62)	68 (24)
Broadway-Slavic Village	22432	9198 (41)	11665 (52)	Hough	11475	230 (2)	11016 (96)
Brooklyn Centre	8954	5104 (57)	1881 (21)	Jefferson	16548	11584 (70)	2814 (17)
Buckeye-Shaker Square	12470	1622 (13)	10101 (81)	Kamm's	25170	20388 (81)	2769 (11)
Buckeye-Woodhill	6657	134 (2)	6391 (96)	Kinsman	6987	70 (1)	6778 (97)
Central	12306	493 (4)	11568 (94)	Lee-Harvard	10326	104 (1)	10017 (97)
Clark-Fulton	8548	4360 (51)	1625 (19)	Lee-Seville	4496	45 (1)	4362 (97)
Collinwood-Nottingham	11542	1155 (10)	10042 (87)	Mount Pleasant	17320	174 (1)	16974 (98)
Cudell	9288	4459 (48)	3158 (34)	North Shore Collinwood	15768	4888 (31)	10407 (66)
Cuyahoga Valley	969	582 (60)	349 (36)	Ohio City	8736	4456 (51)	3058 (35)
Detroit Shoreway	11567	6594 (57)	2429 (21)	Old Brooklyn	32009	26248 (82)	2561 (8)
Downtown	9464	4165 (44)	4165 (44)	St.Clair-Superior	6876	1101 (16)	5432 (79)
Edgewater	5850	4095 (70)	1229 (21)	Stockyards	10372	5809 (56)	1971 (19)
Euclid-Green	5533	332 (6)	5091 (92)	Tremont	7948	4769 (60)	1828 (23)
Fairfax	6239	125 (2)	5927 (95)	Union-Miles	19004	190 (1)	18434 (97)
Glenville	27268	273 (1)	26450 (97)	University	7920	4356 (55)	1822 (23)
Goodrich-Kirtland Pk.	4238	1653 (39)	1018 (24)	West Boulevard	18888	10955 (58)	3967 (21)



# Poster Tips and Tricks (Print this page for reference)

## Page Size:

- The page size is already set up at ½ scale.
- To calculate the final printed size for an item, *multiply by two* (e.g. 12 pt text in this template = 24 pt text on printed poster).

## Layout Tips:

- The non-printing *Guides* can be turned on under the *View* menu. Use them for aligning items. To create a new guide, hold down the *Control* key while click-dragging an existing guide.
- Multiple items can be aligned or spaced evenly using the *Align* menu on the *Draw* pop-up box. Turn off *Snap-to-Grid* for fine adjustments.
- Zoom in to align your work and check details. Use *View > Zoom* menu, or the *Zoom* box on the *Main Toolbar*.
- To import and scale a figure you created in another PowerPoint presentation, select all pieces of the figure and *Copy*, then in the poster choose *Edit > Paste Special > Picture*. Now the pieces of your figure will scale correctly.

## Backgrounds, Styles & Color Schemes:

- **Light backgrounds must be used!**
- To change background, select *Format > Background*, click on the color swatch & choose *> More colors* or *> Fill Effects*.

## Fonts:

**Note: Font errors are *the most common problem in printing from files*.**

- If you use fonts other than those in the template, make sure we have them!
- If we *don't* have them, here are your options:
  - Copy the font(s) to your disk. To open the Fonts Folder, go to *Start > Settings (or Control Panels) > Fonts*, or...
  - Use the *File > Pack and Go* feature when saving to a disk. Be sure to choose *Embed TrueType Fonts* under *Links*.
- Use the **Symbol font for math and Greek characters**. If you use the optional characters found in other fonts, they may re-map to a symbol you didn't expect.
- Bullets can also remap to wrong characters. **Be sure to check *all* special characters in the proof file you receive from Printing Services.**
- PowerPoint's *Word Art* function may pixelate when printing. It is not supported.

## Text:

- Keep contrast high between text and background colors or images! Color text on color backgrounds is almost always hard to read in print.
- **Do not align columns using spaces in PPT!** Turn on *Rulers* in the *View* Menu and set tabs in the ruler. With your text box selected, simply click in the ruler to place a left, right, centered or decimal tab. Drag the tab to reposition it.

## Tables, Charts and Vector Art:

- To retain editability for items from *Excel*, use either of these methods:
  - Create and save the work in *Excel*, then bring into PowerPoint using *Insert > Object > Excel (Worksheet or Chart Object) > From File*, or...
  - With your work open in *Excel* copy to the clipboard, then use *Edit > Paste Special > Microsoft Excel (Worksheet or Chart) Object*. Simply using *Paste* rather than *Paste Special* may degrade your object and break any links to data.
- If figure looks right in *Excel* but not in PowerPoint, use this method:
  - Copy figure in *Excel*, then in PowerPoint use *Edit > Paste Special > Picture (or Picture Enhanced Metafile)*, whichever preserves the figure best.
- **Except for Excel or Word, do not use Copy and Paste to place items into PowerPoint.**
  - *The clipboard loses important print data!*
  - From the original program, *Export* (or *Save As*) a Windows Metafile or Enhanced Metafile for charts/tables. Use a JPG (best quality) for photos. Save the file.
  - In PowerPoint use *Insert > Picture > From File*.
- Vector graphics can be scaled or recolored in PowerPoint and print hi-rez.
- Chart and table figures (from other programs) work best when saved as a Windows Metafile (.wmp) or Enhanced Metafile (.emf), rather than a raster format (.jpg or .tif).

## Scans, Photos and Bitmap Figures:

- Never use GIF files for posters.
- Never use the Set Background Transparent tool (*Picture Toolbar*), since this creates a nightmare GIF file!
- For image resolution, insert the figure into the template at the desired size (e.g. *without resizing in PowerPoint*) at 400 pixels per inch. You can fix your size and resolution in a program like *PhotoShop*. (See previous page for more details.)
- For a color bitmap (raster) image, use JPG files (maximum quality). Use RGB mode.
- Change black & white photos (scanned documents, Western Blots, X-Rays, MRI's, etc) to grayscale in *PhotoShop*.
- Use the *Picture Toolbar* to crop, adjust brightness/contrast, or to *Reset* a picture (undo settings after importing). To make a toolbar visible, use the menu: *View > Toolbars >*
- Never throw away your original images or scans, since PowerPoint doesn't export original-quality images!
  - Too late? If you lost your original and need to edit an image, try this: In PowerPoint, use the *Reset Image* button on the *Picture Toolbar*, zoom in to 400% and copy the image to the clipboard.
  - In *Photoshop*, select *File > New* and *Paste*. Save your changes as a new file, then bring back into PowerPoint using *Insert > Picture > From File*.