

Rescue Calls to Cleveland EMS for asthma and wheezing during April 1, 2006 – May 31, 2007

David Bruckman, MS, MT(ASCP)
Cleveland Department of Public Health

Cdr. Jim Willson
Cleveland EMS



EMERGENCY MEDICAL SERVICE



Data

- All calls to Cleveland EMS for asthma and/or wheezing (chief complaint)
 - 14 months of data
 - April 1, 2006 to May 31, 2007
 - Data by Age, Ward and census tract
 - Severity measure provided
 - No names, race, sex, or addresses provided
 - Data sharing approved by Law Department

Objective

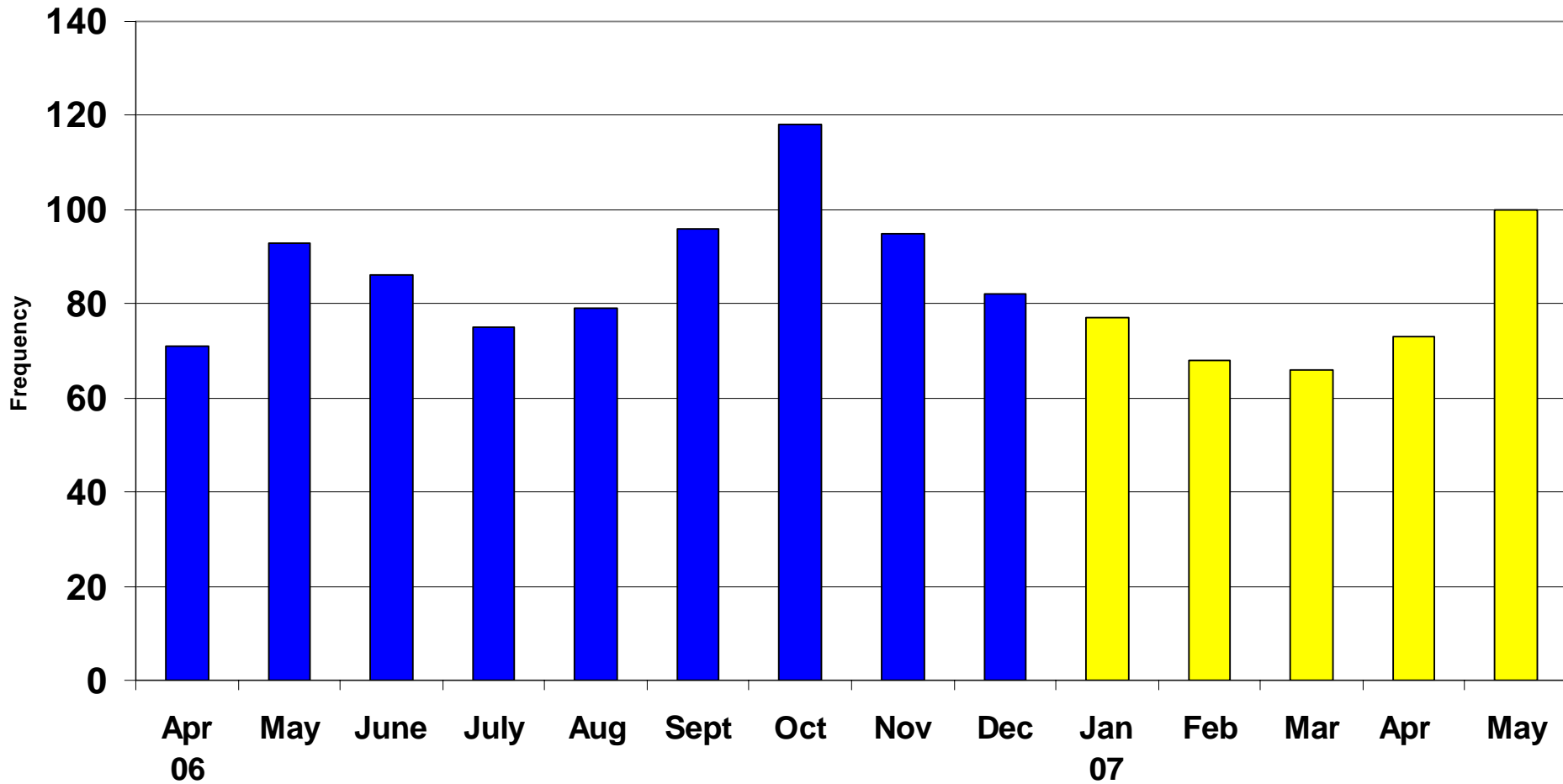
- Who is calling EMS rescue calls for asthma and wheezing?
- Are there areas with higher rates (e.g. calls per population)?
- Can we correlate call rates with possible factors?
 - Poverty?
 - Environmental insults

Results

- 1,222 calls to Cleveland EMS for asthma and/or wheezing
 - Average = 2.9 calls/day
 - Maximum: 9 calls (Oct 14, 2006)
 - Two calls excluded (cancelled by dispatch)
- Peak number of calls (*next slide*)
 - May and October 2006
 - May 2007

Cleveland EMS calls for asthma and wheezing during April 1, 2006 to May 31, 2007

Cleveland EMS and Cleveland Department of Public Health

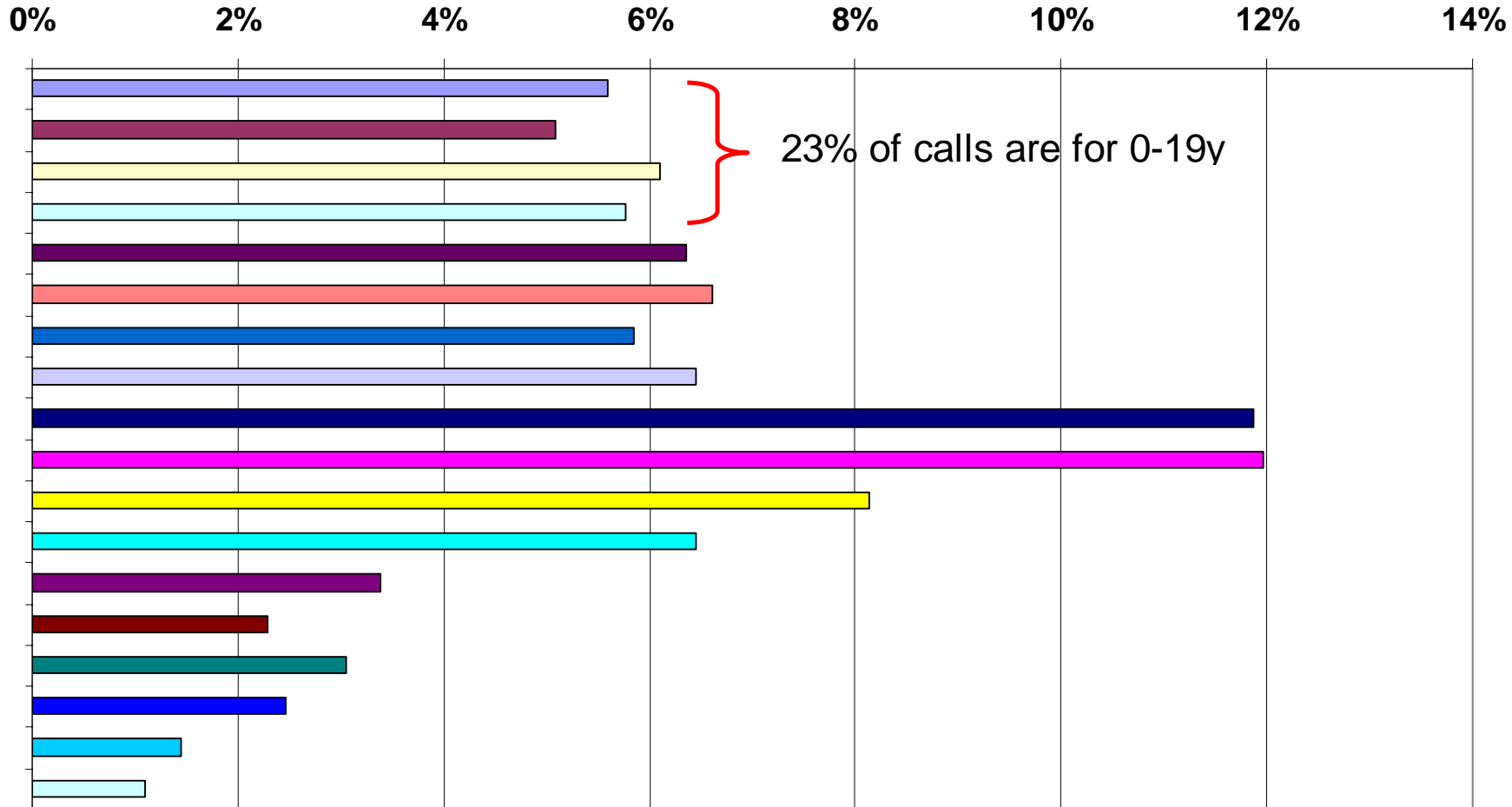


Most calls made by those 40-54

Percent of Cleveland EMS calls for each age group for asthma and wheezing during April 1, 2006 to May 31, 2007

Cleveland EMS and Cleveland Department of Public Health

Percent of all calls



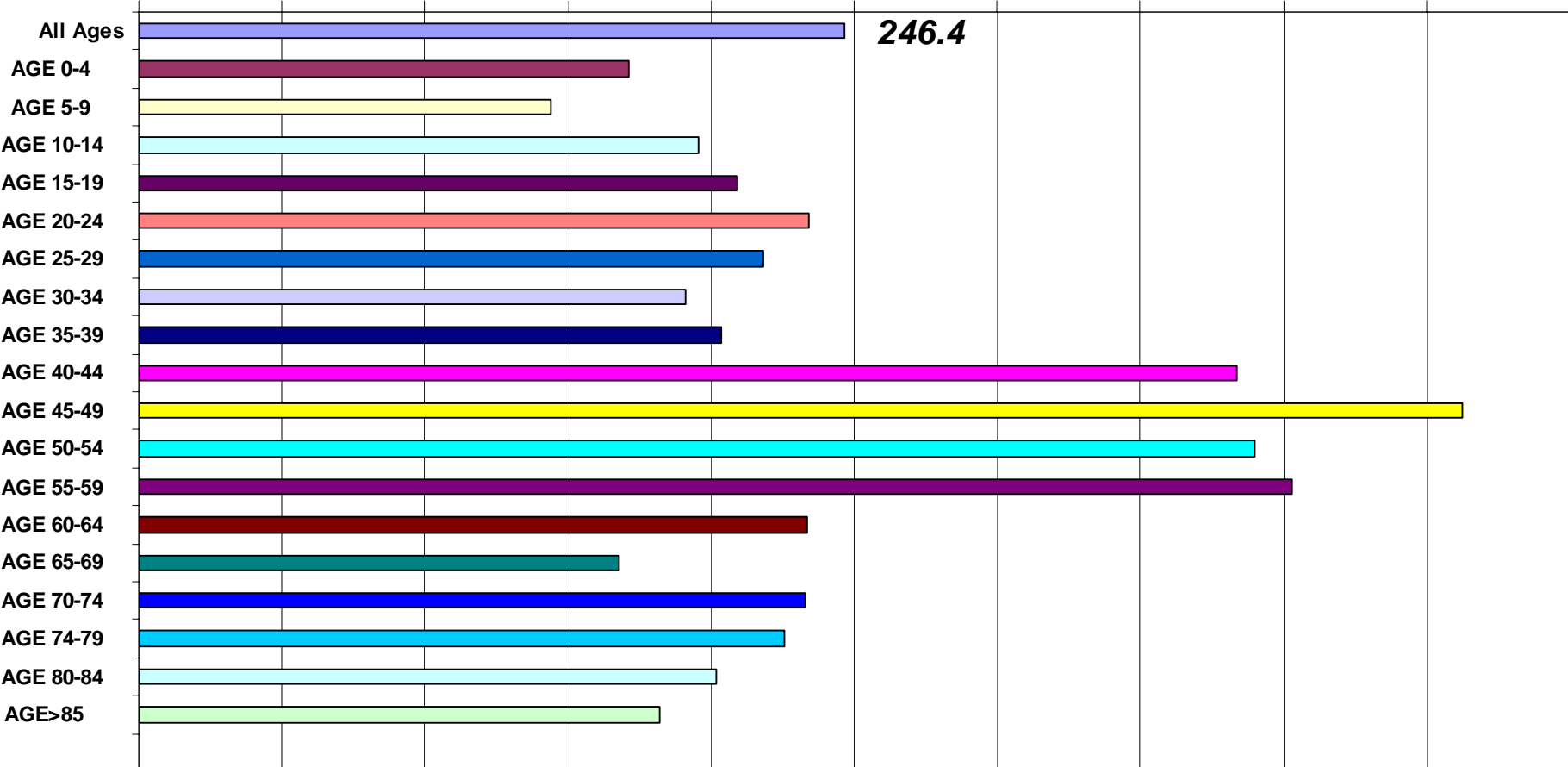
Highest call rates per 100,000 are among those 40-59

Rate of Cleveland EMS calls per 100,000 for each age group for asthma & wheezing during April 1, 2006 to May 31, 2007

Cleveland EMS and Cleveland Department of Public Health

Call rate per 100,000 population

0 50 100 150 200 250 300 350 400 450 500



Day of the week

- Calls are evenly spaced throughout the week
- Did not vary much across (four) age groups

Sunday	14.9%
Monday	15.6%
Tuesday	14.5%
Weds.	15.1%
Thurs.	13.6%
Friday	12.7%
Saturday	13.7%

Severity levels

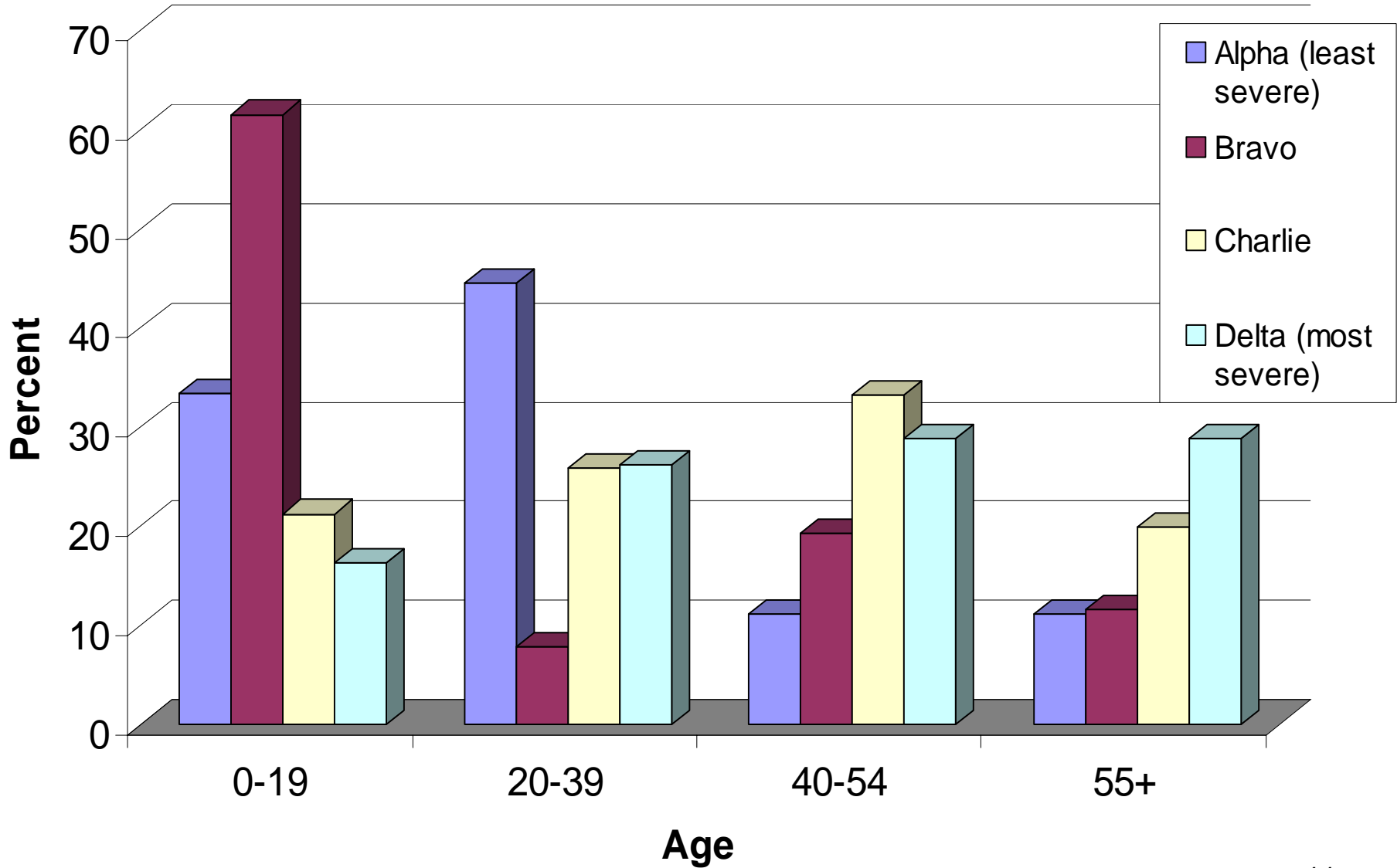
- Alpha
 - No medications given
- Bravo = mild symptoms
 - Medications may be given
- Charlie = moderate symptoms
 - Requiring Advanced Life Support
 - Medications (e.g. Albuterol), IV, cardiac monitoring
- Delta = severe symptoms
 - Requiring ventilation, intubation

Severity

Level	N	%
Alpha	9	1%
Bravo	52	5%
Charlie	1,006	85%
Delta	111	9%

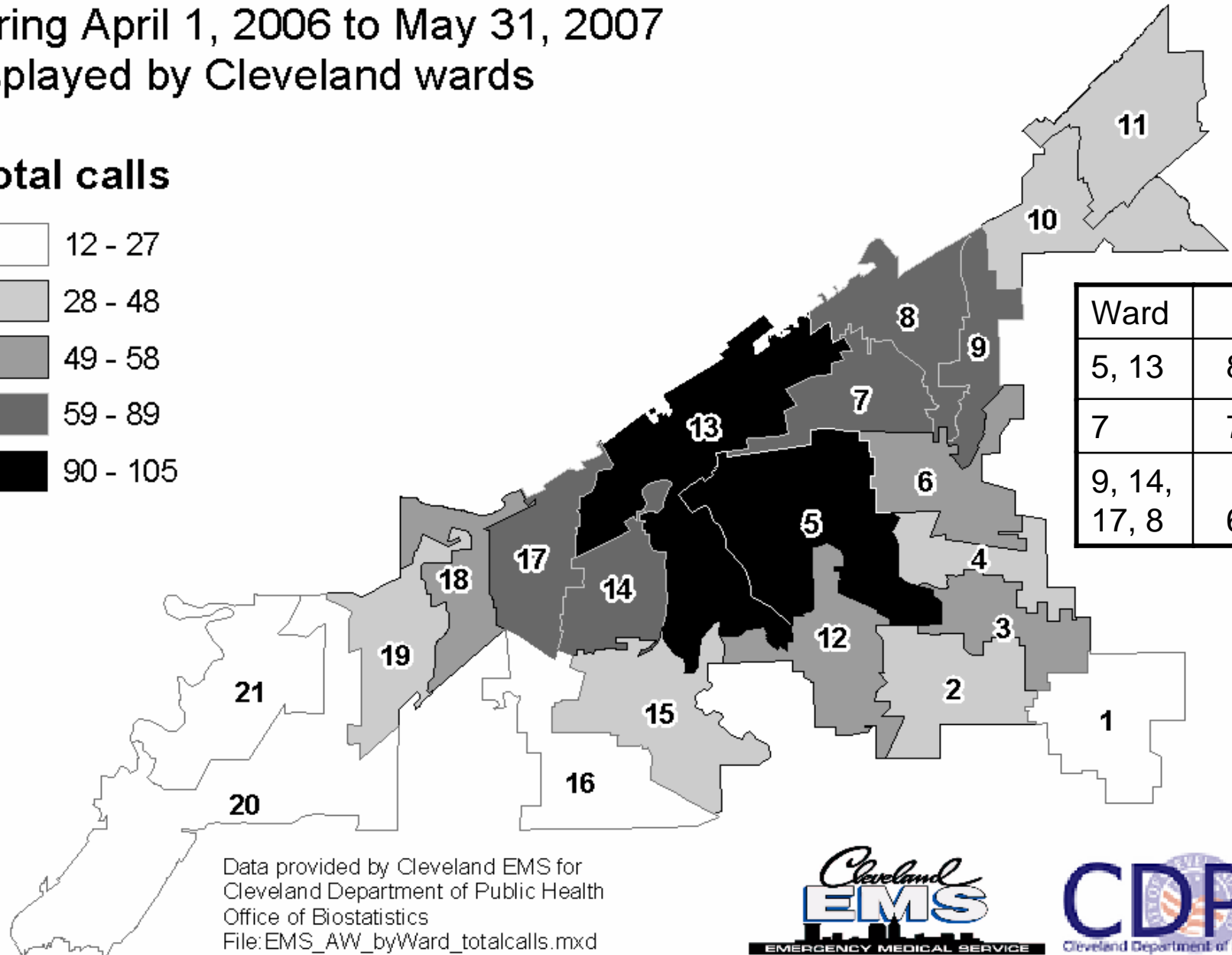
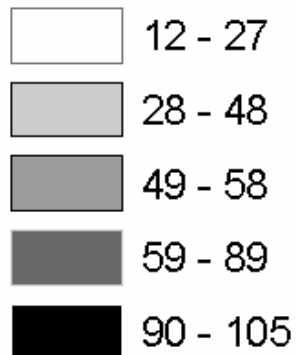
- **85%** of cases required medications and monitoring
 - Albuterol
 - Cardiac monitoring
 - IV
- **9%** of cases required
 - Intubation
 - Ventilation

Response category (severity) across age of patient



Cleveland EMS calls for asthma & wheezing as the chief complaint during April 1, 2006 to May 31, 2007 displayed by Cleveland wards

Total calls



Ward	%
5, 13	8.9%
7	7.6%
9, 14, 17, 8	6.8-6.0%

Data provided by Cleveland EMS for
 Cleveland Department of Public Health
 Office of Biostatistics
 File: EMS_AW_byWard_totalcalls.mxd
 Last revised 06/20/07

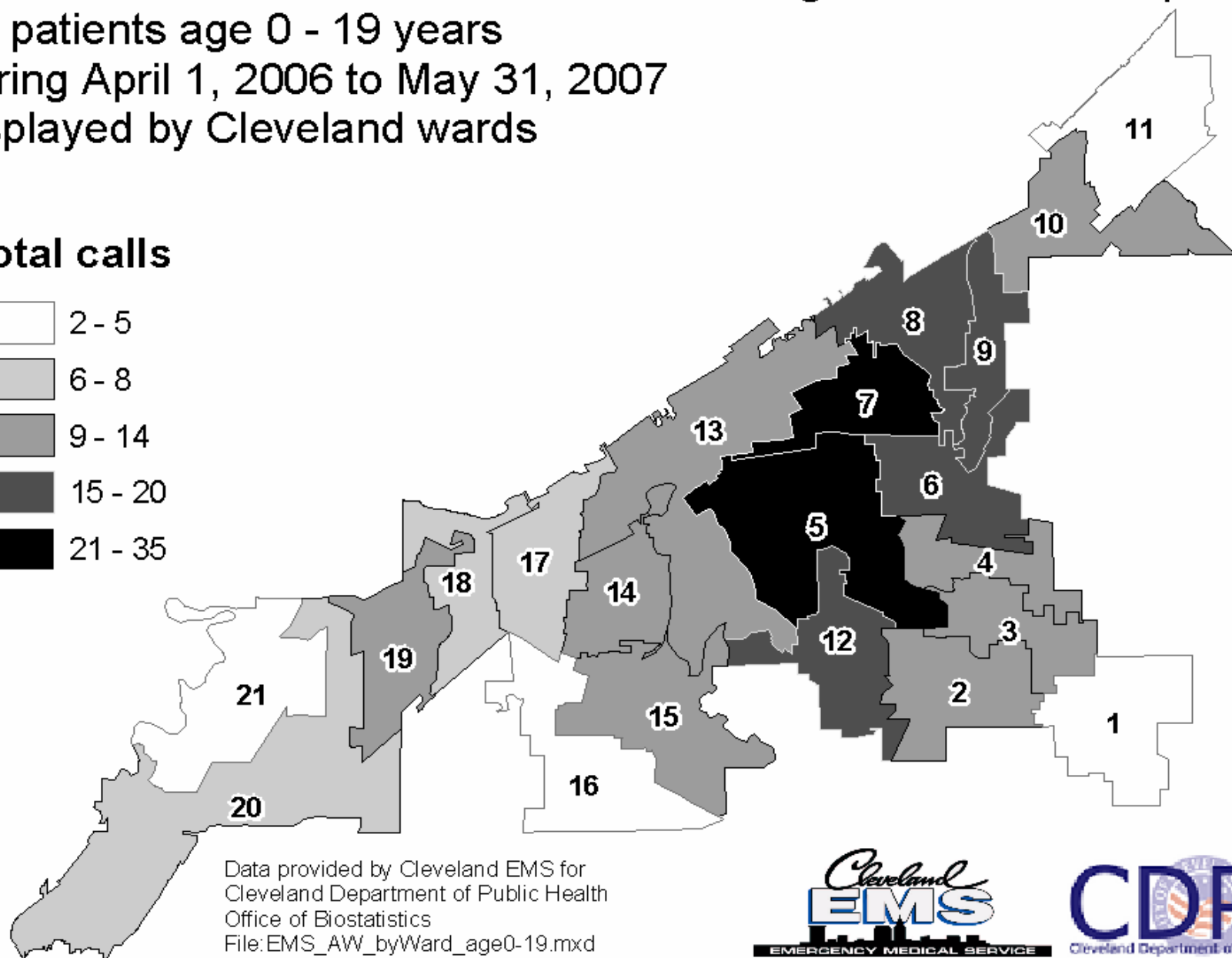
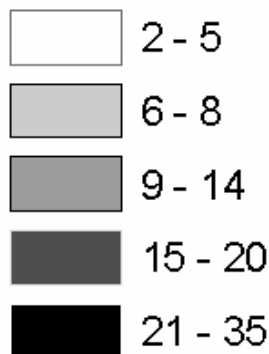


Calls by Neighborhood

- One-third of asthma & wheezing calls are from five neighborhoods
 - Glenville (8%)
 - Hough (7%)
 - Central (6.3%)
 - Detroit-Shoreway (6.0%)
 - Downtown (5.4%)

Cleveland EMS calls for asthma & wheezing as the chief complaint for patients age 0 - 19 years during April 1, 2006 to May 31, 2007 displayed by Cleveland wards

Total calls

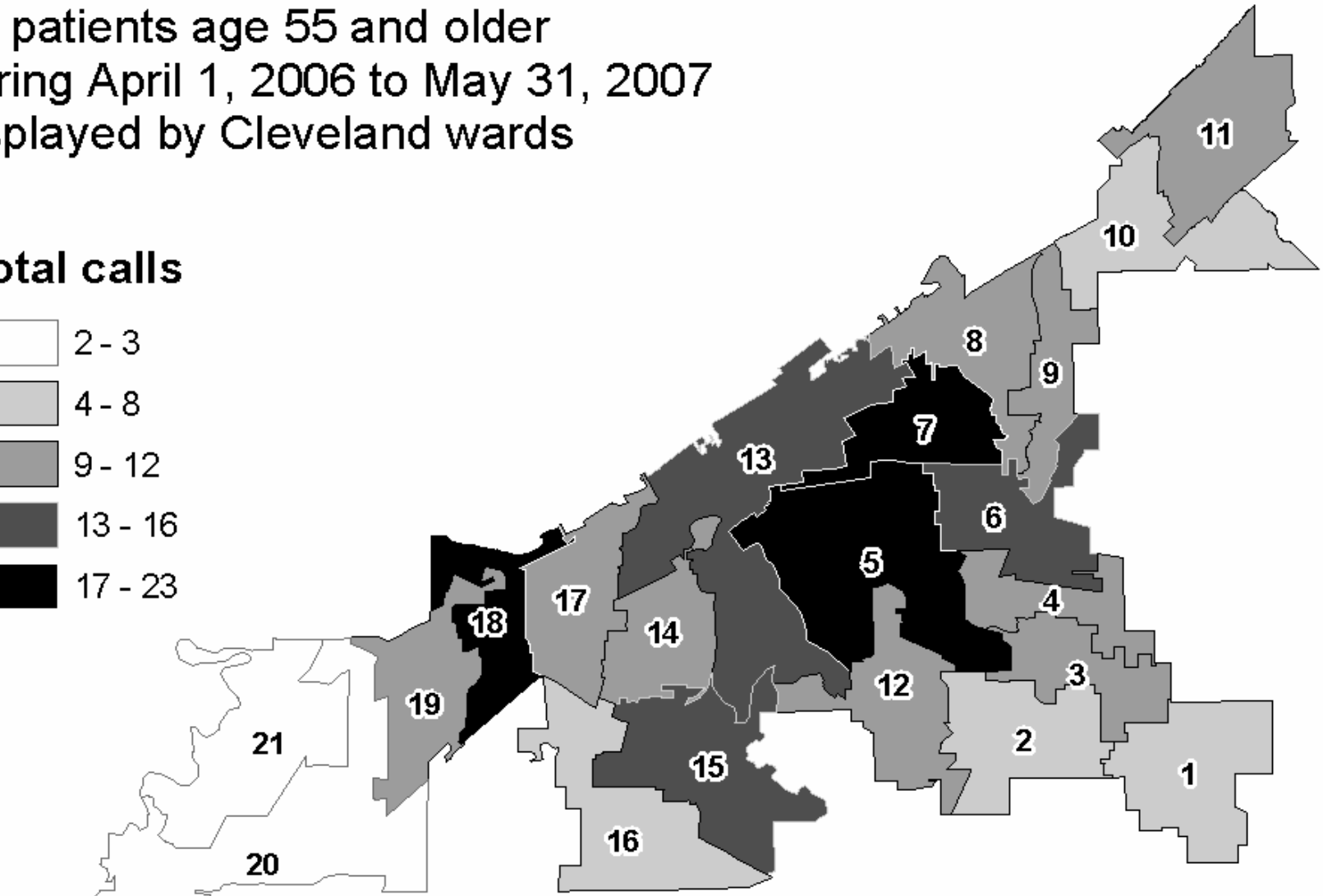
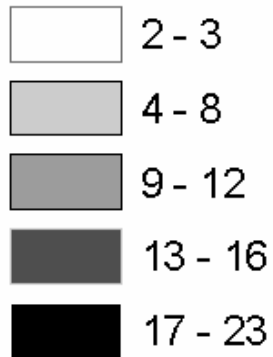


Data provided by Cleveland EMS for
Cleveland Department of Public Health
Office of Biostatistics
File: EMS_AW_byWard_age0-19.mxd
Last revised 06/20/07



Cleveland EMS calls for asthma & wheezing as the chief complaint for patients age 55 and older during April 1, 2006 to May 31, 2007 displayed by Cleveland wards

Total calls

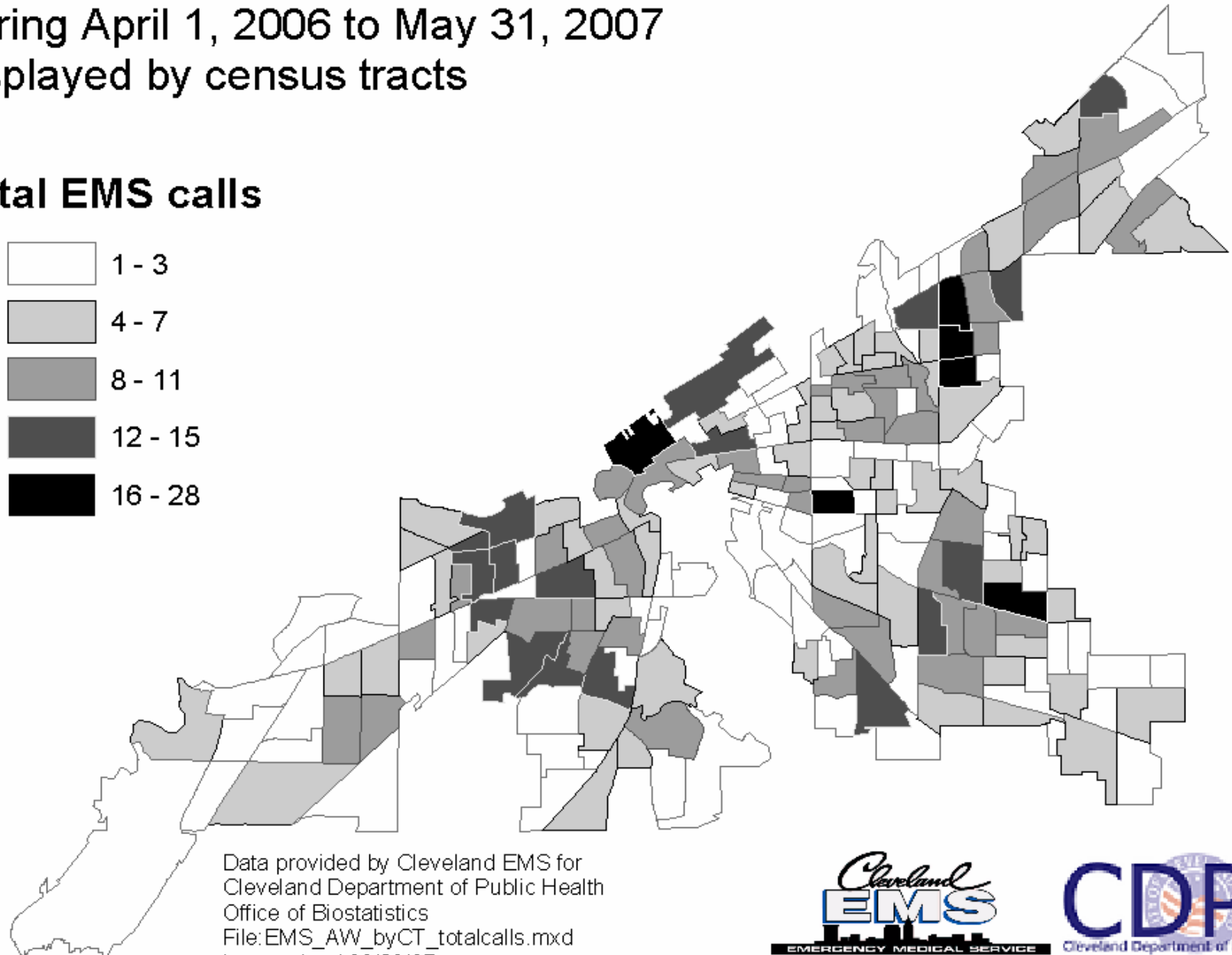
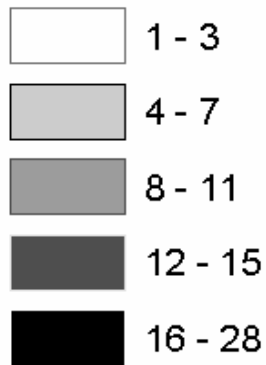


Data provided by Cleveland EMS for
Cleveland Department of Public Health
Office of Biostatistics
File: EMS_AW_byWard_age55plus.mxd
Last revised 06/20/07



Cleveland EMS calls for asthma & wheezing as the chief complaint during April 1, 2006 to May 31, 2007 displayed by census tracts

Total EMS calls

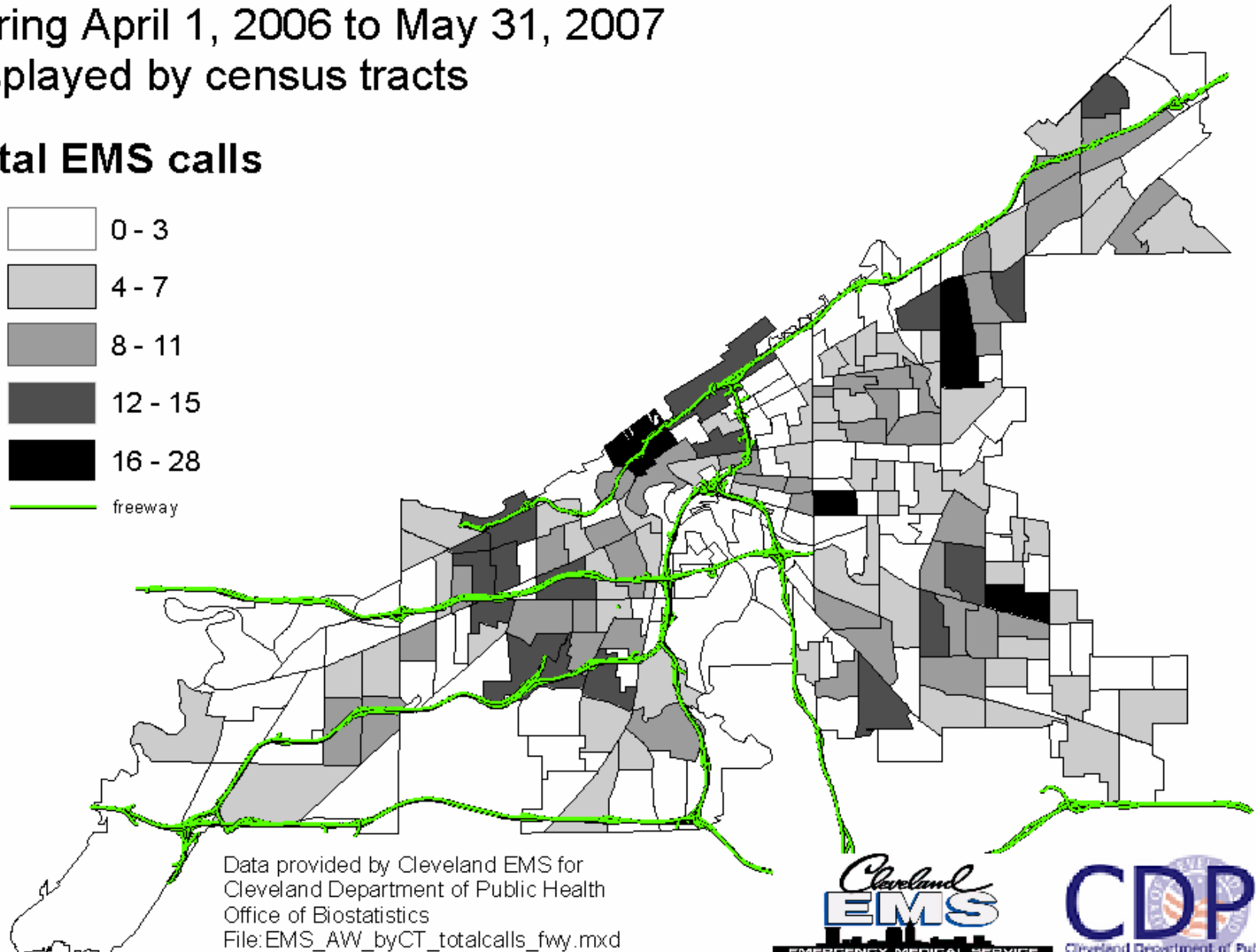
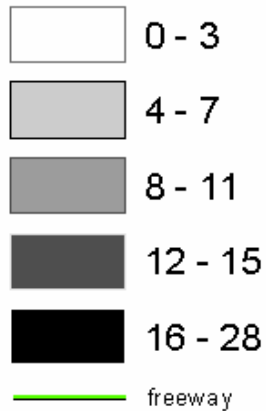


Data provided by Cleveland EMS for
Cleveland Department of Public Health
Office of Biostatistics
File: EMS_AW_byCT_totalcalls.mxd
Last revised 06/20/07



Cleveland EMS calls for asthma & wheezing as the chief complaint during April 1, 2006 to May 31, 2007 displayed by census tracts

Total EMS calls

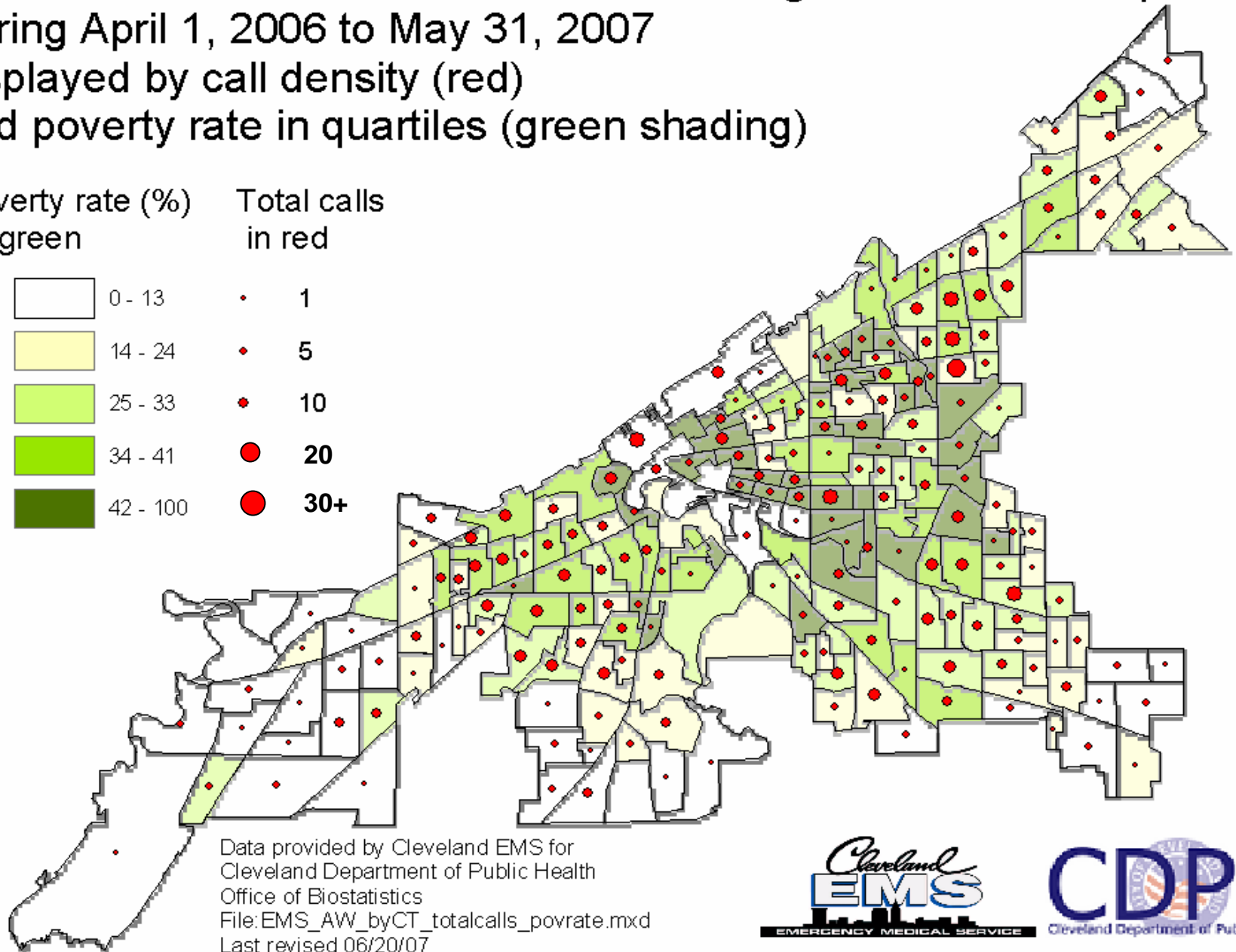
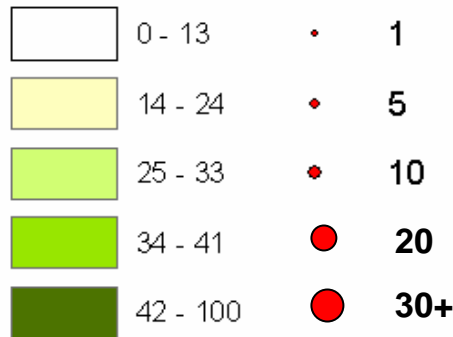


Data provided by Cleveland EMS for
Cleveland Department of Public Health
Office of Biostatistics
File: EMS_AW_byCT_totalcalls_fwyt.mxd
Last revised 06/20/07



Cleveland EMS calls for asthma & wheezing as the chief complaint during April 1, 2006 to May 31, 2007 displayed by call density (red) and poverty rate in quartiles (green shading)

Poverty rate (%) in green Total calls in red

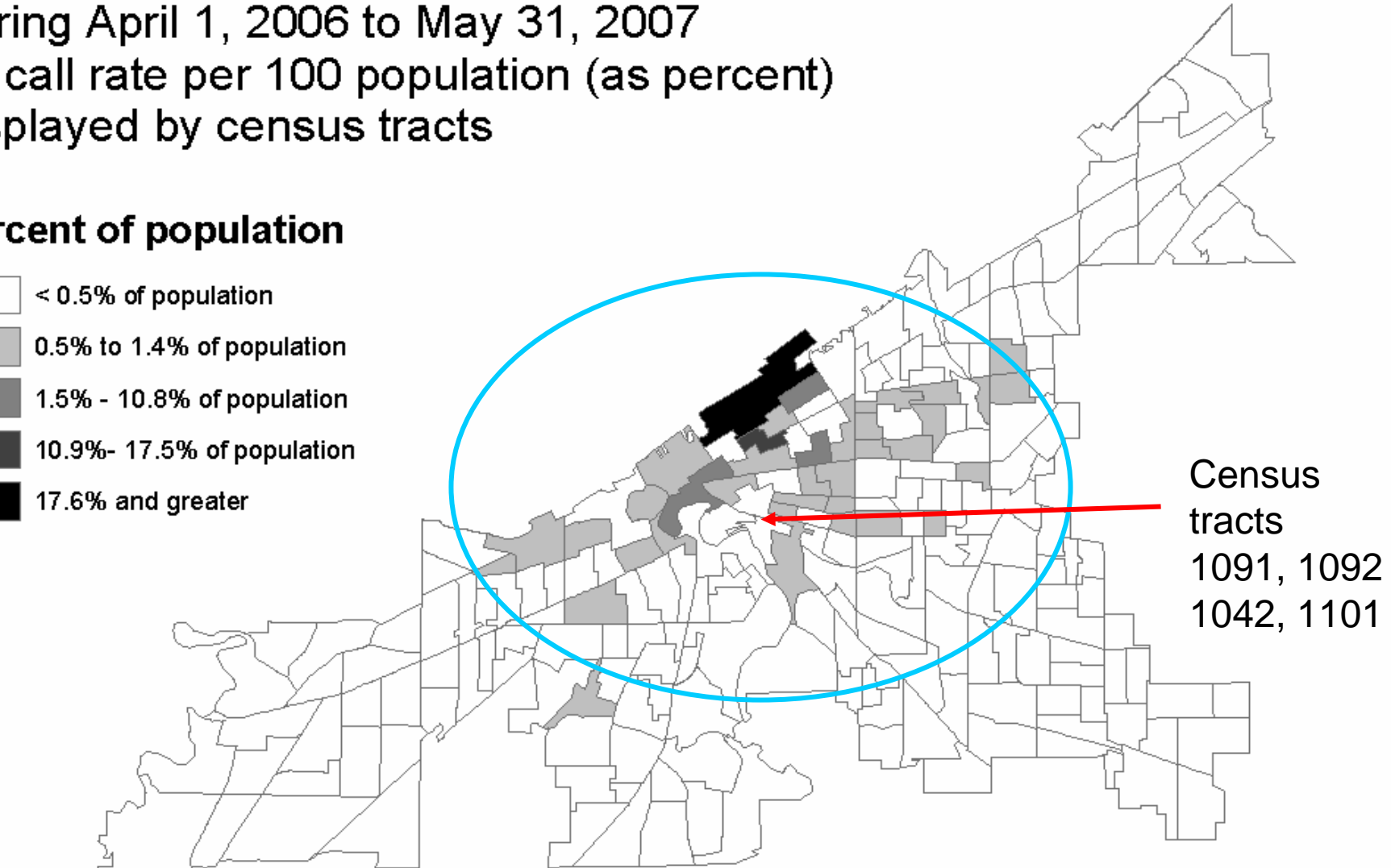
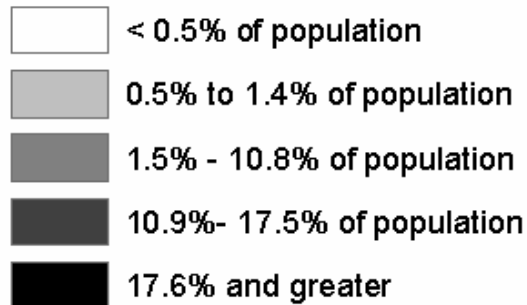


Data provided by Cleveland EMS for
 Cleveland Department of Public Health
 Office of Biostatistics
 File: EMS_AW_byCT_totalcalls_povrate.mxd
 Last revised 06/20/07



Cleveland EMS calls for asthma & wheezing as the chief complaint during April 1, 2006 to May 31, 2007 as call rate per 100 population (as percent) displayed by census tracts

Percent of population



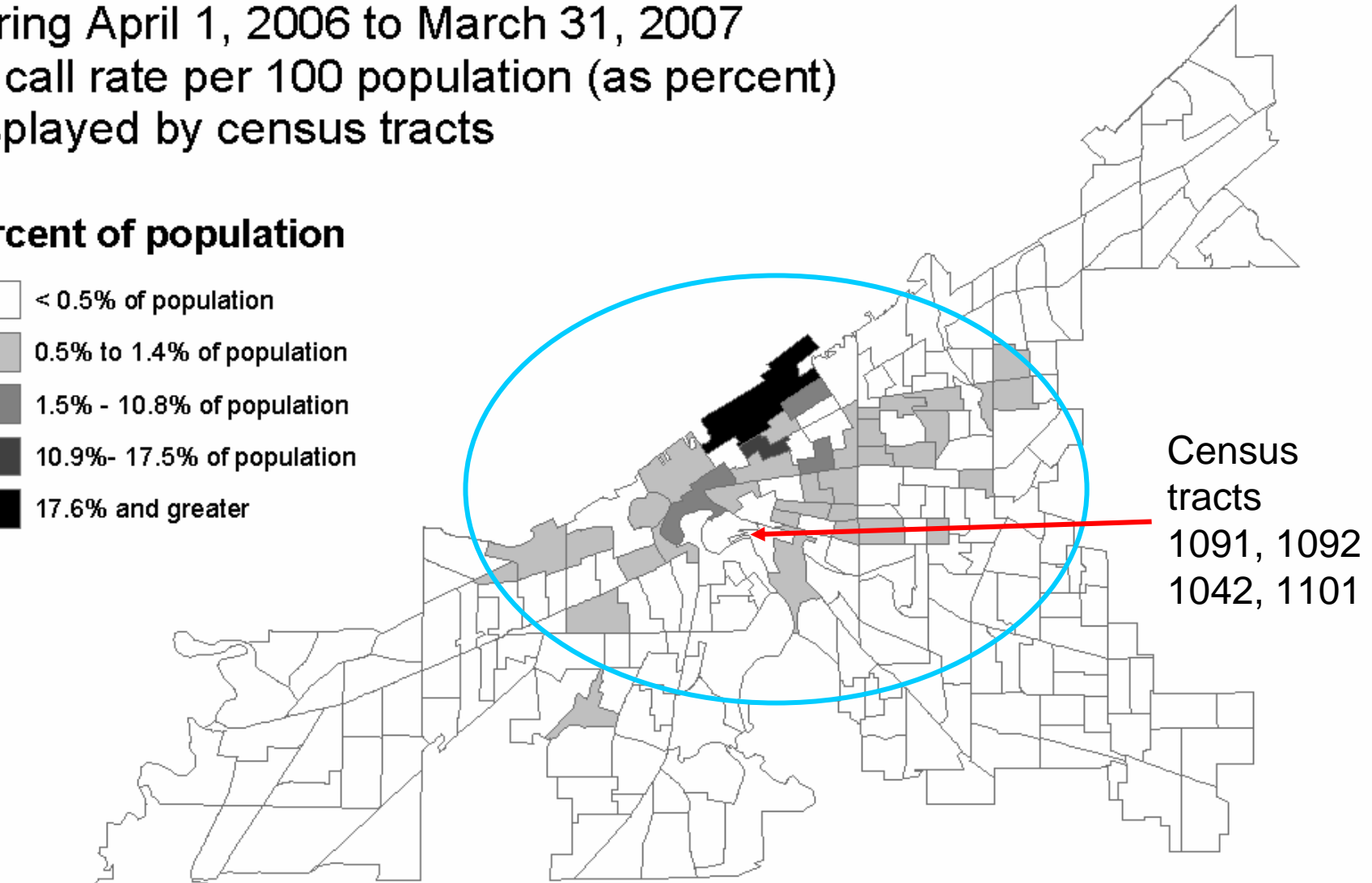
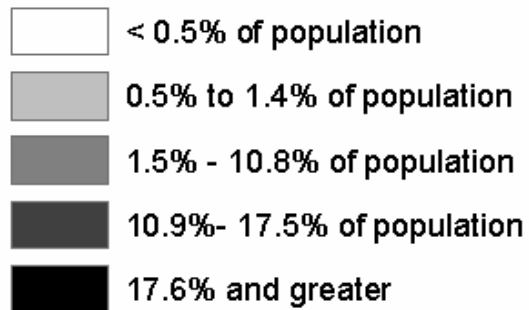
Census tracts
1091, 1092
1042, 1101

Data provided by Cleveland EMS for Cleveland Department of Public Health Office of Biostatistics
File: EMS_AW_byCT_totalcallrate.mxd
Last revised 06/25/07



Cleveland EMS calls for asthma & wheezing as the chief complaint during April 1, 2006 to March 31, 2007 as call rate per 100 population (as percent) displayed by census tracts

Percent of population



Data provided by Cleveland EMS for
Cleveland Department of Public Health
Office of Biostatistics
File:EMS_AW_byCT_totalcallrate.mxd
Last revised 06/20/07

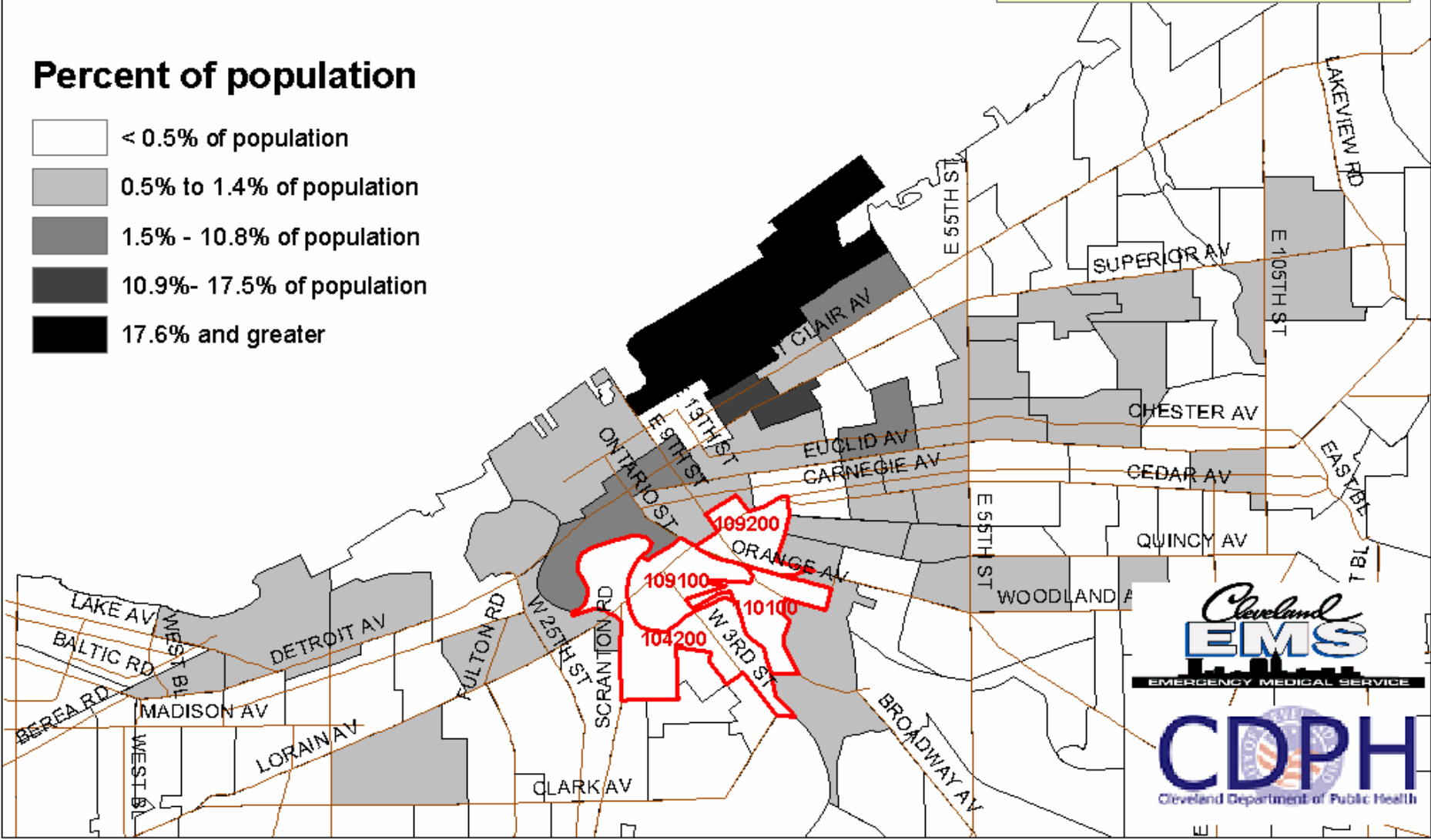


Cleveland EMS calls for asthma & wheezing as the chief complaint during April 1, 2006 to May 31, 2007 as call rate per 100 population (as percent) displayed by census tracts

Data provided by Cleveland EMS for Cleveland Department of Public Health Office of Biostatistics
 File: EMS_AW_byCT_totalcallrate2.mxd
 Last revised 06/20/07

Percent of population







- < 0.5% of population
- 0.5% to 1.4% of population
- 1.5% - 10.8% of population
- 10.9%- 17.5% of population
- 17.6% and greater

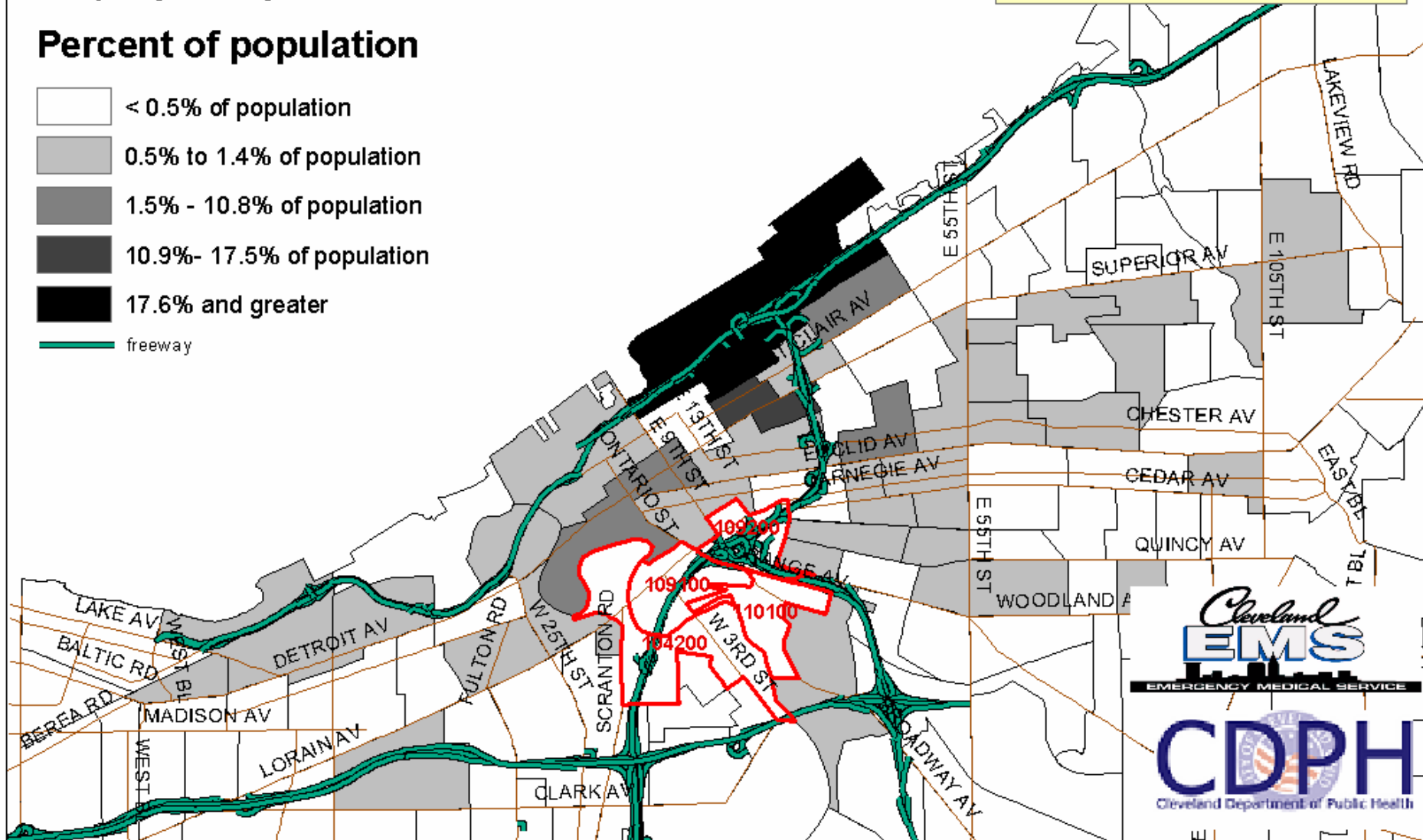


Cleveland EMS calls for asthma & wheezing as the chief complaint during April 1, 2006 to May 31, 2007 as call rate per 100 population (as percent) displayed by census tracts

Data provided by Cleveland EMS for Cleveland Department of Public Health Office of Biostatistics
 File: EMS_AW_byCT_totalcallrate3.mxd
 Last revised 06/20/07

Percent of population

-  < 0.5% of population
-  0.5% to 1.4% of population
-  1.5% - 10.8% of population
-  10.9%- 17.5% of population
-  17.6% and greater
-  freeway



Conclusions

- Highest call rates were among middle age/older patients (40-59)
- 94% of EMS calls for asthma & wheezing require medical intervention and monitoring
 - Older patients (over 40) had a greater need for aggressive intervention than pediatric patients (0-19y)

Conclusions

- Seasonal cycle
 - Peaks in May and October
- Higher call frequency appear to correlate with higher poverty rates

Conclusions

- Calls concentrated north and east of four census tracts in the Industrial Valley SPA
 - 1042.00, 1091.00, 1092.00, 1101.00
- Wards 13 (Downtown & Industrial Valley) and 5 (Central)
 - Have highest frequency of calls
 - Have highest call rate per 1,000 population

Conclusions

- Pediatric calls:
 - East/Central part of city
 - Wards 5 (Central) & Ward 7
- Age 55+ calls:
 - West: Ward 18
 - i.e. Edgewater + eastern halves of Cudell and West Blvd.
 - East: Wards 5 & 7
 - Secondarily in Wards 6, 13 & 15

Discussion

- High call frequency occurs Downtown
 - May be an artifact due to small census denominator
 - E.g. area around Burke and Marginal Aves., census tract 1074.00
 - Effect of proximity to industry, traffic, daily population changes?
- Poverty and asthma calls appear to be visually correlated.
 - Apply spatial statistics?

Limitations

- EMS call data do not reflect true burden (prevalence) of asthma
- EMS may provide transport service for those in need, regardless of severity
- Data not adjusted for multiple calls to the same location

Further exploration

- Overlay ArcGIS mapping layers onto
 - Environmental data layers
 - Industrial locations