GIS Analysis Utilized for Decision Decision Making During a County-Wide Mass Vaccination Exercise

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Objectives

- Describe Public Health's role in emergency treatment distribution
- Describe how GIS can be utilized to assist with managing a Public Health emergency

Outline

- Public Health Duties
- SWIPERS Overview
- GIS Application
- Challenges/Improvements
- Questions

Public Health Duties

- Provide treatment or vaccine to population
  - Mass – pandemic flu
  - Exposed – bioterrorism event
  - As quickly as possible
    - Walk-in, drive-thru, bus
- Manage receipt and distribution of treatment or vaccine
  - Point of Distribution (POD)

POD

- Register
  - Who is coming for treatment
- Screen
  - Check for contra-indications
- Treat
  - Provide with medication or vaccine
- Track
  - Follow-up if multiple doses needed
  - Prevent multiple treatments

Registration

Screening and Treatment

Tracking

Walk-in Clinic

Drive-thru Clinic

Bussed Groups

Public Health Tools

- Program to monitor treatment inventory
- Collects patient information, screening questions, and lot number of treatment or vaccine

Community Tools

- MINS (Muskingum Information Notification System)
  - Reverse 911
  - GIS enabled
  - Record phone messages
  - Select areas or phone numbers

Vaccination Clinic Summary

- Held November 30, 2006
- 9:00 am – 3:00 pm
- Over 600 vaccinations administered
  - Late in season, demand low but good time to test the process
- Over 10,500 MINS calls made week leading up to clinic
- Over 150 staff and volunteers participated

GIS Analysis Goals

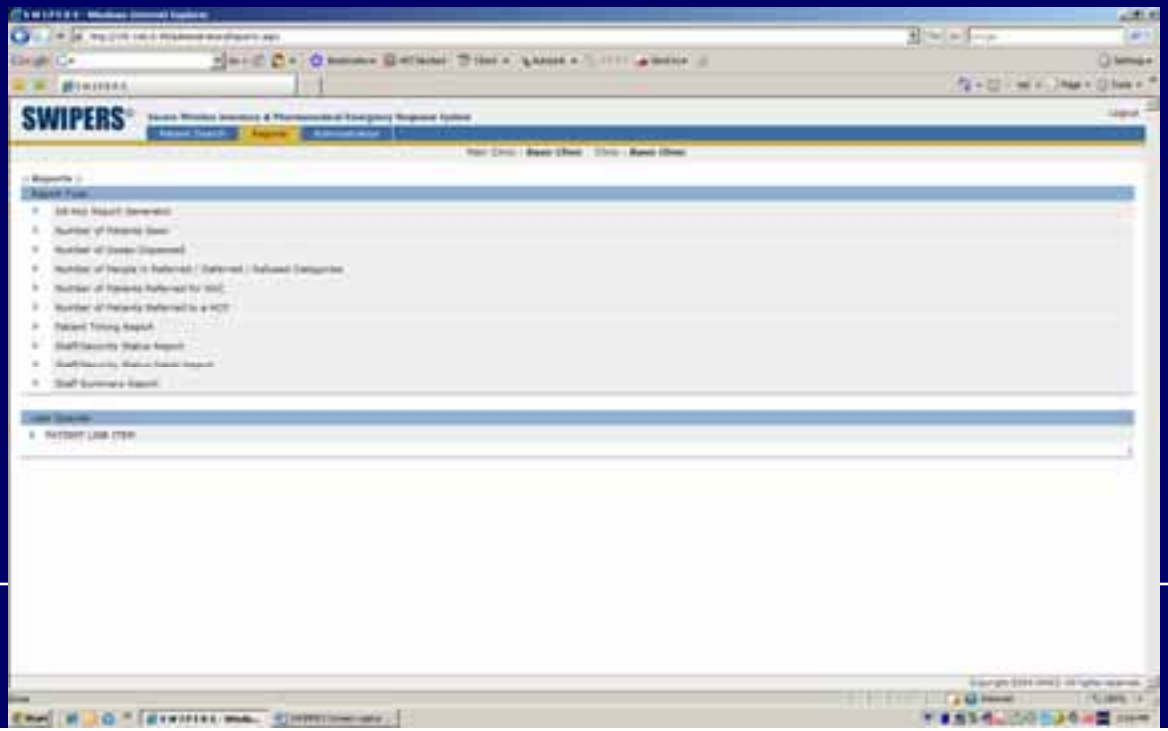
- Determine Who Was Treated
- Determine Who Needs To Be Treated
- Notify Those Needing Treatment
- Show It Is Possible

GIS Analysis Goal

- Determine Who Was Treated
  - Geocode patient information

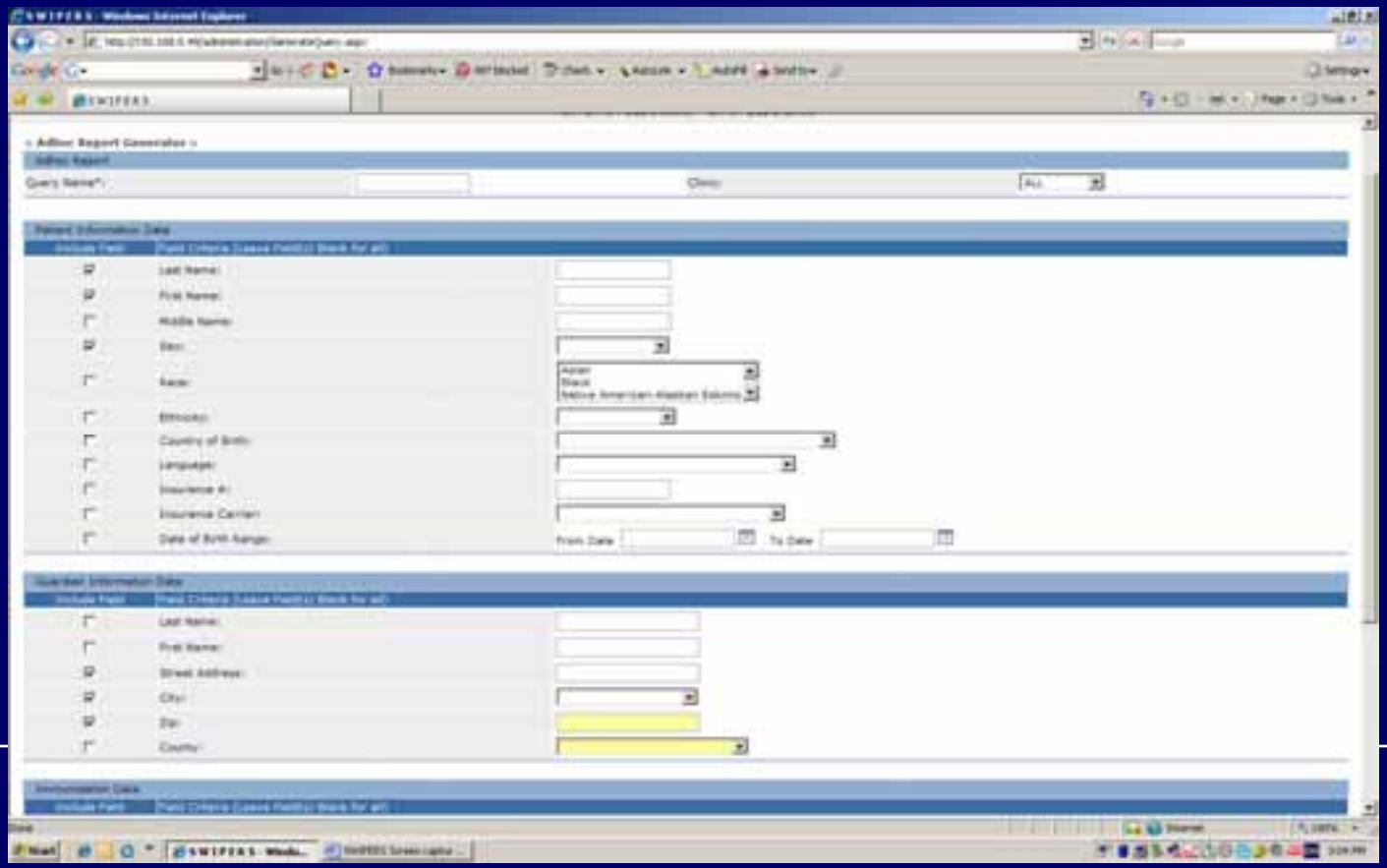
GIS Analysis

- Geocode Patients Treated
  - Extract address information from SWIPERS
    - Ad-hoc report generator



GIS Analysis

- Ad-Hoc Report



GIS Analysis

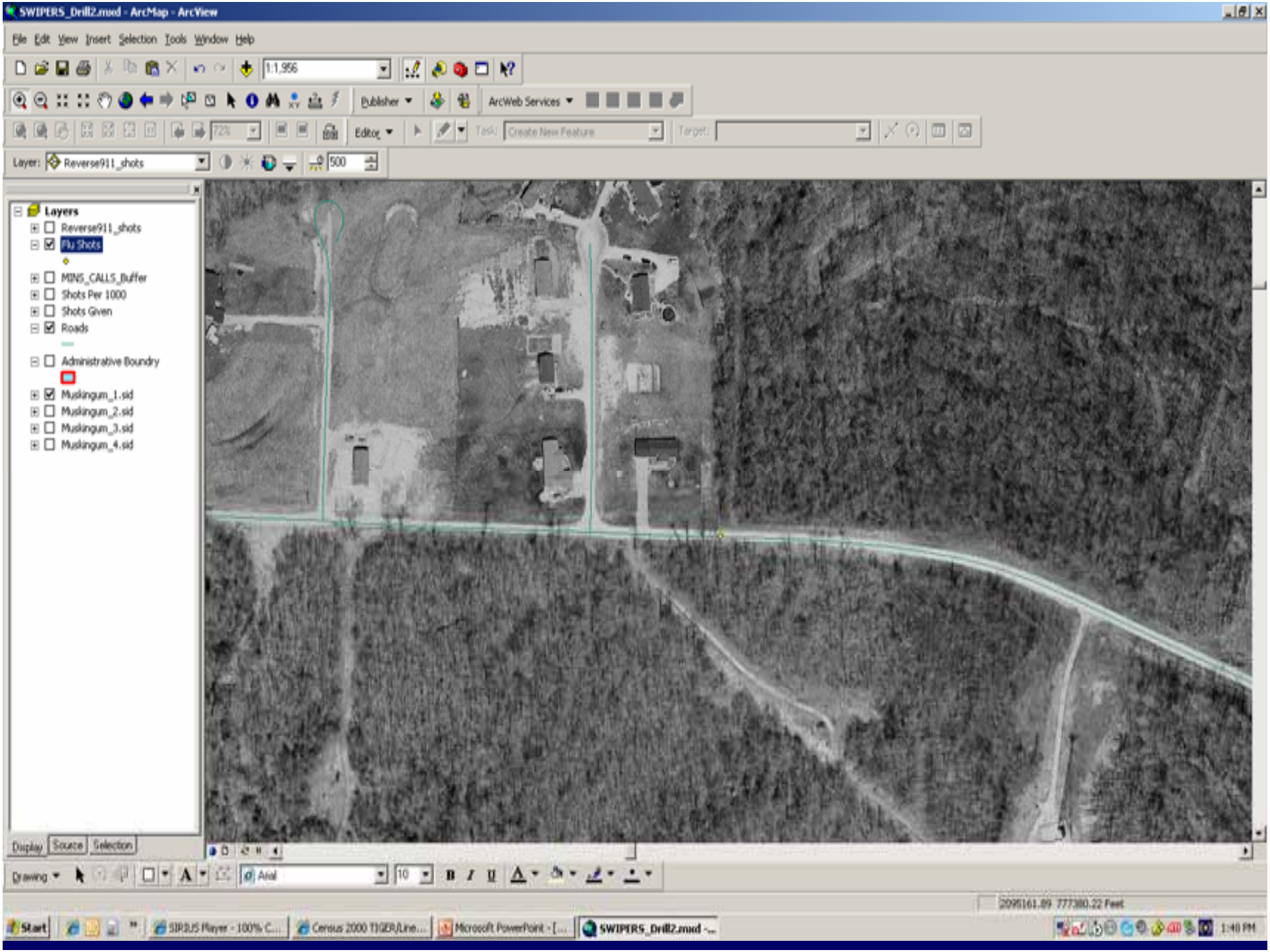
- SWIPERS Ad-Hoc Report
  - Generated hourly
  - Not directly exportable
  - Report generated on screen
  - Copied into MS Excel

GIS Analysis

- After initial export de-duplication necessary
  - Ad-hoc report limited in query
  - SPSS statistical software used
- Saved as dBase file from SPSS

GIS Analysis

- Geocoding
  - Based on home address exported from SWIPERS
  - Geocoded to field verified centerline file from Muskingum County LBRS initiative
  - 69% successfully geocoded
    - Most unsuccessful had missing address or were out of county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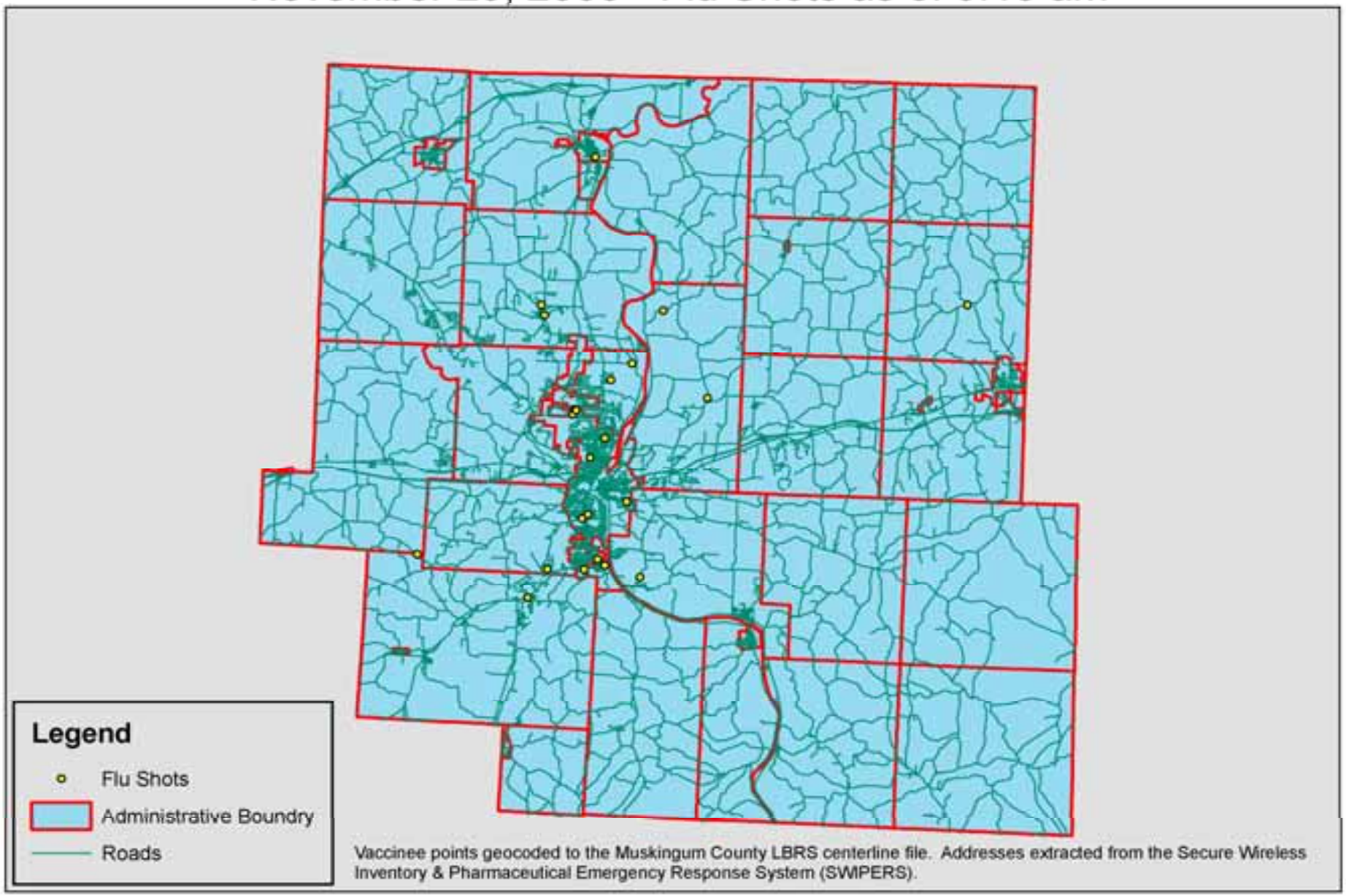
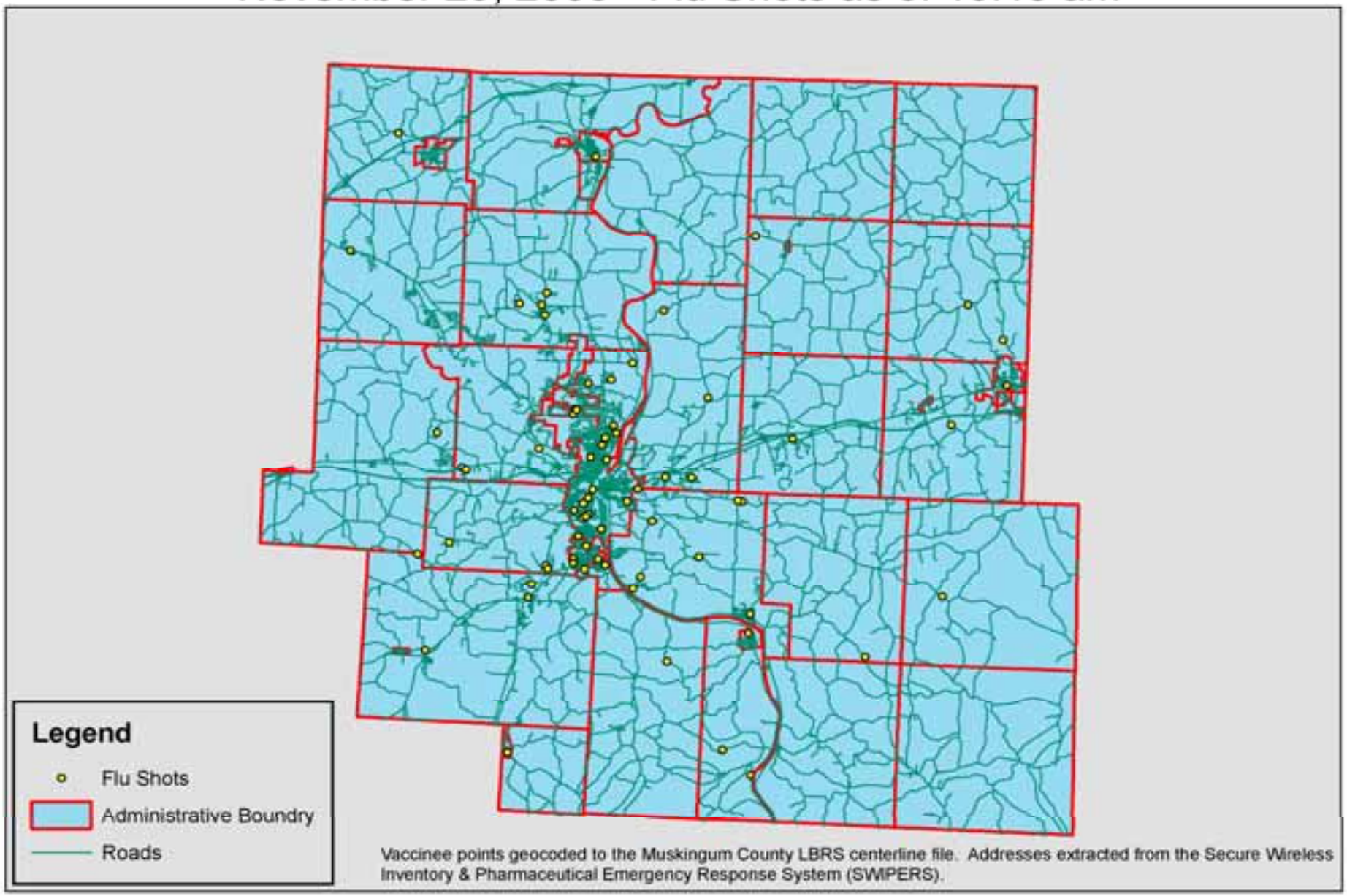
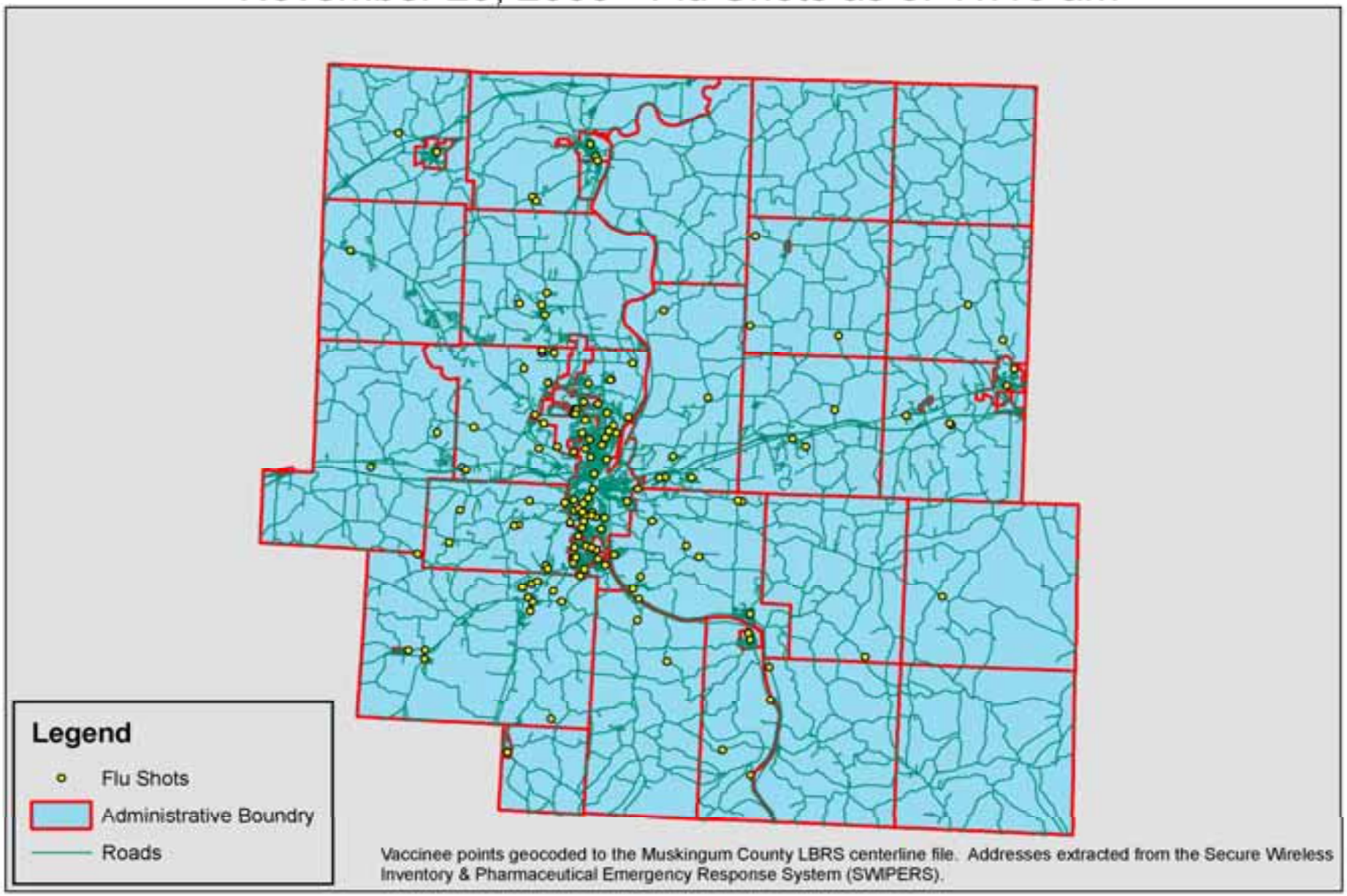
Muskingum County Mass Flu Vaccination Clinic
November 29, 2006 - Flu Shots as of 9:15 am



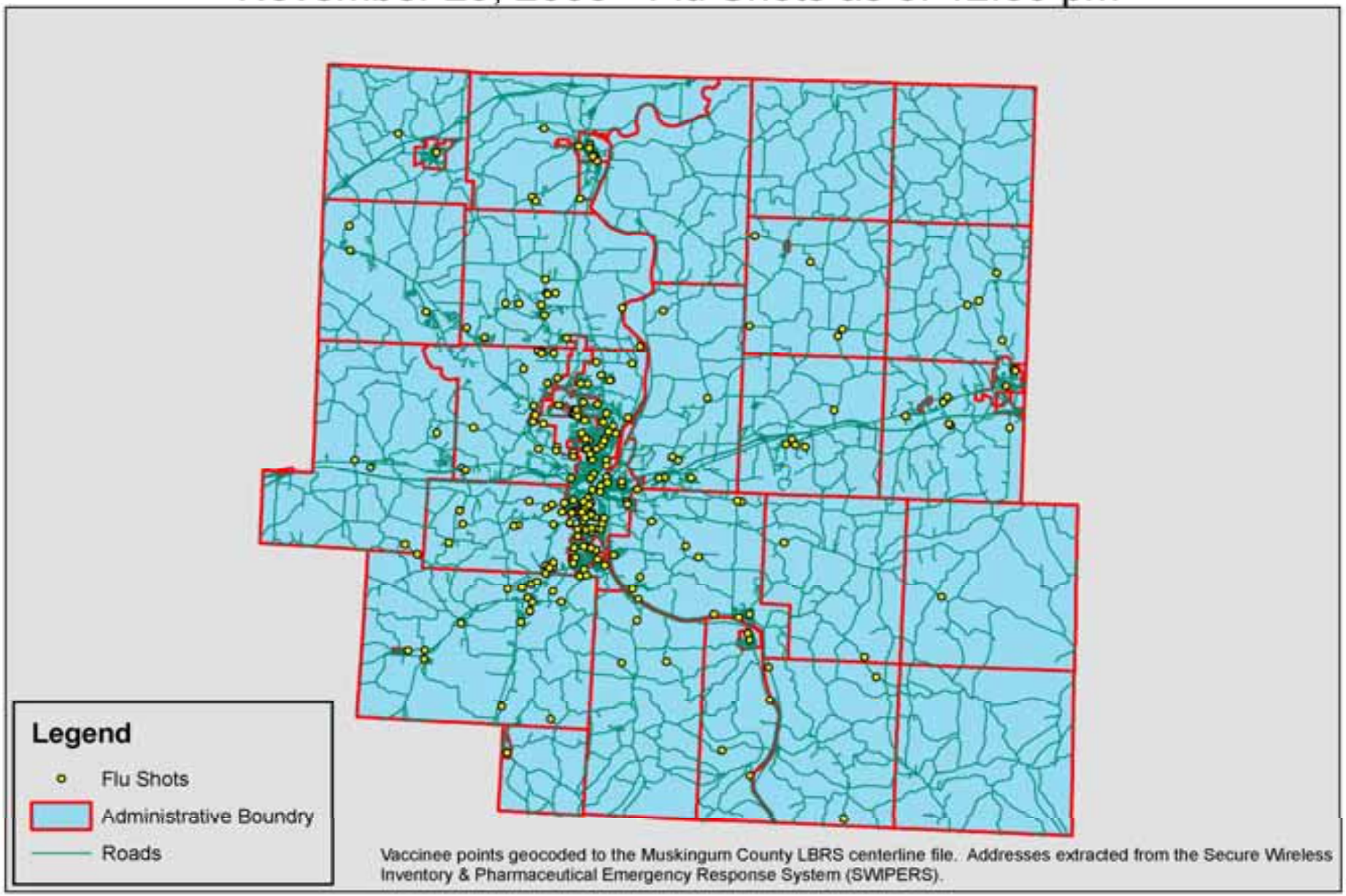
Muskingum County Mass Flu Vaccination Clinic
November 29, 2006 - Flu Shots as of 10:15 am



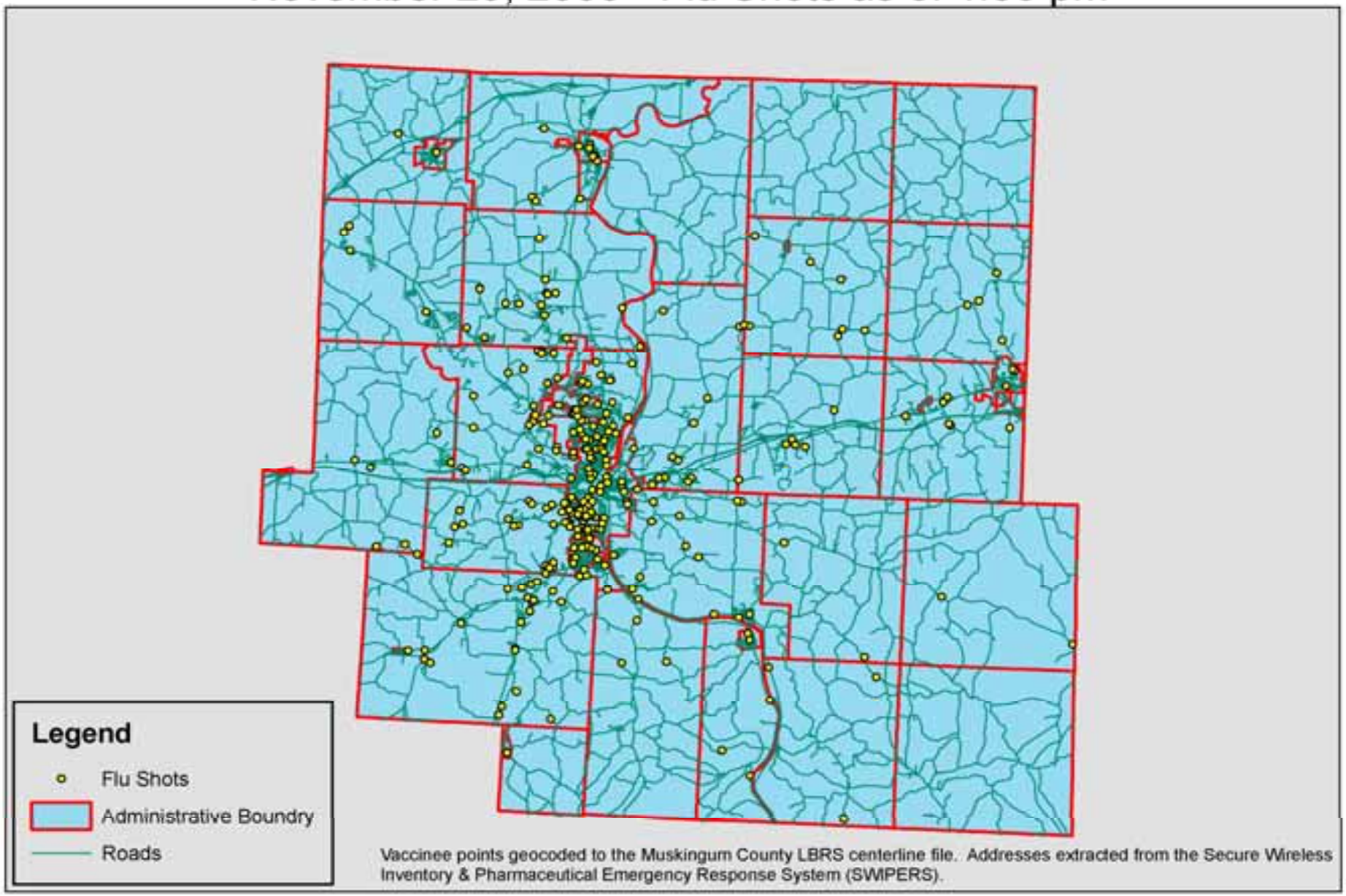
Muskingum County Mass Flu Vaccination Clinic
November 29, 2006 - Flu Shots as of 11:15 am



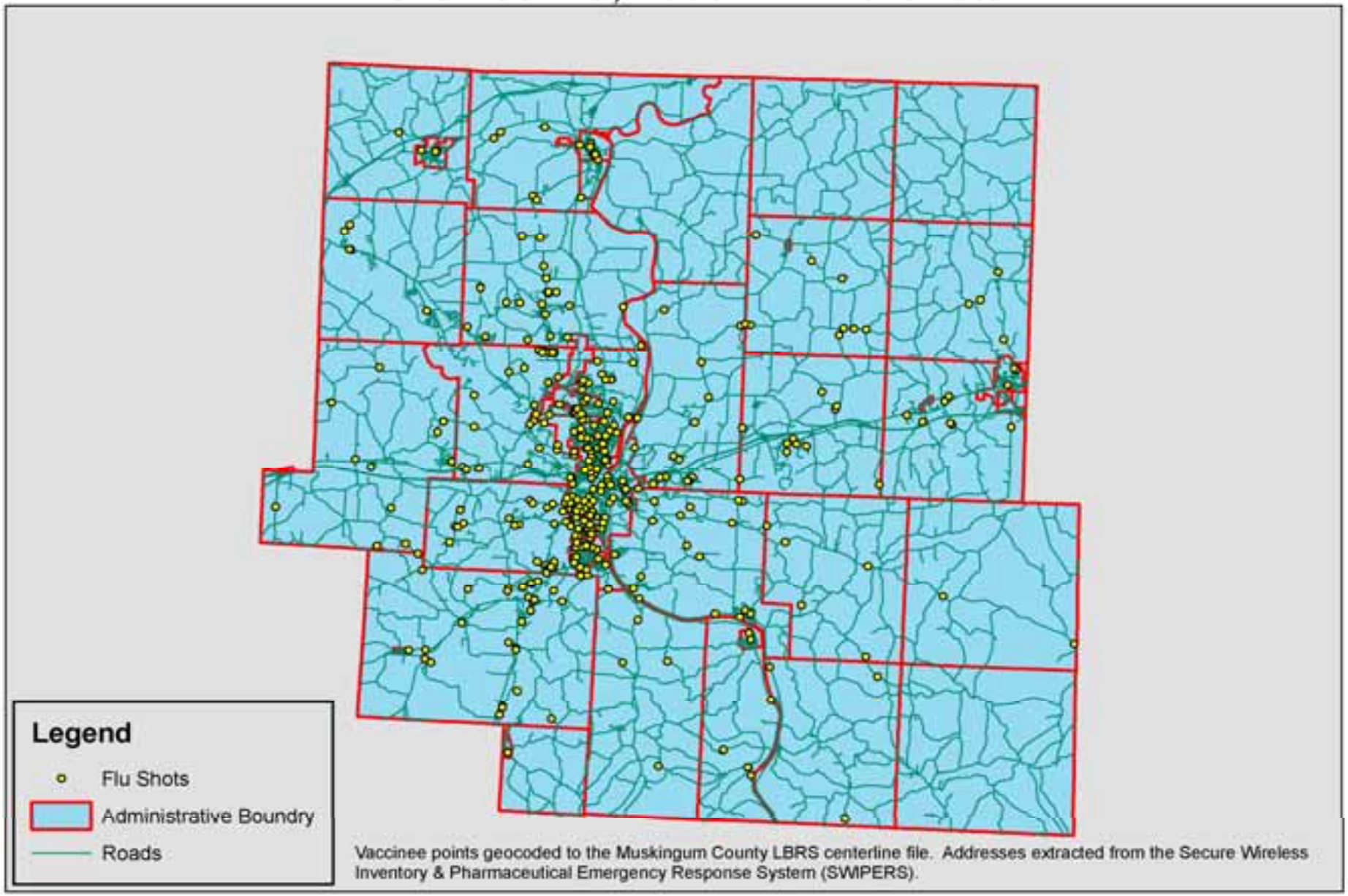
Muskingum County Mass Flu Vaccination Clinic
November 29, 2006 - Flu Shots as of 12:30 pm



Muskingum County Mass Flu Vaccination Clinic
November 29, 2006 - Flu Shots as of 1:30 pm



Muskingum County Mass Flu Vaccination Clinic
November 29, 2006 - All Flu Shots



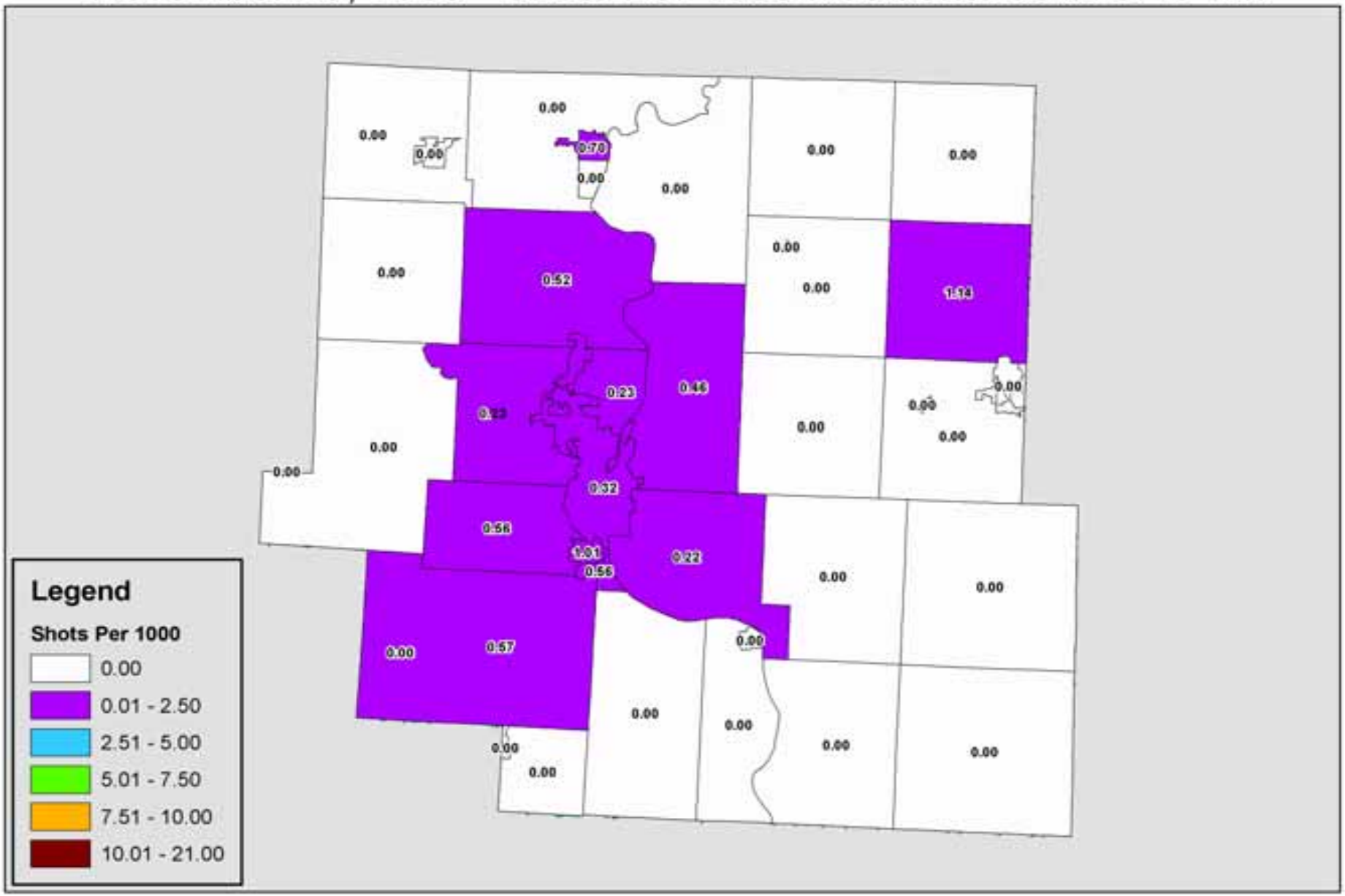
GIS Analysis Goal

- Determine Who Needs To Be Treated
  - Spatial join with population information
  - Calculate vaccination rates

GIS Analysis

- Spatial Join – Points to Polygons
  - Points – Geocoded addresses
  - Polygon – Administrative boundaries
    - Cities, townships, villages
    - Population – attribute
  - Calculate vaccination rate
    - Field calculation after spatial join
    - Count/population X 1,000
    - Result – vaccinations/1000

Muskingum County Mass Flu Vaccination Clinic
November 29, 2006 - Shots Per 1000 Residents as of 9:15 am



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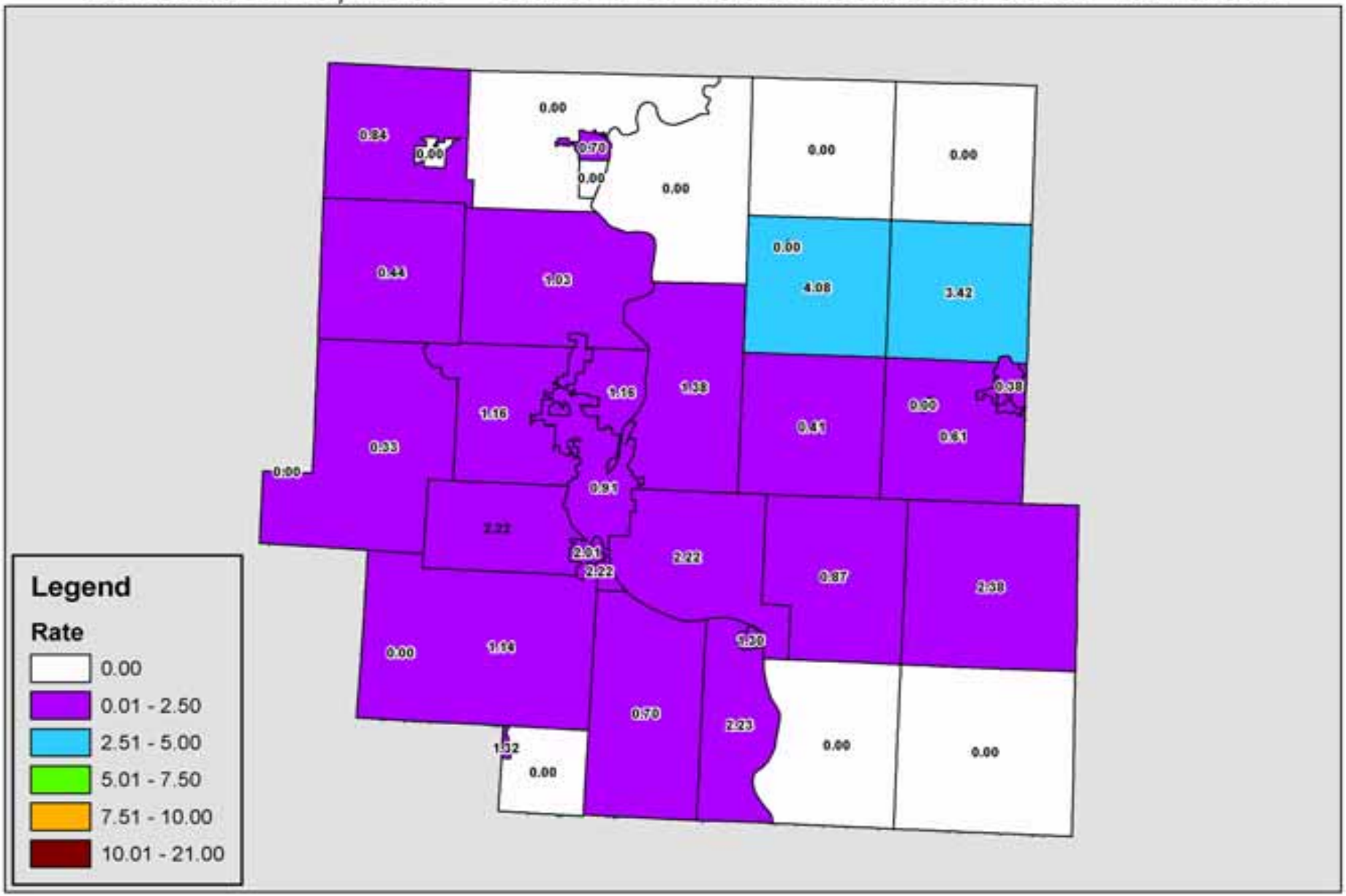

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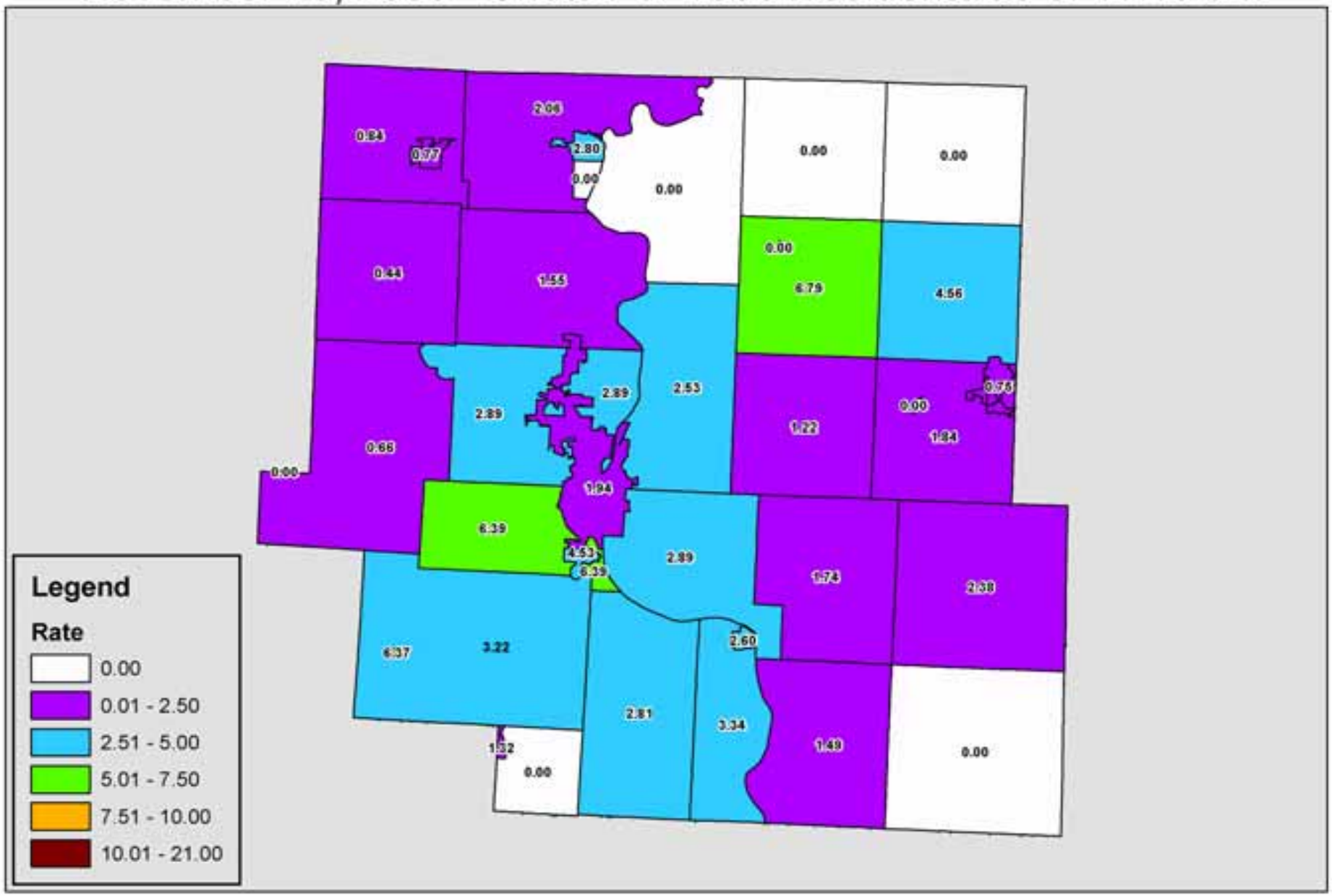

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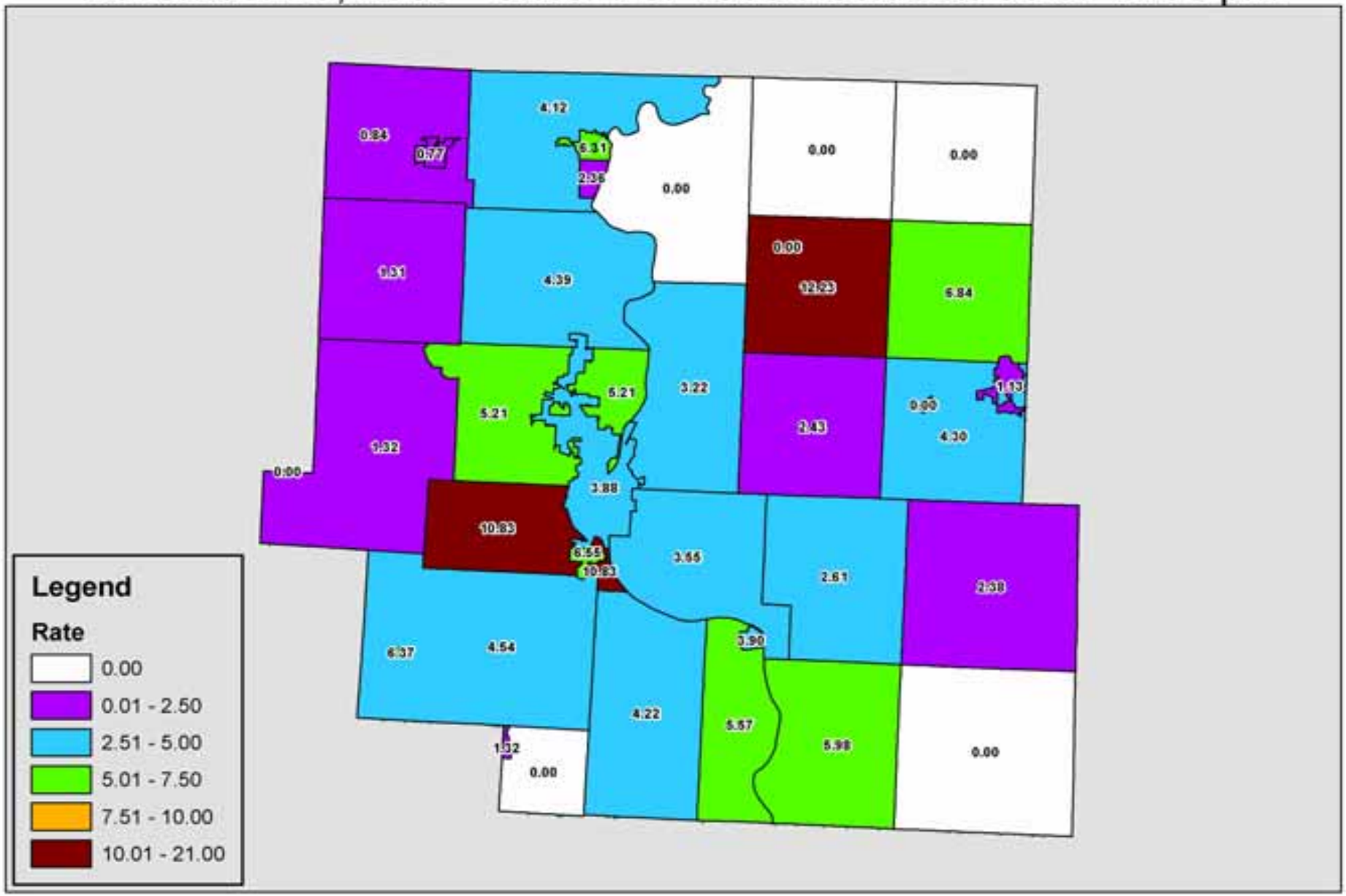
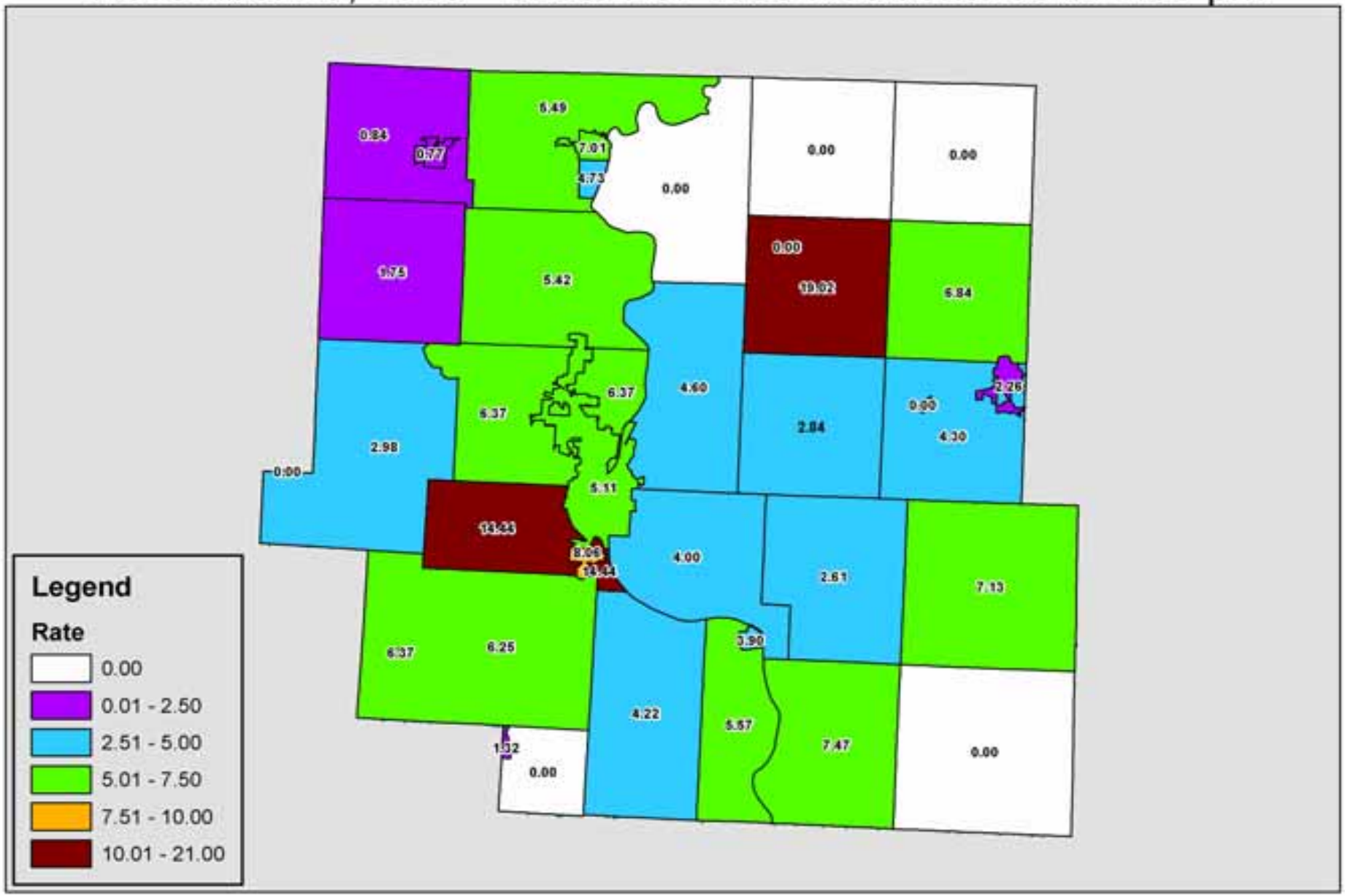
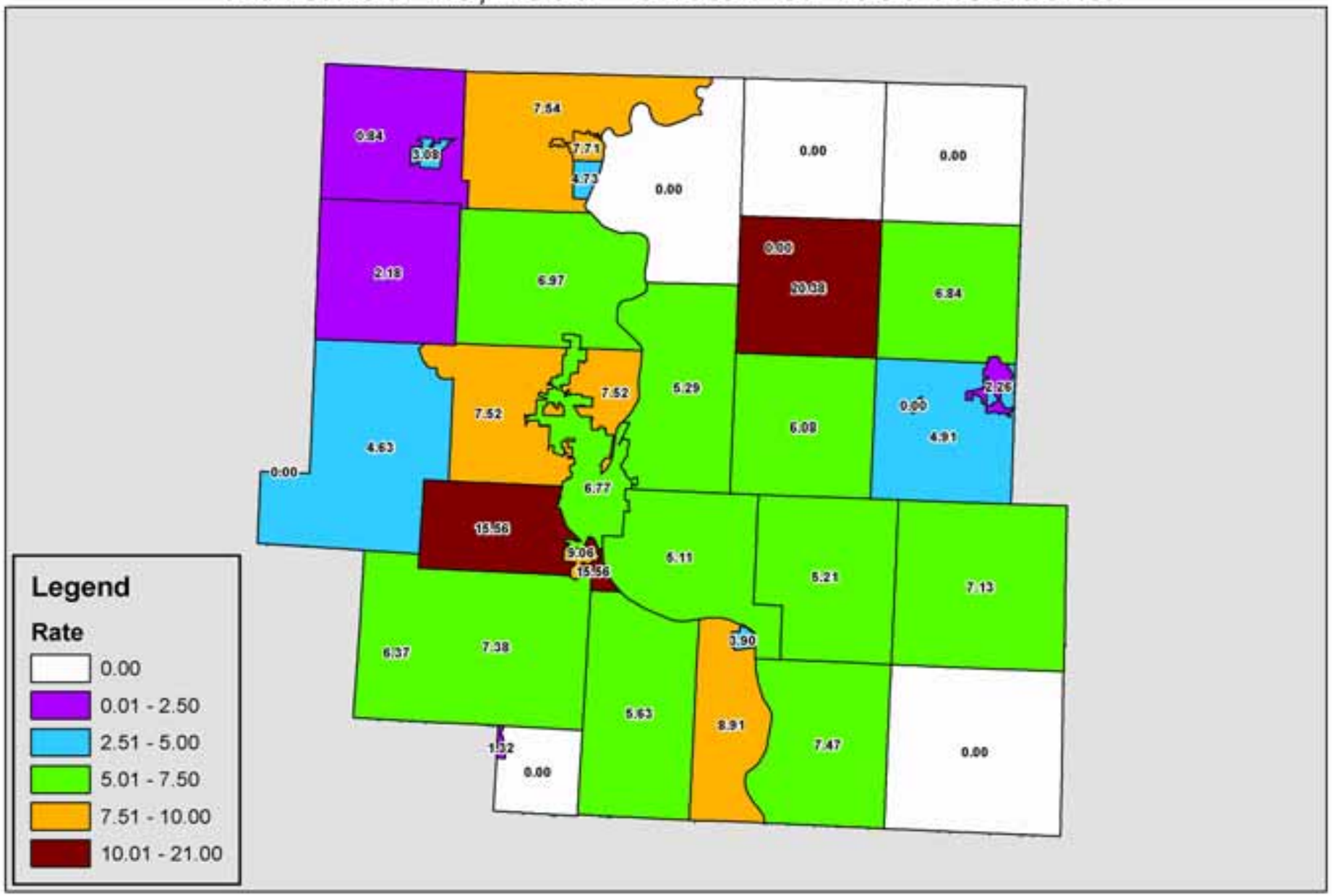


Muskingum County Mass Flu Vaccination Clinic
November 29, 2006 - Shots Per 1000 Residents as of 1:30 pm



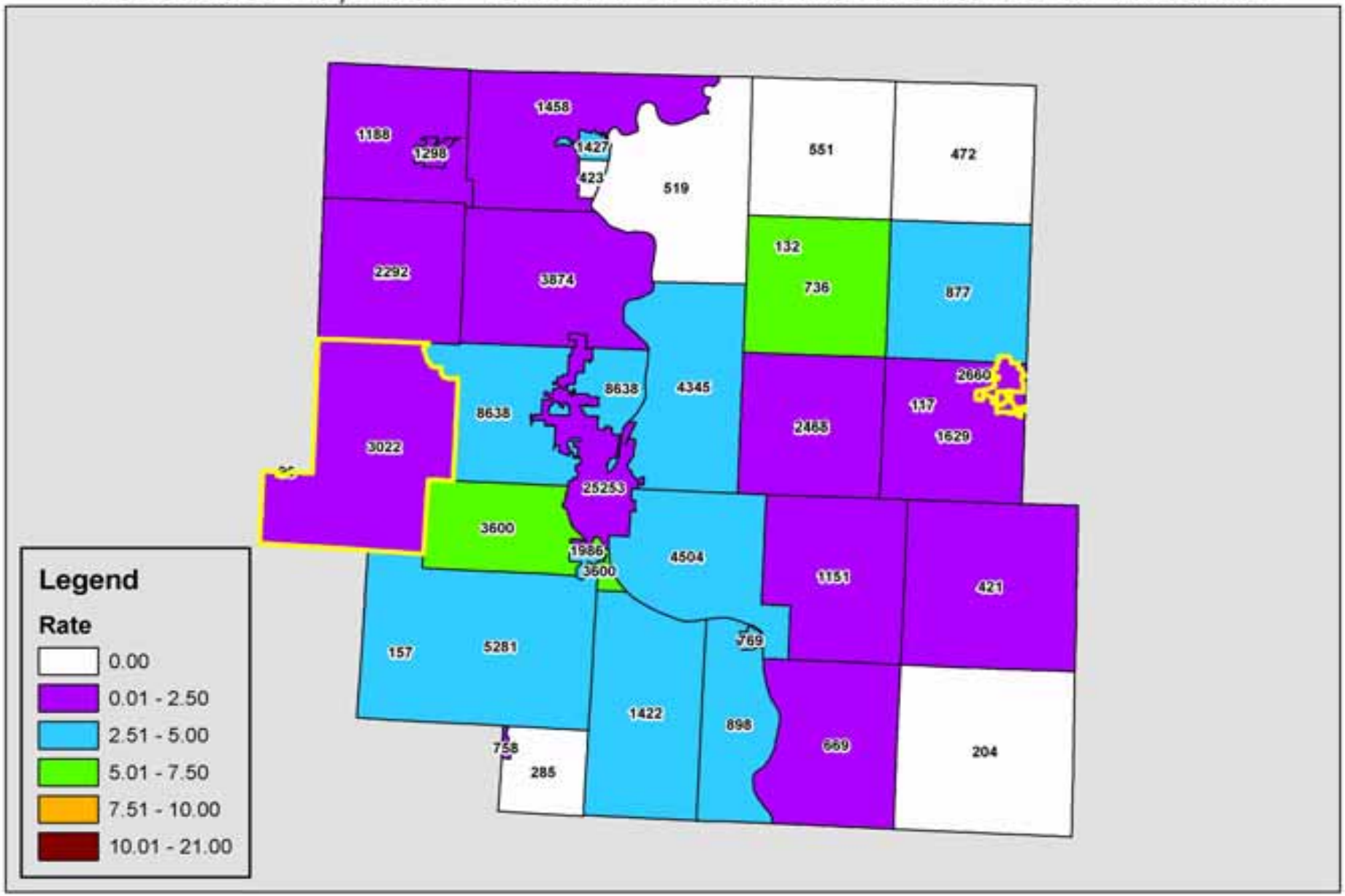
Muskingum County Mass Flu Vaccination Clinic
November 29, 2006 - Shots Per 1000 Residents



GIS Analysis Goal

- Notify Those Needing Treatment
  - Activate MINS in low rate areas
  - Select areas with:
    - Low vaccination rate
    - Large population
  - 627 MINS calls in two selected areas

Muskingum County Mass Flu Vaccination Clinic
November 29, 2006 - Shots Per 1000 Residents as of 11:15 am



GIS Analysis Goal

- Show It Is Possible
  - Nay Sayers
    - ODH
    - SWIPERS

Challenges/Improvements

- Card swiping inconsistent resulting in missing address information
  - Have registration workers verify address
- SWIPERS wireless connection not reliable
  - Purchase more robust hardware
  - Hard wire portions of the system
- De-duplication of records
  - Suggest that ad-hoc report filter by time
- How do we fare with many more people
  - Clinic run on October 4, 2007

Improvements 2007

- Clinic Held October 4, 2007
  - Registration verified address information – Result: 95+% points geocoded
  - Upgraded equipment/hardwire – Result: System went down once due to overheating
  - Ad-hoc filter by time – Result: Bat file supplied by SWIPERS did not work, program update made cutting from the report more difficult
  - More people – Result: Over 3100 vaccines administered, able to geocode and update each hour, worked in the same room with Muskingum GIS this yea

Conclusions

- Outstanding partnerships with other agencies
- Real live test for MINS in emergency situation
- GIS proved to be useful analysis tool

Thanks to Participating Agencies

- Muskingum County Fair Board – Location
- Rambo Memorial Health Center – Vaccine
- Muskingum County Sheriffs Office – Security and traffic control
- Muskingum County Commissioner's – MINS
- Muskingum County EMA – Communications
- Muskingum County Information Services – IT
- American Red Cross Muskingum Valley Chapter – Staff care
- Zanesville Police and Fire – Security, traffic, and air monitoring
- Genesis Health Care/Community Ambulance – Emergency medical
- Z-Bus – Transport
- Ohio State Patrol – Traffic control
- Muskingum Area Mental Health & Recovery Services Board – Evaluate
- Muskingum County GIS – GIS assistance
- ODH – Evaluate
- 5 Neighboring Health Departments – Equipment and evaluate

Questions?

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