# Assessing factors associated with school closures and pandemic influenza A (H1N1) — Michigan, Fall, 2009

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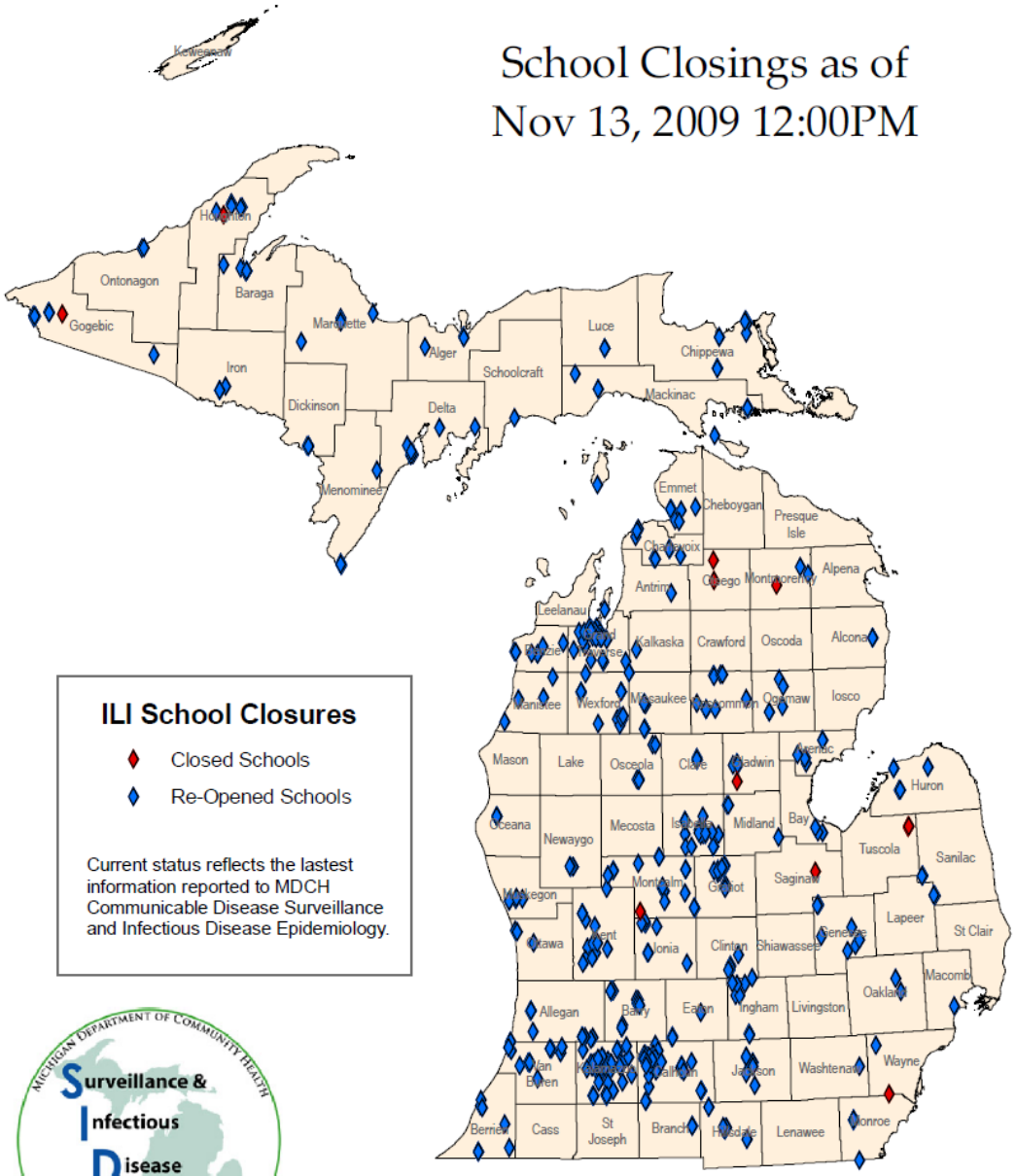
# Background

- Spring 2009 (First Wave)
  - Emergence of influenza A (H1N1)
- Fall 2009 (Second Wave)
  - Disproportionate impact on children and young adults
  - Influenza A (H1N1) flu transmission increased in mid-October in Michigan; experienced >560 school closures (most in US)
- School closures
  - Public and non-public schools (K-12)
  - All grade levels
  - All regions of the state

# School Closings as of Nov 13, 2009 12:00PM




## ILI School Closures

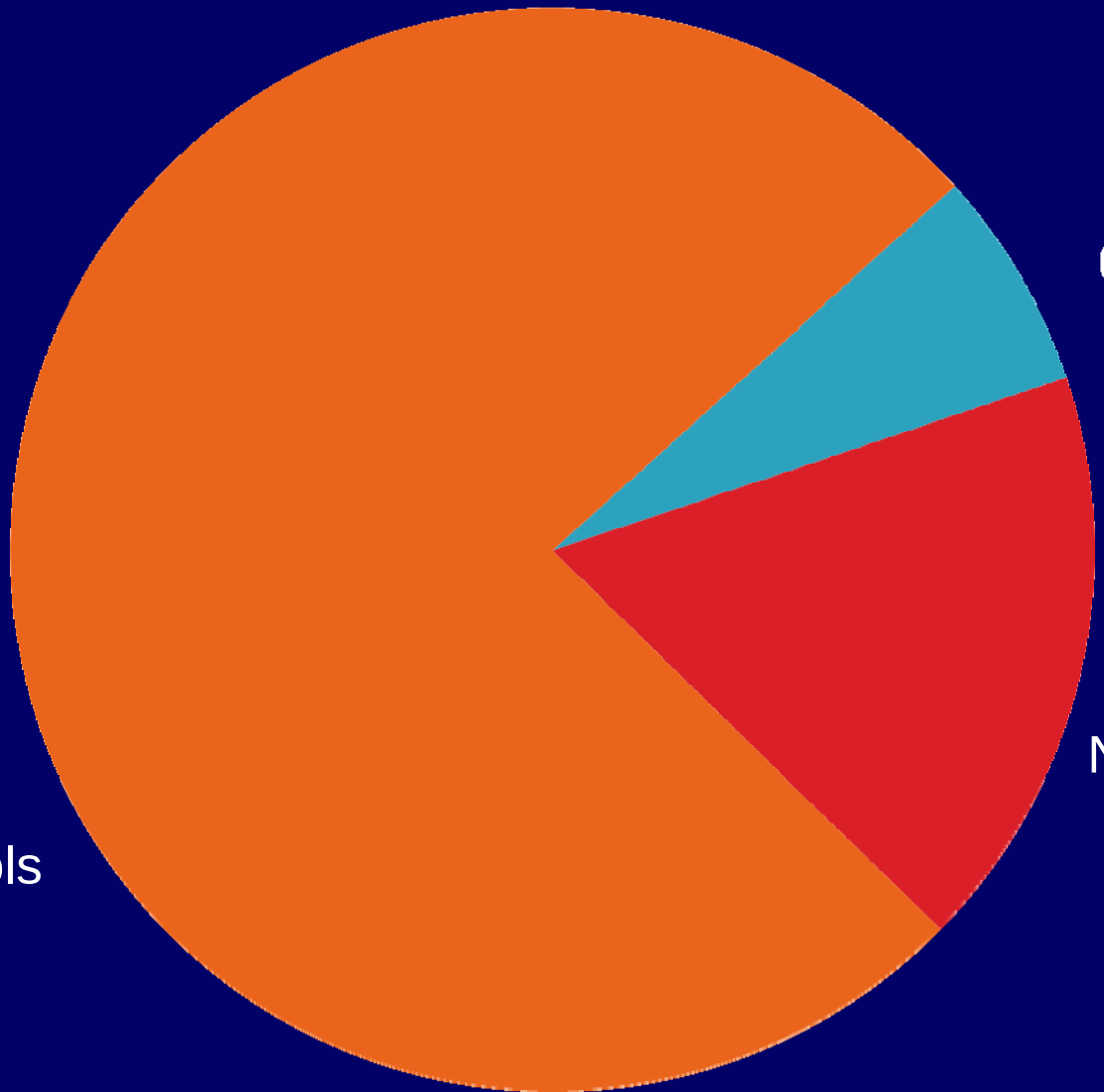
- Closed Schools
- Re-Opened Schools

Current status reflects the lastest information reported to MDCH Communicable Disease Surveillance and Infectious Disease Epidemiology.

Michigan Department of Community Health
Surveillance & Infectious Disease Epidemiology
Bureau of Epidemiology

11/13/2009

# Proportion of schools in Michigan, by type (n=4441)



# School (K-12) Closures, Michigan Fall, 2009

- Data Source
  - Statewide school closure data collected by MDCH staff
- Type of Schools (n=567)
  - 84% Public (477/567)
  - 6% Public School Academy (PSA) (34/567)
  - 9% Non-public (50/567)
  - 1% Data missing (6/567)
- Duration of Closures (n=539)
  - Mean duration 4.6 days
    - Median 5 days
    - Range 1 to 12 days

# Study Objectives

- Identify reasons for large number of school closures in Michigan
  - Policies and practices which may increase the number of school dismissals/closures
    - Local Health Departments (LHDs)
    - Schools and School Districts
  - Factors that may decrease (or increase) transmission of influenza A (H1N1) within schools
    - Adherence of schools to state and federal influenza A (H1N1) guidelines
    - Knowledge, Attitudes, Practices of teachers, students and parents to influenza A (H1N1) guidelines

# Methods

- Three surveys
  - Local Health Department [LHD] Survey (study 1)
  - Principal/Superintendent Survey (study 2)
  - Family/Teacher Backpack Survey (study 3)

- School closure data collected by MDCH

# Proportion of closed schools

| School type | Number of closed schools* | Total number of schools** | % affected |
|---|---|---|---|
| Public | 477 | 3363 | 14% |
| PSA | 34 | 289 | 12% |
| Non-public | 50 | 789 | 6% |
| TOTAL | 561 | 4441 | 13% |

*Data on school closures from MDCH school closure database
**Data regarding total number of public, non-public and PSA schools from the Michigan *Center for Educational Performance and Information* at http://www.michigan.gov/cepi

# School Closures by Grade

| Closure by grade | Number of closures | % of closures |
|---|---|---|
| Elementary School | 218 | 39% (218/561) |
| Middle School | 44 | 10% (44/561) |
| Middle/High School | 44 | 8% (44/561) |
| High School | 103 | 18% (103/561) |
| K – 12 School | 37 | 7% (37/561) |
| K – 8 School | 70 | 12% (70/561) |
| No data | 34 | 6% (34/561) |
| Total | 561 | 100% |

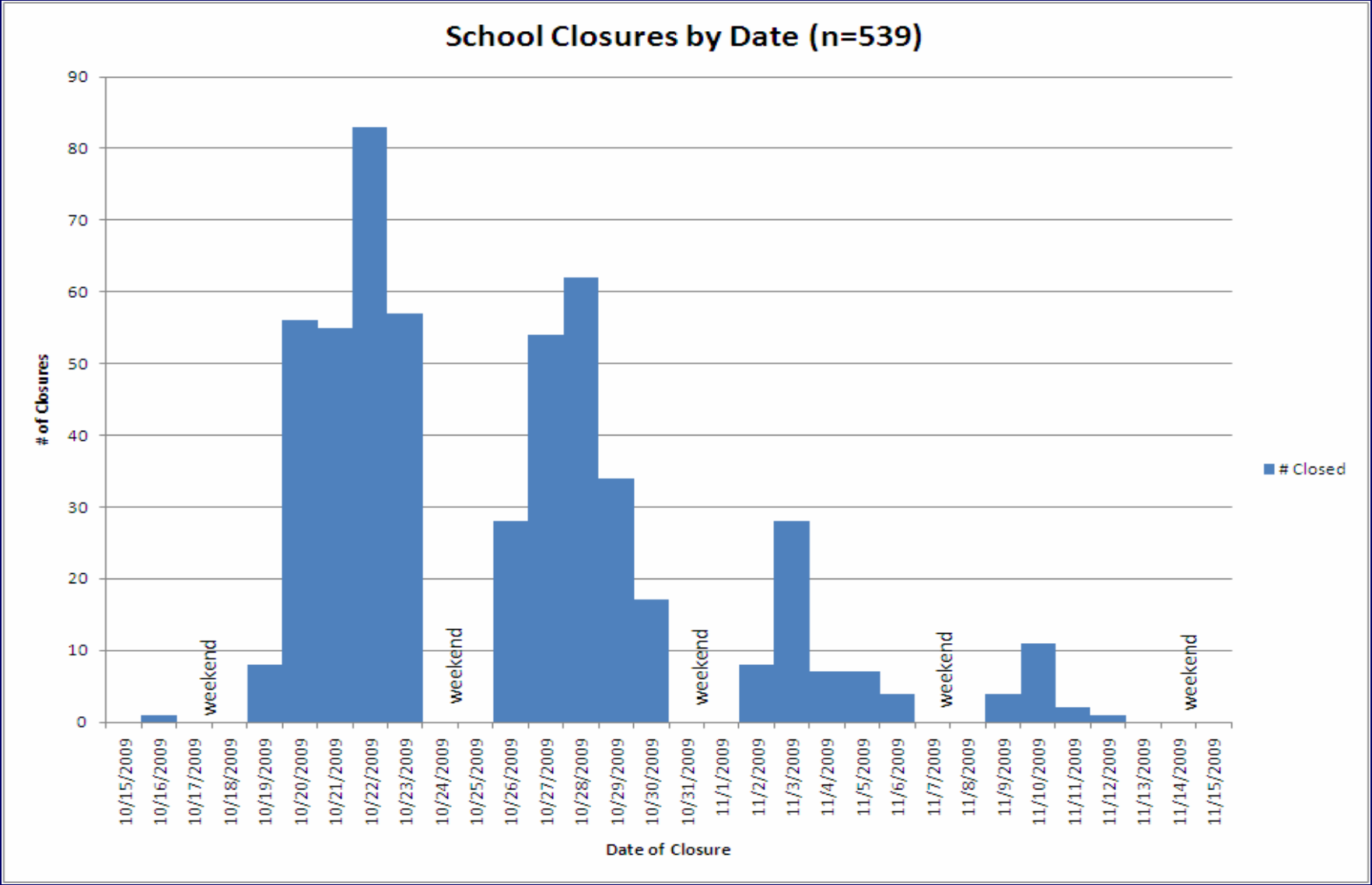
*Note: 6 schools missing data*

# Closures by Region

| Region | Number of closures | Number of schools in region | % affected |
|---|---|---|---|
| 1 | 53 | 488 | 11% |
| 2N | 4 | 810 | 0.5% |
| 2S | 8 | 911 | 0.8% |
| 3 | 54 | 578 | 9% |
| 5 | 152 | 494 | 31% |
| 6 | 98 | 730 | 13% |
| 7 | 109 | 247 | 44% |
| 8 | 83 | 183 | 45% |
| Total | 561 | 4441 | 13% |

*Note: 6 schools missing data*

# New School Closures by Date




*Note: 28 schools missing data*

# Local Health Department Survey

- Objective
  - Assess communications and information flow between LHD and school administrators
  - Explore recommendations and communications provided by LHD to schools
- Retrospective cross-sectional survey
  - One respondent from each LHD
  - Online survey from December 7, 2009 to January 14, 2010

# LHD Results

- 36 of 45 LHD (80%) jurisdictions participated
  - 66 out of 83 counties are represented
  - Urban and Rural areas represented

- Communication
  - 94% of LHDs had data about outbreaks or absenteeism from half or more of the schools in their jurisdiction
  - 72% (26/36) of LDHs stated there was adequate communication with schools/districts

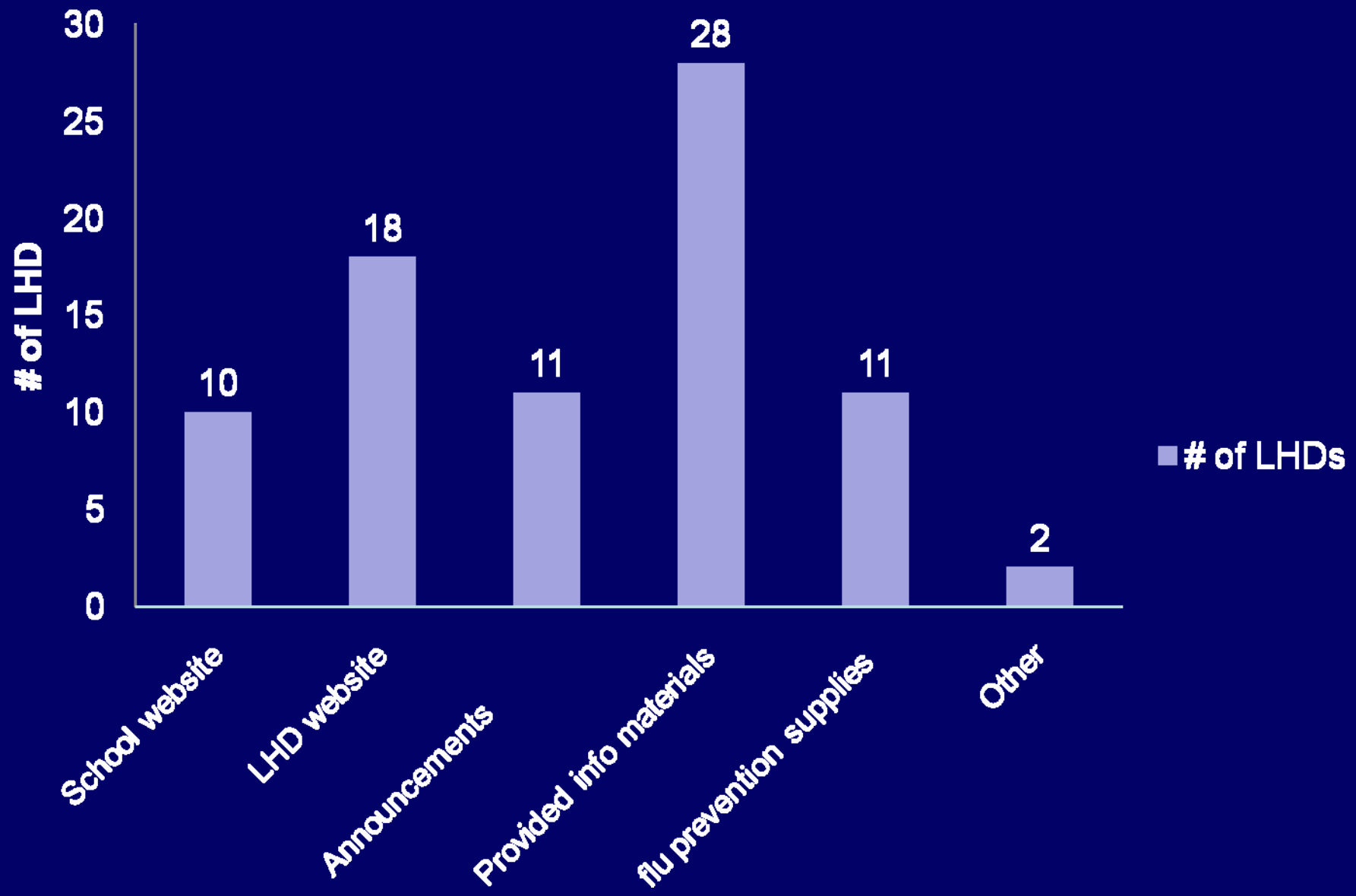
# Recommendations to schools

- All LHDs recommended increased hand hygiene or respiratory etiquette*
- 97% of LHDs recommended isolation for 24 hours after fever resolution*
- 36% of LHDs recommend reducing out-of-school contacts*
- * Consistent with CDC and MDCH Guidelines

# Closure Advice

- 48% (17/36) LHD did not recommend closure
- 52% (19/36) did recommend closure
  - 37% (7/19) recommended closure to limit the spread of ILI
  - 63% (12/19) recommended closure for staffing or other logistical concerns
  - Two LHDs had schools closing *against* the advice of LHD
- Recommended length of closure (n=9)
  - 5 days (Range 4 to 7 days)

# Hand Hygiene and Cough Etiquette



# Principal Survey

- Objectives
  - Identify factors (e.g. policies, practices, communication) associated with school closures and flu response
- Retrospective cross-sectional survey
  - Sent to all MI principals and superintendents (N=5,292)
  - Survey online from December 7 – 24, 2009
  - Data collected in aggregate form

# Principal Survey Results

- 1222 respondents
  - 4441 schools in MI
  - 854 school districts in MI
  - 1222/5292 school/school districts = 23% response rate

- 73% (887/1222) principals
- 13% (154/1222) superintendents
- 15% (180/1222) other

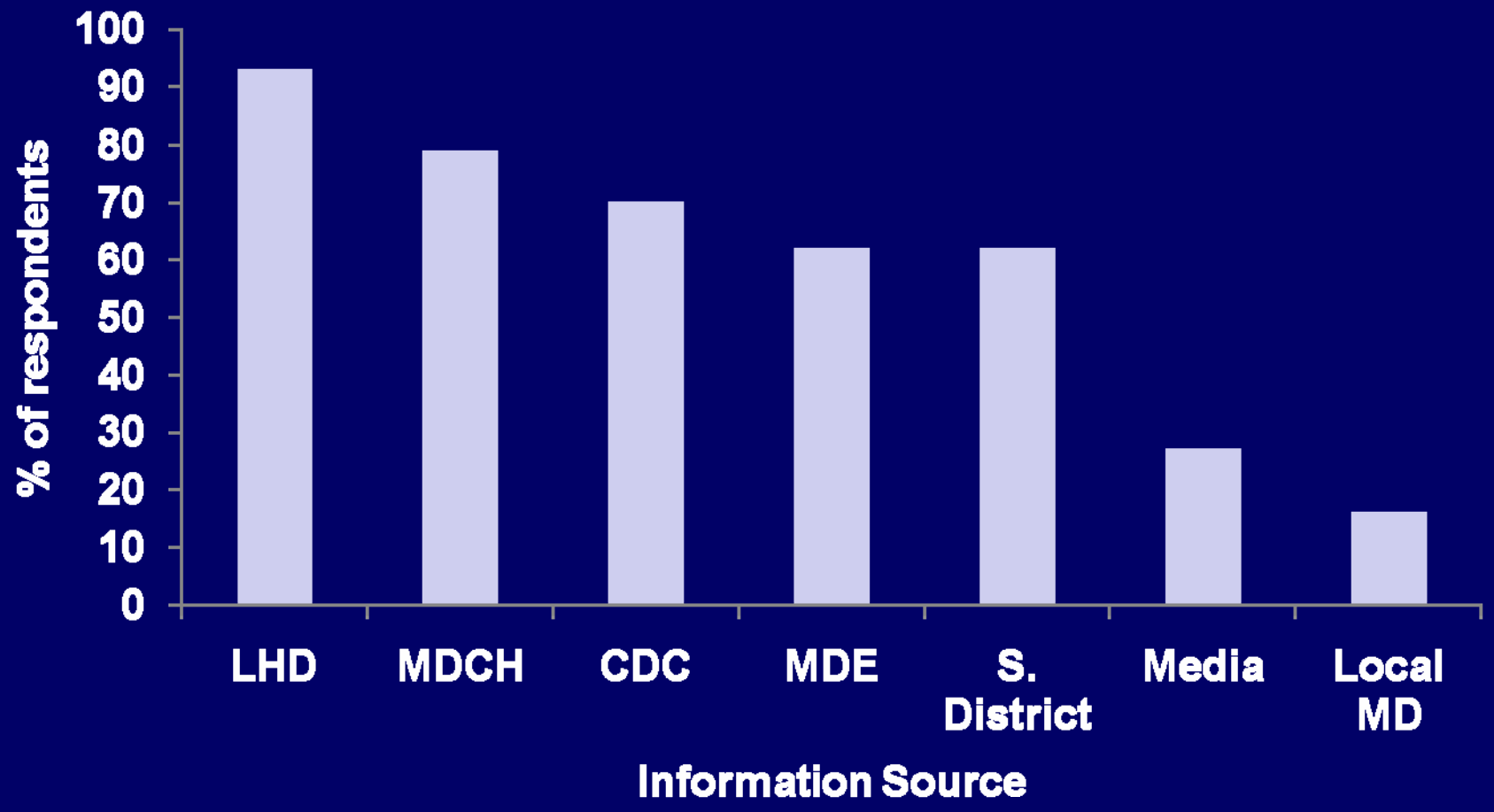
# Respondents by School Type

| School Type | # | % |
|---|---|---|
| Public School | 931/1222 | 80% |
| Non-public school | 138/1222 | 12% |
| Public School Academy | 62/1222 | 5% |
| Other | 43/1222 | 4% |

# Policies and Practices

- School nurse
  - 57% (661/1163) do not have school nurse
  - 43% (502/1163) have school nurse
    - 19% have full time school nurse
- Health Clinic
  - 5% (61/1165) have a health clinic
- Flu plan
  - 32% no flu plan in Spring
  - 6% no flu plan Fall

# Source of Flu Information



# Care of Students

- 87% required ill students to stay home for 24 hours
- 61% (685/1115) had a “sick room”
  - School office most frequent location
- Communication to parents
  - Letters, handouts, postings on school websites, email
  - 19% (207/1111) had flu communications in other languages

# School Closure

- 212 schools closed
  - 16 Spring 2009
  - 195 Fall 2009
  - 1 Spring and Fall 2009
- Closure by type
  - 81% (169/212) Public
  - 11% (23/212) Non-public
  - 4% (9/212) PSA
  - 4% (8/212) Other

# Fall School Closure

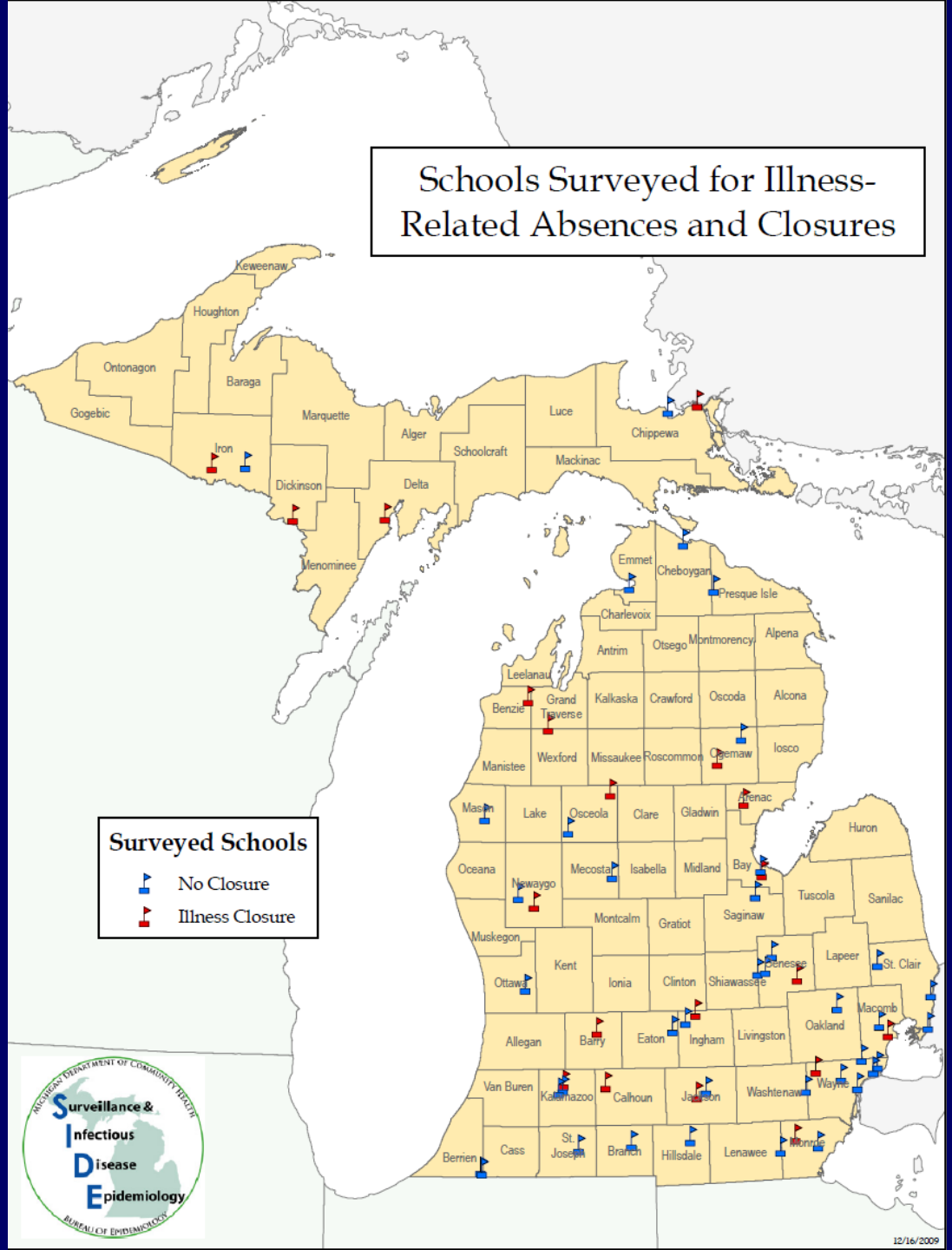
- Reasons for Fall closure (n=195)
  - Excessive student absenteeism (83%)
  - Preventing the spread of flu (76%)
  - Cleaning the school (49%)
  - District-wide attendance policies (37%)
- Closure decision making
  - School superintendents (92%)
  - Principals (69%)
  - Local health departments (LHDs) (56%)
- Mean Fall duration of closure
  - 4.8 days (range 1-12 days)

# Additional Principal Survey Analysis

- Factors such as
  - Size of school
  - Demographics
  - Community ILI levels
  - District-wide closure
  - Non pharmaceutical interventions (NPIs)

# Backpack Survey

- Objective
  - To explore the knowledge, attitudes, and practices (KAP) of elementary school teachers and families in regards to influenza A (H1N1)
- Retrospective cross-sectional survey
  - Systematic random sample of public, non-public, and PSA elementary schools
  - 8 schools chosen per region (n=64)
  - At least 3 closed schools were recruited from each region


Schools Surveyed for Illness-Related Absences and Closures
Surveyed Schools
No Closure
Illness Closure
Keweenaw
Houghton
Ontonagon
Baraga
Gogebic
Marquette
Iron
Alger
Schoolcraft
Luce
Chippewa
Mackinac
Dickinson
Delta
Menominee
Emmet
Cheboygan
Presque Isle
Charlevoix
Antrim
Otsego
Montmorency
Alpena
Leelanau
Benzie
Grand Traverse
Kalkaska
Crawford
Oscoda
Alcona
Manistee
Wexford
Missaukee
Roscommon
Ogemaw
Iosco
Mason
Lake
Osceola
Clare
Gladwin
Arenac
Huron
Oceana
Newaygo
Mecosta
Isabella
Midland
Bay
Tuscola
Sanilac
Montcalm
Gratiot
Saginaw
Muskegon
Kent
Ottawa
Ionia
Clinton
Shiawassee
Genesee
Lapeer
St. Clair
Macomb
Oakland
Allegan
Barry
Eaton
Ingham
Livingston
Van Buren
Kalamazoo
Calhoun
Jackson
Washtenaw
Wayne
Berrien
Cass
St. Joseph
Branch
Hillsdale
Lenawee
Monroe
Surveillance & Infectious Disease Epidemiology
MICHIGAN DEPARTMENT OF COMMUNITY HEALTH
BUREAU OF EPIDEMIOLOGY
12/16/2009

# Backpack Sample Selection

- Paper surveys sent home in backpacks
  - One classroom randomly selected from each grade (K-5)
  - Distributed December 9 – 18, 2009
- School participation rate 73% (47/64)
- Preliminary Results
  - Expected for late Spring

# Preliminary Findings

- Reasons for school closure are complex
- Good communication between LDH and schools
  - LHDs source of information
  - LDHs stated communication adequate
- Schools followed State and CDC guidelines
  - Fever resolution, increased hand/respiratory hygiene, reducing out of school contacts

# Conclusion

- Reasons for closure
  - Excessive absenteeism
  - Importance of other factors requires further study

- LHDs and closure advice
  - Reasons for closure included
    - Supporting school administrators
    - Limit the transmission ILI

# Conclusion

- Principal survey aids in understanding of the decision making processes of schools/districts

- Surveillance
  - Ad hoc surveillance establish by MDCH effective in identifying schools
  - MDCH Surveillance system can referenced with other surveys

# Recommendations

- Public health officials need to balance the public health and non public health needs of schools
- Continue to facilitate relationships between public health and education
- Enhanced communication between education and public health at all levels of government

# Acknowledgements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*"The findings and conclusions in this report are those of the author and do not necessarily represent the official position of the Centers for Disease Control and Prevention"*

# Discussion / Questions