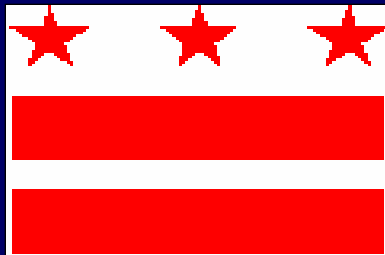


# **Novel Surveillance System Based on School-Nurse Visits To Detect Trends in Influenza-Like Illness: Washington DC, 2004–05**

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**District of Columbia Department of Health  
EFAB/CDD/OWCD**



# Influenza Public Health Importance

- **Highly contagious respiratory tract illness**
- **Yearly winter epidemics in the United States**
  - 5%–20% of the population infected
- **Morbidity and mortality**
  - >200,000 hospital admissions / year
  - >36,000 deaths / year

# Monitoring Influenza in Community

- **Laboratory-confirmed influenza**
  - Considered gold standard
- **Influenza-Like Illness (ILI)**
  - Based upon symptoms
- **Student absenteeism**
  - Used in certain communities
  - Not routinely reported to District of Columbia Department of Health (DCDOH)

# School Nurse System (SNS)

- Created by DCDOH in 2004
  - Interest in early outbreak detection
- Uses syndromic surveillance
  - School nurse visit data
- Can report ILI

# Study Objective

- Determine if reports of ILI from SNS can be used to augment traditional influenza surveillance

# Methods

- **Compared five methods of monitoring influenza in community with reports of ILI from SNS**
- **Examined November 2004 through May 2005 influenza season**

# **Influenza Surveillance Data Comparison Systems**

- **Laboratory-confirmed influenza**
  - **Sentinel clinics**
  - **Hospitals**
- **Visits related to ILI**
  - **Sentinel clinics**
  - **Hospital emergency departments**
- **School absenteeism due to illness**

# Influenza Surveillance Data SNS

- **Electronic reports of school nurse visits by students**
  - All reporting public schools included
- **Percentage of school nurse visits each week related to ILI**
  - Control for reporting fluctuations



# ILI Definitions

- **Sentinel clinic and emergency department ILI definition**
  - **Fever and sore throat or cough (standard)**
- **SNS ILI definition (non-standard)**
  - **Fever or**
  - **Sore throat or**
  - **Headache or**
  - **Respiratory illness**

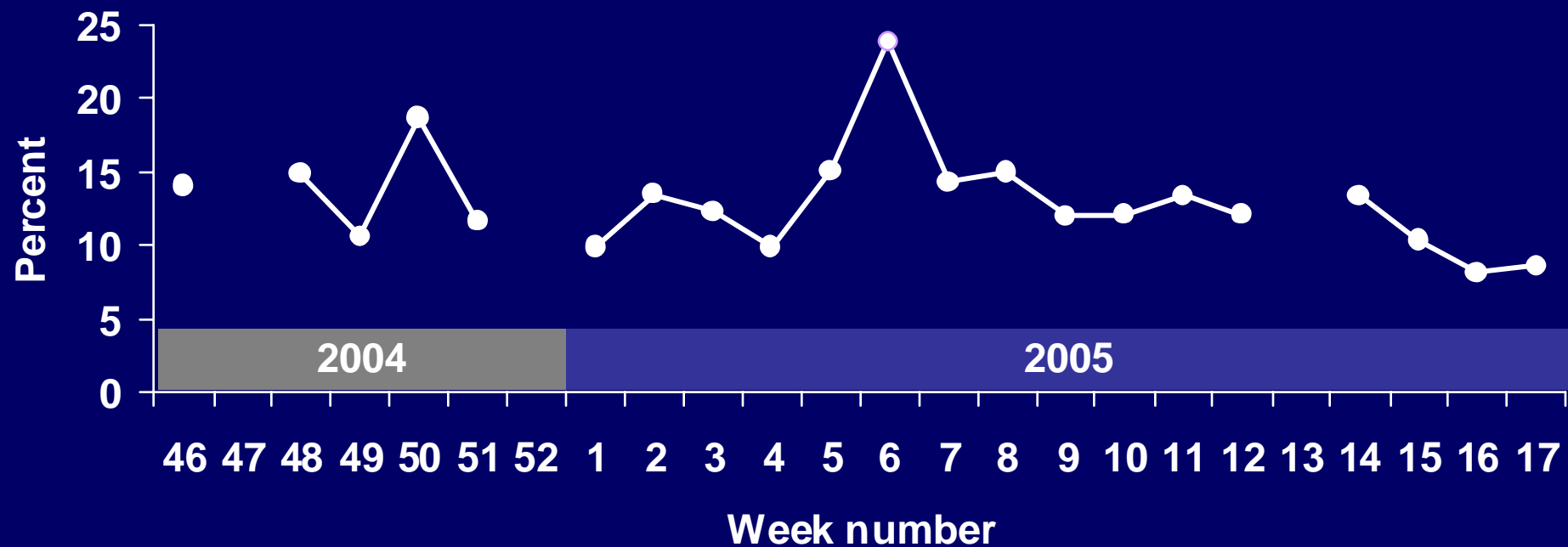
# Statistical Process Control (SPC)

- **Used to detect peaks**
  - **Quality-control method from manufacturing industry**
  - **Also for hospital infection control**
- **Uses graphs to identify abnormal data that vary from norm**

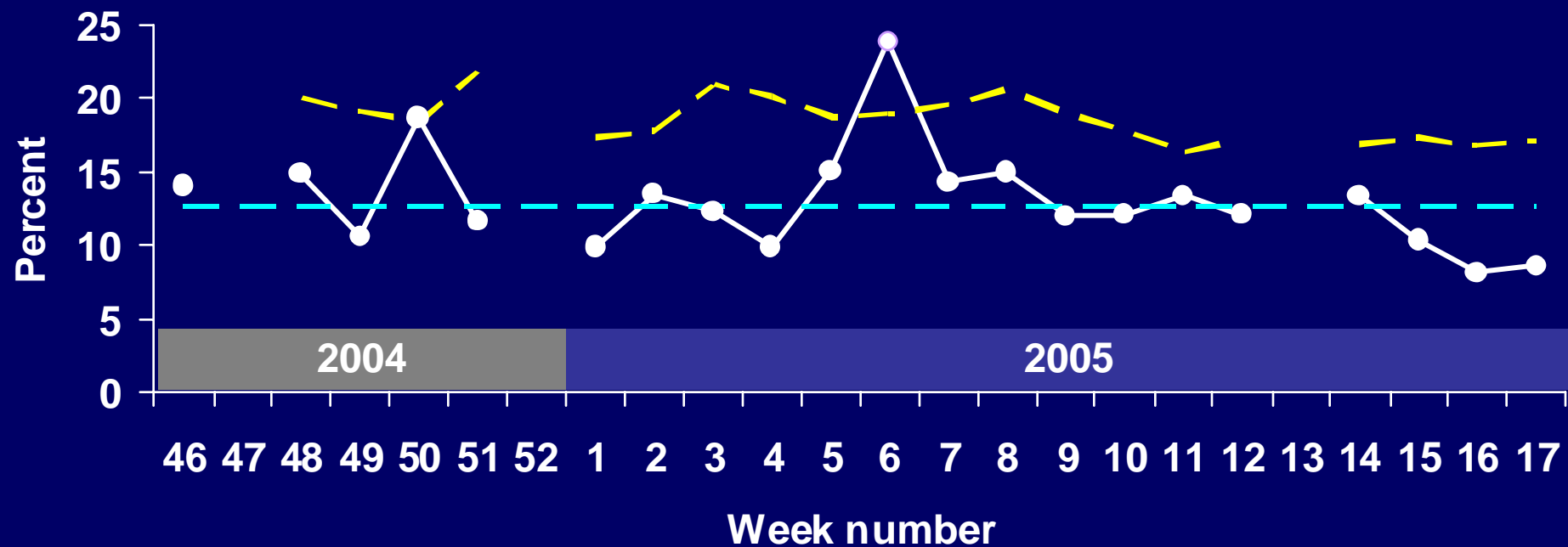
# Participation by Surveillance Sites

| Site                                | Participants / Total | %   |
|-------------------------------------|----------------------|-----|
| Public schools<br>(SNS)             | 34 / 151             | 23  |
| Sentinel clinics                    | 2 / 2                | 100 |
| Hospital emergency<br>departments   | 3 / 9                | 33  |
| Elementary schools<br>(absenteeism) | 95 / 107             | 89  |

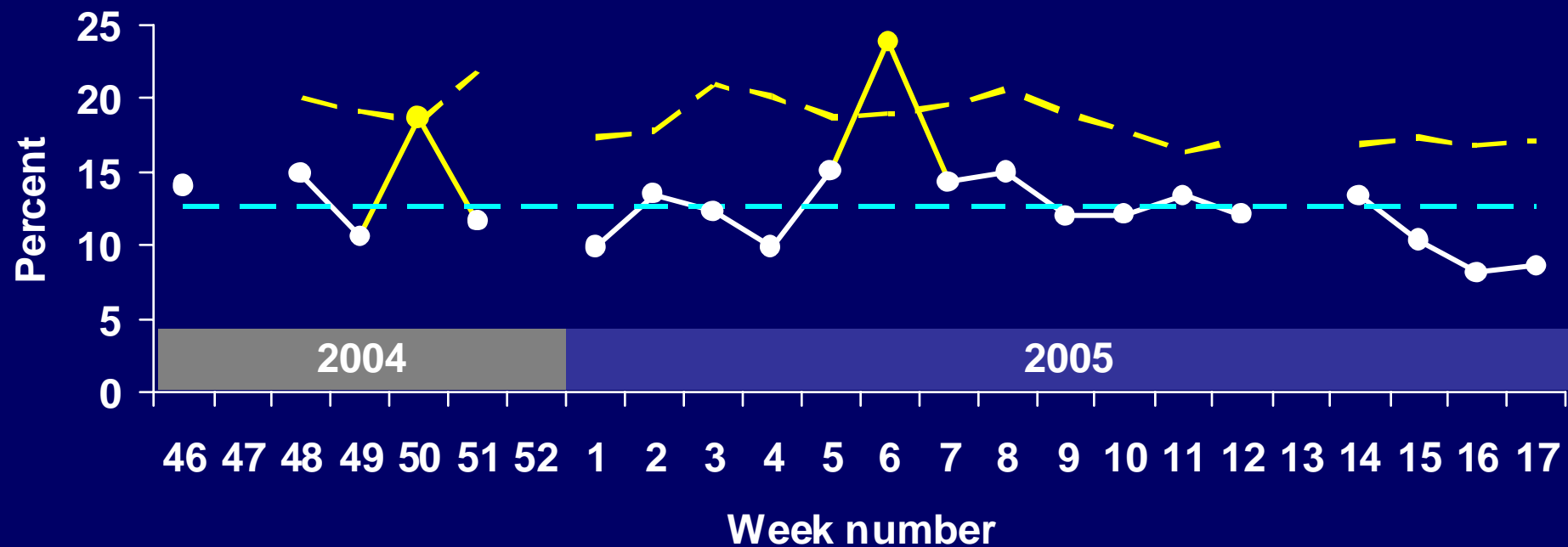
# SNS Influenza-Like Illness per Week



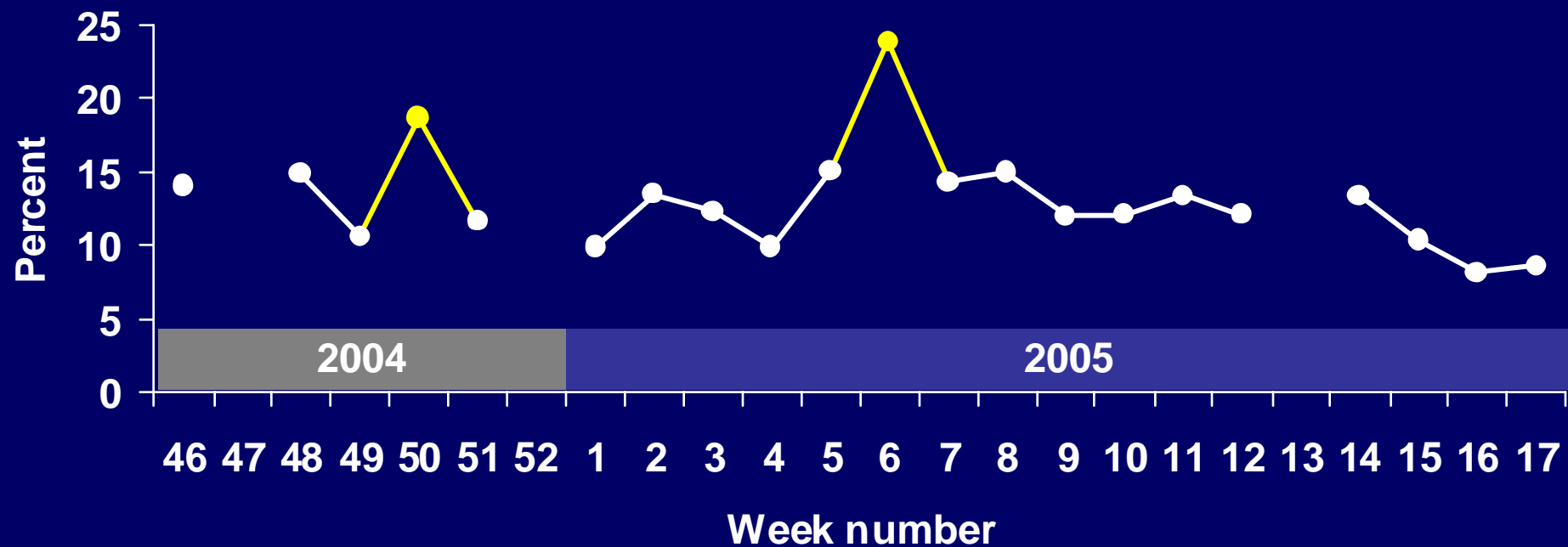
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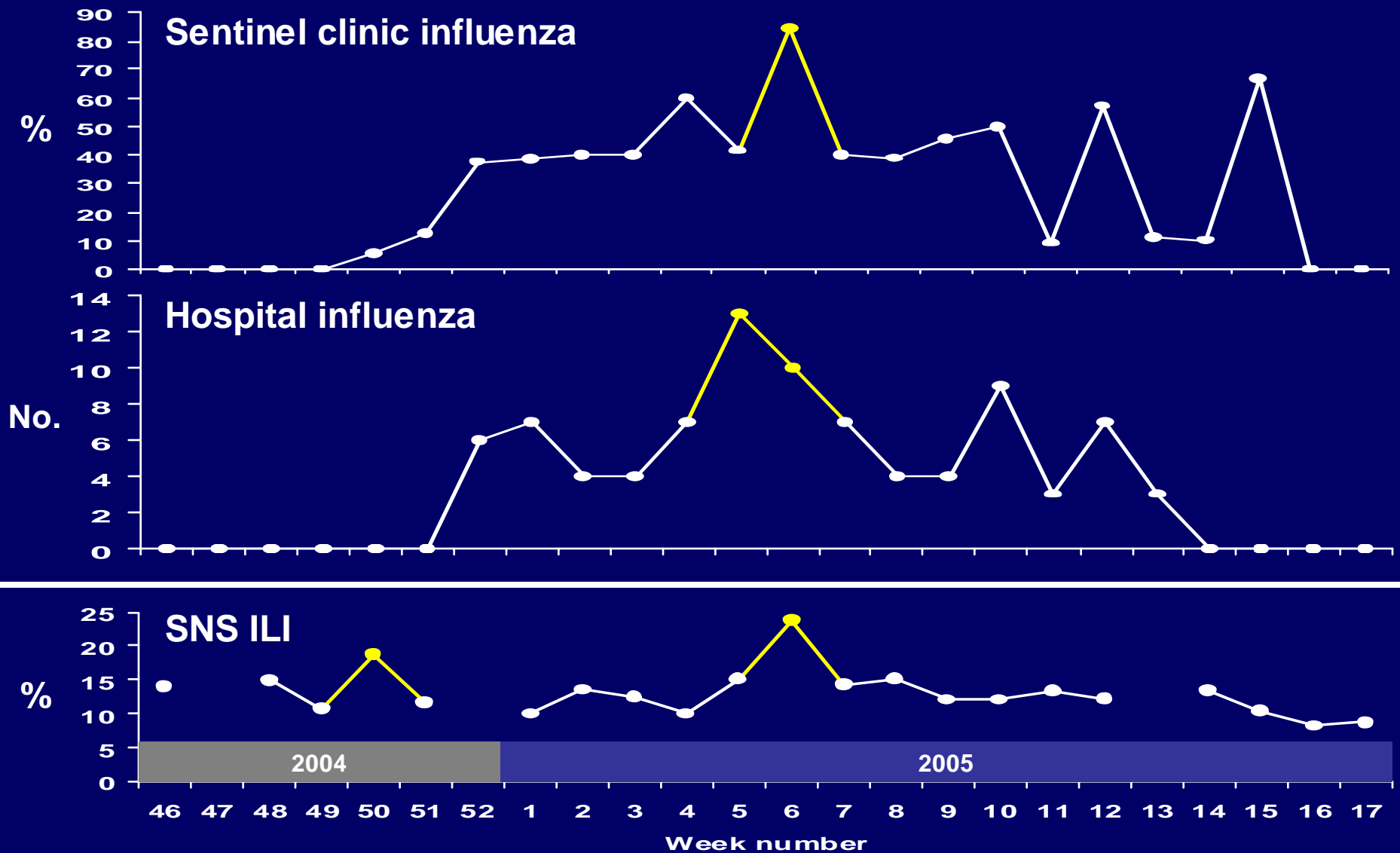
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# SNS Influenza-Like Illness per Week

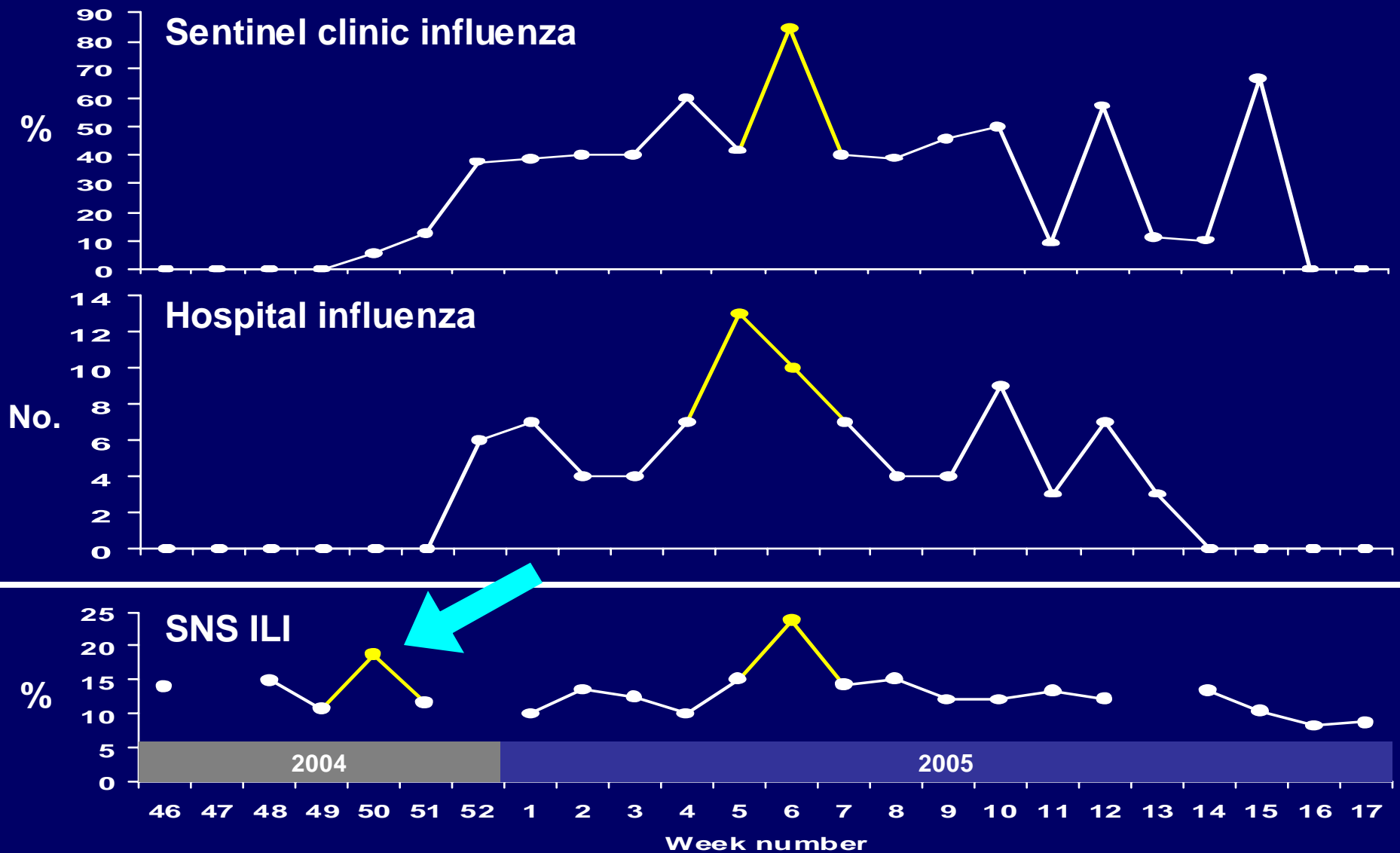


# Lab-Confirmed Influenza Versus SNS

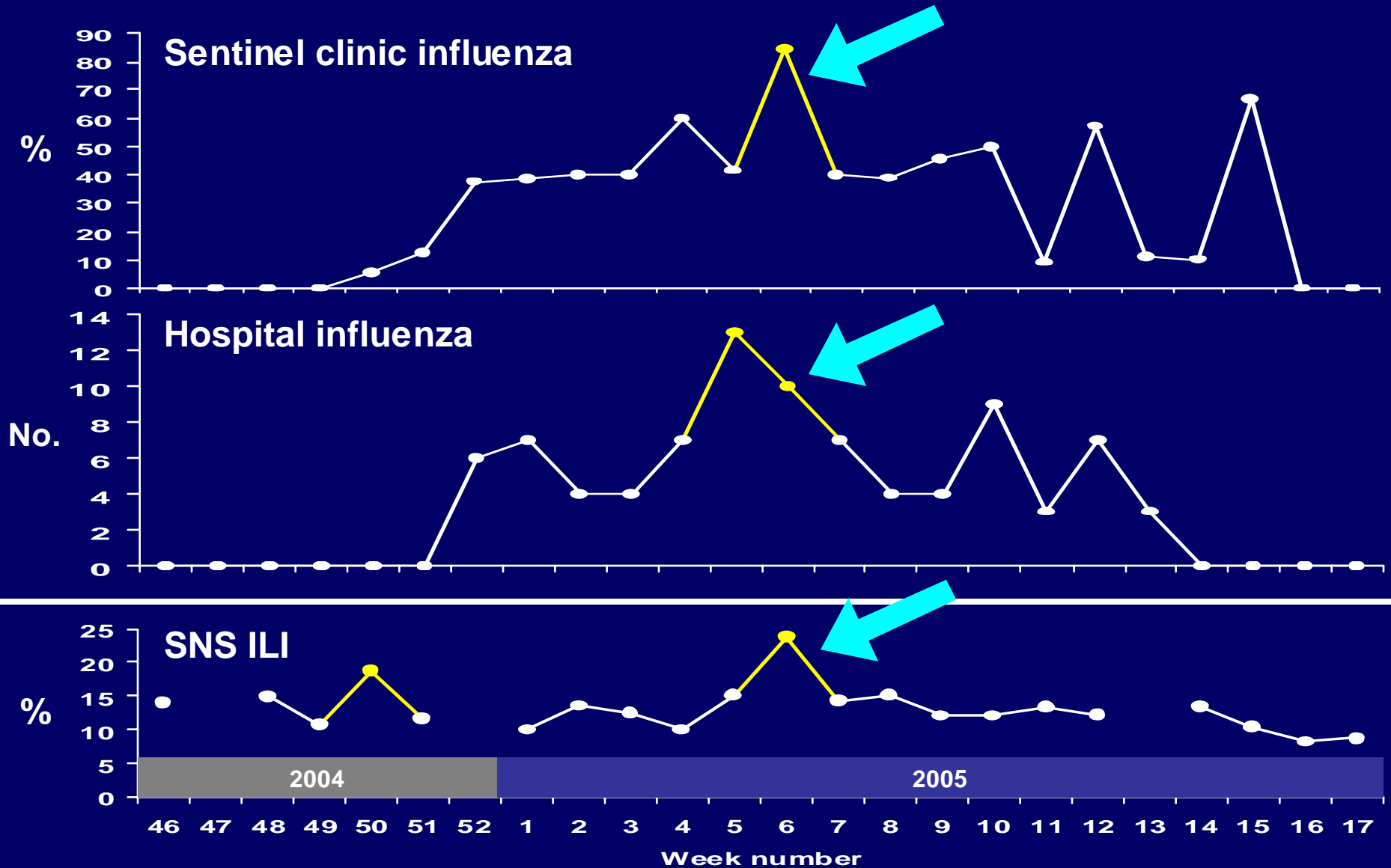




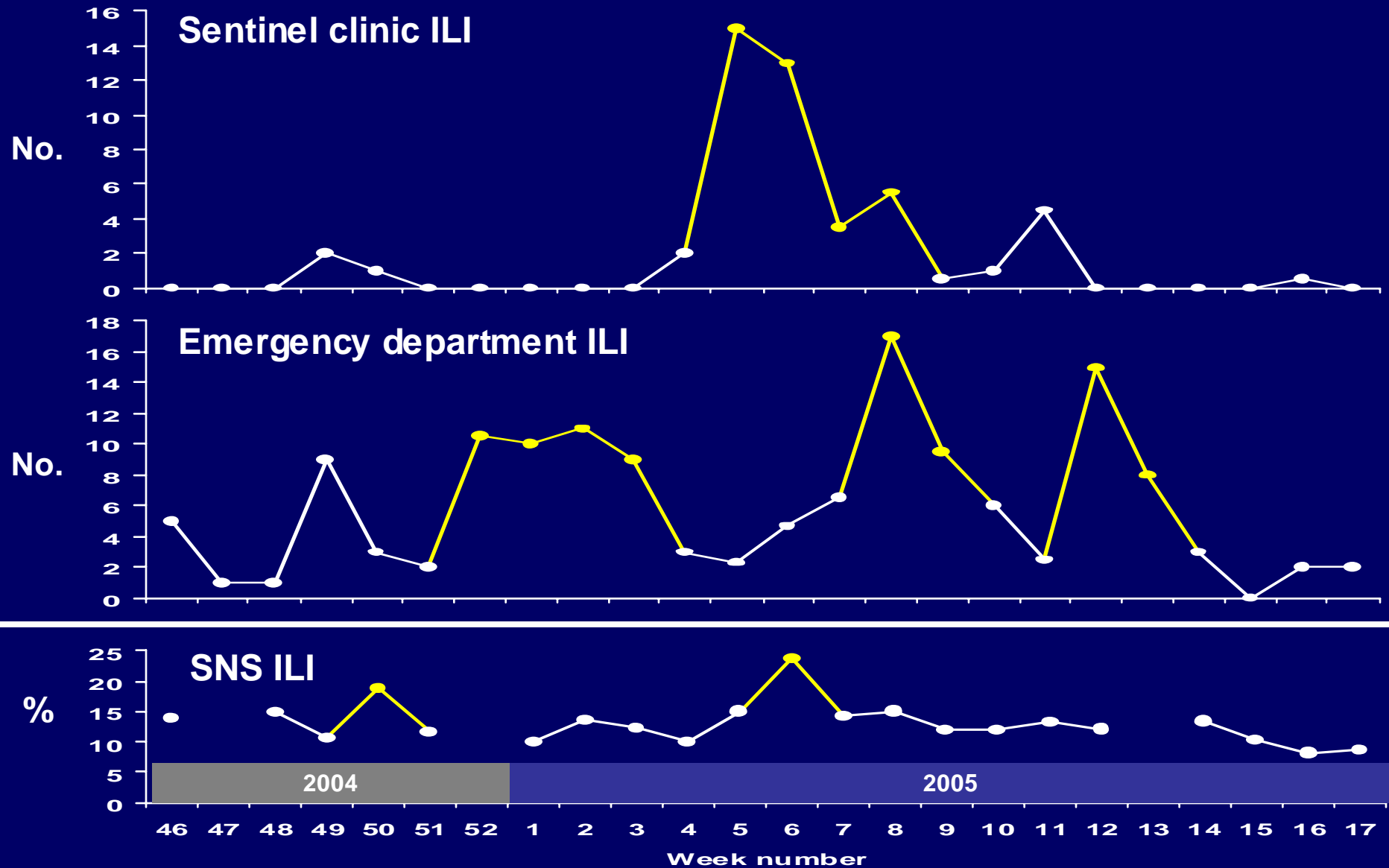
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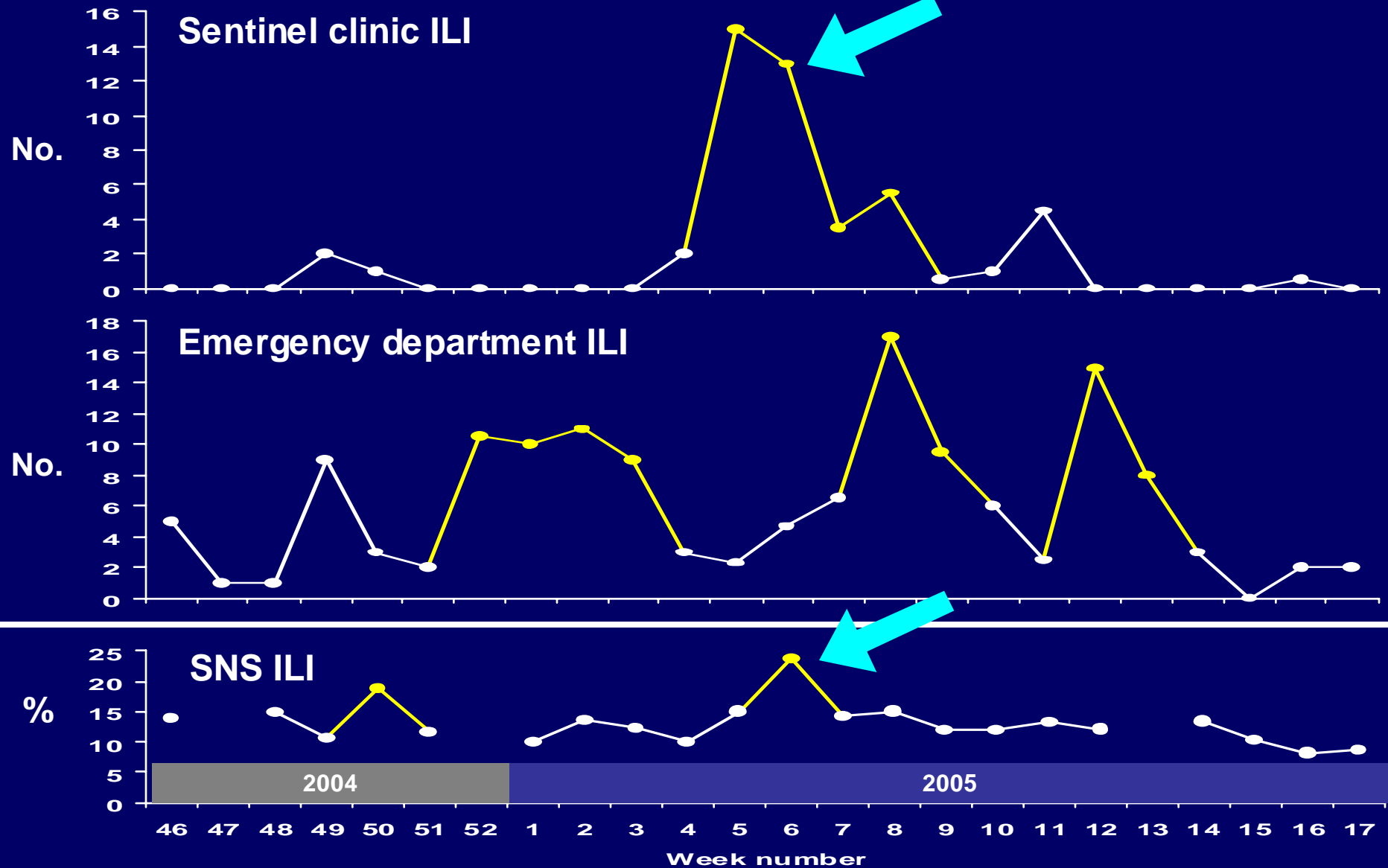
# Lab-Confirmed Influenza Versus SNS



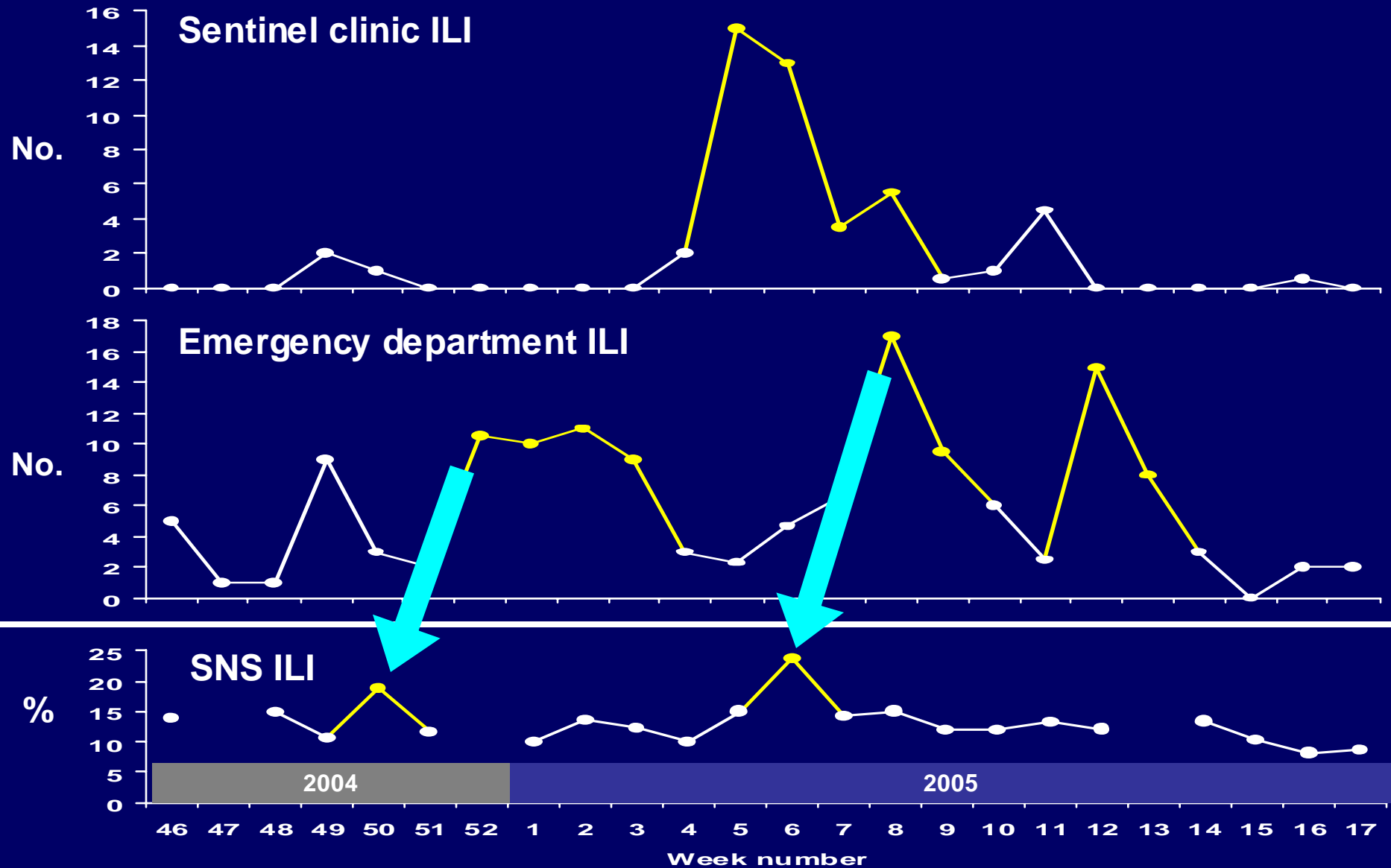
# ILI Visits Versus SNS



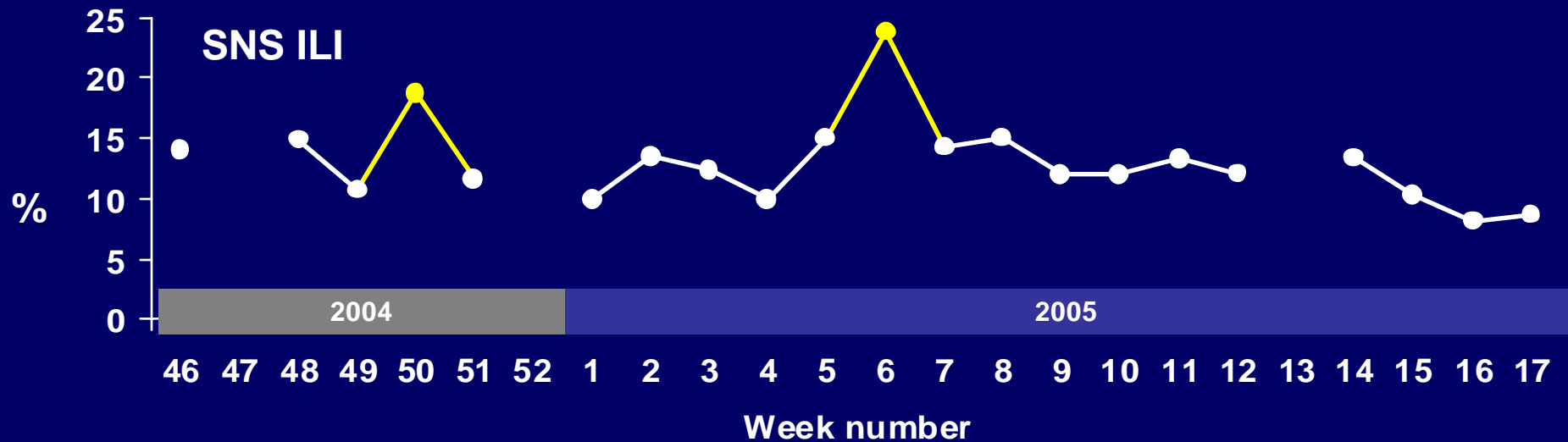
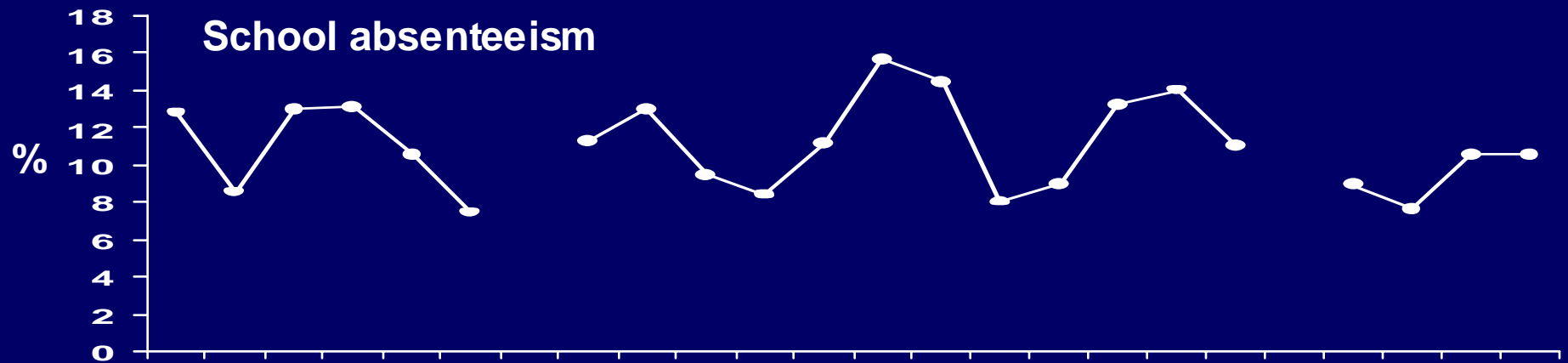
# ILI Visits Versus SNS



# ILI Visits Versus SNS



# School Absenteeism Versus SNS



# Discussion

- **School nurse visits related to ILI might help monitor community influenza activity**
- **Two peaks in school nurse visits**
- **The large peak likely caused by influenza**
  - **Hospital influenza, sentinel clinic influenza, and sentinel clinic ILI with coincident peaks**
  - **Emergency department ILI with 2 peaks likely preceded by SNS peaks**

# Discussion

- Cause of small peak in SNS visits less certain, but influenza most likely
- School absenteeism had no peaks



# Limitations

- **Restrictions in SNS required a non-traditional ILI definition**
  - **Unknown effect on sensitivity and specificity**
- **Hospital and clinic data might not be representative**

# Conclusion

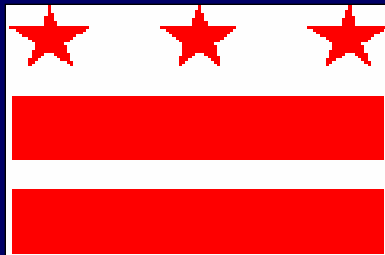
- **Increases in school nurse visits related to ILI might be useful in augmenting traditional influenza surveillance**

# Recommendations

- Encourage school nurses to report more than one symptom to SNS to improve ILI detection
- Encourage more schools to report to SNS and encourage hospitals and sentinel clinics to report denominator data
- Consider collection of specimens by school nurses to improve specificity and usefulness of system

# Acknowledgments

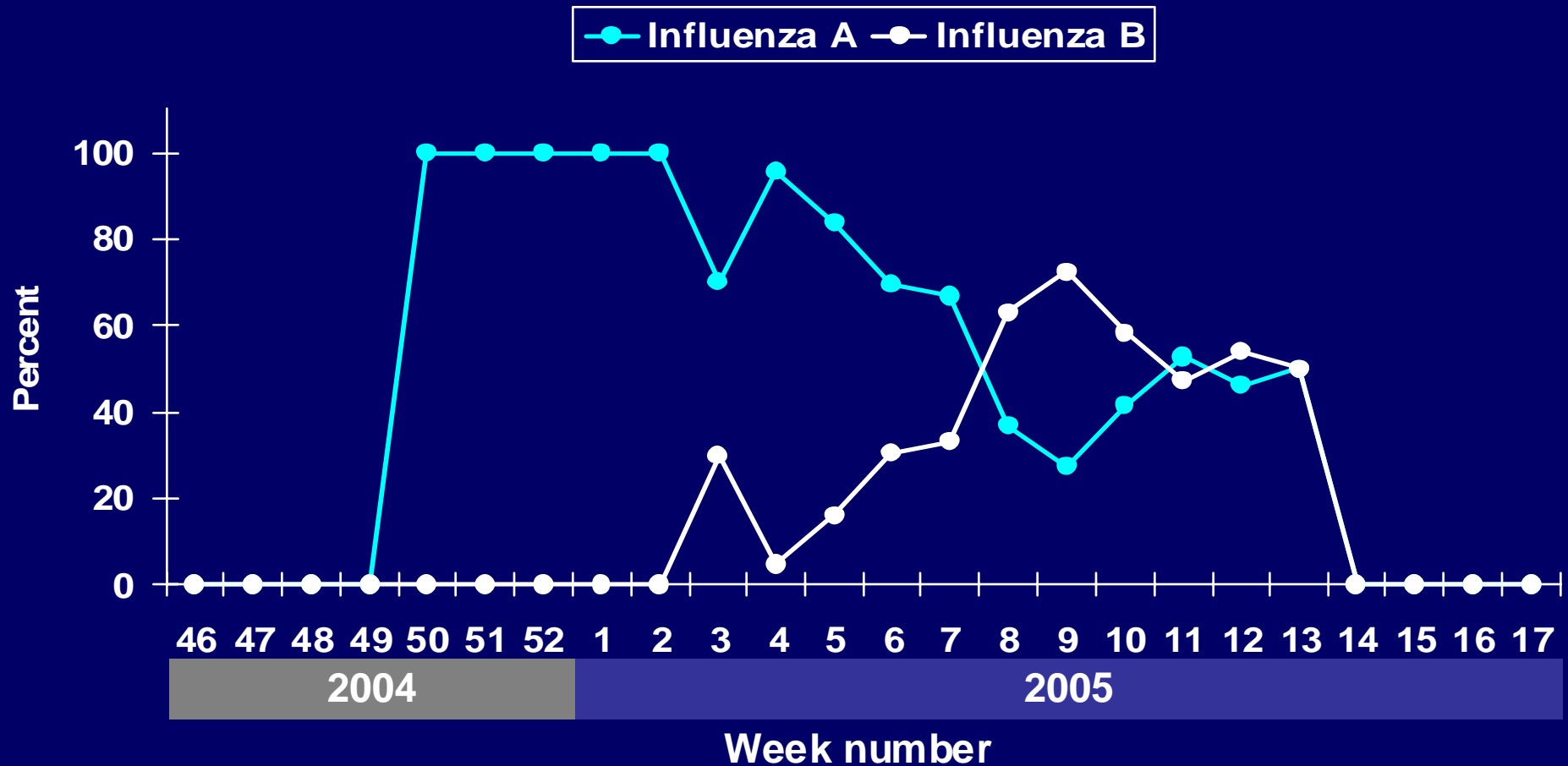
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OMB Disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention



# Influenza A Versus B Positive Samples per Week



\*Weeks when only 1 positive reported were excluded