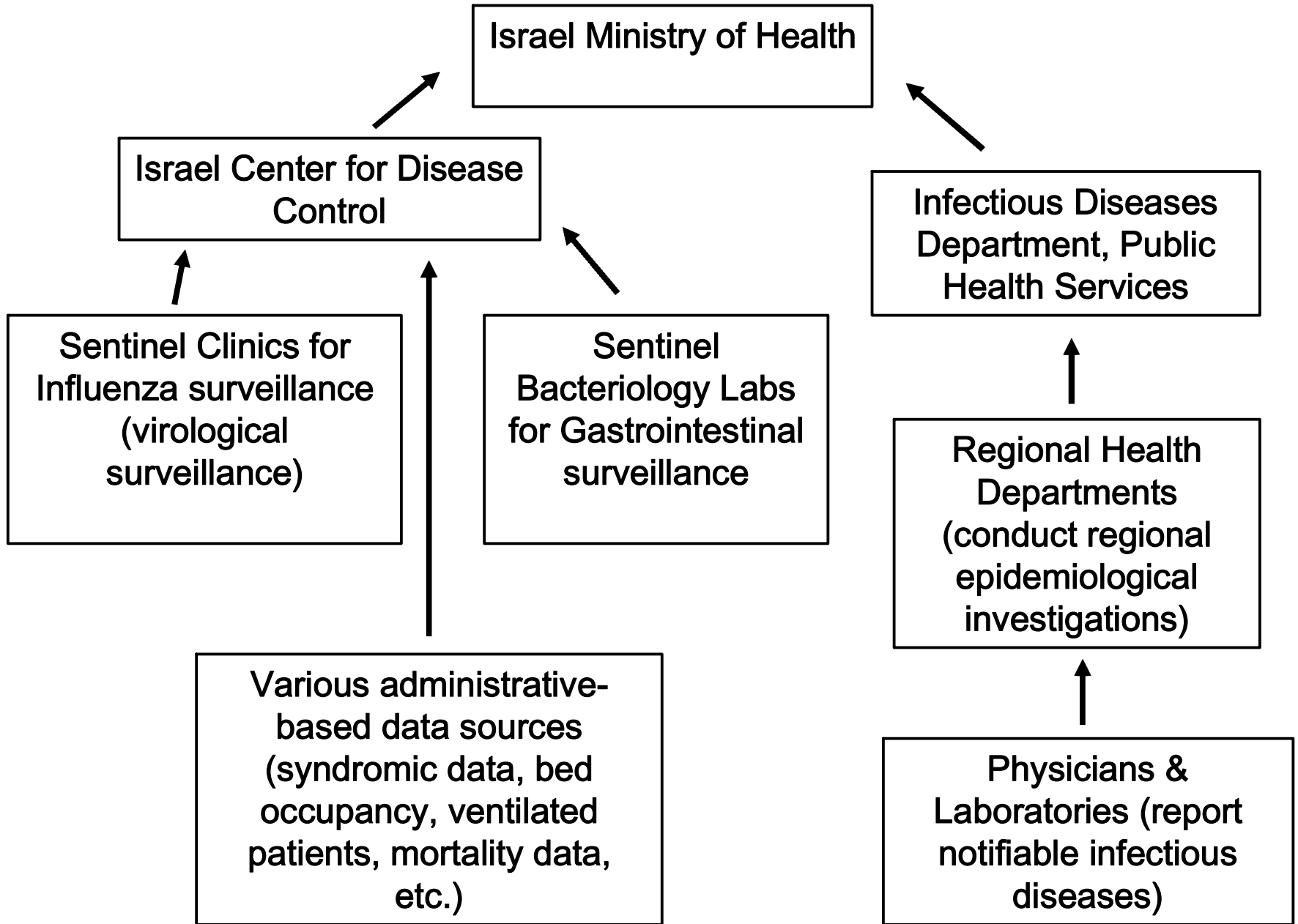
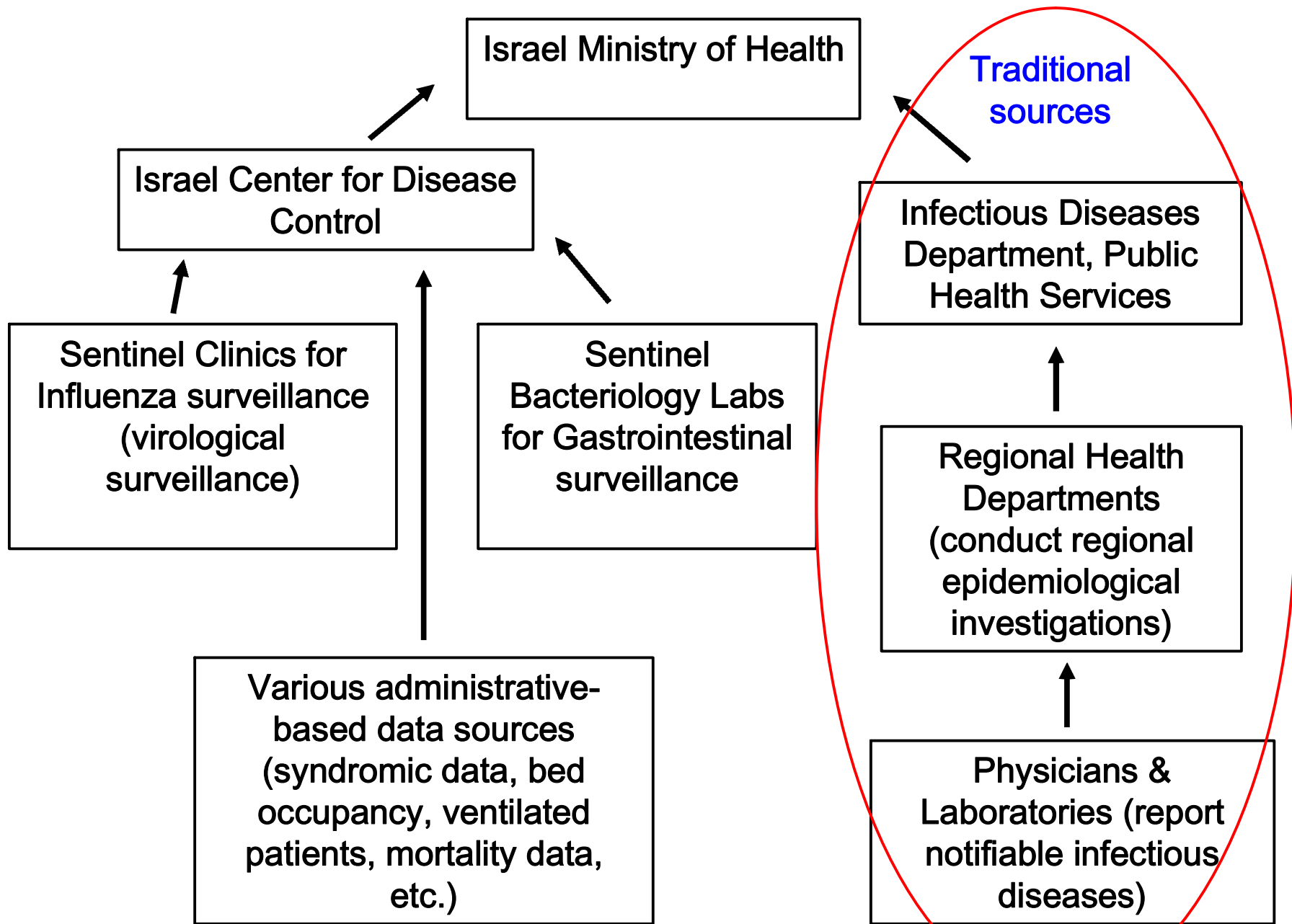


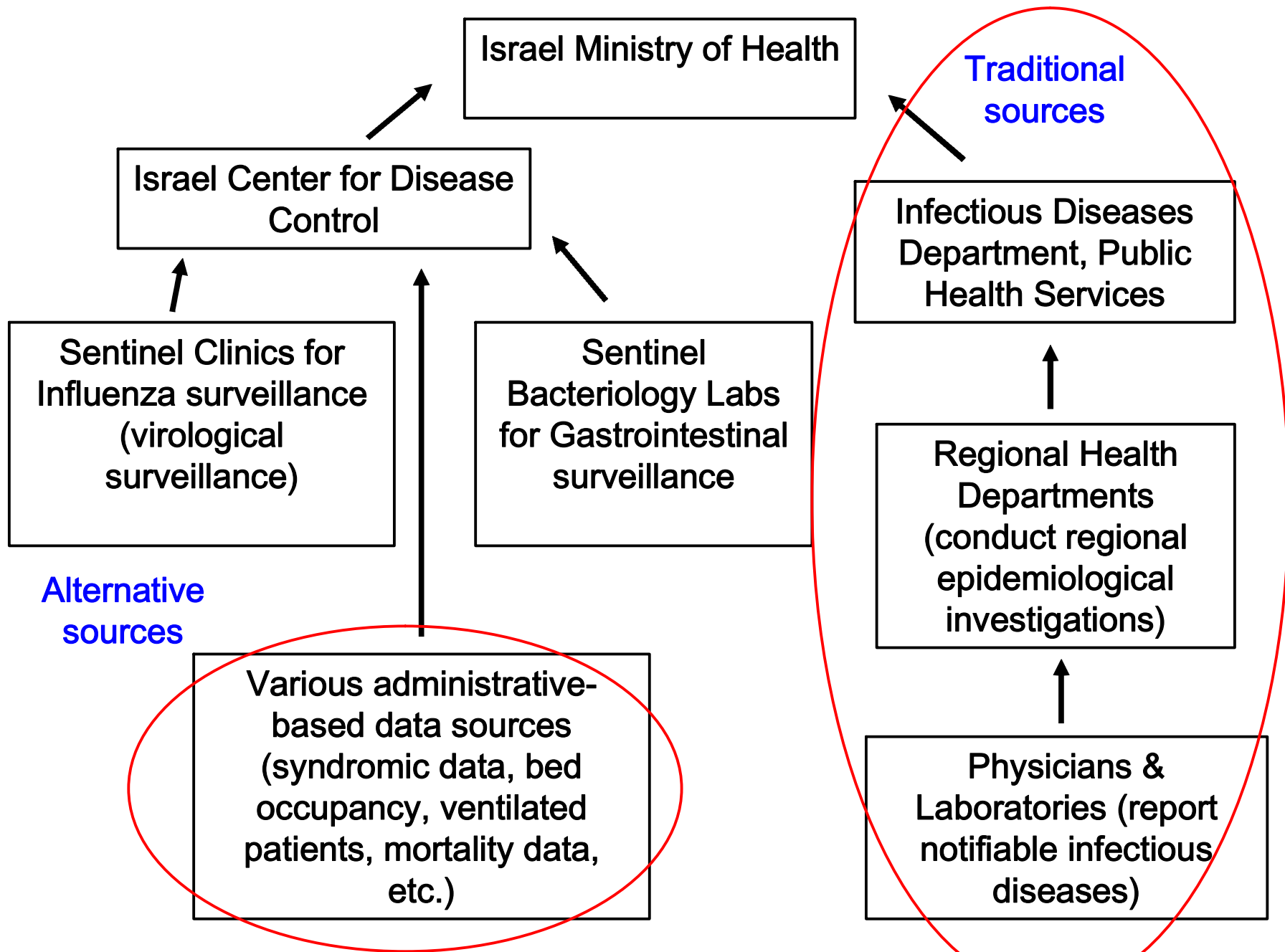
Integration of Alternative Sources in Israel's Surveillance Systems

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Ministry of Health











Traditional Sources

- Based on compulsory reporting of specific, diagnosed diseases
- Deficiencies:
 - Passive system
 - Under reporting
 - Time lag from beginning of outbreak
- Example in Israel: Notifiable Infectious Diseases, Department of Epidemiology and Infectious Diseases, MOH



Alternative Sources Used by the ICDC



Syndromic Surveillance

- Collects information on signs and symptoms
- Examples: fever, headache, diarrhea, cough, rash, etc.
- Based on the underlying assumption of an increase or clustering of cases with non-specific symptoms in the early phase of the outbreak
- Therefore, should enable relatively early detection of infectious disease outbreaks



Syndromic Surveillance Data Sources

- **Community clinics**
 - Visits to community clinics due to specific symptoms & signs
 - ~25% coverage of the Israeli population
- **Emergency rooms**
 - Visits to ER due to specific symptoms & signs
 - Coverage: 8 / 23 general hospitals



Other Data Sources

- **General hospitals**
 - Bed occupancy by wards
 - Mechanically ventilated patients
 - Nationwide
- **Bacterial laboratories**
 - Blood cultures
 - 9 / 23 general hospitals



Other Data Sources

- District health departments
 - Out of hospital death
 - Coverage: ~30%
- Department of epidemiology
 - Total mortality
 - Nationwide
 - Time delay



Alternative Sources transmission

- Most of the data are transmitted:
 - On daily basis
 - By e-mail



Alternative Sources Summary

- Based on administrative data
- Not disease specific
- Advantages:
 - Not dependent on diagnosis
 - Makes use of data gathered during routine clinical practice or for administrative purposes
 - Simplifies electronic case reporting by clinicians- by automatic reporting to a central monitoring station



Alternative Sources Summary

- **Disadvantages:**
 - Detects signals that need to be validated to events
 - Need for appropriate analytical tools
 - False positive- identification of unimportant outbreaks
 - False negative- failure to detect due to high inherent noise in the data
 - Technical difficulties in obtaining the data and maintaining the databases



Usage of the Alternative Sources by the ICDC



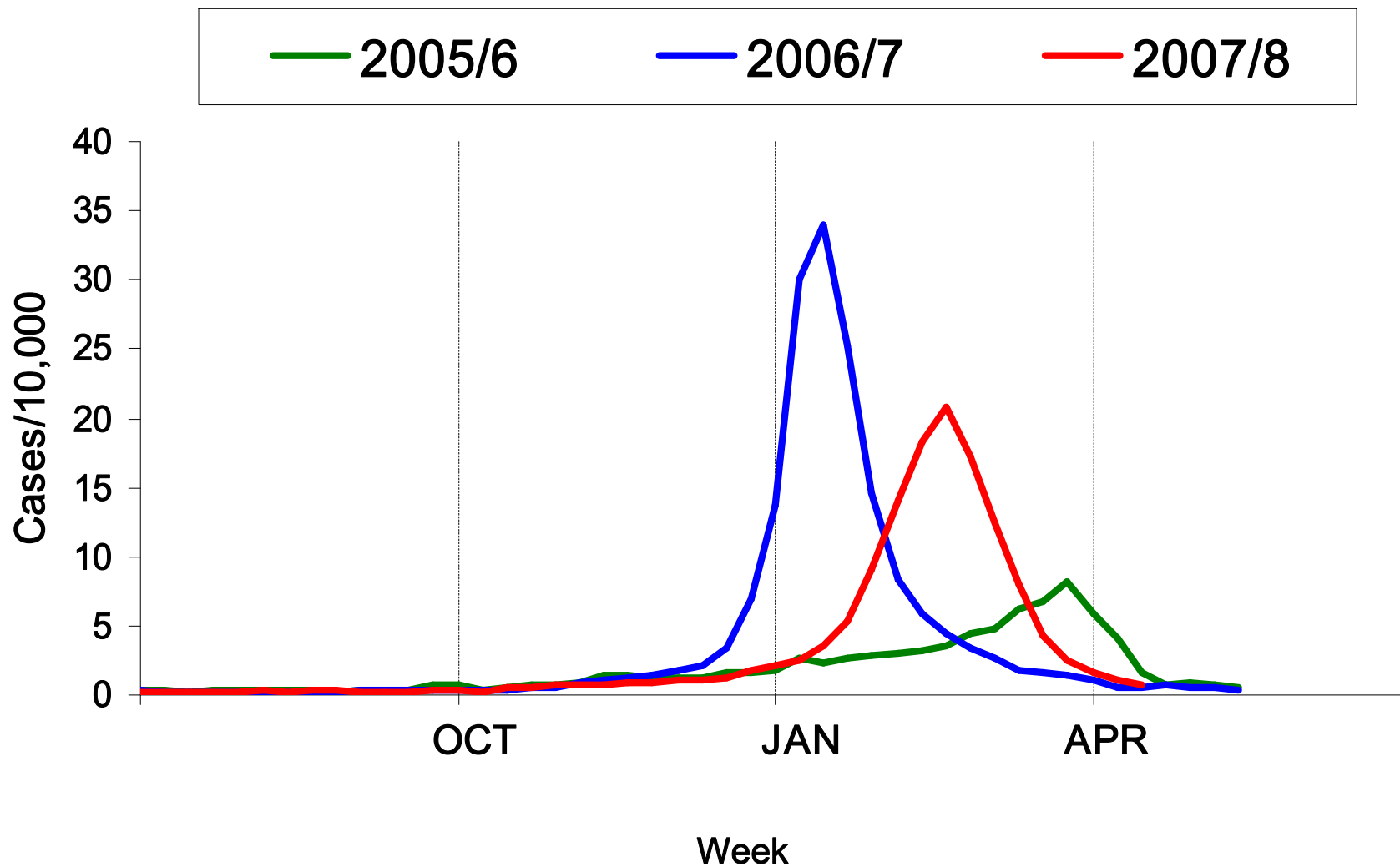
Usage of the Alternative Sources

- Routine usage
 - Influenza surveillance
 - Gastrointestinal surveillance
- Part of Israel preparedness plan for
 - Pandemic influenza
 - Bioterrorism
- Future usage: surveillance of antibiotic resistant infections

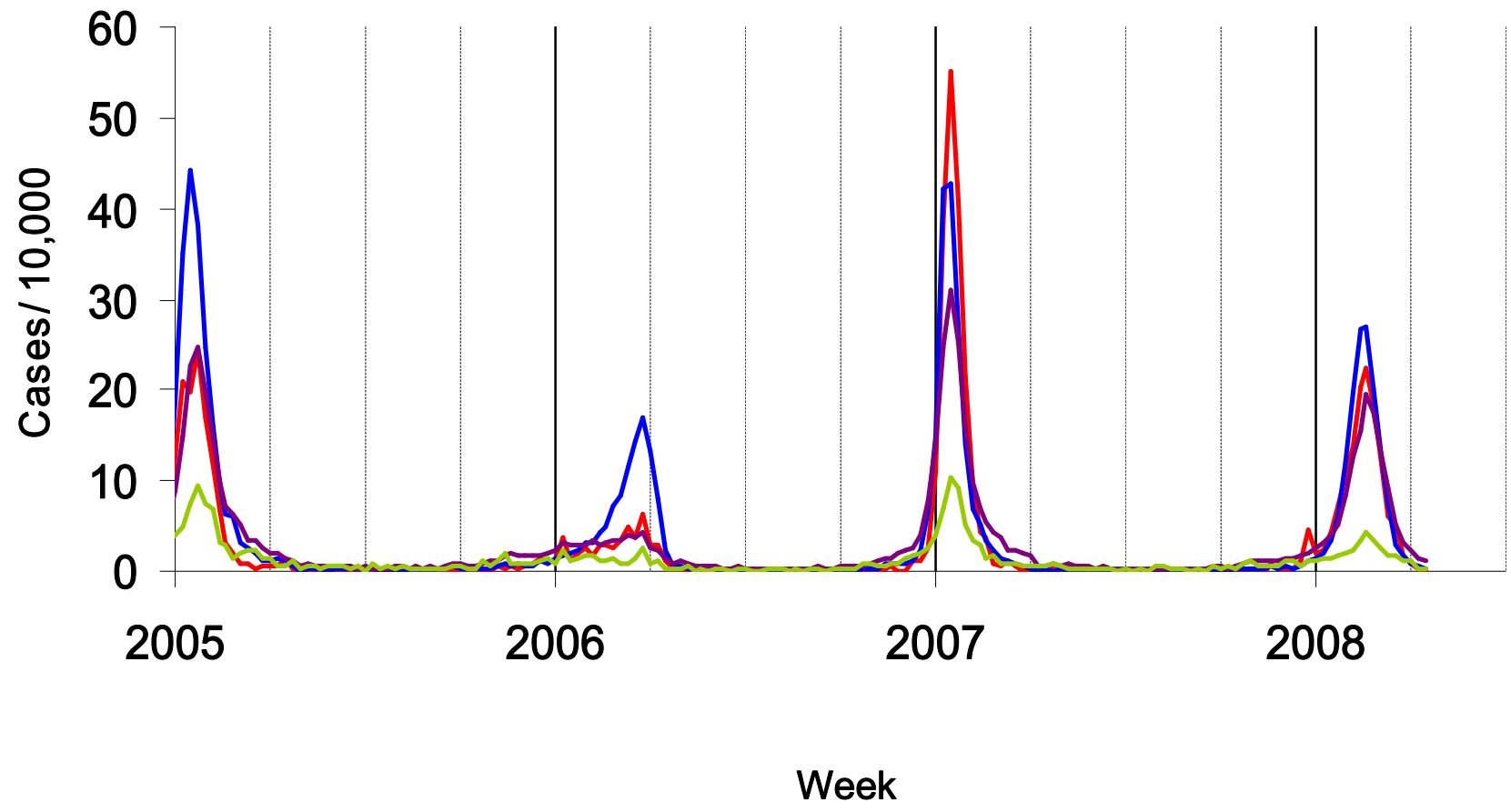


Influenza Surveillance

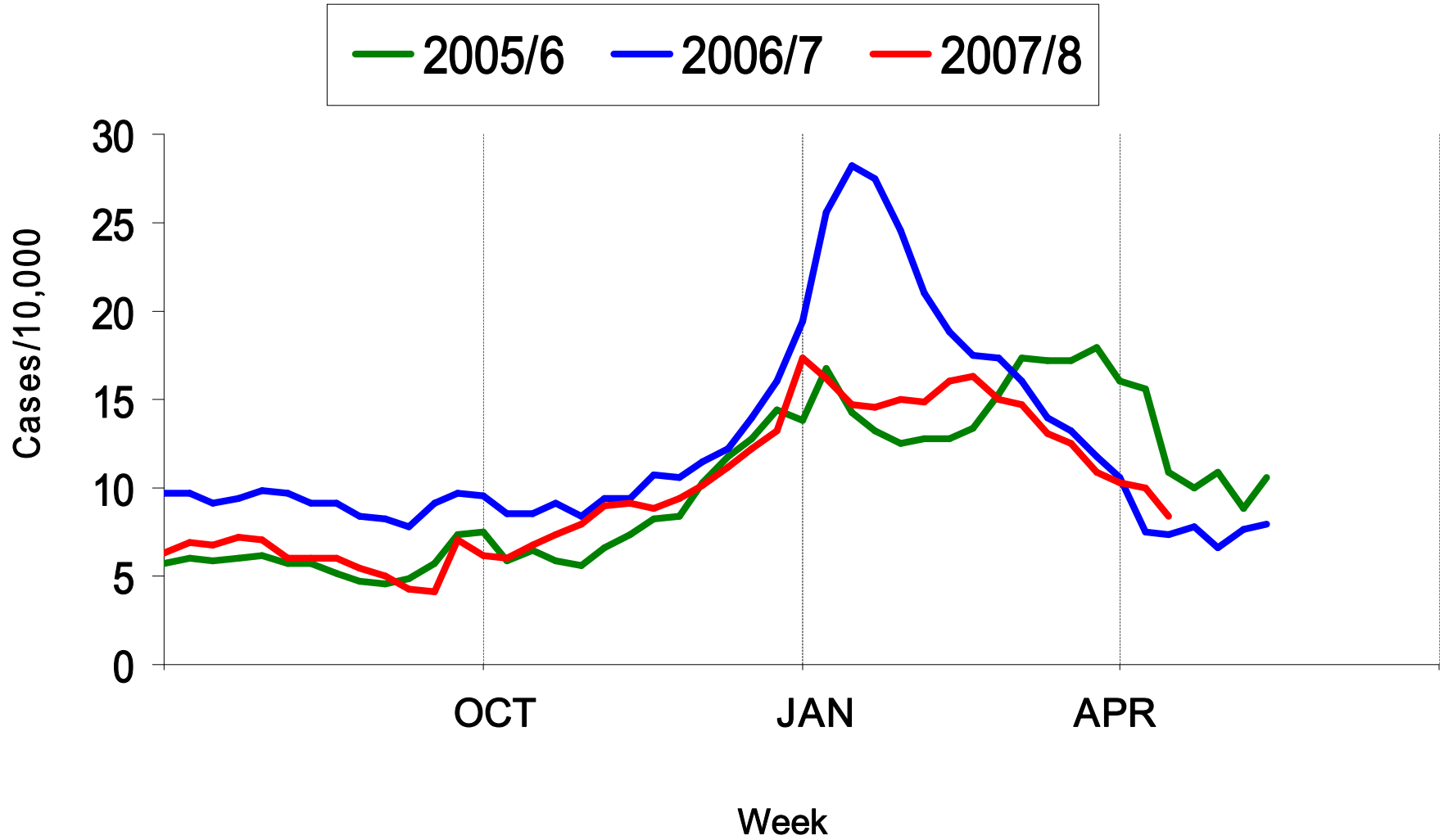
Weekly visits to community clinics due to influenza like illness, by year 2005-2008



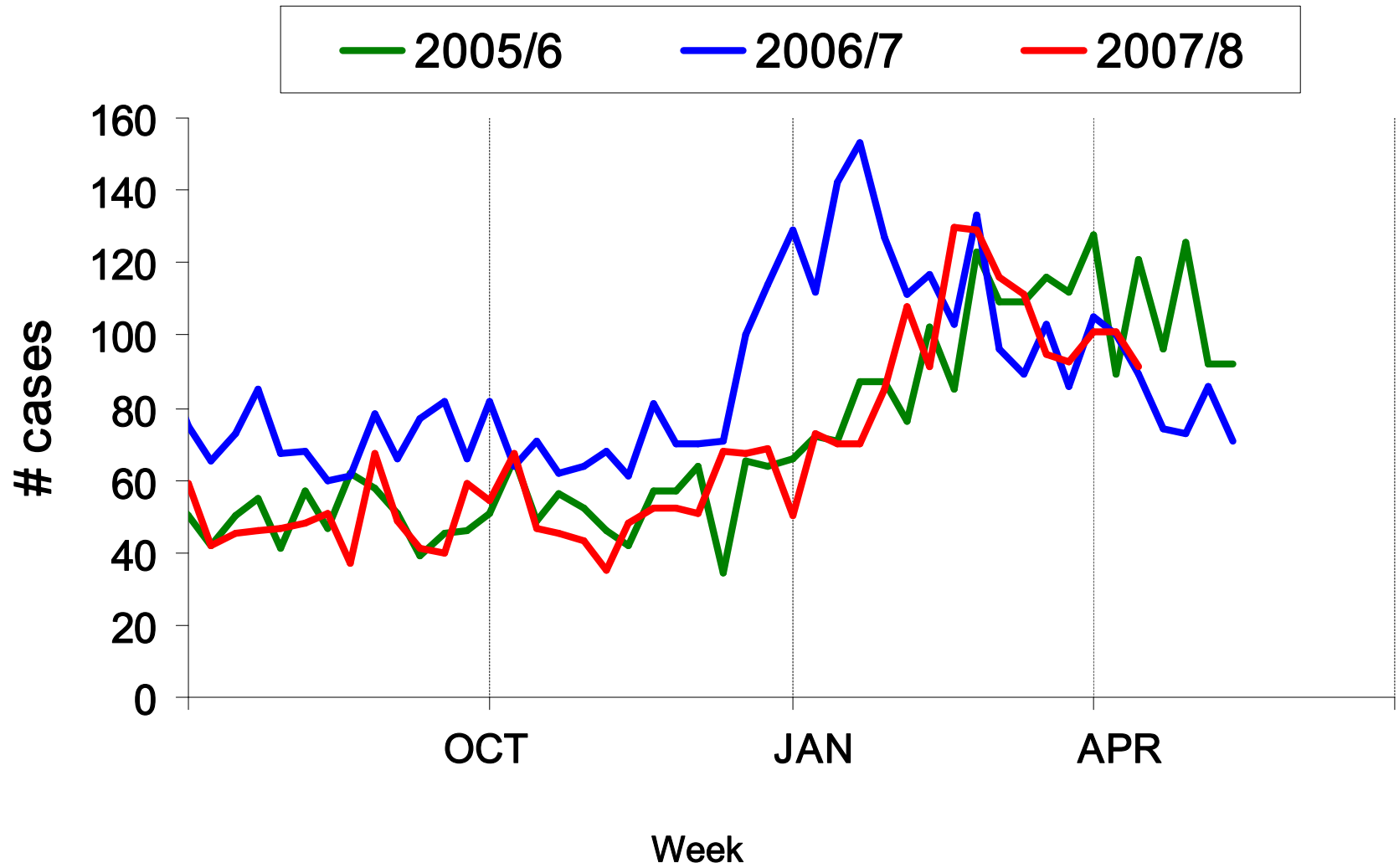
Weekly visits to community clinics due to influenza-like illness, by age 2005-2008



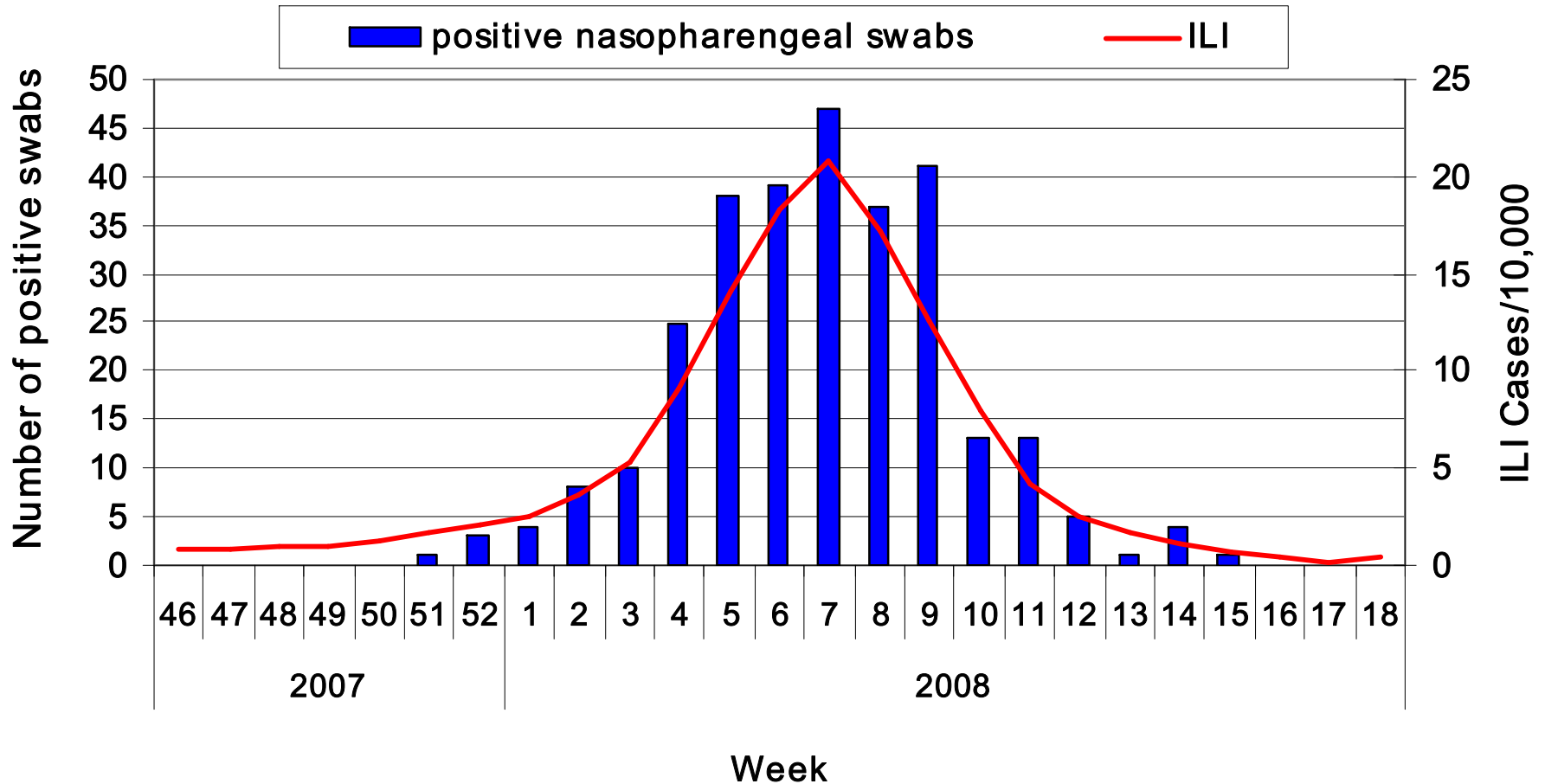
Weekly visits to community clinics due to pneumonia, by year, 2005-2008



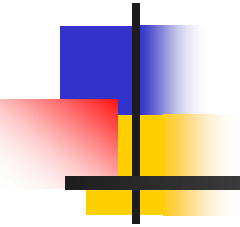
Visits to Emergency Rooms (adults) due to Pneumonia, Clalit Hospitals, 2005-2008



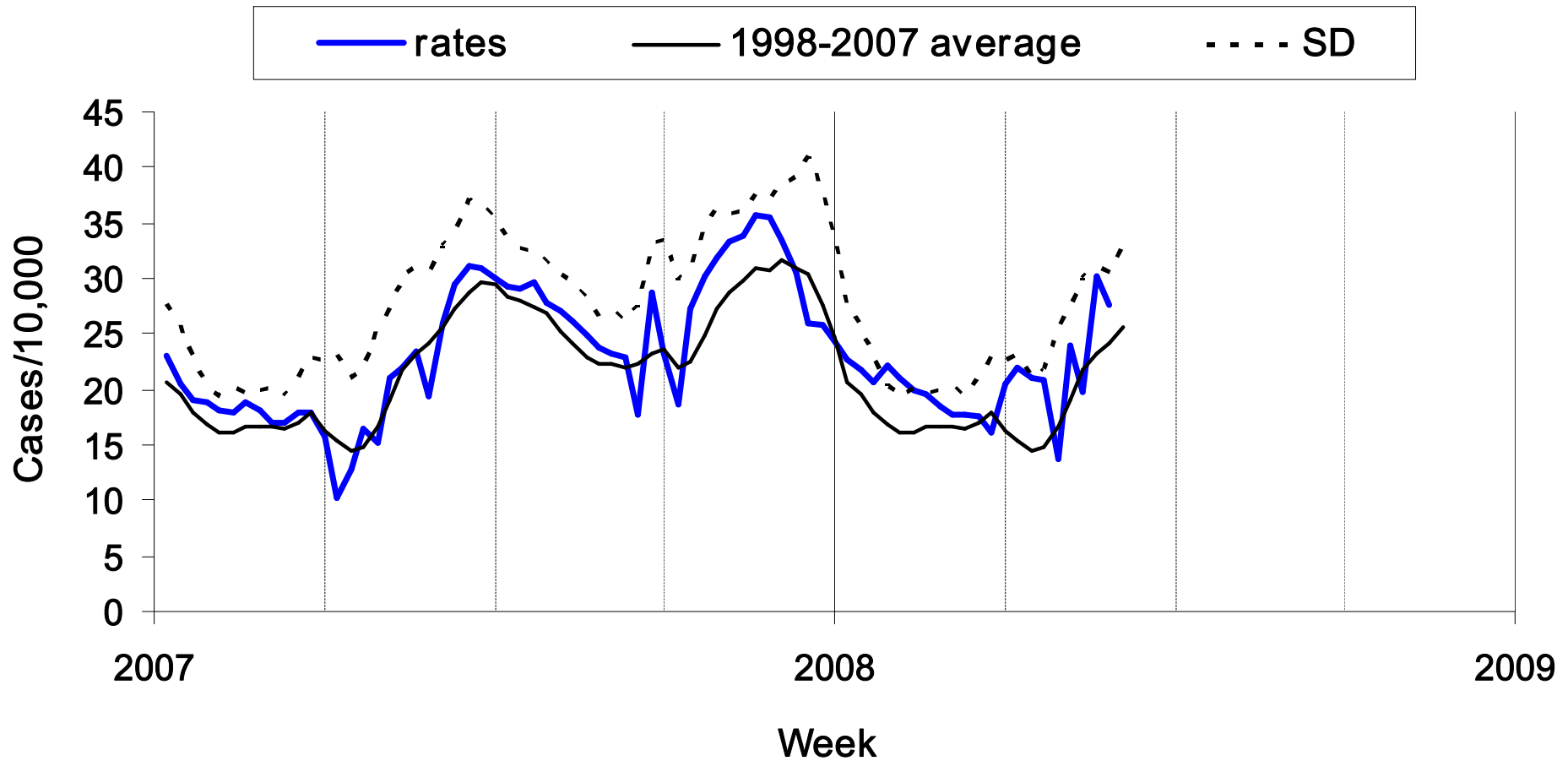
Number of positive specimens to influenza compared to weekly consultation rates due ILI, winter of 2007/08



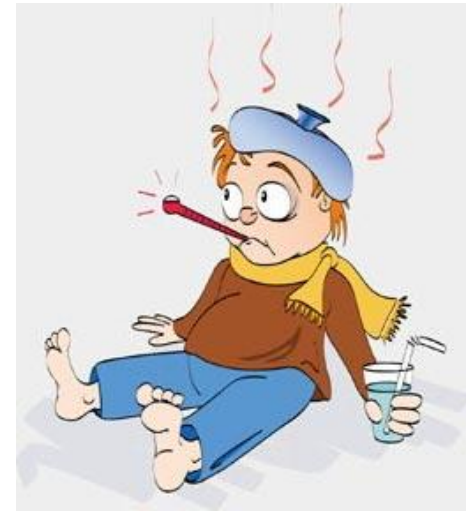
Gastrointestinal Surveillance



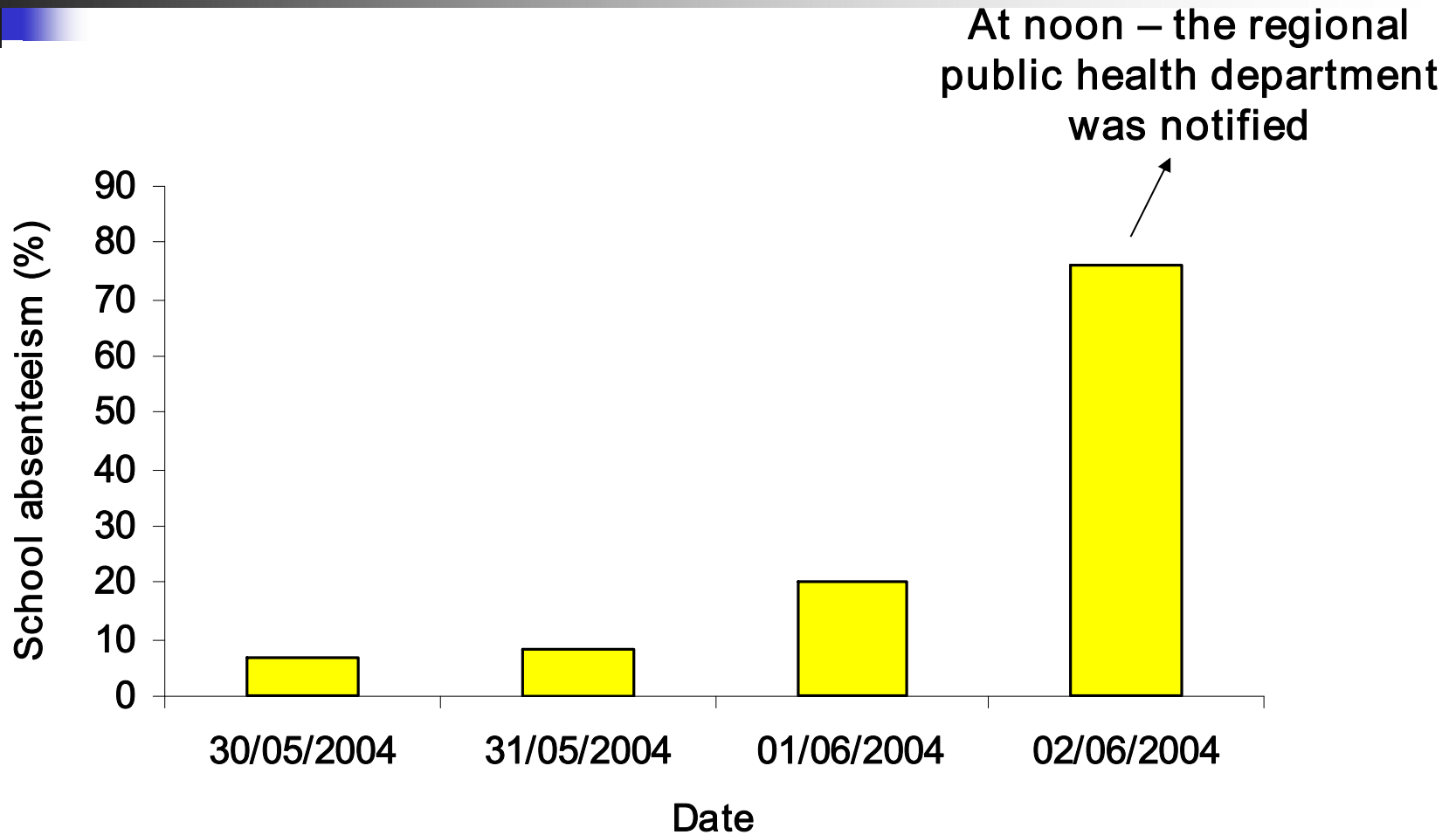
Weekly visits to community clinics due to gastroenteritis, 2007-2008



Unusual Outbreak of Influenza B in an Elementary School



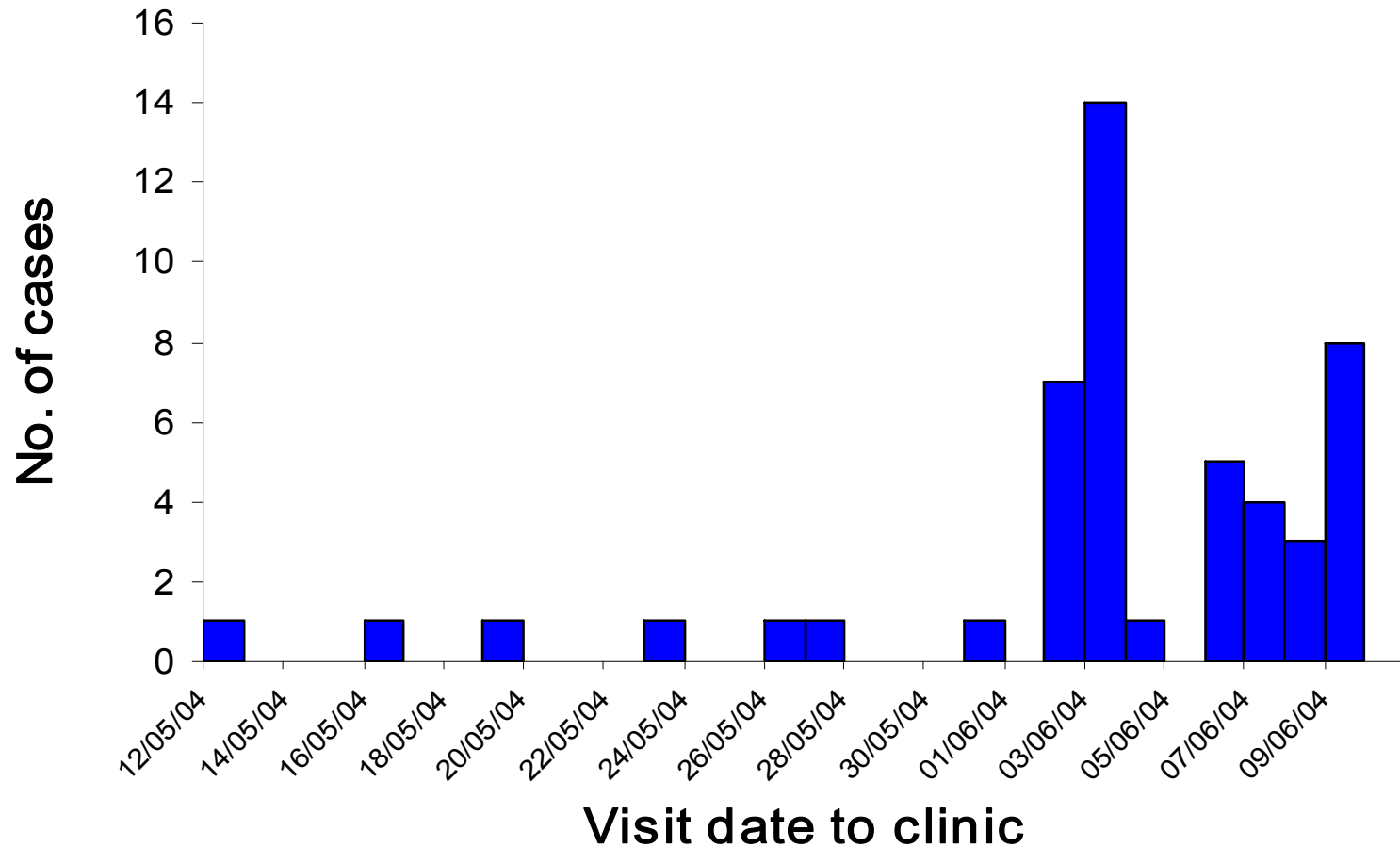
Absenteeism of Pupils of Two 4th Grade Classes



Statistically significant signals identified in the community clinic data set by WSARE

| Date | Today's ratio | Other ratio | Town | Age | Diagnosis | p- value |
|---------|---------------|-------------|------|------|-----------|----------|
| 25/5/04 | 2.55 | 0.14 | Z | - | URTI | <0.0001 |
| 27/5/04 | 2.35 | 0.16 | Z | - | URTI | <0.0001 |
| 2/6/04 | 1.44 | 0.02 | X | 6-14 | VI | <0.0001 |
| 3/6/04 | 2.78 | 0.02 | X | 6-14 | VI | <0.0001 |
| 6/6/04 | 4.08 | 1.83 | - | - | CHP | 0.002 |
| 7/6/04 | 2.45 | 0.29 | Y | - | VI | 0.002 |

Visits to Community Clinics due to Viral Infection, children 6-14 years, Residing at Town "X"





Conclusions

- If data were available for analysis in real time, the first anomaly could be detected on day 2 of the outbreak (simultaneously with notification)
- Timely information produced by syndromic surveillance is of highly value in supporting outbreak management



Questions