Electronic Pathology Reporting to the OCR

Statistical Process Control?

Paper vs E-path?

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E-path System

- > 90,000 pathology reports annually
- From 85+ labs across Ontario
- As of June 1, 2003 there were 7 labs reporting electronically
- The 7 labs account for 20-25% of the volume
- All by March 2005??

DQ Parameters for Cancer Information Systems (from Hilsenbeck, 1990)

- Consistency of classification / coding
- Completeness and accuracy of data elements
- Timeliness of registration
- Constancy of publication
- Completeness of case ascertainment
- Cost-efficiency

Ultimate Parameter of Data Quality ?

Lots of Good Use !

"The only value of an information system is in its use."

Calum Muir

Quality and Productivity
Measurement and Improvement

- **Basic Infrastructure/Resources**
- **Designed Studies**
- **Statistical Process Controls**

Basic QM/I Infrastructure

- Staff and Training
- Documentation of Processes
- Data Dictionary
- Edit Checks

Designed Evaluation Studies

- Consistency of Coding/Classification
- Estimation of Completeness of Case(Report) Finding
- Estimation of Completeness and Accuracy of Core Data Elements

Statistical Process Control

- Using statistical methods and tools to continuously monitor and improve the quality of production systems

➔ not only the average quality/productivity, but the variability too!

Statistical Process Controls

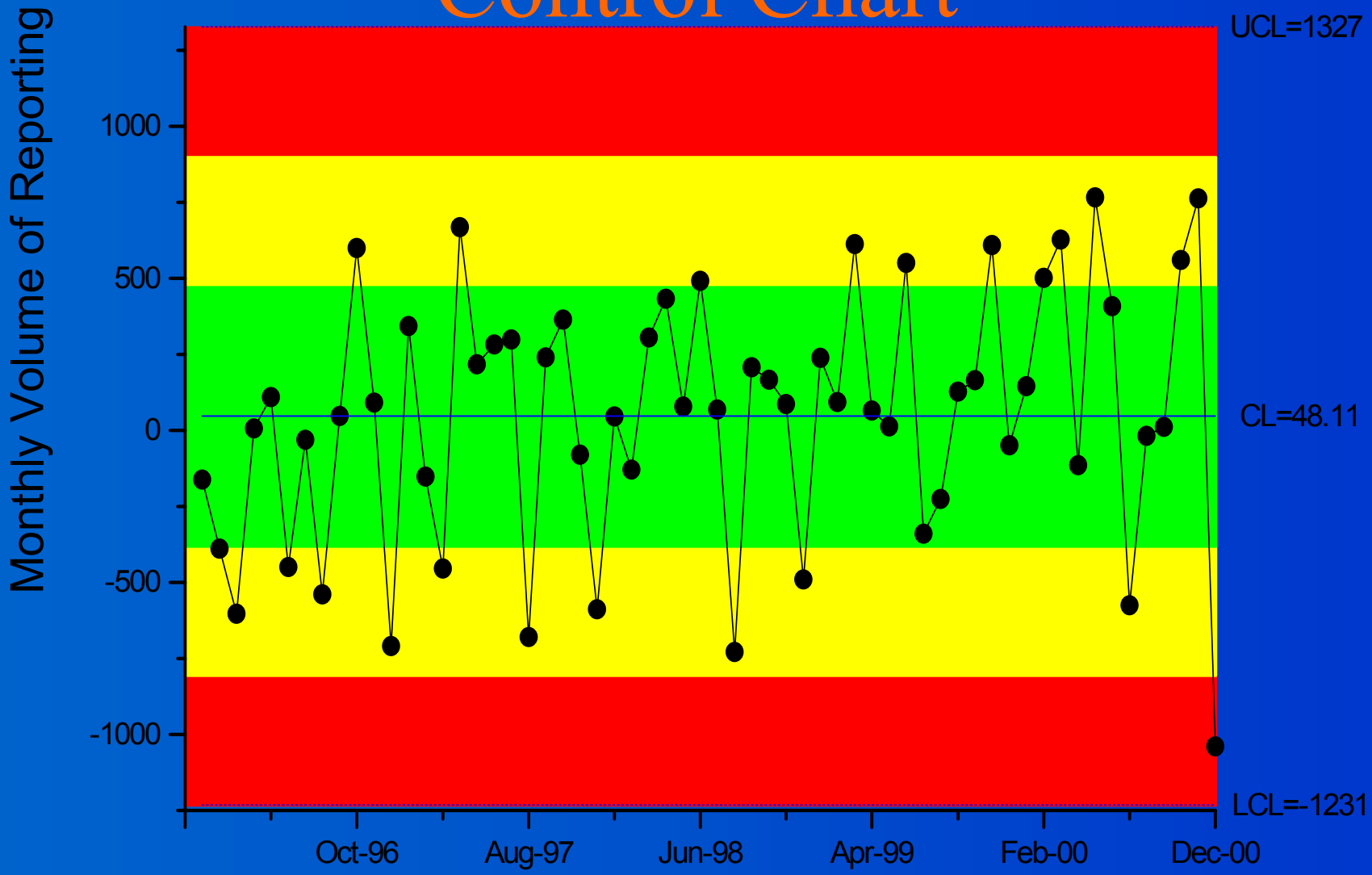
- Control Charts for Time-series Monitoring

  - ***completeness of source reporting / reg'n***
  - ***timeliness of reporting / reg'n***
  - ***completeness of core data elements***

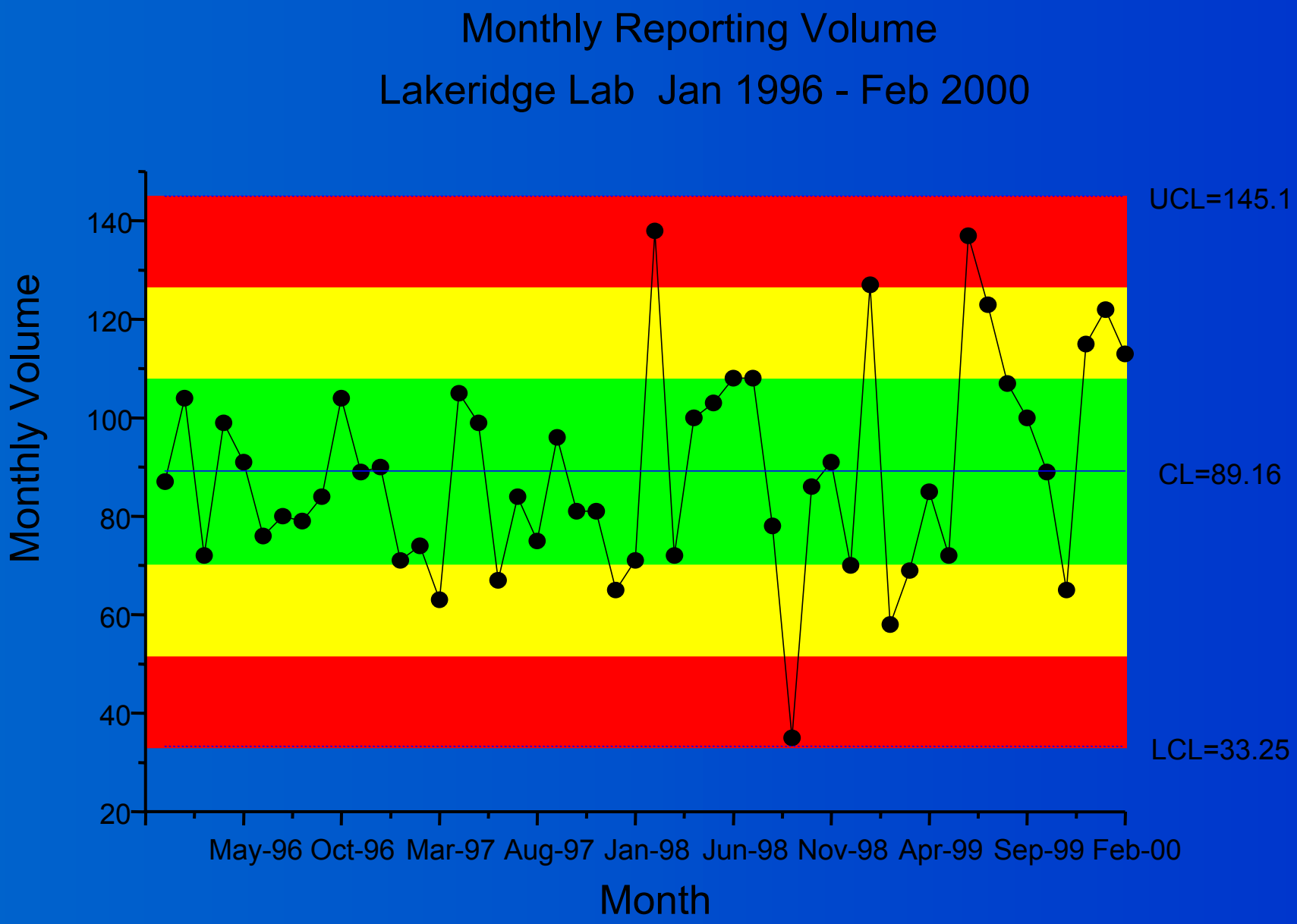
All Ontario Labs

EWMA Residuals

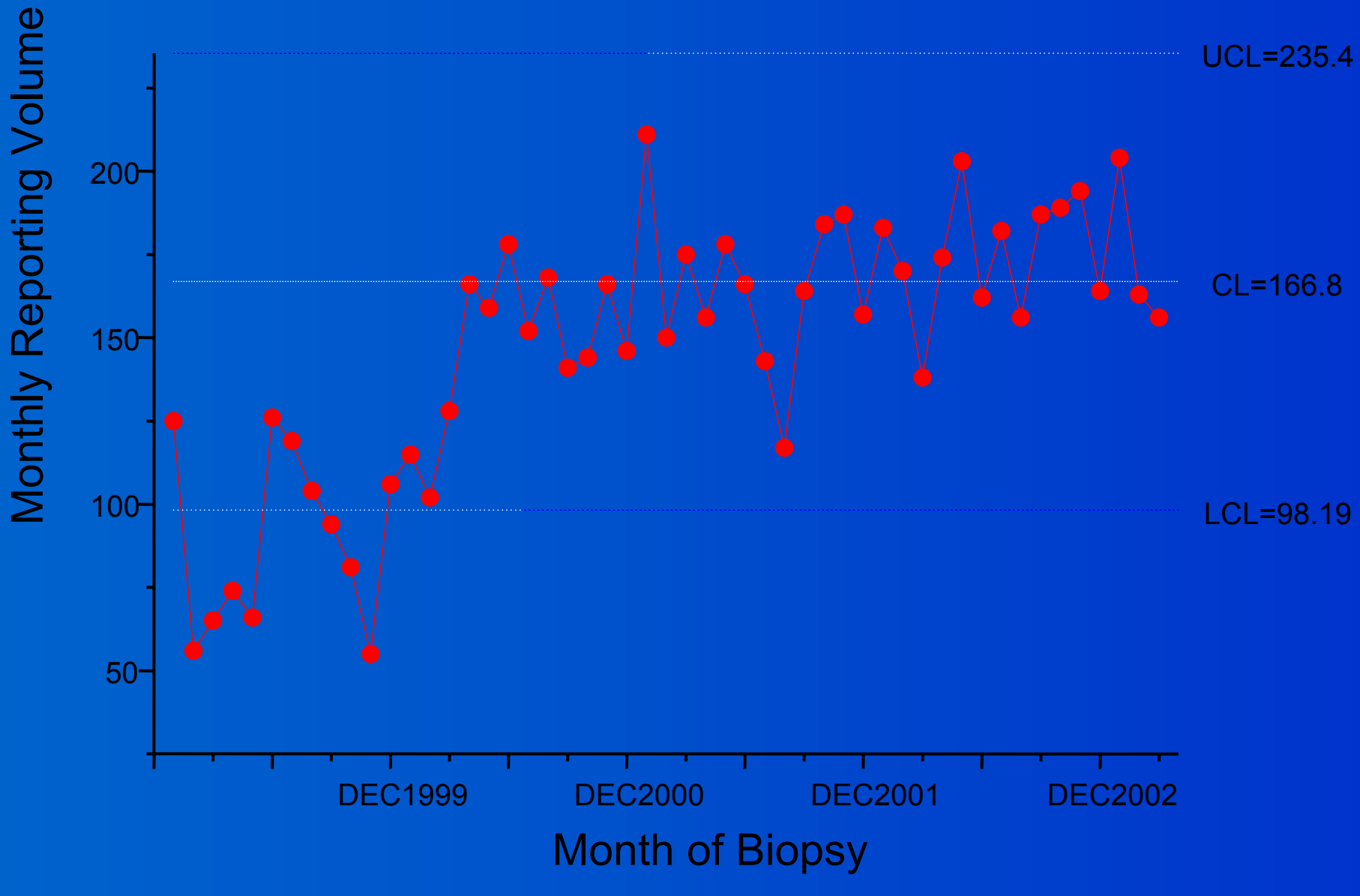
Control Chart



Lakeridge Lab - *pre-E-path*

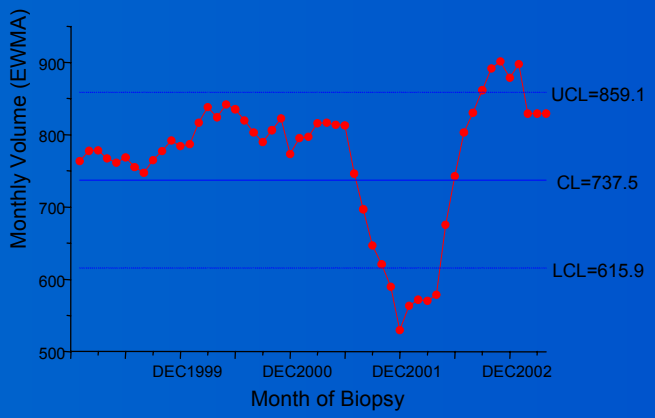


Lakeridge Lab - Post-E-path

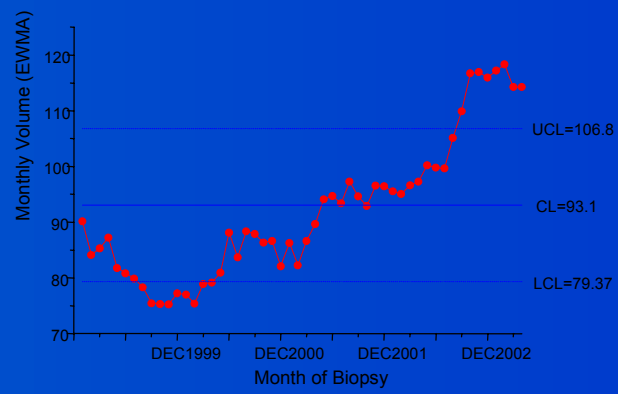


Other Labs

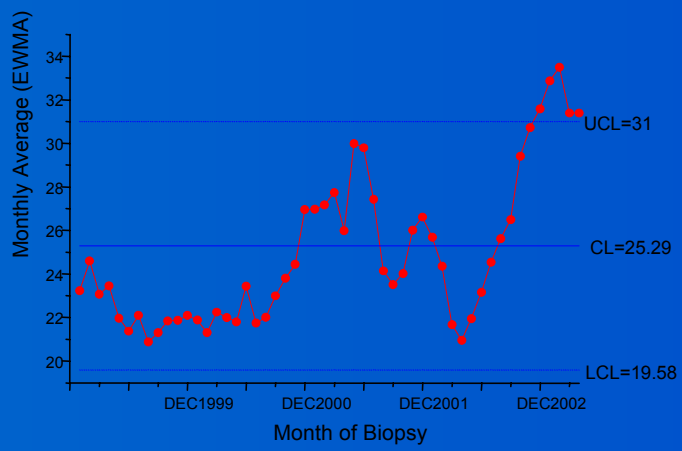
UHN Labs



Scarb. Centenary



Ajax



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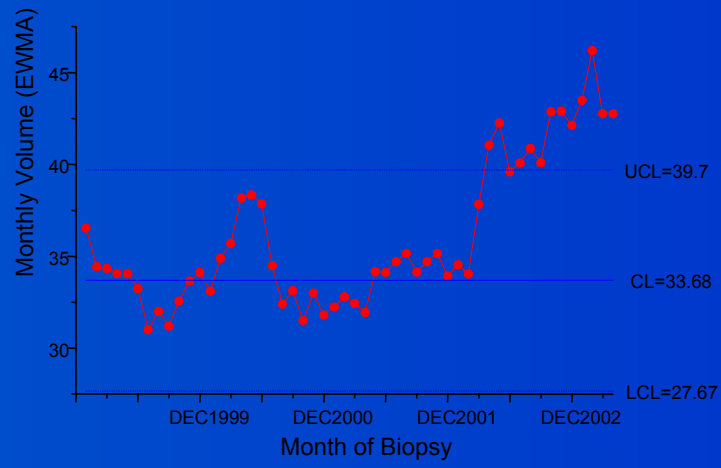
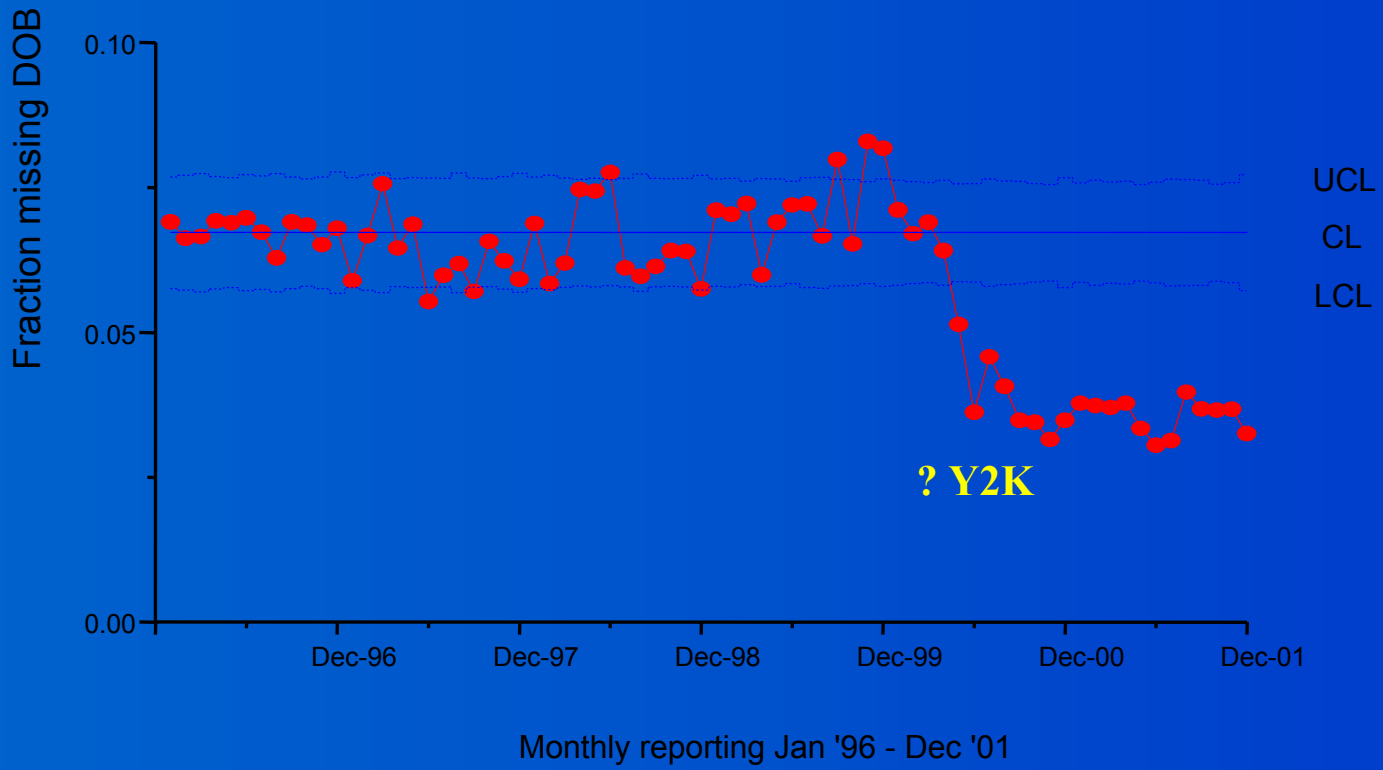


Completeness of Data Elements
e.g. DOB
All Ontario Labs (n=85)

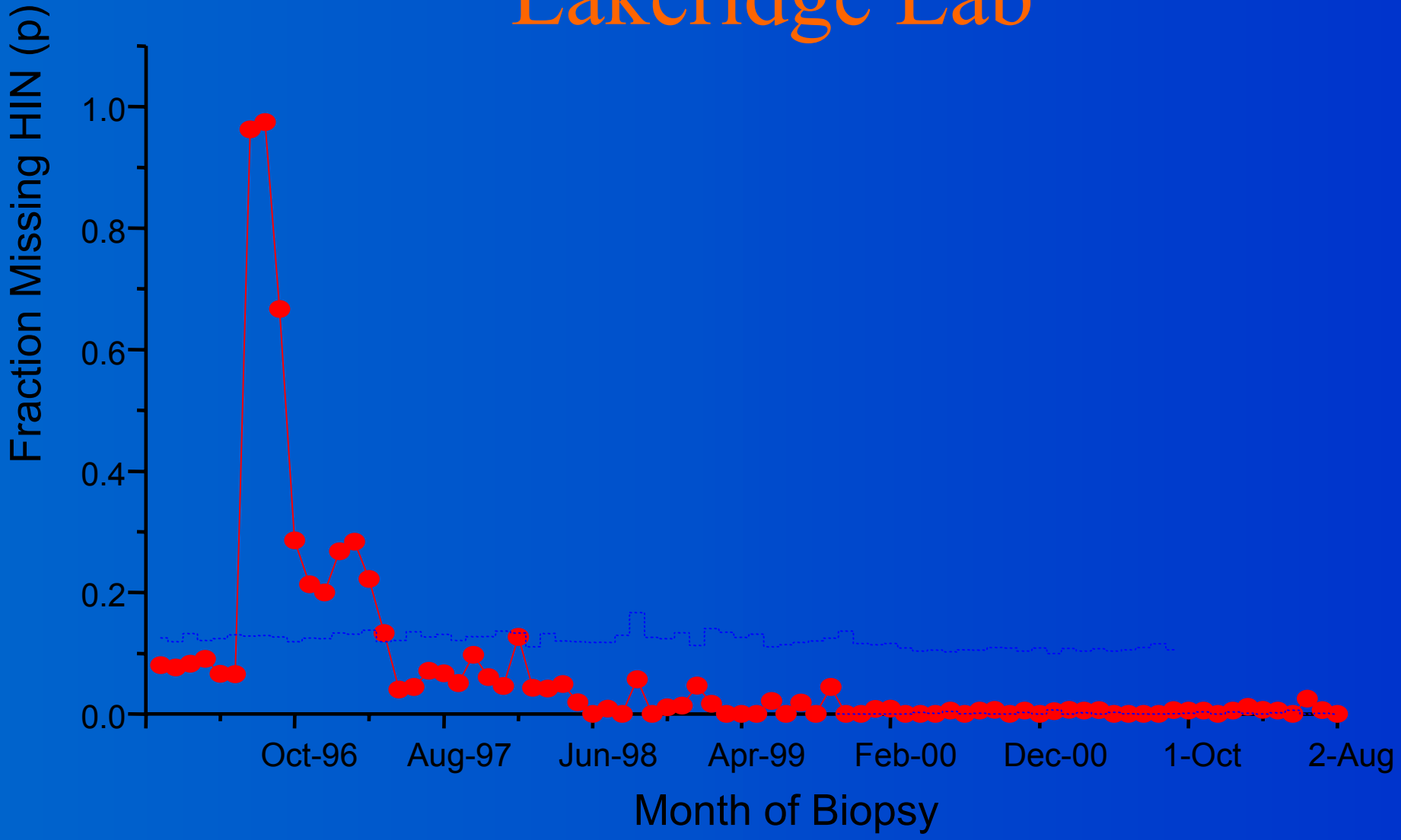


What About DOB Completeness?

Lakeridge Lab

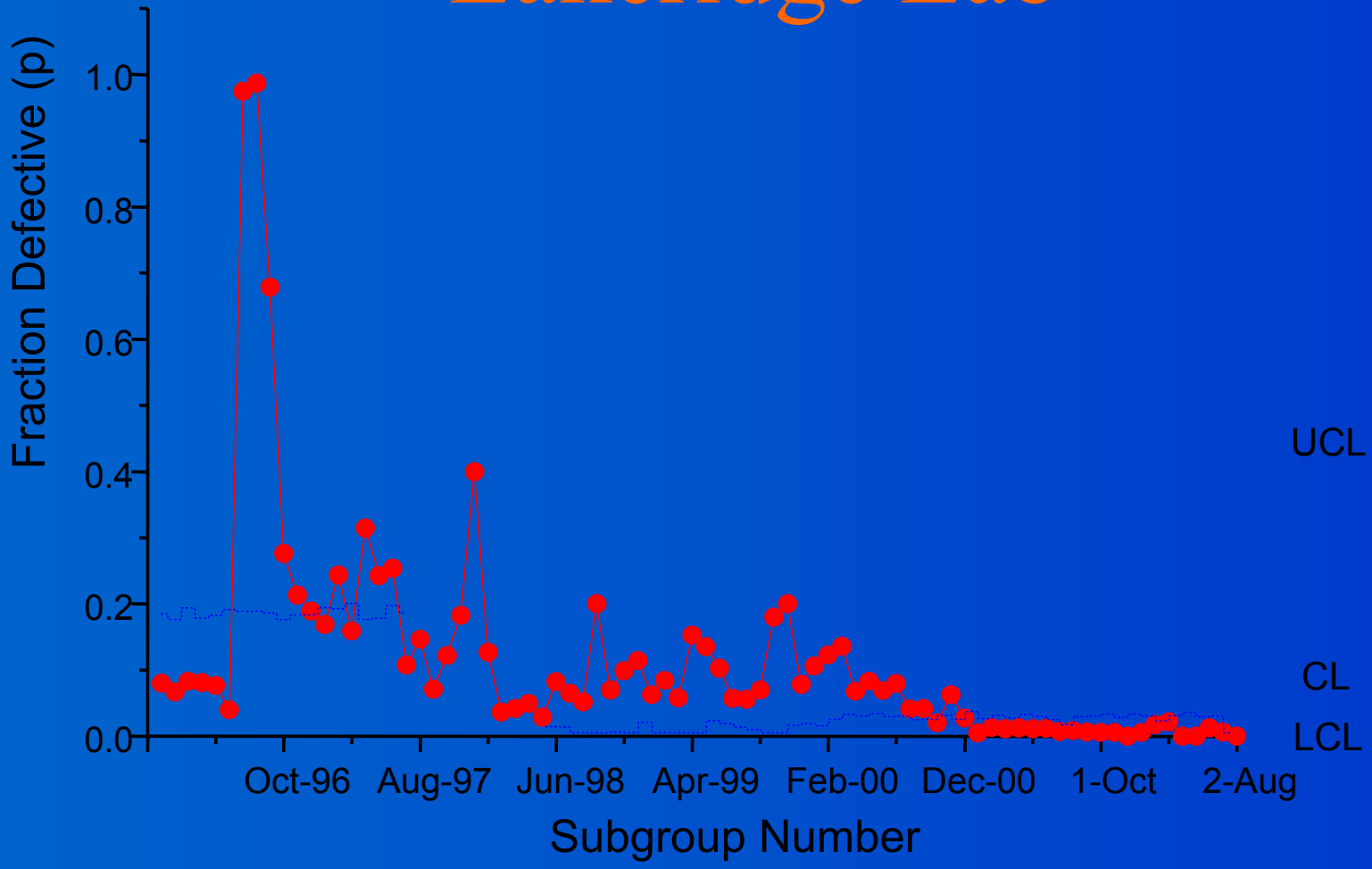
And HIN Completeness?

Lakeridge Lab



And Postal Code Completeness?

Lakeridge Lab



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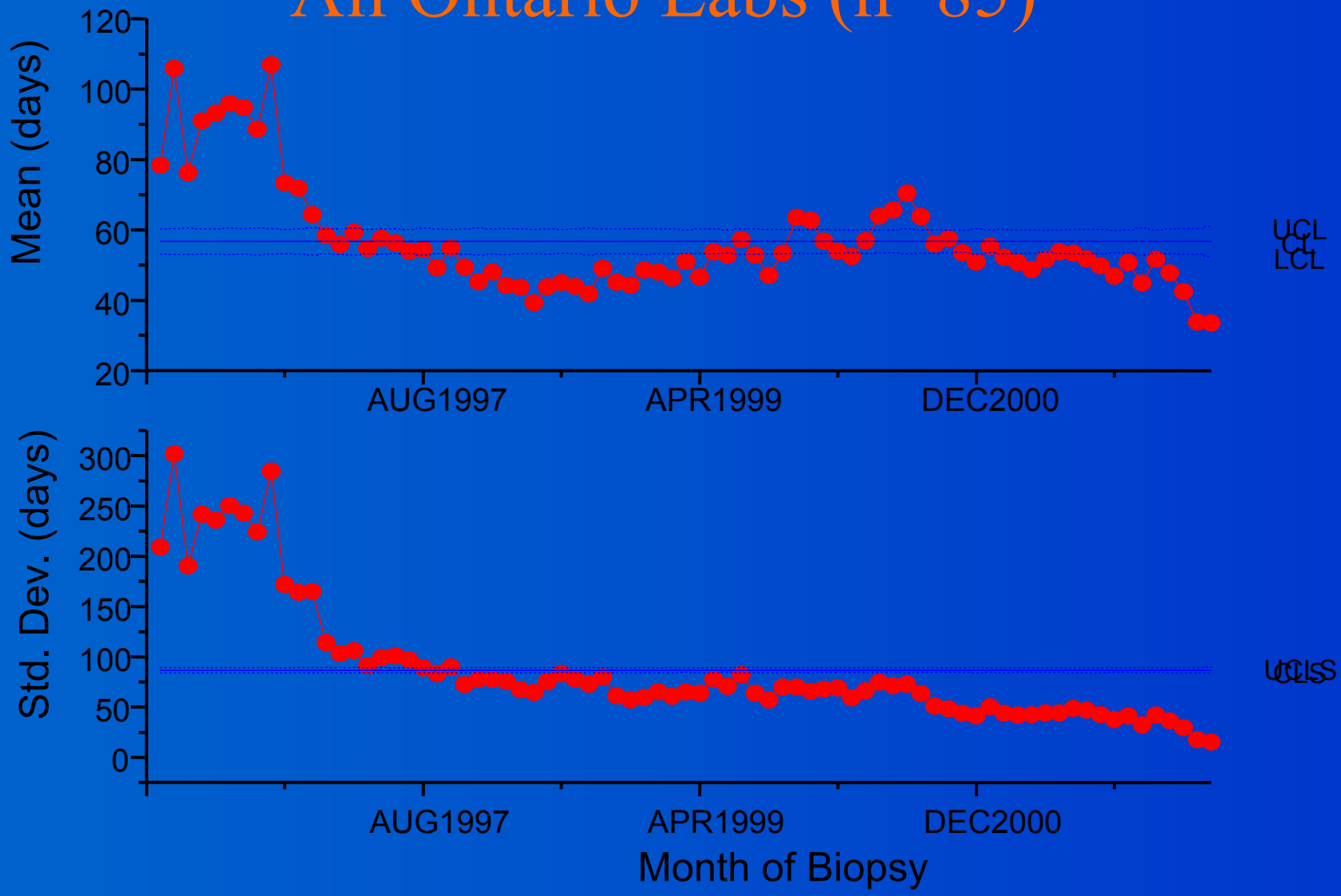
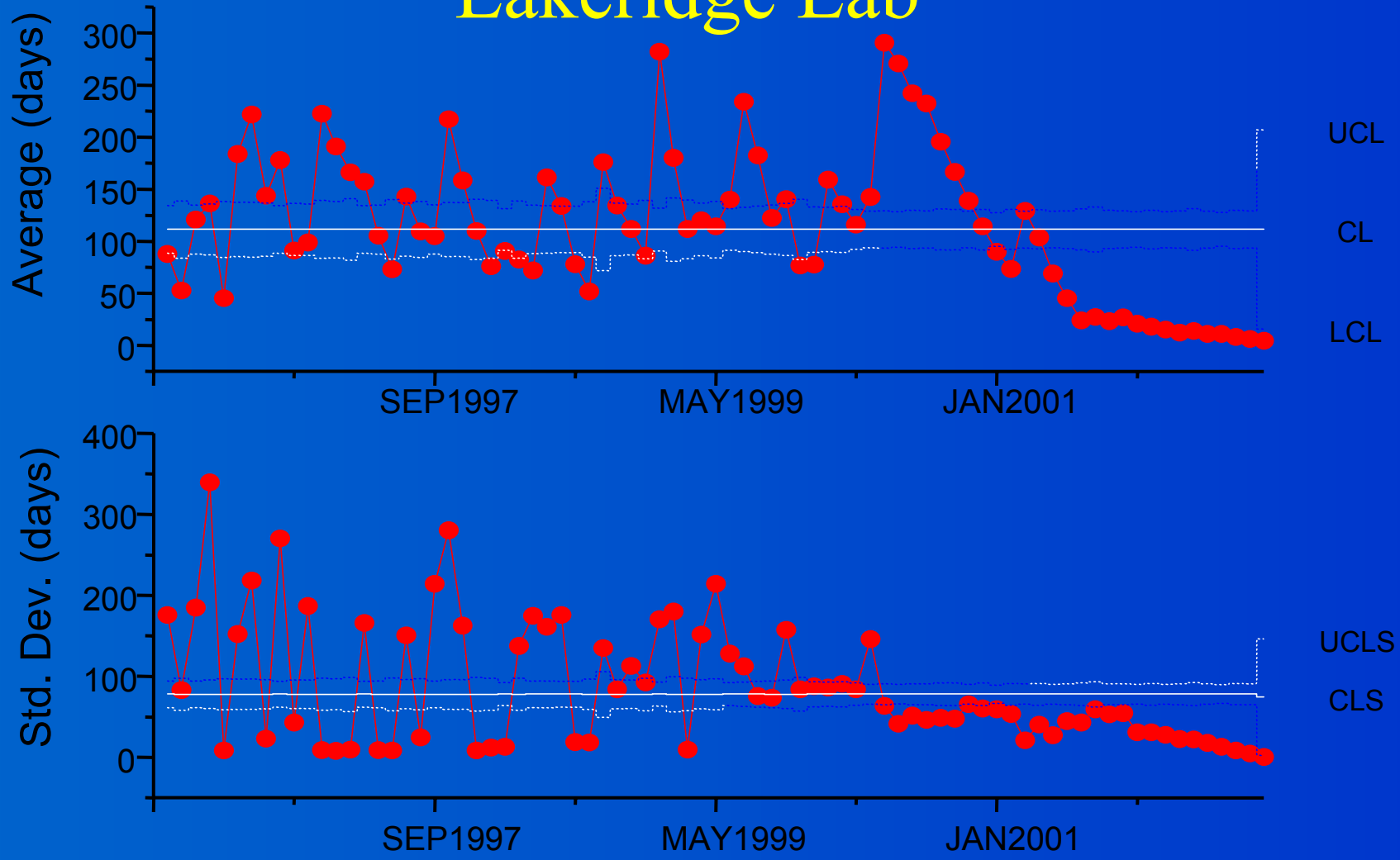
What about the Timeliness of Reporting?

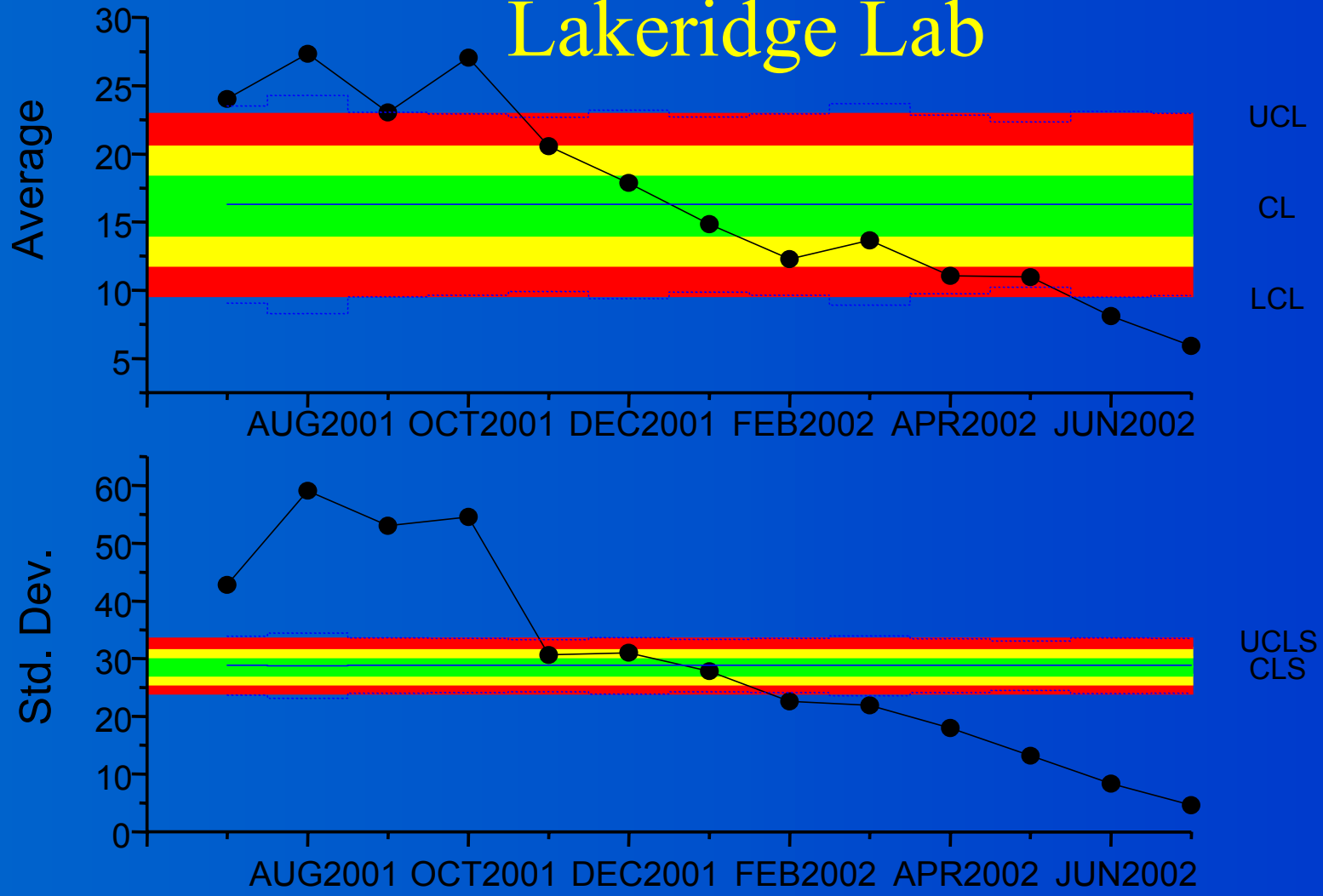
All Ontario Labs (n=85)



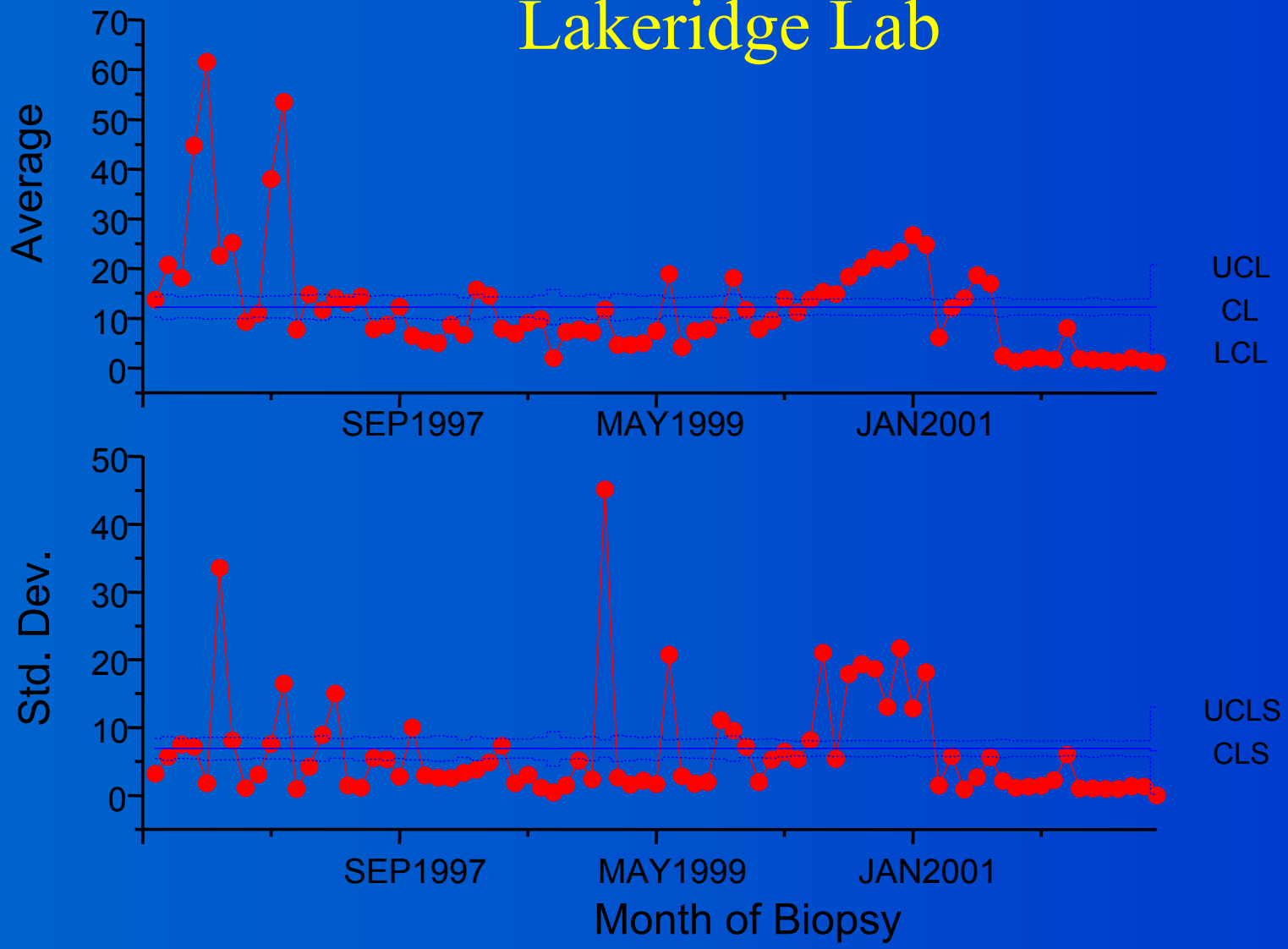
Timeliness of Reporting (Bx to Rec't)
Lakeridge Lab



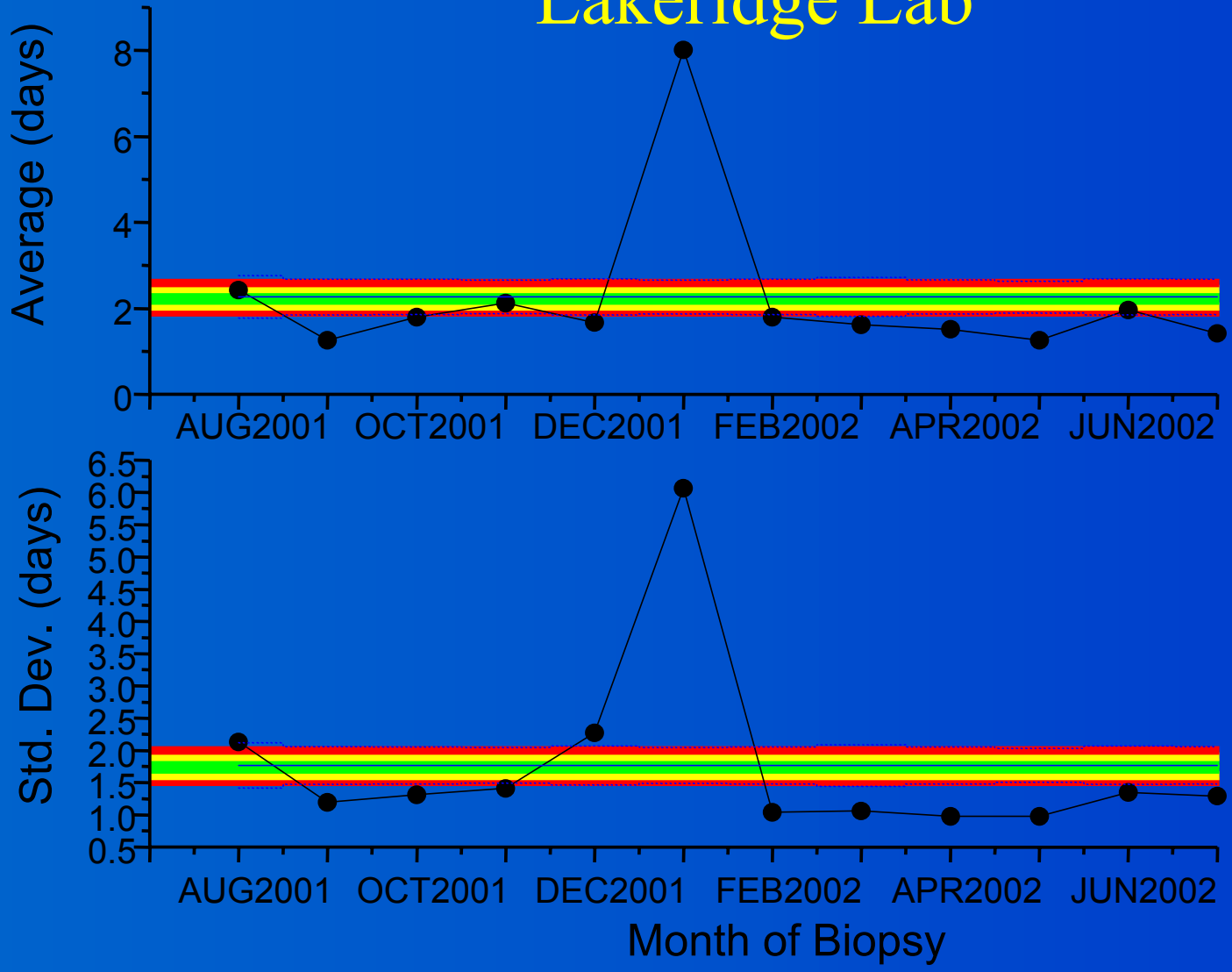
Timeliness of Reporting (Bx to Rec't) Lakeridge Lab



Timeliness of Registration (Rec't to OCR)
Lakeridge Lab



Timeliness of Registration (Rec't to OCR)
Lakeridge Lab



Conclusion and Recommendations

- Control charts are feasible & produce informative output.
- SPC is a necessary adjunct to monitoring and improving our production systems.
- Importance of training, stat. support and networking.
- Real time monitoring is vital if we are to operate E-path as a real production system!

Paper vs E-path?

- January 1, 2002 - April 30, 2002
- Reduced to 3 months only
- Paper - 1983 records from 1952 patients
- E-path - 3686 records from 3634 patients
- E-path records not on paper = 1742
- Paper reports not in E-path = 71

Paper vs E-path?

- Matches - 1944 E-path with 1912 paper
- # Differences - major; minor (?)
  - Surname 6; 14 (2)
  - First name 0; 23 (4)
  - Second initial 46; 5 (4)
  - HIN 0; 0 (0)
  - Sex 3; 0 (3)
  - Birth date 17; 9 (0)

Paper vs E-path?

- Matches - 1944 E-path with 1912 paper
- # Differences - major; minor (?)
  - Behaviour 43; 87 (6-3)
  - Site 135 (3 digit); 92 (4th digit) (9 Vs; 4)
  - Histology
    - Dif 4th digit (8500 vs 8503) 131
    - Same subgroup (8500 vs 8522) 98
    - Same group (8500 vs 8230) 35
    - Different group (8500 vs 9590) 71 (8 missing; 1)

Conclusions

- **Major and minor differences are small**
- **Intra or inter-coder variability?**
- **Behaviour 2.2% ; 4.4%**
- **Site 6.9% ; 4.7%**
- **Histology**
  - **Dif 4th digit 6.7%**
  - **Same subgroup 5.0%**
  - **Same group 1.8%**
  - **Different group 3.6%**