Evaluation of the Alaska Lead Surveillance Program

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**BACKGROUND**
- Since 1995, the Environmental Public Health Program (EPHP) has collected all blood lead test results for Alaskans. Results must be reported by law.\textsuperscript{1}
- Blood lead testing is conducted by providers, Public Health Nursing, some employers, and other entities.
- EPHP follows up with patients who have elevated blood lead levels (eBLLs) to identify exposures, educate patients, and help with the medical management of patients.
- According to CDC, as of December 2015, an eBLL for people of all ages is at or above 5 µg/dL.\textsuperscript{2} Due to staffing constraints, EPHP only conducts follow-up for the following:
  - ≥25 µg/dL in children ≤18 years old,
  - ≥25 µg/dL in non-occupationally tested adults ≥18,
  - ≥40 µg/dL in occupationally tested adults ≥18.
- Employers in some industries, such as mining, must provide testing for employees at least every 6 months.\textsuperscript{3} Head Start programs must screen for participating children at 2 and 24 months.\textsuperscript{4} No regular screening in the state are screened systematically for lead.
- EPHP is considering moving its lead database from MS Access to SQL to link it with other registries.

**DATA PROCESS**
- Assess the effectiveness of the Lead Surveillance Program in identifying and managing Alaskans with eBLLs.
- Make recommendations for improving program.

**METHODS**
- The 2001 CDC Updated Guidelines for Evaluating Public Health Surveillance Systems\textsuperscript{4} were used to assess the efficiencies and limitations of the Alaska Lead Surveillance Program.
- Program attributes were assessed for their strengths and limitations through stakeholder and expert interviews.

**OBJECTIVE**
- Identify eBLLs and common sources of lead exposure.
- Provide needed information for prevention and public health advisories.
- Due to low screening, the program cannot accurately estimate the extent of lead-associated morbidity, and might not detect changes in disease patterns among some groups.
- Reporting is simple.
- Staff can easily contact patients with eBLLs.
- Manual data entry adds to system complexity.
- Program and testing methods easily adjust to changes in definitions.
- Low funding requirements.
- Data incomplete for many test results (Table).
- Many non-elevated reports not yet entered.
- Manual data entry raises potential for errors.
- Gaps in institutional knowledge inhibit data cleaning for past years.
- Software changes could negatively affect data quality.
- Tests are reported within the time required by law.
- Follow-up on eBLLs is initiated within two business days of report.
- Data entry of eBLLs are completed the day of report.
- System always operational during business hours.

**RESULTS**

**Strengths**
- Programs are very likely to identify eBLLs among occupationally exposed adults and children in Head Start programs.
- Database is incomplete for non-elevated levels.
- Manual data entry is inefficient.
- No regular data cleaning makes analysis and summary reporting time-consuming.
- System 100% operational during business hours.

**Limitations**
- Some blood collection materials are difficult to use, especially with children.
- No regular lead surveillance or lack of contact with pediatric health care providers.
- Software changes may impede such efforts.
- Conduct outreach with underrepresented groups and health care providers.
- Work with partners to increase awareness of lead.
- Staff contact funding would further limit system capacity.

**Sensitivity & Positive Predictive Value**
- Quantitative sensitivity is unknown since population eBLL prevalence in Alaska is unknown and database is incomplete for non-elevated BLLs.
- Positive predictive value is high since lab instruments have high accuracy and reporting of results is high.
- Contamination or low volume could cause false positive results and reduce positive predictive value. Though not quantifiable, the extent of these issues is likely to be low.

**REFERENCES**
1. 7 AAC 27.014. Reporting of blood lead test results.

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