PREVENTING MORE HARM - REDUCING CHILDHOOD LEAD POISONING WITH COMMUNITY HEALTH WORKERS

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CHILDHOOD LEAD TOXICITY

• In 2016, approximately 25% of Maryland children under 72 months of age were screened for lead out of a total of 442,000.¹
• Roughly 2,500 children that were screened (~2%) were found to have BLL >5 micrograms/deciliter¹
  • This is the threshold for public health interventions.²
• Lead is associated with brain damage, manifesting in behavioral, learning, and speech problems.²
• Over the long term, these consequences can cause low IQ, poor attention, as well as underperformance in school.²
• Maryland Department of the Environment (MDE) house inspections in Baltimore County from 2017 revealed
  • 31 confirmed cases of lead toxin following home inspections in Baltimore County
  • 52 possible lead hazards identified.
  • The top three sources were spices (14), travel outside of the USA (7), and unknown (7).
  • Other lead hazards identified by MDE were lead dust, make-up, soil, occupation-related, pottery, and hobbies. (Source: Maryland Department of Environment)
PROJECT OVERVIEW

• Program 2, A Childhood Lead Poisoning Prevention and Environmental Case Management program
• Began in early 2018
• Nine health department jurisdictions across Maryland.
• Connects children with lead toxicity with Community Health Workers (CHWs) and Environmental Case Managers.
• CHWs conduct one to six home visits
  • Provide education
  • Connect families with social services
  • Provide durable medical equipment
• Enrolls children ages 0 - 18 years old who meet the following criteria:
  • Enrolled in Medicaid or Children’s Health Insurance Program (CHIP) or eligible for Medicaid/CHIP but not yet enrolled.
  • Resides in one of nine counties in Maryland;
  • Has a BLL of ≥ 5 micrograms/deciliter and/or diagnosis of moderate to severe asthma.
METHODS

- Prospective cohort study following the progress of all children enrolled in Program 2 at Baltimore County Health Department.
- CHWs help locate and track lab confirmed venous BLLs of children
- Also collects information about the child such as age and zip code of their home.
- Prior open cases were digitized and stored into a spreadsheet
- Password protected and securely stored at the Baltimore County Department of Health electronic network.
- A separate de-identified spreadsheet was created with the purpose of this analysis of the program.
- Results highlight Baltimore County children enrolled in the Program 2 since the initiation of the program until April 4th 2019.
Mapping reveals highest initial average BLL, highest number of cases, highest average age at diagnosis were in locations near the Patapsco and Black rivers as well as closer to Baltimore City.

Conversely, the lowest initial average BLL, lowest number of cases, lowest average age at diagnosis were in consistently in Glyndon, Freeland and Sparrows Point cities.
FINDINGS

% per Avg. Initial BLL Bin

<table>
<thead>
<tr>
<th>INITIAL BLL BINS (MICROGRAMS/DECILITER)</th>
<th>5 to 9</th>
<th>10 to 14</th>
<th>15 to 19</th>
<th>20 to 24</th>
<th>over 25</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>70.3</td>
<td>17.4</td>
<td>6.2</td>
<td>3.6</td>
<td>2.6</td>
<td>100.0</td>
</tr>
</tbody>
</table>

# Cases of Childhood Lead Toxicity in Baltimore County In Program 2 thorough April 4 2019

<table>
<thead>
<tr>
<th>INITIAL BLL BINS (MICROGRAMS/DECILITER)</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 to 9</td>
<td>137</td>
</tr>
<tr>
<td>10 to 14</td>
<td>34</td>
</tr>
<tr>
<td>15 to 19</td>
<td>12</td>
</tr>
<tr>
<td>20 to 24</td>
<td>7</td>
</tr>
<tr>
<td>over 25</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>195</td>
</tr>
</tbody>
</table>
FINDINGS

# Cases of Childhood Lead Toxicity By Age

<table>
<thead>
<tr>
<th>Age Bin @ dx</th>
<th>0-1 yo</th>
<th>1 yo</th>
<th>2 yo</th>
<th>3 yo</th>
<th>4 yo</th>
<th>5 yo</th>
<th>6-17 yo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series1</td>
<td>0</td>
<td>15</td>
<td>74</td>
<td>49</td>
<td>20</td>
<td>15</td>
<td>14</td>
</tr>
</tbody>
</table>

*Missing 4 Ages at Time of Diagnosis

% per Age Bin

<table>
<thead>
<tr>
<th>Age Bin</th>
<th>% of Total Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1 yo</td>
<td>7.9</td>
</tr>
<tr>
<td>1 yo</td>
<td>38.7</td>
</tr>
<tr>
<td>2 yo</td>
<td>25.7</td>
</tr>
<tr>
<td>3 yo</td>
<td>10.5</td>
</tr>
<tr>
<td>4 yo</td>
<td>7.9</td>
</tr>
<tr>
<td>5 yo</td>
<td>7.3</td>
</tr>
<tr>
<td>6-17 yo</td>
<td>2.1</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>
LIMITATIONS

• Families enrolled in the Childhood Lead Poisoning Prevention and Environmental Case Management program are Medicaid enrolled/eligible and frequently come from low-income families.

• Loss to Follow Up
  • May not follow up with their pediatrician for counseling or BLL testing in order to ensure subsequent BLLs fall below the threshold to be safely cleared.
  • Poses a challenge for children to ultimately be discharged from the program.
  • Poses a challenge in terms of determining where the source of lead toxicity initially took place or was most harmful.
LESSONS LEARNED

• From this experience, I learned a great deal about a career in public health, specifically the health department.
• I learned about the importance of how an integrated team is important in tackling important public health challenges.
• I also learned a lot from working alongside community health workers and the value they bring.
• Further identified ongoing disparities in health, in this case for childhood lead toxicity.
POLICY AND PRACTICE IMPLICATIONS

- Document the source of lead in spices, namely brand and location of purchase.
  - Educate and advise the public about safe spices and spices to avoid.
  - Important to collect because in 2017, spices were the most commonly identified source for lead on home inspections in Baltimore County.
- Additionally, a survey of CHWs working for the program was created, recently approved and delivered for quality improvement purposes.
  - Proposed research survey can help better understand CHWs demographics and current roles as well as strengths, weakness, and opportunities for improvement.
REFERENCES

References:


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