Analyzing Indiana Poison Control Center Calls in Children Under Thirteen

Statement of the Problem:
- The Indiana Poison control center receives 23,151 calls each year involving children twelve or under.
- Unintentional substances exposures can be dangerous to early development and child wellbeing.
- Agents that fall under the grouping of “One Pill Can Kill” (OPCK) because of their potentially fatal effects.

Research Question: What patterns exist in exposures to deadly single-dose agents among children in Indiana?

Objectives:
- Analyze a Poison Control Dataset that contained calls from all Indiana Counties ranging from 2015-2021.
  - Find areas with higher rates of exposure by county.
  - Analyze substance exposures in children 12 & under.
- Observe trends in:
  - County exposure statistics.
  - Exposure site.
  - Call time, date, and year.
- Substances.
- Create a dashboard summarizing the data and the knowledge gained from it:
  - Map.
  - Summaries.
  - Selection tools.

Methodology:
- Receive data from Indiana Poison Control Center.
- Clean/organize data.
- Substances categorized.
- Date transformed.
- Created categorical data.
- Basic summary statistics.
- Create Graphics.
- Dashboard from resulting data.

Findings:
- The numbers of calls tied to poisoning decreased per year.
- Time trends: Peak around 11 am and 8 pm.
- The group most impacted by poisoning is 1-5 year-olds.
- Majority of exposures occurred at home.

Methodology:
- lubridate.
- tidyrverse.
- usmaps.
- ggplot.
- dplyr.

Impact:
- Presentation at CDC PROTECT Annual Meeting in December 2022.
- Conversation with colleagues in the field provided insights into the issue.
- Presentation Engagement and Service-Learning Summit.
- Dashboard presenting the data based on different year, county, substances, age.
- Additional research, funding, analysis, and decrease in the incidents of overdose.

Reflection & Conclusion:
- Challenges:
  - Retrieving the data from the Indiana Poison Center.
  - Cleaning the data and classifying cases by substance.
  - Meaningful analysis of the data in the context of our research question.

The project served as a learning experience for us in terms of the technical skills for data analysis, and in soft skills such as presenting at a professional conference. In the coming months, we will continue to work to achieve our overall goal of decreasing overdoses in children.

Future Goals:
- Expand the data to other states.
- Adding machine learning for classification of substances.
- Receiving data from other CDC centers.
- Statistical analysis on potential causal/correlating variables.

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References: