Supporting the PROTECT Initiative

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INTRODUCTION AND BACKGROUND

- Dosage errors are the most common medical errors
  - 1.5 million people are affected annually
  - 200,000 U.S. poison-control cases per year
  - 3.5 billion in medical costs
  - 30% of cases are children under age 6

- The PROTECT Initiative (Preventing Overdoses and Treatment Errors in Children Taskforce)
  - Launched in 2008
  - Aims to highlight medication dose error causes
  - Provides recommendations to increase prevention

GOALS

- Develop script to parse XML files
- Produce output with the number of labels using ml or tsp and the types of dosing tools
- Examine children hospital websites for dosage measurements

METHODOLOGY AND CONCLUSIONS

- The DailyMed database contains XML files with the text for tens of thousands of medication labels, including...
  - Pills
  - Tablets
  - Creams and Lotions
  - Orally administered liquids (our focus)

- We created a parser that searched for...
  - Keywords to determine if it the label was for an orally administered liquid medication (seen to the right)
  - The dosage units used on the medication label
  - Any dosing tools mentioned on the label
  - Name of the product
  - Name of the manufacturer

- We searched 42,726 OTC labels and 9,590 prescription labels
  - ~5% of OTC and ~15% of prescription labels use non-metric units

- We also searched hospital websites to discover if they used metric or non-metric units
  - 80% did not have dosing units on the site
  - 8% used metric
  - 10% included both
  - 2% only used non-metric

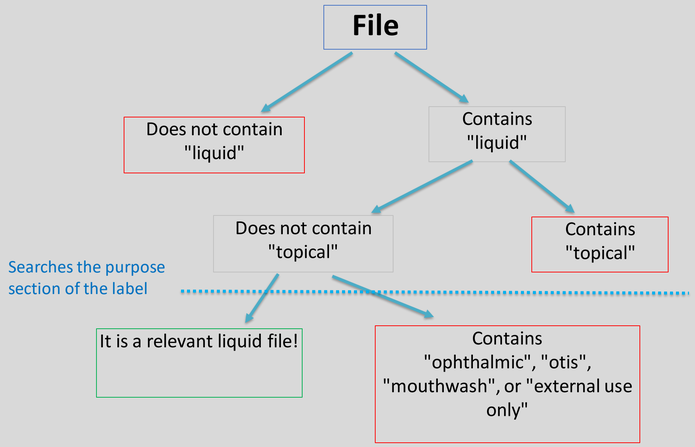


IMAGE QUALITY

On the left, you can see an example of a low-quality image that is unreadable.

On the right, you can see an example of a high-quality image. In this case, we can read and use the OCR.

DATA AND VISUALIZATIONS

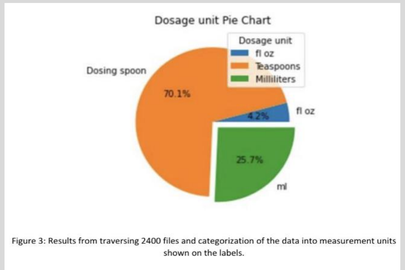
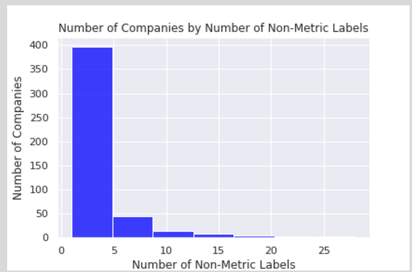
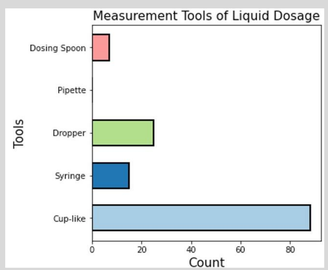


Figure 3: Results from traversing 2400 files and categorization of the data into measurement units shown on the labels.

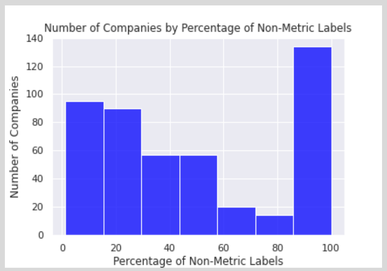
- CDC Recommendation is mL (only represents 25% of the dataset)



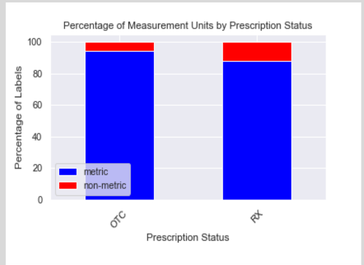
- 350+ Companies produce a product using a non-metric unit



- Syringe (CDC's Recommended Tool) is present in a ¼ of these 135 drug labels



- Non-Metric units is prevalent across most companies



- A total of 15% of products in OTC & RX Datasets use Non-Metric Units

FUTURE GOALS

- Evaluate and analyze other sources of medication dosage recommendations:
  - Forums
  - Social Media

- Extract relevant information directly from label images
  - XML files may not always be available
  - Use Super-resolution and Optical Character Recognition
  - Some examples in image to the left

COMPLETE GOALS

- ✓ Develop script to parse XML files
- ✓ Produce output with the number of labels using ml or tsp and the types of dosing tools
- ✓ Examine children hospital websites for dosage measurements

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