Webinar on Laboratory Study of Chemicals in Nail Products

December 5, 2023

The meeting will begin shortly.

Today's meeting is being recorded.

Department of Toxic Substances Control

CalEPA

Webinar Instructions

- You are in a listen and view only role
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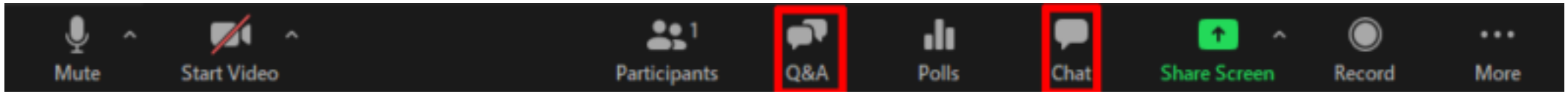

- Use Q&A feature (bottom of the screen)
- Chat function is disabled
- Email: SaferConsumerProducts@dtsc.ca.gov
- We will respond during Q&A session

Agenda

- Opening Remarks
- Key Findings on Laboratory Study of Chemicals in Nail Products
- Questions and Answers
- Closing Remarks

Webinar on Laboratory Study of Chemicals in Nail Products

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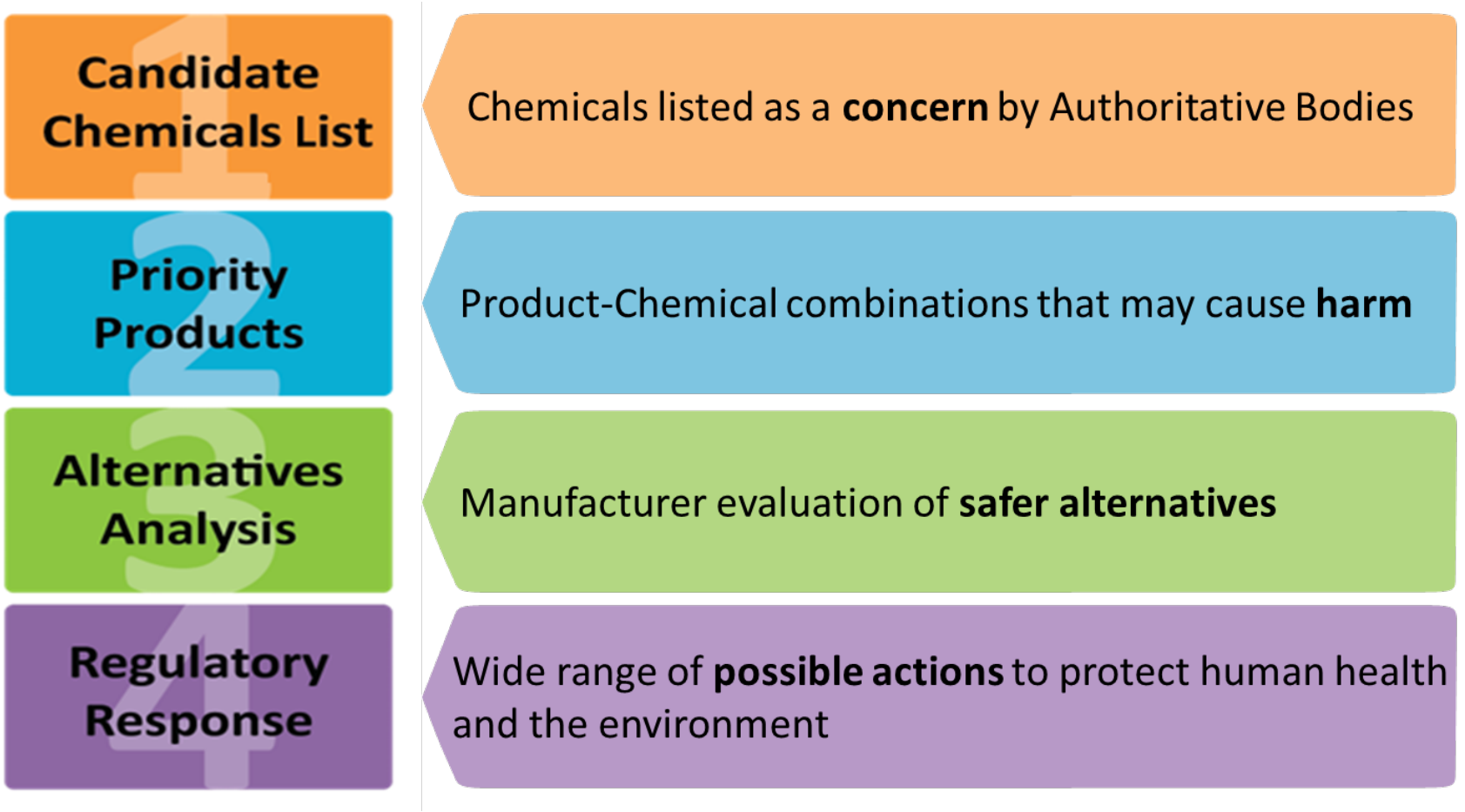
December 5, 2023

Overview

- SCP Regulatory Framework
- DTSC's Nail Product Efforts
- Summary of Key Findings from Laboratory Study
- Questions and Answers

Safer Consumer Products (SCP) Regulatory Framework



SCP website:
https://dtsc.ca.gov/scp/

DTSC's Nail Product Efforts

- Tested nail products (2012)
  - DTSC tested limited number of nail products
- Evaluated chemicals in nail products (2016 – 2021)
  - Screening research and information call-in
- Priority Products
  - Nail products containing toluene (adopted January 1 2023)
  - Nail products containing methyl methacrylate (proposed)
  - Nail products containing triphenyl phosphate (proposed)

Goals of Laboratory Study

1. Measure chemicals in both retail and professional-use nail products
2. Follow up on DTSC's 2012 nail product study
3. Potentially identify additional Priority Products

Research Questions

1. What were the detection frequencies and concentrations of Candidate Chemicals in different nail products?
2. Do nail product labels accurately identify ingredients?
3. Do nail polishes categorized as professional or retail and by price contain different Candidate Chemicals or concentrations?

Research Questions (cont.)

4. What Candidate Chemicals are detected in products marketed to children or marketed as safe for children?
5. Have retail stores met their public commitments not to sell nail products with certain chemicals?

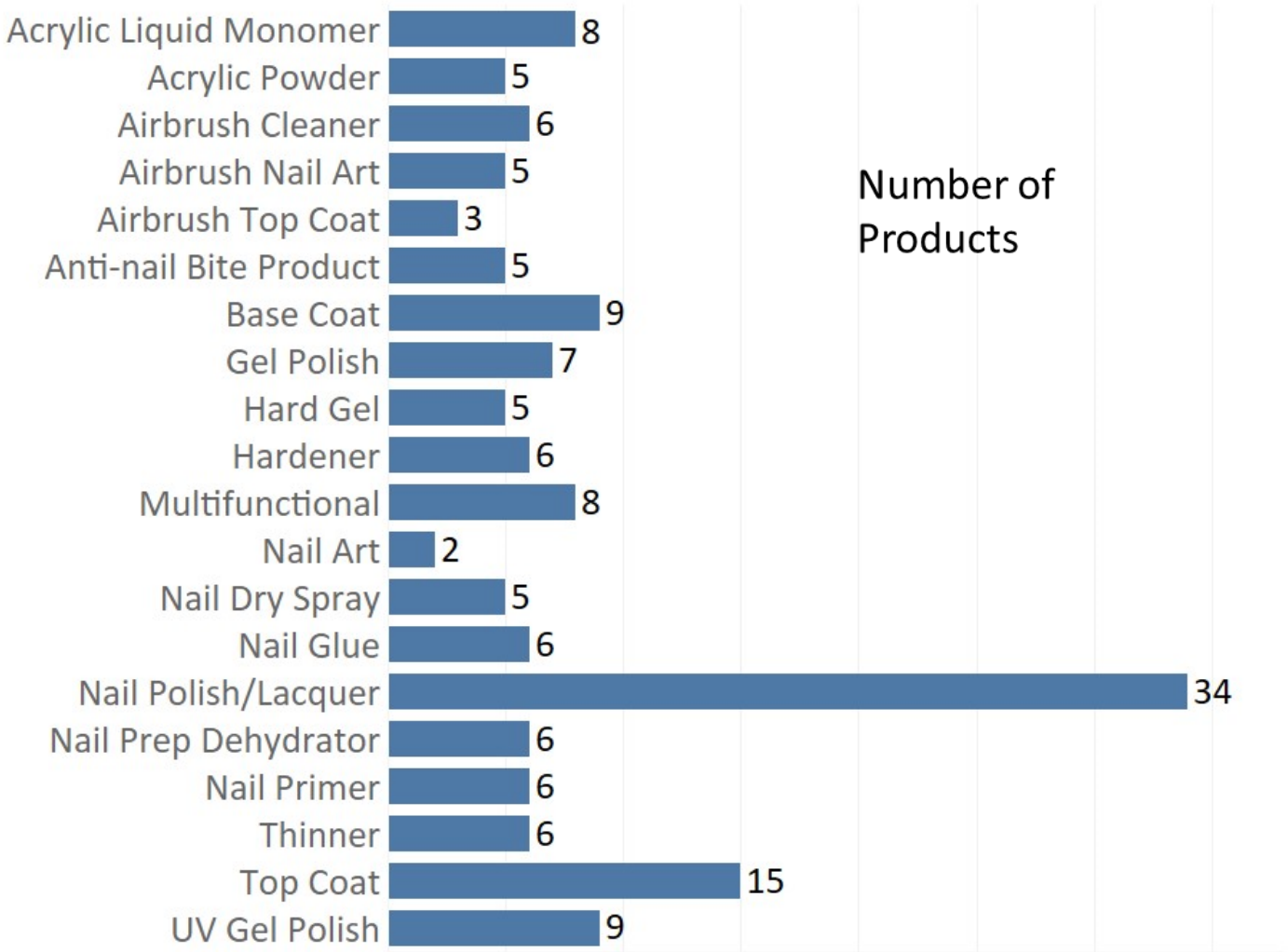
How Were Products Chosen?

- Include wide variety of product types
- Represent professional and retail use
- Price
- Explore various marketing claims
- Marketed to children or as safe for children

How Were Products Chosen? (cont.)

- Ability to answer research questions
- Suggestions from stakeholders
- Review of ingredient labels
- Include products tested in DTSC's 2012 study
- Availability

Product Types



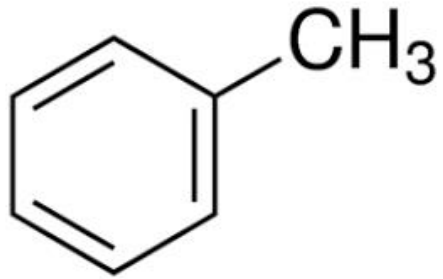
Analysis

- 156 different nail products
- 52 target analytes
- Instrumentation
  - Gas chromatography/ mass spectrometry (GC/MS)

Overview of Results

- Quantified **29** different target analytes, of which **24** were Candidate Chemicals
- Tentatively identified an additional **154** compounds, of which **23** were Candidate Chemicals

Toluene Detections

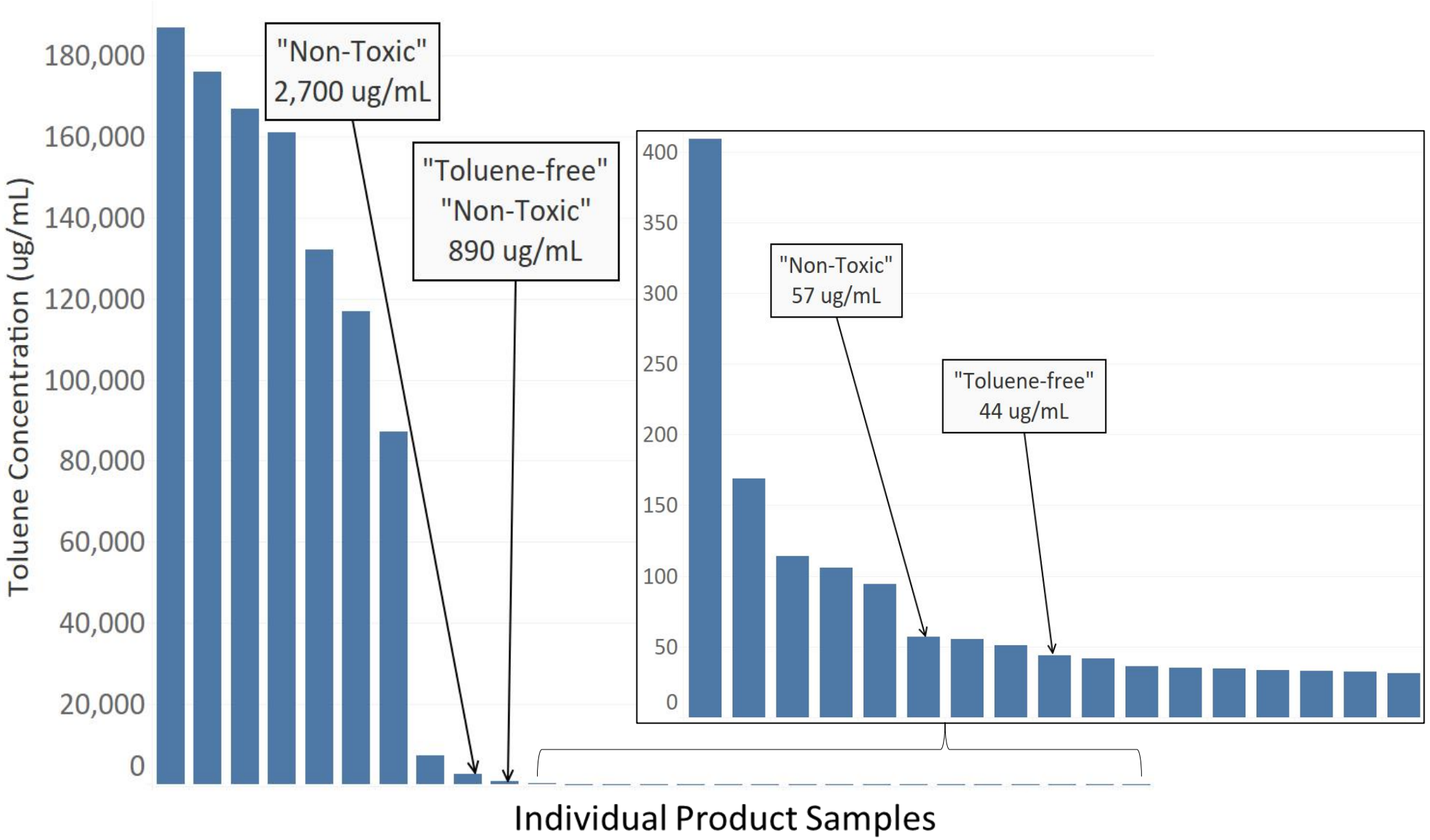


- Detected in **27** samples
- 31 – 187,000 µg/mL

Product Type	Concentration Range (µg/mL)
Airbrush Top Coat	117,000 – 187,000
Hardener	161,000
Thinner	167,000 – 176,000
Top Coat	87,200 – 132,000

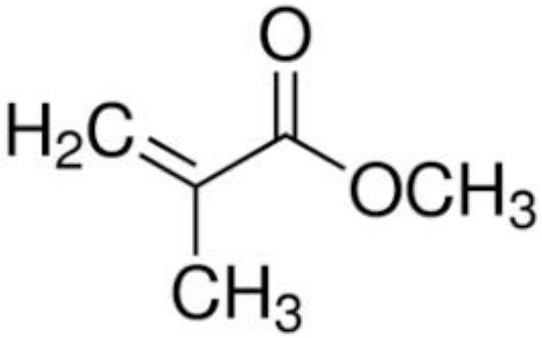
Product Type	Number of Products
Top Coat	5
UV Gel Polish	3
Multifunctional	3

Toluene Detections



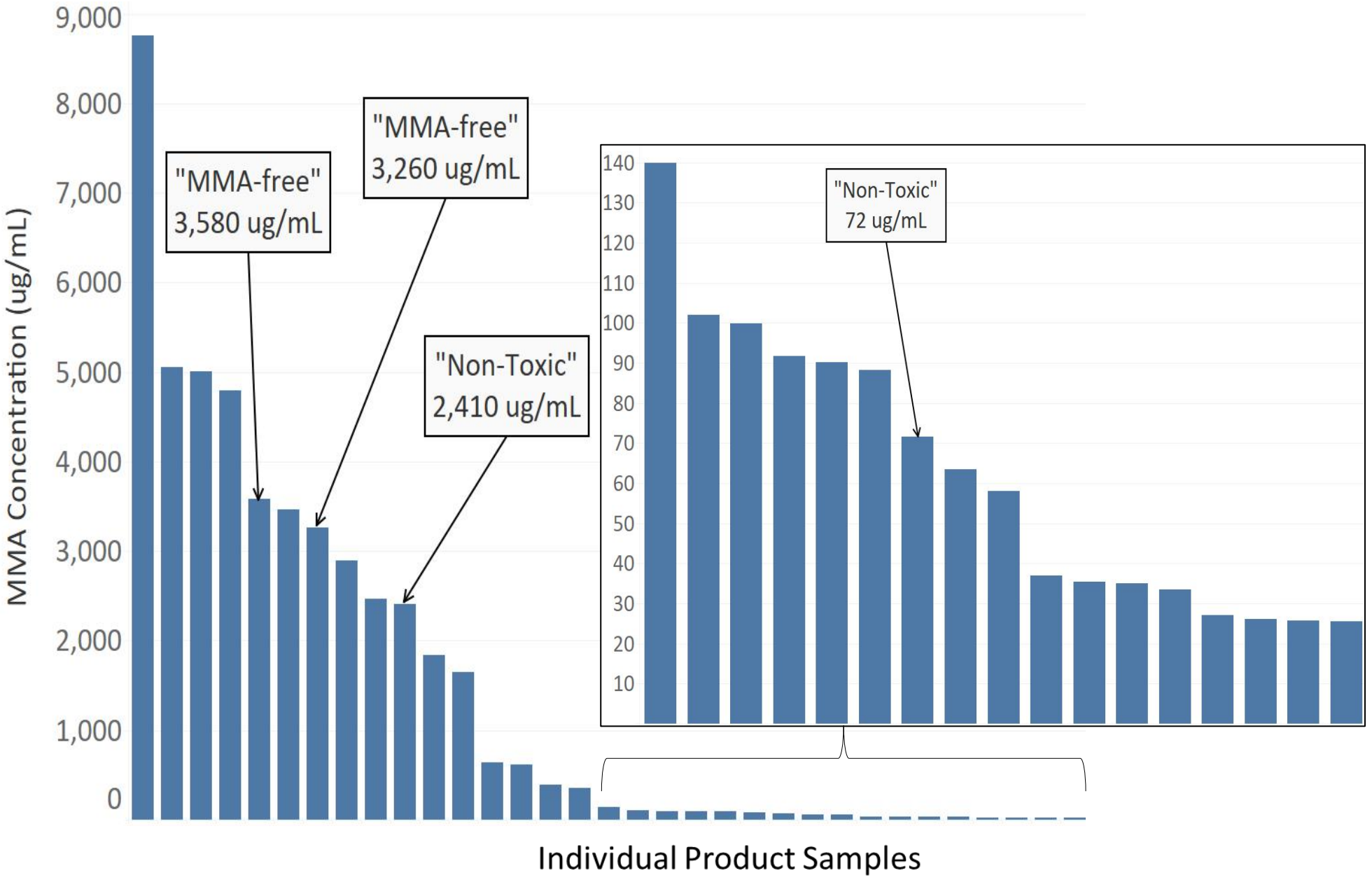
Methyl Methacrylate (MMA) Detections

- Detected in **33** samples
- 26 – 8,760 µg/mL
- 38 – 450 µg/g in acrylic powders



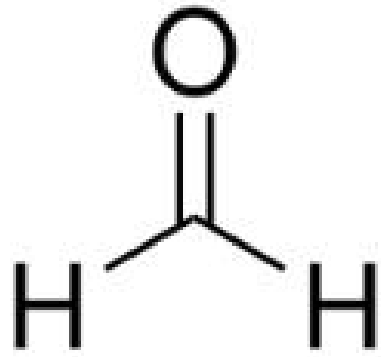
Product Type	Concentration Range (µg/mL)
Acrylic Liquid Monomer	1,650 – 8,760
Airbrush Top Coat	2,470
Anti-nail Bite Product	2,410
Multifunctional	4,800

MMA Detections



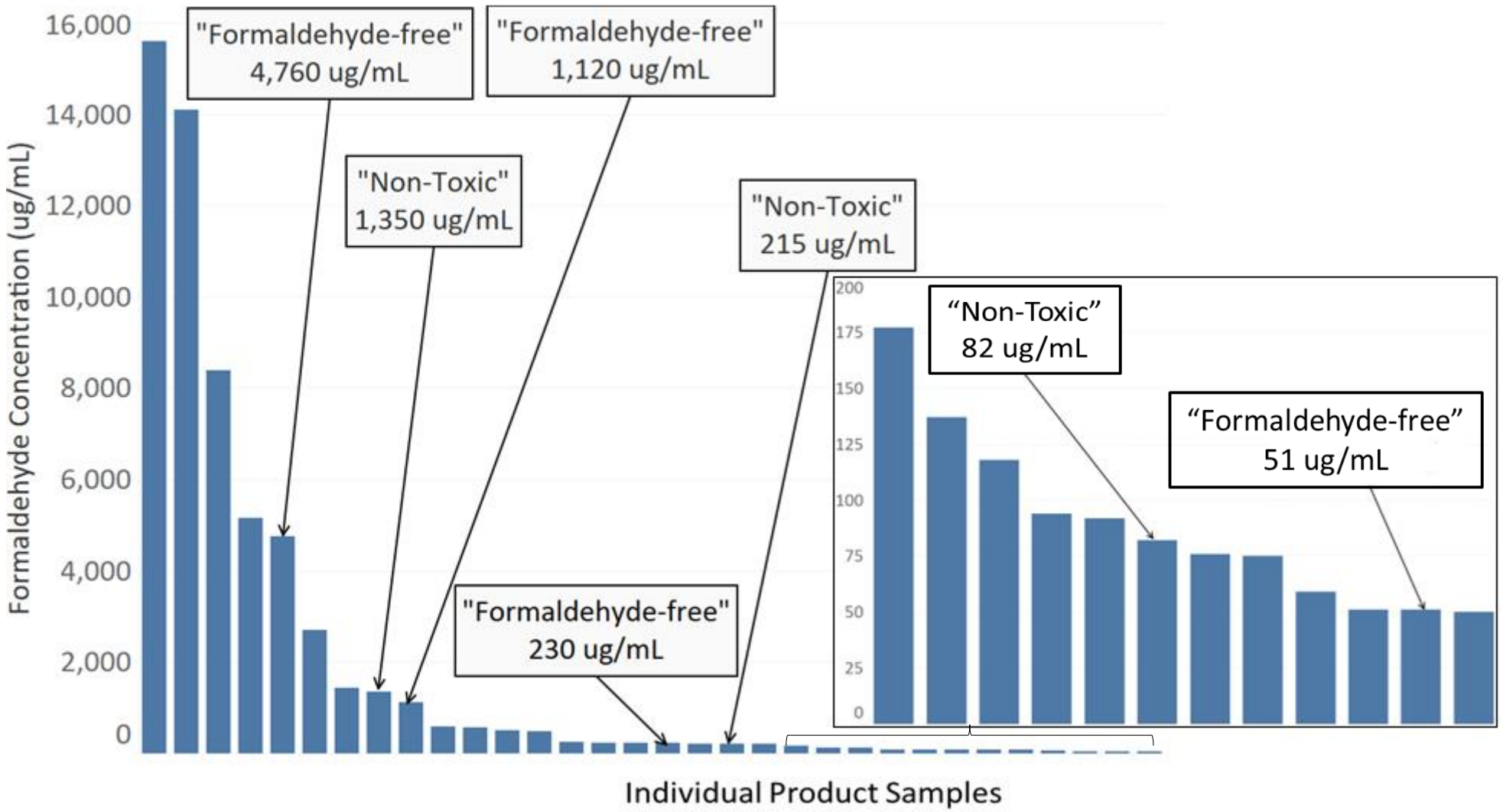
Formaldehyde Detections

- Detected in **35** samples
- 50 – 15,600 µg/mL
- 110 – 230 µg/g in acrylic powders



Product Type	Concentration Range (µg/mL)
Nail Hardener	15,600

Formaldehyde Detections



Other Candidate Chemical Detections

Chemical Name	Number of Products
Ethyl acetate	112
Acetone	92
1-Butanol	85
Isopropyl alcohol	82
Acetonitrile	23
Triphenyl phosphate (TPhP)	16

Tentatively Identified (TIC) Candidate Chemicals
Volatile Organic Compounds

Chemical Name	Number of Products
Heptane	7
Acrylonitrile	3
Isopropyl benzene	3
Methyl acrylate	3
Butane	3
Isobutane	2
Ethyl acrylate	2

Chemical Name	Number of Products
n-Hexane	2
Octamethylcyclotetrasiloxane (D4)	1
1,2-Dichloroethane	1
Vinyl acetate	1
1-Butanol	1
2-Ethylhexyl acrylate	1

Tentatively Identified Candidate Chemicals
Semi-Volatile Organic Compounds

Chemical Name	Number of Products
Isophorone diisocyanate	9
Phthalic anhydride	5
Ethylene glycol monobutyl ether	3
Decamethylcyclopentasiloxane (D5)	3
Ethyl methanesulfonate	2

Chemical Name	Number of Products
Diethylene glycol dimethyl ether	1
Oxybenzone	1
Pyromellitic dianhydride	1
α-Methyl styrene	1
Octamethylcyclotetrasiloxane (D4)	1

Comparison of TIC Data with Ingredient Labels

- Candidate Chemical TICs*
  - **18 out of 23** were not listed on ingredient labels
- Non-Candidate Chemical TICs*
  - **105 out of 131** were not listed on ingredient labels

*TIC: Tentatively Identified Compound

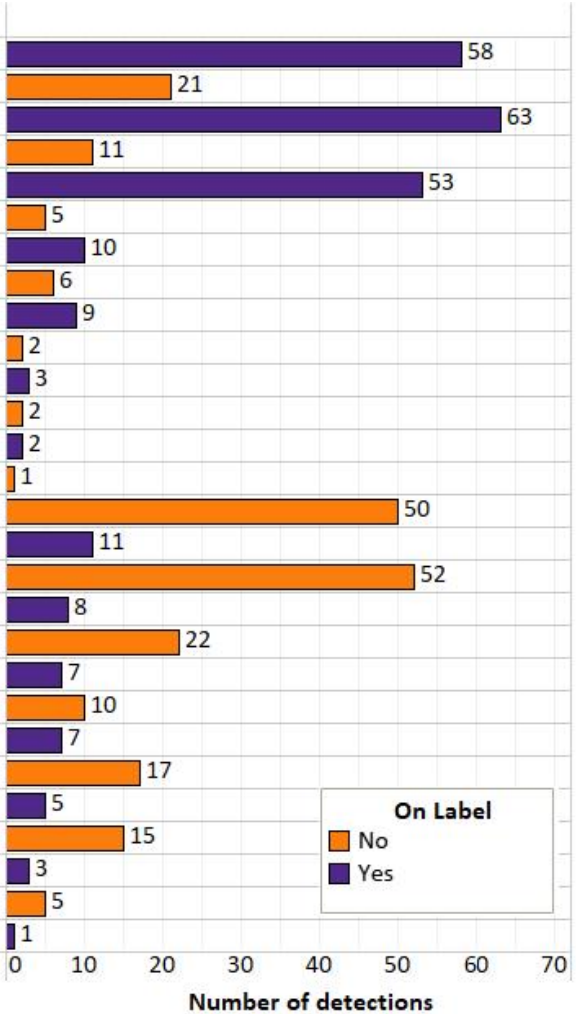
Nail Products Marketed to Children

- **17** products marketed for use by children

- Detected **15** Candidate Chemicals
  - Example: N-Methyl pyrrolidone (NMP)
    - Detected in two nail polishes marketed to children
    - NMP is a developmental and reproductive toxicant

Do the Ingredient Labels Accurately List Ingredients?

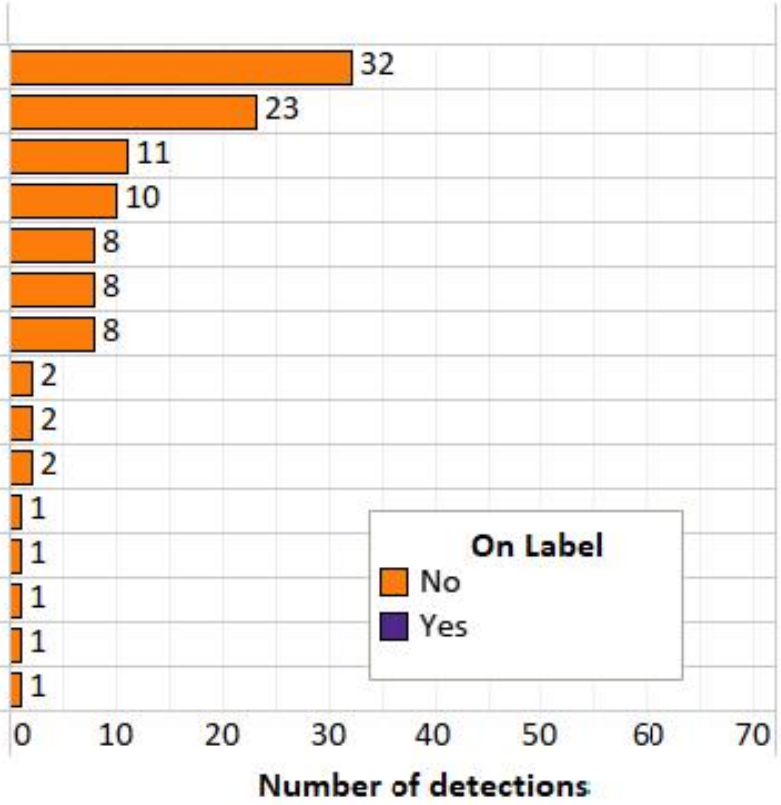
Analyte	CAS RN	Min	Max	Median
Ethyl acetate	141-78-6	93	716,000	282,500
		31	263,000	495
Butyl acetate	123-86-4	202,000	652,000	320,000
		26	34,400	54
Isopropyl alcohol	67-63-0	496	307,000	44,600
		513	20,000	853
r & s-Camphor	76-22-2	4,490	20,500	8,610
		90	5,570	1,459
Triphenyl phosphate	115-86-6	8,880	33,700	28,100
		27,200	46,100	36,650
Dimethyl-p-toluidine	99-97-8	26	9,080	7,840
		48	2,860	1,454
Ethyl tosylamide	80-39-7	2,420	2,830	2,625
		4,570	4,570	4,570
1-Butanol	71-36-3	305	77,900	3,250
		622	89,700	7,630
Acetone	67-64-1	50	517,000	327
		607	728,000	185,270
Propyl acetate	109-60-4	28	8,360	49
		796	94,000	61,800
Ethyl methacrylate	97-63-2	26	502,000	811
		65	840,000	642,000
Formaldehyde	50-00-0	51	584	218
		50	8,390	4,760
Toluene	108-88-3	31	2,700	42
		409	87,200	7,320
2-Butanone	78-93-3	76	996	489
		65,600	65,600	65,600



Concentrations for each target analyte are in µg/mL

Do the Ingredient Labels Accurately List Ingredients? (cont.)

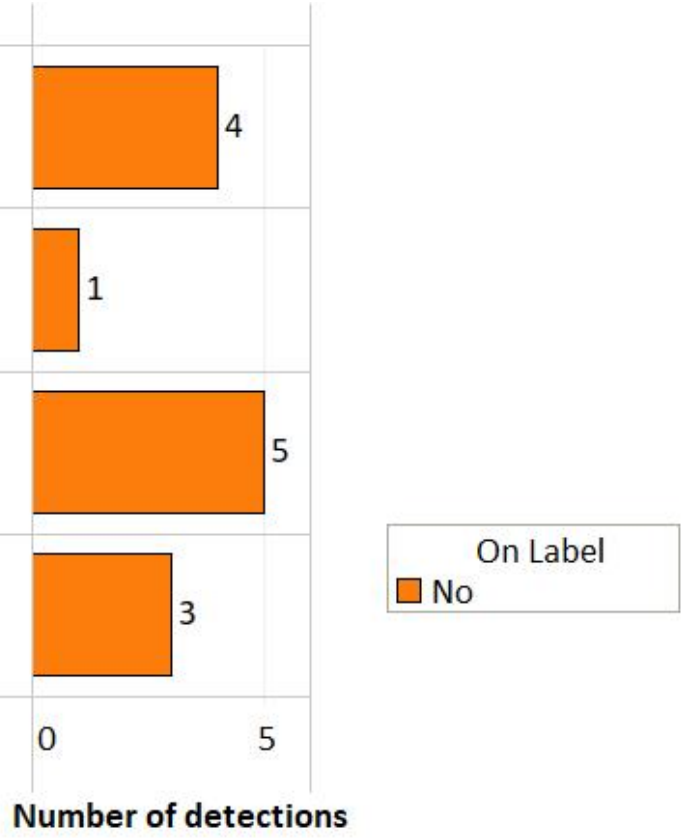
Analyte	CAS RN	Min	Max	Median
Methyl methacrylate	80-62-6	26	8,760	296
Acetonitrile	75-05-8	322	98,800	3,800
meta & para-Xylene	179601-23-1	52	34,300	75
Ethylbenzene	100-41-4	25	7,070	29
tert-Butyl alcohol	75-65-0	261	673	359
ortho-Xylene	95-47-6	26	5,050	63
Benzene	71-43-2	29	349	37
Methylene chloride	75-09-2	29	58	44
4-Methyl-2-pentanone	108-10-1	76	83	79
1-Ethyl-2-pyrrolidinone	2687-91-4	2,730	53,400	28,065
Tetrahydrofuran	109-99-9	222	222	222
Ethyl paraben	120-47-8	30,000	30,000	30,000
Di-n-butyl phthalate	84-74-2	51,100	51,100	51,100
1,3,5-Trimethylbenzene	108-67-8	33	33	33
1-Methyl-2-pyrrolidinone	872-50-4	39,000	39,000	39,000



Concentrations for each target analyte are in µg/mL

Do the Ingredient Labels Accurately List Ingredients? (cont.)

Analyte	CAS RN	Min	Max	Median
Ethyl methacrylate	97-63-2	765	2,220	924
Formaldehyde	50-00-0	230	230	230
Methyl methacrylate	80-62-6	38	453	237
Benzene	71-43-2	35	73	37



Concentrations for each target analyte are in µg/g

Do Nail Polishes Categorized as Professional or Retail Contain Different Candidate Chemicals or Concentrations?

- Categorized products as “Professional” or “Retail”
- Only included nail polish/lacquers, top coats, hardeners, and multifunctional products
  - Classified as solvent-based nail coatings
- Compared median concentrations and detection frequencies

Do Nail Polishes Categorized as Professional or Retail Contain Different Candidate Chemicals or Concentrations? (cont.)

- Chemicals with five times difference in median concentrations between “Professional” and “Retail”
  - Propyl acetate
  - MMA
  - N-Ethyl-2-pyrrolidone (NEP)
  - Toluene

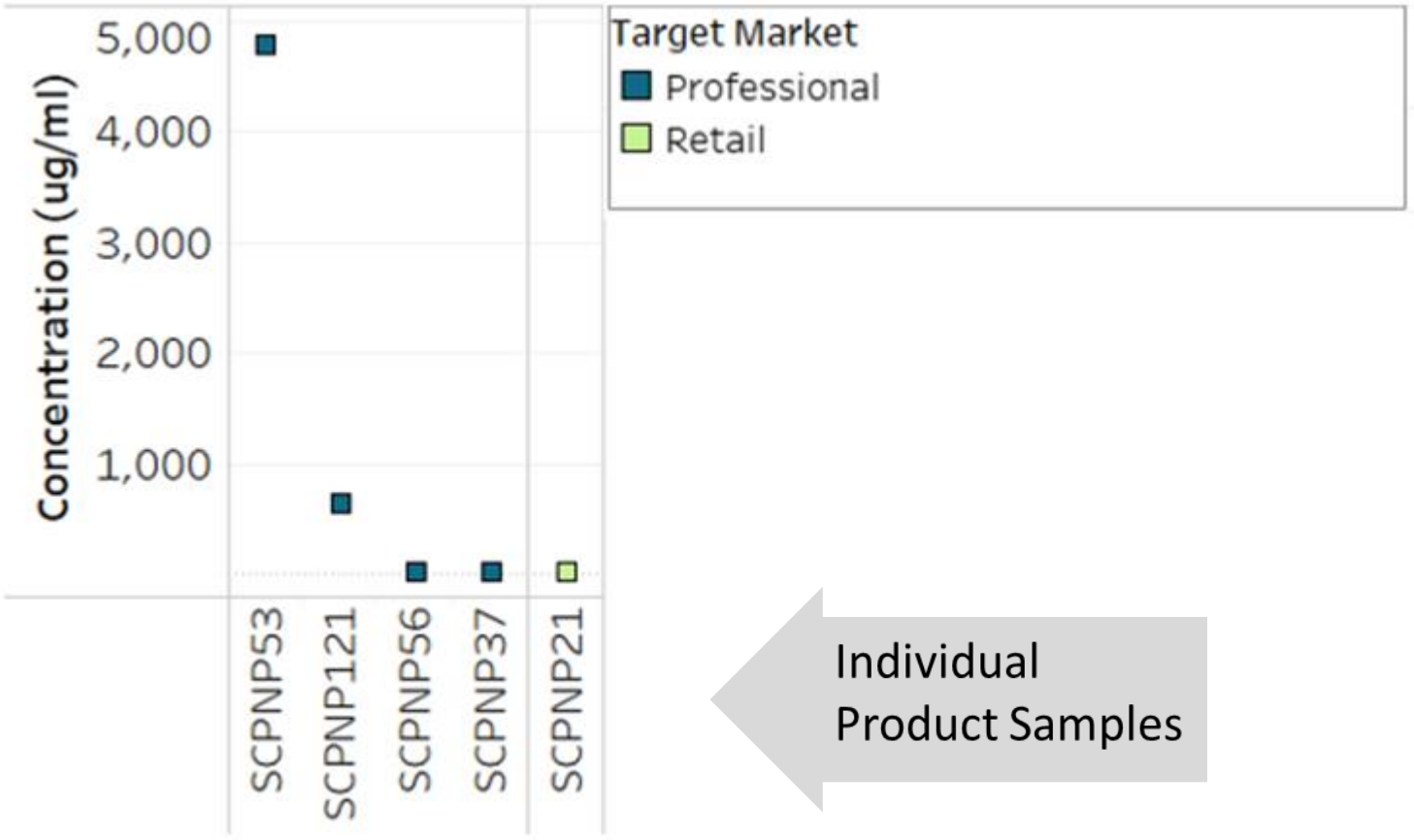
Comparison of Chemical Concentrations

Propyl acetate

Individual Product Samples

Comparison of Chemical Concentrations (cont.)

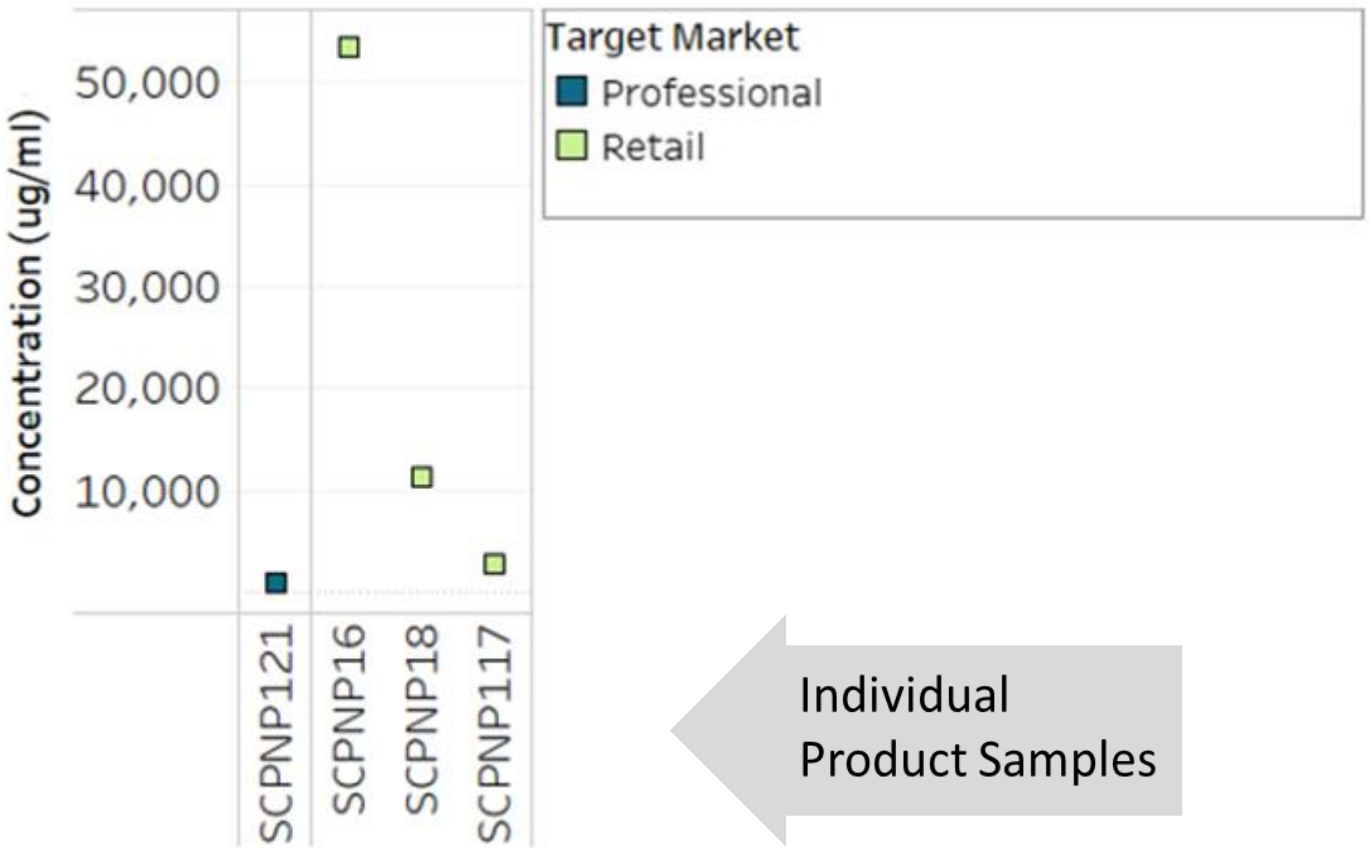
Methyl methacrylate (MMA)



Individual Product Samples

Comparison of Chemical Concentrations (cont.)

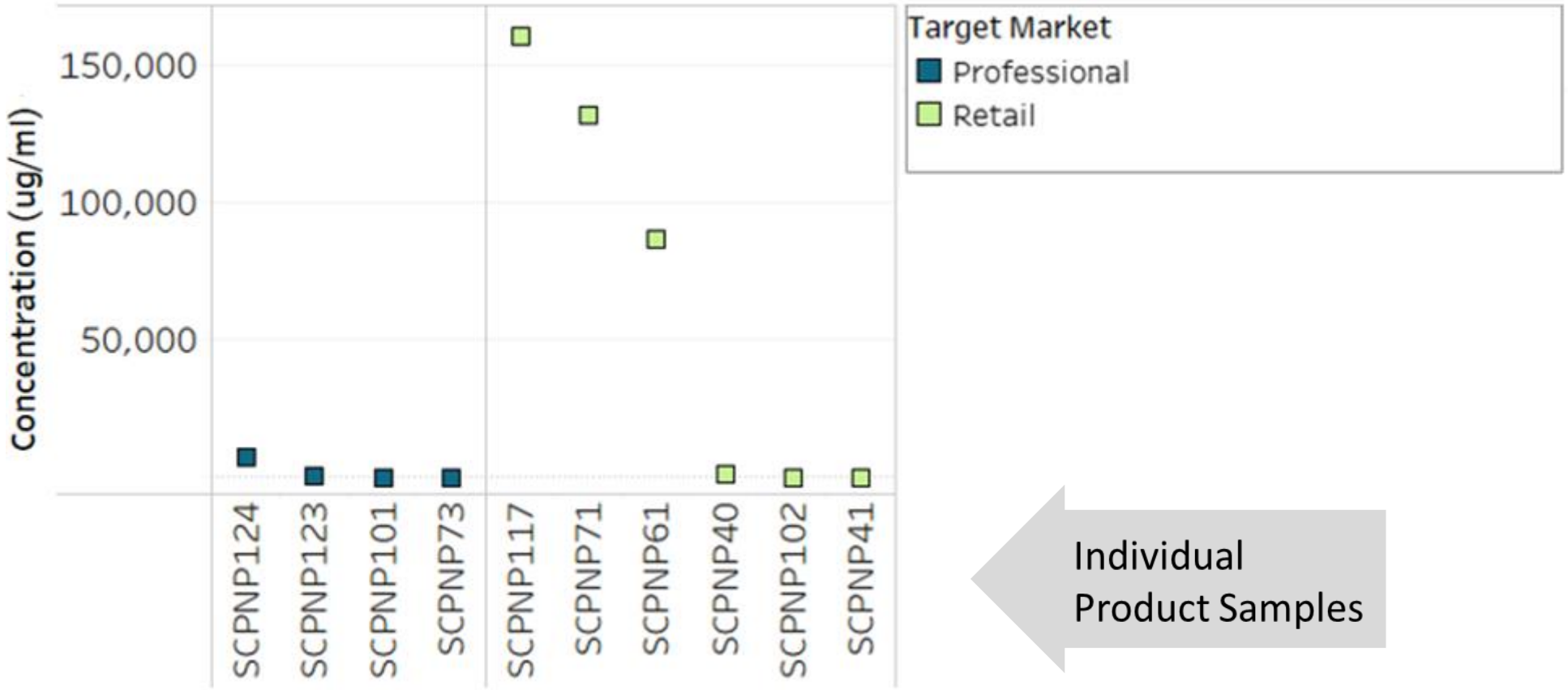
N-Ethyl-2-pyrrolidone (NEP)



Individual Product Samples

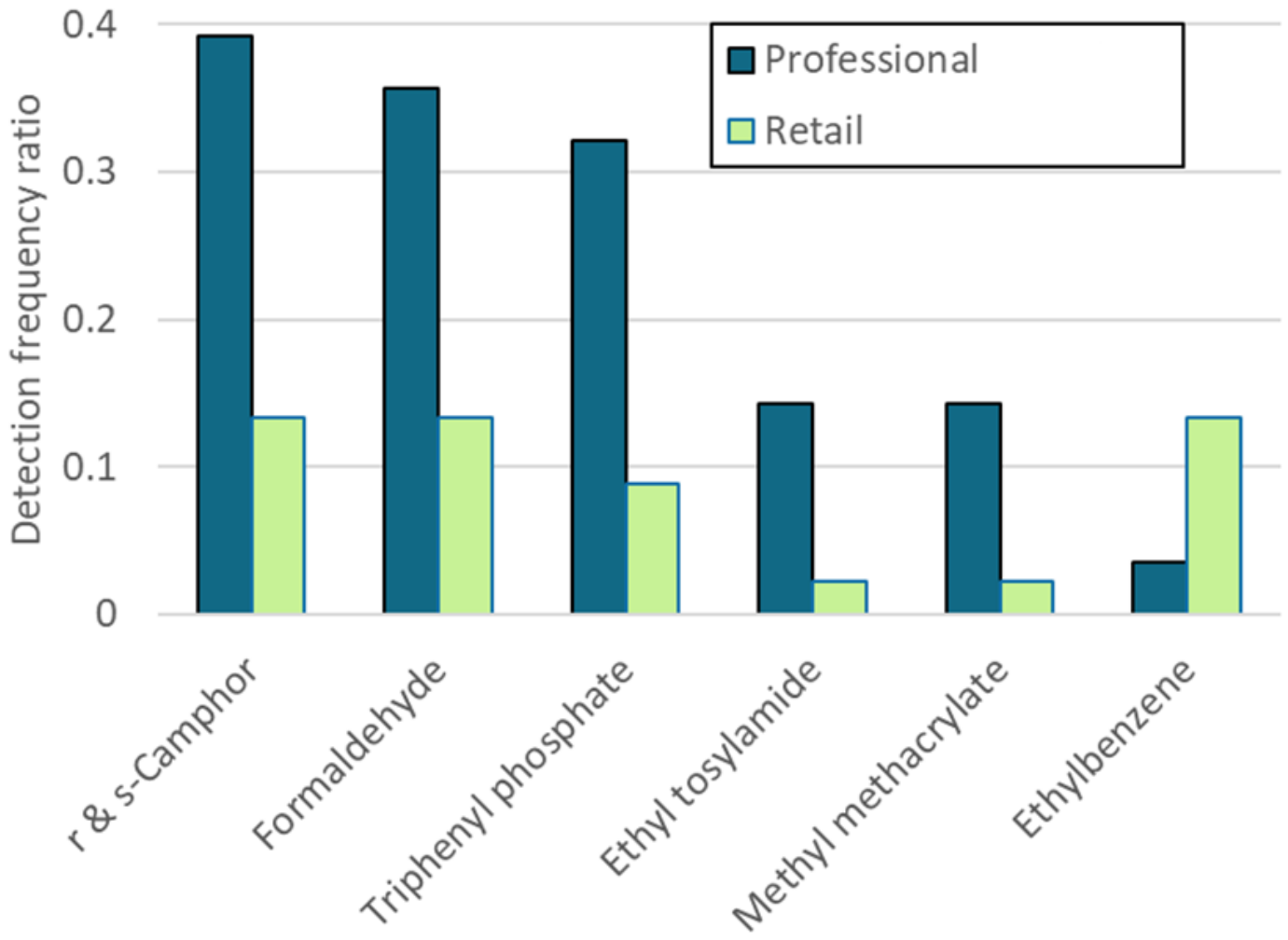
Comparison of Chemical Concentrations (cont.)

Toluene



Individual Product Samples

Comparison of Detection Frequencies



Do Nail Polishes Categorized by Price Contain Different Candidate Chemicals or Concentrations?

- Categorized products by price:
  - low-price (< $5)
  - mid-price ($5 - $15)
  - high-price (> $15)
- Limited analysis to solvent-based nail coatings
- Compared median concentrations and detection frequencies

Do Nail Polishes Categorized by Price Contain Different Candidate Chemicals or Concentrations? (cont.)

- Chemicals with five times difference in median concentrations between low-priced, mid-priced, and high-priced
  - Formaldehyde
  - N-Ethyl-2-pyrrolidone (NEP)
  - Toluene
  - Ortho-xylene

Comparison of Chemical Concentrations

Formaldehyde

Individual Product Samples

Comparison of Chemical Concentrations (cont.)

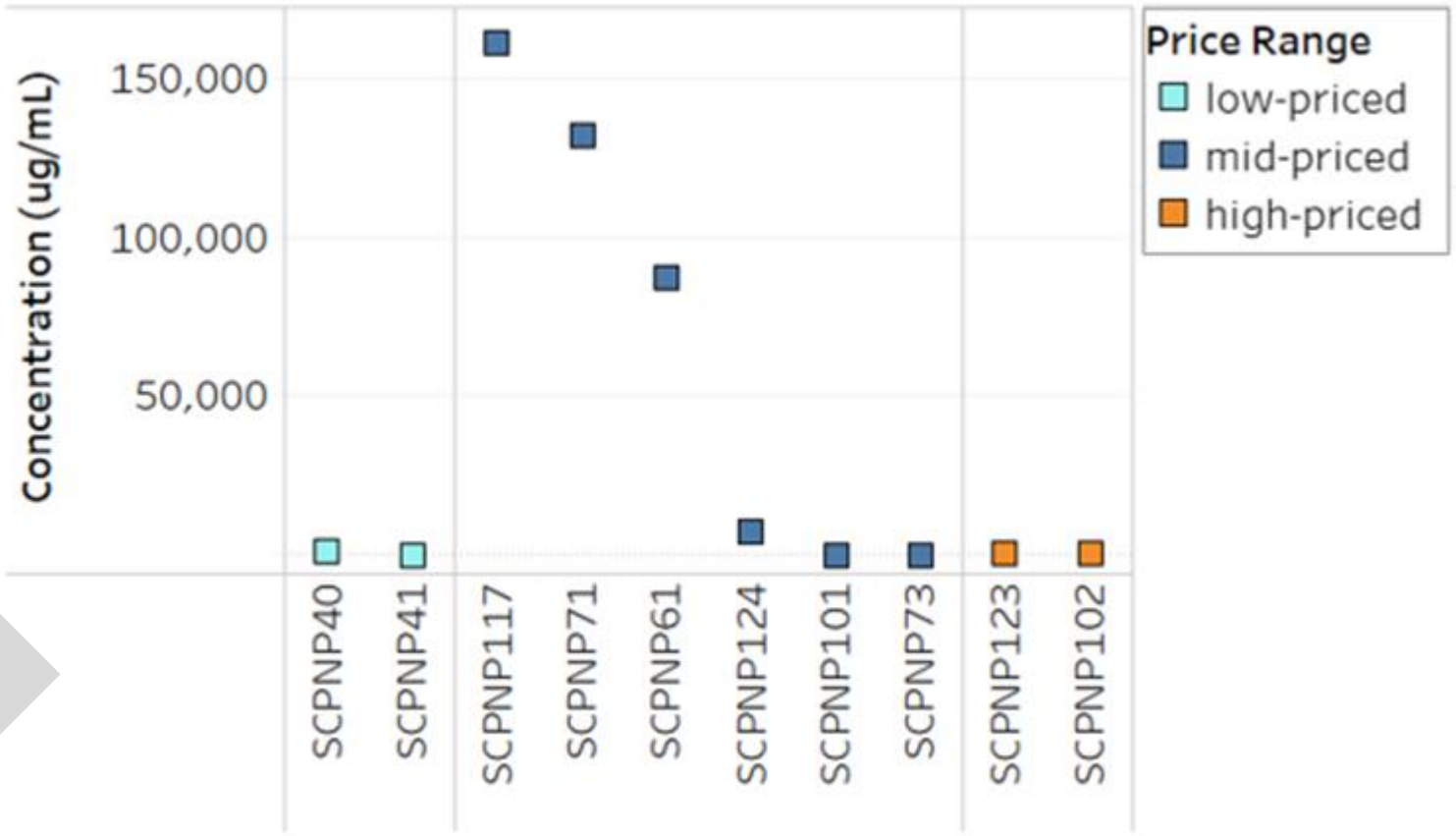
N-Ethyl-2-pyrrolidone (NEP)

Individual Product Samples

Comparison of Chemical Concentrations (cont.)

Toluene

Individual Product Samples

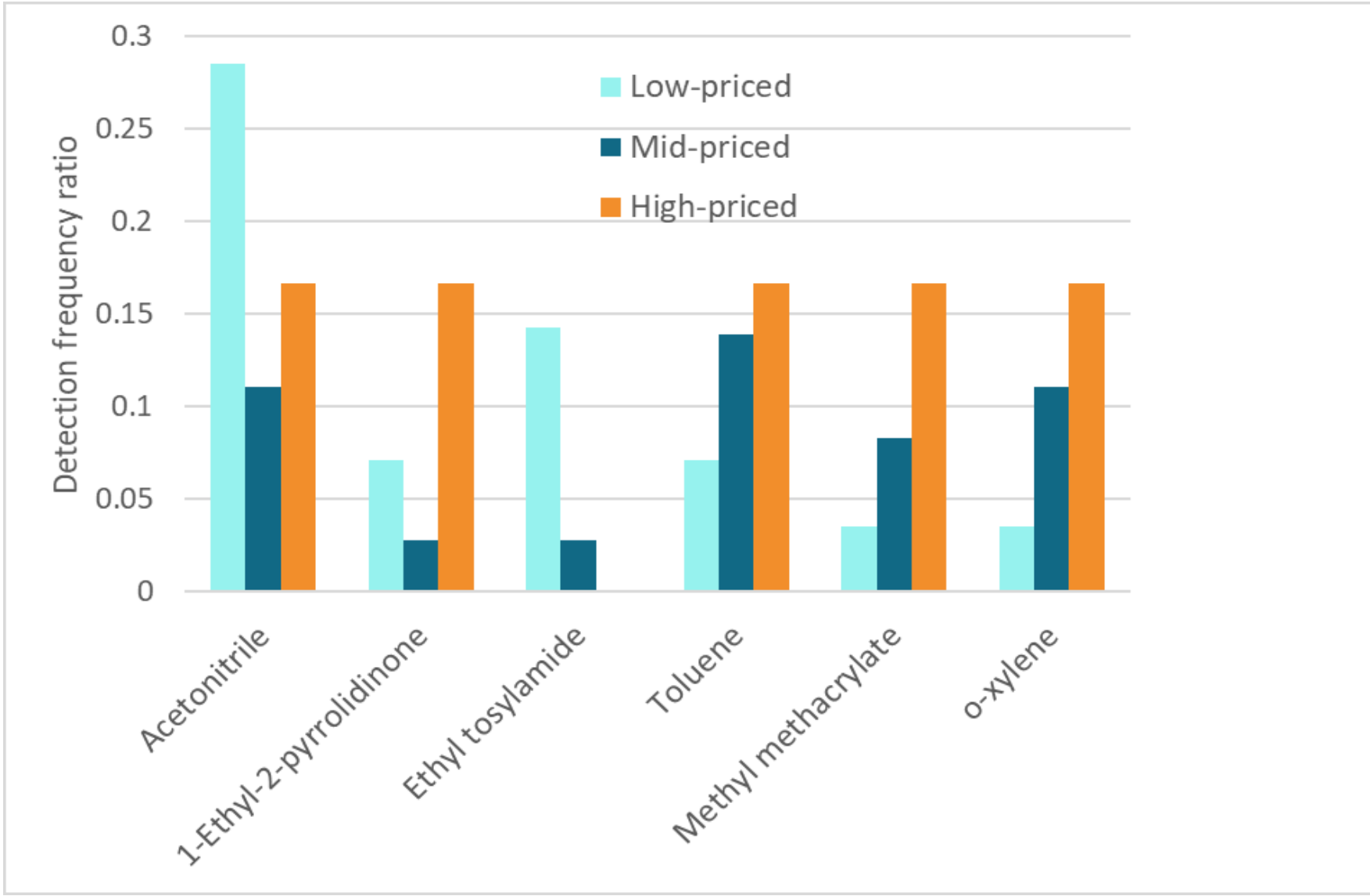


Comparison of Chemical Concentrations (cont.)

o-Xylene

Individual Product Samples

Comparison of Detection Frequencies



Have Retail Stores Met Their Public Commitments to Not Sell Nail Products with Certain Chemicals?

- Compared the chemical policies of only Amazon, Target, Walmart, and Dollar Tree
  - Formaldehyde, Toluene, and Dibutyl phthalate

- In general Amazon, Target, Walmart, and Dollar Tree met their chemical policies for nail products

Summary

- Marketing claims and ingredient labels continue to be inaccurate
- Nail products marketed to children contain various Candidate Chemicals
- Distinct differences found in Candidate Chemical detections in solvent-based nail coatings categorized by price and as professional or retail

Acknowledgments

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- Click **Raise Hand** in the webinar controls to ask your question directly
- Click Q&A at the bottom of your screen to type in your question
- From the phone, press ***9** to raise your hand and ***6** to unmute
- Please say your **name** and **affiliation** prior asking a question
- Please ask only **one (1) question** at a time