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# Breast Cancer Risk in California Nail Salon Workers



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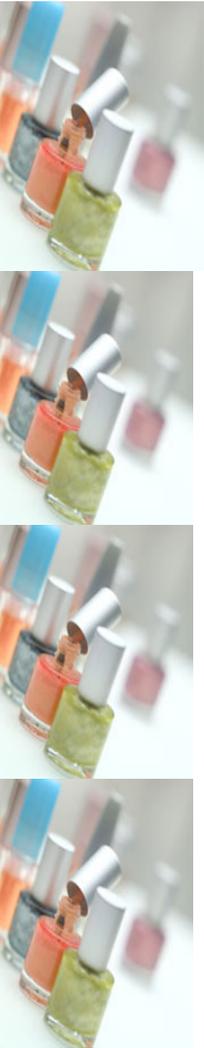
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# Presentation Outline

- ❑ Background of nail salon workforce
- ❑ California Healthy Nail Salon Collaborative
- ❑ Asian Health Services-Northern California Cancer Center community-research collaboration projects
- ❑ Air monitoring Component of our study

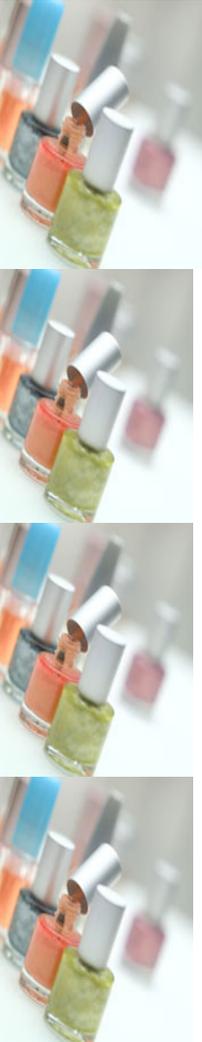


# Background on Cosmetics Products & their Regulation



- ❑ U.S. FDA does **NOT** have the legal authority to require:
  - Pre-market testing of products by manufacturers
  - Cosmetic companies to provide necessary information for FDA to conduct its own pre-market testing
  - Products sold for professional to include ingredients labels
  
- ❑ In 2002, “Not Too Pretty” phthalates report released
  - Found three quarters of off-the-shelf beauty products contained phthalates but not listed on label
  - Phthalates: family of industrial chemicals linked to birth defects and other adverse reproductive outcomes
  
- ❑ In Europe, European Union banned any carcinogen, mutagen and reproductive toxins in personal care products (went into force 9/04)
  - Forced cosmetics companies to reformulate products sold in Europe
  - Same companies refused to reformulate products sold in the U.S.
  - Some companies are voluntarily phasing out some compounds

# Why the interest in nail salon workforce?

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- ❑ Rapid growth due to tripling of nail salons in last two decades
  - ❑ California—largest number of establishments (N=35,000) and licensees (N>300,000) in the U.S. to perform hair and/or nail services
  - ❑ Likely to be exposed to toxic compounds in cosmetics at higher level than consumers
  - ❑ Immigrant workers: Vietnamese comprise as much as 80% of nail salon workforce in California
  - ❑ 95% female workers
  - ❑ Anecdotal stories from health outreach workers and community clinicians
    - Workers experience acute health symptoms (e.g., headaches, breathing problems, skin irritations)
    - Symptoms disappear when workers are away from work for a few days

# Nail Salons Services and Work Environment

- ❑ Nail Care Service Types:
  - Standard manicure/ pedicure— cleaning and coloring
  - Artificial nails—artificial nail over natural nail using liquid and powder polymer, shaping and coloring of nails
- ❑ Disinfection of tools to prevent spread of disease and bacteria
- ❑ Some salons include hair services and other beauty care services
- ❑ Long hours in small salons with as many as 10 work stations
- ❑ Number of salons lack methods for proper ventilation:
  - No local exhaust ventilation
  - No multiple passageway to allow indoor-outdoor exchange



# Select Compounds in Nail Products

Compounds	Nail care use <sup>1</sup>	Potential Health Effects <sup>2</sup>	Route(s) of Exposure
Ethyl acetate	Nail polish, nail polish remover,	Eye, nose, throat irritant; dermatitis	Inhalation
Formaldehyde	Nail hardener, tool disinfectant <sup>1</sup>	Known Carcinogen	Inhalation, dermal
Silica (quartz or cristobalite)	Acrylic nail powder	Known Carcinogen	Inhalation
Methylene Chloride	Artificial nail solvent	Possible Carcinogen	Inhalation, dermal
Titanium Dioxide	Acrylic nail powder <sup>1</sup>	Possible Carcinogen	Inhalation
Isopropyl acetate	Nail polish	Eye, nose, skin, lung irritant	Inhalation
DiButyl Phthalate	Nail polish	Endocrine disruptor	Inhalation, dermal
Toluene	Nail polish, nail adhesives <sup>1</sup>	Suspected Teratogen	Inhalation, dermal

<sup>1</sup>US EPA Pollution Prevention Practices for Nail Salons: A Guide to Protect the Health of Nail Salon Workers and their Work Environment, 2007.

<sup>2</sup>Agency for Toxic Substances Disease Registry (ATSDR). Toxicological Profile Information Sheet [web page] 2006.

# Existing Literature

## Exposure Assessment Studies:

- ❑ NIOSH field investigations at salons suggest low air ventilation
  - measure of CO<sub>2</sub>
- ❑ As much as half of workers are reporting acute health symptoms after begin working in industry
- ❑ Limited air monitoring data in California nail salons available for chemicals and particulates

## Cancer Studies:

- ❑ No studies focused specifically on nail salon workers
- ❑ Mainly of hairdressers
  - cancers among hairdressers: bladder, multiple myeloma, non-Hodgkin's lymphoma, ovary
  - last two decades—dramatic demographic shift in workforce

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# California Healthy Nail Salon Collaborative

**Purpose:** To address the environmental health issues facing the nail salon community through an integrated policy advocacy, research, and outreach and education approach.

- ❑ Established in 2005
- ❑ Sharing knowledge, resources, wisdom, and best practices
- ❑ Unifying our collective voices to leverage for change
- ❑ Over 20 collaborative members, including public health/ environmental advocates, nail salon workers and owners, community-based groups, and allies in public agencies
- ❑ Three levels of work: policy, outreach & education and research



# Asian Health Services (AHS)



To serve and advocate for the Asian community regarding its health rights, and to assure access to health care services regardless of income, insurance status, language, or culture.



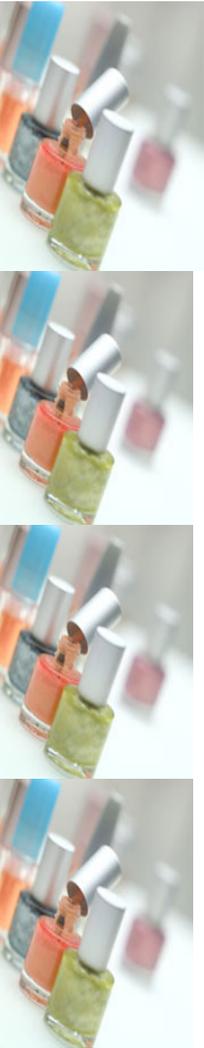


# Northern California Cancer Center (NCCC)

Dedicated to preventing cancer through population-based research and community education



# Impetus for Research Focused on Nail Salon Workers



- ❑ AHS has over 15 years of outreach and education to nail salon workers
  - Health outreach staff have long recognized the acute health symptoms of nail salon workers
  
- ❑ NCCC staff had concerns about occupational exposures
  - Carcinogens and toxins in nail products
  - Poorly ventilated shops
  - Chronic exposures with multiple routes
  - Large vulnerable population: immigrant workers
  
- ❑ Common interest in understanding workforce members
  - Informing ongoing policy debates regarding potentially hazardous compounds in cosmetics
  - Drawing attention to workers' health problems rather than penalizing their work conduct



# AHS-NCCC Pilot Study (2005-2007)



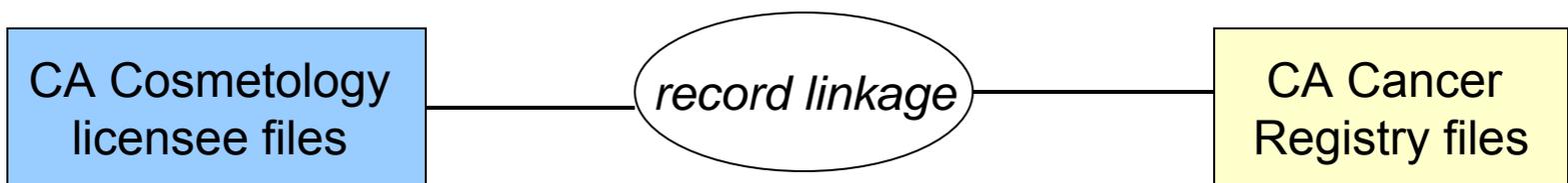
- ❑ Community-research collaboration funded by CA Breast Cancer Research Program
- ❑ Research methods:
  - 1) Two focus groups (N=20 workers and owners)
  - 2) in-person surveys in salons (N=201 workers and owners)
- ❑ Promoting meaningful community participation
  - Community Advisory Committee: Vietnamese community members and workers
  - Surveys conducted by nail salon workers: engaging community member and effective for participation rate
- ❑ Major findings:
  - Half the salons had poor methods for ventilation
  - 80% of workers reported having health concerns due to work
  - Nearly half of workers reported acute health symptoms potentially related to chemical exposures at workplace (headaches, dizziness, difficulty breathing, skin irritations)

# AHS-NCCCC Continuation Project (2007-2010)



Part I. Do nail salon workers have higher breast cancer rates than the general population, or the Vietnamese population, in California?

- All cosmetologists and manicurists required by law to be licensed by state
- Statewide licensee file linked to statewide population-based cancer registry



- Compare to female general population
  - Excess cancer incidence may suggest occupational link

# AHS-NCCC Continuation Project (2007-2010)



## Part II. Do Vietnamese nail salon workers have workplace exposures to organic solvents that exceed health-based standards?

- Personal air monitoring with Vietnamese nail salon workers to measure select solvents
- Identify predictors of exposure levels (through questionnaire)
- Compare to health standards



# Air Monitoring Pilot Phase

- Passive Diffusion Monitors:
  - Solvent desorption + GC-FID = 3M 3500
  - Thermal desorption + GC = SKC Ultra I
- Volatile organic compounds of interest:
  - Benzene, toluene, xylenes and acetates
- Results:
  - Ultra passive devices contaminated with benzene
  - Could not quantify benzene or xylenes with either device for 6 hour samples
  - Solvent desorption lower cost and therefore can analyze more samples



# Study Population for Air Monitoring

- N=80 Female Vietnamese nail salon workers working at a salon in the San Francisco Bay Area
- Collect through multiple seasons
- Collect from at least 20 beauty salons
- Collect from at least two workers per salon
- Collect two different measurements from each worker



# Air Monitoring Measurements

- Passive Diffusion Monitor device (3M 3500)
- Worn on shirt collar or pants
- Each participant wears device for  $\geq 6$  hours during work shift
- Each participant has two (some three) measurements on separate days
- Workers asked to remove device if they leave the salon for lunch or break
- Compounds tested: toluene, ethyl acetate and isopropyl acetate
- First ten all had detectable levels of these compounds



# Information Collected from Questionnaire

- **Demographic** (e.g., birth year, birthplace)
- **Work history** (e.g., length of time worked in industry, length of time worked at that salon, work hours/week)
- **Health Symptoms** (e.g., headaches, skin irritation, breathing problems)
- **Salon Characteristics** (e.g., salon size, number of hair/nail stations, temperature)
- **Behavior during measurement** (e.g., number of manicure/pedicure services, protective wear, ventilation)



# Recruitment Barriers

- Fear of government regulation
  - History of citations from different government agencies
  - Suspicious that information will be reported to regulatory agencies (more fines, shutdown)
- Fear of effects on health care services
- Salon owners as gate keeper
- Fear that device can cause harm
  - Device captures chemical compounds and worker exposed at higher level by wearing it



# Recruitment Strategy for Participants

- Community-based organization (AHS) familiar with community to recruit
- Community Advisory Committee (nail salon workers and owners) to provide guidance and help recruit
- Ethnic media to publicize study
- Incentives for workers: \$50/ measurement



# General Project Timeline

## Part I. Record Linkage

- ❑ Complete Analysis: June 2009
- ❑ Finish writing reports: October 2009
- ❑ Disseminate results: December 2009

## Part II. Air Monitoring

- ❑ Complete data collection: August 2009
- ❑ Complete laboratory analysis: October 2009
- ❑ Analyze data: March 2010
- ❑ Finish writing reports: May 2010
- ❑ Disseminate results: June 2010

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# Project Staff and Contributors

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# Thank You