Pretty Scary

Could Halloween Face Paint Cause Lifelong Health Problems?



A Report on Heavy Metals in Face Paints by the Campaign for Safe Cosmetics

Acknowledgements

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Support for this project was provided by The As You Sow Foundation, The Beldon Fund, The Jacob and Hilda Blaustein Fund, Johnson Family Foundation and The Richard and Rhoda Goldman Fund.

About the Campaign for Safe Cosmetics

The Campaign for Safe Cosmetics is a national coalition of nonprofit women's, environmental, health, faith, consumer and worker safety organizations. Our collective goal is to protect the health of consumers and workers by requiring the personal care products industry to phase out the use of chemicals linked to cancer, birth defects and other serious health concerns, and replace them with safer alternatives. The Campaign for Safe Cosmetics is working with endorsing organizations, responsible businesses and thousands of citizen activists to shift the cosmetics market toward safer products and to advocate for smarter laws that protect our health from toxic chemicals and encourage innovation of safer alternatives.

The Campaign for Safe Cosmetics coalition members include: The Alliance for a Healthy Tomorrow (represented by Clean Water Action and Massachusetts Breast Cancer Coalition), the Breast Cancer Fund, Commonweal, Environmental Working Group, Friends of the Earth, and Women's Voices for the Earth. The Breast Cancer Fund, a national 501(c)(3) organization focused preventing breast cancer by identifying and eliminating the environmental links to the disease, serves as the national coordinator for the Campaign.

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Executive Summary

Ghosts and goblins are not the only scary things at Halloween. As children across the country paint their faces into all sorts of characters, they may be unknowingly spreading harmful substances on their delicate skin.

For this report, the Campaign for Safe Cosmetics sent popular children's face paints to an independent laboratory to test them for heavy metals, and we reviewed the labels of cosmetic products at seasonal Halloween stores. Our findings paint a frightful picture: Due to the lack of cosmetic industry regulation in the United States, face paint, hair color and other products on U.S. shelves contain dangerous heavy metals and toxic substances that are banned or restricted in other countries. Disturbingly, parents have no way of knowing what's really in these products just by reading the labels.

Our Findings Include:

- Ten out of 10 face paints tested contained lead.
- Six out of 10 face paints tested contained known skin allergens nickel, cobalt and/ or chromium – at levels far exceeding the recommendations of industry studies.
- Labels contained misleading claims, such as "hypoallergenic," on products with known skin allergens.
- Hair colors and other cosmetic products contained hazardous chemicals that are banned or restricted in Europe, Canada and Japan and contained colors not approved for use in cosmetics by the FDA.

Why Look for Heavy Metals in Face Paint?

In 2007, the Campaign for Safe Cosmetics tested for – and found – lead in numerous top-selling lipsticks.¹ It stood to reason that lipstick may not be the only product that could contain lead and not list it on the label. After reports revealed that several other countries such as Italy,² Ireland³ and Canada⁴ found heavy metals in face paints, we decided to see if there are similar problems in the United States.

The Food and Drug Administration (FDA), the agency responsible for cosmetic safety, does little to ensure that cosmetics are safe and actually lacks the power to do so. For example, the FDA does not conduct routine testing of cosmetic products and does not have the authority to require companies to conduct pre-market safety assessments of their products or the ingredients in them.

The FDA also does not require companies to list heavy metals or other harmful contaminants on product labels, even though they are commonly found in a wide array of personal care products.⁵

The only way to know if a cosmetic product contains lead or other heavy metals is to test the product at a laboratory, which the Campaign for Safe Cosmetics did for this report at a cost of \$270.00 per sample.

What We Found

The Campaign sent 10 face paint products, including products marketed as theater face paint, to Analytical Sciences, an independent lab based in Petaluma, California, to test for a range of harmful metals. The results were mixed. Fortunately, we did not find mercury or arsenic, which were found in Canadian testing.⁶ But we did find that all the products were contaminated with low levels of lead, which can harm children's developing brains. Six of the products were contaminated with nickel, cobalt and/or chromium which can cause lifelong skin problems. Many of the products contained two, three or even all four of these metals. Findings include:

Lead – Harms Children's Brains Even at Very Low Levels

- All 10 products contained lead, ranging from .054 parts per million (ppm) to .65 ppm.
- The Centers for Disease Control and Prevention (CDC) and many other experts agree that lead exposure is not safe at any level,^{7 & 9 10} and exposure to lead adds up in the body.¹¹ Lead primarily enters the body through ingestion or inhalation. There is limited evidence that lead can be absorbed through the skin, though this is less understood than other routes of exposure.^{12 13 14}
- Lead exposures during prenatal development, infancy and childhood can cause attention deficits, hyperactivity, impulsive behavior, IQ deficits, reduced school performance, aggression and delinquent behavior.^{15 16 17}
- Lead is banned from cosmetics in Canada¹⁸ and Europe.¹⁹ It is legal for cosmetics sold in the U.S. to contain lead in any amount.

Nickel, Cobalt and Chromium – Top Skin Allergens

- Four out of 10 products contained nickel, ranging from 2.1 to 5.9 ppm.
- Two out of 10 products contained cobalt, ranging from 4.8 to 5.5 ppm.
- Five out of 10 products contained chromium, ranging from 1.6 to 120 ppm.
- The levels found in all the products exceed the recommendations of several industry studies ^{20 21 22} which recommend that nickel, cobalt and chromium levels not exceed 1 ppm for consumer products.
- In 2008, nickel was designated "Allergen of the Year" by the American Contact Dermatitis Society.²³
- Nickel is the leading contact allergen in children and adults.^{24 25 26 27} Prevalence of nickel allergy is on the rise.^{28 29 30}
- Nickel is banned for use in cosmetics in the European Union.³¹ Europe has also placed significant restrictions on nickel in products that come into prolonged contact with the skin, such as earrings.³²
- Chromium is widely restricted from use in cosmetics. It is banned in the European Union,³³ Canada,³⁴ Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam.³⁵
- Exposure to these allergens early in life increases the risk of allergies later in life.^{36 37}

How Do These Metals Get There?

The metals discussed in this report are not listed as ingredients on any of the products. Due to a lack of manufacturer testing and regulatory oversight, it is possible that the companies are not even aware that the products are contaminated. These contaminants likely get into the products when poor-quality ingredients are used. Most likely, the metals are contaminants from one or more of the inorganic (i.e. mineral) base materials.³⁸ Since all the metals are found in various environments. manufacturers would have to test the raw ingredients before they are assembled into the final product in order to track the origin of these contminants. The FDA should require that raw materials be tested for purity, that ingredients in cosmetics be shown to be safe for children and other vulnerable populations, and that all chemical constituents in personal care products, including fragrance ingredients and contaminants, be listed on ingredient labels.

Face paints are not just a once-a-year concern. The paints we tested are commonly used for theater, face-painting booths at carnivals and fairs, and everyday play. Children love getting their faces painted, and they and their parents deserve to have a guarantee that it is safe.

What these tests indicate is that children are being exposed to potentially hazardous levels of heavy metals from face paints, some of which claim to be "safe," "non-toxic" or "hypoallergenic." These results further indicate that the FDA is not ensuring that face paints and other cosmetics are safe, and it is not taking the necessary steps to protect the most vulnerable – our children.

What Does Hypoallergenic Mean? Nothing.

For decades, products have been labled "hypoallergenic," which is supposed to mean that no allergens are present in the product. However, there is no legal definition for this term and no watchdog or oversight agency to enforce the validity of these claims.

Case in point: Snazaroo Face Paint claims on its package that the product is "hypoallergenic," "non-toxic" and "specially formulated to be friendly to the most delicate skin" – yet the product contained some of the highest levels of lead, nickel and cobalt in our tests (see *Test Results*).



These results show that the FDA is not ensuring that all cosmetics are safe, and it is not taking precautionary measures to protect the most vulnerable – our children.

How the Tests Were Conducted

Ten face paint and theater makeup products were chosen for testing. These included a variety of water-, cream- and grease-based products, crayons, cakes and gels. They came from several different countries of origin. They were all purchased through Amazon.com, though shipped by a variety of distribution companies.

The products were delivered, unopened, to Analytical Sciences, an independent laboratory in Petaluma, California, for testing. All products were tested for the same metals, which included arsenic, chromium, cobalt, nickel, lead and mercury. No mercury or arsenic was detected, and therefore those results are not reported. Due to the health concerns associated with all lead exposures, a more sensitive test was performed to determine lead levels. Test procedures are described below.

Inductively Coupled Plasma Metals Analysis (For Nickel, Cobalt, Chromium and Arsenic)

Approximately 1 gram of a face paint sample was accurately weighed to the nearest milligram and placed directly into a metals acid digestion cup. Approximately 5 milliliters of 1:1 Nitric acid was added and the whole digestion cup including the sample was heated to 95C for 15 minutes. Two additional milliliters of Nitric acid were added and the heated digestion was allowed to continue for 30 minutes. The contents of the cup were allowed to cool and approximately 2 milliliters of 30%

Hydrogen Peroxide was carefully added. Two milliliters of concentrated Hydrochloric acid was added and the sample was again heated to 95C for an additional 15 minutes. After cooling, 50 microliters of a Yttrium internal standard was added and the sample was brought to a final volume of 50 milliliters with 2.5% Nitric acid. The sample was sealed, shaken and allowed to stand until analysis. The metals digestate was analyzed using an inductively coupled plasma spectrometer (ICP). Multiple certified standards were used to calibrate the ICP instrument and correct for metal to metal interferences. Sample aspiration efficiency was corrected for and monitored using the Yttrium internal standard signal. All data was reported on a milligram of metal per kilogram of sample basis (i.e. parts per million). (EPA Method 6010).

Lead by Zeeman Graphite Furnace

A 1 to 2 gram amount of a face paint sample was placed into a small, acid rinsed, ceramic crucible. The sample weight was recorded to the nearest milligram. The crucible was placed into a high temperature furnace and gradually heated to 550C (1022F) in an oxygenrich environment. Ashing of the organics present in the sample was allowed to continue for approximately 30 minutes. After cooling, the ashed sample was quantitatively transferred to a plastic digestion cup and brought to a final volume of 5.0 milliliters using Nitric acid. The acid digestate was quantitatively introduced by an autosampler into a graphite furnace atomic absorption spectrometer operating with Zeeman background correction. The instrument was optimized and calibrated using certified lead standards prior to the analysis of samples. All data was reported as milligrams of lead per kilogram of sample (i.e. parts per million). (EPA Method 200.9)

Face Paints Are An All-Ages, All-Year Concern

The paints we tested are commonly used year-round for theater or at face-painting booths, carnivals and fairs and for at-home play.

In addition to concerns for children, adults should also be careful about using face paints, whether for theater performances or just for fun. This is especially true if you are pregnant or hoping to have children in the future. Studies indicate that lead can cross the placenta and affect a developing baby.^{39 40} Pregnancy is an especially vulnerable time for babies to be exposed to lead.⁴¹ Men's sperm quality can decline from lead exposure.⁴² These are just a couple of examples of why exposure to harmful metals should be avoided throughout people's lifetimes.

Test Results

Below are the product test results. Metals are reported in parts per million. Lead levels are reported to a more detailed level because a more sensitive test was used to detect lead.

	Product Description	Lead	Nickel	Cobalt	Chromium
Alex Face Paint Studio	Made in China by Alex Toys	.65			
Ben Nye LW Lumiere Creme Wheel	Made in USA by Ben Nye Co. Inc.	.19			
Crafty Dab Face Paints Push Up Crayons	Made in China by Crafty Dab, a division of Clarence J. Venne, LLC. Sold as part of Gymboree's Play and Music Face Painting Kit	.082			
Don Post Grease Paint Color Wheel	Made in China by Don Post Studios	.63			15
Jovi Make-up	Made in Spain by Jovi	.054	5.9		120
Wolfe Brothers Face Art & FX	Made in China. Sold with Klutz Face Painting book	.18			1.6
Mehron Glow in the Dark Fantasy F-X	Made in USA by Mehron Inc.	.14			
Mehron 6-Pack Greasepaint Crayons	Makeup made in USA. All other components made and packaged in China by Mehron Inc.	.074	4.1	4.8	16
Rubie's Silver Metallic Fard d' Argent	Made in USA by Rubie's Costume Co.	.26	2.1		2.2
Snazaroo Face Painting Kit	Made in UK by Snazaroo	.56	5.5	5.5	

Testing 10 products does not provide a complete window on the entire face paint market. There may be products on the market that contain no lead, even though we found lead in all the products we tested. Also, the fact that we did not find mercury or arsenic does not mean that all face paints sold in the United States are free of mercury or arsenic.

Lead

Lead is one of the most studied metals in terms of its health effects. The evidence of its potential to cause harm, especially to children, is indisputable.

Lead exposures during prenatal development, infancy and childhood can cause attention deficits, hyperactivity, impulsive behavior, IQ deficits, reduced school performance, aggression and delinquent behavior.^{43 44 45} Girls may experience delayed puberty from lead exposure.⁴⁶ It can also impact fertility, including increasing risk for miscarriage and reducing sperm quality.⁴⁷ Early-life lead exposure can even increase risk for Alzheimer's and Parkinson's disease.⁴⁸ Lead also contributes to a wide range of mental health issues throughout people's lifetime.⁴⁹ (See Appendix A: Lead Can Lead to A Lifetime of Health Problems).

Lead does not break down in the body and accumulates over time.⁵⁰ As a result, small amounts of lead can add up to harm. Preventing exposure to lead throughout a person's lifetime, especially in the early years, is a critical action to protect people's health.



Route of Exposure

People can be exposed to lead by ingesting it, inhaling it or absorbing it through the skin. Ingesting and inhaling lead are, without a doubt, the primary routes of exposure and the greatest cause for concern. Although lead absorption through the skin is often ignored, studies show that lead actually can be absorbed through the skin.⁵¹ ^{52 53} One study found that skin-absorbed lead can be detected in sweat, blood and urine within six hours of skin application,⁵⁴ though more research is needed to understand just how skin-aborbed lead is distributed in the body. In a study of nine adult males who applied hair dye containing lead acetate for 90 days, it was found that seven out of nine of them had elevated lead levels in hair on other parts of their bodies.⁵⁵ Additionally, there is a chance that children's face paint may be ingested-either through licking it off their lips or getting makeup on their hands that ends up in their mouths.

Experts agree that no exposure to lead is safe, and while we do not have a full understanding of how much lead would be absorbed from using face paint, we do know that it is an unnecessary and preventable exposure. The FDA should be protecting our most vulnerable by requiring that cosmetics be free of ingredients and contaminants with such well-documented hazards associated with exposure at any level.

Is Any Level of Lead Acceptable?

The short answer is "No."

Our scientific understanding of how much lead impacts the developing brain has changed over time. Exposure levels that were once thought to be safe for children are actually associated with brain damage. Current studies suggest that lead may have no identifiable exposure level that is safe.^{56 57 58} The CDC states: "No safe blood lead level has been identified."⁵⁹

According to the CDC, the current threshold blood lead levels is 10 micrograms of lead per deciliter (microg/dl) of blood, the level at which it recommends public health actions be initiated.⁶⁰ But even today the CDC is contemplating whether to further lower the screening threshold to 5 microg/dl blood since impacts have now been documented at these lower levels.⁶¹ ⁶² According to the World Health Organization, blood lead levels as low as 5 microg/dl can irreversibly impair the development of children's brains, reducing their IQ.⁶³ One study found that the impact from exposing children with low blood lead levels to additional lead had a significantly greater effect on reducing intellectual capacity than when children with higher blood lead levels were exposed to additional lead.64

At least a million children in the U.S. exceed the currently accepted threshold for blood lead level exposure that affects behavior and cognition (10 microg/dl). If the CDC lowered the toxic threshold in response to most recent



studies, it would result in the addition of millions of children being recognized as being exposed to lead at levels associated with impaired neurodevelopment. ⁶⁵

Lead is banned from cosmetics in Canada⁶⁶ and Europe.⁶⁷

The Centers for Disease Control and Prevention states: "No safe blood lead level has been identified."68

The FDA Limits Lead in Candy. Why Not Face Paint?

Currently, it is legal for face paints, lipsticks and other personal care products sold in the U.S. to contain unlimited amounts of lead without listing the substance on the label.

Our test results indicate that all 10 out of 10 face paints tested contain lead and seven out of 10 of the products have lead levels that exceed the allowable level of lead in candy, which is 0.10 ppm. It is important to note that the FDA set the maximum allowable limit of led in candy at 0.10 ppm not because that level of lead in candy is considered safe. but because the FDA determined 0.10 ppm to be the lowest lead level that candy manufacturers can reasonably achieve.⁶⁹ Using this logic, the FDA should set a maximum allowable level of lead in cosmetics based on the lowest levels that companies can reasonably achieve. The laws should also be changed to require companies to list lead on the ingredient label if it is present.



Lead Exposure Adds Up & It Is Preventable

Importantly, face paint is not the only source of lead exposure (see *How to Avoid Lead Exposure*) and it is a preventable source of lead exposure. The fact that lead accumulates in the body and can cause harm even at very low levels means that all measures should be taken to avoid exposing children to lead.

The cosmetics industry argues that cosmetics have such low lead levels that they are safe.⁷⁰ ⁷¹ But when health experts agree that no level of lead exposure is safe, the standards set by the FDA should honor the expert's findings (see *The Experts Agree: All Lead Exposure Is Dangerous*). It would be easy for the cosmetics companies to argue that it is technically too difficult to eliminate all lead from cosmetics, but many industries before them have reformulated successfully (see *Bans and Restrictions on Lead Use*).

This is a question of will, not feasibility. If cosmetic companies were truly invested in the safety of their products, they would take all measures possible to ensure that their products were lead-free.

The Centers for Disease Control specifically recommends that parents avoid using cosmetics on their children that could be contaminated with lead.⁷²

The Experts Agree: All Lead Exposure Is Dangerous

"No safe blood lead level has been identified."

-The U.S. Centers for Disease Control and Prevention⁷³

"I fully endorse the concept that lead is dangerous to the developing brains of children at any level. It is now widely accepted in the scientific community that there is no threshold level below which lead is safe."

 Philip J. Landrigan, MD, MSc, Director, Children's Environmental Health Center Mount Sinai School of Medicine

"No level of lead exposure appears to be 'safe' and even the current 'low' levels of exposure in children are associated with neurodevelopmental deficits. Primary prevention of exposure provides the best hope..."

–David Bellinger, Children's Hospital Boston, Harvard Medical School, Harvard School of Public Health, Boston, Massachusetts⁷⁴

"Many neurotoxicologists believe that there is no exposure, no matter how small, that is without impact on the developing brain."

-From In Harm's Way: Toxic Threats to Child Development by Greater Boston Physicians for Social Responsibility

"There currently is no demonstrated safe concentration of lead in blood." -U.S. Environmental Protection Agency⁷⁵

"Lead, unsafe at any level"

-From the Bulletin of the World Health Organization⁷⁶

"Even blood lead levels as low as 5 micrograms per decilitre can irreversibly impair the development of children's brains, reducing their IQ."

–World Health Organization's Lead IQ Alert⁷⁷

All 10 products tested for this report contained lead.

Some Bans and Restrictions on Lead Use in the United States

- 1973 Phaseout of lead in gasoline begins, with most progress completed by 1986; final phaseout was complete by 1996.⁷⁸
- 1974 The Safe Drinking Water Act mandates that drinking water should not exceed 15 ppb⁷⁹ (or .015 ppm). All products tested for this report exceed that amount, with Alex Face Paint Studio, the product with the highest level of lead, at 43 times that level.
- 1978 The use and manufacturing of lead-based paint is banned.⁸⁰
- 2006 Food and Drug Administration limits acceptable lead in candy to 0.10 ppm⁸¹
- 2009 Lead in toys and other products marketed to children under the age of 12 limited to 300 ppm, except paint, which is limited to 90 ppm. ⁸²
- 2009 Environmental Protection Agency agreed to implement ban on lead weights in automobile wheels.⁸³

Avoiding Lead Exposure

Lead-based paint and lead-contaminated dust (from flaking or peeling household paint) are the main sources of exposure to lead in U.S. children. Lead-based paints were banned for use in housing in 1978, and all houses built before then are likely to contain some leadbased paint. There are, however, numerous other sources of lead exposure including cosmetics, toys that may contain lead paint, and drinking water (contaminated from lead pipes). For suggestions on how to reduce lead exposure, see the CDC's Lead Prevention Tips.⁸⁴

Face Paints Are Not the Only Cosmetics That Contain Lead

In 2007, the Campaign for Safe Cosmetics released a report, *A Poison Kiss: The Problem of Lead in Lipstick.*⁸⁵ More than half of the 33 brand-name lipsticks tested contained detectable levels of lead. None of these lipsticks listed lead on product labels.

In 2009, the FDA released a follow-up study in response to this report.⁸⁶ It found lead in all 20 lipsticks tested, at levels ranging from 0.09 to 3.06 ppm—more than four times higher than the highest lead level reported in the 2007 Campaign for Safe Cosmetics study.

In response to both reports, the industry claimed that the levels of lead in lipstick pose no safety risk.^{87 88} The FDA claimed that this level of lead exposure is acceptable, yet the agency has conducted no formal safety assessment, and has, to date, set no limit for lead levels in cosmetics. The agency has ignored a request by several U.S. senators to set a maximum allowable level of lead in lipstick based on the lowest levels detected by laboratory tests.⁸⁹

Nickel, Cobalt & Chromium

Allergic contact dermatitis (ACD) is a skin inflammation that occurs from contact with allergenic or sensitizing substances, such as nickel, cobalt and chromium.

Symptoms of ACD range from mild irritation to skin rashes, blisters and open sores. Repeated exposure to sensitizing substances, especially in early life, can cause a person to develop allergic reactions over time, resulting in lifelong contact dermatitis.

Three of the metals found in the tests presented in this report – nickel, cobalt and chromium – are well-known triggers for contact dermatitis.^{90 91 92 93 94 95} Jewelry is a leading source of exposure to allergens in children, especially nickel.⁹⁶ The levels of these metals found in our tests far exceed the levels recommended by several industryfunded studies. (see *Ignoring Industry Recommendations for Limits on Nickel, Cobalt and Chromium*).

These metals have no place in products that children put on their skin, often repeatedly and for hours at a time. Half the products we tested did not contain any detectable nickel, cobalt or chromium, demonstrating that it is possible to make face paint without these hazardous metals.

Widespread and Avoidable

An estimated 72.9 million adults in the U.S. suffer from ACD,⁹⁷ which costs the United States an estimated \$1.9 billion a year.⁹⁸ For many years ACD was not considered a problem for children, but in recent years that thinking has changed.^{99 100 101} Testing is not widely available for this age group,¹⁰² making it difficult to get a sense of how many children suffer from ACD, though it is significant.¹⁰³ One study of 95 asymptomatic children found 24.5% of them had allergic skin reactions to common allergens, including nickel and cobalt.¹⁰⁴ Another study that took place from 1996 to 2001 surveyed 1,027 people between the ages of 10 and 19 with a suspicion of contact dermatitis: 56% of them had skin allergies, especially to nickel.¹⁰⁵

The rates of ACD in children, or its detection, are on the rise,^{106 107} which may be due to increased early-life exposure to sensitizing agents¹⁰⁸ or a greater awareness by health care providers.¹⁰⁹ Sensitization can begin in infancy and become more common in early childhood.¹¹⁰ Early age of contact with allergens is a known risk factor for sensitization later in life.^{111 112}

Nickel, cobalt and chromium are widely understood to be skin allergens, and are believed to be among the top 15 most common allergens in children.¹¹³ Children are especially sensitive to nickel and cobalt.¹¹⁴ ¹¹⁵

Though the number of scientific studies on ACD in children is growing, routine testing at doctors' offices is infrequent. As a result, children are often misdiagnosed with eczema or other health problems and treated with unnecessary pharmaceuticals¹¹⁶ – whereas the treatment for ACD is to simply avoid the allergen. Proper identification and elimination of allergens early in life can lead to the prevention of ACD for a lifetime.¹¹⁷

Other countries have restrictions on chromium and nickel in cosmetics, but in the U.S. it is perfectly legal for these metals to be in face paint in unlimited amounts without being listed on labels.

Nickel, Cobalt and Chromium - A Trio of Triggers

Nickel – found in 4 products at levels ranging from 2.1 to 5.9 ppm

- Multiple studies indicate that nickel is one of the leading contact allergens in children,^{118 119} with some studies indicating that is *the* leading contact allergen in children.¹²⁰ At least one study indicates that infants as young as 6 months old are allergic to nickel.¹²¹
- One study found that 15.6% of males and 35.8% of females under the age of 18 were affected by nickel allergies.¹²²
- Allergies to nickel appear to be on the rise in the general population.¹²³
- Nickel is banned for use in cosmetics in the European Union.¹²⁴
- In 2008, nickel was designated the "Allergen of the Year" by the American Contact Dermatitis Society (ACDS) for the notable rising prevalence of allergy noted in patch-tested populations.¹²⁵ Allergy to nickel is so widespread that the ACDS has called for a "Nickel Directive" in the United States, similar to the one enacted in Europe in 1994 (see Setting Restrictions Can Have an Impact).¹²⁶
- In July 2009, Italy pulled children's makeup from the shelf because it was contaminated with chromium and nickel. The concern cited was allergy and dermatitis.¹²⁷

Chromium – found in 5 products at levels ranging from 1.6 to 120 ppm

- Chromium is widely restricted from use in cosmetics products. Some countries that ban its use include the European Union,¹²⁸ Canada,¹²⁹ Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam.¹³⁰
- In July, 2009, Italy pulled children's makeup from the shelf because it was contaminated with chromium and nickel. The concern cited was allergy and dermatitis.¹³¹

Cobalt – found in 2 products at levels ranging from 4.8 to 5.5 ppm

- No international restrictions were found on cobalt, but that is likely due to a lag between the scientific research and enacting policy. Recent studies indicate that cobalt may be a leading contact allergen in children, along with nickel.¹³² ¹³³
- People who are allergic to nickel and/or chromium are more likely to be allergic to cobalt than people who are not.¹³⁴



Ignoring Industry Recommendations for Limits on Nickel, Cobalt and Chromium

Industry-sponsored research recommends that companies limit levels of heavy metals in consumer products for safety reasons. Based on this research, several products tested for this report do not abide by good manufacturing practices which recommend that levels of nickel, cobalt and chromium be as low as possible, ideally no higher than 1 ppm.

- In 1993 the European Chemical Industry Ecology and Toxicology Centre, which is funded by leading European companies with interest in the manufacture and use of chemicals, published a study that concluded, "Current good manufacturing practice ensures that trace nickel, cobalt and chromium concentrations in consumer products are less than 5 ppm of each metal. It is recommended that this be accepted as a standard for maximum concentrations and that the target should be to achieve concentrations as low as 1 ppm."¹³⁵
- A 2003 study by the multinational company Unilever's Safety and Environmental Assurance Centre confirmed this conclusion: "...it was recommended a decade ago that household (and other consumer) products should not contain more than 5 ppm of each of Ni, Cr or Co and that, for an even greater degree of protection, the ultimate target level should be 1 ppm. The data generated since the original recommendations were made serve to reinforce the validity of these recommendations. Indeed, it is our view that typically the level of each

of these transition metals should not normally exceed 1 ppm. Then, where consumer products meet this guideline fully, modern quantitative risk assessment shows clearly that elicitation of ACD is highly improbable, and the chance of the induction of sensitization is even lower." ¹³⁶ Another study done by the same group in 2001 made the same recommendation when focusing specifically on chromium in household products.¹³⁷

 Six out of 10 products tested for this report exceed this industry recommendation of a 1 ppm limit for nickel, cobalt or chromium.



Six out of 10 products tested for this report exceed the industry recommendation of 1 part per million limit for nickel, cobalt or chromium in consumer products.

Cosmetics and Skin Allergies

Face paints are commonly understood to cause allergic reactions. Even the FDA notes that face paints should be tested for a reaction before being used,¹³⁸ a safety warning seldom issued for other products. Many of the products tested for this report suggest testing for allergies before use. Instead of accepting that face paints have the potential to harm children, the FDA should be ensuring that the products are unlikely to cause harm.

There are few studies done focusing on skin reactions from nickel, cobalt and chromium specifically in cosmetics, but the studies that do exist confirm a link. One study in Italy investigated the connection between children's makeup with nickel, cobalt and chromium and skin irritation. They found that children do react to these metals, especially if they are prone to skin allergies or have damaged skin, such as from scrapes or cuts.¹³⁹ The book *Contact Dermatitis*, a standard text for specialists in the field, also notes that researchers "have seen patients with strong nickel sensitivity who seem to have reactions from some cosmetics."¹⁴⁰

The question of skin reactions to cosmetics is much broader than just face paints. Numerous other cosmetics have been linked to dermatitis and allergic reactions,¹⁴¹ including perfumes,¹⁴² children's bath products,¹⁴³ mascara¹⁴⁴ and other eye-care products,¹⁴⁵ hair dye (especially in children),^{146 147} facial care products, body care products¹⁴⁸ and shampoo.¹⁴⁹ Fragrance chemicals and preservatives are some of the most significant allergens.¹⁵⁰ One study in India found that reactions to cosmetics, toiletries and topical applications are the most common single reason for hospital referrals with allergic contact dermatitis.¹⁵¹

Setting Restrictions Can Have an Impact

Attempts to curb nickel allergies were enacted in Europe 15 years ago.¹⁵² "The Nickel Directive," passed by the European Union in 1994, reduced the allowable release of nickel in objects that come into direct and prolonged contact with the skin. This legislation triggered a noticeable decrease in nickel allergy. In Germany, for example, sensitization in women under age 30 decreased from 36.7% to 25.8% over an 8-year period.¹⁵³ Having enacted its own nickel legislation two years before the rest of Europe, Denmark has seen even more dramatic changes. Rates of nickel sensitization among Danish children went from 24.8% in 1985 to only 9.2% in 1998.¹⁵⁴ A separate study in Denmark confirmed declines in nickel allergy: young female patients experienced decreased rates of dermatitis between 1985 and 2007 (from 27.6% to 16.8%).155 Other studies have also confirmed reductions in nickel allergy as a result of restrictions in nickel use.156

Even the FDA notes that face paints should be tested for a reaction before being used,¹³⁸ a safety warning seldom issued for other products.

Different Exposures, Different Hazards

The concern related to contact dermatitis is not the only potential hazard associated with nickel, cobalt and chromium. For example, chromium and nickel are on the **Environmental Protection Agency's Priority** Pollutants lists, which identified chemicals that are not safe in drinking water. Cobalt and Nickel are on California's Proposition 65 list of chemicals known to cause cancer or reproductive harm, though the primary risk with both of these metals is from inhalation or ingestion, not from skin exposure. With face paints, dust inhalation is not likely a problem, though there is potential for ingestion of face paint, especially in younger children. There is no research to indicate whether there would be a measurable risk from ingesting face paints with these metals. But several products tested for this report did not have any detectable nickel, cobalt or chromium showing it is possible to make face paint without contaminants linked to health hazards.

FDA-Approved Colors May Also be Allergens

The chromium detected in Don Post and Jovi may have come from chromium oxide green, an FDA-approved color additive, ¹⁵⁷ or a combination of that plus other chromium contamination. It is impossible to know the breakdown from the type of test performed. Regardless, several sources identify chromium oxide green as an allergen,¹⁵⁸ ¹⁵⁹ especially in tattoos,¹⁶⁰ which calls into question how reliable the FDA's approval for color additives is.



Several products tested did not have any detectable nickel, cobalt or chromium, showing it is possible to make face paint without contaminants linked to health hazards.

What Else Is in the Halloween Store?

In addition to sending face paints to an independent lab to test them for heavy metals, the Campaign for Safe Cosmetics went shopping at a seasonal Halloween store to peruse the cosmetic and body-care products. We wanted to see if Halloween products had ingredients of high concern and if any of them had ingredients banned in other countries or that were illegal in the United States. The ingredient labels showed plenty of cause for concern. Highlights of what we found include:

- Carcinogens, neurotoxins and immunotoxins in products that are banned, restricted and/or found unsafe for use in cosmetics in multiple countries outside of the U.S.
- Colors not approved by the FDA for use in cosmetics
- Hair dye made in Spain that contains chemicals restricted for use in cosmetics in the European Union (but perfectly legal to sell in the U.S.)
- Warnings to not inhale hair sprays
- Products that may be contaminated with butadiene, a known carcinogen

Below are three products purchased at the Spirit Halloween store in Berkeley, California on September 30, 2009.

Hot Hair Neon Hair Color Spray

Made in Spain, distributed by Fun World Div., Easter Unlimited Inc.

"Warning: Danger extremely flammable. Container may explode if heated. Avoid spraying in eyes, ears, nose or mouth."

Ingredients of concern include:

- Butane: Recognized as having strong evidence of human toxicity by the Cosmetic Ingredient Review panel; on the Environment Canada Domestic Substance List because it is persistent or bioaccumulative and moderate to high toxicity concern in humans; restricted in cosmetics sold in European Union. Risk of contamination with butadiene,¹⁶¹ a high hazard ingredient that is listed as a known carcinogen by the Environmental Protection Agency and the National Toxicology Program.¹⁶²
- **Basic violet 11:1:** Classified on the Environment Canada Domestic Substance List as expected to be toxic or harmful, suspected environmental toxin.¹⁶³
- Pigment green 7: Not approved for use in cosmetics by the FDA. On the Environment Canada Domestic Substance List due to moderate to high toxicity concerns in humans.¹⁶⁴
- Diethylaminomethylcoumarin: Known human immune system toxicant.¹⁶⁵
- Pigment blue 15: Not approved for use in cosmetics by the FDA.¹⁶⁶

Black Light Hair Spray

Made in UK, distributed by Rubie's Costume Co.

"Warning: Extremely flammable pressurized container...Do not breathe spray particles."

Ingredients include:

- Butane: Recognized as having strong evidence of human toxicity by the Cosmetic Ingredient Review panel; on the Environment Canada Domestic Substance List because it is persistent or bioaccumulative and moderate to high toxicity concern in humans; restricted in cosmetics sold in European Union. Risk of contamination with butadiene,¹⁶⁷ a high hazard ingredient that is listed as a known carcinogen by the Environmental Protection Agency and the National Toxicology Program.¹⁶⁸
- Propylene glycol: Possible carcinogen and classified as expected to be toxic or harmful on Environment Canada Domestic Substance List.¹⁶⁹ Propylene glycol used in personal-care products has also been linked to skin allergies.¹⁷⁰
- Alumina: Strong evidence of neurotoxicity.¹⁷¹

Fake Skin

Made in China, distributed by Halloween Superstores

"Warning: Liquid latex contains natural rubber latex which may cause allergic reaction. Avoid contact with eyes when using liquid latex or bloody scab."

Ingredients include:

- Thiram: Neurotoxicant, possible carcinogen; banned or found unsafe for use in cosmetics in Canada; restricted for use in cosmetics in Japan and Canada;¹⁷² used in agriculture as a pesticide.
- Centrifuged Natural Rubber Latex: Can cause allergic reactions in sensitized people, ranging from mild irritation to potentially life threatening for those who become extremely sensitized from repeated exposures.¹⁷³

Some products are being sold in the United States that contain colors not approved for use, ingredients banned in other countries and chemicals used as pesticides.

Multiple Chemicals in Cosmetics

In addition to the lead, nickel, cobalt and chromium found in the face paint products tested by the Campaign for Safe Cosmetics, the products contained other ingredients that raise safety concerns. For example, Mehron's Fantasy F-X contains BHA, diazolidin urea, methylparaben, propylene glycol. Snazaroo contains methylparaben and proplyene glycol. Klutz contains parfum/fragrance. Health concerns associated with these chemicals include:

- Butylated hydroxyanisole (BHA): According to the International Agency for Research on Cancer, BHA is "reasonably anticipated to be a human carcinogen based on sufficient evidence of carcinogenicity in experimental animals." Their report specifically references use of cosmetics as a source of dermal exposure for BHA.¹⁷⁴
- Fragrance: Ingredients in fragrance are not required to be listed on personal-care product labels. Fragrance can contain hundreds of chemicals that studies show may be linked to a variety of health problems, including allergies and skin reactions.^{175 176}
- Methylparaben: Recognized as having potential links to cancer, neurotoxicity and skin irritation.¹⁷⁷
- Diazolidynl urea: a preservative known for its potential to release formaldehyde into products.¹⁷⁸ Formaldehyde in cosmetics is widely understood to cause allergic skin reactions and rashes in some people.¹⁷⁹ ¹⁸⁰ ¹⁸¹ Although concentrations of formaldehyde in personal care products are generally low, for people who are sensitive, everyday products can contain enough formaldehyde to trigger a reaction.¹⁸²
- Propylene glycol: Propylene glycol used in personal care products has also been linked to skin allergies.¹⁸³ Used in antifreeze.



What Can Parents Do?

Currently, there is no way to know if your child's face paint contains lead, nickel, cobalt, chromium or other heavy metals. There is no FDA safety standard for these metals in face paints, and federal law does not require them to be listed on product labels.

While all the products tested for this report contain lead, it does not mean that all face paints on the market contain lead. On the flip side, just because the products we analyzed did not test postitive for mercury or arsenic does not mean we know for certain that face paints never contain mercury or arsenic, which were both found in a Canadian study.¹⁸⁴ Unfortunately, this leaves parents in a difficult place when deciding how to help children dress up for Halloween.

For Halloween this year, using costumes that do not include face paint may be the best option.

Moving forward, parents should urge their elected officials to ban harmful ingredients and contaminants from face paints and other cosmetics and enact comprehensive federal "safe cosmetics" legislation that gives the FDA the authority and resources it needs to regulate the cosmetics industry and ensure cosmetic safety (see *Give the Beauty Industry a Makeover*). Parents should also contact the manufacturer of their favorite face paint and insist they remove lead, nickel, cobalt, chromium and other toxic ingredients and contaminants from face paint immediately. The use of harmful chemicals by face paint and other cosmetics manufacturers is unacceptable and avoidable. Safer ingredients must be identified and used.



The Need for Federal Reform

The presence of harmful metals and other chemicals in face paints is just one example of the lack of federal regulation and oversight of the \$50 billion cosmetics industry.

The Campaign for Safe Cosmetics has documented numerous other products that contain harmful ingredients and contaminants, including lipsticks, fragrance, nail polish, baby shampoo, sunscreen and others.¹⁸⁵

1. Chemicals linked to adverse health effects should be banned from cosmetics.

Products we put on our bodies, and especially products marketed to children, should not contain chemicals linked to adverse health impacts. Yet, in the United States, it is perfectly legal for face paints and other personal care products to contain carcinogens and other toxic chemicals that are linked to harmful health effects. The United States lags behind many other parts of the world in safety standards for personal care products. The European Union has banned more than 1,100 chemicals from cosmetics because they are known or highly suspected of causing cancer, genetic mutation or reproductive harm. In contrast, the United States bans or restricts only 11 chemicals from cosmetics.¹⁸⁶ According to the FDA:¹⁸⁷

The regulatory requirements governing the sale of cosmetics are not as stringent as those that apply to other FDA-regulated products. Under the Federal Food, Drug, and Cosmetic (FD&C) Act, cosmetics and their ingredients are not required to undergo approval before they are sold to the public. Generally, FDA regulates these products after they have been released to the marketplace. This means that manufacturers may use any ingredient or raw material, except for color additives and a few prohibited substances, to market a product without a government review or approval.

2. Full ingredient listing should be required. Consumers have a right to know what is in the products they buy, yet loopholes in labeling laws exempt companies from disclosing all the ingredients in personal care products. Companies are not required to list product contaminants, and none of the manufacturers of the products tested for this report voluntarily listed lead, nickel, cobalt or chromium. Companies are also not required to list the ingredients in "fragrance," which can include hundreds of additional, and potentially hazardous, chemicals in a single product. It is almost impossible for the average shopper to know whether a product contains hazardous chemicals without doing their own extensive research or sending products to a lab for analysis.

3. Special protections are needed for vulnerable populations, especially children.

There are currently no requirements for cosmetics companies to conduct safety assessments of the chemicals they use, or to understand the unique risks to developing children. The fact that so many of the products we tested contained lead – a powerful neurotoxin – and ingredients linked to contact dermatitis demonstrates the need for mandatory pre-market safety assessments of cosmetics ingredients. Babies and children are more vulnerable to chemical exposure than adults. The next generation deserves the healthiest possible foundation from which to start their lives.

We Need Safer Products & Smarter Laws

Comprehensive federal safe cosmetics legislation is critical to give the FDA the authority and resources it needs to ensure that cosmetics are free of toxic chemicals. New health-protective policies are urgently needed to protect the safety and health of the American people from unsafe and unregulated chemicals in the cosmetics and personal care products we use every day. These include:

- Pre-market safety assessment of cosmetics ingredients that includes protections for children and other vulnerable populations.
- A ban on the use of chemicals linked to cancer, mutation and developmental or reproductive harm in cosmetics.
- Required listing on product labels of all chemical constituents in personal-care products, including ingredients and contaminants.
- Health and safety data-sharing to avoid duplicative testing and encourage transparency and alternatives to animal testing.
- Access to information about hazardous chemicals in cosmetic products and manufacturing practices by workers and fence-line communities.
- Federal support for the creation of innovative solutions and safe alternatives to toxic chemicals in cosmetics.
- Federal support for small businesses to help them meet federal regulations for safer products.
- Adequate funding and support of the FDA Office of Cosmetics and Colors to provide effective oversight of the cosmetics industry.

Help Give the Beauty Industry a Makeover

Just like face paints, the cosmetics and personal care products that people use on an everyday basis may contain harmful ingredients. Here's what you can do:

1. Buy safer products

By choosing safer products you can reduce toxic chemical exposures for yourself and your family, and help support responsible companies and the growing green economy. Visit our website for tips and resources to help you find safer products: <u>www.safecosmetics.org</u>

2. Help pass smarter, health-protective laws

We can't just shop our way out of this problem. In order for safer products to be widely available and affordable for all people, we must pass laws that shift the entire industry to non-toxic ingredients and safer production.

Ask your U.S. Representative and Senators to support the introduction of comprehensive, federal safe cosmetics legislation.



To learn more and to join this important effort, visit www.SafeCosmetics.org.

Sign up for our action network and get involved!

People can be exposed to lead at any time in their life, and these exposures accumulate. Most of the research on health problems linked to lead have focused on childhood development, but lead exposure can result in health problems throughout one's lifetime. Different types of health problems result from different levels of exposure. For example, low level lead exposures can harm a developing child's brain and learning capacity, while higher levels of lead exposure are associated with poor sperm quality.¹⁸⁸ Some examples of potential health problem are listed below.

Mental Health Issues Throughout a Lifetime ¹⁸⁹	Childhood	Fertility Challenges	Later Life
 academic problems or behavior changes aggression agitation anger antisocial behavior anxiety confusion decreased libido delinquent behavior delusions dementia depression hallucinations impulsivity insomnia irritability mania mood lability nervousness paranoia personality change poor concentration poor memory or memory loss suicidal ideation tension 	 attention deficits hyperactivity impulsive behavior IQ deficits reduced school performance aggression delinquent behavior 190 191 192 antisocial behavior crying distractibility hyperactivity impulsivity lack of attention ¹⁹³ delays in puberty in some girls, especially Mexican American, African American¹⁹⁴ and Mohawk girls.^{195 196} 	 shorter menstrual cycles and more frequent, intense and prolonged bleeding¹⁹⁷ impeding ovarian follicles from developing into mature eggs¹⁹⁸ ¹⁹⁹ poor sperm quality²⁰⁰ longer periods of time to conceive²⁰¹ premature birth²⁰² intrauterine growth restriction and low birthweight²⁰³ 	 Alzheimer's disease²⁰⁴ Parkinson's disease²⁰⁵ reduced cognitive function^{206 207}

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