Phthalates are chemicals that are commonly used as a plasticizer in personal care products. This class of compounds is added to help prevent products from drying out. Phthalates have been shown to have potential negative impacts on reproductive organs, cause birth defects, effect the endocrine system, as well as causing other ill effects. For example, previous work found that phthalates can have an effect on the endocrine system of adolescent individuals. In an intervention study, phthalate exposure was reduced when these products were not being used. The purpose of the present study is to examine phthalate abundance in personal care products and to design an intervention study to lessen exposure.

To identify products containing phthalates, we used the Environmental Working Group's Skin Deep cosmetic database. This database contains personal care products and their ingredients. We used the database to identify products that contain phthalates and the type of phthalates used. The most commonly used phthalate is polyethylene terephthalate, with it currently found in 610 products, with 314 of which are nail polish. There are also 12 other kinds of phthalates that are regularly used in personal care products, ranging from lipstick to sunscreen. We can see that there are still a multitude of products that contain potentially harmful phthalates. This study is the foundation to future work looking at exposure to phthalates in adult populations and assessing sources of exposure from personal care products.

Phthalates are used to enhance the flexibility of plastics, making them common throughout personal care products such as nail polish and lip products. For example, phthalates are used to keep nail polish from drying out and becoming brittle and are used as solvents for perfumes and lubricants (Witorsch & Thomas, 2010). As the majority consumer of these kinds of products, women are at more risk of exposure to these chemicals (Harley et al, 2016). Phthalates can enter the body through a multitude of ways, such as dermal application of personal care products containing phthalates or inhalation of air containing phthalates (Witorsch & Thomas, 2010).

A previous study looked at associations between women who used personal care products within 24 hours before a urine sample was taken and the concentrations of phthalate metabolites in their urine. They reported results where the women that used personal care products, such as nail and lip products, containing phthalates had a 2.08 times higher ratio of metabolite concentration than women that did not use those products previous to the urine collection. This increase looked at monomethyl phthalate (MEP) which had the strongest association between personal care product usage and urinary concentration in this study (Parlett et al, 2012).

Our study was done to show how commonly phthalates are found in products that get used every day. This will allow us to narrow our focus in future work to the most abundant phthalates. In addition, the database, Skin Deep, will give information about the types of products where prevalence is high, helping to reduce the number of products to be examined in future exposure studies.