



## Consumption of cosmetic products by the French population second part: Amount data



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### ABSTRACT

The aim of the study was to assess the amount per use of cosmetic products consumed at home by the adult, child and baby French population. 1078 men and women participated in the study which was performed in four cities of France. This enquiry was performed on 106 cosmetics including general hygiene, skin care, hair care, hair styling, make-up, fragrances, solar, shaving and depilatory, and baby products.

Coupled to frequency data previously obtained (Ficheux et al., 2015), these amounts per use data will be used in order to assess the exposure to cosmetics by the French population. These current exposure values could be useful for safety assessors and for safety agencies.

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## 1. Introduction

Cosmetic products found on the European market have to be safe for consumer health when applied under normal or reasonably foreseeable conditions of use (EU, 2009). In order to perform a safety evaluation, the assessor needs to possess toxicological data on all the constituent ingredients as well as exposure data (EU, 2009). Current and relevant data concerning the amount of product applied and the frequency of use are essential information for a correct exposure assessment. This publication focuses on the amount of product applied.

Few published data concerning the amount of cosmetic used per application are available. Two European works studying, for the first one seven cosmetics (body lotion, deodorant spray and non-spray, lipstick, facial moisturizer, shampoo and toothpaste) (Hall et al., 2007), and for the second one five cosmetics (hair styling, hand cream, liquid foundation, mouthwash and shower gel) (Hall et al., 2011) existed. They conducted clinical studies with approximately 500 volunteers aged 17–74 years old from Scotland giving the distribution shape of consumption and a calculation between two European databases one on frequency of use and the other on

purchasing quantities, whose connection gave the central point value of consumption. The mix of these two results (shape and central value) gave the amount per event distribution curve for each cosmetic and each country (McNamara et al., 2007). These values are currently used by the Scientific Committee on Consumer Safety (SCCS) to estimate the daily exposure levels of European consumers (SCCS, 2012). In this study the number of volunteers was high but babies and children were not taken into account. According to Hall et al. (2007) the seven products studied in 2007 constituted around half of the estimated daily exposure to cosmetics in Europe. In their 2011 paper, Hall et al. considered that their two studies covered around 95% of exposure (Hall et al., 2011). However, it could be useful to collect data on other cosmetics such as depilatory, sunscreen or baby products which are of particular concern because of the potential impact on the health effects of the ingredients they contain. Biesterbos et al. (2013) assessed the amount per application and the application area of thirty two cosmetics used by the Dutch population including hygiene, hair care, skin care, shaving, make-up, nail care and tanning products. As in the European study, the number of volunteers was high (516 participants) but babies and children were not taken into account.

Amount data available for the French population are limited. Values were obtained for rinse-off and leave-on cleanser and diaper dermatitis treatment products for French babies and children (Gomez-Berrada et al., 2013). Bavoux et al. (2011) obtained values

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for twelve products consumed by French pregnant women including face cream, body cream, deodorants, oil massage and stretch mark removal cosmetics. The amount of nail cosmetics (base coat, varnish, top coat and remover) applied by French adults and children were assessed by Ficheux et al. (2014).

Given that cosmetics exposure data are essential for safety assessors and that consumption data are limited in Europe and especially in France, it appears relevant to generate usage pattern data in order to give more information to producers and regulators for chemical protection of consumers. The aim of this publication was to assess the amount of cosmetic products consumed at home by the French population. The evaluation was performed for adult, child and baby consumers. An assessment of the frequency of use was undertaken previously (Ficheux et al., 2015).

## 2. Material and methods

### 2.1. Enquiry design: face-to-face survey

#### 2.1.1. Study population

This study was mainly carried out in the city of Brest (Western France). French people were contacted at random by phone in March 2014. The calls were made by a national survey company. The study inclusion criteria for participating in the study were as follows: women and men accounted respectively for 70% and 30% of people over 15 years old; volunteers with a professional activity accounted for 50%. Women could participate in the study with their daughter aged 13–17 years old. Data for young children and babies were obtained from their parents.

Enquiries were also performed in Paris, Nancy and Toulouse in order to assess inter-regional variability. Nancy and Toulouse were selected to geographically represent the Eastern and Southern parts of France, respectively. Paris (the capital) was selected to geographically represent the central and northern part of France. In each town, the selection criteria were the same as in the city of Brest.

Additional surveys were conducted in Brest: eight nurseries from different parts of the city were visited to obtain data about babies. For solar products, surveys were performed during the summer on the beach.

In total, this enquiry was conducted on 1078 French people.

#### 2.1.2. Data collection

The study subjects entered a lab room specially arranged for cosmetic tests. They were asked to read and sign a consent form informing them of the terms and conditions of the test. The participants filled in a questionnaire regarding the cosmetic product types they habitually used at home (i.e. they used at least once a year). The questionnaires were divided in three groups: women, men and babies. They were divided in categories such as: hair, care products, making-up, mouth, anti-perspirants, sun care, epilation etc. and covered more than 100 products for women, 50 for men and 15 for babies. Some informations were also appearing such as the body part where some specific products were used (for instance for epilation, shaving or anti perspirants) or the frequency of use and the quantity for wipes. Adults with young children and/or babies also completed a questionnaire regarding the cosmetic products they habitually used at home for their children/babies. Additional information concerning possible medical recommendation of using mouthwash and the place of application of Eau de toilette/Perfume (on the skin, on clothes, on both the skin and clothes) was requested in the questionnaire. Data concerning age, place of residence, socio-professional category, body weight and height were also collected at the end of the questionnaire.

The cosmetic products studied were selected according to a

previous consumption study (Ficheux et al., 2015). All the cosmetics used by more than about 10% of French people were included in this enquiry. In total, 106 cosmetics were studied, including general hygiene (soap, shampoo, deodorant, shower gel, toothpaste ...), skin care (moisturizer, exfoliating scrub ...), hair styling (lacquer, gel, wax ...), hair care (conditioner, oil, dye ...) make-up (mascara, eye shadow, foundation ...), fragrances (Perfume, Eau de Cologne), solar (sunscreen, tanning ...), shaving (gel, foam ...) and depilatory (cream, warm strips) products. Baby products, such as cosmetics for babies' bottoms (cleansing lotion, wipes, cream/balm and liniment), were also studied (see Table 1 for a full list).

Products usually used by volunteers were provided by the laboratory (except for make-up products). Participants were invited to use these products in the closest possible way to their personal usage patterns. For most products (cleanser, care, shaving, depilatory products), volunteers were asked to put the corresponding amount per use in their hand. In the case of cosmetics that could be used on different parts of the body (such as body care, solar or depilatory products), the volunteers were asked to specify the body part(s) corresponding to the amount applied. For spray/aerosol products (such as lacquer, deodorant, dry shampoo, perfume, aerosol deodorant ...), individuals were asked to spray the amount in the air. If people used cotton pads to apply cosmetics, such as face cleansing or make-up remover products, they estimated the amount directly on (a) cotton pad(s). Participants applied the amount of toothpaste used on a toothbrush. For make-up products, women were asked to apply their own products to their face in real conditions.

The amount of each cosmetic used was determined by differential weighing before and after use, always in the absence of the volunteer. Three precision balances were used with sensitivity equal to 100 mg, 1 mg and 0.01 mg.

All test products were purchased from French supermarkets. The length of each investigation was estimated at 45 min for women (make-up included) and 30 min for men. The participants were contacted by phone and received financial compensation if they agreed to take part in the study.

### 2.2. Additional enquiries

Additional enquiries were performed for wipes and hair dye products.

#### 2.2.1. Web survey

A web questionnaire survey was conducted in September 2014 by a national survey company. This study was conducted on 1507 people. The respondents were selected to form a nationally representative panel. Selections were made using quotas by sex, age (0–3, 4–9, 10–14, 15–24, 25–39, 40–49, 50–59, 60–70 years old), socio-professional category, household size, geographical area (northwest, northeast, southwest, southeast and Ile-de-France) and degree of urbanization (<2000 people, 2000–20,000 people, 20,000–100,000 people, Paris metropolitan area).

414 consumers of wipes and/or hair dye products were involved in this web enquiry: data were obtained for 313 women ( $\geq 15$  years old), 31 girls (4–14 years old) and 70 babies (girls and boys) aged 3 and under.

This enquiry provided information on the number of wipes used per application for the different parts of the body for babies aged 0–3 years (face, body, hands and bottom) and for different usage patterns in adults and girls (to clean the face, to remove make-up or to clean intimate parts). For people who practiced hair dyeing at home, information on the number of hair coloring kits used per application was collected (0.5, 1, 1.5, 2, more than 2 kits).

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