An Exposure and Health Risk Assessment of Lead (Pb) in Lipstick.

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Abstract:
The lead (Pb) content in lipstick and other consumer products has become an increasing concern over the past several years. In 2007, the Campaign for Safe Cosmetics published the test results of 33 lipstick samples and found that 61% contained Pb, with a maximum Pb concentration of 0.65 ppm. In a 2010 response, the United States Food and Drug Administration tested 400 lipstick samples and found a median Pb concentration of 0.9 ppm and a maximum Pb concentration of 7.19 ppm. To assess the safety of these lipsticks in adults that chronically apply lipstick as well as instances where children might intentionally or incidentally ingest lipstick products, the US EPA ALM and IEUBK models were used to determine the blood Pb concentrations of adults and children (aged 0 – 7) ingesting varying amounts of lipstick of different Pb concentrations. Modeled blood Pb concentrations were then compared to the United States Consumer Product Safety Commission’s and California’s No Significant Risk Level blood Pb concentration guideline of 15 µg Pb/day (orally) and to the Centers for Disease Control and the US EPA’s actionable blood Pb levels of 5 µg/dL and 10 µg/dL, respectively. In this analysis, background Pb exposure was the primary contributor to estimated blood Pb levels (BLLs) in children and adults, and Pb exposure from lipstick did not significantly increase estimated BLLs. To raise the BLL of an adult with average background exposure to the CDC BLL of interest, 5.0 µg/dL, an adult would need to apply lipstick ~ 695 times per day. To raise BLLs to the CDC and EPA standards, a child with average background exposure would need to consume 247 and 897 tubes/year, respectively. Taken together, these results suggest that the safety of consumer products and cosmetics should be assessed not only by the presence and amounts of hazardous contents, but also in conjunction with an assessment of estimated background exposures and comparison to health based standards.