

**Title:** Industry strategies to market opioids to children and women in the United States: A content analysis of internal industry documents from 1999 to 2017 released in *State of Oklahoma v. Purdue Pharma, L.P.* et al

**Running title:** Marketing opioids to children and women

### Supplemental file

Our study relied on a retrospective content analysis of pharmaceutical industry documents (1). On January 24, 2020, the University of California San Francisco Industry Documents Library released 503 documents totaling 62,703 pages drawn from *State of Oklahoma, ex. rel. Hunter v. Purdue Pharma, L.P., et. al. (Okla. Dist. Ct. Aug. 26, 2019)*, a lawsuit brought by the state of Oklahoma against companies manufacturing and selling opioids, including Purdue, Teva (Actavis), Cephalon, Janssen, Ortho-McNeil-Janssen, Allergan, and Watson (2). Documents include reports on clinical trials, witness declarations, internal corporate communications, short videos taken at conferences, and marketing campaign materials.

Our approach to documents review relied on previously validated standards for research using tobacco industry documents (3, 4). Two authors (HY, BG) who had completed training provided by the UCSF Industry Documents Library on search strategies and documents analysis (the Annual Tobacco Documents Workshop) conducted the preliminary analysis; this team independently reviewed all 503 documents in the archive. Both coders and an independent third reviewer (DA) with experience analyzing industry documents and who has served as an instructor for the UCSF Library Annual Tobacco Documents workshop, created a master text file with information on all 503 documents that summarized key points drawn from each document along with supporting information including quotes, figures, and concepts, and in the case of short videos,

transcriptions. To ensure that no documents were excluded, each was marked with the unique identification code provided by the library.

We reviewed documents using modified grounded theory, an inductive methodology that uses source material to identify hypotheses and to categorize evidence based on general themes, an analytical strategy previously used in the analysis of pharmaceutical industry documents (5). Authors of industry documents used consistent terminology (e.g., “youth”) when referring to groups that they identified as target markets, allowing comparison across multiple companies and documents. Our expectations were that opioid manufacturers used strategies similar to those of the tobacco industry, specifically: seeking to influence policymakers, making emotional marketing appeals, and understating the risk of addiction.

We noted strategies mentioned in the documents we reviewed and provided specific quotes and screenshots in the master file to aid understanding of our classifications. When questions arose regarding a document’s relevance, it was discussed by all three authors until agreement was reached. Discussions were conducted in weekly meetings of one to three hours each held May-August 2020. When the two coders disagreed regarding interpretation, the designated reviewer read the document and made a final decision; documents for which there were disagreements were then reviewed again by all three authors before deciding to include or exclude them. Documents were excluded if the authors were unable to identify whether they were relevant (e.g., spreadsheets tracking sales by region that were described only by proprietary identification codes). After this initial review, one investigator (HY) extracted all materials relating to industry marketing to women and children from the master file as a resource for the manuscript. These documents referenced advocacy and marketing campaigns, business plans, and advertising strategies focused on increasing opioid sales or creating favorable perceptions of opioid products.

**Supplement references**

1. Bowen GA. Document analysis as a qualitative research method. *Qualitative Research Journal*. 2009;9(2):27-40.
2. Oklahoma state of ex rel attorney general of oklahoma, plaintiff, v. Purdue pharma lp, et al. 2019
3. Bero LA. Implications of the tobacco industry documents for public health and policy. *Annual Review of Public Health*. 2003;24(3):3.1-3.22.
4. Malone RE, Balbach ED. Tobacco industry documents: Treasure trove or quagmire? *Tobacco Control*. 2000;9:334-338.
5. Ross JS, Hill KP, Egilman DS, Krumholz HM. Guest authorship and ghostwriting in publications related to rofecoxib: A case study of industry documents from rofecoxib litigation. *JAMA*. 2008 Apr 16;299(15):1800-12.