Title:	Systematic misclassification in product-specific coding of poison center data: the example of buprenorphine in the RADARS® System Poison Center Program
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Abstract:

Background: Misclassification of product-specific codes affects the accuracy of poison center (PC) data. Apparent differential misclassification associated with Specialists in Poison Information (SPI) choosing the first code option listed in Micromedex® has been described. Using the example of codes for specific buprenorphine formulations we sought to quantify the accuracy of product-specific coding within the RADARS® System Poison Center Program.

Methods: The RADARS System Poison Center Program captures information regarding drug exposures from participating PCs in the United States. SPIs use standardized electronic systems to record case data, including product codes and narrative notes. RADARS System staff then perform quality control checks to verify product coding accuracy. Exposures to Suboxone® tablets and oral film from the second and third quarters of 2011 were reviewed. A trained researcher reviewed the substance code and narrative notes for each case. Discrepancies were verified by a second researcher. When narrative notes and product codes were discrepant, the narrative notes in combination with substance formulation were considered authoritative. The totals of initial and final product code classification were compared using McNemar's test for correlated proportions to assess differential misclassification.

Results: A total of 1088 cases were reviewed. During the study period, Suboxone oral film was the first Suboxone formulation listed in Micromedex. During RADARS System review, 4.1% (16/395) of cases initially coded by SPIs to Suboxone tablets were re-coded to Suboxone oral film, and 56.3% (390/693) of cases that were initially coded to Suboxone oral film were re-coded to Suboxone tablets. Suboxone tablets were accurately coded in 95.9% of cases (379/395), while 43.7% (303/693) of Suboxone oral film cases were accurately coded. This differential misclassification was significant ($X2 = 942$, $df = 1$, $p<.0001$).

Conclusion: Data from the National Poison Data System and individual PCs are frequently used to study adverse events related to product-specific medication use. The reliability of this research relies on accurate product coding. This study shows that differential misclassification may introduce systematic bias, in which PC data over-reports the first listed formulation in a product class. Quality control measures can identify and correct these errors. The accuracy of buprenorphine product-specific coding in PC data varies differentially. Until data verification steps are applied, PC data may over-report the first formulation listed in a product class.