

THE GRADUATE COLLEGE OF THE  
UNIVERSITY OF OKLAHOMA HEALTH SCIENCES CENTER

ANNOUNCES THE FINAL EXAMINATION OF

# Dana Smith Mowls

FOR THE DEFENSE OF THE DOCTOR OF PHILOSOPHY DEGREE  
GRADUATE COLLEGE  
DEPARTMENT OF BIOSTATISTICS AND EPIDEMIOLOGY

Thursday, April 27, 2017, 10:00 a.m. Room 307,  
College of Public Health, OUHSC



## *Cigarette Smoking, Electronic Nicotine Product Use, and Biomarkers of Exposure among American Indians in the Southern Plains*

COMMITTEE IN CHARGE: Laura A. Beebe, Ph.D.; Janis E. Campbell, Ph.D.; Jenifer D. Peck, Ph.D.; Lancer D. Stephens, Ph.D.; David M. Thompson, Ph.D.; Theodore L. Wagener, Ph.D.

ABSTRACT: Prevalences of smoking and electronic nicotine product (ENP) use are high among American Indians (AI). Data on use behaviors and biomarkers of exposure are lacking. To fill this knowledge gap, AI adults from the Southern Plains region of the US who were smokers (n=35), ENP users (n=28), and dual users (n=32) were recruited. Participants completed a questionnaire, provided a measurement of carbon monoxide (CO), and a urine sample which was analyzed for total nicotine equivalents (TNE), nicotine metabolite ratio (NMR), and 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol and its glucuronides (NNAL). In aim one, behaviors and dependence were examined. Confirming prior studies among AI, relatively low cigarettes per day were observed among smokers and dual users. Most ENP and dual users reported <20 vape sessions per day with 5-10 puffs per session. Data suggests that the dependence potential of ENP is lower than cigarettes among AI. In aim two, TNE, NNAL, and CO were quantified. While TNE was not significantly different, NNAL and CO were lower in ENP users than smokers and dual users. Findings suggest that ENP users have similar levels of nicotine yet lower exposure to a lung carcinogen and a cardiovascular toxicant than smokers or dual users. In aim three, urinary NMR was estimated and the relationship between NMR and TNE was explored. NMR was not significantly different across the user groups. NMR in AI smokers appears to be comparable to blacks and lower than whites in prior studies. Associations between NMR and TNE were non-significant. Results suggest that tobacco use in AI may not be as related to nicotine metabolism as demonstrated in other races. In aim four, age, AI heritage, body mass index, vape sessions per day, and a measurement of dependence were observed to be potential determinants of nicotine exposure in ENP users. Findings are informative for surveillance systems working to identify self-report measures of ENP use. This study provided several novel findings about smoking and ENP use among AI. Results will be informative for future studies seeking to reduce smoking among AI and for understanding the impact of ENP and dual use on public health.