



Physical Anthropology Section - 2014

H115 Migrant Deaths: Complexity of Assessing Place of Origin

Ann H. Ross, PhD*, NC State University, Sociology & Anthropology, Campus Box 8107, Raleigh, NC 27695-8107; Kate Spradley, PhD, Texas State University, Dept of Anthropology, 601 University Drive, San Marcos, TX 78666; and Emily K. Dew, BA, 6409 Wynbrook Way, Raleigh, NC 27612

After attending this presentation, attendees will better understand issues surrounding the identification of undocumented migrants.

This presentation will impact the forensic science community by presenting the utility of using geometric morphometrics to assess place of origin.

Since the start of the United States border enforcement strategy "Operation Hold the Line" in El Paso in 1994, border movement patterns and points of entry at the U.S.-Mexico border have significantly changed from unauthorized entries into residential areas along the border to more inhospitable areas of the American Southwest.^{1,2} According to the U.S. Customs and Border Protection, as the U.S.-Mexico border-enforcement strategies continue to militarize, the number of migrants apprehended has decreased, but the number of deaths has remained stable (~368 per year), increasing the ratio of deaths to apprehensions to approximately 11 percent in 2011. The Pima County (Arizona) Medical Examiner (PCOME) investigated over 1,000 deaths between 2001-2007 resulting from unauthorized entry at the Arizona-Mexico border.³ In addition, the *Arizona OpenGIS for Deceased Migrants* application lists 408 migrant deaths due to all causes for the years 2010-2012.⁴

The 2010 U.S. Census reported that Hispanics/Latinos make up 8.4 percent of the population of North Carolina, 30.2% of the population of Arizona and 16% of the population nationwide. The countries/region-of-origin for North Carolina Hispanics/Latinos follow national trends with 60.9% from Mexico, 9% from Puerto Rico, 2.2% from Cuba, 2.0% from the Dominican Republic, 13% from Central America, 5.7% from South America, and 7.1% listed as "other." A better understanding of the region-of-origin of undocumented migrants could assist in the identification efforts that have become a major human rights issue in the U.S.

The purpose of this study is to: (1) explore the possible origins of Undocumented Border Crossers (UBC's) who died in transit investigated by PCOME and compare these data to unidentified decedents from North Carolina and Georgia whose distance from the border makes their migration status uncertain; and, (2) explore if the UBC's from Arizona differ morphologically from the North Carolina UIDs. The sample totals 356 individuals (UBC n=129; PCOME known n=28; North Carolina/Georgia UID n=22; Panama n=24; Peru n=7; Guatemala n=77; Cuba n=19, Mexico Merida n=44; Mexico Morton Collection n=6). Fourteen standard craniofacial homologous coordinate landmarks were used in the analysis. The shareware program MorphoJ developed by Klingenberg was used to translate, rotate, and scale all coordinates into a common coordinate system using a Generalized Procrustes Analysis or GPA. Group comparisons were explored with a Canonical Variates Analysis (CVA) of the newly derived Procrustes coordinates. Approximately 83 percent of the total variation is accounted for on the first four canonical variates. A Mahalanobis distance was used to examine the similarity between the groups and results show that all groups are significantly different from one another based on 1,000 permutations (p -values range from 0.01-<0.0001). Interestingly, the Arizona UBC are closest to the Guatemalan sample ($D=1.755$) followed by North Carolina/Georgia to Panama ($D=2.283$) to Arizona UBC ($D=2.352$) to Guatemala ($D=2.593$) and the Arizona PCOME sample is closest to the Arizona UBC ($D=3.219$). These results show that the 2010 Census may not adequately reflect the country of origin of undocumented migrants in the United States.

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References:

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2. Eschback K, Hagan J, Rodriguez N. Death at the border. *Int Migration Rev* 1999;33(2):430-45.
3. Anderson B, Parks B. Symposium on border crosser deaths: Introduction. *J Forensic Sci* 2008;53(1):6-7.
4. Pima County Medical Examiner's and Humane Borders, *Arizona OpenGIS for Deceased Migrants* application <http://www.humaneborders.info/app/map.asp>.

Migrant Deaths, Place of Origin, Variation