

## Changes in adult blood pressure associated with modernization on islands of Ambae, Aneityum, and Efate in the Republic of Vanuatu: 2007-2011.

G Buffa<sup>1,2,3</sup>, KM Olszowy<sup>1,2</sup>, KN Dancause<sup>4</sup>, L Soloway<sup>5</sup>, C Sun<sup>2,6</sup>, H Silverman<sup>2,6,7,8</sup>, A Pomer<sup>1,2,6</sup>, G Lee<sup>6</sup>, CW Chan<sup>1,2,6,9</sup>, L Tarivonda<sup>10</sup>, G Taleo<sup>10</sup>, M Abong<sup>11</sup>, R Regenvanu<sup>12</sup>, A Kaneko<sup>9,13,14</sup>, CA Weitz<sup>15</sup>, JK Lum<sup>2,3,6</sup>, RM Garruto<sup>1,2,3</sup>. <sup>1</sup>Laboratory of Biomedical Anthropology and Neurosciences, <sup>2</sup>Department of Anthropology, <sup>3</sup>Department of Biological Sciences, SUNY, Binghamton, NY, USA; <sup>4</sup>Department of Kinanthropologie, Université du Québec à Montréal (UQAM); <sup>5</sup>M Health Information Systems, Population and Payment Services Division, Troy, NY, USA; <sup>6</sup>Laboratory of Evolutionary Anthropology and Health, SUNY, Binghamton, NY, USA; <sup>7</sup>Laboratory of Biomedical Science, The Feinstein Institute for Medical Research, Manhasset, NY USA; <sup>8</sup>Hofstra North Shore-LIJ School of Medicine at Hofstra University, Hempstead, NY USA; <sup>9</sup>Island Malaria Group, Department of Microbiology, Tumor and Cell Biology, Karolinska Institutet, Stockholm, Sweden; <sup>10</sup>Ministry of Health, Republic of Vanuatu; <sup>11</sup>Kaljoral Senta, Republic of Vanuatu; <sup>12</sup>Ministry of Justice and Social Affairs, Republic of Vanuatu; <sup>13</sup>Department of Parasitology, Osaka City University Graduate School of Medicine, Osaka, Japan; <sup>14</sup>Institute of Tropical Medicine, Nagasaki University, Nagasaki, Japan; <sup>15</sup>Department of Anthropology, Temple University, Philadelphia, PA, USA.

Changes in behavior and lifestyle associated with modernization contribute to health transitions in developing countries. In the Republic of Vanuatu, a developing South Pacific island nation, these behavioral and lifestyle changes are contributing to a rapid shift in health burdens, causing non-communicable disease such as cardiovascular disease, diabetes and obesity to increase in prevalence. This study evaluates the impact of modernization on blood pressure and prevalence of hypertension on three islands of varying economic development in Vanuatu. Data were collected in 2007 (n=568) and 2011 (n=1,246) from adult males and females across the islands of Ambae, a rural island, Aneityum, a rural island with tourism, and Efate, an urban island. Participants answered questions regarding their lifestyle and health, and had biophysical and anthropometric measurements taken including blood pressure, stature, weight, and percent body fat. Analyses indicate that the percentage of individuals with hypertensive diastolic blood pressure values increased significantly between 2007 and 2011 across all three islands. Additionally, in both survey years and among both men and women, mean diastolic blood pressures was significantly greater on Efate, the most modernized island in our sample, than on Aneityum and Ambae. Finally, we observed a positive association between blood pressure and smoking tobacco, body mass index, consuming animal protein, and having access to technological goods. These data highlight the remarkable rapidity with which the prevalence of hypertension can increase during health transition. Our data indicate some behaviors associated with these increases might provide promising targets for prevention and intervention strategies in Vanuatu and similar countries experiencing the rapid increase in non-communicable diseases associated with health transition.

*Keywords:* Health transition, Vanuatu, hypertension, chronic disease risk, lifestyle risk.

**Funding:** This research was made possible through the funding provided by Binghamton University's Undergraduate Research Center through the 2014 Summer Scholars and Artists Program. This research was also funded by the Wenner-Gren Foundation for Anthropological Research (Gr 8301), start-up funds from Binghamton University Laboratory of Evolutionary Anthropology and Health, and Harper College Grants in Support of Research, Scholarship, and Creative Work.