**ASHB One-year report- Melandri Vlok**

**Project Title:** The Impact of Migration and Trade on the Prevalence of Infectious and

Nutritional Diseases in pre and proto-historic Japan

**Aims and Objectives**

The aims of my overall PhD project are to assess the the impact of the level of human population interaction (which occurs through processes such as conflict, trade and migration) on the prevalence of infectious and nutritional diseases in past Asia. My research asks the questions: Did levels of infectious and nutritional diseases increase when human interaction occurred? If so, did it influence levels of morbidity and/or mortality? And, is the impact of human interaction context specific or is there a universal trend of relationship between interaction and disease? Three regions within Asia have been selected for investigation in this research: Japan, Vietnam and Mongolia.

In order to address the aims, objectives for this research include:

1. Record skeletal evidence of disease in a total of seven sites across three regions of Asia (Mongolia, Japan and Vietnam), spanning pre-Agriculture to the pre- Industrial periods
2. Identify specific infectious and nutritional diseases which are visible in each region and whether they change over time. Identify any new infectious diseases which may occur with more migration and trade. Assess this within the biocultural context of the region and the overall Asia- Pacific.
3. Assess the change in intensity of migration and trade over time within the three regions of Asia and whether this corresponds with an increase in the prevalence rates of both infectious and nutritional diseases over time.
4. Statistically identify how levels of mortality and morbidity to disease change across time periods in each region
5. Statistically compare all sites studied using Generalised Linear Modelling, to assess the impact of migration and trade, as one of many factors (which include climate, population density, subsistence, geography and settlement patterns) impacting disease, to evaluate how significant the factor of ‘human interaction’ is on the prevalence of disease in Asia.

The particular aspect of the project funded by ASHB involves two contexts of human interaction in Japan: the pre-Neolithic Jomon (3000 to 300 BCE) and the Edo Period of Japan (15th to 17th Century Japan). These two contexts present two different extremes of human interaction. For the Jomon, there is no evidence of interaction from populations outside of Japan. However, between the Middle to Late/ Final Jomon periods, climate cooling results in intra-population interaction increasing in refuge zones. In contrast, the Edo period of Japan is one wherein Japan has had considerable contact with the outside world through global trade prior to the period, and infectious diseases are historically documented to have been introduced.

**Progress of Research and Preliminary Findings**

A three-month research trip between March to May 2018 was completed to collect skeletal disease data on a total of 149 individuals. Final analysis of the sites from Jomon (Ota, Middle Jomon period and Tsukumo, Final Jomon period) and Edo (Ikenohata, Edo city/ Modern Day Tokyo) is still underway. Radiographic and macroscopic methods have been used to record the presence of disease.

Specific disease of non- adults from Jomon has been assessed, and age and sex demographics were completed for all individuals. No specific infectious disease in the non-adults were identified. However, there is evidence of widespread systemic disease in a number of individuals which may be more likely to be infectious than metabolic in nature. Parameters for non-specific systemic infectious disease are currently being worked for statistical analyses of morbidity and mortality in situations where specific infectious disease is not identified, such as in the case of the Jomon. Preliminary data demonstrates a shift in the mortality profile between the Middle and Final Jomon periods, with the later period presenting with deaths at an earlier age. 77% of non-adults from the Final Jomon site present with scurvy suggesting that nutritional stress may be an important factor in this shift. An estimate of prevalence was not possible for Middle Jomon due to the fragmentary nature of the non-adults in the Ota sample. Assessing the rates of scurvy in the adults from the Jomon sites will then yield intriguing results. These findings were presented at the Indo-Pacific Prehistory Conference in Hue, September 2018.

A sample of 18 out of 85 individuals from the Edo period (all non-adults) has been assessed. The results so far are promising with the identification of scurvy, rickets, possible congenital syphilis and possible lead poisoning within the selected sample.

The next step to the research is to finalise diagnosis of specific diseases and to statistically analyse mortality and morbidity change with increasing interaction events.

**Research Output**

Vlok M, Temple D, Ishijima H, Matsumura H, Oxenham M and Buckley H. 2018. A Biocultural Approach to Human Interaction and Consequences of Disease in Japan. *The 22nd Indo-Pacific Prehistory Association Congress, Hue, Vietnam. 23-28th September 2018.*