

Implications of micro-scale *Plasmodium falciparum* transmission among a household in Western Kenya

Kelsey Sumner, MSPH

PhD Student, Epidemiology

UNC-Chapel Hill Gillings School of Global Public Health

Mentors: Dr. Wendy O'Meara, Dr. Steve Taylor, Dr. Steve Meshnick



BACKGROUND

- >70% of Kenya at high risk for malaria despite massive efforts to reduce national coverage^{1,2}
- Need to understand how parasite diversity influences malaria reservoirs



WHO, 2016

STUDY AIMS

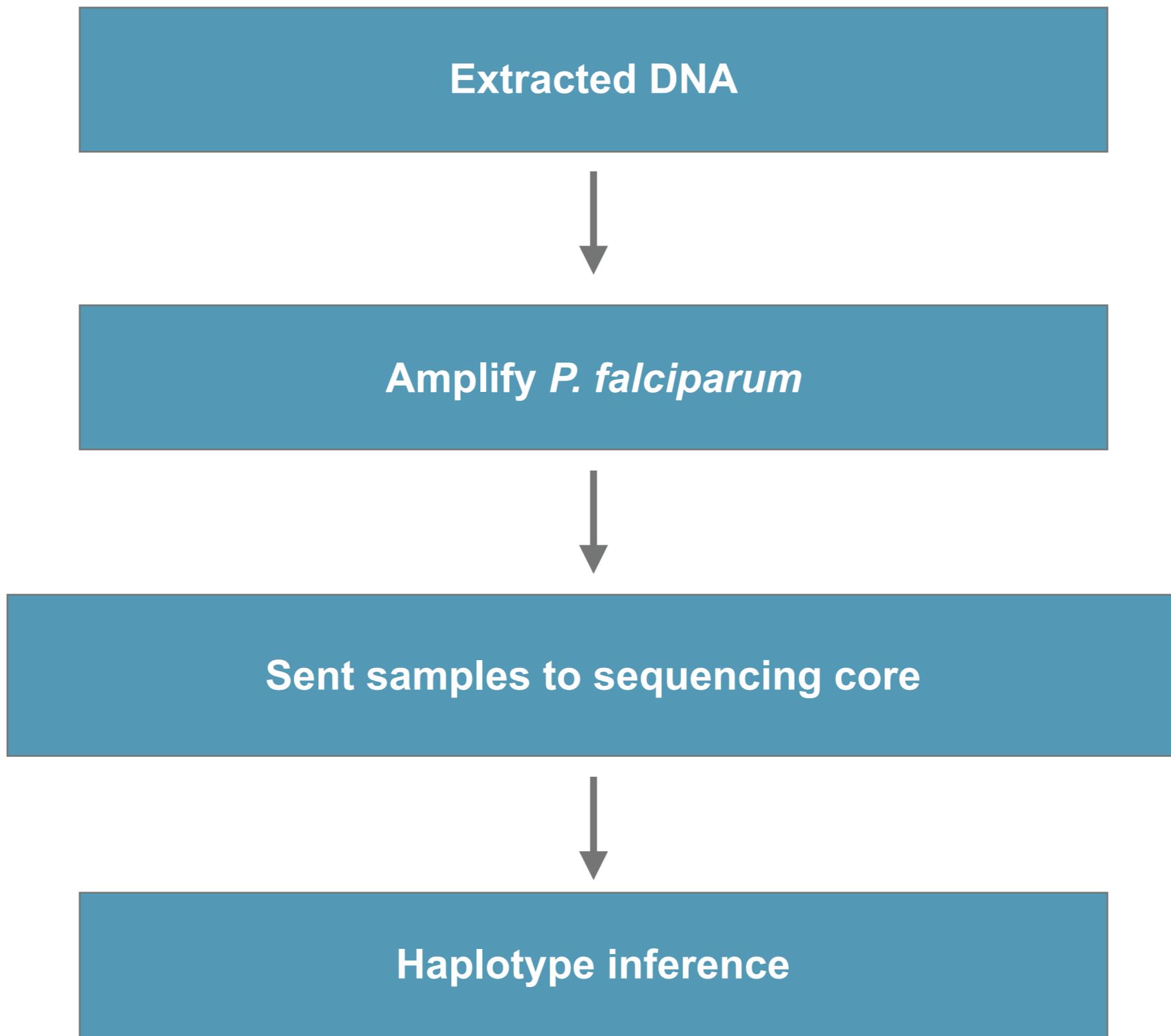
We aimed to assess *P. falciparum* parasite population mixing among household members and *Anopheles* mosquito vectors in a single residence in Webuye, Kenya

PILOT ANALYSIS

- Longitudinal cohort of 36 households spread across 3 villages
- Piloted analysis in 1 household (in Kinesamo — K01)
 - 9 participants
- Samples collected over 2 months
 - July and August 2017
- Sequenced samples to assess parasite strain diversity
 - 16 human dried blood spots
 - 18 mosquito abdomens
 - 15 mosquito heads



GENETIC APPROACH



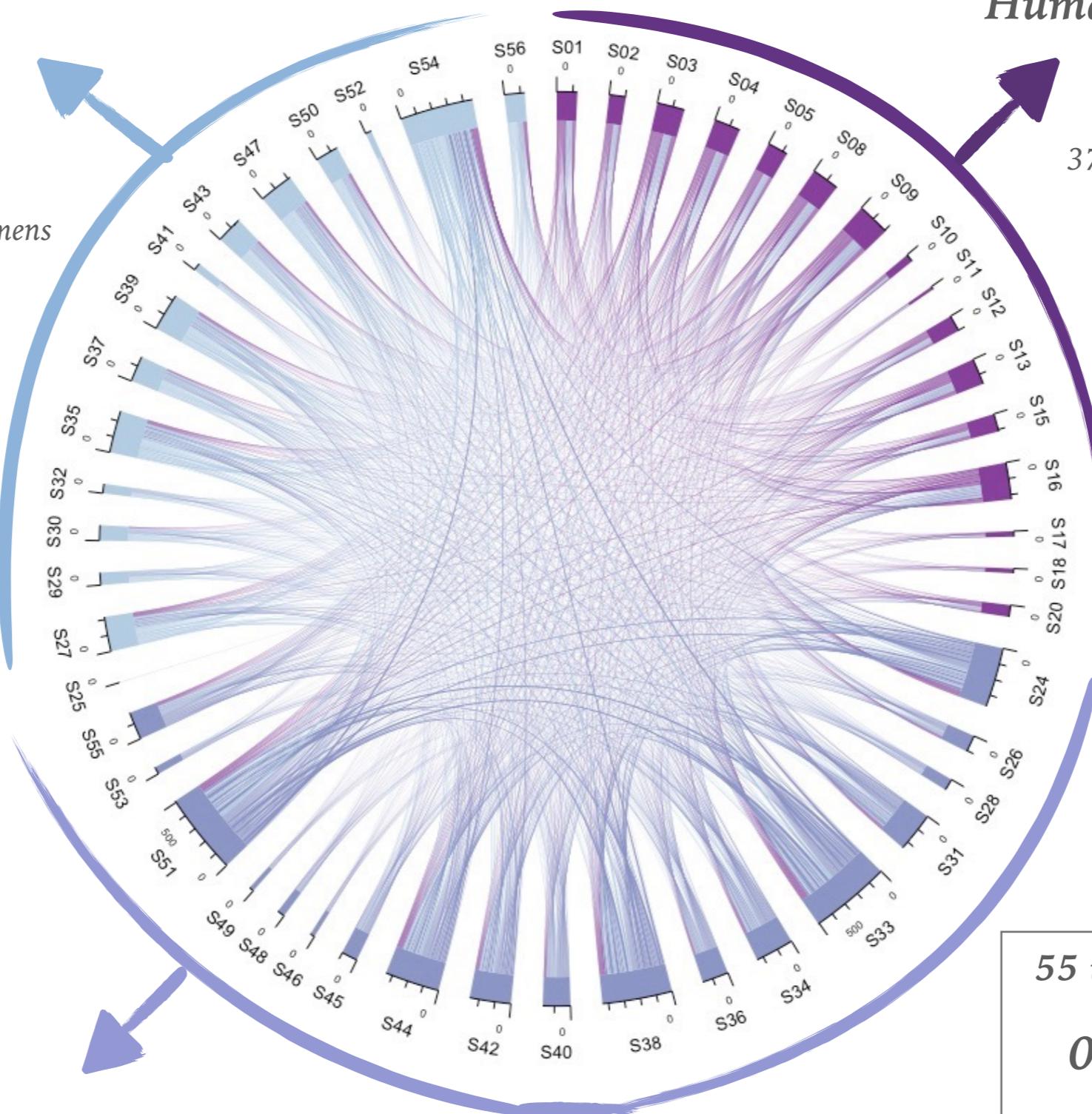
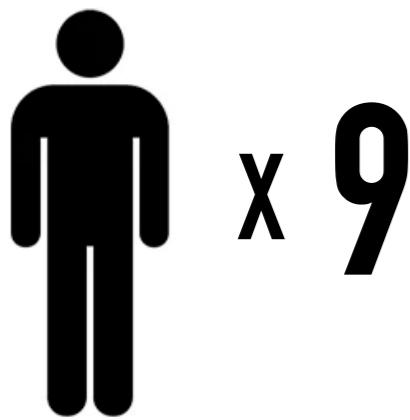
SHARED MALARIA STRAINS

Mosquito Heads

Of the 15 Samples:

33% shared with humans

37% shared with mosquito abdomens

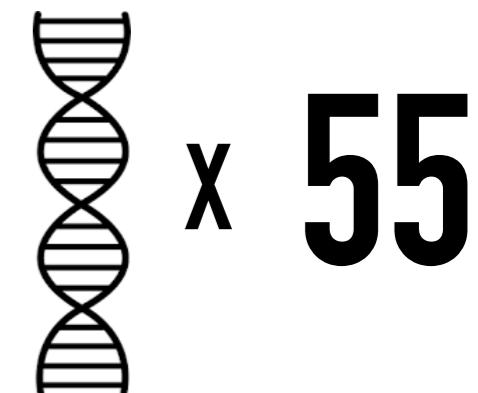


Human Dried Blood Spots

Of the 16 Samples:

37% shared with mosquito abdomens

31% shared with mosquito heads



Mosquito Abdomens

Of the 18 Samples:

33% shared with humans

31% shared with mosquito heads

55 unique strains of malaria

0-22 strains shared

66% of samples shared strains

**THANK
YOU**



REFERENCES

- Background
 1. World Health Organization (2016). Kenya malaria mortality and burden of disease. Accessed on June 18, 2018 from <http://www.who.int/countries/ken/en/>.
 2. Ernst, K. C., Hayden, M. H., Olsen, H., Cavanaugh, J. L., Ruberto, I., Agawo, M., & Munga, S. (2016). Comparing ownership and use of bed nets at two sites with differential malaria transmission in western Kenya. *Malaria Journal*, 15, 217. <http://doi.org/10.1186/s12936-016-1262-1>
- Photos
 3. <https://www.pinterest.com/hicareservices/mosquito-control-prevention/>
 4. World Health Organization (2016). Kenya malaria mortality and burden of disease. Accessed on June 18, 2018 from <http://www.who.int/countries/ken/en/>.