Supplementary Information

Ethnographic detail

We collected the data over two field seasons from April to June 2013 and February to October 2014 from the Agta. Data collection occurred during the dry season (March until September). There are around 1,000 Palanan Agta living in Isabela Province, located in the northeast of Luzon, in the Philippines. The Agta reside in the Northern Sierra Madre Natural Park (NSMNP), a protected area that consists of a mountainous tropical rainforest and includes the coastal beaches, coral reefs and the marine eco-system of the Pacific Ocean. As discussed by Rai (1) the Agta (numbering around 1800) throughout the NSMNP form distinct linguistic groups, broadly adhering to municipal lines. There is limited interaction between the Agta living in San Mariano (1), Cagayan (2), Maconacon (3) and Casiguran (4, 5). From our own records, we find that marriages between these groups are rare and there is limited connections in genealogies collected by Headland in Casiguran, Minter's 2002-2005 data collection in San Mariano, Divilican and Maconacon and our own in Palanan. This perhaps is not surprising since many Agta do not know Tagalog, the national language of the Philippines, making communication difficult.

Mobility

Similar to many immediate-return hunter-gatherer societies worldwide the Agta follow a bilateral descent and residence system, which maintains a large and flexible kinship network (6–9). Having such a large kinship base allows easy access to collectively held land as family groups are mobile, and often move between different camps on a regular basis (8). Peterson (9) notes that factors, such as food availability and personal relations meant that nuclear families move between three to five camps within a delimited locale. In our own data, we found that, on average, households move once every 10 days, but this varies according to degree of sedentarization. This figure was established from households presence in daily camp scans; each day households were recorded as there or away. Some households moved regularly between nearby sites (a trend noted by Peterson (9)), while some never moved. When this data is transformed into a binary variable of either moved once or never moved we find that 27.5% out 444 households were witness to move camp at least once. Accordingly, we find that 26.8% of 444 households reside in mobile camps, comprised of temporary housing (lean-tos) without the presence of infrastructure such as water pumps or the presence of the church. Rai (1) finds among the Disabungan Agta that households moved once every 18 days in the late 1970's, while during the summer months Minter (8) witnessed households to change camp as much as once every couple of days. During Minter's fieldwork in 2002-2005 only one of the camps in Palanan

was heavily settled, now this trend has extended and at least four of 13 camps in our sample have churches, permanent housing and water pumps. Therefore, the average camp movements may have reduced in recent times and more camps are becoming permanent.

Diet

On average 19.6% of food is produced from cultivation while the reminding 80.4% is produced by foraging activities (fishing, hunting and gathering). Further breaking this down into food groups (meat, vegetable and fruit and rice) we find that average meat consumption (primarily fish and other marine resources) equals 0.3 $\pm$ 0.1 of the total diet, compared to vegetables and fruit with consist of 0.2 $\pm$ 0.15 of the diet. While rice makes up 44% of the diet, there is significant variance in this figure as it is dependent on amount of time in wage labor and cultivation: as a proportion of the diet, some households consumed little rice (minimum = 12.5%), while the most extreme households had a diet consisting of 75% rice. Similarly, households involved in a high proportion of foraging (more than 75% of food production activities) consume more honey and less rice than individuals who spend more time in cultivation and wage labor (figure S1). Likewise, individuals living in settled camps produce 78.9% of their food by foraging while individuals in mobile camps produce 90.9% of their food from hunting and gathering.

Modes of subsistence

The Agta rely heavily on foraging modes of subsistence (76.5%) versus non-foraging activities (23.5%). Nonetheless, as argued by Minter (8) the agriculture practices and their economic importance of the Agta have often been ignored. The literature portrays them as 'unsophisticated' or 'hobby' farmers as they gain few and irregular returns from their efforts (10, 11). However, Minter (8) finds that both the domestication of animals and cultivation is becoming increasingly present, however varies greatly by location. Time spent in cultivating their own land (clearing, planting, tending and harvesting) ranged between 4-11% for males and 3-13% for females in three different environments (coastal, interior and watershed). From this work, the crop yielded an average of 283 kg of rice per household, enough for 113 days, given an average daily rice consumption of 2.5kg. Our figures are remarkably similar as we find the range in wage labor (mean = 0.06 $\pm$ 0.19, median = 0) and food production to be large (mean = 0.13 $\pm$ 0.28, median = 0) as a few individuals engage in them a lot, while many individuals not at all. If we examine the amount of time spent in different daily activities by degree of individual settlement we find that mobile groups spend only 3.5% of their work activities in cultivation and 0% of activities in wage labor. Comparatively, settled groups spend 11.6% and 10% of their

work activities in cultivation and wage labor, respectively. As a result it seems that settled and mobile Agta follow different subsistence strategies.

Camp sedentarization

The nature of the camps vary significantly according to degree of acculturation and cultivation. The Agta reside in broadly three types of camps. The most mobile of these are comprised of lean-tos, temporary shelters which are constructed in less than an hour, and frequently moved according to the rain, wind and sun. These shelters are made of crossed poles and palm leaves for roofing, thus are commonly abandoned (9). These types of camps do not have a church or water pump, but rather are often based around a freshwater source. The composition of these camps changes frequently, both in terms of the number, position and location of structures and the individuals residing within the camp. New individuals arrive and leave every couple of days. A semi-permanent camp often contains a mixture of lean-tos and more permanent buildings. The more permanent type of Agta houses are still built over a matter of days, consisting of natural materials. However, these are moved less often and often expanded or altered rather than abandoned. Finally, permanent camps have often been built around a church, garden or water pump and mainly consist of houses made by the Philippine government, which are made of wooden planks and iron roofs. These houses remain unaltered but individuals living in them may change.

As we conducted our research collection over two years we were able to get a sense of the changing composition of camps. There is significant variability in this degree of out-of-camp mobility (a measure of how many people leave a camp over two years) between camps, as some camps had 86% of the same individuals living in the camp between two visits, while others had only 0% when the camp was completely abandoned. The mean figure was 0.59 ± 0.23.

External involvement

The Agta have long-standing interactions with their neighbors, a common feature of many Agta and Aeta groups in the Philippines. Peterson (9) argues it was the disruption caused by the Japanese occupation that caused non-Agta farmers to spread out into the municipality. However, as there is no road or easy route to Palanan, external pressures (extractive industries, land grabbing and clearing, resource destruction and migration) have been significantly reduced for the Palanan Agta compared to populations to the south of the NSMNP

(4, 5, 12). Extractive technologies, such as mining and logging are almost completely absent from Palanan, in complete opposition to Dinapigue and Dilasag to the south. Nonetheless, this does not negate the fact that the Agta do have some access to basic forms of modern medical care, occasionally attend school (however, this remains a minority of children in limited areas and not yet consistently), and a couple of the most settled camps are influenced by the Evangelical church.

We examined the relationship between 'transition' and access to medical care. Vaccination rates are very low in the population in general, with a mean vaccination rate is 0.18 $\pm$ 0.21. In linear regressions on camp vaccination rate (n = 13) the major predictors of having a vaccination is living in a sedentarized camp (β = 0.19 $\pm$ 0.07, p = 0.02) close to town (β = -0.013 $\pm$ 0.005, p = 0.01), which accounts for 76% of the variance. This is because any religious charity or government intervention is focused on the easy to find, easy to access Agta camps. Camps the furthest away reported no contact with nurses, doctors or other medical providers. Accordingly, we find that only 34% out of 325 cases of sickness received medical treatment. Receiving medical treatment was predicted by living in a sedentarized camp (β = 0.36 $\pm$ 0.18, p = 0.04) and household participation in cash labor (β = 0.19 $\pm$ 0.08, p = 0.02) in MLM controlling for sex and age (n = 325). This implies that households in more integrated camps with access to cash are more able to access medical care. Thus, we would expect health to be improved in the sedentarized camps closer to town. However, we find the opposite, implying it has little protective effect, perhaps since the care is not consistent enough or of high enough quality (the resources are rudimentary, medication often expensive and/or unavailable, and cultural barriers are extensive between Agta and non-Agta). Therefore, modern trends such as medical care have little impact on our results.

Some of the best-known literature on the Agta stem from research conducted on the Agta living in Casiguran. Early and Headland (4) and Headland (5) demographic data reveals the Agta to be at the extremes of known rates of infant mortality and homicide, revealing a rapidly declining population (1.2% per year between 1936 to 1976). In part, Headland argues that this is the result of external forces in the area with the rise of migrants, logging, mining and over extractive exploits (13). These events were, in part brought by the construction of a road in 1977 to Dilasag, bringing an influx of violence, alcoholism, homicide and environmental and subsistence loss. Among the Palanan Agta the picture is different: disease is the major cause of mortality (56%), followed by childbirth and its complications (22%) and accidents (9%) in a sample of 108

adult deaths reported by immediate family members. Deaths attributed to alcoholism (such as accidents as well as long-term alcohol abuse) and violence only account for 6% and 7% of deaths, respectively. Neither alcohol nor violence are major influences in the lives of the Palanan Agta. We know of no instances while we were conducting our fieldwork of extreme violence, and only witnessed a few households consuming alcohol (primarily men after hunting or fishing). We examined if living in a settled camp significantly predicted the increased likelihood of a violent or alcohol-caused death being reported. There was no significant effect of living in a sedentarized camp on violent deaths (β = -19.3 $\pm$ 1631, p = 0.9) or alcohol related deaths (β = -0.84 $\pm$ 0.86, p = 0.33). Therefore, as a result we do not believe that specific influences of alcoholism and violence play a major role among the Agta of Palanan.

Extended methodological protocols

Camp Scans

In each camp we conducted daily camp scans to record activity patterns. These scans were based on spot observation techniques. We categorized each individual's activity at the allocated time, and if they were out of camp their location and activity was recorded. We found out about their location from family members who were in the camp during the scan time. To produce an unbiased time sample the first scan was rotated daily (start times from 6:30 to 9:30 at 30 minute intervals and then three more scans were conducted every four hours from this starting point). The activity groups included hunting, foraging, wage labor and agriculture. Therefore, we had four points during each day we knew the exact activities of each member of the camp. An example form is shown in Figure S4. From this data it is possible to extract the variables such as how long individuals spent hunting, foraging and fishing compared food production and wage labor. To create the household foraging variable we took the mother's proportion of time spent in foraging versus 'non-foraging' activities (i.e. cultivation and wage labor). We took the mothers value for the household variable due to our focus on maternal fertility, mortality and survivorship to age 16. Thus, the models are consistent throughout the analysis. As discussed above, there is a significant amount of variance in participant in cultivation. However, on average it forms 15% of activities. Therefore, we took the cut-off of high proportion of foraging at the third quartile of 75%. Thus, households with mother's engaging in 'high' proportion of foraging were coded as 1, households with mother's engaging in less than 75% foraging were coded as 0. Summary statistics for all variables can be found in Table S2-3.

Interviews

We conducted household interviews to quantify demographics and household wealth. For consistency, we conducted the questionnaire with the mother of the household.

Reproductive histories and genealogies

During both our fieldwork periods we collected full genealogies and reproductive histories from each mother. We recorded not only living children, but also miscarriages, stillbirths and offspring mortality. If there was a large interbirth interval between any two children we would enquire if there was a specific reason, which may prompt a mother to report a deceased child. If a child had died, we would enquire what of, roughly how old and when. Often mothers do not know 'when' or 'how old' but it was always possible to associate an individual's age and year of death with another event which we knew. For instance, we would ask, "who was you breastfeeding when child X died?" or "which of your children is the most similar in age to child X when he/she died?" With this information it was possible to triangulate ages and date of death for deceased children, however for older individuals this becomes increasingly more difficult since life-stages become a lot longer. Therefore, our ages for childhood mortality (under 16 years old) are significantly more robust than our ages for adult mortality.

As we often collected the same family tree from several individuals, we did occasionally find inconsistencies in the data, such as an additional child or a different birth order. To produce the most accurate genealogy we took either the genealogy from the most knowledgeable individual (i.e. the mother over the aunt) or the genealogy that reduced other inconsistencies (i.e. avoiding impossibilities such as six month interbirth intervals). Overall the genealogies we collected contained 2953 living and dead Agta from Palanan. From this data it was possible to establish the consanguineous relatedness (r) of each individual we met by using code from the following packages: *pedigree*, *kinship2*, and *igraph* in R 3.1.2 (14) to tabulate the dyadic relatedness of all individuals in both samples. We also calculated maternal fertility and childhood mortality rates from this data.

Household belongings

Our interview also included a quantification of the number of belongings in a household to create an index of wealth. To create an 'emic' based list, we first sought to establish the most important items from a sub-sample (n = 16) of households. Here we just asked each household to name 10 of the most important belongings an Agta could own. Based on this we created a list

14 household items that were mentioned the most frequently. This list was then shown to each household, asking whether they had these items and if they did, how many did they had. As some items were more important than others we weighted each item according to the number of times it appeared in the list. For instance, most households owned cooking pots, if you did not you would be 'poor' since they are an essential daily item. Thus, these items were weighted the highest. On the other hand, not many individuals owned spoons or forks as they had less utility, thus this item was weighed significantly lower. This system assumes that the 'most common' are the most valued, since it would be erroneous to compare cooking pots to spoons one-to-one. However, it does undervalue rare, luxury items (such as radios or guns). Yet since the households with many everyday objects also had luxury items also this does not seem to bias the distribution of wealth. The object, frequency of mention, proportion of importance and computed weight can be found in Table S1. Overall, this method was thought to be more nuanced than taking the monetary value of items since this is unlikely to reflective the value the Agta place in the items.

Table S1: List of objects, their frequency and weighting.

Item	*n*	Proportion	Weight
Goggles	31	0.05	5
Blanket	37	0.06	6
Hunting bow	7	0.01	1
Cups	65	0.11	11
Air gun	5	0.01	1
Kettle	45	0.08	8
Knife	65	0.11	11
Mat	15	0.03	3
Net	12	0.02	2
Plates	93	0.16	16
Cooking pot	123	0.21	21
Radio	4	0.01	1
Spear gun	35	0.06	6
Spoon	50	0.09	9
Total	*587*	*1.00*	

Camp descriptions and mobility

During the two years of fieldwork we visited each camp multiple times (at least twice, sometimes three times, depending on whether the camp had dissolved into other nearby camps), therefore we were able to create mobility variables. This was broken into *individual level mobility* and *out-of-camp mobility*. For camp-level mobility we conducted a survival analysis that quantifies the proportion of individuals leaving camps. If all individuals who had been present on our first

visit remained so during later visits, the camp had a survival rating of 1. If, however, camp composition completely changed the camp had a survival rating of 0. Therefore, this measure quantifies out-of-camp mobility. Leaving was defined as any departure from camp which was longer than overnight. At the individual-level people were either allocated as mobile (0) or settled (1) depending on whether or not we had ever witnessed them to move (again for longer than one night) at least once during our fieldwork.

While these mobility variables capture peoples' movement, the degree of camp sedentarization was also coded according to housing type. The *camp housing type* variable is on a three-point scale, 0 being the most temporary and includes camps with lean-to shelters, which frequently change in either location or position. Camps allocated to 2 on the scale were fully settled camps in which the houses were permanent (wooden huts with metal roofs) and unable to move. Camps with a mixture of both of these features had a temporary measure of 1. Finally, for a binary analysis the camps were simply separated into a category of *sedentarized camp:* 0 being a mobile camp and 1 a sedentarized camp based on the presence of permanent housing, churches and infrastructure such as water pumps. Therefore, with these measures we have both a sense of the permanence of camps as well as individual's mobility in and out of them.

Table S2: Descriptive statistics for the categorical independent variables

	Class	***n***	**%**
Sex	Female	182	43.9
	Male	233	56.1
Settled Agta	Mobile	114	27.5
	Settled	300	72.5
Agta in Sedentary camps	Mobile	111	26.8
	Sedentary	304	73.3
Housing type	Temporary	81	19.5
	Semi-permanent	147	35.4
	Permanent	187	45.0
Maternal Foraging	Less than 75%	358	91.5
	More than 75%	33	0.09

While these settlement and mobility indices may appear similar, they make important distinctions. For instance, the camp housing measures are expected to be more important for soil-transmitted helminths that reside in fecally contaminated soil, of which there is a lot more of in permanent camps. A camp may have many of the same people residing in it (thus high out-of-camp mobility score), but if they actively move around an area this might significantly reduce

helminth transmission. This frequently happens in camps comprised of lean-to shelters, which often change location and position during the night. When asked, the Agta stated they moved short distances because it was dirty, smelly or too many insects at the previous location. Even these short distance moves are sufficient to break up the transmission routes of soil-transmitted helminths (15, 16). Out-of-camp mobility, on the other hand, reflects more about increasing camp size and population density: when few people leave a camp its size necessarily gets larger. Therefore, out-of-camp mobility is likely an important predictor for viral infections which depend on larger population sizes (17). Finally, the binary *sedentarized camp* measure focuses on external influences on the camps: camps with churches and/or water pumps are coded a sedentarized, while camps with no intervention are coded as mobile. Thus, if a disease marker is affected by medical intervention this variable is likely to be an important predictor.

Table S3: Descriptive statistics for the continuous independent variables

	Min	**Max**	**Mean**	**SD**
Age	0.0	80	20.27	18.89
Camp size	5	77	49.62	22.27
Household belongings	0.18	5.5	2.01	1.12
Mean relatedness	0	0.4	0.12	0.07
Out-of-camp mobility	0	0.86	0.59	0.23
Proportion of foraging	0	1	0.73	0.36

Food Diaries

The dietary data was collected at the household level at the end of each day. As shown in Table S5 our data collection for diet was primarily based around activities, rather than an in-depth dietary recall. We asked the mother and the father at the end of the day (between 17:00 – 18:00) what foods they had eaten that day. We then asked the parents what activities they conducted during the day, and this would functioned as a useful prompt if any food had been forgotten (i.e. if someone had been fishing, but not mentioned eating fish this was an obvious oversight). Since this data is at the household level, we do not know specifically what each household member was consuming. We may know that, for instance, a household consumed 50% meat, 25% vegetables and 25% carbohydrate (rice or tuber), however we do not know who is actually eating this. To create variables from this data we simply used the proportion of times a food item was reported (separated by meat, vegetables and fruit and rice). Thus, if 100 foods were reported, and 50 of these were fish then meat is recorded as occurring 50% of the time, and so forth. As a result, the data based on daily activities is more robust and reflective of a wider range of behaviors as the dietary data is restricted to self-reported food consumption once-a-day.

Health Survey

The short-term health survey was conducted over six weeks at the end of the research period (August to late September 2014). We returned to each of the camps to conduct both blood analysis and fecal collection for parasites. During this time we re-met 345 individuals. The anthropometric measurements were conducted using a Harpenden anthropometer. To reduce inter-observer error only one researcher (AP) took the measurements for weight and height that are used in the body mass index (BMI) analysis. All height and weight measurements were taken in light clothing and shoes were removed.

Blood composition analysis was conducted as a proxy for examining the different types of disease pressures the Agta face. We looked at white blood cell (WBC) differentials to examine the prevalence of different types of infectious diseases. The methodology and rationale behind this approach is discussed below.

Blood Collection Protocol

The standard protocol for blood collection is as follows. A blood sample, obtained by a Haemolance Normal Flow lancet, of approximately 10 μL is drawn into the cavity of the specially designed microcuvette by capillary action. Following best procedure, blood was always taken from the end of the middle or ring finger on the right hand (18). The first two or three drops were wiped away. Clotted samples were discarded, and the sample was always taken within one minute prior to analysis. If multiple samples were required (due to a lost sample, clotting or lack of flow) a different finger was used each time as skin puncture causes the body's defense system to increase the number of WBC close to the wound, affecting the overall measurement. The blood flow was never encouraged by squeezing due to the altering effect this has on the blood sample (18). The microcuvette was then placed into the analyzer.

White blood cell composition

The WBC analysis was conducted on HemoCue© WBC DIFF for in-vitro of white blood cell composition in capillary blood. The WBC DIFF produces a full white blood cell differential within five minutes using staining and image analysis within the analyzer. As a portable, battery operated system WBC DIFF provides immediate values for total white blood cell count and a differential count of the five main leukocytes (neutrophil, lymphocyte, monocyte, eosinophil and basophil) each of which have specific functions and morphologic appearance, making

classification possible (19). There is large intra- and inter personal variation in WBC concentrations, therefore the majority of the analysis has been conducted with internationally accepted medically abnormal concentrations of each cell type. These are based on a normal range (two standard deviations from population norms) primarily from European and North American populations (19–21). We found no variance in monocytes and basophils, therefore dropped them from the analysis.

Neutrophils are the major component of our WBC, and it is their activation and death at the sites of infections and wounds which cause pus (22). Thus, severe neutrophilia is suggestive of septicemia or other serious microbial infections (20). Raised neutrophil levels above 7.0 x 10^9/L for adults and 8.0 x 10^9/L for children over 12 indicate bacterial infections (23). Lymphocytosis is a lymphocyte concentration of more than 3 x 10^9/L for adults over the age of 12. For children there is much greater normal variation especially less than two years (normality range from 4 – 12 x 10^9/L) while for children aged 2 - 12 the ranges steady reduces into adulthood (2 – 6 years normal range 6 – 9 x 10^9/L; 6 – 12 years normal range of 1 - 5 x 10^9/L). Such raised lymphocyte levels are indicative of viral infections, such as *Rotoviruses* and *Caliciviruses,* which are major causes of gastroenteritis and diarrhea common among the Agta (23). Due to the differences in abnormal thresholds between age groups both the neutrophil and lymphocyte analysis was logistic; normal concentrations given an individual's age, were coded a 0, abnormally high levels were coded as 1.

Eosinophils are an extremely valuable marker of the presence of parasites, particularly when the eosinophilia is moderate (i.e. between 1.5 and 5 x 10^9/L). Eosinophilia occurs when individuals present with eosinophil levels more than 0.5 x 10^9/L in adults and more than 1 x 10^9/L in children under 12 years. Parasites cause an eosinophilic response when they invade the tissue of the body. Particularly helminths with a tissue migratory phase (such as hookworm and *Ascaris spp.* as they pass through the lungs) cause severe eosinophilia (above 5 x 10^9/L). On the other hand helminths such as *Trichuris trichura* (whipworm) cause mild and occasional eosinophilia (depending on helminthic load) as it attaches to the intestinal mucosa and feeds on tissue secretions rather than blood (unlike the hookworm, (20)). Due to the similarity in abnormal threshold between adults and children, and given the importance of capturing the variance between mild, moderate and severe eosinophilia, the analysis for eosinophil concentration was continuous.

While these are the most likely causes of neutrophilia, lymphocytosis and eosinophilia, it is not always possible to delimitate the effects so neatly. For instance, both neutrophilia and lymphocytosis can be caused by non-acute conditions such as toxoplasmosis, Addison disease and autoimmune disorders and gout (20). Likewise eosinophils are a major effector cell in many types of allergic inflammation. However, increased counts of neutrophils, lymphocytes and eosinophils are here taken to, on average, indicate bacterial, viral and helminthic infections, respectively (20).

All quality control studies of the WBC DIFF system find the results to be confidentially repeatable with small standard deviations between tests and produce similar results to other methods (19, 21, 24). Traditionally the collection of biological samples has been very difficult from foraging groups due to their remote locations and the difficulties of storing biological samples in often hot conditions. The HemoCue systems successfully overcome these limitations by allowing the blood differential to be made immediately and then the sample discarded.

Fecal analysis

To further examine parasite load among the Agta we collected stool samples. This was the more complex part of the data collection as the samples had a limited storage time, particular in the tropical conditions. Therefore, we have only a limited sample (n = 30) from a few camps (two coastal producing 13 samples and three inland with 17 samples). The sample was comprised equally of 50% males and 50% females, however the majority of individuals were under 16 (median age = 9.98 years). Due to difficulties in collection we only sampled individuals who had parasitic symptoms. As such 100% of samples were positive for one to three common species of nematodes (whipworm (*Trichuris trichiura)*, hookworm (*Ancylostoma duodenale* or *Necator americanus* as it was not possible to distinguish between species ova) and roundworm (*Ascaris lumbricoides*). These are the three "soil-transmitted helminths" and collectively infected millions worldwide (15). These data cannot be used to examine *if* individuals are infected but can say something about parasite load by examining correlates of polyparasitic infection. Each stool sample was placed in a sterile and sealed collection pot and preserved with polyvinyl-alcohol and received by the local hospital laboratory for microscopic analysis within 24 - 36 hours. Collection was conducted by a fully trained healthcare assistant and microscopic analysis was conducted by the Palanan hospital laboratory technician.

Transition traits

Hayden (25) states the 'core traits' found throughout the archaeological record associated with transition to food production include sedentism, food storage and increasing population sizes and density. Others similarly reinforce the concept of a 'cluster of traits' associated with transition, leading us to conclude that sedentarization, wealth accumulation, population growth, inequality and cultivation are clear markers of populations undergoing transition from highly mobile, egalitarian, immediate-return hunter-gatherers to settled and stratified food producers (26–28). Therefore, within the process of resource intensification (which is by no means linear) and transition to sedentism and cultivation, there are many highly interrelated variables. These same traits are apparent in the Agta today. Figure 1 in the main text shows a correlation plot between the major predictors discussed in this research. The figure demonstrates the significant relationships between the key traits associated with the Neolithic revolution in the archaeological record. In particular, we can see here that the proportion of food produced through cultivation rather than foraging is positively correlated with camp size, household settlement, camp stability, and household belongings. Therefore, we argue that these trends are significantly interconnected, and representing a set of processes relating to transition from more mobile immediate-return hunter-gatherers to settled food producing communities.

Statistical Analysis

As the Agta are hierarchical nested (individuals within households residing in camps) logistic and linear multi-level models (MLM) were used to avoid problems of non-independence. MLM distributes the response variance into each of the levels. These levels are the 'random-effects' entered into each model (29). The relative explanatory value of these random effects is established using variance partition coefficients (VPC); a VPC is calculated by dividing the variance of one level by the sum of all other variance components. 'Fixed-effects' are then entered into this base model (referred to as intercept-only), which includes all predictive variables of interest.

To produce an estimation of variance reduction with the inclusion of fixed-effects (i.e. the predictors) I followed the procedure cited by (29). This procedure allows for an estimation of the percentage reduction in the unexplained variance at the each level by the inclusion of a predictor variable. To establish this figure an intercept-only model is produced which contains only random-effects (i.e. the levels). The residual variance in this model is used as the baseline to examine how much residual is reduced once fixed-effects are included by removing the new residual figure from the intercept-only figure and dividing this by the original figure (see (29) for

a fuller discussion). This figure can then be compared to the variance explained by the control only model to compute how much of the variance the fixed-effects account for. As a result, VPC provide insight into the influence of fixed-effects has on the overall variance in the dependent variable (29).

Only theoretically informed variables were entered into the model and none were removed once multicollinearity was dealt with. As many variables co-vary (Figure 1 main text) the maximal model suffered from multicollinearity (variance inflation factor (VIF) scores of more than 2.5 (30)). Two types of variables, household mobility and proportion of time spent in cultivation always co-varied significantly, and thus, were placed in separate models. In these models one *camp sedentarization variable* (either *out-of-camp mobility*, *camp housing type* or *sedentarized camp*) was entered according to which produced the lowest AIC in univariate models. As explained above, different measures captured different aspects of disease transmission, thus fitted the data better depending on the dependent variable. The AIC results from the univariate models are shown in Table S4. Note that no one predictor performed significantly better than the others for reproductive success, thus we used the *camp housing type* variable to keep the model consistent with the other demographic measures. All models also contained a household belongings variable, age, sex, mean relatedness to camp mates and number of household dependents as controls when appropriate. VIFs were checked at the end of this process to ensure that multicollinearity was no longer distorting the model results. During WBC analysis, total WBC count and the other WBC types were controlled for as they have a confounding effect. For instance, the proportion of circulating lymphocytes may be reduced due to the neutrophilia, or vice versa. Similarly, extreme eosinophilia may hide the extent of neutrophilia. Therefore, this distorts the actual results and requires controlling for. We report the results of both models (*household mobility* and *household foraging*) in the main text and full model results are in tables S8-14 below.

Table S4: Selection process for camp sedentarization variables to be entered into each model. Models with the lowest AIC are highlighted in italics.

Dependent	Predictor	p	AIC
Lymphocytosis	*Out-of-camp mobility*	*0.001*	*422.71*
	Camp housing type	0.375	433.156
	Settled camp	0.03	427.339
Neutrophilia	Out-of-camp mobility	0.897	140.871
	Camp housing type	0.383	142.143
	Settled camp	*0.253*	*139.527*
Eosinophils	Out-of-camp mobility	0.823	1024.894
	Camp housing type	*0.003*	*1018.366*
	Settled camp	0.025	1020.096
Fertility	Out-of-camp mobility	0.07	504.849
	Camp housing type	*0.26*	*463.14*
	Settled camp	0.256	506.815
Reproductive Success	Out-of-camp mobility	0.518	486.548
	Camp housing type	*0.485*	*486.372*
	Settled camp	0.666	486.775
Childhood mortality	Out-of-camp mobility	0.244	324.849
	Camp housing type	*0.011*	*322.549*
	Settled camp	0.066	323.387

Residual analysis

To examine fertility, mortality and survivorship to age 16 the effect of age needed to be eliminated. It was impossible to examine only women who had completed their reproductive lifespans as the sample was too small (n = 11). To create age-specific fertility and survivorship to age 16 we used the residuals from a linear regression between fertility (all live births), age and the natural logarithm of age (as fertility diminishes among the older individuals in the sample). As childhood mortality remains steady until a maternal later life peak an exponential function was applied. By using each mother's residuals from this analysis we can examine how high or low their fertility is, given their age. Thus, an age-specific fertility residual of 0 represents the normal fertility of that given age, -0.5 is below normal fertility while 0.5 is above normal. Once the residuals were transformed into a variable and entered into the model, age was no longer significantly correlated with fertility, mortality and reproductive success (p = 1 in all cases). Thus, these residuals are used in all final analysis.

SI Figures

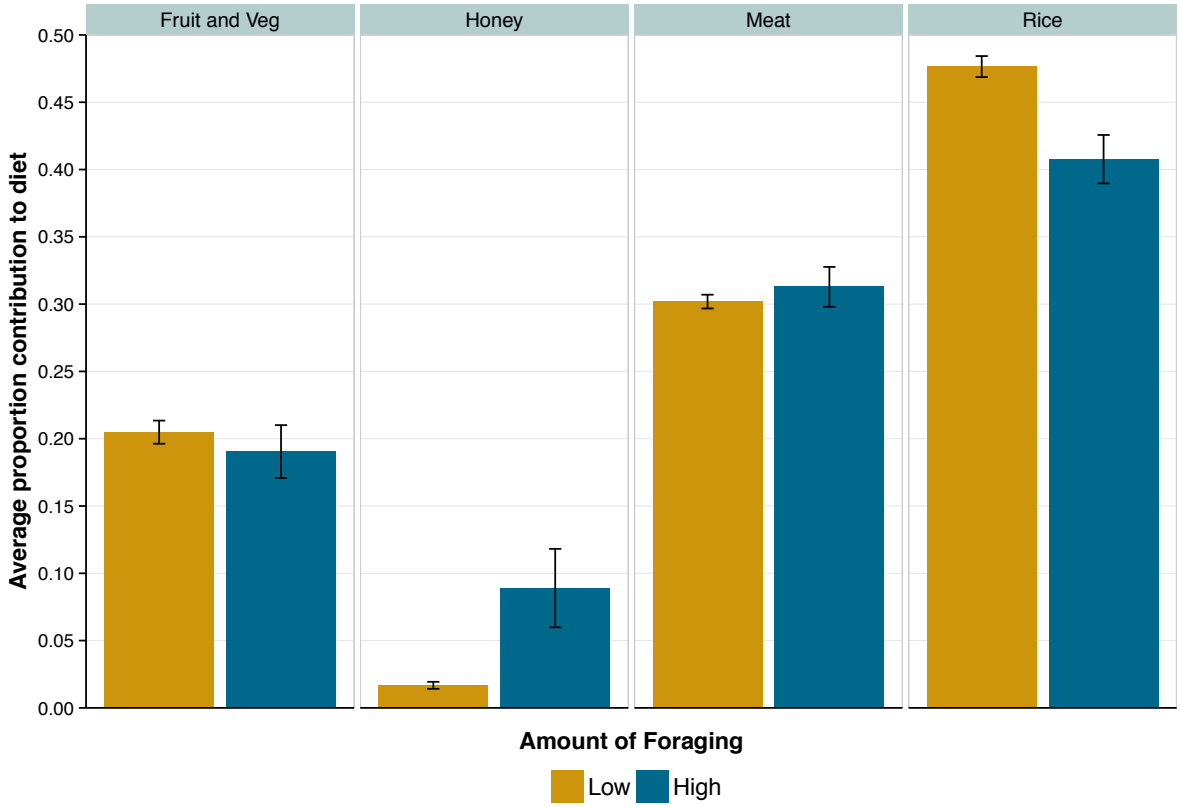

Figure S1: Dietary composition divided by households involved in a high proportion of foraging (more than 75% of all food production activities) versus low proportion of forage (less than 75%), $n = 345$.

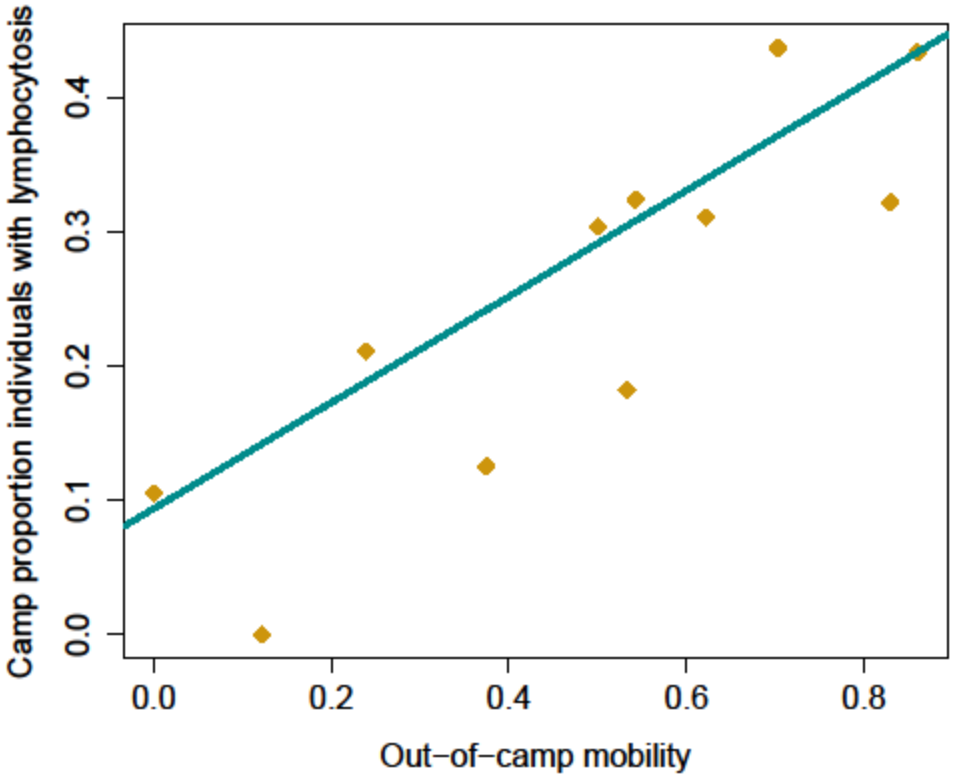

Figure S2: Lymphocytosis by camp survival (n = 345). The dependent variable (presenting with lymphocytosis or not) is binary, thus each point represents the proportion of individuals presenting with lymphocytosis in a camp with that out-of-mobility score, ranging from 0 to 43%. *Out-of-camp mobility* is a measure of camp composition; if a camp has a score of 1 no one left over the two-year study period. A score of zero indicates an abandoned camp.

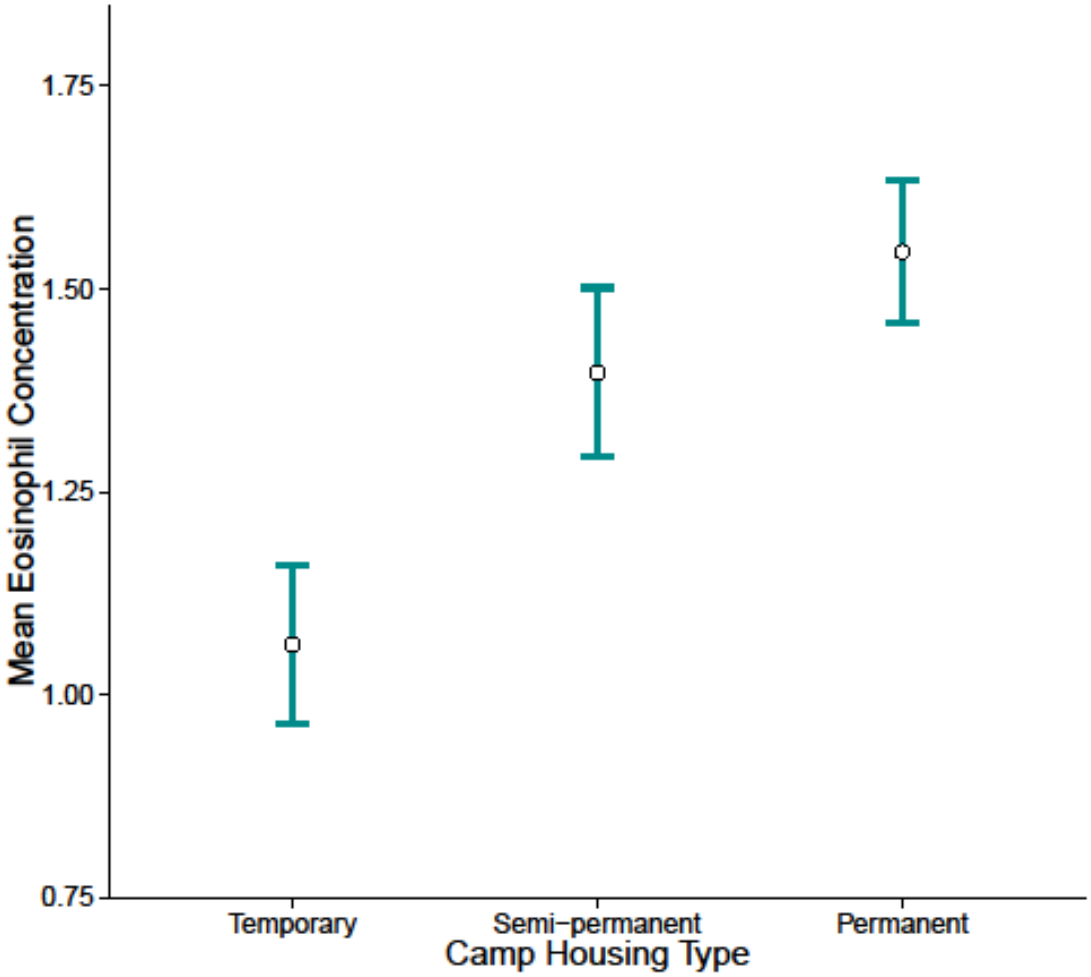

Figure S3: Mean eosinophil concentration by camp housing type (n = 345). Camps with temporary houses (highly mobile lean-tos) have the lowest eosinophil concentrations while camps with permanent housing (wooden huts with metal roofs) have the highest. Bars reflect standard errors.

A) Domestic Activities	B) Childcare	C) Out of Camp	D) Non-Work
A1 - Cooking **A2** - Food processing **A3** - Fetching water **A4** - Collecting firewood **A4** - Cleaning **A5** - Washing clothes **A6** - Preparing medicines **A7** - Constructing/repairing dwelling **A8** - Manufacturing goods/repairing tools (specify) **A9** - Walking with light load (<10kg) **A10** - Walking with heavy load (10 kg – 35kg) *For A1 and A2 state who obtained the food?*	**B1** – Breastfeeding **B2** - Holding children **B3** - Feeding children (not breast-feeding) **B4** - Medical/hygiene care **B5** - Play/Affectionate Activities **B6** - Keeping an eye on children (without direct contact) **B7** - Other touching behaviours **B8** - Proximity (less than 3 meters) **B9** - Vocalising	**C1** - Hunting **C2** - Fishing **C3** - Gathering wild foods **C4** - Collecting honey **C5** - Collecting items for trade (specify shells, orchids, etc.) **C6** - Agricultural work on own land **C7** - Wage labour (specify which) **C8** - Visiting nearby camps (specify which) **C9** - Trade with non-Agta (specify where and item traded) **C10** - At school or accompanying child to school **C11** - Logging *(specify trade/own use for C1, C2, A8)*	**D1** - Resting (state reason; tired/injured/ill/pregnant/bad weather) **D2** - Relaxing/Socialising **D3** - Participating in religious ceremony **D4** – Drinking **D5** - Playing **D6** - Sleeping

ID	Name	Time:			Time:			Time:			Time:		
		Activ	Grp	Whose	Activ.	Grp	Whose	Activ.	Grp	Whose	Activ.	Grp	Whose

Camp: **Dates:**

Figure S4: Daily activity data collection form.

SI Tables

Table S5: Food diary collection form.

Mother			**Father**
What time did you last eat?			
Food 1		Collect/Give/Trade/Buy/Garden	Who?
Food 2		Collect/Give/Trade/Buy/Garden	Who?
Food 3		Collect/Give/Trade/Buy/Garden	Who?
What did you do today			
Mother	Fish/hunt/gather/garden/CL/None/ Sick		Details (i.e. weight):
Father	Fish/hunt/gather/garden/CL/None/ Sick		Details (i.e. weight):

Table S6: Fertility, mortality and survivorship to age 16 figures averaged by mobility and camp type. Actual rates are presented alongside the age-controlled residuals. A residual 0 is the average rate (i.e. fertility, mortality or survivorship) of any given age group. Thus, a positive residual is above average, while a negative residual is below average fertility, mortality or survivorship of that age group. Fertility here includes all live births (i.e. disregarding miscarriages and stillbirths); mortality includes all reported deaths of offspring who were born alive. This data is presented in Figure 2a. We have provided both the age controlled and non-age controlled results as there is no significant relationship between age and degree of sedentarization. SD stands for standard deviation; SEM: standard error of the mean, $n = 117$.

Fertility, mortality and survivorship figures by individual mobility

		Actual rates			**Age controlled residuals**		
Measures	**Condition**	**Mean**	**SD**	**SEM**	**Mean**	**SD**	**SEM**
Fertility	Nomad	4.381	2.889	0.63	-0.408	2.09	0.456
	Mobile in settled camp	3.185	3.026	0.582	-0.998	2.129	0.41
	Settled	5.246	3.296	0.397	0.515	2.535	0.305
Mortality	Nomad	0.571	0.978	0.213	-0.275	1.127	0.246
	Mobile in settled camp	0.727	0.883	0.188	-0.04	0.649	0.138
	Settled	0.926	1.331	0.161	0.098	1.108	0.134
RS	Nomad	3.81	2.562	0.559	-0.304	1.69	0.369
	Mobile in settled camp	3.182	2.343	0.5	-0.729	1.842	0.393
	Settled	4.397	2.632	0.319	0.33	2.242	0.272

Table S7: Fertility, mortality and survivorship to age 16 figures averaged by maternal foraging. A residual 0 is the average rate (i.e. fertility, mortality or survivorship) of any given age group. Thus, a positive residual is above average, while a negative residual is below average fertility, mortality or survivorship of that age group. Fertility here includes all live births; mortality represents all reported deaths of offspring who were born alive. This data is presented visually in Figure 2b. We have not provide the non-age controlled figures here as there is a significant age-bias in proportion of time spent foraging which distorts the result when not controlled for. SD stands for standard deviation; SEM: standard error of the mean, $n = 117$.

Fertility, mortality and RS figures by maternal foraging

Measure	Foraging	Mean	SD	SEM
Fertility	Low	0.231	1.882	0.204
	High	-0.850	1.763	0.532
Mortality	Low	0.048	1.010	0.112
	High	-0.307	0.938	0.283
RS	Low	0.044	1.630	0.180
	High	-0.737	1.809	0.545

Multi-level model result tables

All predictive variables are reported, '-' refers to when variables were removed due to multicollinearity and are contained in the other model. The 'camp variable' included in the model was based on best AIC scores in single level regressions to choose between the binary measure of 'settled' or 'mobile', the housing measure (temporary, semi-permanent and permanent housing), and the continuous variable of 'out-of-camp mobility'. The demographic, BMI and eosinophils models are all continuous multilevel models and lymphocytosis and neutrophilia models are logistic multilevel models, all with individual (level 1) and camp levels (level 2). Significant results are highlighted in bold, marginally significant results ($p < 0.1$) in italics. '*Ref*' refers to the baseline or comparison category, temporal housing. VPC stands for variance partition coefficients (see above) which represent the proportion of variance which each level accounts for. Variance explained is the percentage reduction in the variance at each of the levels compared to the intercept-only level with the inclusion of all fixed-effects into the model. In the logistic models explained variance is computed by establishing the variance of the predicted probability from the model and again allocating percentage variance explained at each level (the individual, the camp and the total variance explained, (31)).

Table S8: MLM results for fertility. *n* = 90, sample size reduced from 117 due to missing data.

		Foraging Model			Settlement Model		
Variable group	**Variable**	**β**	**SE**	**p**	**β**	**SE**	**p**
-	Intercept	-0.893	0.700	0.202	-1.346	0.723	0.063
Household variables	Settled household	-	-	-	**0.934**	**0.441**	**0.034**
	High forager	**-1.399**	**0.680**	**0.040**	-	-	-
	Household belongings	0.234	0.174	0.177	**0.463**	**0.164**	**0.005**
Camp variables	Temporary housing	*ref*	*ref*	*ref*	*ref*	*ref*	*ref*
	Semi-permanent housing	0.087	0.554	0.874	-0.280	0.556	0.614
	Permanent housing	-0.240	0.530	0.650	-0.653	0.547	0.232
-	Model AIC		358.4			386.7	
	Camp VPC		0			0	
	Individual VPC		1			1	
	Camp variance reduction		0.00%			0.00%	
	Individual variance reduction		12.20%			11.70%	

Table S9: MLM results for childhood mortality (under 16 years), *n* = 90

		Foraging Model			Settlement Model		
Variable group	**Variable**	**β**	**SE**	**p**	**β**	**SE**	**p**
-	Intercept	-0.411	0.329	0.212	-0.277	0.371	0.456
Household variables	Settled household	-	-	-	-0.170	0.214	0.42487
	High forager	0.098	0.322	0.761	-	-	-
	Age-specific fertility	**0.191**	**0.044**	**<0.0001**	**0.197**	**0.042**	**<0.0001**
	Household belongings	0.034	0.081	0.672	-0.024	0.083	0.770
Camp variables	Temporary housing	*ref*	*ref*	*ref*	*ref*	*ref*	*ref*
	Semi-permanent housing	*0.492*	*0.284*	*0.083*	*0.604*	*0.362*	*0.096*
	Permanent housing	**0.727**	**0.259**	**0.005**	**0.627**	**0.313**	**0.045**
-	Model AIC		229.9			251.3	
	Camp VPC		0.021			0.081	
	Individual VPC		0.979			0.919	
	Camp variance reduction		86.54%			44.40%	
	Individual variance reduction		21.02%			21.34%	

Table S10: MLM results for reproductive success (survivorship to 16 years), *n* = 90.

		Foraging Model			Settlement Model		
Variable group	**Variable**	**β**	**SE**	**p**	**β**	**SE**	**p**
-	Intercept	-0.136	0.599	0.820	-0.600	0.631	0.342
Household variables	Settled household	-	-	-	**0.824**	**0.385**	**0.032**
	High forager	**-1.151**	**0.581**	**0.048**	-	-	-
	Household belongings	0.099	0.149	0.505	**0.335**	**0.144**	**0.020**
Camp variables	Temporary housing	*ref*	*ref*	*ref*	*ref*	*ref*	*ref*
	Semi-permanent housing	-0.367	0.473	0.438	-0.711	0.485	0.143
	Permanent housing	**-1.010**	**0.453**	**0.026**	**-1.233**	**0.478**	**0.010**
-	Model AIC		332.4			362.3	
	Camp VPC		0			0	
	Individual VPC		1			1	
	Camp variance reduction		0.00%			0.00%	
	Individual variance reduction		12.76%			11.25%	

Table S11: Continuous MLM results for eosinophil concentrations. *n* = 293

		Foraging Model			Settlement Model		
Variable group	**Variable**	**β**	**SE**	***p***	**β**	**SE**	***p***
-	Intercept	0.541	0.237	0.022	0.620	0.259	0.017
Individual variable	Age	**-0.012**	**0.003**	**< 0.0001**	**-0.009**	**0.003**	**0.003**
	Sex	*-0.207*	*0.112*	*0.063*	**-0.241**	**0.110**	**0.029**
	Mean relatedness	0.645	0.951	0.497	0.905	0.974	0.353
Household variables	Settled Household	-	-	-	0.027	0.139	0.845
	High forager	0.053	0.214	0.805	-	-	-
	Dependents	0.049	0.031	0.107	0.035	0.031	0.257
	Household belongings	-0.025	0.053	0.638	-0.036	0.054	0.498
Camp variables	Temporary housing	*ref*	*ref*	*ref*	*ref*	*ref*	*ref*
	Semi-permanent housing	**0.525**	**0.181**	**0.004**	**0.435**	**0.194**	**0.025**
	Permanent housing	**0.448**	**0.166**	**0.007**	**0.371**	**0.180**	**0.039**
-	Model AIC		792.7			818.4	
	Camp VPC		0.007			0.015	
	Individual VPC		0.993			0.985	
	Camp variance reduction		57.73%			5.30%	
	Individual variance reduction		22.92%			21.17%	

Table S12: Logistic MLM results for Neutrophilia. n = 293

		Foraging Model				Settlement Model			
Variable group	**Variable**	***β***	**SE**	**OR**	**p**	***β***	**SE**	**OR**	**p**
-	Intercept	-2.600	1.000	0.242	0.001	-1.948	1.139	0.143	0.087
Individual variable	Age	-0.274	0.319	0.983	0.327	-0.008	0.014	0.992	0.588
	Sex	-0.243	0.569	0.784	0.669	-0.441	0.555	0.644	0.428
	Mean relatedness	-7.729	5.700	0.000	0.175	-7.679	5.806	0.000	0.186
Household variables	Settled household	-	-		-	1.275	0.713	3.578	0.074
	High forager	1.136	0.707	3.995	0.108	-	-	-	-
	Dependents	-0.165	0.159	0.848	0.301	-0.254	0.154	0.776	0.098
	Household belongings	-0.106	0.349	0.900	0.762	-0.024	0.323	0.976	0.941
Camp variables	Permanent Camp	*-1.266*	*0.695*	*0.216*	*0.068*	**-1.785**	**0.693**	**0.168**	**0.010**
-	Model AIC		133.8				136.4		
	Model residual		0.723				0.678		
	Explained from null		0.277				0.322		

Table S13: Logistic MLM results for Lymphocytosis. n = 293

		Foraging Model			Settlement Model		
Variable group	**Variable**	***β***	**OR**	**p**	***β***	**OR**	**p**
-	Intercept	-3.315	0.036	<0.0001	-3.656	0.026	<0.0001
Individual variable	Age	**0.017**	**1.018**	**0.034**	**0.010**	**1.010**	**0.020**
	Sex	0.036	1.037	0.897	0.117	1.124	0.674
	Mean relatedness	-1.180	0.307	0.683	-2.270	0.103	0.455
Household variables	Settled household	-	-	-	-0.152	0.859	0.699
	High forager	**-1.420**	**0.242**	**0.045**	-	-	-
	Dependents	0.067	1.070	0.368	0.118	1.126	0.122
	Household belongings	-0.063	0.939	0.622	0.023	1.024	0.882
Camp variables	Out-of-camp mobility	**1.871**	**6.496**	**0.019**	**2.194**	**8.967**	**0.030**
-	Model AIC		340.3			351.5	
	Model residual		0.754			0.763	
	Explained from null		0.246			0.212	

Table S14: Continuous MLM results for maternal BMI. $n = 57$

		Foraging Model			Settlement Model		
Variable group	**Variable**	**β**	**SE**	**p**	**β**	**SE**	**p**
-	Intercept	18.452	1.151	<0.0001	18.577	1.105	<0.0001
Individual variable	Age	-0.008	0.020	0.680	-0.027	0.018	0.138
Household variables	Settled household	-	-	-	**1.733**	**0.606**	**0.004**
	High forager	*-1.513*	*0.877*	*0.084*	-	-	-
	Household belongings	*0.429*	*0.239*	*0.072*	**0.500**	**0.225**	**0.026**
Camp variables	Temporary housing	*ref*	*ref*	*ref*	*ref*	*ref*	*ref*
	Semi-permanent housing	0.273	0.713	0.702	-0.375	0.697	0.591
	Permanent housing	-0.005	0.714	0.994	-0.672	0.714	0.347
Health variables	Anaemia	0.645	0.552	0.242	0.168	0.555	0.763
	Neutrophilia	-0.228	0.167	0.171	-0.283	0.162	0.080
	Eosinophilia	-0.183	0.185	0.324	-0.104	0.179	0.562
	Lymphocytosis	0.042	0.059	0.472	0.025	0.057	0.666
-	Model AIC		256.1			251.3	
	Camp VPC		0.000			0.000	
	Individual VPC		1.000			1.000	
	Camp variance reduction		100.00%			100.00%	
	Individual variance reduction		18.70%			25.17%	

SI References

1. Rai NK (1990) *Living in a lean-to: Philippine Negrito foragers in transition* (University of Michigan, Ann Arbor).
2. Griffin PB, Griffin MB (1992) Fathers and Childcare among the Cagayan Agta. *Father-Child Relations: Cultural and Biosocial Contexts*, ed Hewlett BS (Transaction Publishers, New Brunswick), pp 297–320.
3. Bion GP, B.Griffin M (1997) Agta Foragers: Alternative histories, and cultural autonomy in. *Aust J Anthropol* 8:259.
4. Early JD, Headland TN (1998) *Population Dynamics of a Philippine Rain Forest People: The San Ildefonso Agta* (University Press of Florida, Gainesville).
5. Headland TN (1989) Population Decline in a Philippine Negrito Hunter-Gatherer Society. *Am J Hum Biol* 1(1):59–72.
6. Dyble M, et al. (2015) Sex equality can explain the unique social structure of hunter-gatherer bands. *Science* 348(6236):796–798.
7. Griffin BM (2012) The Cultural Identity of Foragers and the Agta of Palanan, Isabela the Philippines. *Anthropos* 91(1996):111–123.
8. Minter T (2010) The Agta of the Northern Sierra Madre: Livelihood strategies and resilience among Philippine hunter-gatherers. Dissertation (Leiden University).
9. Peterson JT (1978) *The Ecology of Social Boundaries: Agta Foragers of the Philippines* (University of Illinois Press, London).
10. Estioko-Griffin AA, Griffin PB (1981) The beginning of cultivation among Agta hunter-gatherers in Northeast Luzon. *Adaptive Strategies and Change in Philippine Swidden-Based Societies*, ed Olofsen H (Forest Research Institute, Laguna), pp 55–72.

11. Griffin PB (1985) A contemporary view of the shift from hunting to horticulture. *Recent Advances in Indo-Pacific Prehistory*, eds Misra VN, Bellwood P (Oxford IBH Publishing, New Delhi), pp 349–352.
12. Headland TN, et al. (1989) Hunter-Gatherers and Thier Neighbors from Prehistory to the Present. *Curr Anthropol* 30(1):43–66.
13. Headland TN (1984) Agta Negritos of the Philippines. *Cult Surv Q* 8(3):29–31.
14. Team RC (2012) R: A language and environment for statistical computing. Available at: http://www.r-project.org/.
15. Bethony J, et al. (2006) Soil-transmitted helminth infections: ascariasis, trichuriasis, and hookworm. *Lancet* 367(9521):1521–1532.
16. Dounias E, Froment a. (2011) From foraging to farming among present-day forest hunter-gatherers: consequences on diet and health. *Int For Rev* 13(3):294–304.
17. Van Blerkom LM (2003) Role of Viruses in Human Evolution. *Am J Phys Anthropol* 122(SUPPL. 46):14–46.
18. Morris SS, et al. (1999) Precision, accuracy, and reliability of hemoglobin assessment with use of capillary blood. *Am J Clin Nutr* 69(6):1243–1248.
19. Greer PJ, et al. (2013) *Wintrobes Clinical Hemaology* (Lippincott Williams & Wilkins, Philadelphia). Thirteenth edition.
20. Beck N (2008) *Diagnostic Hematology* (Springer, London).
21. van Assendelft OW (2002) Calibration, control of hematology analyzers. *Adv Adm Lab* 11(2):43–47.
22. Mitaishvili R (2010) *The Human Blood: Composition, Typing, Lab Test Interpretation* (RM Global Health, Glendale, CA).
23. Wahed A, Dasgupta A (2015) *Hematology and Coagulations: A Comprehensive Review for Board Preparation, Certification and Clinical Practice.* (Elsevier, London).
24. Bentley S, Johnson A, Bishop C (1993) A parallel evaluation of four automated hematology analyzers. *Am J Clin Pathol* 100:626–632.
25. Hayden B (1995) A new overview of domestication. *Last Hunters-First Farmers*, eds Price D, Gebauer AB (School of American Research Press, Santa Fe), pp 215–242.
26. Bar-Yosef O, Meadow RH (1995) The origins of argiculture in the near east. *Last Hunters-First Farmers*, eds Price D, Gebauer AB (School of American Research Press, Santa Fe), pp 39–94.
27. Piperno D, Pearsall DM (1998) *The origins of agriculture in the Lowland Neotropics* (Academic Press, London).
28. Price DT, Gebauer AB (1995) New perspectives on the transition to agriculture. *Last Hunters-First Farmers*, eds Price DT, Gebauer AB (School of American Research Press, Santa Fe), pp 3–20.
29. Koster J, Leckie G, Miller A, Hames R (2015) Multilevel modeling analysis of dyadic network data with an application to Ye'kwana food sharing. *Am J Phys Anthropol* 157(3):507–512.
30. Zuur AF, Ieno EN, Elphick CS (2010) A protocol for data exploration to avoid common statistical problems. *Methods Ecol Evol* 1(1):3–14.
31. Snijders TAB, Bosker RJ (2012) *Multilevel Analysis: An Introduction to Basic and Advanced Multilevel Modeling* (Sage, London). 2nd Ed.