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ABSTRACTS

Presenting authors are listed by last name in alphabetical order; sessions are indicated in bold at the top of abstract. The poster session (PST) is on Wednesday, March 24, 2022, 8 a.m. to 11 a.m. The Plenary Session is from 1:00 p.m. to 4:45 p.m. on Wednesday, March 24, 2022; the Raymond Pearl Memorial Lecture is Tuesday at 5:00 p.m. Contributed Podium presentations (Podium A, B, C, D) are on Thursday, March 25, 2022. Human Biology in Place podium (HBP) is 8:30 a.m. to 10:00 a.m. and the Human Biology in Place poster session (HBP/PST) is on Friday, 10:30-11:30 a.m.

PST 64 Effect of modernization on serum c-reactive protein in healthy Chamoru

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This research examines the effect of modernization on serum c-reactive protein (CRP) levels in males and females living in post-WWII Guam. After WWII, northern Guam developed rapidly (e.g., hotels, paved roads, imported foods and a cash economy), while the southern half of the island retained a traditional subsistence economy, thatched-roof housing and unpaved dirt roads. Sera collected from healthy Guamanian CHamoru males and females by NIH researchers between 1950 and 1990 were evaluated for CRP (N:70). The analysis of the relationship between location (north and south) and CRP level, using a Mann Whitney U Test, yielded a z-score of -.58 and a p-value of .56. Additionally, age (under 50 years and over 50 years) and CRP yielded a z-score of -.02 and a p-value of .98; sex and CRP yielded a z-score of -.27 and a p-value of .79.

According to this study, modernization did not significantly affect baseline serum CRP levels in healthy Guamanians.

Podium A | The effects of milk cortisol on immune responses to in vitro bacterial stimulation

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Lactation, and by extension mammalian milk, may have initially evolved as a means to deliver immune components to offspring to protect against pathogens. These immune components (e.g. cytokines) comprise the milk immune system, and are capable of mounting immune responses in the infant gut and coordinating with the infant immune system. Human milk also contains the stress hormone cortisol, which can function in signaling pathways. We explored associations between milk cortisol (0.098-1.007 ug/dL) and in vitro pro-inflammatory responses to bacterial stimuli among 29 mothers from upstate New York (ages 21-40 years). Milk in vitro responses were characterized as the increase in proinflammatory cytokine interleukin-6 (IL-6) after 24h incubation with bacterial stimuli. Greater IL-6 responses to Salmonella enterica are associated with lower infant infectious disease risk. In ordered logistic regression, controlling for child age, milk cortisol was positively associated with IL-6 responses to S. enterica (B:3.896; 95% CI:0.109,

7.682) and Bifidobacterium breve (B:3.680; 95% CI:-0.214, 7.574). IL-6 responses to Lactobacillus acidophilus (B:2.904; 95% CI:-1.662, 7.469) and Escherichia coli (B:2.206; 95% CI:-1.677, 6.089) were unassociated with milk cortisol, suggesting positive associations between milk cortisol and pro-inflammatory responses are strongest for pathogenic rather than innocuous bacteria. Life history theory suggests tradeoffs in the allocation of energy and other resources between growth and immunity; cortisol may function in mediating these tradeoffs. Understanding how milk cortisol may connect maternal stress with the milk immune system, and thus infant infectious disease risk and immune system development, will be important in future maternalchild health and lactation research.

Podium A | Maternal childhood trauma is associated with fatty acids composition of breast milk

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Studies show that maternal early life trauma affects offspring body size during postnatal period. Pathways and mechanisms of these developmental adjustments are poorly understood.

Recently we demonstrated that maternal stress assessed as significant life events can modify breast milk fat composition.

Here we propose that maternal traumatic stress affects breast milk composition, which in turn may program infant growth. Thus, our study investigates the association between maternal childhood trauma intensity and breast milk macronutrients composition.

The study group included 103 Polish healthy, exclusively breastfeeding women, mothers of 58 boys and 45 girls, followed from the 5th month of life. Mothers filled in the Early Life Stress Questionnaire to determine maternal trauma level during childhood. Milk macronutrients and fatty acid profile were measured using mid-infrared transmission spectroscopy (MIRIS) and gas chromatography. Statistical methods included analysis of covariance (ANCOVA) to study the relationship between maternal trauma level and breast milk composition adjusting for cofounders such as infant sex, maternal BMI, and dietary intake.

Mothers with higher childhood trauma produced milk with a lower level of medium-chain ($\eta 2=0.06$; $p=0.01$) and a higher level of polyunsaturated fatty acids ($\eta 2=0.04$; $p=0.04$) when compared to mothers with lower trauma level. Neither maternal salivary cortisol ($p=0.32$) nor milk cortisol ($p=0.31$) was related to trauma level. These results indicate that childhood trauma may alter maternal physiology and breast milk production. Altered milk lipid profiles might be a factor responsible for different infant growth trajectories in infant of mothers with high childhood trauma.

PST 73 | Aging and immune function outside Western populations: An exploratory analysis among a sample of older women in Cebu, Philippines

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Previous research has documented alterations to immune function during aging that are thought to increase morbidity and mortality risk from both non-communicable and infectious diseases. These changes include an increase in chronic systemic inflammation, often called "inflammaging", and impaired immune responses when challenged, often called immunosenescence. However, previous studies have primarily focused on research settings with low levels of infectious disease and high rates of overweight/obesity, and it is unclear if similar aging tends are found across diverse populations. A few studies measuring C-reactive protein (CRP), a marker of chronic systemic inflammation, in higher infectious disease environments have reported less pronounced increases with age, although more research is needed including longitudinal follow-ups and measures of immune responses to challenge. Relying on a sample of women in the Philippines (n=914) as part of the Cebu Longitudinal Health and Nutrition Survey (CLHNS), we assessed (1) longitudinal changes in CRP over a 7-year period from 2005-2012, and (2) acute CRP response to an influenza vaccine in 2012. In 2005, the mean age of the sample was 47.89 years (range: 35-69), with a median CRP of 0.70 mg/L. In 2012, median CRP was 0.69 mg/L, while the median longitudinal change in CRP from 2005-2012 was 0.0005 mg/L, consistent with attenuated inflammaging. There was a non-linear, threshold association between age and CRP response in 2012, in which older age was only associated with lower CRP response beyond 63 years. These findings contribute to understandings of variation in immune function and health in later life.

PST 54 | COVID-19 and the changing perceptions of home birth in the Midwestern U.S.

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The COVID-19 pandemic has brought many changes to U.S. healthcare spaces. One example is a significant increase in interest in birthing at home rather than in the hospital due to restrictive pandemic-related hospital policies. The purpose of this research is to examine how cultural perceptions concerning birth safety and setting have changed due to the pandemic, and asks the following questions: has COVID-19 affected pregnant people's perceptions of perinatal risk in the Midwestern United States? Furthermore, has COVID-19 changed the way that pregnant people and birth workers perceive the safety of home birth in the Midwestern U.S.? To answer these questions, virtual interviews were conducted with birthing people, doulas, and midwives who participated in and/or attended a home birth in the Midwestern U.S. during the COVID-19 pandemic (n=28; March 2020-present). Preliminary results suggest that the most common reasons for transferring antepartum care from the hospital to the home were: 1) fear of giving birth alone without a partner or trusted doula present, 2) fear of catching COVID-19 in the hospital, and/or 3) fear of being separated from the newborn should the birth parent test positive for COVID-19 at the hospital. Though the majority of U.S. births occurred in hospitals during the COVID-19 pandemic, the pandemic provided motivation for some parents to seek

alternative birth choices. This suggests that, while home birth is still not widely accepted in the Midwestern US, cultural knowledge and acceptance about options for place of birth is expanding.

PST 81 | Cravings during pregnancy in pregnant women residing in Merida, Mexico. Nutritional characteristics and their associations with maternal and pregnancy traits

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Aim To describe nutritional characteristics of cravings consumed by a sample of pregnant women from Yucatan, Mexico, and analyze their association with maternal and pregnancy traits.

Methods During September-December 2019, we applied a prenatal questionnaire and three 24-hour dietary recalls to 83 pregnant women (mean age: 27.6 years) resident in Merida, Yucatan. Women were asked about cravings consumed during the three days surveyed. We analyze how the total number of cravings consumed during the three days and their average energy content differ according to the trimester of pregnancy, number of previous offspring and tertiles of pre-pregnancy BMI.

Results We found an important variation in the number of cravings consumed during the days surveyed and their energy content. The number of cravings consumed per day ranged from 0 to 9 with (median=1, IR=0-2). The energy content of cravings ranged from 0 to 1368 kcal (median=105 kcal, IR=46-201). The total number of cravings and their average energy content were similar across the trimesters of pregnancy and number of previous offspring. The energy content of cravings consumed by women in the lowest tertile of pre-pregnancy BMI (median=174 kcal, IR=116- 259) was significantly greater than cravings consumed by women in the middle (median=109 kcal, IR=46-217) and highest (median=105 kcal, IR=62-152) tertiles, and it seem that these results could not be explained by the consumption of a greater number of cravings.

Conclusion Women that began their pregnancy with lower BMI tend to consume more energetically dense cravings that women higher values of pre-pregnancy BMI.

PST 72 | Percentage body fat and somatotype of adult non-elite judokas in Merida, Mexico: A comparison with data from other countries

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Objectives: To evaluate percentage body fat and somatotype of young adult non-elite judokas from Merida, Mexico and compare the results with that reported from athletes of other countries.

Methods: The study selected 20- to 25-year-old non-elite judoists (25 males, 16 females). Measurements of height, weight, circumferences (flexed and relaxed mid-upper arm, calf), skinfolds (biceps, triceps, subscapular, iliac crest, supraspinale, medial calf), and breadths (humerus, femur) were recorded. Derived parameters were heightto-weight ratio, body mass index (BMI), body fat (%), and somatotype.

Results: Mean value of age was not different in male (23.30 years) and female athletes (22.72 years). Male judokas were taller, had higher mean BMI, circumferences, breadths, and lower body fat in comparison with the values recorded among females. Male judokas had balanced mesomorph (2.46-5.24-2.57) and females had endomorphic mesomorph (3.39-4.92-2.57) somatotypes.

Conclusion: Body fat and somatotypes of judokas from Merida had similarities with that reported from non-elite judokas of other countries.

HBP/PST 3 | Intrauterine growth retardation and geographical altitude in Jujuy, Argentina (1991-2014)

Retardo del crecimiento intrauterino y altura geografica en Jujuy (1991-2014)

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The size of a newborn as a result of growth from conception to delivery, depends on the duration of gestation and the speed of fetal growth. It is conditioned by several factors, among them, the geographical height is quite relevant. Small-for-gestational age (SGA) reflect intrauterine growth retardation, are at high risk of neonatal morbidity and mortality, and have long-term negative health consequences. We analyzed the prevalence of SGA and its relationship with

geographical altitude in Jujuy between 1991 and 2014. We included 308,469 live newborn, excluding records without weight, sex and gestational age data, those of multiple pregnancies or with a place of residence outside the province. We estimated the prevalence of PEG (Gestational Weight/Age <P10 and <P3) according to the INTERGROWTH-21st standard for highlands (HL≥2000 masl) and lowlands (LL<2000 masl), grouped into 3 periods (1991-2000; 2001-2008 and 2009-2014) and we performed comparison tests of proportions. 13.7% of births were registered in the HL with an average prevalence of SGA of 11.3% (<P10) and 3.6% (P<3), and 6.3% and 3.1% respectively for lowlands. The observed differences between highlands and lowlands were statistically significant in the 3 periods with a significant decrease in the prevalence of SGA in recent decades in Jujuy. The observed spatial heterogeneity reflects the influence of altitude---------- on this indicator of intrauterine growth retardation and guides the generation and implementation of differential socio-health policies.

El tamaño que tiene un recién nacido (RN) como resultado del crecimiento ocurrido desde su concepcion hasta el parto depende de la duracion de la gestacion y de la velocidad de crecimiento fetal. Esta condicionado por diversos factores, entre ellos, la altura geografica res- ulta muy relevante. Los pequeños para la edad gestacional (PEG) reflejan retardo de crecimiento intrauterino, presentan riesgo elevado de morbimortalidad neonatal y consecuencias negativas para la salud a largo plazo. Se analizo la prevalencia de PEG y su relacion con la altura geografica en Jujuy entre 1991 y 2014. Se incluyeron 308469 RN vivos, excluyendo los registros sin datos de peso, sexo y edad gestacional, los de embarazos múltiples o con lugar de residencia fuera de la provincia. Se estimaron prevalencias de PEG (Peso/Edad Gestacional <P10 y <P3) según el estandar INTERGROWTH-21st para tierras altas (TA≥2000 msnm) y tierras bajas (TB<2000 msnm), agrupados en 3 períodos (1991-2000; 2001-2008 y 2009-2014) y se realizaron test de comparacion de proporciones. El 13,7% de los nacimientos se registraron en las TA con una prevalencia promedio de PEG de 11,3% (<P10) y 3,6% (P<3), y 6,3% y 3,1% respectivamente para TB. Las diferencias observadas entre TA y TB fueron estadísticamente significativas en los 3 períodos con una disminucion significativa de la prevalencia de PEG en las últimas décadas en Jujuy. La heterogeneidad espacial observada, refleja la influencia de la altura sobre este indicador del retraso del crecimiento intrauterino y orienta la generacion e implementacion de políticas sociosanitarias diferenciale.

PST 8 | Examining the impact of societal changes during the COVID-19 pandemic on children′s dietary intake, physical activity, screen time and sleep duration in the United States

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Introduction and Objectives: Preventing transmission of the SARS-CoV-2 virus has required extraordinary protective measures that could contribute to changes in children′s obesity-related behaviors. The objectives were to examine: (1) changes in children′s obesity-related behaviors that are occurring in tandem with societal changes related to COVID-19 and (2) parent perceptions of how the pandemic influenced their child′s behaviors. Methods: Participants were children ages 4-12 years (n=375) and their mothers in California, Colorado, New

Hampshire and South Dakota. Data were collected at 2 timepoints: pre-pandemic (August 2019-March 2020) and during the pandemic (January 2021-June 2021). Diet, activity, screen time and sleep were ascertained through questionnaires, and accelerometers in a subsample. Parent perceptions were assessed using qualitative interviews (n=38). Data were analyzed using multivariate general linear mixed models, and content analysis for the interviews.

Results: For physical activity, the magnitude of change of was greater for children with lower pre-pandemic activity levels (β=-0.65; 95%CI -0.77, -0.54). For screen time, the magnitude of change was greater among older children (β=0.38; 95%CI 0.17, 0.60) and Hispanic (β=2.05; 95%CI 0.58, 3.52) and non-Hispanic Black (β=4.24; 95%CI 1.86, 6.64) children, after adjustment for other demographic characteristics. Qualitative data indicated that changes in parent employment, remote schooling, social isolation, new mealtime routines, shuttered community resources, and altered access to food assistance programs contributed to changes in behaviors.

Conclusions: Societal changes during the COVID-19 pandemic may have implications for children′s obesityrelated behaviors. Future research can identify whether and how the pandemic may have exacerbated health disparities among US children.

PST 42 | Changing risk factors for breast cancer among Bangladeshi migrants in the UK: A life course approach based on three studies over two decades

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Migrant studies can serve as natural experimental models to assess the impact of diverse environments on human plasticity. Such studies have helped to illuminate intergenerational trends in health outcomes and the effects of biosocial practices on disease risk. Here, we use data collected over two decades among firstand second-generation Bangladeshi women living in London, UK, their neighbors of European descent and sedentees in Sylhet, Bangladesh, to illustrate how epidemiological risk factors for breast cancer are changing across migrant generations, age cohorts and populations. Specifically, we collected detailed information on individual reproductive and lifestyle histories at different times in the life course to investigate trends in established reproductive and non-reproductive (energetic and dietary) risk factors. Factors included recalled age at menarche, age at first birth, parity, length of breastfeeding, median age at menopause, estradiol and progesterone levels, BMI, waist circumference, height, daily physical activity, dietary patterns, alcohol intake, and tobacco use. Descriptive comparisons for these factors were made between three age groups: 5-16 years (n=488), 19-39 years (n=248), and 35-59 years (n=541), and between migrant categories within groups. The results illustrated various intergenerational trends that reflect changing breast cancer risk. For example, age at menarche occurred earlier among more recent age cohorts. We used an early life developmental framework and a lifespan perspective to interpret and contextualize findings in light of ethnographic observations about sociocultural changes experienced by these communities over the period studied, and their relationship to lifetime breast cancer risk.

HBP/PST 8 | Infant malnutrition and living conditions in Bolivian migrant families residing in the peri-urban of La Plata city (Buenos Aires, Argentina) Desnutricion infantil y condiciones de vida en familias bolivianas migrantes residentes en el peri-urbano de la ciudad de la Plata (Buenos Aries, Argentina)

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For decades, Argentina has been a preferred destination for Bolivian immigrant families seeking to improve their living conditions, having to adapt to the new environment, among which are the possibilities of access to food. It is known that food consumption reflects the place of individuals in a given society. Thereby, food is understood as an indicator of the living conditions and nutritional status of children an empirical reference of them. Objectives: 1) to characterize the nutritional status of children living in the peri-urban of the city of La Plata (Buenos Aires, Argentina) together with socio-economic and environmental family information (SEFI); and 2) to conduct a comparative analysis between native and migrant families in order to visualize possible inequalities. M&M: Anthropometric techniques were applied to obtain weight and height data that were contrasted with WHO reference and structured surveys were conducted to obtain SEFI. The sample was made up of 465 children between 3.0 and 6.9 years; 64.3% were native families and 35.7% were immigrant families.

Results: 53.5% of the total sample had malnutrition: 6.2% undernutrition (mainly chronic type) and 48.9% excess of weight (32.3% overweight; 16.6% obesity). Comparative analysis showed that migrant children suffered more excess weight (56.0% vs. 44.8%; p=0.021) and were in situations of greater social vulnerability than their native neighbors.

Conclusions: It is essential to implement joint actions by public sectors aimed at improving living conditions and combating child malnutrition in this population, paying particular attention to the needs of immigrant families.

Durante décadas, Argentina ha sido un destino preferido por las familias inmigrantes bolivianas que buscan mejorar sus condiciones de vida, teniendo que adaptarse al nuevo entorno, entre los que se encuentran las posibilidades de

acceso a los alimentos. Se sabe que el consumo de alimentos refleja el lugar de los individuos en una sociedad determinada. De este modo, la alimentacion se entiende como un indicador de las condiciones de vida y estado nutricional de los/las niños/as y una referencia empírica de las mismas. Objetivos: 1) caracterizar el estado nutricional de los niños y niñas que viven en el periurbano de la ciudad de La Plata (Buenos Aires, Argentina) junto con informacion socioeconomica y ambiental familiar (SEFI); y 2) realizar un analisis comparativo entre familias nativas y migrantes para visualizar posibles desigualdades. Se aplicaron técnicas antropométricas para obtener datos de peso y talla contrastados con la referencia de la OMS y se realizaron encuestas estructuradas para obtener SEFI. La muestra estuvo conformada por 465 niños entre 3,0 y 6,9 años; El 64,3% eran familias nativas y el 35,7% eran familias inmigrantes. Resultados: 53,5% de la muestra total tenía desnutricion: 6,2% desnutricion (principalmente tipo cronico) y 48,9% exceso de peso (32,3% sobrepeso; 16,6% obesidad). El analisis comparativo mostro que los niños migrantes sufrieron mas exceso de peso (56.0% vs. 44.8%; p =0.021) y se encontraban en situaciones de mayor vulnerabilidad social que sus vecinos nativos. Conclusiones: Es imprescindible implementar acciones conjuntas de los sectores públicos dirigidas a mejorar las condiciones de vida y combatir la desnutricion infantil en esta poblacion, prestando especial atencion a las necesidades de las familias inmigrantes.

PST 58 | Does early breastfeeding behavior explain bimodality in the distribution of postpartum amenorrhea?

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In some traditional societies, a strong bimodal pattern of postpartum amenorrhea (PPA) duration has been observed in breastfeeding women. The behavioral or physiological mechanisms leading to this pattern are unclear. We investigate the relationship between early breastfeeding behavior and short duration (3 months) or long duration (15 months) PPA in a sample of rural Bangladeshi women. Data came from a prospective study in which the time to initiation of breastfeeding and the duration and frequency of breastfeeding were assessed by questionnaire within about a month of delivery. The duration of PPA was observed for up to 10 months following delivery. We identified six participants who experienced PPA for less than 3 months and 50 participants who experienced PPA for greater than 4 months. Our analysis found that the self-reported time to initiation of breastfeeding and number of breastfeeding episodes were not significantly different between the two groups. The self-reported duration of feeding episodes differed significantly between the two groups. Women who reported longer episodes per nursing episode at around 10 days postpartum experienced, on average, a significantly longer duration of PPA. This study suggests that the bimodal distribution of PPA arises, in part, from breastfeeding differences that arise shortly after parturition. Funding: NIH/NICHD R21 HD052081.

Podium C | Tolerance, hygiene, and the plasticity of human immune function

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The original hygiene hypothesis proposed that allergic disease might be linked to low levels of early life microbial exposure. Since then, the phrase "hygiene hypothesis" has been applied to numerous conditions, including, but not limited to, asthma, rheumatoid arthritis, diabetes, multiple sclerosis, systemic lupus erythematosus, inflammatory bowel disease, hay fever, food allergies, Alzheimer's disease, cardiovascular disease, autism, fibromyalgia, COVID19, and depression. The changes in "hygiene" linked to these diseases include numerous changes in lifestyle, including changes in microbial exposure, parasite infection, the use of antibiotics, alterations in the microbiome, and changes in birthing and breast feeding practices. Thus, many applications extend beyond the word "hygiene" as it is commonly understood. To this end, some have called for abandonment of the term or suggested alternate labels, e.g. the "old friends hypothesis". However, neither of these terms encompass the complexity of plasticity in immune response and host-parasite/commensal interactions that influence these conditions. Here, I reframe these hypotheses in terms of this complexity, with particular regard to the factors affecting immunological strategies and the development of tolerance towards microbes, parasites, and self-antigens. This balance between tolerance and resistance is central to both the development of auto-immune and inflammatory disorders, and the maintenance of commensal microbe communities, and is likely influenced by multi-generational patterns rather than simply early life exposures. Understanding the reaction norms underlying immunological plasticity suggests new avenues for research and intervention in disease, and may help prevent misunderstandings associated with the word "hygiene" in this context, e.g. those underlying anti-vaccination movements.

PST 62 | Building Understanding of Dietary

Diversity: Preliminary Results of the CLE Diet Project

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The CLE Diet Project is an opportunity for museum visitors to participate in research and learn about nutrition and the diversity of human diets (Study20191546, Study20191548). Adult visitors can participate by submitting a hair sample for dietary reconstruction with IRMS or submit images of their typical meals online. For both experiences, participants complete a dietary recall and survey on the primary factors affecting dietary choices. Carbon and nitrogen stable isotope analysis is used to reconstruct diets and the dietary surveys help us understand the accuracy of the reconstructions. Results from samples collected prior to the Covid-19 Pandemic shutdown (n = 28 hair samples; n = 43 photo submissions) are presented here. Stable isotope results indicate most individuals have an omnivorous diet as expected (ranges d13C -16.2‰ to -20.2‰, d15N 6.7‰ to 9.3‰). Three individuals were reconstructed as vegan/vegetarian and two individuals had C4 dependent diets. This is attributed to added sugar and processed foods. Most meal photos could easily be classified as healthy/balanced or as unhealthy. The unhealthy submissions were likely to be celebration or specialty foods. Participants indicated these images were not an indication of their typical diet. Only 24% of the sample felt their diet was not healthy. Participants were asked to list reasons for dietary dissatisfaction if any. The most common response was compromises from communal eating. It is expected that with a larger sample the current dietary diversity will be maintained, but that more evidence of a highly proceed diet with significant added sugar being consumed.

HBP/PST 4 | Tendencias de malnutricion en infantes y adolescentes jujeños, en el periodo 1997-2015

Trends in Jujeñan child and adolescent malnutrition during the 1997-2015 period

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Among the determinants of the nutritional status of populations, food security, demographic, epidemiological and nutritional transition, and life cycle are key. This study analyzed malnutrition trends in school age children and adolescents from Jujuy between 1997-2015. The data came from the School Health Program of San Salvador de Jujuy, capital of the province of Jujuy (Northwest Argentina). Of the total number of schoolchildren, 61,691 were 4-7 years old and 69,694 were between 10-14 years old. Low height (according to Size/Age), thinness, overweight and obesity (according to BMI/Age) were determined, considering the WHO cut-off points. We calculated the annual prevalence of each malnutrition situation by age group and the overall estimated annual percentage change (CPAE) in trends using a JoinPoint regression. The prevalence of malnutrition was higher in schoolchildren aged 10-14 years throughout the period. In children aged 4-7 years, no significant changes in thinness and overweight trends were observed. Low height showed a downward trend (CPAE=-3.2) and ascending obesity (CPAE=5.5), both significant. The same pattern was observed in the 10-14 age group with no significant variation in the global trend of thinness, descending for short stature (CPAE=-3.6) and ascending for overweight (CPAE=2) and obesity (CPAE=4.9). There is evidence of a greater impact of malnutrition in adolescents in relation to children, highlighting the need for policy interventions aimed at preventing malnutrition early in life.

Entre los determinantes de la situacion nutricional de las poblaciones, la seguridad alimentaria, la transicion demografica, epidemiol ogica y nutricional, y el ciclo de vida, resultan claves. Este estudio analizo las tendencias de malnutricion en infantes y adolescentes jujeños entre 1997-2015. Los datos provinieron del Programa de Salud Escolar de San Salvador de Jujuy, capital de la provincia de Jujuy (Noroeste Argentino). Del total de escolares, 61.691 tenían 4-7 años y 69.694 entre 10-14 años. Se determino baja talla (según Talla/Edad), delgadez, sobrepeso y obesidad (según IMC/Edad), considerando los puntos de corte de OMS. Se calculo la prevalencia anual de cada situacion de malnutricion por grupo de edad y el cambio porcentual anual estimado (CPAE) global en las

tendencias mediante una regresion JoinPoint. Las prevalencias de malnutricion fueron superiores en los escolares de 10-14 años en todo el periodo. En los niños de 4-7 años no se observaron cambios significativos en las tendencias de delgadez y de sobrepeso. La baja talla mostro tendencia descendente (CPAE=-3,2) y la obesidad ascendente (CPAE=5,5), ambas significativas. El mismo patron se observo en el grupo de 10-14 años sin variacion significativa en la tendencia global de delgadez, descendente para la baja talla (CPAE=-3,6) y ascendente para el sobrepeso (CPAE=2)

y obesidad (CPAE=4,9). Se evidencia un mayor impacto de la malnutricion en adolescentes en relacion con los niños, destacando la necesidad de intervenciones políticas dirigidas a prevenir la malnutricion desde etapas tempranas de la vida.

PST 9 | Disparities in breastfeeding duration are greatest among low-income infants of color in the US

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Breastmilk is the optimal food in the first 6 months, providing life course benefits. Due to structural racism and discrimination, Black and Hispanic infants, and those from low socioeconomic status (SES) households are most vulnerable to suboptimal breastfeeding. While associations between race/ethnicity and low-SES are hypothesized, they have not been demonstrated in a nationally representative sample. We analyzed the CDC′s 2019 National Immunization Survey-Child, using a sample of 27,990 children aged 19-35 months. Child race/ethnicity included Hispanic, non-Hispanic Black, non-Hispanic white, and non-Hispanic multi-race. SES was categorized as low-SES (≤12 years education), med-SES (>12 years, no college degree), or high-SES (>12 years, college degree). Linear regressions tested associations between race/ethnicity, SES, and their interaction with breastfeeding (BF) and exclusive breastfeeding (EBF) durations, adjusting for maternal age, marital status, WIC usage and first-born status. 86.4% of the sample breastfed. Mean durations were 290±193 days (BF) and 177±63 (EBF). Black (ß-30.94, SE 4.4) and Hispanic infants (ß -33.3, SE 2.9) BF for shorter durations ($p<0.001$). BF durations by SES were 244±196 (low), 268 ±195 (med), and 322±185 (high). Med-SES (ß24.5, SE 3.3) and high-SES (ß78.1, SE 2.9) BF longer ($p<0.001$). Multi-race high-SES infants BF longest (330±138), and low-SES white infants BF shortest (240±190; ß-69.3, SE 5.9), followed by low-SES Black infants (245±209; ß-50.9, SE 9.4; $p<0.001$). Multi-race low-SES infants EBF longest (180±70) followed by high-SES White infants (179±57). Results demonstrate an intersectional approach examining race/ethnicity and SES disparities together better indicates which infants are most at risk for suboptimal breastfeeding.

Podium B | Higher gravidity predicts lower hypertension risk in rural South Africa

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Cardiovascular disease is the leading cause of mortality throughout the world, and its prevalence is increasing rapidly throughout sub-Saharan Africa. Greater access to the prevention and treatment of infectious diseases in this region has also resulted in increased life expectancy and, in turn, susceptibility to various diseases of aging. At the same time, decreasing child mortality and increasing GDP, education, and family planning have driven recent declines in fertility throughout most of sub-Saharan Africa. Pregnancy results in changes to the cardiovascular system, lowering blood pressure via decreased vascular resistance. There is some evidence that these changes last after parturition and may therefore provide protection against hypertension, a strong predictor of CVD. Here, we examine how gravidity predicts blood pressure and hypertension risk in rural South African women (40-100 years old) using data collected in the Health and Aging in Africa study (HAALSI) based in the Mpumalanga province. Blood pressure readings were collected for 2372 women along with data on their demographics and health-related behaviors. Controlling for these other variables, linear mixed effect models found that higher gravidity predicted lower systolic ($t = -9.013$, 95% CI -0.01, -0.007) and diastolic ($t = -3.096$, 95% CI -0.005, -0.001) blood pressure, and a generalized linear mixed effect model found higher gravidity to predict lower risk of hypertension ($z = -4.892$, 95% CI -0.016, -0.007). These results suggest that increased reproductive effort may play a protective role against hypertension later in life, challenging the traditional life history perspective on the costs of reproduction.

PST 95 | Physical and mental health outcomes of displacement: Comparisons of mental health, hair cortisol, and non-communicable disease risk indicators due to displacement in Vanuatu

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Population displacement increasingly impacts people in low- and middle-income countries (LMICs). However, data on how displacement affects mental health and noncommunicable disease (NCD) risk in LMICs are limited. More studies on health outcomes associated with these events can inform both our understanding of the stress response and how people adapt to displacement in vulnerable communities. In 2017/2018, the entire population of one island (Ambae) of Vanuatu, an LMIC in the South Pacific, was evacuated due to volcanic activity. Some families eventually returned to Ambae, whereas others resettled on nearby islands, particularly Santo. We conducted surveys of mental health and NCD risk among adults on Ambae and Santo in June–August 2019. We collected questionnaire measures of mental health (n=494), blood pressure and anthropometric indicators of NCD risk (n>400), and hair cortisol, a biomarker of stress (n=228). We assessed relationships among these measures and variations by displacement characteristics. Results show high levels of hypertension in both settings (>40%), and suggest that each month spent away from Ambae was associated with slightly increased risk of hypertension (OR=1.06, p=0.020). Although distress was higher among women than men (p=0.003), hair cortisol was 18% higher among men than women (p=0.083). Hair cortisol was negatively associated with positive mental health scores among women (r=-0.189, p=0.023), but there were no correlations between distress and cortisol in the full sample (r=-0.007, p=0.923) or in sex-stratified analyses. These data demonstrate broad effects of displacement on physical and mental health indicators, and variability in outcomes that could guide intervention efforts.

PST 38 | Rural Embodiment and Child Health (REACH) Study: Macroparasite infection prevalence and associated immune responses among a preliminary sample of children from rural Mississippi

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Infections caused by protozoa and helminths (i.e., worms) are often grouped with certain bacterial/viral infections as Neglected Tropical Diseases because they receive little research attention despite having notable impacts on immune system development and health. This classification leads to the incorrect assumption that non-tropical highincome nations like the United States are unaffected by these macroparasitic infections. Surveys from the 1930s through 1980s, however, suggest that macroparasites were endemic in the Southern U.S. We hypothesize that macroparasitic infection may still be relatively common, and thus affecting health, in regions like the Mississippi Delta due to climate and inequities in infrastructure and resource access. The present study uses 18S rRNA gene amplification and sequencing to assess macroparasite infection status from stool samples provided by 24 children (6 months to 14 years) from rural Mississippi. Biomarkers of nutritional status (hemoglobin) and immune response (White Blood Cell Count [WBCC]; Immunoglobulin E; Creactive Protein; Fecal Calprotectin [FC]) were measured from finger-prick blood samples and stool samples. 10 (42%) children were infected with at least one parasite. Several types of helminths (platyhelminths [flatworms; n = 5]; nematodes [roundworms; n = 2]) and protozoa (n = 6) were detected. Bootstrapped ANOVA indicated associations between protozoal infection and higher WBCC ($p < 0.001$; Eta-squared = 0.54). Platyhelminth infection was associated with lower hemoglobin ($p = 0.07$; Etasquared = 0.17) and higher FC ($p = 0.05$; Etasquared = 0.20). These findings suggest that macroparasitic infections are still common in the U.S., with implications for immune function and child health.

Podium A | The variable role of PFASs on biological aging by sex and reproductive stage

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An Evolutionary Medicine Mismatch framework predicts that the effects of estrogenic endocrine disrupting chemicals, such as per- and polyfluoroalkyl substances (PFAS), on biological aging processes may differ by sex and reproductive stage. Within this framework, we predict that premenopausal women, postmenopausal women, and men will experience different biological aging dynamics with PFAS exposure depending on the degree of evolutionary mismatch with their endogenous estrogen levels. We tested these predictions using a subset of National Health and Nutrition Survey waves with available PFAS data from 2001 to 2018 (n = 14,728). Specifically, we investigated the association between PFAS exposure and three measures of biological aging (Levine′s Method (LM), Klemera-Doubal method (KDM), and allostatic load) by sex and, for women, menopausal status, controlling for relevant covariates. We

found that PFOA was the only PFAS consistently associated with biological aging using KDM and LM, and this effect was negative for all groups. The KDM indicated a stronger effect of PFOA for menopausal women (B = -1.04, p = 0.008) and men (B = -0.36, p = 0.001) than premenopausal women (not significant). For LM, the effect revealed a similar pattern. Additionally, PFOA was associated with decreased allostatic load among premenopausal and menopausal women, but the effect size was very small (B = -0.014 and -0.007, respectively). This research contributes to a nuanced model of the effect of PFAS exposure on biological aging processes, which could also inform predictions of the effects of other estrogenic chemicals on biological aging dynamics across the life course.

PST 55 | Coping with stress on a college campus during COVID-19: individual disposition, social support, and mental wellbeing among undergraduates

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COVID-19 has significantly impacted the educational experience of U.S. college students. As institutions transitioned to remote learning or adopted "hybrid learning" models, students navigated an unpredictable educational and social atmosphere, which posed challenges to personal health. Individual differences in areas such as personality dimensions and social support systems may interrelate with the way young adults responded to the pandemic in a university setting. Studying undergraduate students at the University of Notre Dame (n=41) during an in-person semester in Spring 2021, we assessed individual neuroticism (tendency to experience unstable, negative emotions), fear of COVID-19, self-compassion (via mindfulness), psychosocial stress, as well as perceived social support and loneliness. Undergraduates who scored higher for self-compassion's mindfulness component (i.e., approaching present circumstances with clarity and balance) reported lower levels of psychosocial stress and neuroticism (r's = -0.43, -0.59; p's<0.05). Students experiencing greater psychosocial stress reported more loneliness and lower perceived social support (r's = 0.31, -0.37; p's<0.05). Fear of COVID-19 was not meaningfully correlated with any of the measures. We collected participants' fingernail samples to measure cumulative cortisol production in prior months and will analyze this data in association with these psychosocial well-being measures. These cross-sectional results suggest that social support and aspects of individual disposition are important correlates of undergraduate mental wellbeing during the pandemic in this setting. Hence, an understanding of these factors may assist educational institutions in addressing the social and personal needs of their student population during times of unpredictable stress.

PST 88 | Icelandic women's perceptions of wellness vary by season but are not predicted by menstrual cycle hormonal variation

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Women's moods and perceptions of wellness may be affected by seasonal differences in sunlight and temperature, and/or by hormonal variation across the menstrual cycle. Previous studies of these factors have been limited by sparse sampling across the menstrual cycle and/or between seasons. This is to our knowledge the first study to test these hypotheses based on daily prospective selfreported mood/wellness data and concurrent hormonal measurements spanning a complete ovulatory cycle in each of summer and winter seasons. Data are from 32 healthy women in Reykjavik, Iceland, where the dramatic seasonal variation in photoperiod could be expected to have a very high impact, if any exists, on mood and/or cycle hormones. Participants completed daily questionnaires on their physical and mental perceptions of health and wellness. Mood, ability to focus, physical wellness, and perceived social support were combined into a composite wellness score. Urine samples were measured by LCMS (liquid chromatography-mass spectrometry) for reproductive hormones (estrogens, progesterone, testosterone). Wellness score and hormone concentrations were compared by season using mixed effects models adjusted for age and BMI. Wellness score was significantly higher in summer than in winter (p<0.001). Within-individual standardized testosterone concentration was significantly higher in summer than in winter (p=0.038), but other hormone concentrations did not vary significantly by season. These results demonstrate that season is a significant factor in perceived wellness. Although testosterone varied seasonally, other reproductive hormones did not. None of the hormones

studied were significant predictors of mood or wellness scores.

PST 80 | The relationship between sleep characteristics and leukocyte telomere length in the Fels Longitudinal Study

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Leukocyte telomere length (LTL) has received great attention as it is related to healthy aging. Sleep impairment is known to affect overall health and has been shown to be negatively associated with LTL. This crosssectional data analysis sought to provide additional insight into the relationship between LTL and sleep in a generally healthy, middle-aged population. Sleep, demographic, behavioral, and anthropometric data from 385 Fels Longitudinal Study participants (176 males, 209 females), aged 40 to 70 years, were used in this study. LTL was obtained from frozen buffy-coat samples using real-time quantitative polymerase chain reaction method. Sleep quality and persistent daytime sleepiness were obtained from the Pittsburgh Sleep Quality Index (PSQI) and the Epworth Sleepiness Scale (ESS) questionnaires, respectively. We used sex-stratified linear regression modeling adjusting for marital status, age, waist circumference, education, and drinking. Each sleep component from the PSQI and the total PSQI and ESS scores were investigated individually in the model. In males, persistent daytime sleepiness significantly predicted shorter LTL (β=-0.011, SE=0.004, p=0.004) while college education attainment predicted longer LTL (β=0.87, SE=0.029, p=0.003). The omnibus test (F-statistic) suggests that this adjusted model explains 11.0% of the variance in LTL (p=0.001). In females, no sleep variables were significantly associated with LTL and the F-statistics were not significant (p>0.05). These preliminary results suggest that daytime sleepiness may have a sex-specific association with telomere length.

PST 37 | Relative socioeconomic position is more influential than nutritional factors in explaining child linear growth

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Background: The relative effect of social inequality and nutrition on linear growth of children is largely unknown. The WHO suggests using Height-for-Age-Zscores (HAZs), a measure of linear growth of children in relation to the reference population. We assessed the differential effects of relative socioeconomic position (RSP) and nutritional factors (NF) on HAZs of Bangladeshi children aged <5 years.

Methods: We used data from 35,106 mother-child dyads from the Bangladesh National Food Security Nutritional Surveillance Project. An RSP index was constructed from social class (occupation), prestige (education) and household assets, using principal component analysis. Following UNICEF′s conceptual framework of malnutrition, NF included diet (child achieving minimum dietary diversity (MDD) i.e.>4/7 food groups in the last 24 hour) and disease (morbidity episodes in last 2 weeks). Multiple linear regression examined the association of RSP and NF with HAZs, controlling for other covariates (child age and sex, birth order, wasting, maternal short stature (≤145cm) and BMI, household size, geographical location, season, year). Standardized beta coefficients, measuring strength of associations of predictors, compared effects of RSP and NF.

Results: Nearly 41% of children were stunted (<-2 HAZs). Comparing mean change in SD of HAZs per SD unit of predictors, RSP inequality (lowest vs. highest group) had greater effect (0.24, 95% CI: 0.20, 0.28) than MDD (0.05, 95%CI: 0.02, 0.08) or morbidity (-0.01, 95% CI: -0.03, 0.003).

Conclusion: These findings reiterate that inequalities in RSP have a greater effect than NF on HAZs, with implications for development programmes attempting to ameliorate stunting through nutritional supplementation.

PST 93 | Maternal socio-political threat and fetal development among pregnant Filipina women

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Given recent work linking restrictive immigration policies with preterm births among targeted minority communities in the U.S., there is a need to examine how perceptions of the socio-political environment become embodied in women's biological experiences and shape future generations. Motivated by fetal programming, a theoretical framework describing fetal development as a function of a mother's prenatal environment, the current study explores how maternal perceptions of the sociopolitical climate among Filipina women affects (and does not affect) concerns over their pregnancy. Addressing this question in the Philippines is important due to the intense State violence in recent years. President Rodrigo Duterte's anti-drug campaign, initiated in 2016 incentivizes extra-judicial killings of suspected drug dealers and users who fail to surrender to local authorities. The administration's COVID-19 response exacerbates these practices. We interviewed 21 pregnant and recently pregnant Filipina women from various regions of the Philippines. We asked them to describe their experiences regarding the current political situation (e.g., war on drugs, COVID-19 response) and how much they felt their socio-political environment contributed to the overall health of their pregnancy and security. Using content analyses to systematically identify themes, we find three
major themes contribute to pregnancy outcomes: (1) degree of support for President Duterte's administration, (2) degree of corruption locally and regionally and (3) consumption and engagement with political news.

These findings attempt to disentangle the complexity of the socio-political climate in the Philippines and suggests that Filipina women attend are attending to different types of environmental stressors during pregnancy.

PST 5 | Inflammation and longevity in postWWII Guamanian amyotrophic lateral sclerosis (ALS)

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Within the framework of evolutionary medicine, environmental mismatch is a primary cause of chronic illness. In the current evolutionary biology debate on inflammation, some have argued that inflammation is more damaging in novel, sterile environments than in higher infectious disease (ID), non-sterile settings to which humans have had more time to adapt. Others have argued that inflammation is always damaging, and lower inflammation in modern populations due to decreased pathogen exposure results in increased lifespan and robust overall health. This research addresses this debate by exploring the role of inflammation in a mysterious, high incidence focus of amyotrophic lateral sclerosis (ALS) among the indigenous CHamoru in post-WWII Guam. The high ALS incidence during this time, uncharacteristically long survival of many Guamanian ALS patients, and the unusual positive association between symptom severity at onset and lifespan make this case study unique. In high income nations, ALS symptom severity is generally associated with high inflammation and short lifespan. We assessed whether, in the high infectious disease environment of mid-twentieth-century Guam, inflammation is associated with ALS disease and survival time. Sera from 58 ALS cases and age- and sex-matched controls (collected within one year of onset by NIH researchers from 1950-1990) were assayed for 11 regulators of inflammation. Serum inflammation (e.g., c-reactive protein HR:1, 95% CI [0.92,1.09], p:0.9; and interleukin-8 HR:0.9, 95% CI [0.99,1], p:0.8; etc.) suggest that unlike ALS progression in modern, sterile settings, high inflammation is not associated with shorter lifespan in Guamanian ALS.

PST 78 | Postpartum maternal nutrition and infant body size in Samoan mother-infant dyads at 2-4 months

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Infancy is a sensitive period for metabolic development. While previous research has demonstrated links between gestational diet and infant growth, few studies examine the association between postpartum nutrition and infant growth. We explored the relationship between maternal nutrient intake and infant body size in exclusively breastfeeding Samoan mother-infant dyads at 2-4 months postpartum (n=98). We estimated mean daily nutrient intake using three 24-hour dietary recalls, log-transformed these values, and calculated infant weight-for-length (WLZ), length-for-age (LAZ), and weight-for-age (WAZ) zscores using the World Health Organization growth standards. Pearson's correlation coefficients were used to describe associations between maternal nutrient intake and infant size. Linear regression models were then used to examine whether significant associations remained after controlling for maternal BMI and infant age. While maternal intake of most nutrients was not significantly correlated with infant size, daily monounsaturated and polyunsaturated fat intake were negatively correlated (r=-0.237, p=0.021; r=-0.246; p=0.016, respectively) and carbohydrate intake (r=0.246; p=0.016) was positively correlated with infant WAZ. Accounting for maternal BMI and infant age, carbohydrate intake was associated with increased infant WAZ (β= 0.917; p=0.027), while monounsaturated (β=-0.394; p=0.026) and polyunsaturated (β=-0.452; p=0.020) fat intakes were associated with decreased WAZ. No associations were found between infant length (LAZ or WLZ) with maternal nutrient intakes. These data raise new questions about a potential role of maternal postpartum diet in shaping infant growth. Future work should attempt to disentangle the contributions of gestational and postpartum diet and explore the role of breastfeeding in mediating associations with infant growth.

PST 10 | Embodying the Macroenvironment: How Shifting Diets Shape Human-Microenvironment Relationships and Health.

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Dietary changes driven by market integration, such as increased consumption of industrially produced foods (IPF), have strong associations with increased risk of non-communicable diseases (NCD). The gut microbiome, which is largely shaped by diet, mediates the impact of diet throughout the body. This project assesses how increased IPF consumption shapes health as mediated by the gut microbiome. We use dietary recall interview data to determine dietary diversity and IPF consumption among Tsimané (N=65) and Moseten (N=30) individuals. Both communities are experiencing varying levels of market integration and IPF consumption. Dietary data (dietary diversity scores and nutritional composition of foods) is used in conjunction with microbiome data (16S rRNA sequencing) and immune biomarkers to assess how different changes in market integration, such as increased high-sugar/high-fat diets, shape the microbiome and health. Compositional Microbial analysis (ANCOM) of findings (considering 6,000+ OTUs, Prevalence cutoff of 25%, and FDR-adjusted $p < 0.05$) indicate that access to market centers and market goods generate distinct microbial taxa in the gut (W statistic of 80 and 108). This study focuses on communities actively experiencing market integration, providing snapshots of what the gut looks like with different levels of access and participation in global market foodscapes. Results indicate that increased participation in the market is associated with specific microbial signatures. As increased rates of NCD coincides with high participation in the global market, distinct microbial signatures could provide a possible sentinel for coming risks of NCD in communities that are actively experiencing market integration.

PST 68 | Relationships among hair cortisol concentrations, perceived stress, health behaviors, and infant outcomes in a sociodemographically diverse sample of pregnant women

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Maternal stress during pregnancy affects not only maternal well-being, but also infant outcomes such as birthweight and

gestational age. Hair cortisol concentration (HCC) represents a non-invasive measure that helps to inform our understandings of the implications of chronic stress during pregnancy. However, HCC also varies based on behavioral characteristics such as physical activity and diet. Furthermore, some studies show sociodemographic variations, such as variations by ethnicity, in relationships between HCC and infant outcomes. More studies of HCC during pregnancy, their relationships with stress and infant outcomes, and behavioral and sociodemographic factors that affect these relationships, remain necessary. We assessed HCC at 16-18 and 32-34 weeks gestation among a diverse sample of 74 pregnant women in Canada. We assessed health behaviors including diet, sedentary behavior, and physical activity, and infant outcomes at birth. Correlation and ordinal regression analyses showed that at 16-18 weeks pregnancy, sedentary behavior was positively associated with hair cortisol concentrations (r=0.310, p=0.009) and predicted cortisol quartiles (OR=1.006, p=0.006), explaining 11.8% of variance. In contrast, at 32-34 weeks gestation, perceived stress was a better predictor of cortisol quartiles (OR=1.081, p=0.012), explaining 10.4% of variance. Greater HCC predicted lower birthweight but not gestational age. The sociodemographic diversity of the sample permits exploration of variations in these relationships by factors such as ethnicity, socioeconomic status, food security status, and immigration status that could help to yield insights into the relationship between prenatal stress and infant development, and the interpretation of hair cortisol as a biomarker of prenatal stress.

Podium D | Seasonal macronutrient consumption in Yucatec Maya mothers and infants from agricultural populations with different degrees of dependence on store foods and impact on gut microbiome impact.

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We present a seasonal food weighing record study amongst mothers and children under 2 years of age in Maya agriculturalists from large and small agricultural communities in the state of Yucatan. Households made up for a Kcal. reduction during the scarcity season (SS) by increasing their carbohydrate intake relative to protein and lipids specially. Mothers and children have lipid restricted diets year-round. The former´s are hypocaloric, the latter hypercaloric with excess carbohydrate intake particularly during the season of abundance (AS). These differences are noticeable in the gut microbiome. Relative abundance of Firmicutes, characteristic of a modern diet, are greater during the scarcity season in mothers and infants. All these observations are particularly noticeable in families with more income generating activities living in large communities that consume more store-bought foods than in those depending on the local agroecological system in small communities. We discuss the implications of our findings on the double burden of the nutrition transition in rural areas.

PST 74 | Menopausal changes to metabolism and energy availability support a cellular hyperactivity model of aging

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Although there is evidence that the risk of aging-related disease increases with menopause, it is not clear how menopause leads to these changes. Energetic constraints have long been thought to be associated with aging processes; however, the association between caloric restriction and elongated lifespan has called these assumptions into question. Instead of aging occurring from a lack of maintenance investment from energetic limitations, we predict that aging occurs in part because of hyperactivity-an excess of cellular activation from nutritional inputs. If energetic constraints are associated with aging processes, we would expect less available energy in the bloodstream (measured as lipids, glucose, and glycated hemoglobin [HbA1c]) after menopause; whereas, if cellular hyperactivity is associated with aging processes, we would expect more available energy in the bloodstream after menopause. The World Health Survey Plus (WHS+) study was used to test these competing hypotheses. Participants included 4,115 women from Tunisia aged 18+ years who were not pregnant or on medications for diabetes or hyperlipidemia. When controlling for age and body mass index, menopausal status was associated with higher levels of HDL cholesterol (b = 6.69, SD = 3.07, p = .03) and glucose (b = 0.58, SD = 0.16, p < .001). LDL cholesterol (b = 2.89, SD = 4.83, p = .55), triglycerides (b = 6.20, SD = 3.82, p = .11), total cholesterol to HDL cholesterol ratio (b = 0.98, SD = 2.87, p = 0.73), HbA1c (b = 0.04 SD =

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0.06, p = .44), and total cholesterol (b = 1.93, SD = 1.44, p = .18) were not associated with menopausal status. This suggests that the changes in health associated with menopause might be more related to an overenergetic state, hyperactivity, instead of energetic restraints with important implications for the physiological basis of aging.

PST 41 | The role of religion and religiosity in women's experience of symptoms at midlife in Campeche, Mexico

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Religion and religiosity have been associated with lower mortality rates and improved physical and mental health. At midlife, religion may impact women's health through social support, alcohol intake, reproductive patterns, and coping strategies. The purpose of this study was to examine the relationship of extrinsic religiosity (church attendance) and intrinsic religiosity (frequency of prayer) with vasomotor (hot flashes, night sweats) and psychological symptoms (sadness, panic attacks) among Catholic and Protestant women, aged 40-60 years, drawn from a study of menopause in the state of Campeche, Mexico (n=543). In bivariate analyses, Catholic/Protestant affiliation was examined in relation to measures of religiosity, urban/ rural residence, Maya/non-Maya ethnicity, parity, attitudes toward menopause, and health-related behaviors by chi-square or ANOVA. Logistic regression was applied to examine the relationship between symptoms at midlife with religiosity while controlling for religious affiliation, urban/rural residence, parity, and (for vasomotor symptoms) menopausal status. Compared to Catholics, Protestants were more likely to live in rural communities and have higher parity, lower alcohol intake, and more frequent church attendance. In logistic regression models for sadness and panic attacks, urban/rural residence and frequency of prayer were significant variables. Women who prayed daily were less likely to report sadness (OR 0.668, 95% CI 0.450-0.993) and more likely to report panic attacks (OR 1.491, 95% CI 0.999-2.227). Women with panic attacks were also more likely to attend church weekly (vs. < weekly; OR 1.985, 95% CI 1.174-3.353). Religiosity was not associated with vasomotor symptoms. The health benefits of religiosity appear to be symptom specific.

PST 23 | Exploring a Trivers-Willard effect on infant feeding practices among mother-infant pairs in Kilimanjaro, TZ

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The Trivers-Willard hypothesis (TWH) proposes sexbiased differences in parental investment influenced by socio-economic status: that mothers invest more in male infants when they have relatively more resources/wealth and female infants when they have relatively fewer resources/wealth. One important practice for maternal investment is time and energy devoted to breastfeeding. However, application of this hypothesis to human mothers must contend with the fact that economic activities that contribute towards resource availability for mothers may interfere with breastfeeding. Few studies that test TWH also assess maternal economic activities that can alter infant feeding practices. We explore predictors of introduction of cow's milk into infants' diets, including the TWH predicted wealth*sex interaction and maternal wage employment, among a group of 97 mother-infant dyads in rural Kilimanjaro, Tanzania. 69 infants (mean age: 7.05 ± 3.53 months) had already begun consuming cow's milk. Cox proportional hazards analyses reveled a TWH effect present, indicating earlier introduction of cow's milk to male infants from poorer families (HR: 2.87; p: 0.07). Additionally, maternal wage labor was associated with earlier introduction of cow's milk (HR: 3.06; p: 0.00). It is unclear in this context that earlier introduction of cow's milk indicates reduced maternal investment as it may come with reduced frequency of breastfeeding or earlier weaning. We see independent effects of TWH and economic engagement; therefore, both are likely to affect child health and wellbeing.

PST 91 | The determinants of health and the nutritional status of students from a city in the Brazilian Amazon

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An individual's nutritional condition influences their development, but the prevalence of unhealthy eating habits or the determinants of health alter nutritional balance and trigger several health complications. This study aimed to analyze the nutritional status of students from a public elementary and high school in a neighborhood on a violent outskirt of Belém, Para State, Brazil. Along with anthropometric measures, an epidemiological and food census was applied, as well as an individual clinical evaluation. Discourse analysis, Z Score and descriptive statistics were considered. 55 students were measured, 30 female and 25 male, with an average age of 13 years old, average BMI of 19.66 for the female group and 19.38 for the male, with 4% of the boys having "severe delay", while 3.7% of girls reported a "delay" in their growth. 13.3% of girls and 25% of boys drink alcohol. We also identified some students who self-mutilated and a male student who had already presented high blood pressure. Unfortunately, we could not manage to contact with their guardians. The community, due to previous misguided experiences and violence, showed certain distrust in our study and sometimes they did not know what a health survey was, despite all invitations to meet our stuff. Despite all this, students showed general physical status without major complications, there were no obese individuals, but there is a potential risk for the condition, however, because it is a peripheral area, the quality of life of students can allow the processing of other nutritional diseases, such as malnutrition.

HBP/PST 6 | Spatial analysis of infant mortality due to infectious and parasitic causes and congenital malformations in Argentina (2001-2015)

Analisis espacial de la Mortalidad infantil por causas Infecciosas y parasitarias y Malformaciones congénitas en Argentina (2001-2015)

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Infant death is the one occurring in children under one year of age. The study of its causes is cricoa; for the proposal of public policies to avoid and reduce them. Infectious and parasitic causes (IP) are easily avoidable and characteristic of places with little socioeconomic development. Congenital malformations (CM), on the other hand, are difficult to avoid and usually prevail when IP are controlled. We used country-wide official data (Directorate of Statistics and Health Research, Ministry of Health of the Nation) for the period 2001-2015 and we conducted a spatial analysis grouping localities with high or low relative risks (RR) with respect to the total of Argentina.

The IP generated groups with high RR in the north of the country, and low in the center-south, following the same pattern in men and women, although the male RRs were higher (RR of men from 0.32 to 5.15 and women 0.29 to 3.37). The MCs grouped the high RRs to the north and center west, while the low RRs were recorded in the east, center and south of the country, a pattern that is repeated in both sexes. For MC, the RR of males was slightly higher (0.67 to 1.62 in males, 0.61 to 1.55 in females). The results indicate that infant deaths from IP have higher RRs than MC and that these causes present spatial heterogeneity with low RR in the most developed areas (center-south), while high RR are concentrated in disadvantaged areas in the north of the country. La muerte infantil es la que sucede en menores de un año. El estudio de sus causas es fundamental para el planteo de políticas públicas para evitarlas y/o disminuirlas.

Las causas infecciosas y parasitarias (IP) son facilmente evitables y características de lugares con poco desarrollo socioeconomico, mientras que las malformaciones congénitas (MC), son difícilmente evitables y suelen prevalecer cuando las IP fueron controladas.

Se utilizaron datos oficiales de todo el país (Direccion de Estadísticas e Investigacion en Salud, Ministerio de Salud de la Nacion) para el período 2001-2015 y se realizo un analisis espacial agrupando localidades con riesgos relativos (RR) altos o bajos con respecto al total de
Argentina.

Las IP generaron grupos con RR altos al norte del país, y bajos al centro-sur, siguiendo el mismo patron en varones y mujeres, aunque los RR masculinos fueron mayores (RR de varones de 0,32 a 5,15 y mujeres 0,29 a 3,37). Las MC, agruparon los RR altos al norte y al centro oeste, mientras que los RR bajos se registraron al este, centro y sur del país,

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patron que se repite en ambos sexos. Para MC los RR de varones fueron levemente superiores (0,67 a 1,62 en varones, 0,61 a 1,55 en mujeres).
Los resultados indican que las muertes infantiles por IP tienen RR mayores que las MC y que estas causas presentan heterogeneidad espacial con RR bajos en las zonas mas desarrolladas (centro-sur), mientras que los RR altos se concentran en las areas desfavorecidas al norte del país.

HBP/PST 7 | Excess weight as a promoting factor of menarche: A study of secular trend in girls from La Plata city (Buenos Aires, Argentina)

Exceso de peso como promotor de la menarquia: Un estudio de tendencias seculares en niñas de la ciudad de La Plata (Buenos Aires, Argentina)

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The age at menarche (AgM) has decreased over the last century according to the literature. Although the reasons are not completely known, one possible explanation relates to the childhood obesogenic environment, since the gene pool remains "relatively" stable over time. The aim of this study was to compare prevalence of menarche (M) and AgM in two cohorts from La Plata city and evaluate whether they differ from each other and in relation to the presence of excess weight (EW). Both cohorts (C) come from cross-sectional studies: C1 (years: 2005-2007; N=418) and C2 (years: 2014-2017; N=474) conducted with the same methodological sampling criteria (8-14 years old and schools). Presence (MP)/ absence (MA) of menarche was recorded, prevalence were calculated and compared by Chi2 test. According to status quo method and logistic regression analysis, AgM was estimated and compared between cohorts. Likewise, BMI was calculated from weight (kg) and height (cm) and standardized to Z-scores (WHO) to estimate prevalence of EW (BMI>1Z) by cohort and maturity stage. The results indicated that MP (25.1%) was higher in C2 than in C1 (28.7% vs 21.1%); that AgM was higher in C1 than in C2 (12.21 years vs 12.82 years) and that EW (30.3%) was greater in C2 than in C1 in both MA (18.4% vs 10.6%) and MP (19.6% vs 14.3%). In a context marked by a significant increase in excess weight, menarche exhibits a positive secular trend, both in prevalence and age of occurrence, showing a decrease of 7 months in the decade analyzed.
Según la literatura científica, la edad a la menarquia (AgM) ha disminuido en el último siglo. Aunque las razones no se conocen completamente, una posible explicacion se relaciona con el entorno obesogénico infantil, ya que el acervo genético permanece "relativamente" estable a lo largo del tiempo. El objetivo de este estudio fue comparar la prevalencia de menarquia (M) y AgM en dos cohortes de la ciudad de La Plata y evaluar si difieren entre sí y en relacion con la presencia de exceso de peso (EW). Ambas cohortes (C) provienen de estudios transversales: C1 (años: 2005-2007; N=418) y C2 (años: 2014-2017; N=474) realizado con los mismos criterios metodologicos de muestreo (8-14 años y escuelas). Se registro la presencia (MP)/ausencia (MA) de menarquia, se calculo la prevalencia y se comparo mediante la prueba de Chi^2. De acuerdo con el método del status quo y el analisis de regresion logística, AgM se estimo y comparo entre cohortes. Asimismo, el IMC se calculo a partir del peso (kg) y la altura (cm) y se estandarizo a puntuaciones Z (OMS) para estimar la prevalencia de EW (IMC>1Z) por cohorte y etapa de madurez. Los resultados indicaron que la MP (25,1%) fue mayor en C2 que en C1 (28,7% vs 21,1%); que la AgM fue mayor en C1 que en C2 (12,21 años vs 12,82 años) y que la EW (30,3%) fue mayor en C2 que en C1 tanto en MA (18,4% vs 10,6%) como en MP (19,6% vs 14,3%). En un contexto marcado por un aumento significativo del exceso de peso, la menarquia exhibe una tendencia secular positiva, tanto en prevalencia como en edad de ocurrencia, mostrando una disminucion de 7 meses en la década analizada.

PST 85 | The Continuous Cash Benefit (BPC) integrating the family income and the conflict with the Bolsa Família Program in the municipality of Breves, Marajo Island, Amazon Region, Brazil

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The Continuous Cash Benefit (BPC) is a financial aid provided by the Brazilian government of a monthly minimum wage for the poor elderly over 65 or for disabled people (PcD). However, this benefit conflicts with Bolsa Família Program (PBF), as the moment the BPC is received, the PBF is canceled for any other family member. We analyzed the situation of 34 families in the municipality of Breves, Marajo Island, Par a State, Amazon, Brazil through semi-structured questionnaires on socio-economic situation. Families are low-income with low education, live in mostly wooden houses, with inadequate supply of water and sewage. 91% of families are dependent on the PBF and BPC, 76% have other source of income to complete their necessities (small businesses). 15% are totally dependent on the BPC. 38% of families receive BF and BPC; 20% BF only; 15% only BPC; 18% BPC and other income, only 9% are not part of any program, since: the medical diagnosis is recent and they have not yet received the benefit, they are under investigation or the day of inspection in the capital Belém has been lost. With the removal of the BF, 9 families are on the poverty line and only 4 are outside of it. The BPC should not be part of the family's income for the purpose of granting the Bolsa Família, as tasks pertaining to the special care these people demand (PcD/elderly) overburden family members, even being prevented from working due to the enormous responsibility, care and attention these people need.

PST 69 Skeletal maturity influences antiMüllerian hormone levels

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The role of anti-Müllerian hormone (AMH), a potential marker of the hypothalamic-pituitary-ovarian axis, is not well established in adolescent females. Most studies use secondary sexual characteristics or chronological age as predictors for AMH. Skeletal maturity, an indicator of growth, has not been examined to predict AMH. This study sought to examine patterns of change in AMH in relation to skeletal maturity. Demographics, anthropometry, hand-wrist radiographs, and cardiometabolic risk factors from 88 females (212 observations), between the ages of 8 to 18 years from the Fels Longitudinal Study were used in this study. AMH was analyzed from stored frozen serum samples. Data analysis included baseline crosssectional analysis (Phase 1) utilizing linear regression modeling, and longitudinal data analysis (Phase 2) utilizing generalized linear mixed effect modeling. In both stepwise regression models, log-transformed AMH (AMHlog) was regressed on relative skeletal age as the skeletal maturity indicator (calculated as chronological age minus skeletal age), and adjusted for chronological age, sex hormone-binding globulin (SHBG), adiposity and/or cardiometabolic risk factors. Skeletal maturity significantly predicted lower AMHlog in Phase 1 (β= -0.177, SE=0.053, p=0.001) and Phase 2 analyses (β= -0.073, SE=0.032, p=0.023). SHBG was a significant predictor of AMHlog (β=0.006, SE=0.002, p=0.011) in Phase 1, while glucose was significantly associated with decreases in AMHlog (β= -0.008, SE=0.004, p=0.044) in Phase 2. Chronological age modelled as a cubic function was not significant. Decreased AMH levels were identified among girls who experienced delayed skeletal maturation. AMH and skeletal maturity may provide correlated information on growth in adolescent females.

PST 39 Traditional food security: the community-based process of creating a new research tool for arctic research

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Food insecurity is an internationally recognized issue that contributes to poor mental and physical health outcomes at all stages of an individual's life course. Western measures of food insecurity characterize insufficient food intake and its physical consequences, insufficient quantity of foods, and uncertainty about the household food supply. While these commonly used measures of food insecurity capture vital information, they have been developed from a Western scientific perspective and do not account for many unique aspects of the food environment present in Alaska and other Arctic communities. Recognizing this disconnect, the Inuit Circumpolar Council identified six dimensions of traditional food security (TFS), including interconnected factors such as environmental health, food sovereignty, and Indigenous knowledge systems. This community based research project aims to develop and validate a tool to assess TFS that is built

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upon culturally meaningful and appropriate perspectives and traditional knowledge. Through semistructured interviews with 25 Alaska Native adult participants living in the remote Alaska community of St. Paul Island (June-October 2021), this study identified key elements of TFS that guided the creation of a novel TFS assessment tool. Next steps include validation of the TFS assessment tool, and deployment to additional communities in different regions of Alaska, including urban and remote locations.

Podium C:4 | Human milk lactoferrin variation by maternal inflammation and nutrition in northern Kenya

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Backgrounds: Lactoferrin is a multi-functional, ironbinding glycoprotein in the transferrin family. In milk, lactoferrin is known for its immunomodulatory effects, protecting infants against infection by binding with many bacteria, viruses, and fungi, aiding infant proinflammatory immune responses, and coordinating multiple immune system functions. We explored how maternal inflammation/infection and iron nutrition may influence maternal delivery of milk lactoferrin. We expected that lactoferrin delivery would be elevated with maternal inflammation (likely indicative of infectious disease processes), decreased with maternal iron deficiency (if lactoferrin were an iron transporter), and elevated for young/male infants who may be particularly vulnerable to infectious diseases or malnutrition. Methods: We analyzed cross-sectional data from Ariaal mothers of northern Kenya to evaluate associations between milk lactoferrin content and maternal inflammation/infection, anemia/iron deficiency, underweight, infant age/sex, and the mother-infant variable interactions in multivariate regression models adjusted for milk total protein. Results: Maternal inflammation was associated with higher lactoferrin content but only for younger infants (p 0.005, n 203). Maternal anemia/iron deficiency was not associated with lactoferrin. Conclusions: Our results suggest that mothers deliver more lactoferrin when they have inflammation/infection but only for younger infants. This conforms to our expectation for vulnerable young infants but falls short of our expectation of elevated lactoferrin for older infants of mothers with inflammation/infection. It may be that the elevation of lactoferrin is energetically costly for mothers or hazardous for infants – excessive inflammatory activity in the infant gut may adversely affect microflora and nutrient absorption. Lactoferrin appears unaffected by maternal iron nutrition.

PST 36 | Life Events, Coping, and Systolic Blood Pressure in Mississippi Middle School Girls

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As adolescents experience the daily (e.g. going to school) and major (e.g., parents divorcing) occurrences in their lives these events may be evaluated as negative or positive. The ways in which individuals cope with these events effect their physiological responses. This project explores the events experienced by rural, low-income, 6th to 8th grade middle school girls (n=26), their coping strategies to respond to events and the effects on their systolic blood pressure.

Data on life events was collected using the Adolescent Perceived Event Scale. Coping strategies were evaluated using the Response to Stress Questionnaire. Results from these were contextualized through ethnography. Height (cm), weight (kg), and blood pressure was assessed using standard methodologies. Hierarchical regressions were used to determine predictors of systolic (SBP) and diastolic (DBP) blood pressure variation.

The regression model with evaluating major negative life events, age specific body mass index , secondary control coping (SCC) (actively engaging and problem solving), and involuntary disengagement accounted for 64.5% of the variation in SBP, but showed no effect on DBP. In this model, negative major life events, SCC and BMI all significantly contributed to increases in SBP.

Major negative events and the way in which girls cope with them influence SBP. Approaching negative events through SCC may result in increased stress as girls actively engage in these situations. The cognitive development in adolescence increases the girl's understanding of these negative situations in a broader societal context. These data show the importance of teaching middle school girls effective coping skills.

PST 48 | Household composition has stronger influence on maternal infectious disease (ID) risk than infant ID risk in Kilimanjaro, Tanzania

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Many factors influence infectious disease (ID) risk, including age and sources of exposure. We investigated risk factors associated with ID among mothers and singleton infants in Kilimanjaro, Tanzania over a 3-month period in 2019. 106 breastfeeding mothers (mean age: 29.0 y, range: 18.2 – 44.5 y) provided milk specimens and information about themselves and their infants, including recent health histories, and household composition and resources. Mothers and their infants (mean age at start of study: 7.0 m, range: 0.1 – 13.9 m) returned to the clinic if either became sick. When controlling for maternal age and household size, maternal ID risk – especially for respiratory infections – was strongly influenced by the number of children living in the house (HR:

6.85, p = 0.006). However, other factors such as household wealth, previous health history, education/job, or additional demographic characteristics did not influence maternal ID risk. When controlling for infant age, sex, and total children in household, infant ID risk was unassociated with any factors relating to maternal characteristics, household composition, or wealth. Household composition had a much stronger impact on maternal ID than infant ID risk over our relatively short monitoring period. These results suggest that despite their proximity and shared household environment, mothers′ and infants′ ID risk are shaped by different factors. It is likely that the immune system of milk buffers infants against ID risk within the household during the period of breastfeeding; therefore, one important question then is how maternal ID may impact the immune system of milk.

HBP/PST 2 | Effectiveness of weekly iron administration versus daily administration for the prevention of infant anemia: Impact of both interventions on genomic stability Efectividad de la administracion de hierro en forma semanal frente a la administracion diaria para la prevencion de la anemia del lactante: Impacto de ambas intervenciones sobre la estabilidad genomica

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Iron deficiency is the most prevalent nutritional deficiency and the leading cause of anemia. While there is consensus about daily supplementation with ferrous sulfate as a strategy for preventing infant anemia (ADH), locally adherence is low. In addition, excess iron can cause genomic instability. A weekly administration could be an alternative of similar efficacy, greater effectiveness and fewer adverse effects. The objectives were to compare the effectiveness of weekly iron administration versus daily administration for the prevention of ADH and iron deficiency (DH) and to analyze their impact on genomic stability. We conducted a randomized controlled clinical trial in infants who attended the IdIP Health Observatory (Children's Hospital of La Plata). They were grouped by exclusive breastfeeding (SCI) or mixed lactation (LMix) and randomized for the intervention: daily or weekly supplementation. Anemia, iron nutritional status and genomic stability (3 and 6 months of life) were evaluated. Infants on supplementation had significantly lower prevalence of ADH and DH than infants with SCI without intervention. Weekly iron administration was equally effective with daily administration in preventing ADH and DH. No statistically significant differences were found in the incidence of adverse effects, adherence, indicators of oxidative stress and genetic damage. We conclude that it is possible to design new prevention strategies that address the reduction of this pathology that has severe consequences on the health and adaptation of individuals. La deficiencia de hierro es la carencia nutricional mas pre- valente y la principal causa de anemia. Si bien existe consenso acerca de la suplementacion diaria con sulfato ferroso como estrategia de prevencion de la anemia del lactante (ADH), localmente la adherencia es baja. Asimismo, el exceso de hierro puede producir inestabilidad genomica. Una administracion semanal podría ser una alternativa de similar eficacia, mayor efectividad y menores efectos adversos. Los objetivos son comparar la efectividad de la administracion semanal de hierro frente a la administracion diaria para la prevencion de ADH y deficiencia de hierro (DH) y analizar su impacto en la estabilidad genomica. Se realizo un ensayo clínico controlado y aleatorizado en lactantes que concurrieron al Observatorio de Salud del IDIP (Hospital de Niños de La Plata). Fueron agrupados por lactancia materna exclusiva (LME) o lactancia mixta (LMix) y aleatorizados para la intervencion: suplementacion diaria o semanal. Se evaluo anemia, estado nutricional de hierro y estabilidad genomica (3 y 6 meses de vida). Los lactantes con suplementacion tuvieron prevalencias de ADH y DH significativamente inferiores a los lactantes con LME sin intervencion. La administracion semanal de hierro fue igualmente efectiva a la diaria en la prevencion de ADH y DH. No se hallaron diferencias significativas en la incidencia de efectos adversos, la adherencia, los indicadores de estrés oxidativo y el daño genético. Sera posible diseñar nuevas estrategias de prevencion que atiendan a la disminucion de esta patología que tiene severas consecuencias en la salud y la adaptacion de los individuos.

PST 50 | Social support promotes postpartum mental health among US-based participants during the COVID-19 pandemic

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The COVID-19 pandemic has been incredibly disruptive for new parents. Consequently, research has overwhelmingly focused on the negative impacts of the pandemic on parental mental health. Additional work is needed to identify protective factors—including emotional and instrumental support from partners, family, and friends—that may have a positive impact on postpartum mental health during this stressful time. Using the third wave of data from the COVID-19 And Reproductive Effects (CARE) study (an online convenience survey of US participants, N=263), we evaluated how sources of social support changed during the pandemic and tested whether social support was positively related to postpartum depression measured with the Edinburgh Postnatal Depression Survey. Sixty-three percent of participants reported finding new sources of support during the pandemic, including online communities (i.e., Facebook and Reddit) and therapy. Linear regression analyses adjusting for maternal income, age, and prenatal depression demonstrated that support from partners, family, and friends, as well as reported ability to reach out to someone for help, were associated with lower postpartum depression scores (all $p < 0.003$). In addition, participants who agreed that their social support systems reduced their stress also exhibited lower depression scores ($p < 0.001$). These results suggest that the ability to access instrumental and emotional support during the pandemic enhances postpartum mental health. Additional qualitative research is needed to understand how individuals adapted to the COVID-19 pandemic, and whether the novel methods of support that have been developed during this period (i.e., virtual communication) can be promoted in non-pandemic contexts.

PST 61 | Bothersome symptoms at midlife in relation to body fat percentage.

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Earlier studies have suggested that increasing obesity is associated with a higher frequency of symptoms at midlife. The association between body fat percentage (%BF) and the bothersomeness of symptoms at midlife is not known. Women aged 40 to 60 in Qatar (n=841) have notably high levels of obesity (mean BMI 34.3 kg/m2). Symptoms hypothesized as most closely related to body composition were selected from a questionnaire symptom list, and bothersomeness was identified by responses "quite a bit" or "intense." As an initial step, we characterized the relationship between continuous %BF and presence (yes/no) and bothersomeness (yes/no) for each symptom using restricted cubic spline (RCS) models to allow for non-linearity. Observing no evidence of non-linearity, we subsequently used multinomial logistic regressions to evaluate associations between BF% and multilevel outcomes with a) no symptoms or bother, b) symptoms without bothersomeness, and c) bothersomeness. The highest frequency of bothersomeness was reported for aches and pains (51%), followed by trouble sleeping (34%), night sweats (21%), urinary incontinence (18%), hot flashes (16%) and shortness of breath (15%). In unadjusted multinomial logistic regressions, aches and pains with and without bothersomeness had the same significant relationship with %BF. Bothersome night sweats, urinary incontinence, hot flashes, and shortness of breath were significantly associated with %BF ($p<0.05$), but those same symptoms without bothersomeness were not significantly associated with %BF. Our findings suggest that bothersomeness is an important outcome variable that tracks with body fat and gives different information than report of the presence/ absence of a symptom alone.

HBP | Migratory contributions to current northwestern Argentine populations: correlation between the geographical origin of surnames and Y chromosome lineages

Aportes migratorios a las poblaciones actuales del NOA de Argentina: correlacion entre el origen geografico de los apellidos y de los linajes del cromosoma Y

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The Argentine population is the result of admixture between three main populations: Native Americans, Europeans and Africans, however, this process presents marked regional differences. The Argentine Northwest (NOA) is a region

composed of the provinces of Jujuy, Salta, Tucuman, Catamarca, La Rioja, and Santiago del Estero, all originated in Spanish foundations of the sixteenth century. In this work, we analyzed the conformation of the current population of the NOA, integrating molecular and genealogical information to understand the history of admixture in the region. We included 1020 male participants of known Y chromosome haplogroup, with recorded geographical origin and with a surname classified by geolinguistic origin. In addition, we analyzed the birthplace data of paternal grandparents (in 742 cases) and the haplotypes of 210 individuals.

The NOA as a whole shows a strong association between Native American haplogroups and native surnames with Jujuy individuals having the highest initial odds of the entire region having a Native American haplogroup and an autochthonous surname. When considering haplotypes, we identified surnames and origin of the paternal grandfather, cases of coincidence of origin were identified and also polyphyletic surnames and maternal transmission of the surname. The complementarity between the origin of the genetic lineages and the surnames found allowed a genetic, demographic and historical analysis of the relative contribution of the immigrant population, both American and overseas, in the constitution of current populations of the NOA.

La poblacion argentina es fruto del mestizaje entre tres poblaciones principales: nativos americanos, europeos y africanos, sin embargo, este proceso presenta marcadas diferencias regionales. El Noroeste argentino (NOA) es una region integrada por las provincias de Jujuy, Salta, Tucuman, Catamarca, La Rioja, y Santiago del Estero, todas originadas en fundaciones españolas del siglo XVI.

En este trabajo se analizo la conformacion de la poblacion actual del NOA integrando informacion molecular y genealogica para comprender la historia de mestizaje en la region. Se incluyeron 1020 participantes de sexo masculino que cuentan con la determinacion del haplogrupo al que pertenece su cromosoma Y con origen geografico asignado y con apellido clasificado por origen geolingüístico. Ademas, se analizaron los datos de lugar de nacimiento de abuelos paternos (en 742 casos) y los haplotipos de
210 individuos.

El NOA en su conjunto muestra una fuerte asociacion entre los haplogrupos nativos americanos y los apellidos nativos con individuos Jujuy que tienen las probabilidades iniciales mas altas de que toda la region tenga un haplogrupo nativo americano y un apellido autoctono. Al considerar los haplotipos, identificamos apellidos y origen del abuelo paterno, se identificaron casos de coincidencia de origen y también apellidos polifiléticos y transmision materna del apellido. La complementariedad entre el origen de los linajes genéticos y los apellidos encontrados permitio un analisis genético, demogr afico e hist orico de la contribucion relativa de la poblacion inmigrante, tanto americana como extranjera, en la constitucion de las poblaciones actuales del NOA.

PST 52 | Exploring the Acceptability of Biomarker Self-Collection among Sexual Minority Men in Canada: Implications for LGBTQ+ focused Human Biology and Population Health Research

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Identifying the sociodemographic correlates associated with biomarker self-collection acceptability among marginalized populations will enhance human biologists and health scientists' capacities to engage with these populations and conduct vital health-related research. Using data from the 2019 Sex Now Survey, a large online cross-sectional survey of Sexual Minority men (SMM) in Canada (N = 7,866), we fit multiple logistic regression models to evaluate associations between demographic, geographic, and socioeconomic variables to the self-reported acceptability of various biomarker self-collection (e.g., throat swab, urine, dried blood spots) for the testing of sexually transmitted infections (STI) among respondents. Overall, 69.1% of the sample indicated that they would likely self-collect biomarkers for STI testing. Chi-squared tests revealed significant sexual identity-based differences in acceptability for self-collection of urine (X2= 17.832, P =0.003), throat swab (X2= 14.986, P =0.010), and rectal swab (X2= 24.91, P=>0.001) samples. Multivariate analysis revealed significant heterogeneity in method of biomarker self-collection acceptability across demographic and socioeconomic variables. Lower biomarker selfcollection acceptability was observed among respondents who identified as straight, queer, bisexual, racialized, Indigenous, who are socioeconomically marginalized as well as French

language speaking participants. The results of this analysis provide important information regarding the uneven acceptability of biomarker self-collection among SMM in Canada, demonstrating the necessity of intentional outreach to certain sub-communities of SMM to improve biomarker self-collection acceptability, which is essential to identifying health disparities and improving health equity among SMM.

PST 17 Point-of-care testing applications in the measurement of intestinal inflammation

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Point-of-care testing (POCT; tests that deliver rapid results from minimally-invasive samples at the location of collection) has the potential to produce actionable health data outside of laboratory settings. These tests may consequently be useful for researchers and clinicians working in low-resource areas. Problematically, POCT development and validation generally occurs in biomedical laboratories, and it is unclear how well these tests perform in non-medical settings. Here, we test the performance of two POCT devices measuring biomarkers of intestinal inflammation in a non-clinical setting. We expected these POCT devices would produce reliable information that can be used to determine risk factors associated with elevated inflammation levels, including emerging health concerns like SARS-CoV-2. Stool samples were collected from 56 adults living in St. Louis and Colorado Springs. Samples were used to measure fecal calprotectin (FC; measured using a BUHLMANN Laboratories Quantum Blue reader) and lactoferrin (LF; measured using TECHLAB rapid tests). Participants also completed surveys assessing health history. Nearly half of the participants exhibited elevated FC levels (14.3% highly elevated, 30.4% moderately elevated, and 55.3% not elevated). Additionally, 12.5% of participants tested positive for elevated LF levels. Fisher's exact test indicated that individuals who reported having had COVID19 were significantly more likely to test positive for elevated LF ($p = 0.030$), suggesting that COVID-19 may chronically elevate intestinal inflammation. POCT devices may provide a rapid, minimally-invasive way to assess these patterns in the future. Additional analyses will compare the performance of these POCT devices to results obtained using well-validated enzyme-linked immunosorbent assays

PST 30 Analysis of breastfeeding and age at menarche in a U.S. population

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We approach this research from the perspective of the Developmental Origins of Health and Disease (DOHaD) paradigm which explores how early life events impact the health and disease of individuals later in the life course. Menarche is a key life history event that shapes the female reproductive trajectory and is important to the study of human biology because of associated epidemiological and social consequences. Early puberty is associated with higher risk of adverse health and behavioral outcomes throughout adolescence and adulthood, and the protective effect of breastfeeding against infant morbidity and mortality is well documented (Aghee et al., 2019; Victoria, 1996). Kale et al. (2014) observed a direct association between duration of breastfeeding and age of onset of breast development in three U.S. populations. However, research about the association of infant feeding practices and menarche is sparse. Using data from a U.S. college-aged female student population from Amherst, MA, we examine whether having been breastfed was associated with age at menarche. Of the 368 female participants with information on breast feeding during infancy, we find that women who were breastfed (n=268) had a mean age of menarche of 12.5 years (SD 1.5), while those who were not breastfed (n=54) had a mean age of menarche of 12.0 years (SD 1.3; $P < 0.05$). We propose further research that explores a finer distinction between formula-fed, mixedfed or predominantly breastfed infants and age at menarche.

PST 83 Associations of behavioral, anthropometric, and dietary risk factors with leukocyte telomere length in the Fels Longitudinal Study

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Telomere length is a marker of cellular aging in epidemiologic studies. Literature has shown telomere length

to be associated with a variety of risk factors, including, adiposity, diet, alcohol and cigarette smoking, and physical activity. We examine associations between leukocyte telomere length (LTL) and behavioral, anthropometric, and dietary risk factors and determine whether they differ by sex and level of LTL.

This cross-sectional analysis consisted of 633 nonHispanic white adult Fels Longitudinal Study participants (females, 58%) ages 18 to 88 years (mean 46 years). Study participants were assessed from April 2002 through October 2014 for LTL, behavioral, anthropometric, and dietary measures. Real-time quantitative polymerase chain reaction was used to measure LTL from frozen peripheral blood lymphocytes. Participants with history of cancer diagnosis were excluded. Analyses consisted of sex-stratified multiple linear (MLR) and quantile regression (QR) on LTL.

Age ($p<0.05$) negatively predicted LTL in MLR and QR in both males and females. Alcohol consumption ($p<0.05$) negatively predicted LTL in males in both MLR and QR (25th and 75th quantiles of LTL). Waist circumference ($p<0.05$) negatively predicted LTL in females (75th and 90th quantiles). Total daily caloric intake ($p<0.05$) negatively predicted LTL in males (75th quantile). Current smoking ($p=0.05$) positively predicted LTL in males (25th quantile). Physical activity was not associated with LTL.

We found that sex-specific risk factors differentially predict LTL in Fels Longitudinal Study participants. The relationship between these risk factors and LTL may further vary by LTL level.

HBP/PST 10 | Pain genetics: a case-control study for migraine with aura in the population of Buenos Aires (Argentina) Genética del dolor: un estudio de casos y controles para la migraña con aura en la poblacion de Buenos Aires (Argentina)

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Migraine with aura is a complex disabling disorder characterized by recurrent headache episodes and transient, focal neurological symptoms that precede the painful stage. The causes underlying migraines are both environmental and genetic. Given its high heritability, knowing the genetic background is of relevance for prevention and therapies. With the aim of characterizing this variation in the population from Buenos Aires province (Argentina) we analyzed 5 SNPs previously reported in association with migraine for other populations, in 86 patients and 55 controls: rs2075968 (PRDM16 gene), rs12134493 (TSPAN2 gene), rs10166942 (TRPM8 gene), rs10456100 (KCNK5 gene), rs11031122 (MPPED2 gene), and rs11172113 (LRP1 gene). Genotyping was performed either by allele-specific PCR or PCR-RFLP, and data analysis was done using Arlequin v3.5, GenAlEx 6, and InfoStat programs.

Allele frequencies did not differ significantly between cases and controls (AMOVA and FST), but genotype frequencies for rs10456100 were significantly different, and showed association in odds ratio calculation ($p <0.05$). Logistic regression was performed for this marker estimating the ORs for CT/TT genotypes, with CC as a reference. We found the T allele, which has been reported as a risk allele in other populations, acting as protective when it is present in homozygous genotype in our population. Although these preliminary results need confirmation in a larger sample size, they suggest a particular genetic basis of migraine with aura in the studied population. This information might be of help for defining a better treatment of migraine patients from our population. La migraña con aura es un trastorno incapacitante complejo caracterizado por episodios recurrentes de cefalea y síntomas neurologicos focales transitorios que preceden a la etapa dolorosa. Las causas subyacentes a las migrañas son tanto ambientales como genéticas. Dada su alta heredabilidad, conocer los antecedentes genéticos es de relevancia para la prevencion y las terapias. Con el objetivo de caracterizar esta variacion en la poblacion de la provincia de Buenos Aires (Argentina) analizamos 5 SNPs previamente reportados en asociacion con migraña para otras poblaciones, en 86 pacientes y 55 controles: rs2075968 (gen PRDM16), rs12134493 (gen TSPAN2), rs10166942 (gen TRPM8), rs10456100 (gen KCNK5), rs11031122 (gen MPPED2) y rs11172113 (gen LRP1). El genotipado se realizo mediante PCR específica de alelos o PCR-RFLP, y el analisis de los datos se realiz o utilizando los programas Arlequin v3.5, GenAlEx 6 e InfoStat. Las frecuencias de los alelos no difirieron significativamente entre los casos y los controles (AMOVA y FST), pero las frecuencias del genotipo para rs10456100 fueron significativamente diferentes y mostraron asociacion en el calculo de la odds ratio ($p <0,05$). Para este marcador se realizo regresion logística estimando los OR para

los genotipos CT/TT, con CC como referencia. Encontramos el alelo T, que ha sido reportado como un alelo de riesgo en otras poblaciones, actuando como protector cuando esta presente en el genotipo homocigota en nuestra poblacion. Aunque estos resultados preliminares necesitan confirmacion en un tamaño de muestra mas grande, sugieren una base genética particular de migraña con aura en la poblacion estudiada. Esta informacion podría ser de ayuda para definir un mejor tratamiento de los pacientes con migraña de nuestra poblacion.

HBP | Programa de referencia y biobanco genomico de la Poblaci on Argentina Reference program and genomic biobank of the Argentine Population

Rolando Gonzalez-Jose

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Admixture is the main characteristic that defines the population of Argentina and other Latin American countries. This mixture is not only genetic, but also product of socio-cultural phenomena, where lifestyle, eating habits and access to Public Health, among other aspects, shape the environment in which many diseases evolve. In recent years, human genome research has shown that the appearance of most diseases is conditioned by the genetic characteristics of each individual and their interaction with the environment. Indeed, genetic variants influence the propensity to suffer from complex diseases such as cancer, neurodegenerative disorders, and common disorders such as diabetes, hypertension and obesity. In addition, both the response to some drugs and the occurrence of adverse effects, also depend on the genetic profile of the individual. These unique characteristics of the individual and the population mean that biomedical research carried out in other countries cannot be extrapolated directly to the Argentine population. This presentation will describe the creation of a Reference Program and Genomic Biobank of the Argentine Population (PoblAr), an institution under the Argentine Ministry of Science, Technology and Innovation. It is aimed at our country developing sovereign public policies in relation to biomedical research and the development of specific medicines for our population.

El mestizaje es la principal característica que define a la poblacion de Argentina y de otros países latinoamericanos. Esta mezcla no es solo genética, sino que también tiene que ser vista como un fenomeno socio-cultural, donde el estilo de vida, los habitos alimentarios y el acceso a la Salud Pública, entre otros aspectos, configuran el entorno en el que evolucionan muchas enfermedades. En los últimos años la investigacion del genoma humano ha demostrado que la aparicion de la mayoría de las enfermedades esta condicionada por las características genéticas de cada individuo y su interaccion con el medio ambiente. En efecto, las variantes genéticas influyen en la propension a padecer enfermedades complejas como el cancer, trastornos neurodegenerativos, y desordenes comunes tales como diabetes, hipertension y obesidad. Ademas, tanto la respuesta a algunos medicamentos, como la aparicion de efectos adversos, también dependen del perfil genético del individuo. Estas características únicas del individuo y la poblacion hacen que la investigacion biomédica realizada en otros países no pueda ser extrapolada de forma directa a la poblacion argentina. En la ponencia, se fundamentara la creacion de un Programa de Referencia y Biobanco Genomico de la Poblacion Argentina (PoblAr), una institucion dependiente del Ministerio de Ciencia, Tecnología e Innovacion argentino, y tendiente a que nuestro país desarrolle políticas públicas soberanas en relacion a la investigacion biomédica y el desarrollo de medicamentos específicos para nuestra poblacion.

PST 71 C-reactive protein and adiposity in peri-urban adolescents in El Alto, Bolivia

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Scarcity is widespread in many rural regions and, as is well documented, children's growth and health are adversely affected. Such conditions are commonplace throughout the rural Andean highlands, prompting substantial rural out-migration. Nonetheless, the hoped-for benefits of urban life are unevenly distributed, and the impacts on children's health are not necessarily beneficial. Studies in various countries worldwide report that rising childhood obesity in urban/peri-urban communities may be setting the stage for adult-onset chronic diseases. However, these assessments typically rely on WHO growth references which, being derived from only six populations, may be unsuitable for assessing most populations. We evaluated 100 nominally healthy 11–14 year-olds living in El Alto, a sprawling peri-urban destination

for rural Bolivians. El Alto adolescents' (Alteños') anthropometrics were standardized (age-sex-specific zscores) to rural high-altitude Bolivian children (Stinson 1980). Peri-urban Alteños were taller and had greater adiposity than rural children (mean±SD: z-height=2.00 ±1.23, z-weight=1.82±1.77, z-mid-arm-circumference=1.99±1.64), but none were classified as "obese" when compared to WHO or national Bolivian references. C-reactive protein (CRP, an immune-activation biomarker) was measured in Alteños: median=0.286 mg/L, IQR=0.6 mg/L, mean±SD=0.662±0.820, maximum=3.994. CRP median and mean are similar to other populations, but unlike rural lowland Bolivian children (McDade et al. 2005), none of the Alteños had CRP>5 mg/L. CRP was significantly positively associated with adiposity [z-MAC (rho=0.358, p<0.001); z-weight (rho=0.253, p<0.011)], but even those at the highest weight-for-age did not exhibit excessive CRP. CRP did not vary significantly with height. There may, however, be long-term health trade-offs between increased height, adiposity, and CRP.

Podium A | Impacts of age, sex, and body composition on C-Reactive Protein, Interleukin-6, Adiponectin in Indigenous Siberians

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Research on the relationship between inflammation and adiposity in Siberian circumpolar populations is limited despite cardiovascular and metabolic diseases being important health concerns. We investigated biomarkers of systemic inflammation, adiposity, and cardiometabolic health and relationships with age, sex and body composition in 127 Eveny, Evenki and Yakut adult reindeer herders from four villages northeast Siberia as part of the NIR project led by the Yakutia Institute of Health. Project goals were to investigate social and biological factors in cardiovascular diseases among understudied minority indigenous groups in Yakutia. Plasma c-reactive protein (CRP), interleukin-6 (IL-6), and adiponectin (APN) were analyzed from whole blood, and data were collected on blood pressure, body composition, and lipids along with sociodemographic and lifestyle data. Participants ranged in age from 15-80.

RESULTS: Sex differences were small and not significant for CRP (women= 0.2 mg/l, men= 0.3 mg/l), adiponectin (women= 20.9 ng/ml, men= 17.2 ng/ml), and interleukin-6 (women=3.9 ng/ml, men= 2.5 ng/ml). CRP was correlated with BMI (r = 0.38), waist circumference (cm) (r = 0.37), and abdominal circumference (cm) (r = 0.32) in women but not men. Adiponectin was negatively correlated with weight (kg) r = (-0.45), BMI (r = -0.41), waist circumference (cm) (r = -0.33), and abdominal circumference (cm) (r = -0.35) in women but not men. CRP was correlated with age in men only (r = 0.46). These results highlight sex differences in inflammatory phenotypes and relationships with adiposity in indigenous Siberians.

PST 3 | Religion and spirituality moderates the relationship between hypertension and dementia risk among Black people

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Black people had the highest prevalence of Alzheimer's Disease and related dementias (ADRD) of any racial/ethnic group in the United States as of 2014. As racial disparities in ADRD prevalence are being investigated, more evidence is necessary to determine the pathways and mechanisms that either slow its progression, or improve the quality of life for its patients, especially for Black people.

Existing research has found a positive relationship between hypertension and ADRD risk; additionally, research has found an inverse relationship between religion and spirituality (R/S) and blood pressure for Blacks, but not for Whites. Crucially, Blacks also report higher levels of religiosity than any other racial/ethnic group in the United States. Despite this, prior work examining the relationships between R/S and ADRD has focused on the R/S of caregivers, has not focused on or utilized large samples of Blacks, and/or was qualitative.

This research seeks to fill that gap by asking if R/S moderates the relationship between hypertension and ADRD risk among Black adults.

Drawing from the Health and Retirement Survey (HRS), a nationally-representative longitudinal dataset with an oversampling of Black adults, we use regression analysis to demonstrate how R/S has an ameliorating impact on ADRD risk among Blacks and, further, how R/S moderates the relationship between hypertension and ADRD risk. These findings demonstrate the importance that existing cultural networks (e.g., R/S) can have for reducing the burden of ADRD on Black people and has important implications for

the role of R/S in shaping ADRD symptomatology. This research was supported by a grant from NIH/NIMHD (Religion, Spirituality, and CVDRisk: A Focus on African Americans, R01 MD011606-01A1).

PST 32 | Close quarters: An investigation of neighborhood effects and SARS-CoV-2 in Chicago

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The variable impact of SARS-CoV-2 on minority communities across the United States is undeniable, with different disciplines proposing theories to understand the origins of these inequalities. Here we investigate individual behavioral predictors of SARS-CoV-2 exposure and zip code-level predictors of infection, in a large seroprevalence study in Chicago, IL (N=7,058) conducted JuneNovember 2020. Participants provided self-collected finger stick dried blood samples which were analyzed for the presence of antibodies against the receptor binding domain of SARS-CoV-2. Seropositivity was modeled as a function of individual variables with multilevel binomial regressions. Results show that self-identified race/ethnicity, age, household density, and occupation were significantly associated with the odds of seropositivity. Individuals who identified as white (OR: 0.54; 95% CI:1.13, -0.10), individuals aged 30-39 (OR: 0.68; 95% CI: -0.69, -0.07), 40-49 (OR: 0.65; 95% CI: -0.78, -0.08) or over 60 (OR: 0.3; 95% CI: -1.61, -0.36) had lower odds of seropositivity. Those living in a household with more than six people (OR: 2.24; 95% CI: 0.13, 1.49) or working in transportation services (OR: 2.85; 95% CI: 0.35, 1.74) had a higher chance of seropositivity. After controlling for individual-level variables, there remains unexplained variation at the zip code level. The next steps will investigate zip code and crosslevel interactions to better understand the impact of community factors on SARS-CoV-2 risk. As more infectious SARS-CoV-2 variants take hold, this analysis may help to understand multilevel factors of infection.

PST 11 | Exploring the impact of freezing and thawing on metabolic hormone degradation in human milk samples

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Of growing interest is the role of metabolic hormones such as leptin and adiponectin in human milk. However, due to limited access to laboratory facilities in many field sites, samples often need to be shipped for compositional and hormonal analysis in which they may be exposed to non-optimal conditions during transportation, particularly extended time outside of freezer settings. To ensure the validity and consistency of assay results, it is important to test the impact of these potential thaw periods on human milk samples and, more specifically, investigate the duration samples may be left thawing before hormone degradation begins to occur. Additionally, to inform decisions regarding sample handling if found to be thawed, we need to understand the implications of refreezing during transportation versus the consequences of leaving samples defrosted to reduce the number of freeze/thaw cycles. To address these questions, human milk samples were systematically subjected to a range of thaw durations from 4-16 hours and assayed (ELISA) for leptin and adiponectin levels to investigate potential degradation. Additional samples were subjected to two scenarios, re-freezing or remaining thawed with the addition of new ice-packs. We found that levels of both leptin and adiponectin concentration were not significantly impacted across the extended thaw duration. However, hormone degradation was found to occur in the samples subjected to re-freezing (minimal degradation) compared to the samples remaining thawed with the addition of new ice-packs (severe degradation). The results of this experiment can inform decisions regarding transportation and data analysis in milk research.

PST 26 | Testosterone therapy masculinizes speech and gender presentation in transgender men

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Voice is one of the most noticeably dimorphic traits in humans and plays a central role in gender presentation. Transgender males seeking to align internal identity and external gender expression frequently undergo testosterone (T) therapy to masculinize their voices and other traits. We

aimed to determine the importance of changes in vocal masculinity for transgender men and to determine the effectiveness of T therapy at masculinizing three speech parameters: fundamental frequency (i.e., pitch) mean and variation (fo and fo-SD) and estimated vocal tract length (VTL) derived from formant frequencies. Thirty gender-diverse men aged 20 to 40 rated their satisfaction with traits prior to and after T therapy and contributed speech samples and salivary T. Similar-aged cisgender men and women contributed speech samples for comparison. We show that transmen viewed voice change as critical to transition success compared to other masculine traits. However, T therapy may not be sufficient to fully masculinize speech: while fo and fo-SD were largely indistinguishable from cismen, VTL was intermediate between cismen and ciswomen. fo was correlated with salivary T, and VTL associated with T therapy duration. These findings suggest that fo may be more responsive to T and that plasticity in VTL may be under some constraint. Additional approaches, such as behavior therapy and/or longer duration of hormone therapy, could be used to improve speech transition.

Plenary, Part 1: 3 | The study of Human Biology in the context of extreme economic inequality

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Human biologists have long sought to understand how our biology responds extreme environments. For many, these extreme environments have been naturalistic settings such as circumpolar environments, dry deserts, high altitude, etc. However, the neoliberal economic transformation that has unfolded over the past fifty years has created a new environmental extreme to which the majority of humans across diverse geographical settings must respond: severe economic inequality. While inequality has been a staple in human society over the last 10,000 years, the scale of those inequalities today is unparalleled in human history. In this presentation, I examine economic inequality as an extreme stressor with significant repercussions for human biology and health. I begin by briefly reviewing the important history of work on socioeconomic inequalities in biocultural anthropology. I will then outline the ways in which this particular stressor interacts with and exacerbates many of the other extremes described in this session, using the high altitude environment of Nuñoa, Peru as a brief case study. I then consider the potential pitfalls of adaptationist frameworks when examining human biological response to this extreme economic inequality and suggest alternative approaches that may help us more effectively examine the biological effects of economic inequality. Finally, I identify areas for future research that may prove particularly fruitful for human biologists examining the effects of this particular extreme including the study of housing insecurity, climate change, and mental health.

PST 22 | Mothers' testosterone and body composition in BaYaka foragers and Bandongo farmers: variation by community and youngest child's age

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Studies on reproductive ecology have demonstrated that female reproductive physiology is often downregulated under conditions of energetic constraint and demanding physical activity, consistent with life history trade-offs between reproduction versus survival. While hormones such as progesterone and estradiol have been investigated in mothers in energetically-demanding settings, less is known about maternal testosterone across a range of cultures and ecologies. Here, we collected salivary testosterone (T) and demographic data from mothers in neighboring BaYaka and Bandongo communities in northern Republic of the Congo. These two societies subsist primarily via foraging and gardening (BaYaka, n=36) and farming (Bandongo, n=18), respectively. In similar communities elsewhere in the Congo Basin, there are differences between these groups in breastfeeding practices and physical demands of women′s roles among mothers with young children and across the life course. We found that Bandongo women had higher triceps skinfold thickness and BMI than BaYaka women ($p<0.05$). Postmenopausal mothers had lower T than younger mothers ($p<0.05$), but there was no difference in T for mothers with infants versus without as a main effect ($p>0.1$). However, in a significant moderation effect, Bandongo mothers with infants had lower T than mothers without infants, while BaYaka mothers with infants had higher T than mothers without infants ($p<0.05$). Our results for Bandongo mothers generally align with past studies indicating the nutritionally

and physically demanding conditions these farming mothers face while nursing infants. The BaYaka results may suggest a role for cooperative community dynamics as buffers for nutritional and physical demands in breastfeeding mothers.

PST 43 | Do perceived infectability and health locus of control affect pandemic related future discounting and the adoption of pathogen avoidance behaviors?

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Utila, a Honduran Bay Island, has an economy reliant on tourism, which has been severely impacted by travel restrictions in response to the COVID-19 pandemic. Resulting stressors may further impact how individuals respond to the pandemic by affecting perceptions of future prospects and the value of investment into health behaviors. However, individuals differ in both perceived threat from infection and perceived ability to affect personal health, referred to as the health locus of control, which past studies have associated with differential uptake of health treatment and prevention. Here, we examine whether stress related to the COVID-19 pandemic is associated with perceived infectability and health locus of control measures, and whether these relate to discounting of future prospects and uptake of infection prevention behaviors such as the use of personal protective equipment (PPE). Interviews were conducted with heads of household (age: 17-83, n=292) during the first wave of the COVID-19 pandemic (August-October of 2020). Results were analyzed by constructing path models. While perceived infectability positively predicted PPE usage, having an internal locus of control negatively predicted infectability and was a strong negative predictor of PPE usage. This finding is opposite to our predictions and may suggest that those with an internal locus of control perceive that they can avoid illness without using PPE. Additionally, infectability, belief in the role of chance in health, and higher internal locus of control all predicted more pandemic-related future discounting. Our results suggest that for residents of Utila, personal factors predict differential responses to pandemic-associated threats.

PST 75 | Hair Cortisol Concentrations Across Pregnancy and Early Postpartum in a Puerto Rican Population

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Chronic maternal stress is associated with poor perinatal health outcomes. Hair cortisol is a non-invasive longterm biomarker of human stress. Hair cortisol data was collected from pregnant women in Puerto Rico to investigate how maternal cortisol levels vary across pregnancy in this sample population. In 2017, we recruited 86 pregnant women who gave birth at large urban hospital in Puerto Rico. We aimed to collect four hair samples from each participant, one in each trimester and one in the postpartum period. First trimester samples (n=82) had a median cortisol level of 5.7 picograms/milligram (pg/mg) (range: 1.0 – 62.4). Second trimester samples (n=46) had a median of 6.8 pg/mg (1.0 – 69.5). Third trimester samples (n=30) had a median cortisol level of 20.1 pg/mg (5.6-89.0). Postpartum samples (n=9) had a median cortisol level of 14.1 (1.7-39.8) pg/mg.). Maternal hair cortisol concentrations were lower in the first and second trimester than the third trimester and early postpartum period. We also observed a wide range of variation in cortisol levels throughout pregnancy and postpartum. We discuss methodological, environmental, and social factors that may attribute this degree of variation and call for more consistent hair cortisol biomarker data collection methods, particularly for pregnant populations.

PST 31 Child dietary patterns in hominin evolution: a systematic review

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Dietary patterns spanning millennia could inform contemporary public health nutrition. Children have been largely absent in this literature despite highly prevalent forms of malnutrition globally. We conducted a systematic review to identify dietary patterns of children ages 6 months to 10 years consumed before the widespread adoption of agriculture. Metrics of mention frequency and standardized food groups were applied to: compare diets across subsistence modes [gatherer-hunter-fisher (GHF), early agriculture (EA) groups]; examine diet quality and diversity; and characterize differences by life course phase and environmental context by KöppenGeiger climate zone.
There were 93 studies included, 51 applying isotope analyses. Animal foods (terrestrial and aquatic) showed higher mention frequency in GHF compared to EA, and among all groups, animal foods were higher compared to plant food categories. Mammals were most common animal type followed by finfish, insects and reptiles. Other frequently foods across groups were fruits, roots and tubers, and nuts. Dietary diversity was greater for GHF and GHF plus horticulture, compared to agriculture only groups within studies. Minimal differences were apparent by life course phase and environment and climate zone were key drivers in dietary patterns. Evidence from Homo sapien evolution points to the need to ensure children consume nutrient-dense foods and diverse diets.

Plenary | Psychological legacies of intergenerational trauma under South African apartheid: Prenatal stress predicts increased vulnerability to the psychological impacts of future stress exposure during late adolescence and early adulthood in Soweto, South Africa

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South Africa's rates of psychiatric morbidity are among the highest in sub-Saharan Africa and are foregrounded by the country's long history of political violence during apartheid. Growing evidence suggests that past stress exposures, particularly those experienced in utero, are potent developmental risk factors for future mental illness risk, yet the extent to which the psychiatric effects of prenatal stress impact the next generation are unknown. This analysis evaluates the intergenerational effects of prenatal stress experienced during apartheid on psychiatric morbidity among children at ages 17-18 and also assesses the moderating effects of maternal age, social support, and recent household adversity. Participants come from Birthto-Thirty, a longitudinal birth cohort study in Soweto, South Africa's largest peri-urban township and an epicenter of violent repression and resistance during the dissolution of the apartheid regime. Pregnant women were prospectively surveyed in 1990, and their children's psychiatric morbidity were assessed in 2007-8 (n = 304). Maternal prenatal stress in 1990 was not directly associated greater psychiatric morbidity during at ages 17-18. Maternal age and recent household adversity moderated the intergenerational mental health effects of prenatal stress such that children born to younger mothers and late adolescent/young adult children experiencing greater household adversity exhibited worse psychiatric morbidity at ages 17-18. Social support did not buffer against the long-term psychiatric impacts of prenatal stress. Our findings suggest prenatal stress is associated with greater vulnerability to the adverse psychological impacts of future stressors and represent possible intergenerational effects of trauma from apartheid in this sample.

PST 66 | The role of early-life adversity on telomere length and psychosocial wellbeing in children: Evidence from Growing Up in New Zealand

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Telomeres are DNA sequences located at the ends of chromosomes that protect DNA from damage. With each cell cycle, telomeres undergo natural attrition and are therefore, negatively associated with ageing. Telomere length is known to be associated with environmental exposures such as oxidative stress. As adversity has been linked to oxidative stress, we aim to determine the effect on telomere length. Adversity also has a psychosocial impact and therefore, we aim to determine whether 4-year telomere length is a potential biomarker of later psychosocial health. Our data has come from the Growing Up in NZ (GUiNZ) study (n=4394)

which has followed participants from the antenatal period onwards. DNA was extracted from saliva samples obtained from children at 4-years. Relative telomere length was measured by qPCR and initial statistical analyses were performed to determine the effect of adversity on telomere length at 4-years and subsequent psychosocial outcomes at 8-years. These investigations have found that, contrary to expectations, children with greater exposure to adversity typically had longer telomeres at 4-years. Additionally, anxiety at 8-years showed a significant positive association to telomere length at 4-years. The cause of these unexpected relationships is unknown. It is possible that children who experience adversity are more likely to demonstrate biological resilience through increased telomere length. This may act as a protection mechanism to balance the effects of oxidative stress on telomere attrition. Future investigations will address the effects of antenatal stress on telomere length at birth and telomere attrition in children between 4- and 8-years.

PST 60 | Biological and perceived stress in pregnant women following Hurricane Florence

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The effects of stress caused by natural disasters may be more pronounced in individuals with socioeconomic disadvantages (associated with race, marital status, etc). Pregnant women may experience unique challenges resulting in increased risk. We interviewed 37 pregnant women impacted by Hurricane Florence (eastern U.S., 2018). We assessed distress due to the hurricane using the Impact of Events Scale-Revised, and sociodemographic characteristics, social support, and food security using questionnaires four months after the event. We also collected hair samples and assessed hair cortisol concentrations in two 3-cm sections, with the proximal section representing stress in the three months immediately preceding data collection, or stress after the hurricane; and the distal section representing stress in the 3-6 months before data collection, or in the weeks before and at the time of the hurricane. We used linear regression to test relationships between hair cortisol and distress, and variations based on sociodemographic characteristics. We observed a positive relationship between distress and cortisol in the distal section (stress preceding and during the hurricane) (R^2=0.138, p=0.024), and a similar trend in the proximal section (stress after the hurricane) (R^2=0.097, p=0.061). Preliminary analyses suggest that distress was higher among ethnic minority women, women experiencing food insecurity, and unmarried women ($p<0.05$ for all). Unmarried women had higher cortisol concentrations in both proximal (p=0.045) and distal (p=0.031) sections, but cortisol concentrations did not differ markedly based on other sociodemographic characteristics. Results add to critical dialog on the influence of social disadvantages on distress and biological stress responses following disasters.

PST 89 | Work-related stress, mental health, and nail cortisol: A pilot study among aid and non-aid workers in Serbia

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Humanitarian work is often characterized by ongoing psychological stress and trauma, with implications for aid workers' mental and physical health. With the rise of humanitarian crises worldwide, aid workers situated on the other side of the calamities often experience primary and secondary trauma, such as direct dangers to their lives and/or witnessing others' suffering. Chronic occupational exposure to trauma may be further exacerbated by the lack of adequate psychological support programs for aid workers in the field. Although related occupational hazards in other demanding professions have been linked to mental well-being and altered neuroendocrine function, aid workers' mental health and physiology remain understudied. Here, we draw on mental health-related surveys, blood pressure, and fingernail cortisol data collected from aid workers and non-aid worker participants (n=33) in Serbia. We found that aid workers tended to report higher work-related effort-reward imbalance than non-aid workers ($p<0.1$) with a medium effect size (Cohen's d=0.65). However, there were no meaningful differences between aid workers and controls for secondary trauma exposure or PTSD-related symptoms (p's>0.4; Cohen d's<0.1) nor recent psychosocial stress (p>0.5; Cohen's

d=0.22). Aid workers and controls exhibited different correlations between effort-reward imbalance and stress-relevant physiology. Aid workers with higher effort-reward imbalance had substantially lower nail cortisol (r=-0.76) and lower blood pressure (r′s=-0.26, -0.35) than their peers potentially consistent with burnout. These associations were muted in non-aid workers (r′s<0.1). Although cross-sectional, our findings align with the idea that occupational hazards and effortreward imbalance may increase risks of ill-health if apt organizational support is not provided.

PST 18 Assessing precision in urinary hormonal sampling design

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Biological anthropologists balance concerns regarding data precision, accuracy, collection burden, and logistical limitations when designing sampling protocols. Systematic analyses of intra- and inter-individual variation in biological data can provide metrics of precision and inform optimal sampling designs. We used a series of Bayesian mixed models to assess precision in longitudinal urinary C-peptide and testosterone during puberty. Samples were collected from 2011-2014, up to 8 times per month every three months, from Indigenous Qom girls in Argentina. Samples were collected as part of the Life History Transitions project carried out by the Chaco Area Reproductive Ecology Program.

Our series of intermittently downsampled models estimated individual- and population-level C-peptide and testosterone trajectories from 35 participants using two years of premenarchal data. We fit Bayesian linear mixed models with sampling depths of three, two, and one sample(s) per month at quarterly, biannual, and annual intervals. We compared the standard errors around individual (random-level) testosterone intercept and slope estimates across sampling models, and those with smaller errors indicate higher precision. Compared to the most frequently sampled dataset (three samples per quarterly interval), several less frequently sampled models showed better precision in individual trajectory estimates, indicating that there is an optimal sampling threshold beyond which more samples decrease precision and increase noise. High intra-individual variability among repeated samples in these data impacts precision in a structured manner, and individual-level estimates showed neither the most precision with the largest datasets nor an overall association between sample size and standard errors.

PST 94 The effect of geographic proximity to family in a cohort of first-time Latina mothers

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Women throughout evolutionary history have relied on alloparental care for successful rearing of offspring. Today, these systems of support can be fractured by global migration. This can be especially consequential for new mothers who have steep learning curves and potentially greater dependence on others. To understand how geographic distance from alloparents influences postpartum mental health and thereby infant development, we interviewed 14 first-time Latina-American mothers on their satisfaction and mobilization of alloparental support in addition to its influences on their mental health. We focus on this cohort as Latinos in the U.S. have simultaneously the highest rates of multi-generational homes and of cross-border families compared to other ethnic groups. Using content analysis, we systematically reviewed semi-structured interviews to identify relevant themes. While mothers describe postpartum experiences as difficult and endorsed the benefits of having family near-by, they also describe how emotional support can effectively be dispensed across borders (e.g.,“Me gustaría que estuvieran mas cerca de nosotros...es igual de cercano el cariño”) and the strategic benefits of geographic distance to avoid family pressures (“I don't feel pressure [from mother-in-law living abroad] that I have to listen to what she says”). These findings suggest that alloparental care is more nuanced than previously thought, and that geographic distance may not hinder mothers′ access to alloparental care. We recommend programs aimed at improving the mental health of first, second, and higher generation postpartum women consider investment in phone and internet infrastructure to facilitate emotional support across geographic space.

Plenary | Living on an uncertain landscape. Fertility and livelihood responses to market integration and climate change

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Globalization has transformative effects on small-scale societies worldwide, and presents a window onto how humans adapt to extreme and rapid change. Small-scale societies are also particularly vulnerable to climate change, which often compounds challenges associated with market integration. Underlying this double exposure to rapid change is keen sense of uncertainty. Here I discuss how people navigate novel reproductive and livelihood decisions using 25-years of longitudinal, data spanning the transition from natural to contracepting fertility and from a subsistence to a marketintegrated economy in a small Maya community. A paved road built in the early 2000s introduced new ways of making a living, options how to spend time, access to hospitals and birth control. While the road offers many new opportunities, it also altered the decision-making landscape to one of uncertainty, where the benefits to adopt birth control, have a smaller family, commit to wage labor or invest cash cropping to pay for education are unknown, especially in light of recent crop failures and periodicity of tropical storms. Study finds that when outcomes are unknown, some double down on what they know, while others take advantage of new but risky options. As parents pursue divergent childbearing and economic strategies, it gives the foothold for inequality to emerge. Detailed ethnographic, biological and climate data give biological anthropologists a particular vantage point to view the multifaceted practices that help mitigate climate and market vulnerabilities and the ways that humans adapt to rapid change.

PST 77 | Associations among sex steroid hormones, bone mineral density, and fracture risk in a sample of adult forager horticulturalists

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Osteoporosis and fracture risk are significant health concerns for the aging population globally. Lifestyle factors including nutrient intake, physical activity, fertility and chronic immune challenges impact bone health across the lifespan. Sex steroid hormones regulate bone maintenance and bioenergetic allocation; yet, interactive effects between lifestyle and hormones on bone mineral density (BMD) and fracture risk remain largely unexplored in non-industrial populations. We investigate whether age, sex, 17β-estradiol (E2), and testosterone (T) predict thoracic vertebral BMD and fracture risk among Tsimane forager-horticulturalists in Bolivia (n=474, age 36-91, 47% female). Tsimane have high lifetime physical activity, and commonly report traumatic injuries, back pain, and functional limitations. Results indicate that younger age (β=-2.28, CI:-2.60 – -1.97, $p<0.001$) and higher (log) T (β=5.52, CI:0.81–10.24, $p<0.05$) are associated with increased BMD (adjusted for sex and fat free mass). E2 tends to positively predict BMD (β=4.27, CI:-0.63 – 9.17, $p=0.09$). The effect of T on BMD was greatest among Tsimane women aged 50+ (β=8.76, CI:0.74 – 16.77, $p<0.05$). Hormones did not impact vertebral fracture odds (adjusted for BMD and fat free mass), although being male increased odds (ORMale=2.77, CI:1.43-5.48, $p<0.01$). Research on BMD and fracture risk typically focuses on estrogens in women and emphasizes fall fractures because spontaneous fractures often go undiagnosed. These findings implicate testosterone—the precursor to E2 and an important but understudied bioenergetic regulator in females— as a key mediator for osteoporosis risk in an ecological setting more similar to which our biology evolved, opening novel avenues for evaluating hormone effects on skeletal health.

Podium B | Unpacking stress among food industry workers during the Covid-19 pandemic

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The Coronavirus pandemic exposed legacies of deep inequality, including who could afford protection from exposure. Food industry workers were among those in essential job force sectors who needed to continue fully inperson work throughout the pandemic and associated shutdowns. Consequently, their work and the lives they lived while working were repeatedly overhauled. This study gathered first-hand perspectives from people employed in the food industry about their experiences working through the pandemic. 34 open-ended phone interviews were conducted from May through September 2020 with people who grew (2), processed (5), cooked (9), sold (17), and/or delivered (5) food in the United States. Audio recordings were transcribed

and coded using Atlas.ti8.4 for themes of workplace change, safety, stress and health since the pandemic began. Stress was also assessed using the 4-item Perceived Stress Scale (PSS-4). Qualitative analysis showed that food industry workers were resilient in the face of months-long instability. Interviewees described inconsistency in hours, pay, and/or workload since the pandemic started, and support from employers or state/federal agencies was fleeting or delayed. Although mean PSS-4 scores were modest (4.8 on 0-12 scale), every interviewee described significant setback from the following stressors: concern about getting themselves or loved ones sick, financial insecurity, loneliness, or overburdening. These findings align with similar investigations into food workers′ limited protections and low-wages, many of which pre-dated the pandemic. Results of this study advocate for better workers′ support systems, and may guide future research priorities as we continue to understand mental, social, and biological impacts of Covid-19.

PST 57 | Do carriers of the attention deficit/hyperactivity disorder associated 7-repeat allele of the dopamine receptor D4 gene have improved nutritional status among seminomadic Kenyan Samburu adolescents?

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The 7-repeat (7R) allele of dopamine receptor D4 (DRD4) is associated with attention-deficient/hyperactivity disorder (ADHD). The 7R allele has been found at higher frequencies in populations with greater histories of migration or nomadic lifestyles. Consistent with this, previous analysis of traditionally nomadic, Ariaal, Kenyan men, found that individuals with the 7R allele had better nutritional status than those without the 7R allele while recently settled 7R carriers had worse nutritional status. Research on children in a neighboring population failed to replicate these results, potentially due to children′s behavior having little influence on their own subsistence and nutrition. Here we study adolescents from a seminomadic, pastoralist, Kenyan population, the Samburu, related to both previous study populations. Two communities were sampled: the more sedentary highland community and the more nomadic lowland community.

Because these adolescents play a substantial role in their own subsistence, we expect 7R carriers in the lowland community to exhibit behaviors which improve their subsistence abilities and therefore show less malnutrition (>BMIs) compared to non-carriers. Conversely, we expect the 7R allele to be less advantageous in the highland community where nomadism is rarer. We genotyped

161 adolescents between 9 and 22 years-old (14±3.1 years old; 48.1% male; 5.7±2.1 years in school). 58.4% of the study participants were identified as "poor." Mean BMI was 15.0 (±2.1). 38.9% of the adolescents had at least one 7R allele. While all data are currently available, we are refraining from conducting preliminary analyses until all models are designed and pre-registered to avoid inadvertent p-hacking.

PST 70 Endocrine and immune response to traditional hand-tap tattooing

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Tattooing is a stressor similar to exercise, but researchers have only begun to characterize endocrine and immune responses to this particular cultural stressor. While previous research indicates an allostatic adjustment to lifetime tattoo experience of modern electric tattooing, it is unclear how the body reacts to intensive traditional hand-tap tattooing. The Samoan pe′a is the traditional male-gendered tattoo administered through hand-tapping. The pe′a covers the thighs and lower torso and is administered over a short period, usually about two weeks (32 hours combined). The pe′a is administered by a perpendicularly hafted tattooing instrument with a wooden handle, which they use to tap ink into the skin. The process generally takes place outdoors on a grass mat while assistants stretch their skin. Before they established modern hygiene measures, infection was a common side effect, and a healed pe′a may have indicated good health. We sought to explore how the body adapts to this intense stressor by examining the endocrine and immune responses over multiple days of tattooing. We conducted a study of traditional tattooing in Samoa, where we collected saliva samples from Samoans receiving the pe′a over approximately one week. From one individual, we collected samples to assay the awakening response and a diurnal profile for the first day of tattooing. In this presentation, we describe

how cortisol, immunoglobulin A, and C-reactive protein react throughout the pe'a process. Exploring tattooing and endocrine function is important to understanding how culture interacts with endocrine and immune responses.

PST 21 | Does maternal early life stress predict offspring telomere length in the Philippines and, if so, via what physiological pathways?

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Childhood psychosocial stress is associated with earlier maturation, elevated inflammation in adulthood, and accelerated cellular aging, each of which is posited to lead to shorter telomere length (TL) in adulthood. Concerningly, when these physiological changes occur in mothers, they could also shorten their offspring's TL by programming oocytes or in utero through accelerating telomere shortening and programming offspring physiology. Shorter TL is associated with cellular senescence and increased functional decline with age; thus, this intergenerational TL shortening could link the mother's psychosocial stress to worse health in her offspring. Analyses of maternal stress predicting offspring TL are mixed. One study found that a mother's increased exposure to Adverse Childhood Experiences predicts shorter offspring TL. Another found no association between childhood sexual abuse and offspring TL.

Using data from the Cebu Longitudinal Health and Nutrition Survey, we investigate whether a mother's childhood stress, assessed by the Childhood Trauma Questionnaire (CTQ: 38.16±9.2) and several populationspecific exposures (e.g., parent death, frequency: 17.8%), predicts her offspring's TL (20-22 yrs; N=653-dyads). Additionally, we examine the physiological pathways through which this may occur. First, we test whether the mother's childhood stress predicts maternal physiology as measured by age at menarche (14.0±1.6y); C-reactive protein levels; and longitudinal change in TL across 11.25 ±0.11 years in adulthood. Then, we test if these associations mediate the broader relationship between maternal stress and offspring TL.

While all data are currently available, we are refraining from conducting preliminary analyses until all models are finalized and pre-registered to avoid inadvertent phacking (https://osf.io/9qy73/).

PST 40 | Measuring menstruation: methodological difficulties in studying things we don't talk about

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We launched a survey in early 2021 to examine changes in menstrual experience after an acute immune stressor – SARS-CoV-2 vaccination – after numerous reports of heavier bleeding after vaccination. We opted to use deviation from an individual's normal experience as the measure of interest for our study and incorporated numerous open-ended text box prompts to elicit detailed descriptions of a "typical" period and descriptions of changed experiences. We received over 165,000 submissions in six months, many from people who experienced heavier periods. Preliminary data from people who regularly menstruate (n=96,665) shows an average cycle length of 28.4 days, with 52% of people reporting bleeding for 3-5 days each cycle. Within this group, 14.1% would characterize their usual periods as "light," 65.7% as "moderate," and 19.6% as "heavy." Initial analysis of the first 3 months of data collected shows that among people who regularly cycle, approximately 42% of had heavier bleeding after vaccination. More notably, descriptions of "heavier" bleeding showed heterogeneity, including descriptions of clots, blood flow, texture, duration, amount, and color as well as references to previous life stages. Understanding these changes in the context of human biological variation would be well-served by attending to these descriptions and the

potential hemostatic and inflammatory mechanisms underlying the resulting menses. Thus, here we present mixed-method data integrating quantitative measures of menstruation (cycle length, bleeding duration, heaviness) with selfdescriptions of menstrual bleeding in a large and diverse sample to suggest additional valuable modes of inquiry for understanding menstrual variation.

Podium A | Evolutionary medicine perspectives on irritable bowel syndrome and future directions

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Irritable Bowel Syndrome (IBS) is a functional gastrointestinal disease, affecting upwards of 20% of people in the United States. IBS is a global phenomenon seemingly correlated with industrialization. IBS is well researched clinically, but this work focuses on proximate explanations (such as altered motility and intestinal hypersensitivity). No work has yet detailed ultimate explanations as to why IBS differentially affects people and populations. We propose that an evolutionary medicine approach is useful to understand, prevent, and treat this common yet debilitating disease.

We conducted a systematic literature review to synthesize the IBS literature within an evolutionary medicine framework. This resulted in analysis of 967 papers, including reviews, meta-analyses, and clinical trials. Our review suggested five potential evolutionary hypotheses for the cause of IBS, including a) a dietary mismatch accompanying a nutritional transition, b) an early hygienic life environment leading to a later inflammatory immune response, c) an artifact of an evolved fight or flight response, d) an outcome of decreased physical activity, and e.) a response to changes in environmental light-dark cycles. Our review also illuminated the additional empirical research needed to move forward in the evolutionary understanding of IBS. We find key limitations in the available data needed to understand early life, nutritional, and socioeconomic experiences that would allow us to understand evolutionarily-relevant risk factors. We identify a strong need for detailed survey data to distinguish potential causes and test evolutionary hypotheses, and lay out a course of research to push forward both theoretical understanding and clinical implications

In Person Abstract Submission for the 2022 Human Biology Association Annual Meeting

Humans at the extremes: Exploring human adaptation to ecological and social stressors

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The field of human biology has long explored how human populations have adapted to extreme environmental circumstances. Yet, it has become increasingly clear that conditions of social stress, poverty, and lifestyle change play equally important roles in shaping human biological variation and health. Drawing on our field's evolutionary and biocultural perspectives, human biologists are uniquely positioned to examine how the interplay between social and ecological domains influence the human condition. The presenters in this symposium highlight new and integrative approaches for understanding distinctive human strategies of adaptation and resilience in the face of extreme conditions. I explore human adaptability to the joint influences of extreme social and ecological constraints in a range of environmental settings – high altitude, the arctic and the humid tropics – and consider the important role that human biology can play in addressing the biological and health consequences of ongoing rapid global change.

PST 12 | Habituation and metabolic responses to stress: patterns from a study of cold stress among Indigenous Siberians and their significance for other types of stressors

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Metabolic responses to low temperature exposure are highly variable across individuals. Previous work documents an increase in resting metabolic rate and total energy expenditure among groups exposed to chronic, severe cold stress; however, exposure to mild cold stress triggers an increase in energy expenditure in some individuals and a decline in others. In order to explore the origins of this variability, we examined metabolic responses to mild cold stress among the Yakut, a population indigenous to northeastern Siberia. Data were collected from 57 young adults (32 women; 25 men; mean age 24.5 years old) during the early fall of 2015 (average high temperature was 12.8C; average low temperature was 0.6C). Participants reported the

number of hours they spent participating in outdoor activities in the past week. Anthropometric dimensions, cold-induced energy expenditure, and changes in supraclavicular skin temperature associated with brown adipose tissue (BAT) thermogenesis were assessed. Multiple regression analyses revealed that adults that reported spending more time outside during the previous week exhibited significantly smaller changes in cold-induced energy expenditure (p=0.04) and less evidence of BAT thermogenesis (p=0.006). This hypometabolic response is consistent with previous studies of habituation to mild cooling. Based on these results and previous work, we propose that metabolic responses to stress likely depend on previous stressor exposure, stressor severity, duration of the stressor, current energetic status, and age.

PST 4 | Demographic correlates of intestinal inflammation among adults from St. Louis, MO and Colorado Springs, CO

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Elevated intestinal inflammation often goes undetected among populations with limited access to medical care, even though it may be indicative of serious health complications (e.g., Inflammatory Bowel Disease, gastrointestinal cancers). Little is known about the prevalence of clinically elevated intestinal inflammation among otherwise healthy populations. Here, we examine effects of several sociodemographic factors on biomarkers of intestinal inflammation. We hypothesized that biomarkers of intestinal inflammation would be elevated in association with female sex, older age, crowded homes, lower socioeconomic status, and atopic/autoimmune conditions. Fifty-six adults (50.05% female, 17.1% male, 32.4% nonspecified) from Colorado Springs, CO and St. Louis, MO completed online surveys and provided stool samples to measure fecal calprotectin (FC; measured using the Quantum Blue reader [BUHLMANN Laboratories]) and Lactoferrin (LF; measured using TECHLAB rapid tests), biomarkers used to detect intestinal inflammation. 45% of individuals had elevated FC, while 12.5% were positive for LF. Chi-square tests indicated no significant relationship between sex (p = 0.401), number of pregnancies (p = 0.939), number of people living in the home

(p = 0.693), allergies or asthmatic conditions (p = 0.779and clinically elevated FC (FC > 50 ug/g). Income level was inversely associated with FC level (p = 0.038), with 64.7% of lower earners (≤$50,000/year) exhibiting elevated FC levels. These findings suggest resource availability may influence inflammatory state, possibly illuminating impacts of socioeconomic status on intestinal health. Research like this is important for understanding biocultural factors that may be contributing to inflammatory profiles in a non-clinical context

Podium A | Household size and the presence of alloparents predict infant gut microbial diversity in Cebu, Philippines

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The gut microbiome (GM) is a pathway that mediates the effect of physical and social environments on health. Since early life establishment of the GM affects immune system development, there is a need to understand how infants acquire commensal microbes. In addition to contact with mothers, interactions with alloparents may be a route through which the social environment seeds the infant GM. Because infant-alloparent interactions vary geographically and culturally, population-based studies that explore these factors are poised to connect infants' social and microbial environments to health outcomes. To this end, we coupled infant GM samples and interview data to test the hypothesis that household size and presence of alloparents is positively associated with infant GM diversity. We collected longitudinal fecal samples from infants living in Cebu, Philippines at two weeks (N=39) and six months (N=29) of age, and mothers provided information about household composition. Results of 16S rRNA bacterial gene sequencing show that infant GM diversity is influenced by household size and the presence of female alloparents in the home, with the strength and direction of effects varying by infant age. Neither the number of siblings nor the presence of male alloparents were associated with infant GM diversity. Our results suggest that the presence of female alloparents may be an important influence on infant GM establishment in this cohort. This study lays the groundwork for future research to test the effect of social caregiving on health outcomes that are associated with the development of the infant GM.

PST 1 | Intergenerational implications of state interventon: pregnancy as a space of vulnerability in Nuñoa, Peru

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Leatherman (2005) argues that the intersections of poor health, wealth inequalities, and social status can create "spaces of vulnerability" in particular populations, with episodes of illness leading to increased economic vulnerability and precarity. We extend Leatherman's spaces of vulnerability to the condition of pregnancy, showing ow policies intended to support the health of pregnant populations can have the unintended effects of worsening the economic and overall well-being. Consistent with the global development goal of reducing maternal mortality, the Peruvian government instituted "The National Strategic Plan for the Reduction of Maternal and Perinatal Mortality for the period of 2009 to 2015," which implemented intensive prenatal monitoring, the use of Casas Maternales or Mothers' Houses, and requirements for delivery in health centers. Although this intervention has successfully reduced maternal mortality, profound social and financial burdens result from this system. The cost of transportation and prolonged stays, straining of social support networks, and reliance on children for labor support at the cost of education are driving countless families deeper into cycles of poverty and poor health. To quantify the effects of the Casa Maternal system on producing vulnerabilities among women in Nuñoa, we employ a mixed-methods approach incorporating ethnographic and survey data from 93 mother/infant dyads to assess the relationship between reported pregnancy related-debt, time spent in the Casa Maternal, and infant outcomes in the first two years of life. Results of this study indicate that pregnancy can function as a space of vulnerability with intergenerational implications for mothers and their infants.

Podium D | Cesarean birth and breastfeeding outcomes in an Indigenous community with high breastfeeding support Resultados del parto por cesarea y la lactancia materna en una comunidad indígena con alto apoyo a la lactancia materna

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Cesarean section, while often lifesaving, may result in early breastfeeding problems or rapid postnatal offspring growth, which in turn may lead to suboptimal breastfeeding outcomes, such as introduction of complementary foods and weaning before recommended ages. However, these associations may be confounded by other factors that influence both cesarean risk and breastfeeding outcomes, including gestational risk factors, maternal birth and feeding preferences, and socioecological contexts of birth and breastfeeding practices. We assessed breastfeeding outcomes in association with cesarean and other gestational risk factors among Indigenous Qom mothers in Argentina (n = 89 maternal-infant dyads). In this community, C-section rates are nearly 50%, but most mothers practice prolonged, intensive breastfeeding, allowing us to examine associations between cesarean birth and breastfeeding with minimal heterogeneity in outcomes due to maternal preference and social support for breastfeeding. For further context, we interviewed a subset of mothers (n = 54 dyads) about their birth and early breastfeeding experiences. In Bayesian time-to-event frameworks, cesarean birth was not associated with time to complementary feeding and was associated with later time to weaning. Although some Qom mothers did report early breastfeeding problems, particularly following first birth, problems were not more frequent following cesarean delivery. Traditional postpartum kin and community support during a prolonged postpartum period may be instrumental in helping Qom mothers to overcome early breastfeeding problems due to cesarean birth or other risk factors.

Aunque a menudo salva vidas, la cesarea puede provocar problemas de lactancia materna temprana o un rapido crecimiento postnatal, lo que a su vez puede conducir a resultados de lactancia materna suboptimos, como la introduccion de alimentos complementarios y el destete antes de las edades recomendadas. Sin embargo, estas asociaciones pueden verse confundidas por otros factores que influyen tanto en el riesgo de cesarea como en los resultados de la lactancia materna, incluidos los factores de riesgo gestacionales, el parto materno y las preferencias de alimentacion, y los contextos socioecologicos de las practicas de parto y lactancia materna. Se evaluaron los resultados de la lactancia materna en asociacion con la cesarea y otros factores de riesgo gestacionales entre las madres indígenas Qom en Argentina (n = 89 díadas materno-infantiles). En esta comunidad, las tasas de parto por cesarea son de casi el 50%, pero la mayoría de las madres practican la lactancia materna prolongada e intensiva, lo que nos permite examinar las asociaciones entre el parto por cesarea y la lactancia materna con una heterogeneidad mínima en los resultados debido a la preferencia materna y el apoyo social para la lactancia materna. Para un contexto mas detallado, entrevistamos a un subconjunto de madres (n = 54 díadas) sobre su nacimiento y experiencias de lactancia materna temprana. En los marcos bayesianos de tiempo hasta el evento, el parto por cesarea no se asoci o con el tiempo hasta la alimentacion complementaria y se asocio con una mayor edad al destete. Aunque algunas madres Qom informaron problemas de lactancia materna temprana, particularmente después del primer parto, los problemas no fueron mas frecuentes después del parto por cesarea. El apoyo comunitario y famil- iar tradicional durante un período posparto prolongado pueden ser fundamentales para ayudar a las madres Qom a superar los problemas de lactancia materna temprana debido al parto por cesarea u otros factores de riesgo .

HBP/PST 9 | Maternal and fetal characteristics of stunted newborns and geographical altitude in the province of Jujuy Características maternas y fetales de recién nacidos acortados y altura geografica en la provincia de Jujuy

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The consequences of stunting in the newborn (RN) include increased risk of morbidity and mortality, deficiencies in child development and learning capacity, increased risk of infections, among others. This paper describes the maternal and fetal characteristics of shortened RNs from different altitudinal floors of the province of Jujuy. The data belong to Sistema Informatico Perinatal (2009-2014). We categorized as stunted those RNs whose length for gestational age was less than the P3 of the INTERGROWTH-21st standard. The prevalence of stunted RNs was analyzed according to birth size, gestation time, maternal height, preconception maternal nutritional status and altitude of the maternal place of residence during gestation (Puna [3000-4000msnm], Quebrada [2000-3000msnm], Valles [1000-2000msnm] and Ramal [500-1000msnm]). The region with the highest prevalence of shortened RNs was Quebrada (13.4%), followed by Ramal (6.2%), Puna (3.9%) and Valles (1.5%). More than 40% of the shortened RNs of Quebrada and Ramal were also small for gestational age. We observed a higher regional prevalence of stunting in preterm RNs except in Quebrada, which presented a higher proportion of

stunted to term. In all regions, as maternal height increased, the rate of stunting decreased.

The prevalence of stunting was similar in all categories of preconception nutritional status. Risk factors for shortfor-gestational-age morbidity and mortality will coexist with the stunted phenotype regardless of geographic height.

Las consecuencias del acortamiento (L/EG<P3) en el recién nacido (RN) incluyen aumento del riesgo de morbimortalidad, deficiencias en el desarrollo infantil y capacidad de aprendizaje, mayor riesgo de infecciones, entre otras. Este trabajo describe las características maternas y fetales de RN acortados procedentes de distintos pisos altitudinales de la provincia de Jujuy. Los datos pertenecen Sistema Informatico Perinatal (2009-2014). Se categorizo como acortados a los RN cuya longitud para la EG era inferior al P3 del estandar INTERGROWTH-21st. Las prevalencias de RN acortados fueron analizadas de acuerdo con el tamaño al nacer, el tiempo de gestacion, la talla materna, el estado nutricional materno preconcepcional y altitud del lugar de residencia materna durante la gestacion (Puna[3000-4000msnm], Quebrada [2000-3000msnm], Valles[1000-2000msnm] y Ramal [500-1000msnm]). La region con mayor prevalencia de RN acortados fue Quebrada (13,4%), seguida por Ramal (6,2%), Puna (3,9%) y Valles (1,5%). Mas del 40% de los RN acortados de Quebrada y Ramal también fueron pequeños para EG. Se observaron mayores prevalencias regionales de acortamiento en RN pretérminos excepto en Quebrada que presento mayor proporcion de acortados a término. En todas las regiones al aumentar la talla materna disminuyo la proporcion de acortados. La prevalencia de acortados fue similar en todas las categorías del estado nutricional preconcepcional. Los factores de riesgo de morbimortalidad de PEG y prematurez coexistiran con el fenotipo acortado independientemente de la altura geografica .

PST 49 | Relationship between food access and dietary diversity in Nicaraguan households

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In 2020, nearly one-in-three people globally lacked access to adequate food; that is, they were food insecure. Food insecurity (FI) has four dimensions – availability, access, utilization, and stability – and is linked to poor health outcomes. Our understanding of the relationship between FI and health, however, is compromised by the fact that most research on FI focuses on the access dimension. This has resulted in a poor understanding of the utilization dimension; that is, how people cope with inadequate access to food as manifest by food choice. Here, we explore the relationship between maternal perceptions of food access and food choice, measured as dietary diversity, in 706 Nicaraguan households across urban, peri-urban and rural settings, and hypothesize that as food access worsens, dietary diversity will decline. Access was measured using the Latin American and Caribbean Food Security Scale. Dietary data were collected via a locally-developed, 7-day food-frequency questionnaire and converted to a household dietary diversity score (HDDS). The relationship was analyzed via multiple regression and ANOVA. We found that 82% of households experienced insufficient access to food and had a mean HDDS=10.9±1.2 out of a maximum score of 12. As access to food worsened, dietary diversity declined (r^2=0.15, p<0.001), and the effect of food access on HDDS varied across settings (F=3.53, p=0.02). While we found a relationship between food access and HDDS, the high prevalence of insufficient access to food combined with a high average HDDS suggests that HDDS is too blunt an instrument to capture the lived experience.

PST 28 | Water insecurity is associated with changes in hydration strategies during the nutrition transition

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Water insecurity has emerged as an important driver of nutrition, and has been hypothesized to lead to overnutrition during the nutrition transition as access to water alternatives increase. One pathway may be the replacement of contaminated water with the consumption of market and non-market beverages. Therefore, this study examined how water insecurity is associated with market and traditional hydration strategies in a context of the nutrition transition. Using logistic regression with robust standard errors clustered by community residence, we analyzed water insecurity (using the HWISE scale) and beverage intake data among Tsimane′ foragerhorticulturalists (n=455) living in hot-humid, lowland Bolivia. For men and women, each point higher water insecurity score (using the HWISE scale) was associated with 23% (OR=1.23; 95% CI=1.01-1.50; P=0.035) and 27% (OR=1.27; 95% CI=1.06-1.52; P=0.008) higher odds of

consuming a sugar-sweetened beverage in the past week, respectively. For men, each point higher HWISE score was also associated with 13% (OR=1.13; 95% CI=1.10-1.16; P<0.001) higher odds of drinking fermented chicha and 16% (OR=1.16; 95% CI=1.02-1.32; P=0.022) higher odds of consuming market liquor. Household income was strongly associated with consumption of sugary drinks, but was inversely associated with fermented chicha consumption for men. These findings suggest that during the nutrition transition higher perceived water insecurity is associated with consumption of sugar-sweetened beverages and chicha. Consumption of non-water beverages is a coping strategy to water insecurity that may have long-term unintended nutritional consequences due to excess calorie consumption, which may lead to future cardiometabolic risk and changes in body composition.

PST 29 | A dried blood spot method for the quantification of Helicobacter pylori antibodies

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Helicobacter pylori (H. pylori) is a bacteria that infects the stomach and has been associated with a number of gastrointestinal diseases worldwide, including gastritis and gastric cancer. Prevalence of H. pylori varies considerably; the highest rates are seen in developing countries and are thought to be related to sanitation. Serological tests examining H. pylori antibodies can be used to measure the prevalence of H. pylori infections. A field friendly collection method, such as that offered by dried blood spots (DBS), would allow researchers to understand prevalence rates across more diverse environments, facilitate more research aimed at understanding the causes and consequences of H. pylori infection, and more easily allow the measure of H. pylori in field-based studies. This paper presents a method for the analysis of H. pylori antibodies (IgG) in DBS. This method is a modification of a commercially available kit (Abnova # KA0220) and requires only two 3.2mm discs of dried blood from each participant. Analysis of matched plasma and DBS samples showed a high level of agreement (Lin's concordance correlation coefficient = 0.94). High and low controls show low interassay and intra-assay variability (CV′s < 10.0 %). The lower limit of detection for the assay was 0.108 U/mL and the seropositive cut-off for DBS was calculated as 13.158 U/mL. Analyses in peripheral versus center DBS punches were not significantly different (t(10) = -0.435, p = 0.673)). This method provides an easy and accurate way to investigate H. pylori across a diverse range of research settings.

Podium B | Gendered relationships between changes in household dynamics and psychological distress during the COVID-19 pandemic: Results from a pilot study in New Mexico colonias

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The COVID-19 pandemic resulted in significant changes in household and family responsibilities and was also associated with increased psychological distress. Early research has shown that burdens associated with these changes have more frequently been felt by women, especially among those from marginalized communities. This study examines gendered relationships between changes in household responsibilities and psychological distress among adults living in colonias in southwestern New Mexico. Colonias are rural communities in the four U.S. states bordering Mexico which have limited access to basic services and infrastructure. Data were collected via online, phone, and mailed paper surveys from 192 adults. We did not detect a significant difference in distress score between men and women. Compared to the period before the pandemic, women were significantly more likely to report spending more time with their children, and on homeschooling, than men. Spending more time with children was not independently associated with distress, but we detected a significant interaction between gender and this variable, such that men who spent more time with their children had significantly higher distress scores than the other groups. Our data suggests that men have more difficulty coping with changes in household dynamics than women during the pandemic. Additional analyses will explore other changes in household dynamics and how their relationship to distress varies by gender, including incorporating data from semi-structured interviews conducted with a sub-sample of participants to shed more light onto the results of the survey data.

PST 65 | Relating Status to Access to

Healthcare in Pre-Contact Peru During the Middle and Late Horizon Periods

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Communities in Pre-Contact Peru, specifically those under the rule of empires were highly stratified and had minimal opportunities for social mobility. Due to the stratification resources were divided by the social classes, with more access available to those of a higher standing. While not often thought of as a resource access to healthcare is vital to an individual's survival. By analyzing skeletal remains for recovery from trauma and surgical intervention, access to healthcare can be assessed and their status in life can be determined through their grave good and burial treatments. Nutritional markers were also examined in order to create a complete picture of the individuals life and health history. Analysis was completed on raw data from skeletal research collections and results show that most members of the populations suffered from some form of trauma during their lifetime, from which they recovered and survived often for many years following the trauma. It also appears that surgical intervention was available to all and was not restricted based on gender or age, suggesting that all members of the community had equal access to healthcare. These results must be taken with caution as few individuals had grave goods associated with them and assessing status was more difficult than expected. These results are unexpected as other resources were heavily divided or organized between the different classes within the community. This new avenue of research offers a new perspective on healthcare methods, accessibility, and the value of community members in Pre-Contact Peru.

HBP/PST: 1 | Secular changes of the midupper arm composition in schoolchildren from the northeastern Patagonia (Chubut, Argentina)

Cambios seculares de la composicion media superior del brazo en escolares del noreste de la Patagonia (Chubut, Argentina)

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The aim of the study was to determine the presence of secular changes in mid-upper arm composition of boys and girls, between 6-14 years old, from Puerto Madryn (Chubut, Argentina) during a decade. The analysis included the comparison of two groups (G) of students who attended schools from different neighborhoods of Puerto Madryn, located in the northeastern Patagonia. G1(n=3114) was measured between 2001-2006 and G2 (n=2799) was surveyed during 2014-2016. To estimate mid-upper arm composition were measured tricipital skinfold thickness (in millimeters) and arm circumference (in centimeters). Then, from these variables, total arm area (TAA), arm muscle area (AMA) and fat arm area (AFA) were calculated.

The software LMS ChartMaker Pro were used to calculate the 5th, 50th, 85th, 90th and 95th percentiles for each sex and age from both G. Comparisons of percentiles between G were analyzed graphically and using the Wilcoxon test ($p<0.05$).

Results obtained showed significant differences in all percentiles of arm areas analyzed in both sexes. Also, differences observed indicated that the higher values of TAA, AMA and AFA corresponded to boys and girls from G2. The study carried out allows to conclude that mid-upper arm composition of child and youth from the Patagonic northeastern record positive secular changes during the first decade of 21th century. This same trend has been seen in other variables of this population and could be related with the increment of weight and ponderal excess observed in schoolchildren from Puerto Madryn in the last years.

El objetivo del estudio fue determinar la presencia de cambios seculares en la composicion media superior del brazo de niños y niñas, entre 6-14 años, de Puerto Madryn (Chubut, Argentina) durante una década. El analisis incluyo la comparacion de dos grupos (G) de estudiantes que asistían a escuelas de diferentes barrios de Puerto Madryn, ubicados en el noreste de la Patagonia. G1(n=3114) se midio entre 2001-2006 y G2 (n=2799) fue encuestado durante 2014-2016. Para estimar la composicion media superior del brazo se midio el grosor tricipital del pliegue cutaneo (en milímetros) y la circunferencia del brazo (en centímetros). Luego, a partir de estas variables, se calcularon el area total del brazo (TAA), el area muscular del brazo (AMA) y el area grasa del brazo (AFA). El software LMS ChartMaker Pro se utilizo para calcular los percentiles 5, 50, 85, 90 y 95 para cada sexo y edad a partir de ambos G. Las comparaciones de percentiles entre G se analizaron graficamente y utilizando la prueba de Wilcoxon ($p<0,05$). Los resultados obtenidos mostraron diferencias significativas en todos los percentiles de las areas del brazo analizadas en ambos sexos. Asimismo, las diferencias observadas indicaron que los valores mas altos de

TAA, AMA y AFA correspondieron a niños y niñas de G2. El estudio realizado permite concluir que la composicion media superior del brazo de niños y jovenes del noreste patagonico registra cambios seculares positivos durante la primera década del siglo 21. Esta misma tendencia se ha observado en otras variables de esta poblacion y podría relacionarse con el incremento de peso y exceso ponderal observado en escolares de Puerto Madryn en los últimos años.

Plenary | Human Biologists for New Approaches to Metabolic Health: How anthropological perspectives contribute to our understanding of obesity and health

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The Worl Health Organization estimated that in 2016 650 million people worldwide had obesity, categorized using the body mass index (BMI). The obesity epidemic exposes many individuals to greater risks of metabolic diseases, yet many have noted the shortcomings of BMI to estimate metabolic health across populations, emphasizing the necessity to consider a wider range of factors contributing to extreme weight gain and poor metabolic health. Here we discuss how human biologists can provide a more holistic picture of metabolic health by incorporating biocultural, evolutionary, and populationspecific perspectives in our work. We highlight existing studies on physical activity, metabolism, and lifestyle that have enhanced our understanding of metabolic health among different populations. We put particular emphasis on preliminary work on brown adipose tissue (BAT), a metabolically active tissue, generating heat under mild cold exposure. Its effects on metabolic rate and glucose disposal suggest it may contribute to metabolic health in addition to playing a potential role in cold adaptation. Using examples of recent studies on BAT activity, examining its association with body fat and obesity from biocultural and evolutionary perspectives, we show how to make use of the anthropological toolkit to gather accurate estimates of body composition and metabolic health in future research. The growing interest in BAT by human biologists makes it an ideal candidate for the implementation of anthropological approaches to metabolic health beyond the use of BMI and emphasizes how anthropologists can contribute to public health and help combat the growing threat of the obesity epidemic.

PST 92 | Household chaos and infant feeding: the role of infant temperament

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Household chaos (HC) has been inversely associated with responsive parenting and positively associated with consumption of energy-dense foods, risk factors for poorer child growth and development. Research suggests that HC may affect how parents interpret and respond to infant feeding cues. This study examined associations between HC, maternal perception of infant temperament, and age-inappropriate infant feeding among 428 motherinfant pairs enrolled in 'Mothers & Others,' a homebased randomized controlled trial to prevent obesity. HC was measured at 28 weeks' gestation (baseline). Maternal perception of infant temperament and infant diet were assessed at months 3, 6, 9, and 12 postpartum. Ageinappropriate infant feeding was defined as infants whose current diet did not align with the American Academy of Pediatrics (AAP) guidelines for pediatric nutrition. Longitudinal logistic mixed-effects models were used to evaluate associations between household, maternal, and infant characteristics and age-inappropriate infant feeding. Generalized structural equation modeling tested whether infant distress to limitations (e.g., fussiness) mediated the association between HC and age-inappropriate infant feeding. The prevalence of age-inappropriate infant feeding increased over time from 29.0% at 3 months to 67.7% at 12 months. Age-inappropriate infant feeding was associated with lower maternal education, increased maternal perception of infant fussiness, a shortened breastfeeding duration, and HC. Infant fussiness mediated the relationship between HC and age-inappropriate infant feeding, in adjusted models. Our analysis suggests that a chaotic household environment increases maternal

perception of infant fussiness and that fussier infants are more likely to be fed against AAP guidelines, a risk factor for poor growth.

Podium D | Using complete blood count tests to explore the etiology of anemia, infection and inflammation in children experiencing food insecurity in a rural agricultural community in Veracruz, Mexico

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Parasitic, gastrointestinal and respiratory infections are some of the leading causes of morbidity and mortality among children in low- and middle-income countries. In poor rural subsistence communities, undernutrition compounds the problem. Our previous work in Ocotepec, Veracruz, a small rural subsistence community in Eastern Mexico with very high levels of food insecurity, poor housing and sanitation and limited access to health care, has documented a 90% prevalence of multi pathogenic parasitism, and 30% growth faltering among children under 5 years of age. Here we expand the analysis to document the prevalence of infection, inflammation, anemia and nutrient deficiency. Specifically, we use a battery of indices of red blood cells, white blood cells and platelet counts to explore not only the prevalence but to shed light on the potential etiology of the chosen health indicators. By capitalizing on the detailed information afforded by clinical tests of single fasting venous blood samples obtained from 112 children ages 6 months to 16 years, we aim to provide a more nuanced analysis of the associations between nutritional and health biomarkers beyond those typically used in field settings. These results contribute to our understanding of the life history trade-offs incurred in a population living in a highly pathogenic, nutritionally poor but energetically sufficient environment, characteristic of populations undergoing nutritional and epidemiological transitions.

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Plenary | "Nothing Burns Like the Cold": Human biocultural adaptations to extreme cold

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The Arctic has felt the dramatic effects of climate change sooner and more acutely than other parts of the world, making it an ideal location for studying both cold climate adaptations and climate change resilience. Though work on cold climate adaptations has a deep history within the fields of anthropology and human biology, that work has largely separated the biological from the cultural. However, to understand how humans in the past have and continue to survive and thrive today in harsh, cold, and now rapidly changing environments, a biocultural approach is necessary. Here I will briefly review the foundational work on cold climate adaptations including classic Bergmann, Allen, and Thomson rules as well as early work assessing metabolic differences among Indigenous cold climate populations. From there, I will discuss some of the groundbreaking work currently taking place, highlighting cold climate adaptations such as brown adipose tissue (a heat generating organ), physical activity levels, metabolic rates, and behavioral/cultural mechanisms. Finally, I will present a path forward for future work on cold climate adaptations with a focus on using resilience and situated biologies frameworks to better assess human biocultural capacities. These two frameworks will provide a holistic view of human adaptation and biocultural resilience in a rapidly changing Arctic, and demonstrate that human biology and anthropology have a great deal to contribute to the conversation around, the human capacity to cope with, and the ability to address climate change.

PST 33 | Factors associated with self-reported weight gain during the COVID-19 pandemic: Results from a pilot study in rural New Mexico communities

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The COVID-19 pandemic and associated public health policies instigated radical changes in the day-to-day lives of millions of Americans, including impacts on factors associated with weight management. Rapid public health assessments highlighted food insecurity, financial insecurity, changes in childcare, and psychological distress as factors contributing to weight changes, and particularly weight gain. These public polling projects may miss, however, the experiences of harder-to-reach populations, such as among those living in rural communities with inadequate infrastructure. We conducted a pilot study of COVID-19 perceptions, knowledge, and experiences among adults living in colonias (unincorporated rural communities along the US-Mexico border) in southwestern New Mexico. This study reports on factors associated with weight gain in this community. Data were collected from 192 individuals using online, phone, and mailed paper surveys. Over 43% of participants reported weight gain of 5 or more pounds. Factors negatively associated with weight gain included age and White/Caucasian identity. Factors positively associated with weight gain included female gender identity, Hispanic/Latinx identity, spending more time with one's own children, decline in financial status, and psychological distress. Further analysis will examine potential confounding and interactions among these variables in conjunction with results from qualitative interviews conducted with a subsample of participants. These results highlight how health-related changes associated with disasters are not evenly distributed among the general population. Weight changes may also be a bellwether of future shifts in chronic disease epidemiology, and studies like these can provide new information on how disasters impact human health in the short- and long-term.

PST 24 | Relationships between positive postpartum experiences, social support, and mental health during the COVID-19 pandemic

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Resilience to stressful situations remains a poorly studied aspect of mental health, especially during the COVID-19 pandemic, when mental health has declined for many individuals. Links between mental health, resilience, and associated factors (e.g., social support) may be especially important in vulnerable groups like new parents, potentially easing the transition to parenthood while decreasing postpartum depression risk. To test links between resilience, social support, and mental health, this study used data from the COVID-19 And Reproductive Effects (CARE) study, an online convenience survey of U.S. participants. Third wave data collected from individuals at least five months postpartum (n = 221) were used. We hypothesized that individuals reporting positive pandemic postpartum experiences (used as a proxy of resilience) and greater social support (i.e., reported that they "always" or "often" felt they had good social support in the last three months) would have lower depression scores, as measured by the Edinburgh Postnatal Depression Survey. Interestingly, 85.5% of participants reported positive postpartum experiences during the pandemic. Commonly cited positive aspects included reduced pressure to take part in social events and positive breastfeeding experiences. Linear regression analyses indicated that participants who reported positive experiences (B = -1.97, p = 0.012) and consistent social support (B = -1.67, p = 0.003) exhibited significantly lower depression scores than those reporting no positive experiences and inconsistent social support, respectively. These findings suggest that strategies to enhance positive experiences and social support during the postpartum period may help protect against postpartum depression, both during and after the COVID-19 pandemic.

PST 70 Socioeconomic status, appetite traits, and infant body size in Samoa

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In high-income countries, obesity prevalence is generally highest among low socioeconomic status (SES) groups. Reasons for this are multifactorial but socioeconomic factors are hypothesized to affect appetite trait development in early life. Few studies have examined the relationship between SES and appetite traits in low- and middleincome countries like Samoa, where obesity still disproportionately affects high SES groups. We therefore explored cross-sectional and

longitudinal associations between SES, appetite traits, and body size among Samoan infants. Mother-infant dyads participated in data collection when infants were approximately 2 (n=105), 4 (n=117), and 21 (n=113) months old. Appetite traits were characterized using the Baby Eating Behavior Questionnaire at 2 and 4 months and the Child Eating Behavior Questionnaire at 21 months. Both are maternal-report questionnaires recently validated for use in Samoa. SES tertiles were constructed based on household asset indices. SES was positively associated with infant body mass index (BMI) at all time points, even after controlling for potential confounders, including birth weight, maternal BMI, and exclusive breastfeeding status. High SES infants experienced 0.25 ± 0.12 kg greater weight gain between 2 and 4 months ($p = 0.03$) and 1.09 ± 0.35 kg greater weight gain between 4 and 21 months ($p = 0.003$) than low SES infants. However, we found little evidence that appetite traits explained these relationships. Other aspects of the food environment/culture likely play a larger role in establishing the early association between SES and body size among Samoan infants.

PST 86 | Variation of human milk lactoferrin in relation to maternal-infant illness status among dyads from northern Kenya

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Background: Infectious diseases are a leading cause of child mortality. Exclusive breastfeeding has been a strategy to reduce the risk of infectious diseases among infants. Despite the benefits of breastfeeding, there is still considerable variation between infant morbidity among breastfed infants. This may be due to differences in milk immune component concentrations. Research remains limited regarding the factors that impact milk immune component concentrations. The responsive model posits that milk immune component concentrations increase in response to infant illness. Less is known about how maternal illness status relates to immune component concentrations. This study evaluated associations between lactoferrin concentrations in milk and maternalinfant illness status.

Methods: Milk specimens from mothers (n = 83) of northern Kenya were assayed for lactoferrin using ELISA. Maternal and infant illness data were obtained from 10-day morbidity symptom recalls. Regression models were constructed to evaluate the association between milk lactoferrin and maternal-infant illness status.

Results: There was a positive association between maternal symptoms of illness and lactoferrin ($\beta = 0.26$, $p = 0.02$, 95% CI 0.048, 0.47), after adjusting for maternal age, time postpartum, and parity. There was no association between lactoferrin and infant symptoms of illness. Conclusion: These results suggest that elevation of lactoferrin may be responding to maternal illness more so than to infant illness. These results are congruent with literature reporting that milk immune component concentrations vary in relation to maternal experiences with pathogens and immunological memory. Future research should consider maternal illness to further understand the variation of milk immune components.

Podium A | Stigmatizing attitudes toward refugee communities in Turkana County (Kenya) in relation to nutritional status

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Host community attitudes toward refugees are shaped through the local economic, political, and social contexts by which they interact. In northwest Kenya, past work found that Turkana residing near Kakuma Refugee Camp were in better energetic condition than less proximal communities, suggesting benefits of the refugee camp, possibly through trade and resource availability. However, host community psychological burdens near Kakuma were higher than less proximal locations. Here, we assess the same four Turkana communities (Kakuma, Lorengo, Lokichoggio, and Lorugum; N=586) varying in engagement with refugees to test for differences in stigmatizing attitudes across locations and to assess the links between stigmatizing attitudes and nutritional status (via skinfolds). Across locations, Turkana who expressed more stigmatizing beliefs about refugees were in better nutritional condition. However, location significantly moderated this association. For Kakuma, greater stigmatizing attitudes were associated with thicker skinfolds, while in Lorugum there was a negative association between stigmatizing attitudes and skinfold thickness. This suggests that attitudes toward refugees in locations with more interaction with refugees (Kakuma) worsened even with increased access to nutritional and, potentially, economic resources, while decreased exposure (Lorugum) had the opposite relationship. Lorengo and Lokichoggio had higher

stigmatizing attitudes than Kakuma, yet the slope relating these beliefs to skinfolds was flat. Variation in the relationship between nutritional status and attitudes toward refugees points to contextualizing factors such as the level of local development, prevalence of trade and employment, and proximity of host communities to the camps in shaping the intersections of physical health and cognitive attitudes.

PST 20 | Childhood and early adulthood social and environmental factors affecting variation in vitamin D production in young adulthood in Cebu City, Philippines.

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While vitamin D is commonly known as a necessary component for bone health, less commonly known is the role vitamin D plays in many other human tissues and organs with over 1000 target genes throughout the body. Because of the numerous linkages to health outcomes, it is imperative to understand the developmental and environmental factors that shape vitamin D production throughout the life course. Data from the Philippines (latitude 10.3 N) was used to assess vitamin D variation among people in the Cebu Longitudinal Health and Nutrition Survey. Vitamin D assays were performed from whole blood samples from a sample of 349 young adults ages 20-22 years (66 males, 283 females) to determine circulating vitamin D levels. Socio-cultural environmental factors in both childhood and adulthood were analyzed to determine the impact of those variables on vitamin D levels in adulthood. Vitamin D status was then analyzed in conjunction with already existing DNA methylation data from the same participant samples. DNA methylation is a mechanism through which environments during development can regulate genome activity in adulthood. Epigenetic factors did not appear to have lasting effects on vitamin D production. However, early-life social and environmental factors do have important roles in shaping vitamin D variation in young adulthood in metropolitan Cebu, providing avenues for further research into risk factors for decreased vitamin D production and areas to target for prevention.

PST 44 | Fertility & the Feminine Body in Biomedicine: An Exploration of Transitory Fertility & Reproductive Agency in Cobbs Creek, West Philadelphia

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The relationship between the psychosocial experience of fertility and its biological basis in women is underresearched and under-theorized. In order to create standard assessments informed by both the mental and the physical states of female fertility, qualitative work is necessary to augment our biological knowledge and provide an ethnographic lens on how women contextualize fertility outside of a biomedicine. Here, I operationalize the concept transitory fertility, a term I use to describe moments of perceived variability in fertility status among women. It is a concept currently unrecognized in biomedicine. Women who may be physically able to conceive naturally experience emotions similar to 'infertile' women when trying to become pregnant. Qualitative evidence of the ideas surrounding the female body and fertility is presented from the perspective of women in the low-wealth neighborhood of Cobbs Creek, West Philadelphia in partnership with Sayre Health Center (SHC). Cobbs Creek is a medically underserved area currently composed of 73% African Americans. In 2017, 35.0% of SHC service area population was below the federal poverty line compared to 13.5% of Pennsylvania. Over 6 months, semi-structured interviews were conducted virtually with women. Preliminary analyses illuminate the limits of biomedical constructs to contend with shame and anxiety surrounding fertility. Further, the stress associated with fertility struggles may contribute to reduced ability to conceive in women. The creation of a scale to measure transitory fertility will allow for the study of the relationship between women's perceptions of fertility, their biological fertility, and their ability to become pregnant.

Validation of I-FABP as a Blood-Based Biomarker of EED

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Environmental Enteric Dysfunction (EED) is a subclinical condition caused by consistent fecal-oral contamination leading to blunting of intestinal villi, and appears to play a significant role in the etiology of malnutrition. Individuals with EED often experience increased intestinal permeability, increased enteric and systemic inflammation, and reduced nutrient absorption, but current methods for assessing EED are invasive, resource-intensive, and time-consuming. Dried blood spot (DBS) technology, in which drops of whole blood are collected on filter paper from a fingerstick, offers a minimally invasive method of detecting EED. We present the development and validation of a DBS protocol for the measurement of I-FABP, a biomarker released into the intestinal circulation following enterocyte damage. The protocol employs a commercially available human I-FABP ELISA kit, which was optimized for use with a single 3mm DBS hole punch. Matched DBS from a fingerstick and venous blood samples from n=80 individuals aged 18-45, were collected in September and October 2021. Whole blood was collected and used to make DBS samples after which it was spun down to separate plasma for matched sample testing. All DBS cards were stored at -25°C, while plasma samples were stored at -80°C, until I-FABP levels of an individual from all three sample types were assessed with the ELISA assay. Thus far, results indicate that I-FABP is a valid measure of EED and compatible with DBS sampling. The development of this minimally invasive assay improves our ability to assess EED in low-resource and non-clinical settings where it is most prevalent.

Podium D | Lactational programming inverted: the role of development in programming milk composition in later life

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Research into the developmental origins of health and disease (DOHAD) has invested considerable resources into understanding how early life influences later health. While the majority of research into DOHaD has focused on models of disease causality, there is an emerging understanding of how development influences normal human biological variation. However, outside of the dairy industry, almost no research has focused on the potential for developmental programming OF the mammary gland and subsequent milk composition.

We investigated this topic among participants (n=106) in the Cebu Longitudinal Health and Nutrition Survey (CLHNS). Here, we specifically investigate the association between growth velocity during the first year of life and milk composition in adulthood. Predictors were 1) length velocity from birth to six months postpartum; 2) length velocity from six to twelve months postpartum. Outcome measures were milk nutrients (fat, protein, sugars, energy), and hormones (leptin, adiponectin).

There were no significant associations between maternal length gain from birth to six months of life and milk composition. Maternal length gain from six to twelve months of life was significantly associated with milk total energy and fat. Each 1 cm increase in length gain from 6 to 12 months predicted a 0.16 ± 0.07 g/dL increase in milk fat and a 1.47 kcal/dL increase in milk energy. The associations between length gain from six to twelve months and milk leptin and adiponectin approached significance. There were no associations between any measure of length gain and milk sugar or protein.

HBP/PST 5 | Body fat percentage and adipose distribution in adolescents from Jujuy-Argentina

Porcentaje de grasa corporal y distribucion adiposa en adolescentes de Jujuy-Argentina

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Excess abdominal fat in children and adolescents, as well as in adults, is associated with metabolic and cardiovascular alterations. This paper compares the percentage of body fat and the adipose distribution in Jujuy adolescents between 10 and 18 years old. The sample included 218 males and 322 females. The percentage of body fat was estimated with Slaughter's formula and categorized into: with (EGC) and without excess body fat (SEGC). The waist-hip index was calculated and classified as: with (EGA) and without excess abdominal fat (SEGA). Sex differences were analyzed with z test. 46% of men and 50% of women had CGD while 59% and 72% of men and women respectively registered EGA. No intersex differences were observed for EGC, but for EGA

where women presented higher percentages ($p<0.05$). When analyzing both indicators together, 72% of men and 84% of women presented EGC-EGA while those SEGC-SEGA, represented 52% of men and 40% of women. In 28% of men and 16% of women, EGC-SEGA was registered and 48% of men and 60% of women presented SEGC-EGA. Significant percentages of excess body and abdominal fat are observed in the adolescents analyzed, with women showing a greater tendency to accumulate abdominal fat. The correct nutritional assessment requires complementing the evaluation of the percentage of fat with its distribution to identify cardio-metabolic risks from early in life. El exceso de grasa abdominal en niños y adolescentes, al igual que en adultos, se asocia con alteraciones metabolicas y cardiovasculares. En este trabajo se compara el porcentaje de grasa corporal y la distribucion adiposa en adolescentes jujeños entre 10 y 18 años. La muestra incluyo 218 varones y 322 mujeres. Se estimo el porcentaje de grasa corporal con la formula de Slaughter y se lo categorizo en: con (EGC) y sin exceso de grasa corporal (SEGC). Se calculo el índice cintura-cadera y se lo clasifico en: con (EGA) y sin exceso de grasa abdominal (SEGA). Se analizaron diferencias sexuales con prueba z.
El 46% de varones y el 50% de mujeres presentaron EGC mientras que el 59% y 72% de varones y mujeres respectivamente registraron EGA. No se observaron diferencias intersexuales para EGC, pero sí para EGA donde las mujeres presentaron mayores porcentajes ($p<0,05$). Al analizar ambos indicadores conjuntamente un 72% de los varones y 84% de las mujeres presentaron EGC-EGA mientras que aquellos SEGC-SEGA, representaron el 52% de varones y 40% de mujeres. En el 28% de varones y el 16% de mujeres se registro EGC-SEGA y el 48% de varones y 60% de mujeres presentaron SEGC-EGA. Se observan importantes porcentajes de exceso grasa corporal y abdominal en los adolescentes analizados presentando las mujeres mayor tendencia a la acumulacion de grasa abdominal. La correcta valoracion nutricional requiere complementar la evaluacion del porcentaje de grasa con su distribucion para identificar riesgos cardiometabolicos desde etapas tempranas de la vida.

Podium D | The embodiment of water insecurity: Injuries and chronic stress in Lowland Bolivia

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Water is critical to health and human biology. Studies have theorized that problems with water can become embodied, yet few have quantified this. Therefore, aimed to holistically understand the lowland Bolivian water environment of Tsimane' forager-horticulturalists, including water quality, water services, perceived water safety, and water insecurity experiences (HWISE scores) (n=270 households). We then tested if and how water becomes embodied via water-related injury and a chronic stress biomarker, hair cortisol concentration (HCC). Results demonstrated that, compared with households using surface water, households with basic water services had HWISE scores 1.59-pts lower (SE=0.29; $P<0.001$). Ingestion of water perceived to be "bad" was associated with higher HWISE scores. Twenty percent of households reported prior water-related injuries, with women most commonly injured. In logistic regressions, each point higher HWISE score was associated with 28% (95% CI:1.16-1.41; $P<0.001$) higher odds of injury. Basic water services compared to surface water was associated with 48% lower odds (OR=0.52; 95%CI:0.33-0.82; P=0.005) of injury. Finally, using linear regressions among 332 adults, HWISE scores were not associated with HCC. Past waterrelated injury was associated with higher HCC (Beta=0.31; SE=0.09; P=0.029) among women, but not men. Relying on unimproved water services compared to surface was associated with 46.2% higher HCC for women (Beta=0.38; SE=0.14; P=0.048) and 55.3% higher HCC for men (Beta=0.44; SE=0.15; P=0.044), respectively. Overall, our findings demonstrate that water insecurity can become embodied through water-related injuries and elevated HCC. Improving water service levels through an equity lens may help ameliorate water insecurity and its accompanying negative health effects.

PST 34 | Hypothalamic-pituitary-adrenal axis activity and sleep patterns across stages of the adolescent transition in a group of Mayan girls – A preliminary analysis

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Adolescence is a difficult transition where individuals face critical energetic trade-offs between growth and reproductive development and function, while also allocating metabolic energy to respond to social and physical challenges. The hypothalamic-pituitary-adrenal axis (HPAA) is a key modulator of these trade-offs. One mechanism that helps restore energy levels is sleep. Both HPAA activity and sleep are known to change during the adolescent transition, yet few studies have examined the role of said changes during this period. Here we explore these issues using data from 19 Mayan adolescent girls (12 to 15 years) from Guatemala. Data was collected over a 19-day period in 2017. Measures included sleep quotas (total sleep time, TST), biomarkers of stress (cortisol), and reproductive stage (pre-menarche, early transition, advanced transition). We ran an ANOVA to test the effects of cortisol and reproductive stage on sleep. TST among and within girls ranged from 235-548 minutes. Cortisol levels ranged from 3.8-633 ng/ml. Cortisol and reproductive stage both had significant, independent effects on TST. TST was negatively associated with cortisol level ($p=0.002$). There was a significant mean difference of TST between pre-menarche girls and early transition girls ($p=0.037$), where early transition girls exhibited less sleep compared to pre-menarche girls. These findings may reflect the shifts in energy allocation from growth to reproductive maturation in pre-menarche girls preparing to enter their transition. Next steps will include adding biomarkers of energy into the model to better understand the role of sleep on energy restoration during the reproductive adolescent transition.

HBP | Relationships between genomic ancestry, self-perceived ancestry and identity variables in a sample from Puerto Madryn, Argentina

Relaciones entre ancestría genomica, ancestría auto-percibida y variables identitarias en una muestra de Puerto Madryn, Argentina

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The diversity of origins and identities of the current population of Argentine Patagonia is the result of various migratory and miscegenation processes that occurred from the settlement of the American continent to the present. In this work, we explored how genomic ancestry is related to self-perceived ancestry and other identity variables in a sample from the city of Puerto Madryn, Chubut. In 2018, a sampling was carried out for which volunteers over 18 years of age were summoned. Each participant was sampled with biological material for DNA extraction, and an extensive questionnaire was conducted that included questions about self-perception of their ancestry, as well as the mother tongue and place of origin of their mother, father, grandfathers and grandmothers. Using the ADMIXTURE program, the genomic ancestry of a sample of 96 people was calculated. The most prevalent genomic component (48%) was of European origin, specifically from regions of Spain and Italy, followed by the Native American genomic component (24%). The self-perceived Native American ancestry showed a tendency to exceed the genomic ancestry value of this origin, while when comparing the self-perceived European ancestry with the genomically calculated one, the tendency on the part of the volunteers was to underestimate this origin. Through a Multiple Correspondence Analysis it was possible to verify that the mother tongue and the place of origin of the ancestors are variables closely related to genomic ancestry as well as selfperceived ancestry.

La diversidad de orígenes e identidades de la poblacion actual de la Patagonia argentina es resultado de diversos procesos migratorios y de mestizaje ocurridos desde el poblamiento del continente americano hasta el presente. En este trabajo, se busco conocer como se relacionan la ancestría genomica con la ancestría auto-percibida y otras variables identitarias en una muestra de la ciudad de Puerto Madryn, Chubut. En el año 2018 se realizo un muestreo para el cual se convoco a personas voluntarias mayores de 18 años. A cada participante se le tomo una muestra de material biologico para extraccion de ADN, y se le realizo un amplio cuestionario que incluyo preguntas
sobre auto-percepcion de su ancestría, así como el idioma materno y el lugar de origen de su madre, padre, abuelos y abuelas. Mediante el programa ADMIXTURE se calculo la ancestría genomica de una muestra de 96 personas. El componente genomico mas presente (48%) fue de origen europeo, específicamente de regiones de España e Italia, seguido del componente genomico nativo americano (24%). La ancestría nativa americana auto-percibida mostro una

tendencia a superar el valor de ancestría genomica de este origen, mientras que al comparar la ancestría autopercibida europea con la calculada genomicamente, la tendencia por parte de los/las voluntarios/as fue a la subestimacion de este origen. Mediante un Analisis de Cor- respondencias Múltiples se pudo comprobar que el idioma materno y el lugar de origen de los/las antepasados/as son variables estrechamente relacionadas con la ancestría genomica así como con la ancestría auto-percibida.

PST 45 Hot flashes and other symptoms at midlife among women in Nagaland, India.

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Hot flashes, a common type of menopausal symptom, are accompanied by a sudden feeling of heat, which can lead to a red, flush face and/or sweating. The causes of hot flashes are not yet fully understood, but they are believed to be related to the hypothalamus, a region of the brain that controls body temperature. The severity of hot flashes can vary among individuals, geographic regions, and ethnicities. In some women, the experience of hot flashes can hinder their daily lives. This cross-sectional study examined hot flash experience, timing, and concordance between subjective and objective hot flashes, amid other symptoms, among 151 Naga women, aged 40-55 years, in Nagaland, India. The study excluded women who belonged to a non-tribal population, pregnant/lactating women, and those who underwent hysterectomies. Feeling tired or lack in energy (63.9%) was the most common symptom experienced during the past two weeks, followed by headaches (62.3%) and hot flashes (51.7%). Culture-specific symptoms such as feelings of heaviness and chills were also reported. In addition to subjective hot flashes, participants (n=87) were also asked to wear a Biolog monitor to record the experience of objective hot flashes, out of which 51.7% experienced objective hot flashes. However, the results indicated no concordance between subjective and objective hot flashes. This may be because women were more likely to overlook the subjective hot flash as they were engaged in their daily activities.

PST 82 Dietetic diversity in pregnant women residing in Merida, Mexicio

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Introduction High scores of dietary diversity (DD) are associated with an adequate intake of micronutrients. However, studies assessing DD in pregnant women are scarce.

Objective To analyze the characteristics of DD in a sample of pregnant women from Yucatan, Mexico.

Methods During September-December 2019, we applied a socioeconomic questionnaire and three 24-hour dietary recalls to 83 pregnant women residing in Merida, Yucatan. DD was assessed according to the Minimum Dietary Diversity score for Women method (MDD-W). A high DD was considered when a consumption of 5 or more food groups occurred in a day, while a consumption of less than 5 groups was considered as a low DD. Results The mean age of participants was 27.6 years and the average gestational age was 23 weeks. Overall, the food groups with the highest consumption rates were high content starch foods (99%) and meats (93%), while those with the lowest consumption percentages were dark green leafy vegetables (20%), eggs (20%) and nuts and seeds (2%). Thirty-nine percent of women had a low DD. Low DD was more frequently registered during weekend days (49% vs 68%, P = 0.005). Women with low DD showed significantly lower or no consumption of meat, eggs, dark green leafy vegetables and fruits and vegetables rich in vitamin A.

Conclusion DD assessment show that a number of women of this sample have a low consumption of foods rich in micronutrients which are important for healthy pregnancy outcomes.

HBP 35 years of admixture studies in Uruguay: National identity, self-identity and genetics
35 años de estudios de mestizaje en Uruguay: identidad nacional, autoadscripcion y genética

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35 years ago, neither indigenous nor mestizos were mentioned as members of Uruguayan society. Genetic studies carried out since the late 1980s showed the existence of these groups, subsequently allowing the various population contributions to be quantified. It was determined that the indigenous maternal ancestry (mitochondrial DNA) was 34-37% and the biparental ancestry of 14% (AIMs), at the national level but with regional variations. It asks: did the perception of the indigenous contribution change from this

information? Although a process of indigenous re-emergence is currently taking place, particularly Charrúa, and various societies of indigenous people and descendants have emerged, in the 2011 Census only 4.9% of the population declared having indigenous ancestors, and 2.4% declared the indigenous as the main ancestor. This scarce recognition is based on the construction of Uruguayan history, from the voice of a few. From the comparison of genetic data with census data, possible explanations are sought for the concealment of part of the population process in the light of historical, genetic and demographic information, and its relationship with the construction of national identity, oral history and family stories. We hope that the continuation of genetic studies, the dissemination of results and the gathering of more specific data on the origin and chronology of the different contributions, we can achieve a more appropriate relationship between genetics and identity. We will have to wait until the 2023 Census to see if the process of indigenous recognition increases.

Hace 35 años, ni indígenas ni mestizos eran mencionados como integrantes la sociedad uruguaya. Los estudios genéticos realizados desde fines de la década de 1980 mostraron la existencia de estos colectivos, permitiendo posteriormente cuantificar los diversos aportes poblacionales. Se determino que la ancestría materna indígena (ADN mitocondrial) era de 34-37% y la ancestría biparental de 14% (AIMs), a nivel nacional pero con variaciones regionales. Se plantea: ¿cambio la percepcion del aporte indígena a partir de esa informacion?

Si bien ocurre actualmente un proceso de reemergencia indígena, particularmente charrúa, y han surgido diversas sociedades de indígenas y de descendientes, en el Censo de 2011 solo 4,9% de la poblacion declaro tener ancestros indígenas, y 2,4% declaro a la indígena como ancestría principal. Este escaso reconocimiento se basa en la construccion de la historia uruguaya, a partir de la voz de unos pocos. A partir de la comparacion de los datos genéticos con los datos censales, se buscan posibles explicaciones del ocultamiento de parte del proceso poblacional a la luz de la informacion historica, genética y demografica, y su relaci on con la construccion de la identidad nacional, la historia oral y a los relatos familiares.

Se espera que la continuacion de los estudios genéticos, la difusion de resultados y la obtencion de datos mas concretos en cuanto a origen y cronología de los distintos aportes, se pueda lograr una mas adecuada relaci on entre genética e identidad. Habra que esperar al Censo de 2023 para observar si el proceso de reconocimiento indígena aumenta.

Plenary | The Human Biology of spaceflight

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Human biologists have been at the forefront of understanding humans in the most extreme environments. However, they have been largely excluded from the study of humans in perhaps the most extreme environment of all: space. Like most extreme environments on Earth, the human spaceflight environment (including, but not limited to long duration spaceflight, the Moon, and Mars) represents a myriad and intermixing of intensive social and physical challenges on the individual. Particularly as we anticipate longer duration missions in the future, from 1-year ISS missions to longer term lunar missions and Mars missions, life history and longer-term evolutionary perspectives are increasingly more central to understanding how humans acclimate and adapt to the spaceflight-relevant environments. While current research in space life sciences advocate for a multisystem integrated approach, with few exceptions, most work is siloed and fails to address the whole human system. Adaptations and physiological/behavioral shifts are not dependent solely on space-specific properties, like microgravity (gravity shifts) and increased exposure to radiation, but also to the built isolated and confined environment and the unique social milieu of human spaceflight - a combination of state and commercial interests, interpersonal interactions, and a distinct lack of control. Relevant to this, current work in human biology examining similar expedition-like settings suggest that interpersonal relationships and self-perceived experience in extreme settings can dramatically shape physiological output. Here, I address what we know about what happens to humans in space but also what the critical contribution perspectives in human biology can make.

PST 46 | Birth Seasonality among Tamang Women in Central Nepal

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Birth seasonality and the factors that influence it has been an important area of research in reproductive ecology. Previous research with Tamang women from Nepal has demonstrated that birth seasonality is influenced by factors such as physical and nutritional status associated with agricultural seasons, and behavioral factors. However, most research into birth seasonality among Tamang women was conducted on non-contraceptive using communities. It is unknown if birth seasonality would continue in Tamang communities where contraceptives are used, and what this may indicate about the factors that influence birth seasonality.

We investigated this question of birth seasonality in a community of Tamang women from Bhorle, Central Nepal. We interviewed 21 women about their reproductive histories. Questions focused on past and current pregnancies, miscarriages, live births, living children, and contraceptives using the Own Child Method (OCM). Additional behavioral and lifestyle information was also collected.

71 births were recorded for 21 women across 42 years. 55% of the total births occurred in Summer, 39% in Winter and 6% occurred in Fall or Spring. 8 women had or are currently using a type of hormonal contraceptive, while 13 had no history of contraceptive use. There was no difference in birth season between the contraceptive and non-contraceptive using women suggesting that women were consciously planning their pregnancy timing. These findings suggest that personal preference for birth time – linked to agricultural cycles - may play a larger role in birth seasonality than previously thought for agricultural communities such as the Tamang.

PST 6 | Germ aversion and COVID-19 knowledge during the early pandemic

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The SARS-CoV-2 pandemic has highlighted the importance of clearly and accurately communicating relevant health information. However, surveys exploring knowledge about COVID-19 during the early pandemic found significant deficits driven in part by factors such as age. Beyond demographics, psychological factors – such as perceived vulnerability to a given threat – may also drive attention to public health messaging or retention of threat-related knowledge. In the context of COVID-19, this may be particularly true during the early phases of the pandemic. We hypothesized that perceived vulnerability to infectious diseases in general would be associated with increased COVID-19 knowledge. A convenience sample of 335 students at a large southwestern university completed an online survey approximately three weeks after the first confirmed COVID-19 case in the state. The survey included questions about COVID-19 knowledge and the Perceived Vulnerability to Disease (PVD) scale. Using bivariate statistics and multiple ordinal regression, we found that the germ aversion PVD subscale, but not the perceived infectability subscale, was significantly associated with worse COVID-19 knowledge (OR = 1.26, p = 0.03), contrary to our hypothesis, after controlling for age, sex, and race/ethnicity. Furthermore, perceived susceptibility to SARS-CoV-2 specifically was not associated with COVID-19 knowledge. These results suggest that public health messaging that accounts for health-related anxieties may improve attention to, and/or retention of, key health information.

PST 87 | Assessment of potential recall bias and the multiple meanings of "heavy" in the study of menstrual bleeding

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There are several hypotheses regarding the evolution of copious menstrual bleeding in human females but surprisingly little data on menstrual bleeding variability or the causes and consequences of copious bleeding. The available data, from only a few populations, suggests bleeding duration and volume vary greatly. Heavy menstrual bleeding (HMB) may indicate disease/dysfunction, is associated with impaired quality of life, and may be more common in higher income countries. Studies estimate 10%35% of females experience HMB during their reproductive lifespan. Uncertainty in HMB prevalence and etiology may be partly due to recall bias in reporting bleeding duration or volume, and/or personal constructs of "heavy". We evaluated recall bias and construct ambiguity by comparing individual responses to a questionnaire regarding the attributes of her most recent period with experiences recorded concurrently in a menstrual tracking app during the same period. Of 8680 US respondents (18+ years old; 52% college graduates; 95% reported their health as average or better), only 42% accurately recalled their most recent period length (41% overestimated; 17% underestimated). Shorter periods were more likely to be described as light or very light; longer periods were more likely described as heavy or very heavy. Nonetheless, 26% of those with 2-day-periods characterized them as heavy or very heavy; 14% of those with 7-day-periods described them as light or very light. Even for the most recent period, recall data are insufficiently reliable

for research or clinical diagnoses. "Heavy" may mean bleeding duration and/or volume, therefore multiple bleeding attributes should be assessed and compared.

PST 47 Hot Bods: Body composition and frequency of hot flashes

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More than half of the people who go through menopause experience hot flashes. However, the underlying physiology and risk factors of hot flashes are still not well understood. Literature examining body composition and hot flash frequency has produced contradictory results. Here, we utilize an on-going study of brown
adipose tissue activity and hot flashes to explore whether various measures of body composition (body mass index (BMI), sum of skinfolds, waist-to-hip ratio (WHR), and Body Fat % (BF%)) are associated with frequency of hot flashes in women aged 45-55 living in Western Massachusetts. BMI was calculated as kg/m2. Bicep, tricep, subscapular, and suprailliac skinfolds were summed. WHR was calculated using the waist and hip circumferences. BF% was calculated with bioelectrical impedance analysis. To determine hot flash frequency, women were asked to wear an ambulatory hot flash monitor for 24 hours. Objectively measured hot flashes were identified by an increase in skin conductance > 2 μmhos over 30 seconds or by a distinctive hot flash pattern (sharp increase in sweating) concordant with subjective report. Linear regression analyses for objectively measured hot flash frequency were completed in SPSS for each measure of body composition, and included menopause status (pre-, peri-, or postmenopausal) as a covariate. To date (n=120), we found that no measure of body composition is significantly associated with hot flash frequency. These results suggest that body composition is not a strong risk factor for objectively measured hot flash occurrence.

PST 90 Simultaneous occurrence of dengue and Covid-19 cases in Belém, Para, Brazil: Epidemiological and socio-ecological challenges in a large Amazonian city during pandemic times.

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A survey was carried out with secondary data collected from official websites of the State Coordination of Arboviruses, the Municipal Health Department, and other official sources, to investigate the occurrence of dengue cases in Belém, capital of the State of Para, the second largest urban area in the Brazilian Amazon. From January to August 2021, the city recorded almost 2,000 cases of dengue amidst the COVID-19 pandemic period. The simultaneous occurrence of SARS-CoV-2 and dengue virus worsens the socio-ecological situation of the poor and the black population, which overlap, and have been the most infected. The high rates of notifications, deaths and hospital admissions caused by COVID-19, and the vaccination process, have hampered the recording of many health indicators of seasonal endemic diseases such as dengue, zika, and chikungunya, which are carried by Aedes aegypt mosquitoes. The long periods of lockdown and social distancing experienced in Belém saved lives in relation to COVID-19, but made the home visits who are responsible for the control, collection of insects, and guidance on dengue in homes difficult. Alarming number of confirmed cases in 2021 can lead to an increase in clinical complications in people with comorbidities, or those infected with the new coronavirus, especially among persons over 65 years old, and the unvaccinated children, leading to higher burden on the health care services and more deaths. The epidemiological and social consequences of the dengue-SARS-CoV-2 combination in the Amazon still needs to be further investigated.

PST 13 Non-WEIRD circadian rhythms: is there an adolescent shift in sleep timing?

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Studies in WEIRD societies argue that post-pubescent teens experience a phase shift in sleep, representing a

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Sickle Cell Disease (SCD) is the most prevalent genetic syndrome in the world. In Brazil approximately 3,500 children are born with Hb SS each year and 200,000 with

"biological/natural" circadian cycle where they sleep later at night and wake up later next morning. We tested this hypothesis in Mexico among 145 adolescents (aged 11-16, $\bar{x}$=13.7, SD ± 1.21) from: 1) Maya agriculturalists, 2) Totonac agriculturalists, and 3) urbanites in Mexico City. From February-November, 2019, we collected 1,405 sleep observations using actigraphy, sleep diaries, interviews, and ethnographic observations. We used threelevel mixed-effects models to assess bio-socio-ecological predictors of nightly sleep-midpoints during school -and non-school nights. The mean difference in sleepmidpoints between school -and non-school nights was 110.7 (SE=7.3), 35.7 (SE=3.9), and 30.8 min (SE=3.9) for urban, Maya and Totonac teens, respectively. Advanced puberty significantly predicted changes in sleep timing only during non-school nights (b=25.9, t(135)=2.2, p<.05), while gender significantly predicted sleepmidpoint exclusively during school nights (b=-17.6, t (136)=-2.4, p<.05). Strikingly, we found no evidence of a significant effect of pubertal development on sleepmidpoint variance among Maya juveniles (b=-5.96, t(78) =-0.7, p=0.5), who also expressed the shortest sleep duration (8.4 hr). Compared to post-industrialized urban teens, sleep of rural adolescents was more responsive to napping behavior before nightly sleep, to natural light, and to social cues. These findings challenge current ideas concerning the adolescent "biological/natural" circadian cycle, providing evidence of adolescent sleep variation in non-industrial societies not subject to the same cultural influences as WEIRD societies (such as technological gadgets with screens, gendered physical activity, the materiality of sleep, etc).

PST 25 Sickle cell disease in North and South America: a bioanthropological perspective

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the Sickle Cell Trait (Hb AS). In the United States SCD affects about 1 in 500 live births in African-Americans. The S variant of the hemoglobin gene came to the American continent in the 16th Century through the slave traffic, which brought with the Africans their genomes and cultures, so the focus on a biocultural approach to understand the socio-historical and adaptive processes of SCD in North and South America is of great importance. Qualitative and quantitative research on genomic ancestry, clinical manifestations, identity building, SES, access to health care, and lifestyle of individuals with SCD in Brazil and the USA was conducted to understand how these group deal with the syndrome. In addition, institutional racism as a reality faced daily by many with SCD, both by the stigma generated by the diagnostic itself, and by the race/color bias in each country, was also investigated. Results show that SCD is a multifaceted disease, with high prevalence among low income groups, with diverse genetic backgrounds, several self-identified races/ colors, and subject to high social vulnerability. The lifelong combined biological and sociocultural impacts of the disease should be further investigated in order to generate information to improve public health policies for African derived populations in both countries.

Podium C | Bacteria-killing activity, immunoglobulin A, C-reactive protein, and cortisol responses to tattooing

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Tattooing is a culturally structured stressor, like exercise, that people undertake to enhance their body. Previous research indicates that tattooing may stimulate the adaptive immune system by changing the allostatic set-points of immunosuppression. Those studies find that greater lifetime tattoo experience correlates with reduced immunosuppression when getting a new tattoo. These studies used a research design derived from exercise science and used secretory immunoglobulin A (sIgA) as an indicator of immune function. SIgA is a frontline antibody for mucosal immunity and may not be the best proxy of integumental immunity. The current analysis compares bacteria killing activity (BKA) as a more direct biomarker of skin immunity to sIgA in response to tattooing. We aggregated data from three studies of tattooing and immune and endocrine function collected in American Samoa (2017), at the Northwest Tatau Festival in Puyallup, WA (2018), and in Samoa (2019). We assayed 250 saliva samples from 120 participants, but due to contamination or low remaining saliva volume from previous analysis, BKA could be calculated for only
150 samples. These included participants receiving modern electric tattoos as well as traditional hand-tap tattoo in indoor and outdoor settings. We compare BKA to sIgA, C-reactive protein, cortisol, and lifetime tattoo experience and characterize the response of these homeostats of endocrine and immune function to the cultural stress of tattooing. This

model suggests new directions for field studies of immune function using salivary biomarkers.

PST 56 | Dietary Diversity is associated with lower adiposity in women but not men in the Northern Ecuadorean Amazon.

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Previous studies have shown that overweight and obesity is on the rise in indigenous populations of the Amazon, yet studies of the role of diet patterns (DP) are limited. Cross-sectional data (n = 130) were collected from four indigenous groups: the Quichua, Shuar, Cofan, and Huaorani to examine associations between diet patterns and adiposity. Dietary intake was measured using 7-day food records. DP scores were calculated by coding foods into 12 food groups, assigning a point value for each group and summing the points. OLS regression models were used to estimate the effect of DP score on body mass index, percent bodyfat, and sum of four skinfolds separately for men and women with age, age2, education, and market integration included as covariates. The prevalence of overweight/obesity was 36.3 percent in men and 37.9 in women (P = 0.56). DP score was negatively correlated with sum of four skinfolds (r = -0.17; P = < 0.05) and percent body fat (r = -0.17; P = < 0.05) but was not correlated with BMI or waist circumference. In regression models for women, DP score had a negative effect on percent bodyfat (standardized coefficient -0.46, P < 0.001) and sum of four skinfolds (standardized coefficient -0.46, P < 0.001), but not BMI (P < 0.163). We found no associations with adiposity in men. This research highlights the need to further investigate changing patterns of food consumption in obesity risk in populations in the Amazon.

PST 63 | Health condition of hypertense women from the interior of the Brazilian Amazon

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Systemic Arterial Hypertension (SAH) is a chronic and non-transmissible disease. Its prevalence increases with age, being higher in females, who are at high risk for hypertension-related stroke. This exploratory, descriptive and retrospective study evaluated blood pressure levels and health status of hypertensive women. Data were collected from randomly selected paper medical records from three public health centers, located in the outskirts of the municipality of Santarém, Para, Brazil. We collected: date of birth, race/color, height and weight to calculate Body Mass Index (BMI), systolic blood pressure (SBP) and diastolic blood pressure (DBP). A total of 327 patients were identified, with 68% of the medical records without self-declaration of color/race, however, Brown (25%/82) was more frequent, followed by Black (4%/14) and White (2,5%/8). ≥60-yearold women (65%/212) comprised the majority of hypertensive women compared to young women, 20-59 years old, (35%/115). The mean BMI corresponded to 29 kg/m2 and overweight (S) and obesity (O) were the most prevalent weight conditions among elderly hypertensive women (S=31%/65 and O=33%/70), and among young people (S= 26%/30 and O=48%/55), respectively. The mean pressure levels measured in the office were for SBPmean 130 mm/Hg and DBPmean 80 mm/Hg, there was no statistical difference in SBP (p=0.1092), but DBP was statistically different (p=0.0013) between elderly and young women. Although patients have controlled blood pressure levels, there are classic risk factors as poor access to health, violence, social determinants of health that weigh and impact the health condition of these women and potentiate their predisposition to cardiovascular events.

PST 16 | Situating sites of human biology research: a meta-analysis of research trends based on the American Journal of Human Biology

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Shifting conditions, standards, and research trends have altered the landscape of human biological research.

Institutional centers of research and research sites migrate (Zhou et al. 2019). Conditions such as the COVID-19

pandemic limit travel and researchers may value studying "home" over distant sites and the exotic "other"(Castro-Gomez and Martin 2002). This project tracks research trends in human biology research by sampling original research articles of the American Journal of Human Biology from 1989 to present. Articles were screened for appropriateness and limited to primary data analyses (no metadata or review). Twenty percent of articles in each issue were chosen using a random number generator (n=233). The R package PubmedR was used to gather some metadata, while some data came from articles themselves. Authors' affiliated institutions, research site locations, data types, incidence of "local" co-authors, incidence of multi-site projects, types of collaborative institutions, and incidence of recurring longitudinal projects were recorded. We predicted that research site locations would become more local to researcher institution locations over time. In addition, we predicted that modern researchers may rely more on various institutional collaborations, while previous researchers may have had more direct community collaboration. Preliminary analysis revealed that researchers were indeed more likely to conduct research within the same country as their institution, with a 15% increase from 1989 to 2021. Analysis of variance (ANOVA) determined significant effects of later date ranges on institution location ($p<.01$) and local copublisher incidence ($p<.000$). No significant effects were found based on collaborative institution type ($p=.275$).

PST 14 | Community and immunity: maternal dilemmas in balancing child safety and isolation during the COVID-19 pandemic, findings from the CARE study

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New variants of the SARS-CoV-2 virus have prolonged public health measures designed to reduce infection transmission, especially among children ineligible for the vaccine. Continued social distancing, however, could have unanticipated impacts on children's development and health. Here we use third wave data from the COVID-19 and Reproduce Effects (CARE) study (N=288) – a convenience sample of U.S. participants – to evaluate the extent to which mothers continued to maintain social distancing measures in mid-2021, and whether these were associated with variation in their children's behavioral development as measured by the Baby Pediatric Symptom Checklist (BPSC). We found 57.63% of participants (N=166) said their pandemic safety measures wouldn't change even after they themselves were fully vaccinated to protect their child from infection, implementing measures such as limiting travel, visits with friends and family, and going to public spaces with their children. Parents also reported delaying or suspending daycare, continuing to work from home, wearing masks, and socially distancing. Forty-six percent of participants agreed or strongly agreed that social distancing has affected their ability to parent, and 41% of participants had strong concerns that social distancing has affected their child's development. Individuals who were concerned about their children's development being affected by the pandemic were significantly more likely to have a child with a behavioral problem as indexed by the BPSC, even after adjusting for maternal age, income, and postpartum depression ($p < 0.001$). Future research should investigate the biological and behavioral impacts of pandemic-related social isolation during critical periods of development.

Podium B | Water insecurity associated with multiple measures of perceived health in the Peruvian Amazon

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Research documenting the relationship between water insecurity and human health and biology is growing, with a particular emphasis on water-scarce settings. However, climate change, pollution, and population expansion are also affecting "water-rich" environments such as the Amazon rainforest. In this paper, I examine the associations between measures of water insecurity and measures of physical health and biological functioning in a sample of 250 Awajún men and women living in the northern Peruvian Amazon. Multivariate ordered logistic regressions show that higher water insecurity scores were associated with higher incidences of reported diarrhea (OR = 1.23, 0.02), nausea (OR = 1.22, 0.035) back pain (OR = 1.26, 0.005), headaches (OR = 1.45, 0.05), dizziness (OR = 1.25, 0.028), and overall poor perceived health (OR = 0.75, p = 0.00). Associations between water insecurity scores and hemoglobin concentrations approached significance (OR = -0.098, 0.10). Water insecurity scores were not significantly associated with other biomarkers of nutrition (cholesterol, triglycerides, and glucose), levels of C-reactive protein (CRP) or Epstein-Barr

Virus (EBV) antibodies. Future research will include field-friendly analysis of parasitic load and intestinal permeability to ascertain whether water insecurity and associated health problems are linked to biomarkers reflecting gastrointestinal health.

PST 59 | Water insecurity and beverage consumption among adult residents of colonias in southwestern New Mexico: Results from a pilot study

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Household water insecurity (HWI), or inadequate household water access and quality, poses significant risks to human health and well-being. For example, HWI may contribute to increased consumption of high-calorie beverages, a risk factor for chronic conditions like obesity. Communities at risk for HWI in the US include those with inadequate water and sewer infrastructure, such as among colonias, which are underdeveloped communities along the
US-Mexico border. Colonias also exhibit high prevalence of chronic conditions like diabetes. More studies are needed to investigate potential pathways between HWI and chronic disease risk factors in these communities. This study investigates the relationship between HWI and individual beverage choices among adults in colonias in southwestern New Mexico. Data were collected from 220 participants through surveys conducted online, by phone, or by mail. We found that 22.3% of participants surveyed were water insecure. Individuals in water insecure homes more frequently consumed bottled water (p=.007) and beer (p=0.029) as compared to individuals in water secure homes, while individuals in water secure homes consumed tap water more frequently (p<0.001). No significant differences were found in frequency of sugar-sweetened beverage consumption. Results from ongoing qualitative-interviews conducted with a sub-sample of participants will aid in expanding knowledge on how participants who live with HWI adapt and cope with inadequate water quality and/or access and its impacts on food and beverage choices. These results show that HWI impacts beverage consumption behavior among adults living in the colonias, and future research will explore potential downstream impacts on chronic disease risk.

PST 67 | Metabolic hormones, food insecurity, and depression: leptin and adiponectin in a traditional subsistence population in Bolivia

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One evolutionary hypothesis for depression argues that it is a strategy that serves to regulate energy allocation, especially when faced with sickness in food-limited environments. The hormones leptin and adiponectin play a crucial role in metabolic function and energy availability, and therefore may be important physiological mediators of depression′s effect on nutritional status. Both hormones originate in adipose tissue; leptin levels generally increase with adiposity, while adiponectin decreases with adiposity. However, these hormones have not been wellstudied in contexts of food insecurity, high levels of physical activity, and low body fat. Here, we explore relationships between leptin and adiponectin, depression scores, and self-reported food insecurity among Tsimane forager horticulturalists of lowland Bolivia. We assess whether these two hormones help mediate the effect of depression on nutritional status. Leptin and adiponectin levels were quantified among 148 Tsimane adults (mean age= 58, range= 36-92, 49% female) using enzyme immunoassays. 34% of respondents surveyed reported recent concerns about food insecurity. Log leptin levels were negatively associated with reported food insecurity (β= -0.372, P= 0.02) when adjusting for age, body fat, obesity status, and sex. Log adiponectin levels were negatively associated with depression scores (β= -0.302, p=0.004). However, there were no associations between adiponectin and food insecurity, nor leptin and depression scores. These results suggest that leptin may be a good proxy of shortterm food insecurity, even in a low body fat population. Overall these data support the theory that depressive symptoms help regulate energy allocation.

Podium D | Dietary resilience in Amazonian communities experiencing extreme seasonal flooding

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Every year, during one the planet's greatest seasonal flooding events, Central Amazonian rivers inundate floodplain forests and cropland. Accompanying this influx of water are fish, a local staple food, which become much harder to catch. Understudied is whether human protein and energy ingestion remain sufficient throughout the hydrological regime, and if this varies between communities located in flooded (varzea) and non-flooded (terra firme) zones. To address this knowledge gap, we collected dietary data from 177 households over the course of the hydrological cycle in 4 varzea and 4 terra firme communities. Weighed household food records were collected and these data were converted to total protein and energy consumption using food composition tables. Fish and toasted manioc flour (farinha) respectively made up 44% and 26% of biomass and were the principal sources of protein and energy. Terra firme households consumed more game meat and different species of fish and crops than varzea households. We found a significant negative relationship between protein consumption and water level ($p<0.001$, $t=3.715$, $n=2,210$, linear mixed-effects model). Protein fell from a mean of 188 to 160 g/person/day between the low and high-water season. However, mean energy and protein consumption remained well-above recommended levels across the hydrological cycle. These data indicate that, on average, households were able to maintain energy and protein adequacy despite extreme fluctuations in water level. Future studies should investigate the factors that contribute to inter-household variation in resilience to flooding, as a minority of households were unable to maintain adequate intakes throughout the year.

Podium C | Self-interest versus cooperation: experimental evidence and implications for the COVID-19 era

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Human cooperation is enigmatic since organisms are expected by evolutionary theory to act principally in their own interests. However, self-interested defection from cooperative endeavors in the time of a worldwide pandemic can have devastating consequences for health and well-being. Data from a range of experiments conducted in two regions of Papua New Guinea (PNG), one on the mainland of PNG and the other on the island of Bougainville, are presented to explore the conditions under which cooperation tends to be promoted. One of these experiments allows for punishment of non-cooperative players while another allows for players to either be punished for non-cooperation or build a positive social image for acting cooperatively. It is demonstrated that although both mechanisms tend to raise cooperation above baseline levels, only when social image is at stake do average gains rise significantly. Recent experiments on selfinterest and cooperation conducted in other parts of the world, which have yielded similar results, will be presented. While it is heartening that the seemingly universal desire to promote a positive social image can lead to enhanced cooperation, the division of society into parochial subgroups may lead to less than desirable outcomes – for example, enhanced cooperation within subgroups but not between them. The implications of these findings for health and well-being in the COVID-19 era are discussed.

PST 2 | Ethical considerations in biocultural research with vulnerable communities and added value of community-engaged methodology

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Working among vulnerable communities poses unique ethical challenges when conducting biocultural research. When communities face dire poverty and social injustice, simply observing and documenting stressors and related health outcomes may be considered exploitative by vulnerable and already overburdened residents. As biocultural researchers, our responsibility is to work toward solutions addressing differential impacts of social injustice. Here, we highlight work amongst the Comcaac, an indigenous group native to Sonora, Mexico. Today, they experience significant resource insecurity secondary to historical marginalization and structural violence. Employing ethnographic methods (participant observation, focus groups, unstructured and semi-structured interviews), we investigated social and ecological stressors likely affecting

members′ health. First, we determined visible themes encompassing resource insecurity (e.g., water, food, power, medicine etc.) and struggles with poverty, racism, and associated feelings of injustice. Through deep engagement, we also discerned community members′ frustrations with what they see as exploitative research – obtaining information but failing to work actively toward solutions or remain invested in participants′ well-being. To begin addressing their most severe issues, we first documented substantial needs within the community, then obtained outside donors and organized a weekly food bank delivery of fresh foods. Now, these are distributed weekly by community leaders in culturally appropriate and locally embedded ways. Thereby, we were able to address an immediate need in a manner that will have continuing impact even while not actively conducting fieldwork. To have real meaning for our research communities, as biocultural researchers we must create ethically based long-term relationships to develop meaningful scholarship.

HBP | Association between genetic profile assessed from 10 SNPs (single nucleotide polymorphisms) and anthropometric obesity in Argentine schoolchildren Asociacion entre perfil genético evaluado a partir de 10 SNPs (polimorfismos de nucleotido único) y obesidad antropométrica en escolares argentinos

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Obesity has a multi-causal origin mainly related to highcalorie diets and sedentary lifestyles. However, genetic composition may condition the predisposition to put on weight, as not all individuals and human groups show the same response to the obesogenic environment. The aim of this study is to analyse the phenotypic variability of the anthropometric profile and in particular of the diagnostic indicators of obesity in a sample of 283 Argentinean schoolchildren aged 6 to 14 years.

Data were collected in 2019 in the city of La Plata, Buenos Aires province. Height, weight, body circunferences and subcutaneous skinfolds were measured, estimating body mass index (BMI), waist-to-height ratio (WtHR), and body fat percentage (%BF). DNA was isolated from saliva and 10 single base polymorphisms (SPNs) in the TMEM18, INSIG2, GNPDA2, CLOCK, FAM120AOS, FAIM2, OLFM4 and FTO genes

(rs1558902, rs171817449, rs9939609) were genotyped. The nutritional phenotype-genotype association was analysed for each of the SNPs separately and with the genetic risk score (GR) set at a range between 0 (no risk allele) and 20 points (homozygous risk for all 10 markers). A GR score above the 50th percentile (4.96 ± 2.48) was associated with increased waist circumference, skinfold sum, BMI, %BFG and WtHR. Anthropometric indicators showed higher prevalences according to polygenic risk, with significant differences between Q1 and Q4 for excess weight (29.10% vs 44.30%), high adiposity (17.30% vs 30.10%) and abdominal obesity (41.19% vs 54.90%). La obesidad tiene un origen multicausal relacionado principalmente con las dietas altas en calorías y los estilos de vida sedentarios. Sin embargo, la composicion genética puede condicionar la predisposicion a aumentar de peso, ya que no todos los individuos y grupos humanos muestran la misma respuesta al entorno obesogénico. El objetivo de este estudio es analizar la variabilidad fenotípica del perfil antropométrico y en particular de los indicadores diagnosticos de obesidad en una muestra de 283 escolares argentinos de 6 a 14 años. Los datos fueron recolectados en 2019 en la ciudad de La Plata, provincia de Buenos Aires. Se midieron la altura, el peso, las circunferencias corporales y los pliegues cutaneos subcut aneos, estimando el índice de masa corporal (IMC), la relacion cintura-altura (WtHR) y el porcentaje de grasa corporal (%BF). Se aislo ADN de saliva y se genotiparon 10 polimorfismos de base única (SPN) en los genes TMEM18, INSIG2, GNPDA2, CLOCK, FAM120AOS, FAIM2, OLFM4 y FTO (rs1558902, rs171817449, rs9939609). La asociacion fenotipo-genotipo nutricional se analizo para cada uno de los SNP por separado y con la puntuacion de riesgo genético (GR) establecida en un rango entre 0 (sin alelo de riesgo) y 20 puntos (riesgo homocigoto para los 10 marcadores). Una puntuacion GR por encima del percentil 50 (4,96 ± 2,48) se asocio con un aumento de la circunferencia de la cintura, la suma del pliegue cutaneo, el IMC, el %BFG y el WtHR. Los indicadores antropométricos mostraron mayores prevalencias según el riesgo poligénico, con diferencias significativas

entre Q1 y Q4 para el exceso de peso (29,10% frente a 44,30%), la alta adiposidad (17,30% frente al 30,10%) y la obesidad abdominal (41,19% frente a 54,90%).

HBP | The CARE Program: 25 years of learning from the Qom of Formosa, Argentina El Programa PERCHA: 25 años aprendiendo de los Qom de Formosa, Argentina

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The CARE Program, created in 1996, has been working with Qom communities to learn about the meaning of life transitions in the Gran Chaco region of northern Argentina. We are interested in exploring how biology, society, and culture come together to shape the way Qom women, men, and children experience growth, health, fertility, and change. Originally hunter-gatherers, the Qom are now facing profound changes in their lifestyle and are graciously allowing us to learn from their experience. We use a combination of frameworks, built on life history theory, reproductive ecology, and situated biology and have focused on life transitions, both at the individual and at the population level. We have learned about transitions from reproductive to non-reproductive status and vice-versa, about how children grow in different ecologies, how the body is in constant dialog with the social, political, economic, and cultural environment, and about the meaning of health and disease. We will present an overview of all this learning and, as importantly, the unlearning we have been doing during this past 25 years. We will share not only the results of our research, but also the challenges and opportunities we have encountered and open the conversation about our role as researchers.

El Programa PERCHA, creado en 1996, ha estado trabajando con las comunidades Qom para aprender sobre el significado de las transiciones de vida en la region del Gran Chaco en el norte de Argentina. Estamos interesados en explorar como la biología, la sociedad y la cultura se unen para dar forma a la manera en que las mujeres, los hombres y los niños de Qom experimentan el crecimiento, la salud, la fertilidad y el cambio. Originalmente cazadores-recolectores, los Qom ahora se enfrentan a cambios profundos en su estilo de vida y nos permiten amablemente aprender de su experiencia. Utilizamos una combinacion de marcos, construidos sobre la teoría de la historia de la vida, la ecología reproductiva y la biología situada, y nos hemos centrado en las transiciones de la vida, tanto a nivel individual como a nivel de poblacion. Hemos aprendido sobre las transiciones del estado reproductivo al no reproductivo y viceversa, sobre como los niños crecen en diferentes ecologías, como el cuerpo esta en constante di alogo con el entorno social, político, econ- omico y cultural, y sobre el significado de la salud y la enfermedad. Presentaremos una vision general de todo este aprendizaje y, lo que es mas importante, del desaprendizaje
que hemos estado haciendo durante estos últimos 25 años. Compartiremos no solo los resultados de nuestra investigacion, sino también los desafíos y oportunidades que hemos encontrado y abriremos la conversacion sobre nuestro papel como investigadores.

PST 79 | Quantitative estimates of the relative contributions of secular trend and community type to variation in adolescent growth in the Andean highlands

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Children's growth at high altitude is affected by multiple factors including genetics, nutrition, and hypoxia. In the Andean altiplano, subsistence agropastoralism in rural areas is typically associated with heavy physical workloads and seasonal nutritional scarcity, stressors which are less likely to be experienced in urbanized communities. We investigated the relative effects of rural-urban community differences, and of regional improvements in living conditions and economic opportunities, on children′s height. (Due to its sensitivity to socioeconomic conditions, particularly nutritional resources, height has been dubbed "the biological standard of living" (Komlos 2019)). We focused on adolescents (ages 12–14 years), who have been less studied than adults or younger children, using data from five previously published studies and from our study in El Alto, Bolivia. The average regional secular trend in height-for-age z-scores relative to the WHO growth reference was approximately +0.39 SD/decade between the late 1970s and the early 2000s. (This trend is an average over a roughly 25-year time span; the trend is not necessarily linear.) Peri-urban/ urban adolescents were approximately 0.75 SD taller than contemporaneous rural adolescents. The regional secular trend contributed approximately 60%, and the ruralurban community difference contributed approximately 40%, to the total height z-score difference (1.73 SD) between Ancoraimes, Bolivia (a

poor rural community) in 1977 and El Alto (a peri-urban community with less poverty) in 2003. We conclude that overall regional improvements in living conditions/economic opportunities, and rural-urban community differences, have both contributed greatly to variation in adolescent growth in the Andean altiplano.

Podium C | Does the immune system of milk increase activity for infants undergoing infectious disease episodes?

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Human milk content is dynamic, changing over time to meet infants' needs. Multiple studies have suggested that milk immune content increases for infants undergoing infectious disease (ID) episodes, suggesting that the immune system of milk (ISOM) offers enhanced protection when needed to combat the threat of ID. We tested the hypothesis that milk immune factors and ISOM activity increase during an infant's ID episode. We characterized milk secretory immunoglobulin A (sIgA), interleukin-6 (IL-6), and in vitro IL-6 response to Salmonella, which provides a useful system-level biomarker of ISOM activity, among 95 mother-infant pairs in Kilimanjaro, Tanzania. After control for covariates, milk sIgA (Coef: 0.04; 95% CI -0.25, 0.32), IL-6 (Coef: 0.16; 95% CI -0.38, 0.69), and in vitro IL-6 response to Salmonella (Coef: 0.12; 95% CI: -0.74, 0.98) were unassociated with ongoing ID at the initial participation visit. In second samples, collected if infants experienced an incident ID, milk sIgA (N: 61; p: 0.792), IL-6 (N: 65; p: 0.376), and IL-6 response to Salmonella (N: 56; p: 0.328) were not substantially higher; this was unchanged by exclusion of infants with ID symptoms at the time of initial participation. Indeed, the strongest predictor of milk sIgA, IL-6, or IL-6 response to Salmonella at the sick visit was the value at the initial visit. These findings are not consistent with the hypothesis that milk delivers enhanced immune protection when infants experience ID, which suggests that milk immune content and activity may be less changeable in environments with a high burden of ID.

Podium B | Intergenerational effects of prenatal depression on the developing infant gut microbiome: Evidence from Cebu, Philippines

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Prenatal stress has been linked to variation in infant growth and development, but intergenerational effects of prenatal stress on microbiome development are understudied. We drew on longitudinal data from motherinfant dyads in Cebu, Philippines to examine associations between prenatal depression and infant gut microbiome development. During pregnancy, mothers completed the Centers for Epidemiologic Studies-Depression scale and Perceived Stress Scale (both treated as continuous variables). Infants reporting C-section birth, recent illness, or recent antibiotic use were excluded. Infant fecal samples were collected at 2 weeks (n=32) and 6 months (n=22). After 16S rRNA bacterial gene sequencing, differences in infant microbial diversity (Shannon) predicted by prenatal depression were estimated using a hierarchical model accounting for incomplete microbial community structure. Differentially abundant genera associated with prenatal depression were estimated using a beta-binomial model that accounts for within-taxon correlation and multiple testing. All models were adjusted for prenatal perceived stress, infant feeding, and household assets. Prenatal depression was associated with lower microbial diversity at 2 weeks (b=-0.10 [SE=0.01]) and 6 months (b=-0.05 [0.01]). At 2 weeks, prenatal depression was associated with increased infant relative abundance of Streptococcus. At 6 months, prenatal depression was associated with increased abundance of Streptococcus, Bifidobacterium, and Prevotella, and lower Akkermansia. Our findings provide support for an association between prenatal depression and infant gut microbial diversity that persists, but diminishes, with age. Future studies should aim to clarify the dynamic interplay across levels, from society to stress physiology to microbes, that shape microbial pathways of intergenerational embodiment of maternal adversity.

Plenary Food for Thought: Climate Change, Food insecurity and Poor Health

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Climate change poses an unprecedented risk to human physical and mental health across the lifespan. Of the many pathways through which climate change exacts its toll on human wellbeing, food insecurity is among the most insidious, with impacts ranging from malnutrition to infectious and chronic disease risks to neurologic and mental health problems. Climate change impacts all dimensions of food insecurity including food access, availability, utilization and stability. Food insecurity and climate change also interact with systems of oppression and social exclusion to amplify these health effects among marginalized and underserved communities, a phenomenon known as the climate gap. These effects will be far reaching, and not far off; it is estimated that climate change will increase global hunger by 20-50% by as early as mid-century. There is an urgent need to devise sustainable food security solutions that are adaptive to or mitigate negative health impacts brought upon by climate change. In this plenary, I will first review the major pathways through which climate change shapes physical and mental health, with an emphasis on food insecurity. Then I will review the pathophysiology linking climatedriven food insecurity and poor health outcomes, grounding these linkages in social determinants like race, class, and gender. Finally, I will review solutions-focused interventions and other actions we can take to build healthy and flourishing communities during the era of rapid climate change.

PST 35 In utero exposure to trace elements and infant growth

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Children can be exposed in utero to maternal toxicant exposures via the placenta, and these placental levels can be assessed at birth. Exposure to multiple toxicants occurs in many populations, but is not commonly assessed in the literature. This study will determine whether there is an association between an exposure to a combination of trace elements and growth in infancy. The sample of 158 mother-infant dyads was drawn from the Albany Pregnancy Infancy Lead Study (APILS; phase two conducted 1992-1999). Nine toxic trace elements were measured in the placental body and membrane, and cord tissue: aluminum, arsenic, cadmium, lead, mercury, thallium, nickel, chromium, and barium. Using multiple linear regression analyses with all nine trace elements in the model, controlling for gestational age and either birth length or birthweight we found statistically significant negative ($0.001 < p < 0.05$) relationships between cord tissue aluminum (Al) for birthweight, 3- and 6-months weight at visit, and 3- and 6-months length at visit. Placental Al levels in this study are low in comparison to the few other human studies. Fifty-four percent of umbilical cords had non-detectable levels of Al. Analyses using a dichotomized sample (detectable vs. non-detectable cord Al levels) found the same statistically significant negative relationships. The relationship with cord Al only should not be over-interpreted. Further analyses to explain this relationship are warranted. The other eight toxicants showed no or weak associations.

Podium B | Intergenerational transmission of the historical trauma response and strategies for its interruption among urban American Indian survey respondents

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Background: American Indians and Alaska Natives (AI/AN) experience an elevated burden of poor physical and mental health compared to other groups in the US. A contributing factor may be the continued impacts of historical trauma events, including the federal boarding school era of the 1870s to 1970s, which resulted in generations of children being removed from their families and forced to abandon their language, culture, and religion. These policies are widely recognized as disrupting family structures and eroding traditional culture.

Methods: This study uses data from the Honor Project, a survey of urban, two-spirit AI/AN (n=447) to examine the impact of boarding school exposure on individual health outcomes and the pathways through which trauma may be transmitted intergenerationally. We additionally explore the role of cultural engagement in interrupting the relationship between intergenerational boarding school exposure and health.

Results: While only 18% of the study population were themselves boarding school survivors, 40% of participants were raised by someone who attended boarding school, and 27% thought about the loss of family ties resulting from the

schools weekly. 35% of respondents self-rated their health as fair to poor compared to 33% who rated it very good or excellent. More than half of respondents (55.6%) received a high score on the Urban American Indian Identity and Attitudes scale (UAIIA), indicating a high level of connection to traditional culture and activities. Collectively, these results suggest that boarding school attendance has intergenerational impacts that may contribute to contemporary physical and mental health in AI/AN.

PST 15 | Pre- and postnatal maternal psychological wellbeing and infant socioemotional development during the COVID-19 pandemic

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The COVID-19 pandemic has negatively impacted the wellbeing of almost all segments of society. However, few studies have investigated how the pandemic has affected infants. Pandemic-related stressors (e.g., fear of infection during pregnancy, infection stigma, passing the virus to their baby, financial strain, etc.) experienced in the preand postpartum periods may disrupt infant socioemotional development by negatively affecting maternal mental health, potentially influencing caregiving environments. Using data from a longitudinal convenience sample of women in the United States, we tested whether maternal psychological wellbeing during the pandemic was associated with infant socioemotional development. Pandemic-related stress was assessed using an original questionnaire. Maternal wellbeing was measured using the Edinburgh Postnatal Depression Survey, the PROMIS Anxiety scale, and an original measure of perceived availability of emotional support from partners, family, and friends. Infant development was assessed with the Baby Pediatric Symptom Checklist. We used multivariate logistic regression models adjusted for maternal age, education, parity, household income, infant sex, and age (N = 263). Sixty percent of infants scored positive for potential behavioral problems. Prenatal pandemic stressors were not associated with infant behavioral scores, but were associated with postnatal depression, anxiety, and parenting stress ($p<0.05$). Participants with less emotional support and higher parenting stress had more postnatal symptoms of depression and anxiety ($p<0.05$). Postnatal depression ($p=0.004$), anxiety ($p=0.009$) and parenting stress ($p<0.001$) were positively associated with infant behavioral problem scores. Our findings suggest that the pandemic may indirectly impact infant socioemotional development by influencing maternal postnatal psychological wellbeing and caregiving environments.

PST 53 Novel C-reactive protein shapes across the menstrual cycle

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We utilize a novel geometric morphometrics (GM) method in order to analyze C-reactive protein (CRP) phenotypes across a menstrual cycle. CRP is a biomarker of general inflammation and is commonly used in biological anthropology research, but current methods of analyzing CRP across a menstrual cycle must often remove the beginning or end of the cycle. However, GM controls for disparate sizes of CRP concentrations and cycle length. Utilizing a GM approach, we can scale cycle data so a full cycle can be included and uncover novel phenotypes based on shape of CRP. We collected daily urine samples for one full cycle from 114 healthy, Polish and PolishAmerican women (age=18-45). Cycles were aligned by ovulation using mid cycle estradiol drop. Only ovulatory and non-pregnant cycles were used in this analysis (n=98). We use principal components analysis to identify meaningful axes of shape variation and used these PC scores to create a distance matrix for cluster analysis to determine phenotypic groupings. Controlling for size, we identified 4 statistically significant phenotypes (p-values <.05), characterized by high vs low CRP concentrations and a rising vs falling CRP across the menstrual cycle. There was no association between these groups and age or cycle length, but the high CRP groups differed ($p<.01$) from the low CRP groups in average CRP. We are able to identify two CRP phenotypes, an increasing and a decreasing pattern of CRP which would be otherwise obscured by a truncated luteal phase and a large range of CRP concentrations.

PST 17 | "You cannot be alone or you will not feel good": Social support, postpartum practices, and maternal mental health in Mexico

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Postpartum depression (PPD), documented across cultures, is associated with negative outcomes for both mothers and infants. In effort to enhance maternal-child health during this vulnerable period, most cultures recognize the postpartum as a special time when mothers are expected to receive additional social support and follow diet and activity prescriptions unique to the local context. Despite the potential of these practices to protect maternal mental wellbeing during the postpartum period, no studies have examined their effects in Latin America, where rates of PPD are especially high. Here, we explored whether adherence to the local model of postpartum social support in Coatepec, Mexico, referred to as the cuarentena, is protective of maternal mental health. We hypothesize that when mothers' actual postpartum experience more closely aligns with cultural expectations of support, they experience fewer postpartum depressive symptoms. Surveys and semistructured interviews with 48 first-time mothers assessed degree of adherence to the cuarentena, severity of depressive symptoms, and women's subjective assessments of the role social support played in their postpartum experience. While a multivariate regression analysis did not find an association between postpartum depressive symptoms and adherence to the cuarentena when holding infant health constant ($F(2,45) = 1.784$, $p = .255$, $R2=.073$, $R2Adjusted=.032$), the qualitative data clearly indicated that cuarentena participation, including the receipt of additional social support, was linked with emotional satisfaction, as almost all women described its centrality to their feelings of wellbeing. Researchers who focus on minimizing risk for PPD should consider the importance of culturally-defined social support.

PST 84 | Parental absence during childhood and underweight and excess weight among middle-aged community dwellers in rural Vietnam

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While adverse childhood experiences (ACEs) are shown to be associated with adulthood obesity, little has been studied about being underweight. We examined the associations between parental absence (i.e., one of the major components of ACEs) and both underweight and excess weight among middle-aged rural community dwellers in Vietnam, where people might have lost or separated from their parents during and after the Vietnam war (1955− 1975). Data came from 3000 middle-aged adults who participated in Khanh Hoa Cardiovascular Study. Parental absence was defined if they reported parental absence due to death, divorce, and out-migration. We categorized participants into those who experienced parental absence before the age of 3, between age 3 to 15, and those without such experiences. BMI was calculated based on measured height and weight (kg/m2) and categorized into three: underweight <18.5; normal 18.5–24.9; excess weight ≥25. Multinomial logistic regression was used to investigate the association. Results showed that parental absence that occurred before the age of 3 was marginally associated with underweight but not with excess weight (prevalence ratio [PR]=1.44, 95% confidence interval [CI] 0.95, 2.20). The trend was not observed for parental absence due to migratory work, whereas parental divorce was associated with excess weight (PR=2.48, 95%CI 1.28, 4.81). We found weak but important evidence on the association between parental absence and underweight among middle-aged rural people in Vietnam. While previous studies in Western settings extensively studied obesity in relation to ACEs, the findings indicate the importance of studying underweight, especially in lowand middle-income countries.

PST 19 | Social, physiological, and genetic contributions to reproductive success among Tibetan women

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Variation in reproductive success related to variation in heritable traits is central to evolution by natural selection. Challenges to linking human reproductive success with adaptive trait variation include the variety of environments humans inhabit and the strong influence of sociocultural factors on reproductive success. Many studies report that taller women and those with higher body mass index (BMI) enjoy higher reproductive success. Few studies account for potential confounding by sociocultural factors such as marital status or examine traits occurring in a particular environment. We tested the hypothesis that sociocultural considerations plus hematological, ventilatory, and cardiopulmonary traits contributed to variation in the number of pregnancies of 357 ethnic Tibetan women living at 3500m in Nepal with an average age of 59 who had completed their childbearing years. Comprehensive modeling using both tree based methods and regression analyses revealed factors associated with higher reproductive success measured as the number of pregnancies. They include Body Mass Index, which interacted with oxygen transport traits tidal volume and percent arterial oxygen saturation; lower hemoglobin concentration; and lower aural temperature. The phenotypic data suggest that stabilizing selection is acting on BMI and hemoglobin concentration. Genome-wide association analyses detected single nucleotide polymorphism sites associating with BMI at genome-wide levels of significance; analyses did not detect signals of recent and strong selection. BMI stands in contrast with hemoglobin concentration where selection signals consistent with directional selection have been previously described.

PST 76 | Mothers and others – the association between maternal social support, infant body size at birth, and breast milk composition

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This presentation describes the results of two studies that aimed to examine the effect of maternal social support on infant size at birth and breast milk composition. Sample of healthy postpartum (N=916) and breastfeeding women (N=146) were recruited via an advertisement in social media and newspapers from the general population of Polish pregnant women and exclusively breastfeeding mothers from the city of Wroclaw, respectively. Maternal Social Support (MSS) and search for support (SS) were assessed based on Berliner Social Support Scales (BSSS). Infant body size at birth (weight, length, and head circumference) were taken from Child Medical Records. Breast milk composition was analyzed based on a single milk sample (5 months of breastfeeding) using near-infrared methods (milk macronutrients), gas chromatography (fatty acid profile), and ELISA method (immune components).

MSS positively predicted infant birth weight (β=.07, p=.036), length (β=.09, p=.008), and levels of IgG (β=.25, p=.017) in breast milk. In contrast, SS negatively predicted milk energy (β=-.21, p=.008), fat (β=-.20,p=.012) and levels of medium-chain (β=-.17,p=.034), long-chain saturated (β=-.21, p=.008) and unsaturated fatty acids (β=-.17,p=.030). The observed associations were significant when adjusted for confounders such as maternal BMI, age, socioeconomic status, stress, diet, and child age.

Maternal social support significantly predicted infant size at birth and breast milk composition. Results of these studies underlie the evolutionarily rooted importance of maternal social network for reproductive outcomes in women.