ABSTRACTS OF PODIUM PRESENTATIONS

Presentation number: 01

BEZDANJAČA: OLD RESEARCH, NEW METHODS

Caric Mario[1], Janković Ivor[1], Radović Siniša[2], Martinoia Valentina[3], McClure Sarah[4], Kennett Douglas J.[4], Novak Mario[1]

[1]Institute for anthropological research, Centre for Applied Bioanthropology, Zagreb, Croatia; [2]Institute for Quaternary Palaeontology and Geology, Croatian Academy of Sciences and Arts, Zagreb, Croatia; [3]Department of Archaeology, Simon Fraser University, Department of Archaeology, Zagreb, Croatia; [4]Department of Anthropology, University of California, Santa Barbara, CA, United States of America

mario.caric@inantro.hr

Originally discovered in the mid-sixties, Bezdanjača, a cave located in Lika, Croatia, was recognized as an important Bronze Age burial site containing several hundred individuals. Subsequent excavations retrieved a sizeable amount of finds, including material culture and skeletal remains, mostly skulls. Preliminary bioanthropological overview of around 30 skeletal and dental samples was conducted shortly after the excavations, while a more comprehensive and revised analysis followed decades later, which included new types of research such as stable isotope analysis of carbon and nitrogen for the purpose of diet reconstruction. This presentation will showcase new results of stable isotope analyses on dental and skeletal samples.

Keywords: bioarcheology, bioanthropology, osteology, stable isotope analysis, bronze age, Croatia

Presentation number: 02

XAVANTE: AN EXAMPLE OF INTERDISCIPLINARY FORENSIC RESEARCH OF HUMAN RIGHTS VIOLATION IN INDIGENOUS POPULATIONS

Górka Katarzyna[1], Plens Claudia Regina[2], Mazur Melania[3]

[1]Department of Anthropology, Hirszfeld Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Wroclaw, Poland; [2]Laboratório de Estudos Arqueológicos, Departamento de História, Universidade Federal de São Paulo, São Paulo, Brazil; [3]Fingerprint and Forensic Anthropology Section, Department of Criminalistics, Institute of Forensic Research, Kraków, Poland

katarzyna.gorka@hirszfeld.pl

Forensic archaeology and anthropology have proven their great usefulness in the analysis of recent human burials and the elucidation of possible crimes and human rights violations. The majority of forensic cases that we hear about involve contemporary Western societies. Nevertheless, human burials resulting from criminal activity, or otherwise direct or indirect violence also reach indigenous communities and isolated tribes. Forensic anthropological and archaeological work does occur in such settings. However, the logistics related to such activities greatly differ from the common and typical forensic cases. The environmental, landscape, legal and social issues related to such projects constitute challenges that greatly affect their execution. They have to take into account the community's interests and needs but also maintain the scientific integrity and reliability of the research. In the present communication, we will present the example of an unprecedented, community-based participative forensic archaeology and anthropology case of the Xavante community in Brazil. Our aim is to discuss the importance of human remains and academic responsibility to respond to human issues in the context of original populations in order to minimize violence against minority groups, including murder and human rights violations.

Keywords: indigenous issues, forensic archaeology, forensic anthropology, human rights violations, Brazil

Presentation number: 03

NEW POPULATION SPECIFIC STATURE RECONSTRUCTION FORMULAE FROM MEDIAEVAL EGYPT BASED ON LENGTH OF DRY LONG BONES

Mahler Robert[1], Lesiak Joanna, Wysocka Joanna[2]

[1]Polish Centre of Mediterranean Archaeology, University of Warsaw, Warsaw, Poland; [2]Hirszfeld Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Wrocław, Poland

r.mahler@uw.edu.pl

Stature as one of the most eco-sensitive characteristics of the human body allows for general comparisons of the well-being of human groups. Stature reconstructed using linear regression formulae based on long bones is commonly used in analyses of skeletal series from archaeological excavations. It is generally agreed that stature to limb bone ratios are population dependent, therefore the most reliable regression formulae for stature reconstruction of skeletons would be based on the population to which they belong. This study is aimed at developing the regression formulae for a skeletal population from the mediaeval cemetery at Naqlun, which — based on the anatomical reconstruction of well-preserved skeletons — would make it possible to carry out a reliable reconstruction of stature for skeletons that are only partially preserved. The material used was excavated at a cemetery dated to the 11th–13th centuries CE. The graves were located in the ruins of the late antique monastery of Naqlun in the Fayoum Oasis, Egypt. To date more than five hundred burials have been excavated and 228 of the adult skeletons stored on site were sufficiently preserved to enable an anatomic reconstruction of stature. A morphological examination made it possible to classify 102 as females and 126 as males. To assess the uncertainty, all the long bones, vertebrae, and skull measurements were repeated in 50 of the cases by the same researchers after a certain period of time and, in the same number of cases, measurements were taken twice by different researchers. To date the only other set of regression formulae developed for Egypt was based on a group of skeletal series, of which 89% precede the current series by three thousand years (Raxter et al.: Am J Phys Anthropol 136 (2008) 147–155). The current work fills the gap constituting an alternative for the samples from mediaeval Egypt. This research was funded by the National Science Centre, Poland, 2022/47/D/HS3/02162.

Keywords: bioarchaeology, stature reconstruction, linear regression

Presentation number: 04

GORJANI MURDERS: ANTHROPOLOGICAL ANALYSIS OF TRAUMATIC INJURIES FROM A LATE MEDIEVAL SITE

Bedić Željka[1], Hirschler Marić Ivana[2], Janeš Andrej[2], Boras Jelena[3]

[1]Institute for Anthropological Research, Zagreb, Croatia; [2]Croatian Conservation Institute, Zagreb, Croatia; [3]Museum of Đakovo Region, Đakovo, Croatia

zeljka.bedic@inantro.hr

The analyses of human skeletal remains use methods from bioarcheology, paleopathology and forensic anthropology, often revealing violent episodes which can improve the understanding of violence in past populations. Traumatic injuries can be distinguished, based on time of occurrence, into antemortem and perimortem traumas. Antemortem trauma happens before death and is characterized by healing and remodelling while perimortem trauma occurs at or near the time of death and there is no sign of healing. The latter are of special interest because they usually witness someone's murder. In the archaeological excavations in Gorjani near Đakovo (Eastern Croatia), which have been carried out since 2017, 138 graves from the late medieval period have been researched. As part of the anthropological processing, a demographic and paleopathological analysis of all skeletons was made. Many recorded traumas in adults, especially perimortem ones, point to some kind of violence. Perimortem traumas were found in seven individuals (six males and one female), of which two males ended up being beheaded. The question arises as to what kind of episodes of violence this could have been? Historical sources mention two battles from the area of Gorjani: the battle of 1386 related to the struggle for the Hungarian throne and 1537 the battle against the Ottomans. The lecture will discuss the types of injuries, their distribution on the skeleton as well as by gender and age, and whether they can be related to the previously mentioned events.

Keywords: Gorjani, late medieval period, perimortem trauma, battles

Presentation number: 05

PULP STONES PRESENCE IN MOLARS OF PAST HUMAN POPULATIONS - THE POTENTIAL INFLUENCE OF SELECTED FACTORS

Nowaczewska Wioletta[1], Drozd Karolina[1], Kubiak-Nowak Dominika[2], Kiełbowicz Zdzisław[2], Pietrzycka Krystyna[3]

[1]Department of Human Biology, University of Wroclaw, Wrocław, Poland; [2]Department and Clinic of Surgery, Faculty of Veterinary Medicine, Wroclaw University of Environmental and Life Sciences, Wrocław, Poland; [3]Department of Endodontics, Conservative Dentistry and Endodontics, Medical University of Lodz, Łódź, Poland

wnowacz@wp.pl

The knowledge about the causes of pulp stones occurrence in human teeth is far from complete and most traits described as influencing their prevalence are considered controversial. Studies on the occurrence of these structures in the teeth of representatives of ancient human populations are extremely rare. The main aim of this study was the assessment of the occurrence of pulp stones in two samples of past human populations and determining the importance of sex, dental wear and type of population (non-industrial and industrial) for their formation. The three types of permanent lower molars (first, second and third, n = 169) belonging to 43 adults from two different populations: Czeladź Wielka (the 13th-14th century) and Wrocław (the 19th-20th century) were examined. For each tooth, the degree of dentine exposure was assessed using precise point scale and the presence/absence of pulps stones (by using their tomographic images and appropriate software). The sex determination of the individuals to which the examined molars belonged was performed according to standard methodology applied in the case of the skeletal collections. Detailed statistical analysis was performed (for each type of molar separately) taking into account the division into sex and population type. A non-significant relationship was found between the occurrence of pulp stones and two traits: sex and type of population - contrary to the degree of molar wear (but not in the case of all groups of molars). The hypothesis of the meaning of the dental wear for the formation of pulp stones was only partially supported, but this could be due to the influence of other factors that were not taken into account in this study (e.g. dental caries and/or type of diet). The results suggest that the occurrence of pulp stones could be mainly caused by dental wear in non-industrial population and mainly by other factors not included in this study in the case of the second of the examined samples.

Keywords: pulp stones, dental wear, past populations

Presentation number: 06

GENETIC INSIGHT IN THE LATE AVAR POPULATION FROM CROATIANTERRITORY – THE STORY OF SOCIAL ORGANIZATION, ANCESTRY AND ADMIXTURE TOLD BY ANCIENT DNA

Havaš Auguštin Dubravka[1], Zagorc Brina[2,3], Šarac Jelena[1], Novak Mario[1,4], Carić Mario[1], Novokmet Natalija[1], Rimpf Andrea[5], Rapan Papeša Anita[6], Fernandes Daniel[2,3,7], Olalde Iñigo[8,9,10],Marjanović Damir [1,11], Reich David [10,12], Pinhasi Ron[2,3]

[1]Centre for Applied Bioanthropology, Institute for Anthropological Research, Zagreb, Croatia; [2]Departmentof Evolutionary Anthropology, University of Vienna, Vienna, Austria; [3]Human Evolution and Archaeological Sciences (HEAS), University of Vienna, Vienna, Austria; [4]Department of Archaeology and Heritage, Faculty of Humanities, University of Primorska, Koper, Slovenia; [5]Ilok Town Museum, Ilok, Croatia; [6]Vinkovci Municipal Museum, Vinkovci, Croatia; [7]Research Centre for Anthropology and Health (CIAS), Department of Life Sciences, University of Coimbra, Coimbra, Portugal; [8]Department of Zoology and Animal Cell Biology, University of the Basque Country UPV/EHU, Vitoria-Gasteiz, Spain; [9]Ikerbasque— Basque Foundation of Science, Bilbao, Spain; [10]Department of Human Evolutionary Biology, Harvard University, Cambridge, United States of America; [11]International Burch University, Sarajevo, Bosnia and Herzegovina; [12]Department of Genetics, Harvard Medical School, Boston, United States of America

dhavas@inantro.hr

Avars arrived in the 6th century from the Eurasian steppes to the Pannonian Basin and establishing an empire lasting for over 200 years. Their dominations diminished in the early 9th century and the questions about their fate and position in the Medieval Europe remained largely unanswered by historical records. Also, very little was known about Avars from contemporary Croatian territory dated to the late Avar period (8th century). In order to shed light on those populations we have analysed ancient human remains fromtwo excavation sites (Šarengrad- Klopare and Nuštar) from eastern Croatia. The aim was to assess their genetic ancestry and assimilation with indigenous population of the same period, as well as to possibly establish their social organization. Extraction of aDNA and library preparation were performed in dedicated clean aDNA facilities. Sequencing was performed on Illumina instruments. Haplogrep2 was used to assign mtDNA haplogroups, and Yleaf program to infer Y haplogroups. Kinship analysis up to the 3rd degree of ancestry was estimated using the READ and TKGWV2 methods. Kinship analysis and the type of burial revealed certain elements of social stratifications in our sample. Also, the results of genetic analysis are in line with other research of late Avar sites (8th-9th century) from Hungary and Slovakia, showing high level of intermixing with local communities, but also minor but traceable Asian genetic elements.

Keywords: Avars, ancient DNA, Croatia

Presentation number: 07

GERIATRIC PALEOEPIDEMIOLOGY: SKELETAL MARKERS OF QUALITY OF LIFE IN ELDERLY POPULATION FROM TWO AVAR PERIOD NECROPOLISES (SERBIA)

Mikašinović Veda[1], **Djukić Ksenija**[1]

[1]Center of Bone Biology, Institute of Anatomy, Faculty of Medicine, University of Belgrade, Belgrade, Serbia

ksenja.djukic@gmail.com

Although looking at attitudes towards the elderly and their well-being within the community can help us to better understand the social foundations of ancient communities, the investigation of old age has been relatively neglected in bioarcheology. This study will present skeletal markers of life quality, such as diseases, physiological stress and trauma patterns, of the elderly population in two Avar period necropolises. The Čik necropolis, dated between 6th and 7th CA, and the Gornje Sajlovo - site 40 necropolises, dated between 7th and 9th CA, are both attributed to the Avar cultural context. Only skeletons older than 55 years were included in this study. The total of 298 was analysed, 102 from Čik and 197 from Gornje Sajlovo - site 40. On Čik, 6% were recognized as elderly, while on Gornje Sajlovo - site 40 - 6.1%. In Čik, all individuals were females, and in Gornje Sajlovo - site 40, seven males and five females were recorded. Overall, degenerative diseases were identified in 12 cases, porotic lesions of cranium in three cases, and postcranium in two cases, and traumatic injuries were recorded in four cases. Three were probably accidental and one was a blunt force trauma of the cranium. The overall paleoepidemiological picture suggests a small percentage of elderly individuals with an expected high prevalence of degenerative diseases. All recorded injuries were well healed with no traces of complications. On one female skeleton we recorded signs of chronic sinusitis, and on one male skeleton hip dysplasia was diagnosed. One female suffered from the initial form of hyperostosis frontalis interna. In this study, there is a prevalence of females in the small elderly population. The small percentage of metabolic diseases suggests a sufficient diet and relatively good living conditions. The presence of hip dysplasia, potentially limiting everyday functions, suggests that this individual probably received some form of health care, provided probably from locally.

Keywords: geriatric paleoepidemiology, Avar period, elderly population, Čik, Gornje Sajlovo - site 40

Presentation number: 08

HEALTH STATUS AND SOCIAL ROLE DIFFERENCES AMONG SEXES IN A MODERN ITALIAN ANTHROPOLOGICAL CONTEXT: COMBINING PALEOPATHOLOGICAL, ANTHROPOLOGICAL AND FUNERARY DATA

De Luca Federica[1], Taglialegne Sara[1], Rinaldo Natascia[1]

[1]University of Ferrara, Ferrara, Italy

federica.deluca@unife.it

In the last years, there has been a growing interest in the study of sex and gender differences in the past. Bioanthropology, through the integration of anthropological, paleopathological, and funerary data, can give information not only on the health status of individuals, but also on the socio-cultural organization of past societies. In this study, we analysed the skeletons of 112 adults from the St. Biagio Cemetery (Ravenna,17th-19th Century, Italy). This study aims to give an overview of the health status, with a focus on sex differences, and to highlight possible different roles between males and females. Anthropological analysis (sex and age at death estimation) was carried out using classical methods. Frailty was assessed using the biological index of frailty (BIF) on 104 individuals and paleopathological analysis was conducted using macroscopic and radiological methods. The difference in frailty (evaluated through ANCOVA adjusted for age) is not statistically significant between sexes, with similar mean values that fall into the “medium frail” category. Males and females were equally affected by pathologies in all age classes. The distribution of diseases was similar between the two sexes, except for metabolic disorders, congenital diseases, and neoplasms that were only found in males. Interpersonal violence was widespread throughout the site but only males presented multiple inflicted traumas. Concerning the analysis of funerary treatments, there were 12 cases of non-conventional burial treatments among both sexes. For example, various individuals of both sexes were found with isolated skulls while evidence of marginalization has been shown only in female individuals. In conclusion, males presented more pathologies and inflicted trauma than females, but frailty was similar in both sexes. Non-conventional funerary treatments were used only in the middle and older adults of both sexes, but marginalized positions were recorded only in female individuals.

Keywords: Health status, gender archaeology, Bioarcheology, Italy, funerary treatments, care and compassion

Presentation number: 09

A 'MADMAN' ON THE BATTLEFIELD? A FORENSIC AUTOPSY IN BUCHAREST, ROMANIA, FROM THE CRIMEAN WAR

Constantinescu Mihai Dan

University of Bucharest, Bucharest, Romania

mihai.constantinescu@istorie.unibuc.ro

This study presents a post-mortem exploratory autopsy of an adult male excavated from the Saint Sava monastery graveyard in the centre of Bucharest. According to archaeological context and historical sources, the autopsy was performed on an officer of the Russian Imperial Army between 1853-1854, likely by surgeons of the Russian army at the Colţea Hospital. Macro- and microscopic analysis of the skeletal remains revealed preserved skeletal damage related to disarticulation and dismemberment of the remains for removal and examination of the central nervous system. The overlying soft tissues of the calvaria and spine were removed with a scalpel-like instrument, the calvaria was removed with a thin-bladed handsaw, and a laminectomy was performed using a rachitome. A scalpel was then used to incise the spinal nerves and other connections of the spinal cord to the rest of the body, while cut marks on the cranial base bones indicate the intention of taking the cranial contents and spinal cord en bloc. This is the first case of an autopsy from a historical period identified in Romania, which is more interesting as the skeleton shows no signs of violence and the stages of the autopsy are different from the current practice of 19th-century physicians. The manner in which the autopsy was conducted, the pathological changes of the skeleton, and the historical sources indicate a forensic autopsy whose purpose was to identify the effects of infectious diseases, possibly congenital syphilis, on the central nervous system.

Keywords: Bucharest; Crimean War; forensic autopsy; congenital syphilis.

Presentation number: 10

A REMARKABLE DISCOVERY OF THREE EARLY MEDIEVAL HUMAN SKELETONS IN A STORAGE PIT IN MODRá NEAR VELEHRAD (CZECH REPUBLIC)

Fojtová Martina, Galuška Luděk, Langr Jakub, Roblíčková Martina

Moravian Museum, Brno, Czechia

mfojtova@mzm.cz

In 2023, while conducting rescue excavations prompted by the construction of a new exhibition building, a storage pit containing the skeletal remains of three individuals placed one above the other was discovered in the area of the open-air archaeological museum site in Modrá near Velehrad (Zlín Region, Czech Republic). The skeletons, accompanied by a large number of animal bones (cow, pig, horse, sheep/goat) and a few pottery fragments, were lying in non-standard positions. Furthermore, a large quern-stone was placed vertically at the bottom of the pit. The skeleton placed in the lowest position belonged to an old woman lying crouched on her right side. A cow's skull had been laid on her right knee, which was bent over the edge of the quern-stone. Given the dislocation of her skull, the number of ashes in the backfill around the skeleton, and the blackish-grey-coloured surface of most of the bones, we cannot rule out decapitation and attempted cremation of the body. A little higher up at the opposite wall of the pit, the skeleton of a man aged 40-50 years, lying on his left side, was uncovered. His hands were clasped, with his right elbow touching the nasal part of the cow's skull. About 10 cm above the male skeleton was the skeleton of a woman aged 40-60 years in a crouched position on her back. This suggests she had probably been bound before being thrown into the pit. Two earrings were found near her skull. The site is located near the burial ground and foundations of a 9th-century Great Moravian church. However, the situation described is unlikely to be related to the Great Moravian settlement since radiocarbon dating places the skeletons as most probably originating in the first half of the 8th century, i.e. in the period before the Slavs in the region adopted Christianity, when their dead were preferably cremated. It is all the more challenging for us today to decipher what happened in these places 13 centuries ago.

Keywords: Early Middle Ages, deviant burial, bioarcheology, decapitation, human sacrifice

Presentation number: 11

ANALYTICAL CHEMISTRY IN ANTHROPOLOGICAL RESEARCH – INANTRO PERSPECTIVE

Čoklo Miran[1], Dolanc Ivan[1], Jonjić Antonija[1], Slivšek Goran[1], Obad Ante[2]

[1]Institute for Anthropological Research (INANTRO), Zagreb, Croatia; [2]University Department of Health Studies, University of Split, Split, Croatia

miran.coklo@inantro.hr

Analytical chemistry is nowadays an inevitable part of the interdisciplinary and holistic nature of the anthropological research. Using various chemical analytical methods (organic, inorganic, multielemental, stable isotope…), it is aimed to provide additional knowledge on numerous subjects, such as — nutritional and other habits and lifestyle of ancient populations, use of the archaeological non-biological artefacts (e.g. ceramic pottery), analysis of disease and skeletal trauma on archaeological skeletal remains, environmental exposure to various chemicals or elements that influence human health and disease (e.g. chemicals and elements with endocrine-disrupting properties), population studies, proteomic and metabolomics analyses etc. Special emphasis will be given to the INANTRO perspective, including national and international research projects and pilot studies that take advantage of the chemical analyses to provide explanations and answers to research questions that would otherwise remain unanswered. Among these, studies of the role of lead poisoning in rural and urban settlements within the Roman province of Dalmatia (Croatia), using a combination of elemental analysis of lead levels within dental samples of non-adults and macroscopic paleopathological analysis, as well as a research on a comprehensive investigation of human remains and material culture from ten ancient sites from Croatia, including chemical analyses of stable carbon and nitrogen isotopes and lead analysis, will be presented. Also, studies of the role of endocrine- disrupting chemicals in occurrence of the complex diseases and clinical course and outcome of COVID-19 disease will be elaborated.

Keywords: analytical chemistry, anthropological archaeology, anthropology, complex diseases, interdisciplinary approach

Presentation number: 12

VIRTUAL ANTHROPOLOGY AS CULTURAL AND RESEARCH RESOURCE: THE DIGITALIZATION AND ETHICAL MANAGEMENT OF THE DOCUMENTED HUMAN OSTEOLOGICAL COLLECTIONS (DHOCS)OF THE UNIVERSITY OF BOLOGNA

Sorrentino Rita[1,2], Nicolosi Teresa[3], Mameli Davide[1], Mariotti Valentina[1], Pietrobelli Annalisa[4,1],Belcastro Maria Giovanna[1,2]

[1]Department of Biological, Geological and Environmental Sciences, University of Bologna, Bologna, Italy , Bologna, Italy; [2]CHANGES - Cultural Heritage Active Innovation for Sustainable Society- Spoke n. 6 "History, Conservation and Restoration of Cultural Heritage" - Piano Nazionale di Ripresa e Resilienza (PNRR), Bologna, Italy; [3]Department of Cultural Heritage, University of Bologna, Ravenna, Italy, Ravenna, Italy; [4]Department of Human Origins, Max Planck Institute for Evolutionary Anthropology , Leipzig, Germany

rita.sorrentino2@unibo.it

Human skeletal remains represent pivotal evidence for understanding human evolution and population dynamics. In the last decades, Virtual Anthropology has emerged as a powerful tool for conducting research on human skeletal remains in anthropology, archaeology, and forensics. By using 3D imaging technology, researchers can conduct non-destructive dissection, morpho-functional analyses, and geometric morphometric to explore evolutionary variations and reconstruct the life histories of populations and individuals. In addition, Virtual Anthropology has profound implications for conservation, data sharing, and cultural heritage valorisation. Digitization reduces the risk of damage to fragile bones and allows for virtual reconstructions, ensuring their preservation. Furthermore, digital databases facilitate global collaboration among researchers and promote participative culture through online exhibitions and interactive educational initiatives. However, the ethical dimension of digitized human remains presents complex challenges. While they are recognized as bio-cultural archives by the academic community, their juridical status still lacks clear guidelines for management, access, and reuse. Efforts to navigate these challenges include adherence to research ethics principles, as well as compliance with national and international regulations governing the handling of human remains. Within the CHANGES project, the digitalization of the Documented Human Osteological Collections of the University of Bologna (Italy) seeks to address these issues. By providing open access to 3D scans and models of human skeletal remains,the project aims to facilitate interdisciplinary research and contribute to the preservation and accessibilityfor future generations. This virtual database attempts to apply best practices for managing digital human skeletal remains considering the ethical, scientific, cultural, and social implications surrounding this sensitive bio-cultural asset.

Keywords: Virtual Anthropology, human skeletal collections, bio-cultural assets, open-osteology, datasharing, ethics

Presentation number: 13

EXPLORING THE ASSOCIATION BETWEEN BODY SIZE, GROWTH AND LOWER LIMB BODY COMPOSITION AND INJURIES IN YOUNG ELITE SOCCER PLAYERS

Rinaldo Natascia[1], Zaccagni Luciana[1], **Toselli Stefania**[2]

[1]University of Ferrara, Ferrara, Italy; [2]University of Bologna, Bologna, Italy

natascia.rinaldo@unife.it stefania.toselli@unibo.it

Soccer is one of the three most popular team sports among children and adults. Indeed, is estimated to be played by over 250 million players worldwide. Despite the well-known benefits of sports participation in children and adolescents, the rate of injuries in soccer is very high, especially during games (it is estimated to be between 9.5 to 48.7 injuries per 1000 hours), with an increasing trend with increasing age. Few studies have documented the role of anthropometric and body composition measures, as well as maturity offset and growth rate, on injury occurrence. This study aims to: i) analyse body composition and anthropometric measures in a sample of Italian youth elite soccer players and ii) explore the relationship between maturity and peripheral body composition on injury rate. A total sample of 185 youth athletes from under-9 to under-15, who played soccer in two elite soccer clubs, participated in this study and were evaluated for an entire soccer season (from September to May). Lower limb body composition and maturity offset were estimated based on anthropometric data and the number, type, location, and severity of injuries were collected using standardized protocols. Younger players (U9-U12, n=79) are significantly lighter and smaller than older players (U13-U15, n=106), as expected. Older players have also significantly higher mean BMI, calf fat percentage, and thigh muscle area than younger players. The total number of injuries was 67, with an incidence of 0.43 per player, and the majority were moderate or severe. Significant associations have been found between injury occurrence and lower limb fat and muscle area; years at peak height velocity did not seem to be associated with injury risk in our sample. Given the results of this study, is fundamental for coaches to evaluate and consider the body composition of young athletes to reduce the risk of injuries.

Keywords: Soccer; injuries; anthropometry; body composition; growth

Presentation number: 14

THREE-DIMENSIONAL DATABASE OF FACIAL ANTHROPOMETRIC PARAMETERS OF AZERBAIJAN POPULATION

Sultanova Nigar

Azerbaijan Medical University, Baku, Azerbaijan

sultan23nika@yahoo.com

Facial morphology is a constant topic of concern for clinicians. Normative data of facial measurements are indispensable to precise determination of the degree of deviations from normal. Aim. Establish database of facial anthropometric parameters of Azerbaijan population. Method. The study group consisted of 900 healthy young subjects, 450 males and 450 females, from 7 different regions of Azerbaijan. Age groups: I - 18-25; II - 26-45; III- 46-65 years. All subjects underwent 3D facial scanning using a Bellus- Arc 7 scanner (California, USA). The anthropometric examination was performed according to L.Farkas's method with our modification. In order to determine the morphologic characteristics of seven regions of the craniofacial complex 42 anthropometric measurements were selected. The measurements were collected with MeshLab software (MeshLab, MeshLab). The anthropometric examination included the usage of 33 anthropometric landmarks. The 80 indices of the craniofacial proportions were calculated: head -10, face -23, nose-23, lips-9, orbits -11, ears-4. Results. Anthropometric measurements of facial proportions in Azerbaijan population revealed a significant difference between men and women, according to sexual dimorphism. In comparison with North American whites, considerable differences of facial proportions were observed in the head, face, orbits, labio-oral, nose and ear region. However, in women of the Azerbaijani population, 29 out of 80 proportion indices were similar to the proportions of NAW women. In the men of the Azerbaijani population, 27 out of 80 proportion indices did not reveal a statistically significant difference from the proportions of NAW men. Conclusion. Estimation of the reference range of facial proportions in Azerbaijan population migth be helpful to formulate surgical plan in treatment of congenital or post-traumatic facial deformities successfully.

Keywords: Bellus- Arc 7 scanner, facial morphology, anthropometric measurements, proportion indices, Azerbaijan population

Presentation number: 15

BRIDGING HERITAGE AND PROGRESS: PERSPECTIVES ON TOURISM DEVELOPMENT IN GORSKI KOTAR, CROATIA

Jarec Morana

Institute for Anthropological Research, Zagreb, Croatia

morana.jarec@inantro.hr

This research delves into the paradoxical scenario of Gorski Kotar, a region nestled in the historically rich Croatian landscape. Despite being situated in the tourism-centric county of Croatia; the region faces a notable deficiency in tourism offerings. Focusing on key elements of large infrastructure, including a historical road, a motorway, and a reservoir lake, this study aims to elucidate the untapped potential of Gorski Kotar's tourism sector. The Lujzijana road, a significant cultural heritage road, once served as a crucial route to the seaside, fostering transit tourism. However, with the advent of modern highway, the region has witnessed a decline in tourist engagement. The motorway, while expediting travel to coastal destinations, inadvertently bypasses the cultural richness and historical allure of Gorski Kotar, resulting ina lack of tourist stopovers. Furthermore, even though artificial, a Lokvarsko lake is harmoniously embedded in the natural landscape. Despite its scenic beauty, the lake has not been incorporated into the regional tourism narrative, hindering its potential contribution to the tourism industry. The research methodology employed a combination of semi-structured interviews with local residents and a comprehensive review of online articles, providing insights into the challenges and opportunities faced bythe region. By examining the interplay between human, natural and built environment, the study seeks to bridge the gap between historical significance, modern infrastructure, and the region's inherent natural beauty. The findings provide insights into local perceptions, attitudes, and media representations, offering valuable perspectives for policymakers, tourism stakeholders, and researchers seeking to uncover tourism potential in overlooked yet culturally rich regions.

Keywords: infrastructure, tourism, media, local population, Gorski Kotar, Croatia

Presentation number: 16

SOCIAL MEDIA IN ANTHROPOLOGICAL SCIENCES

Dodigović Lucija

Institute for anthropological research, Zagreb, Croatia

ldodigovic@inantro.hr

Social media is revolutionizing the promotion of science in anthropology, enabling global collaboration, knowledge dissemination, and public engagement. Anthropologists leverage platforms like Facebook, Twitter, Instagram, and YouTube to transcend traditional academic boundaries. The democratization of information on social media connects researchers worldwide, fostering cross-cultural dialogue and collaborative projects. Anthropologists use visually engaging content such as infographics and videos to make complex concepts accessible. This multimedia approach enhances the impact of scientific communication, reaching a diverse audience. The interactive nature of social media facilitates real-time engagement through Q&A sessions, live discussions, and virtual events, promoting a two-way exchange of knowledge. Additionally, social media empowers anthropologists to amplify underrepresented perspectives, contributing to the decolonization of anthropological knowledge. Researchers actively advocate for inclusivity, challenging traditional power dynamics within the discipline. However, challenges like misinformation and ethical considerations necessitate a thoughtful and responsible approach to social media promotion in anthropology. In conclusion, social media is an indispensable tool for anthropologists, transforming the discipline by fostering inclusivity, accessibility, and global connectivity. Through these platforms, anthropologists contribute to a more equitable and diverse representation of human experiences, enhancing the impact and reach of anthropological research.

Keywords: social media, communications, popularization of science

Presentation number: 17

EXAMINING THE RELATIONSHIP BETWEEN ULTRA-PROCESSED FOOD CONSUMPTION, SOCIODEMOGRAPHIC, AND BMI: AN INVESTIGATION OF THE CHMS

Baric Angelina, Christoforou Anthea

McMaster University, Milton, Canada

barica1@mcmaster.ca

Nearly three-quarters of Canadian children have adverse levels of at least one cardiometabolic risk factor, and 27.5% of Canadian children are classified as overweight or obese. Research from other jurisdictions has begun to implicate ultra-processed foods (UPF) in the rise of a number of negative health outcomes, including a higher body mass index (BMI), waist circumference (WC), blood pressure (BP), and unfavourable blood lipid profiles. Data from Canada and from Canadian children specifically is limited. Drawing on the Canadian Health Measures Survey (2016-2017 and 2018-2019), the present study investigates the relationship UPF consumption, sociodemographic variables, and BMI in Canadian children and adolescents (ages 3-18, n=4865). Dietary data collected by Food Frequency Questionnaire were used to classify foods as UPF or not using the validated NOVA classification system which scores foods along a continuum based on the degree and nature of processing. Participants were grouped into quartiles based on percent of total energy consumed from UPF per day. Chi-square tests for categorical outcomes and ANOVA for continuous outcomes were conducted to assess differences between quartiles of UPF across various axes of interest. The percentage of daily energy from UPF ranged from 24.3% in the lowest quartile and 62.6% in the highest quartile. Males, those aged 9-18 yrs, those who were not breastfed as well as those with lower household income and education, had significantly higher intakes of UPF. The average BMI in the lowest quartile of UPF intakes (18.9) was significantly lower than that in the highest quartile (19.9) ($p<0.001$). This data provides insight into populations at risk for high UPF consumption in Canada and adds to the growing body of literature demonstrating the detrimental health effects associated with UPF consumption in children.

Keywords: Ultra-processed foods, nutritional epidemiology, children's health, body composition

Presentation number: 18

ANTHROPOLOGICAL RESEARCH ON NUTRITION. WHAT THE MEDIEVAL FRESCOES TOLD US.

Vidovič Maruška

Institute of Public Health of the Republic of Slovenia, Ljubljana, Ljubljana, Slovenia

maruska.vidovic@nijz.si

An extensive, multi — year anthropological and public health project of isolated populations in the Selška valley with international participation included data from registry books, morphological and anthropometric to DNA analysis, as well as research relating to way of life and health. Nutrition has a fundamental biological function it therefore has an impact on health. We obtained a wealth of data on the food and diet of the historical population from land registers, i.e. inventories of land ownership and yields of produce from the land (crops belonging to the landowner). We examined how today's population of the upper part of Selška valley where many traditional elements persist, feed themselves by visiting households and carrying out interviews. 24-hour menus for one day of the week and Sunday were also prepared and analysed. Our guideline was the holistic approach and that is why, when researching nutrition in Loško Selška region, we also looked at medieval art. Our attention was drawn to the frescoes from the 15th Century in Crngrob and Križna gora which told us a lot about life, work and food in the past. These imposing frescoes opus is a remarkable monument. From the depicted scenes of everyday life, much can be learned about social conditions, about of organization of society and the nutrition and diet of that time. This wonderful church wall paintings frescoes are very impressive, very special and are anthropologically extremely interesting.

Keywords: isolated populations, nutrition, health, holistic approach, Selška valley, frescoes, medieval art

Presentation number: 19

A WEAK TERATOGENIC INSULT INDUCES BONE LOSS IN ADULTS DEPENDING ON THE EMBRYONIC GENOME

Kobyliansky Eugene, Torchinsky Arkady

Tel Aviv University Sackler Faculty of Medicine, Tel Aviv, Israel

anatom14@tauex.tau.ac.il

Background: Evidence shows pregnant mothers malnutrition can cause age-related bone loss. We hypothesize some teratogens at a sub-threshold teratogenic dose can also detrimentally affect bone health in adult offspring. We examined:1) can some teratogens detrimentally affect skeletal health in adult offspring 2) extent such teratogenic exposure depends on the embryonic genome. Methods: For #1, ICR mice received a single of 5-aza-2-deoxycytidine (5-AZA) injection at a sub-threshold teratogenic dose on day 10 of gestation. Offspring femur was evaluated by Micro-CT. Activity of caspase 3 & miRNA expression (~380 miRNAs) was tested in embryonic hind limb buds collected 24 & 48h after injection. Also, primary cultures of femoral stromal/osteoblastic cells & osteoclast precursor cells were used to test the expression of RANKL & OPG & osteoclast formation level by TRAP staining. For #2, micro-CT comparison of structure & bone mineral density of the femur of male offspring of 5-AZA treated 57Bl/6J (C57) & C3H/HeJ (C3H) mice exhibiting a low (C57) & high (C3H) bone mass phenotype was done. Results: the femora of ICR 5- month-old male offspring exposed to 5-AZA had trabecular microarchitecture indicative of bone loss. In hind limb buds of embryos exposed to 5-AZA, altered expression of some microRNAs demonstrated as regulators of key osteoblastogenic genes were observed. Also, increased expression of RANKL in femoral stromal/osteoblastic cells of offspring of 5-AZA-treated females was found. Experiments in C3H & C57 mice show 5-AZA-induced loss of bone quality was registered in 6mo C3H offspring but not in their C57 counterparts. Conclusions: The study implies low-dose exposure to a teratogen can induce bone loss in adult offspring. Also, the data from C57 & C3H mice allows hypothesis that offspring inherently exhibiting a low bone mass phenotype may be more resistant to antenatal stress induced bone loss than those inherently exhibiting a high bone mass phenotype.

Keywords: TERATOGENIC INSULT BONE LOSS IN EMBRYONIC GENOME

Presentation number: 20

THE RELATIONSHIP BETWEEN ENDOCRINE STATUS AND BODY COMPOSITION IN ELITE HANDBALL PLAYERS (14-21 YS)

Ratz-Sulyok Fanny Zselyke[1,3,2], Jang-Kapuy Csilla[2], Nagy Abigel Sara[4], Zsakai Annamaria[2,3], Szabo Tamas[3]

[1]Neuroscience and Human Biology Programme, Doctoral School of Biology, Faculty of Science, Eotvos Lorand University, ELTE, Budapest, Hungary; [2]Department of Biological Anthropology, Faculty of Science, Eotvos Lorand University, ELTE, Budapest, Hungary; [3]Sport Sciences and Diagnostic Research Centre, Hungarian Handball Federation, Budapest, Hungary; [4]Revai Miklos Gymnasium, Gyor, Hungary

rsfzs5@gmail.com

Objective. To study the relationship between body mass components and sex hormone levels (both absolute and relative levels) in youth handball players. The analysis is a part of a large study to develop a new screening method for overtraining status in athletes. Subjects and methods. 175 elite Hungarian handball players (14-21 ys) were examined in 2023. Body composition (bone, muscle, fat mass) and bone structure (BMC, BMD) were analysed via DEXA examination. Saliva samples were collected to measure the concentration of testosterone and cortisol hormones in all subjects and 17-β-estradiol hormone level in females, hormone levels were estimated by ELISA method. Results. The absolute and relative levels of sex hormones (expressed in the percentage of the median reference values of the studied sex hormones recommended for the given age-group, as well as the ratio of sex hormone and cortisol hormone levels) were used to construct the athlete references of testosterone and 17-β-estradiol levels for subadults and young adults. As a summary, it could be stated that testosterone level of male athletes was higher, while 17-β-estradiol level of female athletes was lower than non-athletes in their age-groups. The preliminary results showed that testosterone/cortisol ratio in male handball players and the level of testosterone in females related with muscle mass, while 17-β-estradiol level did not relate with any of the studied body mass components in female athletes. Conclusions. Sex hormone levels of youth athletes showed deviations from the non-athlete references in both sexes. A new index of testosterone/estradiol and cortisol level is under construction for the screening of not normal level of sex hormones in athletes. It is our further aim to study fatigue, inflammatory and immune biomarkers beside the sex hormone levels to analyse their relations with injury status and risk in elite athletes.

Keywords: athletes; handball; sex hormones; body composition

Presentation number: 21

THE CHANGES IN THE PREVALENCE OF UNDERWEIGHT AND SHORT STATURE AMONG POLISH YOUTH FROM 1938 TO 2020

Kryst Łukasz[1], Żegleń Magdalena[2], Kowal Małgorzata[1], Woronkowicz Agnieszka[1]

[1]Department of Anthropology, Faculty of Physical Education and Sport, University of Physical Education in Kraków, Kraków, Poland; [2]Pain Research Group, Institute of Psychology Jagiellonian University, Kraków,
Poland

lkryst@poczta.onet.pl

The problem of underweight and short stature, especially in developed countries, is important but not discussed as frequently in the literature. This study aimed to examine the changes in the prevalence of underweight and short stature among Polish youth from 1938 to 2020. The study utilized five sets of cross- sectional data, collected between 1938 and 2020 in Kraków, Poland. The study group consisted of 24639 children and adolescents aged 3-18 years old. The height and weight were measured, and BMI was calculated based on those parameters. To determine underweight, Cole's cut-off points were used, while short stature was defined as body height falling below -2 standard deviations from the mean for age and sex. The statistical significance of the differences between the cohorts was assessed using the Chi2 test. For girls, the overall prevalence of underweight in 1938 and 2020 was very similar (about 9.5%). The highest values were recorded in 1983 (especially in the pubertal period), and in subsequent cohorts, the prevalence steadily decreased. It should be noted, however, that the highest prevalence of underweight in the 21st century characterized girls in the post-pubertal period. In boys, on the other hand, the overall prevalence of underweight varied more ($p<0.006$) - the lowest percentage was recorded in 1938 (5.6%), the highest in 1983 (11.1%), and it has been steadily declining since then. The overall prevalence of short stature in both sexes is relatively small (1.5 - 2.5%) and has not changed markedly over the past 85 years. The prevalence of underweight increased markedly between 1938 and 1983, indicating worsening environmental conditions (WWII, communist period). However, a decrease in the prevalence of children with underweight has been recorded in the last 4 decades, also illustrating the impact of the socioeconomic environment. As is well known, both underweight and short stature can have a substantial impact on the current and future health of children

Keywords: underweight, short stature, children, secular trend

Presentation number: 22

IMPACT OF MATERNAL CHARACTERISTICS ON PREGNANCY OUTCOME: A HOSPITAL-BASED FOLLOW-UP STUDY AMONG THE BENGALI POPULATION OF KOLKATA, INDIA

Mitra Maitrayee[1,2]

[1]Visva-Bharati University, Bolpur, India; [2]Anthropological Survey of India, Mysore, India

maitrayeemitra901@gmail.com

In view of the high rate of Low-Birth-Weight cases among the Bengali population in Kolkata, a total of 189 singleton pregnancies (who began antenatal medical consultation on or before the 4th week of pregnancy) were included for a follow-up study at two multi-specialty hospitals in Kolkata, India. As per the secondary resources low-birth-weight babies were quite frequent in the nearby localities of the two hospitals. Mothers were followed up in each trimester until parturition. Maternal socio-demographic profile, reproductive history, anthropometric and hemodynamic factors for each trimester as well as late gestational metabolic profiles along with lifestyle patterns were recorded. Maternal characteristics were divided into two groups based on the pregnancy outcome in terms of the neonatal birth weight (Low Birth Weight and Optimal Birth Weight). The 189 pregnancies lead to 25.92% low birth weight babies. A single case of macrosomic child was reported having maternal characteristics of class II obesity at 1st trimester, dyslipidaemia and gestational diabetes. Maternal anthropometric profile showed that the third trimester weight, gestational weight gains and gestational BMI gain contributed significantly to the manifestation of low-birth-weight babies. As far as hemodynamics profile of the mothers were concerned, the difference of SBP and MAP during the first trimester only had significant contribution to the low-birth-weight babies. Late pregnancy metabolic profile of the mother did not impact the birth weight. Regression analysis showed that mothers who gained weight in their third trimester pregnancy were more likely to produce low-birth-weight babies. As per Beck's depression classification, psychologically stressed mothers contributed significantly towards low-birth-weight babies.

Keywords: Maternal health, Follow-up study, Low Birth Weight, Bio-social factors, India

Presentation number: 23

ESTIMATION OF SKELETAL AGE THROUGH DRY BONE ANALYSIS: A STUDY ON SHOULDER AND WRIST DEVELOPMENT FROM BIRTH TO ADULTHOOD.

Salazar Fernández Azahara, Carretero Diaz José Miguel, García Gonzalez Rebeca

Laboratory of Human Evolution. University of Burgos., Burgos, Spain

azahara_sf@hotmail.com

Growth reflects incremental increases in size, whereas maturity signifies the attainment of a fully developed and specialized adult form. These two distinct yet interrelated processes form the foundation of what we term skeletal development (Roche, 1992). The study of skeletal development has been predominantly conducted using radiographic techniques. Yet, the investigation of these processes through the analysis of dry bones remains notably underrepresented in scientific literature. This scarcity of dry bone data poses significant obstacles in the accurate identification of skeletal remains and the precise estimation of skeletal age, particularly within the fields of forensic anthropology and archaeology. To bridge this gap, our research utilizes an array of dry bone specimens from two distinct collections, spanning from birth to 20 years, aiming to estimate the bone transformations of the shoulder and wrist—two of the most crucial joints in human anatomy—during developmental progressions. Our methodology involved processing the sample using advanced high-resolution 3D scanning technology. Subsequently, we conducted various geometric morphometric analyses on the complete sample, which comprises 87 scapulae, 153 clavicles, 102 humeri, 40 scaphoid bones, 36 lunate bones, 38 distal radial epiphyses, and 41 capitate bones. The results indicate that the morphological variations associated with age progression are suitable for establishing age groups based on skeletal maturity. These variations are correlated with the onset and fusion of the ossification centres, hormonal transitions, and biomechanical factors. Thus, our findings not only facilitate the creation of a novel method for determining skeletal age but also enrich our comprehension of the human body's developmental processes. Bibliography: Roche, AF. Growth, Maturation, and Body Composition: The Fels Longitudinal Study 1929-1991. (Pp 282; C37 50.) Cambridge University Press, Cambridge, 1992. ISBN 0-521-37449-9

Keywords: Skeletal development, geometric morphometric, physical anthropology.

Presentation number: 24

WHICH CONTRIBUTES MORE TO THE MAXIMUM GROWTH GAIN IN STATURE, SITTING HEIGHT OR LEG LENGTH USING A NEW BPC (BODY PROPORTION CHART)?

Satake Takashi[1], Hirohara Toshie[2], Hattori Komei[2]

[1] Institute of Human Culture Studies, Otsuma Women's University, Tokyo, Japan; [2]Ibaraki University, Mito, Japan

satake.tt@gmail.com

INTRODUCTION: Growth in leg length terminates, on average, earlier than growth in sitting height, which continues until late adolescence. Sitting height thus contributes more to the adolescent gain in stature than leg length. From another viewpoint, this paper attempts (1) to confirm which contribute more to the maximum growth gain in stature (MAHG: Maximum Annual Height Gain), the growth gains in sitting height at the peak height velocity (SHG: Sitting Height Gain at MAHG) or leg length at the peak height velocity (LLG: Leg Length Gain at MAHG) and (2) to describe variation in contribution of the SHG and LLG, and (3) to examine relationship between individual versus average growth by using longitudinal data. SUBJECTS AND METHODS: The data are from annual health examination surveys conducted by school health teachers. A longitudinal data set spanning the 1st grade of elementary school through the 3rd grade of high school was extracted from serial surveys. The subjects born from 1980 to 1986 were healthy, adequately nourished Japanese youth (boys: 520, girls: 306). The measurements used were stature and sitting height. Leg length was estimated as stature minus sitting height. Age at peak height velocity was estimated on the BPC and MAHG were calculated, and also calculated SHG and LLG for each individual, respectively. To examine growth variations among individuals using a new BPC (LUGC: Lower Segment - Upper Segment Gain Chart) whose idea is the same as the BPC. LUGC simultaneously describe MAHG, SHG, LLG and LUGR (Lower segment -Upper Segment Gain Ratio) on a single graph. LUGR was derived as LLG/ SHG*100. RESULTS: Cross-sectional analyses (average growth) showed that the LLG contributed more to the MAHG than the SHG. However, longitudinal analysis showed that there were some variations on contribution of the SHG and the LLG. Thus, longitudinal observations on an individual may be as different from mean trends in a longitudinal study of a population.

Keywords: peak height velocity, stature, sitting height, lower limb length, BPC

Presentation number: 25

DEVELOPMENTAL DIFFERENCES IN DYNAMIC INDICATORS OF THREE SIMPLE COGNITIVE SUB-SYSTEMS FUNCTIONING OBSERVED IN GIRLS AND BOYS AGED 8-17 YEARS

Žebec Mislav Stjepan[1], Kaurić Katja[2]

[1]Institute for Anthropological Research, Zagreb, Croatia; [2]Rimac Technology d.o.o., Zagreb, Croatia

mislav.stjepan.zebec@inantro.hr

Mainstream post-Piaget cognitive development researchers mostly ignored performance dynamics behind the total paper-and-pencil tests score, or average reaction time on computerized tests. Like other Dynamic Systems Theory applications in cognitive psychology, this research focuses on several indicators of performance dynamics while solving three computerized cognitive tests of various complexity. In order to get developmental picture of the corresponding cognitive subsystems and their dynamics, the tests were solved by girls (N=228) and boys (N=253) aged 8-17 years. Study participants were students of a primary and a secondary school from Zagreb (Croatia) that individually solved three simple tests of MID KOGTESTER-1 computerized reaction-meter, which assessed perceptual and working memory functioning of various complexity. Four reaction-time dynamic indicators (minimal, maximal and average time of cognitive task solving, and average time of non-optimal task solving) were mostly positively correlated, sharing an average variance of 37% - thereby presenting non-redundant measures of cognitive dynamics. The non-trivial and significant results were: (1) age-related decrement of all 4 indicators was non-linear, but with different shape (related to indicator); the decrement was steeper for more complex tests and more steady for girls; (2) girls outperformed boys in all indicators but minimal time of cognitive task solving, although the intensity of the differences depended on the indicator type and test complexity; (3) inter-individual variability of all dynamic indicators of related cognitive subsystem functioning decreased with age and increased with test complexity. Dynamics of cognitive subsystem functioning reflects at least the consolidation level of cognitive and neural structure behind the cognitive performance and its development. Therefore, performance dynamics indicators contribute to our understanding of human cognitive development.

Keywords: cognitive development, indicators of performance dynamics, sex differences, inter-individual variability

Presentation number: 26

TIMING OF SEXUAL INITIATION AMONG POLISH ADOLESCENTS AND ASSOCIATED FACTORS: IMPLICATIONS FOR HPV VACCINATION PROGRAMMES AND FUTURE FERTILITY

Kaczmarek Maria Agnieszka, Durda-Masny Magdalena

Institute of Human Biology and Evolution, Faculty of Biology, Adam Mickiewicz University, Poznan, Poland

maria.kaczmarek@amu.edu.pl

Objectives: Initiation of sexual activity before the age of 15 is recognized as a risky behaviour associated with several negative reproductive health outcomes, including sexually transmitted infections, unwanted pregnancies, unsafe abortions and the potential for later infertility. This study aims to determine the age at which Polish adolescents initiate sexual activity, identify factors influencing this behaviour, and use this information to recommend prophylactic vaccination against human papillomavirus (HPV). Methods: Data were obtained from the population-based, cross-sectional ADOPOLNOR study, focusing on a subset of 1571 boys and 1580 girls aged 13-19 years. Participants completed the Polish version of the Youth Quality of Life Instruments (YQOL-R), supplemented with additional questions on sexual activity. Socioeconomic, behavioural, educational and peer approval variables were considered as potential predictors. Median age of sexual debut was calculated using Kaplan-Meier estimation. Univariate and multivariate logistic regression (MLR) models were used to assess the crude and adjusted effects of selected predictor variables on sexual debut, reported as odds ratios (ORs). Results: Among boys, 4.8% reported sexual debut before age 15, compared with 3.2% of girls ($p=0.025$). By the age of 18-19 years, 40.2% of boys and 34.9% of girls reported sexual initiation ($p=0.299$). The median age of first sexual intercourse was 16.49 years for boys and 17.08 years for girls ($p<0.001$). MLR analysis revealed that predictor variables for sexual debut before age 15 for both genders included low educational attainment, smoking, and substance abuse and additionally for boys' rural residence and peer approval. Conclusions: This updated analysis of sexual initiation and associated predictor variables in Polish adolescents provides valuable insights for policy makers developing reproductive health policies and may serve as a recommendation for prophylactic vaccination against HPV

Keywords: adolescents, sexual initiation, smoking, substance abuse, educational attainment, peer approval, HPV vaccination

Presentation number: 27

FEMALE FINGER PROPORTION AS AN INDICATOR OF THE HIGHER BLOOD PRESSURE RISK.

Pruszkowska-Przybylska Paulina, Opoka Anna, Żądzińska Elżbieta

University of Lodz, Łódź, Poland

paulina.pruszkowska@biol.uni.lodz.pl

The association between predictor of the prenatal sex hormones steroids: second to fourth finger ratio and parameters of blood pressure has been considered as the aim of this study. The study included 171 children (93 girls and 78 boys) aged 6-13 years who were examined in Łódź in central Poland in years 2016-2017. Measurements consisted of the length of the second and fourth fingers using a Vernier calliper and blood pressure parameters: diastolic (DIA), systolic (SIA) and pulse using blood pressure monitor. Girls with higher 2D:4D digit ratio for the left hand tend to have higher systolic blood pressure (positive correlation, tau=0.14; p=0.04). Boys with female pattern had higher diastolic pressure (median=68.19 mmHg) than those with the male pattern (median=63.69 mmHg) ($Z = -2.11$; $p = 0.033$). Prenatal steroid hormone proportion may be related to blood pressure in the later human ontogenesis. Finger ratio might be a possible indicator of the higher blood pressure risk. The association between predictor of the prenatal sex hormones steroids: second to fourth finger ratio and parameters of blood pressure has been considered as the aim of this study. The study included 171 children (93 girls and 78 boys) aged 6-13 years who were examined in Łódź in central Poland in years 2016-2017. Measurements consisted of the length of the second and fourth fingers using a Vernier calliper and blood pressure parameters: diastolic (DIA), systolic (SIA) and pulse using blood pressure monitor. Girls with higher 2D:4D digit ratio for the left hand tend to have higher systolic blood pressure (positive correlation, tau=0.14; p=0.04). Boys with female pattern had higher diastolic pressure (median=68.19 mmHg) than those with the male pattern (median=63.69 mmHg) ($Z = -2.11$; $p = 0.033$). Prenatal steroid hormone proportion may be related to blood pressure in the later human ontogenesis. Finger ratio might be a possible indicator of the higher blood pressure risk.

Keywords: Hypertension, 2D:4D, prenatal steroids

Presentation number: 28

THE EVOLUTION OF THE SOCIAL REGULATION OF GROWTH

Hermanussen Michael[1], Groth Detlef[2], Scheffler Christiane[2]

[1]University of Kiel, Kiel, Germany, [2]University fo Potsdam, Potsdam, Germany

michael.hermanussen@gmail.com

Background: Animal societies are structured by dominance hierarchy and can be viewed as networks. Recent analyses highlighted the importance of pairwise agonistic contests, inter-individual signalling and winner-loser effects on the emergence of efficient network structures. Efficiency is a natural target in the evolution of social structures. State of the art: Success in contests reflects “hard skills”: physical fitness, resource holding power, fighting ability, mirroring an individual’s current metabolic and endocrine condition. Handsome sex characteristics, impressive weaponry and large body size reflect fitness and fighting ability. Success also depends on current opportunities, motivation, and the ability of signalling one's physical capabilities. “Soft skills” mirror emotionality and preceding experiences. Both skills are reciprocally linked. Sexual attractiveness and size predispose to success, dominance, and upward social mobility. On the other side, a complex system of hypothalamic neuropeptides that regulates stress, sex steroids and skeletal growth allows for “adaptive developmental plasticity”, “strategic adjustments” and “competitive growth”. Aggression and the drive for status maintenance/improvement activate these neuropeptides and their endocrine sequelae which in turn then signal the respective attributes of dominance/subordination. Inter-individual signalling avoids lethal conflicts. Signalling facilitates rank adjustments, network centralization, thereby improving network efficiency, and survival at the group level, at low risk. Conclusion: The ability to signal dominance/subordination plays a crucial role in evolution. The hypothalamic-pituitary axes for stress and reproduction have been conserved for at least 700 million years; the hypothalamic- pituitary-IGF-1 axis for some 400 million years. Social growth regulation is an evolutionarily preferred long- term trait for optimizing social network efficiency.

Keywords: growth, dominance, subordination, competitive growth, hypothalamus

Presentation number: 29

SEASONAL CHANGES IN BODY COMPOSITION IN CHILDREN FROM MAYA AGRICULTURALISTS IN CENTRAL YUCATáN, MEXICO

García Francisco, Ruiz-García Wilma

El Colegio de la Frontera Sur, Campeche, Mexico

fgurri1@gmail.com

Development policies have aimed to substitute subsistence agriculture for cash crops or other cash generating activities to encourage local farmers to depend on store-bought groceries available year-round instead of seasonal subsistence crops. In this paper we test the hypothesis that increased dependence on store bought foods has decreased seasonal changes in nutritional status and fat mass in Maya Children from Yucatan, Mexico. Weight for Age (W/A), Body Mass Index (BMI) and Tricipital Skinfold z scores in children under the age of 10 years from 14 Maya rural towns with different degrees of development were compared longitudinally between scarcity and abundance seasons using a Repeated Measures Analysis of Variance (RMANOVA). Height for Age (H/A) z scores were also estimated. It was found that origin of food consumed corresponded to the town´s degree of development. Nutritional status (W/Az) and adiposity, BMI & Tricipital z scores, were significantly lower during the scarcity season in every community. W/Az, Tricipital skinfold z and H/Az scores were significantly higher in developed than in traditional towns, yet in both types of town W/Az and H/Az scores were below the WHO standard mean. Tricipital skinfold z score was only below the WHO standard amongst traditional towns during the scarcity season. To conclude, increased dependence on store foods failed to eliminate significant losses in body fat during the scarcity season. This failure may be affecting linear growth and promoting a thrifty phenotype that is seen in short and stocky individuals with a tendency to accumulate fat during abundance seasons.

Keywords: Nutrition transition, Thrifty Phenotype, Growth, Subsistence Agriculture, Body Mass Index, Tricipital skinfolds, Nutritional Status.

Presentation number: 30

LITTLE FORAGERS: EXPLORING THE ACTIVE ROLE OF PYGMY HUNTER-GATHERER CHILDREN IN FOOD ACQUISITION

Yamauchi Taro, Hagino Izumi

Hokkaido University, 札幌市北区北十二条西 5 丁目, Japan

taroy@med.hokudai.ac.jp

In traditional hunter-gatherer societies, children are seen as playing rather than directly involved in food acquisition. This study focuses on the daily activities of Pygmy hunter-gatherer children in a foraging forest camp. The research aimed to elucidate their time allocation and involvement in food procurement activities, as well as assess their contribution to the food acquisition process. Over a two-year period, we spent 22 days with the Baka hunter-gatherers, observing 16 children aged 5 to 18 from 06:00 to 18:00 each day, recording their behaviours minute by minute. The children actively participated in fishing and hunting small animals, independently acquiring 30% of the total wild food. When combined with the 20% obtained through collaboration with adults, children collectively contributed 50% to the overall food acquisition. Although children's food acquisition capacity was about one-third of adults', they managed to meet 80% of their nutrient requirements, with the remaining 20% coming from adult support. The study highlights how children maintained good nutritional status through adults' substantial food acquisition capacity and the fair food distribution characteristic of hunter-gatherer societies.

Keywords: hunter-gatherers, children, forest, food acquisition, time allocation

Presentation number: 31

UNRAVELING THE SIGNIFICANCE OF MOLLUSC SHELLS IN PREHISTORIC ADAPTATIONS: INSIGHTS FROM VLAKNO CAVE, CROATIA

Cvitkušić Barbara[1], Cristiani Emanuela[2], Vujević Dario[3]

[1]Institute for Anthropological Research, Zagreb, Croatia; [2]Sapienza University of Rome, Rome, Italy; [3]University of Zadar, Zadar, Croatia

bcvitkusic@inantro.hr

Archaeological research has pointed out the role of marine resources in modern humans' cognitive and cultural evolution. A significant share of these consistently exploited resources in prehistory is attributed to mollusc shells. Their dual anatomy, 1) the animal that resides inside a seashell, a mollusc, and b) shell, a complex covering skeleton, is considered vital for understanding maritime and human communities' interaction. Throughout human history, both parts have been used, either as food or to obtain hard animal materials for symbolic and technological productions. For a long time, archaeological studies on osseous materials have not considered the significance of the shell industry in techno-economic terms. This disparity arises from the conventional tendency of these studies to narrow the analysis of the shells exclusively to the production of ornaments. Recent archaeological studies supported by ethnographical evidence have provided important data on how certain types of bivalve shells have been used for different purposes, such as containers or various tools. Shells have been utilized as raw materials for almost 400,000 years, and in the Mediterranean, they have become frequent in Neanderthal sites in the form of retouched shell tools. Many Upper Palaeolithic sites with marine shells identified as beads are discovered in the Adriatic region. Among these sites, Vlakno cave has the wealthiest assemblage of marine shells. Within its rich Late Upper Palaeolithic sample of various marine shells identified as beads, the function of Glycymeris shells is ambiguous. Here, we would like to present a conducted microscopic surface analysis of the Glycymeris shells, and a reference collection of use-wear traces made experimentally by processing various animal, vegetal, and mineral materials on fresh Glycymeris to discern use-wear traces and possible use and function of the archaeological sample aiming to improve knowledge of past technological and social behaviours.

Keywords: Mollusc shells, coastal adaptations, Late Upper Palaeolithic, Eastern Adriatic

Presentation number: 32

MUSCULAR ROBUSTICITY AND STRENGTH IN ELITE HANDBALL PLAYERS

Zsakai Annamaria[1,2], Ratz-Sulyok Fanny Zselyke[1,2,3], Jang-Kapuy Csilla[1], Varga Szonja[4], Petridis Leonidas[2,5], Bakonyi Peter[2], Szabo Tamas[2]

[1]Department of Biological Anthropology, Eotvos Lorand University, ELTE, Budapest, Hungary; [2]Sport Sciences and Diagnostic Research Centre, Hungarian Handball Federation, Budapest, Hungary; [3]Neuroscience and Human Biology Programme, Doctoral School of Biology, Eotvos Lorand University, ELTE, Budapest, Hungary; [4]Apaczai Csere Janos Gymnasium, Eotvos Lorand University, ELTE, Budapest, Hungary; [5]Research Centre for Sport Physiology, Hungarian University of Sport Sciences, Budapest,
Hungary

annamaria.zsakai@ttk.elte.hu

Objective. The main aim of the analysis was to study morphological and strength parameters of the thigh region in elite handball players to explore age-group differences, sexual dimorphism, asymmetry characteristics of the structural and functional parameters in the studied body region and the associations among the studied parameters. Subjects and methods. 175 elite Hungarian handball players aged between 14 and 21 years were examined in 2023. Muscle mass component of the body segments was estimated by DEXA method and muscle thickness of the anterior mid-thigh region was measured by a new ultrasonic technique that provided the possibility to construct muscle mass prediction equations for the lower extremities. Strength testing of the knee extensor muscles was performed on a Kineosystem dynamometer using an isokinetic protocol. Results. A strong association between muscle robusticity and strength in the thigh region was confirmed in males, but not in females. A protective effect of 5-10% muscular robusticity dominance in favour of the jumping leg appeared in both sexes. A new predictive equation of muscle mass in the jumping leg and the total body from the muscle thickness in the anterior mid-thigh region of jumping leg was introduced by analysing the relationship between DEXA muscle mass estimations and ultrasonic measures of quadriceps femoris in the thigh. Conclusions. The exploration and understanding of asymmetric structural and functional adaptations can help athletes and trainers in planning the training and training interventions to reduce the risk of injuries. The ultrasonography of muscle layers (BodyMetrix BX-2000 ultrasound imaging unit) is an appropriate method for this purpose. Our aim is to study the relationship between muscle thickness and strength in other body regions in youth athletes.

Keywords: muscle mass; muscle strength; DEXA; ultrasonography; athletes

Presentation number: 33

THE EFFECT OF RUNNING ON BONE MINERAL DENSITY IN WOMEN DURING AGEING

Kutáč Petr

University of Ostrava, Ostrava, Czechia

petr.kutac@osu.cz

Background: Osteoporosis is a disease that occurs all over the world. Its prevalence in women is 23.1%. Physical activity belongs among significant exogenous factors for bone health. Some authors consider running to be a suitable physical activity (PA). However, many study results are inconsistent and bone density (BMD) is not always found to be higher in runners than non-runners. BMD is also influenced by ageing. In healthy individuals, BMD starts to decrease at the age of 40; it is reduced by 6–8% in ten years. The aim of the study is to analyse BMD changes in various age groups of runners and inactive individuals. Methods: The study included 608 women (304 runners and 304 non-runners) in five age groups (18–65). The runners ran 23.7–28.4 km/week on average; non-runners did not meet the PA recommendations by WHO. BMD was measured using a bone densitometer on the body, limbs, hips and spine. Both statistical and substantive significance (ES) were assessed in the differences found between BMD values of runners and non-runners. Results: The runners had a higher BMD in all body segments than non-runners. In all age groups, runners had statistically and substantially higher BMD in lower limbs; statistical significance ranged from $p<0.05$ to $p<0.001$ (ES: $d = 0.5$ to 0.8). In the age groups of 26–35, 46–55 and 56–65, runners had significantly higher BMD than non-runners not only in lower limbs, but also upper limbs and the body. The statistical significance ranged from $p<0.05$ to $p<0.001$ (ES: $d = 0.5$ to 0.7). Higher values in hips and spine in runners were not significant. Conclusion: The study results indicate that recreational running in an amount that can be implemented into everyday work life can have a positive effect on BMD values, namely in lower limbs. It helps maintain or slow down the reduction in BMD during ageing.

Keywords: osteoporosis, bone mineral density, age groups, recreational runners, inactive individuals

Presentation number: 34

NEW HAND-WRIST ATLAS FOR INDIVIDUALS FROM SUDAN

Elamin Fadil[1,2]

[1]Queen Mary University of London, London, United Kingdom of Great Britain and Northern Ireland; [2]Khartoum Centre for Research and Medical Training, Khartoum, Sudan

fadilelamin@yahoo.co.uk

Aim: The aim of this study is to present an atlas of hand-wrist maturity for each year of age describing skeletal maturity in a group from Sudan with known age and ancestry. Methods: The sample was selected from healthy patients attending a dental hospital in Khartoum with known age and ancestry (males = 280, females = 330; aged between 3 and 25 years). Bones were assessed from radiographs of the left hand and wrist after the Greulich and Pyle (GP) Atlas (1959) and median bone stages were noted for each year of age in males and females separately. Line drawings of the median bone stage per year were drawn. We highlight group differences between the new atlas and GP atlas, particularly for 15 to 20-year-old individuals. Results: Overall median ages were earlier in females than in males for specific bones. The difference could be as large as 2 years. In several instances, carpal bones were late maturing (>18 yo) and presented in an Atlas in a diagrammatic format for each sex over yearly age groups. Conclusion: The study describes bone maturity from Sudan and serves as a baseline for hand-wrist development in this endogenous East African group.

Keywords: hand-wrist, maturity atlas, East-Africa

Presentation number: 01

TRENDS IN OVERWEIGHT, OBESITY AND SEVERE OBESITY IN BERGEN, NORWAY (2010-2022) USING DATA FROM ROUTINE CHILD HEALTHCARE.

Balthasar Melissa[1], Juliusson Petur[1], Roelants Mathieu[2], Brannsether-Ellingsen Bente[1]

[1]University of Bergen, Bergen, Norway, [2]KU Lueven, Lueven, Belgium

melissabalthasar@gmail.com

Aims: Information on weight status is essential to guide the development of preventive measures, whichcan reduce adverse consequences for health. Data on prevalence and trends of unhealthy weight status during the last decade in Norway is limited and restricted to cohort studies. Our aim was to estimate the prevalence and trends of overweight, obesity and severe obesity before the pandemic (2010-2019) in 2- 14-year-old children and to evaluate if the prevalence during the COVID-19 pandemic years diverges from the predicted trend. Methods: This study had a repeated cross-sectional design. Data on weight and length were obtained retrospectively for calculation of body mass index (BMI) from standardized electronic child health and school health records. Weight status was categorized according to cut-offs proposed bythe International Obesity Task Force (IOTF). Trends in the proportion of children above IOTF25, 30 and35 were analysed using linear regression, at scheduled contacts at 2, 4, 6, 8 and 13 years. Prevalence estimates during COVID-19 was compared to the 95% prediction interval of this model. Results: A total 181,527 BMI measurements from 78,024 children were included. The participation rate was >95% in in children aged 2, 4, and 6 and 80-90% in children aged 8 and 13. There was a significant decrease in the trends of overweight among 4- and 13-year-old boys. There were no significant trends in in girls. Duringthe pandemic, the prevalence of overweight in boys exceeded the predicted interval at ages 4, 6 and 8.For girls, a similar trend was observed only at age 6. Conclusion: There was a stabilization of overweight, obesity and severe obesity, and even a decreasing trend in preschool and adolescent boys between 2010to 2019. Increased prevalence of overweight and obesity during the pandemic was more notable in boysthan girls. Routine healthcare data is useful for estimating the prevalence of unhealthy weight status.

Keywords: Electronic medical record, overweight, obesity, pandemic, time-trends

Presentation number: 02

WEIGHT AND BMI DISTRIBUTIONS IN NATURAL OR 'NON-MODERN' POPULATIONS

Christiane Scheffler[1], Theresia Nitschmann[1], Michael Hermanussen[2]

[1] University of Potsdam, Institute of Biochemistry and Biology, Human Biology, Potsdam, Germany, [2]Pediatrician, Eckernförde - Altenhof, Germany

christiane.scheffler@uni-potsdam.de

Body weight and body mass index (BMI) are usually taken as indicator of healthiness. Agreement exists that in a healthy population, both variables are skewed into the right i.e., the number of obese people and the magnitude of obesity is larger than number and magnitude of the slim people. Modern growth charts e.g., WHO charts, show this skewness in all data sets. We analysed the skewness of BMI and weight distribution (Shapiro-Wilk-Test) of 21 child and adolescent populations since the early 20th century from Germany, Hungary, India, South Africa, and Indonesia. Modern weight and BMI distributions are skewed, e.g., in German children since the 1980th. This is different in historic populations and in rural populations of developing countries, e.g., in Indonesia. In these populations, body weight and BMI show basically symmetric normal distributions. Mixed patterns of skewness are visible in societies in transition such as South Africa (1980th) and urban Indonesia. Modern references are inherently affected by the obesity pandemic with major weight and BMI skewness that is not evident in healthy traditional societies. Modern references grossly underestimate the true prevalence of obesity, and overestimate the prevalence of wasting in these people.

Keywords: weight, body mass index

Presentation number: 03

PROBLEMS OF ADOLESCENT HYPERTENSION AND ASSOTIATION WITH BODY FATNESS AND SCREEN TIME

Meitei Sanjenbam Yaiphaba[1]

[1]Department of Anthropology, Manipur University, Imphal, Manipur, India

yaiphabameitei@manipuruniv.ac.in

Both undernutrition and overnutrition affect children and adolescents' overall growth and development. Childhood obesity has been of concern as it can impact the health of children and adolescents, even when they grow up as adults. The present paper attempts to understand the problems of adolescent hypertension among adolescents and its association with body fatness and screen time. The study was conducted on 728 adolescents aged 15-19 years recruited from the school of Imphal city, Manipur. Blood pressure and related anthropometric data were collected. General obesity and central obesity measures, such as body mass index (BMI), waist circumference (WC), and waist-height ratio (WHtR), were extracted from anthropometric data. The prevalence of adolescent hypertension is 29.12%, and elevated blood pressure is 20.47%. Boys are more hypertensive than girls. Obese adolescents are more prone to hypertension. Overweight, obese, and abdominal volume index (AVI) has 2.31, 5.15, and 3.41 OR to develop hypertension significantly, irrespective of gender. Moreover, physical inactivity and spending more screen time greater than and equal to 6hrs a day are associated with central obesity among adolescents.In conclusion, it can be proposed that the problem of adolescent obesity is increasing, and it may affectthe overall health of adolescents and even in the future. Policies on adolescent obesity management could be a suitable approach to control the problem at the earliest.

Keywords: Adolescent, Hypertension, Fatness, Screen Time, Anthropometric

Presentation number: 04

HEALTH OUTCOMES AND THEIR ASSOCIATIONS IN PRETERM SURVIVORS FROM BIRTH TO ADOLESCENCE: A LONGITUDINAL COHORT STUDY

Morkuniene Ruta, Levuliene Ruta, Gegzna Vilmantas, Tutkuviene Janina[1]

Vilnius University, Vilnius, Lithuania

ruta.morkuniene@mf.vu.lt

Background and aim: The study bridges the research gap by investigating health outcomes and disease patterns from birth to adolescence in preterm survivors, highlighting the necessity of integrated over isolated organ system research. Materials and Methods: In a retrospective longitudinal study of 417 preterm children until adolescence (201 boys, 216 girls, born 2000-2015), first-time diagnoses (1,818 total) from medical records were categorized using ICD-10 classification. Sex, birth weight (BW), and gestational age (GA) were analysed using Poisson and negative binomial regression to explore disease associations. Results: Premature children's primary disease burden spans from birth to preschool. Lower BW groups - “Extremely and very low”, “Low”, and “Sub-optimal” - displayed an increased number of diseases, by 1.77, 1.50, and 1.34 times, respectively, compared to the “Normal” BW group. Main logistic regression results for age [0-3]: perinatal conditions quadrupled the risk of nervous system diseases ($p<0.01$); probability of having mental, behavioural disorder was over five times higher in those with nervous system or musculoskeletal conditions. Results for [4-7] years: endocrine, metabolic diseases more than doubled the odds of infectious diseases (OR=2.44, $p<0.01$); respiratory diseases were twice as likely with prior endocrine disorders (OR=2.04, $p<0.05$); genitourinary conditions were linked to prior infectious diseases (OR=4.02, $p<0.01$). For ages [8-12], endocrine, metabolic disorders were stronglyassociated with prior musculoskeletal conditions (OR=8.72, $p<0.001$); respiratory diseases exhibited aremarkable association with prior endocrine and metabolic diseases (OR=26.98, $p<0.01$). Conclusions: Logistic regression results advocate for the complex interactions between developing organs and their systems, which begin in prenatal life and continues throughout the growth period. An evolutionary approach will be presented and discussed.

Keywords: Prematurity, multimorbidity, longitudinal study, ICD-10, diseases

Presentation number: 05

D-SCORE: A UNIVERSAL MEASUREMENT UNIT FOR EARLY CHILDHOOD DEVELOPMENT

van Buuren Stef

TNO, Leiden, Netherlands

s.vanbuuren@uu.nl

The lecture explores the transformation within early childhood development circa 2014, when the absenceof a precise global standard for measuring children's, development became evident. Studies highlighted the critical importance of the first three years of life for future well-being, prompting urgent calls from influential organizations like WHO and UNICEF for a reliable, globally applicable measure. The D-score offers a single numerical representation of development derived from 57 basic measurements. Despite initial doubts, the D-score proved adaptable across diverse datasets, potentially serving as a global unit for child development, similar to centimetres or kilograms. Over the last decade, research on the D-score has expanded, offering practical benefits like result comparability and simplified analysis. The lecture will examine the developments so far and explore further avenues for research and application.

Keywords: Early Child Development, Rasch model, comparability, dscore R package

Presentation number: 06

GUIDANCE FOR INTERNATIONAL GROWTH STANDARDS: WHEN,WHERE, AND HOW TO APPLY INTERNATIONAL GROWTH STANDARDS

Ohuma Eric[1], Vesel Linda[2], Parker Simon[1], Ngatia Bancy[1]

[1]London School of Hygiene & Tropical Medicine, London, United Kingdom of Great Britain and Northern Ireland; [2]Ariadne Labs, Harvard T.H. Chan School of Public Health / Brigham and Women's Hospital, Boston, Massachusetts, USA, Boston, United States of America

eric.ohuma@lshtm.ac.uk

lvesel@ariadnelabs.org

Infant growth is a commonly used proxy of population health, human capital, and socioeconomic development. Additionally, failure to achieve growth potential is associated with increased risk of mortality and morbidity throughout an individual's life. Therefore, accurate growth assessment using international prescriptive growth standards is a key step towards efficient, accurate, and comparable tracking of progress towards achieving the Sustainable Development Goal 3.2, which aims to reduce preventable newborn and child mortality by 2030. Different growth standards exist and can lead to differences ingrowth estimates due to lack of comparability as a result of how they were constructed, study design, statistical methodology, etc. There is a lack of clear guidance on which growth charts to use when, and for whom. Consequently, growth standards are often applied incorrectly, leading to inappropriate assessment and interpretation of growth trajectories This can alter prevalence estimates for stunting, wasting, and other indicators of non-optimal growth. In light of these challenges, the Guidance for International Growth Standards (GIGS) project has developed guidance and software to facilitate consistent, standardized, and accurate application of child growth based on the international standards from the INTERGROWTH-21stand WHO Child Growth Standards. This talk will detail guidance from GIGS on when, for whom, and how to apply international growth standards in settings where gestational age data is available. We will first discuss the rationale for the GIGS project, then present case studies of individual infants from a large cohort of moderately low birthweight infants in India, Malawi and Tanzania. We will use scenario-based approach to demonstrate the implication of using/applying existing standards inappropriately and further, provide clear guidance on appropriate application of these international standards based on the GIGS- recommended approach.

Keywords: Growth standards, INTERGROWTH-21st, WHO child growth standards, Guidance for International Growth Standards

Presentation number: 07

ACCOUNTING FOR MISSINGNESS USING BAYESIAN JOINT MODELLING: A CASE STUDY USING LONGITUDINAL CHILD HEIGHTAND WEIGHT DATA

Ouko Rehema[1], Mukaka Mavuto[2], Ohuma Eric[1]

[1]London School of Hygiene & Tropical Medicine, London, United Kingdom of Great Britain and NorthernIreland; [2]University of Oxford, London, United Kingdom of Great Britain and Northern Ireland

rehema.ouko@lshtm.ac.uk

Background Longitudinal data involve repeated measurements of the same individuals over time. In anthropometry, it is common for more than one aspect of growth measurement to be taken at eachtimepoint of data collection e.g., weight and height. In follow-up studies of child growth, missing data forone or more growth measurements is common. Joint modelling of two or more associated longitudinal measurements can allow borrowing of information for correlated data in cases where there is missing data for one variable of interest. Therefore, we propose to evaluate a joint model of longitudinal measurementsof child weight and height data in various levels of missingness using a simulation study. Methodology Ajoint Bayesian model is applied with a fractional polynomial to capture the nonlinear structure of child weight and height. A shared random-effects model is proposed to incorporate the correlation structure of weight and height. Markov chain Monte Carlo sampling is used to carry out Bayesian posterior computation. The methodology is illustrated with simulated data of child weight and height <5 years according to WHO child growth standards. We introduced various scenarios of missingness e.g. 10%, 20%, 30% to evaluate the impact on predictions from joint Bayesian model. Results We successfully applied joint Bayesian modelling and demonstrated that this approach modelled child height and weightdata very well — based on visual model fit assessments. The performance of joint Bayesian model was unaffected when we introduced 10% missingness at random for child height and weight at various ages. Conclusion Joint Bayesian modelling approach is feasible for modelling growth data and incorporates correlation between measurements. In longitudinal studies, it can be used in the case of missing data fortwo or more correlated variables of interest. Further work will evaluate performance of joint Bayesian model under extreme cases of missing data and its impact on prediction

Keywords: Joint modelling, correlated measurements, longitudinal data, missingness, height, weight, Bayesian

Presentation number: 08

GUIDANCE FOR INTERNATIONAL GROWTH STANDARDS: A SUITE OF STATISTICAL PACKAGES FOR CONSISTENT GROWTH ANALYSES USING INTERNATIONAL STANDARDS

Parker Simon[1], Ngatia Bancy[1], Vesel Linda[2], Ohuma Eric[1]

[1]London School of Hygiene & Tropical Medicine, London, United Kingdom of Great Britain and Northern Ireland; [2]Ariadne Labs, Harvard T.H. Chan School of Public Health / Brigham and Women's Hospital, Boston, Massachusetts, USA, Boston, United States of America

simon.parker@lshtm.ac.uk

Understanding how and why child growth patterns change is necessary to characterize global health inequalities. Sustainable Development Goal (SDG) 3.2 aims to reduce preventable newborn deaths by at least 12 deaths per 1,000 live births and child deaths to 25 per 1,000 live births by 2030. However, large gaps remain in achieving these goals: currently 59 and 64 (of 194) countries will miss the targets for child and neonatal mortality, respectively. Infant mortality is associated strongly with non-optimal growth. Therefore, accurate growth assessment using international prescriptive growth standards is a key step towards efficient, accurate, and comparable tracking of progress towards achieving the SDGs. Different growth standards exist and can lead to differences in growth estimates due to lack of comparability as a result of how they were constructed (prescriptive vs descriptive approaches), study design, statistical methodology, etc. Growth of preterm and term infants should be assessed against a respective standardof optimal growth. The WHO GS describe optimal growth in term babies. These standards were not gestational age specific, and INTERGROWTH-21st aimed to fill this gap by developing gestational age- and sex-specific standards for size at birth in babies from 24 weeks' gestational age. In addition, INTERGROWTH-21st developed postnatal growth standards for preterm infants. However, guidance on transition between the WHO and INTERGROWTH-21st standards is unclear and has implications for growth assessment. To facilitate standardized growth assessment, the Guidance for International Growth Standards (GIGS) project has developed a suite of statistical packages in R, Stata, and SAS. These packages simplify accurate application of the WHO Child Growth Standards and growth standards from the INTERGROWTH-21st project. This talk will introduce the GIGS packages and their functionality for standardized growth assessment in R, Stata, and SAS.

Keywords: Growth standards, INTERGROWTH-21st, WHO child growth standards, Guidance for International Growth Standards

Presentation number: 09

MIXED METHODOLOGY TO ASSESS THE RELATIONSHIP BETWEEN MULTIPLE ENDOCRINE DISRUPTING CHEMICALS AND HUMAN GROWTH AND DEVELOPMENT

West Casey

University at Albany, SUNY, Albany, United States of America

cwest@albany.edu

There is an association between dysregulation of the endocrine system in humans and exposure to specific toxicants identified by the U.S. Environmental Protection Agency. Much human exposure is from chemicals in waste dumps and chemical processing, compounded by exposures through personal use products and ingestion of contaminated food and water. Many current and past studies do not account for this multiplicity of exposures. This study will analyse data from the New Bedford Cohort (NBC) to test the effect of multiple toxicant exposures on size and growth trajectories from birth to age 15, as well as age at menarche and Tanner stages. The NBC includes 788 mother-infant dyads recruited at birth from four communities around New Bedford Harbor, Massachusetts. Known toxicants include heavy metals and multiple persistent organic pollutants. For a subsample (N = 144) there is also information on parabens, phthalates, and phenols. Preliminary analyses will determine the most highly associated exposures to be used in Bayesian Kernal Machine Regression (BKMR). BKMR tests mixture groups (different combinationsof toxicants) and relationships to characterize the relationship between exposure and outcome. BKMR will show: 1) a comparison of the mixture groups identified for their strength of association, and 2) posterior inclusion probabilities (PIPS), which display the exposures by component groups, showing associations of the toxicants within each selected component group. By displaying conditional relationships among exposures, BKMR will allow for an examination of how the toxicants in multi-toxicant models interact, and how component groups vary between outcomes. I hypothesize that different mixture groups (i.e., androgenic, estrogenic, anti-androgenic, anti-estrogenic) are associated with different growth andmaturation outcomes.

Keywords: endocrine disrupting chemicals, persistent organic pollutants, multi-toxicant exposure, pubertal development, growth, environmental influences

Presentation number: 10

RELATIONSHIP BETWEEN BEHAVIOURAL IMMUNE SYSTEM AND FREQUENCY OF PROXIMITY CONTACTS AMONG SECONDARY SCHOOL STUDENTS

Fedurek Piotr, Danel Dariusz

Hirszfeld Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Wrocław, Poland

fedurekpiotr@yahoo.co.uk

Recently there has been much research regarding the extent to which behavioural immune system (BIS; behavioural responses related to avoidance of communicable diseases) is related to a variation in terms of social profile and personality traits among individuals. Studies suggest that BIS is a genuine psychological adaptation developed through evolutionary processes to minimize the risk of infection. However, most research on the relationship between BIS and sociality are based on short-term experimental studies and thus little is known about the degree to which BIS is related to the frequency of day-to-day proximity contacts. We used data obtained from secondary students (n=53, age 16-18yo, n schools/classes=2) to determine whether the variation in BIS values is associated with frequency of proximity contacts. Proximity data were derived from sensors registering proximity of other classmates within 2m radius. Students belonging to the same class were wearing the proximity sensors within the school environment for the period of 4 weeks. BIS activity was assessed using a total score of Perceived Vulnerability to Diseases (PVD) questionnaire. We used regressions with proximity as a dependent variable and PVD as predictor. We show that individuals exhibiting higher PVD values had higher proximity contact rates compared to individuals with lower PVD values, but only in males. Our preliminary findings do not support assertions of previous studies positing that BIS activation exhibited by higher PVD values are related to lower rate of face-to-face interactions. Our data suggest that it might be an exposure to high frequency of close-range social contacts that activates BIS mechanisms (rather than the other way round) mitigating potential risks related to contracting infectious diseases spread through close face-to-face contacts. We suggest that caution should be taken while inferring data obtained from short-term experimental studies to actual patterns in social contacts.

Keywords: proximity, disease avoidance, immune system, sociality

Presentation number: 11

THE 'MUSCLE-BONE UNIT' FROM CHILDHOOD INTO EARLY ADULTHOOD: A SITAR NONLINEAR GROWTH MODEL

Baxter-Jones Adam[1], Elhakeem Ahmed[2], Jackowlski Stefan[3,1], Barbour-Tuck Erin[1], Erlandson Marta[1]

[1]College of Kinesiology, University of Saskatchewan, Saskatoon, Canada; [2]MRC Integrative EpidemiologyUnit, University Bristol, Bristol, United Kingdom of Great Britain and Northern Ireland; [3]Children's Hospital of Eastern Ontario Research Institute, Ottawa, Canada

baxter.jones@usask.ca

One approach to modelling nonlinear longitudinal data is to fit Super Imposition by Translation and Rotation (SITAR) models. Using data from the paediatric bone mineral accrual study (PBMAS, 1991-2017) we have shown that during adolescence, bone development is driven by muscle development. We havenot explored if this relationship continues into early adulthood. The aim of this study was to create boneand lean mass development curves for individuals from 8 to 40 years of age. Methods: PBMAS, initiated in 1991, recruited 251 children aged 8-15 years. Participants underwent up to fifteen annual DXA scans (Hologic QDR-2000) until 2017 when values for total body Bone Mineral Density (BMD) and lean mass (LM) were recorded. 112 males and 127 females with ≥1 bone and lean mass measure are included in this analysis. SITAR models were fitted with manually selected knots with number and position informed by the cohort-specific model. All analyses were performed in R version 4.0.2 (R Project for Statistical Computing) and RStudio integrated development environment version 1.3.1 (RStudio Team). Results: Models showed rapid increases in both LM and BMD in adolescence, plateauing in adulthood. Age at peak LM and BMD accrual in girls was 11.7 yr. (4.9 kg/yr.) and 13.0 yr. (0.06 g/m2/yr.) respectively, compared to boys whosewere 13.7 yr. (9.6 kg/yr.) and 14.4 yrs. (0.07 g/m2/yr.). From peak bone mass and 35 yr. age LM increasedby 9% in girls and 1% in boys compared to an increase in BMD of 9% in girls and 8% in boys. Discussion: These models graphically illustrate the nonlinear development of bone and lean mass across the life- course and show sex and tissue differences in both velocity trajectories and magnitude of change. Peak adolescent accrual of lean mass precedes BMD. From peak to 35 yrs. percentage increases in tissues are similar in girls but not boys. These results continue to illustrate the strong relationship between muscle and bone from adolescence through to early adulthood.

Keywords: non-linear models, bone, lean mass, adolescence, growth

Presentation number: 12

A PHOTOANTHROPOMETRIC STUDY: A COMPARISON OF FACIAL INDICES DERIVED FROM PROFESSIONAL AND NON-PROFESSIONAL PHOTOGRAPHS

Stukaite-Ruibiene Egle[1], Simkunaite-Rizgeliene Renata[1], Barkus Arunas[1], Tutkuviene Janina[1]

[1]Department of Anatomy, Histology and Anthropology, Faculty of Medicine, Vilnius University, Vilnius, Lithuania

egle.stukaite-ruibiene@mf.vu.lt

Objectives. There are facial studies including professional photographs, however, studies investigating non-professional photographs are lacking. It is important to find out if non-professional photographs couldbe relevant for longitudinal facial analysis, as it could allow to perform such studies cheaper and savetime. The aim of this study was to compare indices obtained from professional and non-professional photographs with anthropometrically determined indices. Methods. Faces (in frontal view) of 18–21-year- olds (35 males, 39 females) were measured by direct anthropometry and photographed using a standard protocol (professionally). In addition, non-professional frontal photographs of the same individuals were collected. Craniofacial landmarks were superimposed on all photographs in the frontal plane. Ten facial parameters were measured in total, 25 facial indices were calculated. Indices obtained from direct anthropometry and from both types of photographs were compared. Results. Fourteen of 25 (56%) facial indices did not differ in males and 10/25 (40%) in females ($p>0.05$) between those obtained from direct anthropometry and from professional photographs. Comparison of direct anthropometry with non- professional photographs revealed that 8/25 (32%) indices did not differ in males and 7/25 (28%) — in females. These mostly contained vertical parameters and eye measurements. Comparing professional and non-professional photographs, it turned out that 16/25 (64%) of indices in men and 8/25 (32%) in women did not differ. Conclusion. In both types of photographs, indices including vertical facial dimensions and eye measurements were mostly consistent with those obtained from direct anthropometry. These parameters can be used interchangeably between photographs and direct craniofacial measurements and may therefore be suitable for longitudinal facial analysis using non-professional photographs.

Keywords: Anthropometry; craniofacial compartment; facial indices; photo-anthropometry, professionalphotographs, non-professional photographs

Presentation number: 13

NEUROENDOCRINE TRANSDUCTION OF SOCIAL-ECONOMICPOLITICAL-EMOTIONAL (SEPE) FACTORS THAT REGULATE HUMAN SKELETAL GROWTH

Bogin Barry

Loughborough University, Loughborough, United Kingdom of Great Britain and Northern Ireland

b.a.bogin@lboro.ac.uk

There is renewed research focus on the regulation of human growth via biocultural interactions between community networks and hormonal physiology. Human communities are networks of Social-EconomicPolitical-Emotional (SEPE) factors. SEPE factors can enhance or diminish feelings of love and hope, which in turn can promote or delay skeletal growth. This presentation extends previous research (DOI: 10.1186/s40101-023-00330-7) on the physiology of the SEPE factors 'love and hope'. The scientific study of love and hope is possible via pathways that transduce Social-Economic-Political factors that structure human communities into Emotional factors (the SEPE infrastructure). There are several neuroendocrine pathways by which love and hope create measurable hormonal substances that regulate skeletal growth: 1) the hypothalamic-growth hormone-insulin-like growth factor-I pathway; 2) the hypothalamic-adrenalstress hormone pathway; 3) the stress hormone–osteocalcin pathway; 4) the hypothalamic-oxytocin-bone formation pathway. Human examples of neuroendocrine transduction from love, hope, and other SEPE factors to skeletal growth regulation are: 1) civil war in Guatemala, 2) international migration, 3) the 2008 banking crisis, and 4) winner-loser effects in status competition.

Keywords: Biocultural, SEPE, Community effects, Strategic growth

Presentation number: 14

SECULAR GROWTH OF HEIGHT FROM IMPERIALISM TO DEMOCRACY: THE IMPACT OF POLITICS ON LONG-TERM TRENDS IN HEIGHT OF GERMAN CONSCRIPTS

Hermanussen Michael[1], Scheffler Christiane[2]

[1]University of Kiel, Germany, Altenhof, Germany; [2]University of Potsdam, Potsdam, Germany

michael.hermanussen@gmail.com

Background: Average body height of European male populations varies between just over 160cm reflecting bare survival under extreme constraints, and 184cm under optimal nutritional, economic and social conditions. Genetic heterogeneity adds within-population variation, but the extent to which these factors ultimately contribute to height is still controversial. Contrasting the broad overall height variability, height standard deviations of local samples never exceed 7cm. Material: Annual height of more than 12 million German conscripts and recruits born between 1865 and 1975 was related to the independent variables GDP, income inequality, wealth distribution, domestic agricultural production, meat consumption, infant mortality, birth rate, %female students and population density. Results: Average German male height increased from 166cm to 180cm during the last century. Similar trends with high correlations to each other were found among the independent variables. Significant reduction of height variance by about 75% was caused by the height of immediately preceding birth cohorts (community effects). After the collapse of rigid state authority (1918, 1945, 1989), dynamic adjustments in average height occurred with increases of up to 4 mm/year, independent of nutritional and economic factors. Conclusion: The strongest driver of secular trends in body height is the collapse of rigid political power structures.

Keywords: Community effect on height, strategic growth, secular trend, political power structure

Presentation number: 15

CHANGES IN NUTRITIONAL STATUS AMONG WOMEN AND INFANTS AGED 6-23 MONTHS BEFORE AND AFTER THE COVID-19 PANDEMICIN LOW-INCOME AREAS OF TWO CITIES IN PERU

Rousham Emily[1], Pareja Rossina[2], Pradeilles Rebecca[3], Creed-Kanashiro Hilary[2]

[1]Loughborough University, Loughborough, United Kingdom of Great Britain and Northern Ireland; [2]Instituto de Investigación Nutricional, Lima, Peru; [3]UMR MoISA, Montpellier, France

e.k.rousham@lboro.ac.uk

Background: Peru has made significant progress in the reduction of stunting and undernutrition in children. However, malnutrition persists with high rates of anaemia, overweight and obesity and stunting.We aimed to assess whether the changing conditions over the course of the COVID-19 pandemic (lockdowns, unemployment, access to healthcare) led to changes in maternal and infant and young child (IYC) nutritional status over this period. Methods: A nutritional and anthropometric survey on mothers and IYC aged 6-23 months (n=244) was conducted prior to the COVID-19 pandemic (January-March 2020) in low-income peri-urban areas of Huánuco city and Manchay in Lima. A second cross-sectional survey of mother-infant dyads (n=253) was carried out 2 years later (February-April 2022). Height, weight and haemoglobin (Hb) were assessed. Hb values from Huánuco were adjusted for altitude (~1900 m). Anaemia cut points were <105 g/L for 6–23-month-olds and <120 g/L for non-pregnant women (WHO, 2024). Results: In mothers, univariate analyses showed no change in BMI, but mean Hb was lower (122 g/L vs.126 g/L, p<0.001) and anaemia prevalence higher (38.5% vs. 26.1%, p<0.003) pre- compared to post- pandemic. Overweight and obesity prevalence was similar in both surveys, but obesity prevalence was higher post-pandemic (20.4% vs. 28.1%, p<0.05). Among IYC, mean Hb was lower (104 g/L vs. 107 g/L, p<0.001) and anaemia prevalence higher (51.6% vs. 40.3%, p=0.011) pre- compared to post-COVID-19.All other indicators remained similar (height-for-age and weight-for-length z-scores; prevalence of stunting, underweight and risk of overweight). Conclusions: Despite negative impacts of the pandemic in Peru, maternal and child nutritional status pre- and post-COVID-19 was relatively stable, with higher mean haemoglobin and lower anaemia prevalence in both mothers and infants post-COVID-19. The increase in maternal obesity prevalence, however, may indicate a negative trend in nutritional outcomes.

Keywords: Peru, nutrition, child growth, anaemia

Presentation number: 16

A RETROSPECTIVE STUDY TO UNDERSTAND THE IMPACT OF FLOOD EFFECTED ENVIRONMENT ON POST-NATAL GROWTH AND NUTRITIONAL STATUS

Sikdar Mithun

Anthropological Survey of India, Mysore, India

msikdar@hotmail.com

Flooding is one of the most devastating natural disasters that has overwhelming impacts on communities around the world, resulting in loss of life and severe disruption to national economies. Perennially, it impacts millions of people across Assam (one of the states of India), including one of the riverine tribal populations of Assam named Mishing. Though the Mishing population has tried to adapt physically as wellas culturally through cohabiting with this natural disaster, the interplay between the impact of the flood and physical growth is yet to be understood properly.1464 boys and 1506 girls were investigated through a cross-sectional study to understand the impact of the flood-effected environment on growth parameters, particularly the differential timing and tempo of height growth following the Preece and Baines Growth Curve Model-1. 1353 boys and 1399 girls (6–19 years) were considered to understand their nutritionalstatus as per the WHO 2007 height-for-age reference. Individual Z-score values were calculated following the LMS method (Cole and Green, 1992) and categorized to represent normal, moderate, and severecases of malnourishment. Further, the impact of differential fertility and mortality on selection intensity, particularly at different phases of life, was investigated through Sikdar's index (2012). Mathematical parameters estimated by the Preece and Baines Model-1 showed no differences in final height (h1), peak height velocity size (hθ), age at peak height velocity (APHV), or peak height velocity PHV (cm/y) between the subjects living in two different environmental setups. No significant differences in nutritional status (Z score) were found between the two setups. Sikdar's index showed differential selection intensity, highlighting the significant impact of the flood-effected environment until the infant stage through differential mortality, resulting in an attenuation of variability in physical growth and nutrition during the adolescent period.

Keywords: Flood, post-natal growth, nutritional status, infant mortality

Presentation number: 17

INTERGENERATIONAL CHANGES IN BODY HEIGHT, BODY MASS, AND BODY MASS INDEX IN SLOVENIAN POPULATION: SECULAR TREND OR AGE-RELATED CHANGES?

Robič Pikel Tatjana[1], Gregorič Matej[2], Blaznik Urška[2], Delfar Nataša[2], Golja Petra[1], Zdešar KotnikKatja[1]

[1]Biotechnical Faculty, Ljubljana, Slovenia; [2]National Institute of Public Health, Ljubljana, Slovenia

tatjana.robic@bf.uni-lj.si

Objectives: Secular trends in body height have been proved indicative of socio-economic development ofa country or a region, as well as of childhood and adolescent (mal)nutrition. Taller body height was associated with enhanced longevity and several related factors involved. While basic anthropometric measurements, including body height, have long been performed in developed societies, primarily in men and children, far less data are available for adults and women in particular. The aim of the present cross- sectional study was to collect basic anthropometric data related to the assessment of nutritional status of adult population, to establish normative anthropometric data, and provide intergenerational analysis for height, body mass, and body mass index (BMI) of adults of both sexes. Subjects and methods: From March 2017 to April 2018 body height and body mass data of the more than 800 participating volunteers were collected by trained interviewers during home visits. BMI and sex-related percentile values were calculated, and percentile curves constructed. The protocol of the study was approved by the MedicalEthics Committee of the Republic of Slovenia. Results: Weighted percentile values (3, 5, 10, 15, 25, 50, 75, 85, 90, 95, and 97) for body height, body mass, and BMI were calculated, as were the non-weighted percentile curves for these parameters for both sexes. Secular trends and age-related height loss of the reported parameters will be discussed. Conclusion: The reported percentile values provide an insight intothe secular trend of body height, mass, and BMI of an understudied population, i.e. adults of both sexes ina transitional society. As such, they can be useful to researchers, ergonomic professionals, health program coordinators, and policy makers.

Keywords: anthropometry, SI. Menu 2017/18, percentile values, centile values, population reference data, secular trend, age-related height loss

Presentation number: 18

HIGH PREVALENCE OF STUNTING AMONG SANTAL ADOLESCENT BOYS OF PASCHIM MEDINIPUR, WEST BENGAL, INDIA.

Bose Kaushik, Roy Pijush Kanti

Vidyasagar University, Midnapore, India

kaushik241162@gmail.com

Background: Adolescent undernutrition is a major human development concern in developing countries. Objective: The present study was carried out to assess the prevalence of stunting among Santal adolescent boys aged 10-18 years of Paschim Medinipur, West Bengal, India. Materials and methods: A total of 460 adolescent boys aged 10 to 18 years of Paschim Medinipur, West Bengal, India, were measured. Height (cm) and weight (kg) were measured using standard techniques. Data analysis was carried out using Statistical Package for Social Sciences (SPSS) version 16.0. Nutritional status wasevaluated by calculating the Z-score using the standard formula. The studied participants were classifiedas stunted if the height-for-age Z-score was < -2 standard deviations (SD) from the reference standard ofthe World Health Organization (WHO). One-way-ANOVA was performed to assess differences in mean height, weight and body mass index (BMI) between different age groups. Findings: The overall prevalenceof stunting was 38%. The highest (50.0%) and the lowest (26.5%) prevalence of stunting were foundamong 15 years and 13 years, respectively. Significant age group differences ($p < 0.001$) were observedin mean height, weight and BMI. Conclusion: As per WHO classification of severity of malnutrition, the overall prevalence of stunting was high (30-39%) which indicated a serious nutritional situation. Appropriate targeted nutritional intervention programs are required to ameliorate this health burden.

Keywords: Undernutrition, Santals, adolescents, stunting

Presentation number: 19

NUTRITIONAL CHALLENGES AMONG IMMIGRANT KYRGYZ CHILDRENIN ULUPAMIR VILLAGE, TüRKIYE

Koca Özer Başak[1], Meşe Yavuz Cansev[2]

[1]Ankara University, Faculty of Languages, History and Geography, Department of Anthropology, Ankara, Turkey; [2]Van Yüzüncü Yıl University, Faculty of Letters, Department of Anthropology, Van, Turkey

basakkoca@gmail.com

Migration, influenced by various macro and micro social, economic, political, and demographic factors, constitutes mass population movements that induce social changes. As a result of this population movement, among migrating population undoubtedly, children represent the most vulnerable group affected by migration. The Kyrgyz Turks are one of the oldest Turk communities with a nomadic lifestyle inthe Central-Asia since the 2nd century. The struggle of the Kyrgyz Turks, especially those residing in the Pamir region, reflects the complexities of forced migrations and adaptive challenges with Russian invasions, Kyrgyz Turks from the Alay Region migrated to various territories, including Tajikistan's Pamir region, Afghanistan, and eventual to Türkiye. Present study evaluates the growth patterns and nutritional status of Kyrgyz children -150 children and adolescents aged 3-18 years- in Ulupamir village, Türkiye. Anthropometric measurements were taken, dietary intake and socio-economic indicators were collected. Findings reveal a high prevalence of stunting, underweight, and thinness, indicating significant malnutrition challenges within the community. The prevalence of stunting was 2.5% in boys and 5.6% in girls, while underweight affected 11.9% of boys and 13.9% of girls. Factors such as low socioeconomic status and inadequate nutrient consumption contribute to these issues. Risk factors identified include age, daily iron consumption, and meal skipping. Inadequate consumption rates varied for all energy and nutrients, with notably high rates observed for vitamin D, vitamin E, and vitamin C. Significant differences in insufficient consumption rates were observed among protein, vitamin C, B1, B2, B12, and vitamin A across age groups ($p < 0.05$, $p < 0.001$). Despite limitations, the research provides crucial insights into the complex dynamics of malnutrition among Kyrgyz Turk immigrant children community.

Keywords: Immigrant children, Nutritional assessment, Kyrgyz, Turkey

Presentation number: 20

IS A BODY SURFACE AREA A GOOD PREDICTOR OF MATURITY STATUS AMONG SCHOOL CHILDREN AND ADOLESCENTS

Koziel Slawomir

Hirszfeld Institute of Immunology and Experimental Therapy Polish Academy of Sciences, Wrocław, Poland

slawomir.koziel@hirszfeld.pl

Biological maturation is an important and complicated process leading to highly organized, specialized and mature state of organism. Although there are many indicators that measure maturity status, such as those based on skeletal age or secondary sexual characteristics, most of them are impractical and invasive. On the other hand, maturity offset equations proposed by Mirwald and Moore have been one of the most widely used non-invasive techniques. More recently, however, a body surface area (BSA), which changes significantly during each stage of growth and maturation, has been proposed as a reliable indicator of maturity status. The aim of the present study was to compare whether BSA was a better predictor of maturity status compared to maturity offset equations. Three separate longitudinal studies were conducted using age at peak height velocity (APHV) as an indicator of maturity status. In order to estimate an APHV, a SITAR model was applied separately into three series of longitudinal data. BSA was assessed using the equation of Haycock (1978). In addition, maturity offsets were calculated using the Mirwald's and Moore's equations. Separate regressions for each sex and study between APHV, as a dependent variable and BSA and maturity offsets were applied. Coefficients of determination R2 and root mean square errors (RMSE) were compared between different regressions. Overall, the results of this study show that the BSA is not a better predictor of maturity status compared to maturity offsets.

Keywords: maturation status, APHV, maturity offset, SITAR, body surface area