

GLOBAL VIRTUAL SUMMIT ON ENVIRONMENTAL HEALTH

May 17, 2021 | Webinar

Population Health: Identifying skill sets and Education alignment for him Professionals**Linda Sorensen***University of Michigan, USA*

The COVID-19 pandemic has increased the emphasis on population health, therefore potentially amplifying demand for healthcare workforce professionals in this area. There is an urgent need to explore and define the roles of health information management (HIM) professionals in the population health workforce. This study sought to identify the skill sets and qualifications needed, and HIM education alignment with skills necessary for HIM professionals entering the population health workforce. An intentionally broad internet search of job postings was conducted to determine skills in population health. Population health-related job descriptions and qualification requirements were abstracted and analyzed using ATLAS.ti. Three common job categories were identified: management, analytics, and coding. Skill set requirements included soft skills, problem solving, project management, research, and data analysis. The study results identified HIM educational alignment and found that HIM professionals are generally a good fit to meet the increased need in the population health workforce.

Biography

Linda received her Doctorate in Educational Leadership as well as her Master's degree in Public Health Administration from the University of Michigan. She holds an undergraduate degree in Health Information Management as well as the RHIA and CHPS credentials through AHIMA. Linda is currently the Associate Dean/ Department Chair for the Allied Health and HIM departments at Davenport University. She has 20 years of professional experience in a variety of roles that include pharmacy technician, health information technician, health information director, privacy officer, utilization review coordinator, program director, and instructor. She has worked in traditional hospital settings, as well as nontraditional settings (such as long term care, physical rehabilitation, and education). Linda has participated in many speaking opportunities at state and national levels and was involved in the creation of HIM Reimagined.

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Air Pollution in Railway Environments: Metal-enriched nature of Nanoparticles and Black Carbon**Bianca D Lima***Universidade Federal do Rio Grande do Sul (Brazil)*

The use of the rail system with electricity is especially interesting due to its low emissions, high speed and safety. The aim of this work was to study the concentrations of nanoparticles (N) and black carbon (BC) in two ground-level railway platforms and inside trains in the Metropolitan Area of Porto Alegre (MAPA), through the monitoring of its variability and characterization of its chemical composition. The campaigns distributed in a period of thirteen months between 2018 and 2019 occurred twice a month with two-hour daily measurements inside trains and seven hours on Rodoviária, station in urban area of Porto Alegre, and Fatima, station in industrial area of Canoas. For the monitoring of N10- 420 nm and BC2.5 µm, SMPS Nanoscan 3910 TSI® and aetalmeter AE51 MicroAeth® were used, respectively. Meteorological variables and other pollutants from the study area (PM10, SO₂, CO, NO₂, NO, O₃) were studied in order to relate them to N and BC. Passive samplers and T60 aetalmeter filters were used for particle sampling. For analysis of chemical composition, field emission scanning electron (FE-SEM) and high resolution transmission (HR-TEM) microscopies, energy dispersion (EDS) and Raman spectroscopies were performed. The results showed that the vast majority of the recorded nanoparticles have an aerodynamic diameter of less than 100 nm, and their concentrations, as well as those of BC, are higher in the station in industrial area when compared to urban and trains. The influence of meteorological variables, especially temperature with higher concentrations in cold periods, was observed. On the platforms, correlations with other pollutants were obtained, mainly with NO and NO₂. In the chemical analyses, high levels of metal compounds like Ba, Zn and Ti were found both on the platforms and inside trains, in amorphous and crystalline phases. Through the methods employed, the wear processes arising from the operation of trains and the contribution of vehicle and industrial emissions around the stations were considered the main sources of nanoparticles and black carbon in the MAPA's rail environment.

Biography

Bianca Lima has a bachelor's degree in Chemistry (2017) and a master's degree in Remote Sensing with emphasis on Atmospheric Sciences (2020). Currently works with research on atmospheric pollutants, especially nanoparticles, black carbon and volatile organic compounds indoor and outdoor in different conditions, and their effects on human health and the environment.

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The detrimental effects of Human exposure to Pollutants: in-vitro studies and correlation with increased hair structure degradation**Thomas Bornschlögl***R&I Advanced Research, L'Oréal*

With the rise of industrialization, air pollution via phototoxic polycyclic aromatic hydrocarbons (PAHs) became a major risk factor for human health. In-vitro observations suggest a detrimental effect of PAHs for human health even at very low doses in combination with UVA exposure. While some in-vivo correlations corroborate these findings, overall in-vivo observations of the structural impact of PAHs on biological tissue are rare. We use transmission electron microscopy on human hair fibers collected from 200 volunteers living in two different cities with different air pollution exposure. A first analysis showed that fibers from the more polluted city (Baoding, figure B) show more internal structural damage of the fiber as compared to fibers from the less polluted city (Dalian, figure A). The quantification of internal defects (Figure C) together with an exact quantification of 25 biomarkers for PAH exposure in all fibers allowed to show an increased structural degradation of the hair fiber over time, when increased PAH concentrations are present (Figure D)

Biography

Thomas Bornschlögl received his PhD in Munich in the area of biophysics, performing single molecule force spectroscopy experiments that gave insight in the thermodynamics of protein folding and the working mechanisms of molecular motors. He later on pursued his research on biomechanics and mechano-biology at the Institute Curie in Paris working on bacterial infection pathways and force induced cytoskeletal reorganizations. Today he is the head of the imaging platform within the advanced research division of L'Oréal, where he uses different microscopy approaches to better understand the biophysics of skin and hair.

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Woody Biomasses are not true Renewable Energies and they are estimated to cause in Italy about 18-20,000 premature deaths each year**Ugo Corrieri***ISDE-International Society Doctors for the Environment, Italy*

Using forest biomasses as a renewable fuel causes loss of urban trees and widespread forest devastation and significantly increases greenhouse gas emissions. Burning woody biomass emits great amounts of CO₂; its carbon neutrality is based on the assumption that an equivalent CO₂ will be sequestered by regrowth of new trees. But it can take decades to over a century to replace the trees that were cut, provided they are replanted. This time lag is not factored and wood-fired power plants emit more CO₂ per unit of energy generated than coal plants, heavily aggravating climate change. Moreover, biomasses cause serious environmental, social and public health impacts. In Italy there are from 18,000 to 20,000 premature deaths a year just for the pm_{2.5} emitted by the combustion of all woody biomasses - from stoves, fireplaces and pellet boilers to biomass power plants - and the official ISPRA and GSE 2017 data show that about 7% of them, that is about 1400 Italian citizens, are prematurely killed every year only by the PM_{2.5} issued by the biomass power plants officially financed by public money. Other health damages are caused by dioxins, furans, polycyclic aromatic hydrocarbons, mercury, arsenic emitted by wood combustion. Last but not least, bioenergies are very expensive and not very effective for producing energy. They are sustained only because they brings lucrative public subsidies. Scientific evidence shows that it is mandatory to stop burning and strongly safeguard both virgin forests and urban trees, which protect our well-being and counteract climate change.

Biography

Ugo Corrieri, M.D., psychiatrist, psychotherapist, sexologist, hypnotist, was born on June 15, 1953 and worked from 1980 in the public psychiatry service of Grosseto (Italy), where he was Chief of the Psychiatric Ward from 1998 to 2008, and then (2008-2016) Chief of the whole Service for addicted patients. Trained also in Tropical Medicine (Brescia, 1996) and in Tropical Surgery (Rome, 1997), he worked as a volunteer in Africa (Niger, 1997). Retired from the National Public Service in November 2016, he is currently Professor in a Family Therapy Institute (SRPF, Rome) and Health Director of a private psychiatric residential facility in Perugia. President of Italian Society of Forest Therapy and Coordinator for Central Italy of ISDE - Doctors for the Environment, he conducts periodic conferences and has published scientific articles about healing trees, forest therapy and the damages of the combustion of woody biomasses.

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Toward a correct measure of third-hand exposure**Cristina Lidón-Moyano***PhD, UIC, Spain*

Statement of the Problem: While exposure to secondhand smoke (SHS) is a well-established problem, exposure to third-hand smoke (THS) is scanty known and needs to be studied. The objective of this work is to characterize salivary cotinine concentrations among people who self-reported exposure to SHS and THS at home. **Methodology & Theoretical Orientation:** Longitudinal study of a representative sample (n = 736) of the adult population (≥ 16 years) from the city of Barcelona carried out in 2004-2005 and 2013-2014. A questionnaire on tobacco use and passive exposure was administered, and a saliva sample was collected for cotinine determination. For this study, the information of the non-smoker participants who provided saliva sample was used. The geometric means (GM) and geometric standard deviations (GSD) of the cotinine concentration were compared according to the type of self-reported exposure at home: (1) Not exposed to SHS or THS; (2) Exposed to SHS and THS; and (3) Only exposed to THS. We used log-linear models to compare the cotinine concentration of each exposed group with respect to the unexposed group, adjusting for sex, age, educational level, and tobacco exposure in other settings. **Findings** Our study shows differences in salivary cotinine according to type tobacco smoke exposure at home, being salivary cotinine concentrations higher among SHS and THS, and only THS exposed individuals, when comparing with non-exposed ones. In addition, we found no difference in the salivary cotinine concentrations when comparing SHS and THS exposed individuals with only THS exposed individuals. This pattern was kept in baseline and follow-up. **Conclusion & Significance:** In spite of all the limitations (i.e. SHS and THS exposure are overly intertwined, lack of markers of THS as home dust or hand nicotine levels), our results seem to be a good approximation of the distinctly tobacco exposure between the proposed groups.

Biography

Cristina Lidón is a statistician with more than seven years of experience within the field of biostatistics and epidemiology. She is also a tenured-eligible lectured teaching in biostatistics in health-related degrees. Her research focuses on tobacco, addiction, and risk-taking behaviors. Her main expertise is in tobacco control policies, including smoking behaviors and second- and third-hand smoke, measured by questionnaire and biomarkers. However, her research interests also include self-harm behaviors, and screen exposure.

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Development of a new approach using mathematical modelling to predict cocktail effects of Micropollutants of diverse origins**Hélène Duval**

UBS Vannes, FRANCE

Statement of the Problem: A wide variety of organic chemicals can be detected in waste and surface waters at very low concentrations (micrograms to Nano grams per litre). They are generally found in all matrices and also accumulate in wild-life organisms. These micro pollutants (MP) threaten ecosystems and human health as they exhibit potential harmful effects on non-target organisms. MP are predominantly aromatic compounds used as pesticides, pharmaceuticals or industrial chemicals that may act as endocrine disrupting compounds. The effect resulting from the interaction between chemicals is called cocktail effect but the impact of chemical mixtures is poorly documented and often limited to binary mixtures using MP of the same category. The purpose of this study is to propose a new methodology using mathematical modelling to easily determine cocktail effects within complex mixtures containing diverse categories of MP, whatever their mode of action. Six MP were selected: bisphenol A, diclofenac, tramadol, cyproconazole, diuron and terbutryn. A statistical design was used to reduce the number of in vitro experiments using MP mixtures. A response surface model was then applied to look for cocktail effects. Findings: Different mixtures were tested using MP at the concentration at which 10% or 25% of the maximal effect on human cytotoxicity was observed. A strong global cocktail effect between the micro pollutants was evidenced. This effect was further investigated by considering micro pollutant response surfaces taken in pairs. Hence, we showed that there was a neutralization effect between bisphenol A and tramadol. Conclusion & Significance: We present a study focusing on MP cocktail effects where a selection of micro pollutants was made to reflect the heterogeneity of water contamination. The proposed methodology was inspired by clinical methodologies developed to test the effect of drug combinations. Hopefully, new legislation dealing with priority cocktail monitoring will appear to reinforce micro pollutant monitoring policy.

Biography

Hélène Duval is a lecturer at the University of South Brittany (UBS) in France and conducts her research activities at the IRDL laboratory (Institut de Recherche Dupuy de Lôme). She has her expertise in molecular and cellular approaches used to evaluate the deleterious effects of chemicals, including endocrine disrupting compounds, on human cells. Recently, she collaborated with mathematicians in order to focus on cocktail effects associated with the presence of micro pollutant mixtures in the aquatic environment using mathematical modelling. She is also involved in the characterization of the human estrogen receptor and its splice variants in breast cancer.

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The influences of Parasitic Zoonosis to one Health Safety**Subhash Chandra Parija***Sri Balaji Vidyapeeth University, Pondicherry, India*

The relevance and practicality of One Health Safety and security has been highly realized due to the ongoing Pandemic COVID-19. The One Health concept that looks into overarching health of human-animal and environment in a cross sectorial fashion insists looking into human health disasters from infectious agents owing to the pathogen spillage from animal origin and vice versa mostly in a relation with environmental influences. Events like climate changes, urbanization, deforestation, etc., have nearly dissolved the wildlife-human boundaries. These have influenced, in large, the flow of all parasite infections within the One Health triad and has resulted in a landscape change of zoonotic parasitic infections. As consequences, parasites are found in different ecology and in the continent with strong evidences of uprising of new and emerging parasites with antimicrobial resistances.

In our studies focusing parasitic infections in some regions of India has given hints of abundance of infections among populations. Intestinal parasitic infections like Entamoeba, Blastocystis, Giardia, Ascaris were noted. Likewise, prevalence of cysticercosis were also recorded. Parasites were mostly prevalent in rural compared to urban population giving hints of species spillage from animals. With such strong footprints across India and other reported studies suggesting higher parasitic abundances in Low- and Middle-Income Countries (LMICs), therefore, hints towards increasing instances of zoonotic spillover influenced by environmental changes. As such, this altered parasitic epidemiology is posing a great threat to the One Health safety by creating new evolutionary opportunities for host jumps and also making parasites resilient to the new environment leading to higher chances of transmission and virulence.

This calls for improving aspects of parasitology studies in One Health Framework to enable a mechanism for early detection, response, and effective medical countermeasures. In attempts to facilitate parasitic detection, we have tested improved molecular tools and technologies that had facilitated accurate species delineation and found promising tool to support effective medical countermeasures. In this presentation, the influence of parasitic infections, antimicrobial resistances on the One Health Safety will be discussed including advancements of molecular detection strategies to place a strong mechanism for healthcare management for better preparedness and responses.

Biography

Dr Subhash Chandra Parija is currently the Vice-Chancellor of Sri Balaji Vidyapeeth, Pondicherry and was the former Director of the Jawaharlal Institute of Postgraduate Medical Education & Research (JIPMER), Pondicherry. He is a Fellow of the Royal College of Pathologists, London; Royal Society Biology, UK and International Academy of Medical Sciences, New Delhi. He is the founder of the Indian Academy of Tropical Parasitology, and the Editor-in-Chief of Tropical Parasitology.

Dr. Parija has contributed immense in R&Ds in tropical parasites, and had initiated IATP-quality assurance programme for parasitic diseases in India. He has authored more than 400 research papers, 2 patents, 3 copyrights, 1 technology transfer and 16 books including most popular "Textbook of Parasitology". He is the recipient of more than 26 awards both international and national including the prestigious Dr. BC Roy National Award. He is currently figured among 2% Top Scientists in World in Tropical Medicine in the year 2020.

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Study on Environmental Radiation levels and their associated Health risks to general Public of Dera Ghazi Khan, Southern Punjab, Pakistan**Sidra Ghias***Quaid-I-Azam University, Islamabad Pakistan*

Background: The Earth is a radioactive planet and soil contributes extensively to external and internal exposure by gamma and beta doses to environmental radioactivity. Environmental matrices with elevated levels of NORMs can expose humans to higher levels of radiation and, once present in the soil, can be absorbed by plants and crops intended for human and animal consumption.

Objectives: The objectives of this study were to measure radiation levels from selected environmental matrices, and to evaluate associated radiological doses and excess lifetime cancer risk factor.

Methods: To achieve these objectives samples were collected from various locations of Dera Ghazi Khan, Pakistan. The samples of soil and vegetation were analysed by using high purity (HPGe) gamma spectroscopy. Spectrum analysis was done by using Genie 2000 software. While, the water samples were analysed by using scintillation detector for the measurement of gross alpha and beta activities. The results accuracy was confirmed by the standards obtain from International Atomic Energy Agency. Results &

Conclusion: The radioactivity of measured radionuclides (^{226}Ra , ^{232}Th and ^{40}K) in soil samples were surpassed the world average reference values given by (UNSCEAR, 2000). The radiological hazards such as Req , Hin , and Hex are under permissible limits while Dair , AEDE , AGDE and ELCR have higher values than world's average limit. The radiological risk assessment specifies that soil of the study area possess insignificant health risk to the residents. Only ^{40}K was assessed in vegetation samples. The gross alpha and gross beta activities in water samples fall within the permissible limits recommended by WHO. This study could be used as a baseline for further radiation epidemiological studies and comparing any changes in radiation levels in future.

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A Thermoluminescent method for the evaluation of the ^{131}I effective half-life in the Thyroid when treating Graves' disease

Sabrine Meftah

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When planning treatment for Graves' disease with ^{131}I , the effective half-life (Tef) should be estimated individually as it depends on biological characteristics such as iodine uptake and excretion, which differ from an individual to another (Berg et al. 1996). All the methods to quantify Tef described in the literature are quite complex and are difficult to be used in clinical routine. With the aim of optimizing this process, a simplified method is proposed here to evaluate Tef of ^{131}I during treatment of Graves' disease. The present study suggests improving the method of determining Tef based on thermoluminescence dosimetry. This involves implementing a new method and includes reduction of TLD (Thermoluminescent Dosimeter) measurements. The proposed method was validated on patients with Graves' disease. The radiation dose delivered to the patients was determined using the MIRD (Medical Internal Radiation Dosimetry) formalism. The relative difference between Tef obtained based on seven measurement intervals at [0–24 h, 24–48 h, 48–72 h, 72–96 h, 96–120 h, 120–144 h, 144–168 h] and based on three measurement intervals at [0–24 h, 72–96 h, 144–168 h] and [0–24 h, 120–144 h, 144–168 h] was 1.9% and 3.81%, respectively. Comparison of doses obtained based on a general Tef and on a personalized Tef gave a statistically significant difference with a correlation coefficient R^2 of 0.44. The Tef obtained from just three measurements was found to be sufficiently accurate and easily applicable. The results obtained demonstrate the need to determine and use personalized Tef values instead of using a fixed value of 7 days.

Biography

Sabrine MEFTAH is a medical physicist who has been working for 7 years in the field of radiotherapy and nuclear medicine. His thesis subject focuses on internal dosimetry during the treatment of thyroid pathologies, in particular for Graves' disease. These main publications are in the field of medical physics and internal dosimetry.

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Particulate soot-matter Pollution of recreational pools in Port Harcourt; Toxicity evaluation and children's Health risk assessment**Ikechukwu N. Onwurah***University of Nigeria, Nsukka, Nigeria*

Statement of the Problem: The increasing level of air pollution from air-borne black soot particles in Port Harcourt metropolis in the past 4 years with very obvious deposits in residential homes and water bodies/ponds has become a great concern especially for children who indulge in recreational pools' activities. Researchers have shown that the soot deposits contain metals ions and hydrocarbons. This study was carried out as a preliminary health risk assessment for children who utilise swimming pools for recreational activities in Port Harcourt. This involved evaluation of the toxicity of selected recreational pools using "Ostracods-linked mathematical model", (a quantitative whole-water toxicity assay), protein oxidation and hepatotoxicity in the rats' hepatocytes and questionnaire-based analysis. Five (5) recreational pools (4 outdoor and 1 indoor) were used out of the randomly selected 8, from 30 identified in Port Harcourt. Structured questionnaires were also used to elicit relevant information from children (10-13 years) who consistently engaged in recreational pool activities. Results show that 3 of the 5 recreational pools have significantly high percent mortality effect on Ostracods *Heterocypris incongruens*, the indicator organism. The toxicity indices of the pool waters showed "no-observed effect toxicity" for the indoor pool (SP 4), 20.8 for 1 outdoor pool (SP 1), 42.5 for 2 outdoor pools (SP 2 and 3) and 49.0 for 1 outdoor pool (SP 5). Out of 79 children who are frequent users of the 5 selected pools, 26 (32.91%) were traced. Analysis of the structured questionnaires administered to these 26 children and their parents inferred that none of the children has or had any of the recreational water illnesses such as gastrointestinal disorder, skin rashes and acute respiratory disease, suggesting zero or insignificant bacterial contamination of the pools. However protein oxidation in rats and hepatotoxicity of rats' hepatocytes incubated with portions of pool water samples suggest that the exposed children may not be cancer-risk free in future especially if the prevailing black soot particles pollution continues unabated while the children still indulge in the use of these pools. It is recommended that further monitoring of the exposed children be continued while measures such as more frequent changes of the pool water be ensured or to prevent further use of pools while the particulate soot-matter air pollution persists.

Biography

Ikechukwu N. E. Onwurah, (PhD) a Professor of Biochemistry is vastly knowledgeable in Environmental Toxicology/Biotechnology. He consults for some NGOs such as United Nations Development Programme (UNDP), State Ministries of Environment, etc. He has published several papers in many International Journals and also authored some books, one of them Perspective of Industrial and Environmental Biotechnology (reviewed in SETAC Globe, (12) 2002. He has the following certificated Professional Training courses: Modelling human and ecosystems exposures and impacts for life-cycle assessment; the USEtox Model (Germany); beyond ecological risk assessment; fully integrated assessment (Canada); the endocrine system; Global perspectives on testing methods and evaluation of endocrine activity (USA). He is a Fellow (F.Env), of the Society of Environmental Toxicology and Pollution Mitigation and one time President, Society of Environmental Toxicology and Chemistry – Africa.

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