CRESS
Epidemiology
Statistics

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How AI and LLM are transforming research in Public Health?

Université Paris Cité

Université Sorbonne Paris Nord

Inserm
La science pour la santé
From science to health

INRAE

How AI and LLM are transforming research in Public Health?

9h00 - 9h30: Registration and Welcome Coffee

Session 1. Understanding and Building evidence with AI

9h30 - 9h45: **Artificial Intelligence: Concepts, Perspectives, and Implications for Research.** François Petit *(Chaire Professor Junior, Inserm)*

9h45 - 10h30: **Can AI and LLM generate trustworthy knowledge? The example of mathematics.** Ivan Nourdin *(Professor in Mathematics, University of Luxembourg)*

10h30 - 10h50: **What does pain mean? When digital and medical humanities meet to highlight a public health challenge.** Astrid Chevance *(Professor of Epidemiology, Université Paris Cité)*

10h50 - 11h20: Coffee break

Session 2. AI in Health and Clinical Research

11h20 - 11h40: **Opportunistic screening for osteoporosis.** Christian Roux *(Professor of Rheumatology, Université Paris Cité)*

11h40 - 12h00: **Artificial intelligence–assisted otoscopy.** Jérémie Cohen *(Professor of Paediatrics, Université Paris Cité)*

12h00 - 12h20: **AI for participatory research in nutrition: ongoing solutions and future perspectives.** Alice Bellicha *(Associate Professor of Nutrition, Université Sorbonne Paris Nord)*

12h20 - 12h40: **Use of machine learning in accelerometry research.** Ian Danilevicz *(Postdoctoral researcher, Inserm-Université Paris Cité)*

12h40 - 13h00: **Synthetic data for augmented trials.** Alex Fernandes *(PhD Student, Université Paris Cité)*

13h00 - 14h15: Lunch

Session 3. Scholarly dissemination and peer-review

14h15 - 15h15: **Artificial Intelligence and the Future of Scholarly Communication.** Kamran Abbasi *(Editor in chief of The BMJ)*

Session 4. Acceleration of Research and evidence synthesis

15h15 - 16h00: **Can AI and LLM transform Evidence synthesis.** Joerg Meerpohl *(Professor and Director of the Institute for Evidence in Medicine at the Medical Center & Faculty of Medicine, University of Freiburg)*

16h00 - 16h45: **Three proofs of concept for accelerating and simplifying research tasks using AI.** Viet Thi Tran *(Professor of Epidemiology, Université Paris Cité)*

16h45 - 17h00: **Closing Remarks.** Isabelle Boutron *(Professor of Epidemiology Université Paris Cité, Director of the CRESS)*

Speakers

Dr Kamran Abbasi MB ChB, FRCP *is editor in chief of The BMJ. He is a doctor, journalist, editor, and broadcaster. After starting his career in hospital medicine, in various medical specialties such as psychiatry and cardiology, Kamran worked at the BMJ from 1997 to 2005. He was deputy editor and acting editor during that time. In 2013, Kamran returned to the BMJ in a new role as executive editor for content, leading the journal's strategic growth internationally, digitally, and in print. In December 2021 he was appointed editor in chief of the BMJ. Outside the BMJ, Kamran's previous roles include being editor of the Bulletin of the World Health Organization, and a consultant editor for PLOS Medicine. He is editor of the Journal of the Royal Society of Medicine and JRSM Open. Kamran also created three major e-learning resources for professional development of doctors, including BMJ Learning and the Royal Society of Medicine's video lecture service. Kamran has held board level positions and been chief executive of an online learning company. He has consulted for several major organisations including Harvard University, the World Health Organization, and McKinsey & Co. In addition, Kamran is an honorary visiting professor in the department of primary care and public health at Imperial College, London. He is a fellow of the Royal College of Physicians of Edinburgh and the Royal College of Physicians of London, patron of the South Asian Health Foundation, and an Honorary Professor & Advisor at the Institute of Medicine, Greater Manchester University. He is an experienced contributor on radio and television. Kamran's other passion is cricket. He writes on cricket for publications throughout the world, including Dawn and Wisden, but is best known for his popular blog that featured on ESPNCricinfo for over a decade. His cricket book, Englistan: An immigrant's journey on the turbulent winds of Pakistan cricket, is available from Amazon.*

Prof. Joerg Meerpohl *is Director of the Institute for Evidence in Medicine at the Medical Center and Faculty of Medicine of the University of Freiburg, Germany, and founding Director of the Freiburg GRADE Center, established in 2013. He is trained as a pediatrician, hematologist, and pediatric oncologist. For more than ten years, Professor Meerpohl has been an active member of the GRADE Working Group and has served as a GRADE methodology advisor for several WHO expert groups and the Robert Koch Institute in Germany, among others. Professor Meerpohl is also Director of Cochrane Germany. He is currently an elected member of Cochrane's Governing Board and of the GRADE Guidance Group. His main research interests include systematic review methodology, research transparency, and guideline methodology. Professor Meerpohl has published over 350 articles indexed in PubMed.*

Prof. Ivan Nourdin *is full Professor in Mathematics at the University of Luxembourg. He is also the Head of the research group Exploring the Fascinating World of Unpredictable. His research interests include Malliavin calculus, Stein's method, functional inequalities, free probability, rough paths theory, and inference for high-dimensional problems. Ivan Nourdin is author/coauthor of more than 110 publications in international scientific journals as well as 2 monographs. He joined the Université Pierre et Marie Curie (Paris VI) as an assistant professor in 2005 and then the Université de Lorraine as a full professor in 2010. In 2011, he was awarded the Annual Prize of the Fondation des Sciences Mathématiques de Paris. In 2013, he was awarded the France Scopus Researcher Award in the field of Mathematics by Elsevier. He was appointed professor of stochastic modelling at the University of Luxembourg in March 2014. Since 2018, he has served as Director of the Bachelor's programme in Mathematics. In 2015, together with Giovanni Peccati he was awarded the FNR Award for Outstanding Scientific Publication (for the book "Normal Approximations with Malliavin Calculus: from Stein's method to universality", published by Cambridge University Press in 2012).*

Assoc. Prof. Alice Bellicha*. I am an Associate Professor in Public Health Nutrition. I coordinate the Master's program in Nutrition and Public Health at University Sorbonne Paris Nord, and I lead research projects aimed at supporting populations in achieving healthier diets. To this end, I draw on approaches from nutritional epidemiology, interventional and participatory research. Assessing dietary habits is a key first step in public health research. In this field, artificial intelligence has potential to improve data quality while making data collection easier for participants. We therefore plan to integrate an AI-based image recognition tool in our dietary questionnaires to better assess dietary habits.*

Assoc. Prof. Astrid Chevance *is a psychiatrist with background in History and social science, and an Associate Professor in Public Health at Université Paris Cité and AP-HP. Her research focuses on measurement in mental health, patient-centred outcomes, and the evaluation of therapeutics in psychiatry. She was funded by the Fondation Inserm Bettencourt and by the Bibliothèque Nationale de France to work on mental pain. In this work she combined methods from clinical epidemiology, social sciences and humanities to rethink how mental pain is understood and measured.*

Prof. Jérémie Cohen*. I am a Professor in the Department of General Pediatrics and Pediatric Infectious Diseases at Necker Hospital for Sick Children (Paris, France), a large university hospital affiliated with Université Paris Cité. I am also a senior researcher in clinical epidemiology at Inserm UMR 1153 (OPPaLE team). My research interests include the evaluation of medical tests (including AI-enabled tests), antibiotic use in children, research methods, and evidence synthesis. I am an active member of the Cochrane Collaboration and a member of the STARD Group.*

***Ian Meneghel Danilevicz**. I am a statistician, graduated from the Federal University of Rio Grande do Sul (UFRGS), with a master's degree in Bayesian Statistics from the University of São Paulo (USP). During my PhD, conducted in cotutelle between the Federal University of Minas Gerais (UFMG) and University Paris-Saclay, I developed quantile regression models. Since 2023, I have been part of the EpiAgeing-CRESS team, where I work on methodological aspects of accelerometer data for studying physical activity and sleep in relation to Major Neurocognitive Disorder. These data can be analyzed as time series or functional data. My current research focuses on applying machine learning (ML) methods to stochastic biological processes.*

***Alex Fernandes**. I am a mathematician and currently a PhD candidate at Université Paris Cité (CRESS UMR1153). My research focuses on the use of real-world data to extrapolate evidence from randomised controlled trials to non-eligible populations in the context of health technology assessment. In particular, I am interested in the application of statistical learning methods to causal inference.*

***François Petit.** He completed a PhD in pure mathematics, with a focus on algebraic geometry, and initially worked in algebraic geometry and mathematical physics. His work later evolved into developing data analysis methods based on algebraic topology techniques. In 2019, he was awarded a Chaire d'Excellence by Université Paris Cité, and since 2022, he holds a Chaire Inserm. His current research centres on the development of mathematical, statistical and machine-learning methods for personalized medicine, with particular emphasis on causal inference and topological data analysis applied to complex biomedical data.*

***Prof. Christian Roux** is Professor of Rheumatology at Université Paris-Cité, formerly Head of Rheumatology Department at Cochin Hospital, Assistance Publique-Hôpitaux de Paris, and member of the ECAMO team (Epidemiology of musculo-skeletal diseases). His clinical activIty and research is focused on bone diseases, from very frequent as osteoporosis, to very rare genotypic disorders. He conducted studies on non-invasive methods to assess bone fragility, identification of risk factors of non-traumatic fractures, and therapeutic trials. His current research is on the potential role of IA-based tools for improvement of patients'care.*

***Prof. Viet-Thi Tran** is a Full Professor of Epidemiology at Université Paris Cité and at the Assistance Publique Hôpitaux de Paris (AP-HP), in Paris France. He leads a research group around novel methods to generate primary evidence in the METHODS team, which is specialized on therapeutic evaluation in chronic conditions. His work revolves around three topicss: 1) minimally disruptive medicine (i.e., how to care for patient in a way that respects his life goals), and especially how digital tools may help achieve such minimally disruptive medicine; 2) citizen science methods (i.e., how to involve patients in research and in evidence generation); and 3) novel methods in therapeutic evaluation (e.g., target trial emulation, virtual controls, etc.)*

https://cress-umr1153.fr