Epidemiological and Statistical Methods and Musculoskeletal Research

Training Workshop, Harare, Zimbabwe

Monday 11th - Wednesday 13th March 2019

This workshop is designed for researchers in Zimbabwe who wish to improve their epidemiology and statistical skills and understanding. This workshop forms part of the **S**ub-Saharan **A**frican **MuSculOskeletal** **N**etwork (SAMSON) programme, a research partnership across West, East and Southern Africa which underpins a programme of Musculoskeletal Health Research and aims to build sustainable capability in Research. However, researchers do not need to necessarily be working in the Musculoskeletal Health field to attend day 1 and day 2.

Monday 11th and Tuesday 12th: Epidemiological and Statistical Methods – Objectives;

Open to all attendees

1. Select the appropriate epidemiological study designs to investigate research questions
2. List the strengths and weaknesses of randomised controlled trials (RCT) and case-control, cohort, ecological and cross-sectional studies
3. Calculate incidence and prevalence and state which measure is most useful in different circumstances
4. Explain confounding, use of stratification and statistical interaction (effect modification)
5. Assess whether an exposure-disease association is likely to be due to chance, bias, reverse causality or confounding;
6. Explain the principles underlying sample size/power calculations
7. Select and use appropriate statistical methods in the analysis of simple datasets
8. Understand and interpret outputs from statistical analyses
9. Critically appraise a published RCT, case-control, cohort, ecological or cross-sectional study

Concepts will mostly be conveyed within the context of HIV and musculoskeletal health research. Where necessary Stata statistical software will be used.

Wednesday 13th: pQCT and Bone Age Methods – Aims;

Open to all musculoskeletal researchers – this follows on from the pQCT training workshop held in Harare in March 2018

1. Optimise technique when performing pQCT
2. Learn how to perform forearm pQCT
3. Understand how to process and analyse the outputs generated by pQCT
4. Understand and interpret assessments of bone age

Please note that for Radiographers who are trained in using pQCT, Micheal O'Beasail will be available for Thursday 14th March to give further practical guidance and training as necessary in the pQCT room (next to the DXA room) at Parirenyatwa Hospital

Speaker List:

- **Ms Tsitsi Bandason** Clinical Epidemiologist, Biomedical Research and Training Institute, Harare, Zimbabwe
- **Dr Mícheál O'Beasail,** Post-doctoral Investigator Scientist, MRC Nutrition and Bone Health Research Group, Cambridge, UK
- **Dr Mutsa Bwakura-Dangarembizi,** Senior Lecturer, Department of Paediatrics, University of Zimbabwe
- **Dr James Church,** Wellcome Trust Research training Fellow, Zvitambo Institute for Maternal and Child Health Research, Harare & Centre of Genomics/ Child Health, Queen Mary University of London, UK
- **Ms Chido Dziva Chikwari** Research Fellow, London School of Hygiene & Tropical Medicine, UK & Biomedical Research and Training Institute, Harare, Zimbabwe
- **Prof Rashida Ferrand**, Wellcome Trust Senior Research Fellow/Professor in International Health, London School of Hygiene & Tropical Medicine, UK & Biomedical Research and Training Institute, Harare, Zimbabwe
- **Dr Felicity Fitzgerald**, Paediatric Infectious Diseases Registrar, NIHR Academic Clinical Lecturer, UCL Great Ormond Street Institute of Child Health, London & Biomedical Research and Training Institute, Harare, Zimbabwe
- **Dr Celia Gregson**, Consultant Senior Lecturer in Musculoskeletal Medicine & Honorary Consultant Orthogeriatrician, Musculoskeletal Research Unit, University of Bristol, UK
- **A/Prof Katharina Kranzer**, Associate Professor in Infectious Disease Epidemiology, London School of Hygiene and Tropical Medicine, London, UK
- **Dr Edith Majonga** Post-doctoral Research Fellow, Biomedical Research and Training Institute and part-time lecturer in the Department of Radiology, University of Zimbabwe
- **Dr Andrew Prendergast** Wellcome Trust Senior Research Fellow, Zvitambo Institute for Maternal and Child Health Research, Harare, / Blizard institute, Barts and the London School of Medicine and Density, Queen Mary University of London, UK
- **Ms Mandikudza Tembo**, Research fellow, Biomedical Research and Training Institute, Harare, Zimbabwe
- **A/Prof Kate Ward**, Associate Professor, MRC Lifecourse Epidemiology Unit, University of Southampton, UK and MRC The Gambia

Reports from the UKRI funded UK training visits from: Farirayi Kowo, Cynthia Kahari, and Rudo Siwela

Workshop organisers;

- Dr Celia Gregson, University of Bristol, UK
- Dr Ruramayi Rukuni, Biomedical Research and Training Institute, Zimbabwe
- Ms Rudo Siwela, University of Zimbabwe

This workshop is funded by a UKRI Global Impact Acceleration Grant awarded to Celia Gregson by the University of Bristol. Hence, this workshop is free to attend but registration is required. Please contact ruramayi.rukuni@lshtm.ac.uk for details.

Meeting Venues

University of Zimbabwe College of Health Sciences Research Support Centre, Parirenyatwa Hospital (with Wednesday 13th workshops in the DXA department at Parirenyatwa hospital)

Twitter handle; #SAMSON19

Monday 11th March Epidemiological and Statistical Methods Day 1		Tuesday 12th March Epidemiological and Statistical Methods Day 2		Wednesday 13th March pQCT & Bone Age Training Day	
08.45	Arrival & Registration	08.45	Arrival & Registration	08.45	Arrival & Registration
09.00	Introduction & Aims for the workshop [CG]			09.00	Introduction & Aims for the day [CG]
09.10	Measuring Health and Disease (incidence, prevalence, risks, rates, and odds) [EM] [35+5]	09.00	Linear regression and correlation [TB] [30+10]	09.10	Overview of pQCT [KW] [20+5]
				09.35	Improving the quality of your pQCT scan [KW] [20+5]
09.45	Data types and distributions [MT] [25+5]	09.40	Logistic Regression [TB] [30+10]	10.00	How to perform forearm pQCT [MO'B] [30+5]
10.20	**Coffee and biscuits**	**10.20**	**Coffee and biscuits**	**10.35**	**Coffee and biscuits**
10.35	Study Design: cross-sectional, case-control, cohort and ecological studies [KK] [30+5]	10.35	Statistical Interaction [CG] [30+5]	**10.55**	***Practical Workshop*** *Performing a forearm pQCT scan* [KW & MO'B]
11.10	Clinical Trials [FF] [30+5]	11.10	Measurement error [CDC] [30+5]		
11.45	Bias [JC] [30+5]	11.45	'Lessons in Epidemiology' [CK & RS] [30+5]		
12.20	**Lunch**	**12.20**	**Lunch**	**12.30**	**Lunch**
13.10	Confounding and stratification [MBD] [30+5]	13.15	Sample Size calculations [CDC] [30+5]	13.20	How to process your pQCT data – part 1 [MO'B/ KW] [30+5]
13.45	***Practical Workshop (small groups)*** How to critically appraise a paper *(please read papers in advance)* [CG, KW, KK, FF]	13.50	***Practical Workshop (participants to present questions for discussion in small groups)*** 'Stats and Study design clinic' Including what stats are needed to support a successful grant proposal [CG, KW]	13.55	How to process your pQCT data – part 2 [MO'B/ KW] [30+5]
				14.30	Review of Bone Age [CG] [30+5]
15.00	**Tea and biscuits**	**15.00**	**Tea and biscuits**	**15.05**	**Tea and biscuits**
15.15	Balancing a research budget Q & A – how to make your money go as far as possible! [RF & CG]	15.15	How to get your paper published – top tips! [AP] [30+10]	15.20	Bone Age in practice [KW] [30+5]
15.50	Data: how to keep your data clean and well managed [TB] [30+5]	15.55	Sensitivity & Specificity [KK] [30+5]	14.55	Bone Age – Learning from Sheffield [FK] [20+5]
		16.20	Summary and closing remarks [CG]	15.20	Bone Age in practice [KW] [30+10]
16.25	Close	16.25	Close	16.05	Close