



Biostatistician Report (An Overview of Biostatistical Support)

2021 – September 2022

by: Dr. Ali Sheikhi
Biostatistician

Introduction

The Biostatistician role includes the provision of high-quality statistical inputs and conduct of research in statistical methodology aligned with clinical research programs. The Biostatistician is dedicated to:

- Support the development, design, analysis and reporting of clinical research projects,
- Prepare and contribute to scientific publications,
- Participate in funding submissions, and,
- Help to generate research funding.

The role is based on a partnership between the University of Limerick (UL - HRI), University Hospital Limerick (UHL) and Mid-West Community Healthcare Organisation (previously, CHO3).

The role was filled in late 2018 by Dr Ali Sheikhi and is funded by the HSE:

50% - University Hospital Limerick, and,
50% - Mid-West Community Healthcare Organisation.

The employment contract is a UL contract.

This report covers the support provided by the Biostatistician to researchers and gives an overview of the activities thus far.

Biostatistician:

Dr. Ali Sheikhi is the senior Biostatistician with the Health Research Institute (HRI). His research interests involve conducting clinical trials, analysis of longitudinal studies, Bayesian statistics, statistical genetics and statistical/mathematical modelling such as Structural Equation Modelling (SEM). He has lectured a wide range of statistics modules within the Department of Mathematics and Statistics in UL and has worked on many clinical trials as a consulting Biostatistician over the past years.

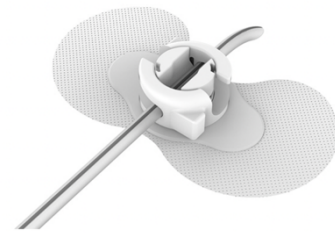
Projects:



The Biostatistician has contributed to many projects from University of Limerick (UL), University Hospital Limerick (UHL) and Health Service Executive (HSE) Mid-West Community Healthcare (previously, CHO3) since 2019 up until now. The total number of projects since the start of this role now **exceeds 150**, with **25 projects** either live or concluded since January 2022 up until September 2022. A detailed list of these projects can be found at the end of this report.

A large number of these projects are collaborations between UL and UHL, as the researchers involved in these works come from both entities. This is a good example of bringing researchers together and encouraging them to do collaborative work.

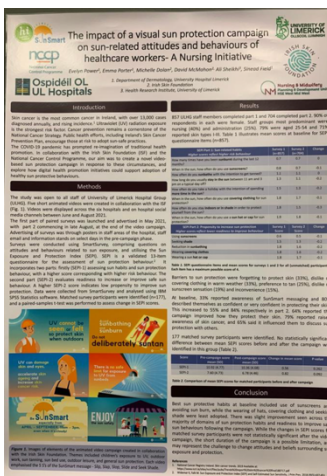
The type of service provided is different in each case and is dependent on the project. The Biostatistician has been involved actively as a co-applicant/collaborator in projects funded by HSE/HRB/HRI.



Some examples include:

- Music and Movement for Health: fun ways to improve balance, mobility, strength, flexibility memory and wellbeing (UL – UHL).
- StathGuard: developing a central venous catheter securement device that would reduce catheter related infections and improve patient quality of life (UL – UHL).
- SunSmart: collaborative research initiative examining the impact of a visual sun protection campaign on sun-related attitudes and behaviours of healthcare workers (UL – UHL).

Being involved as a co-applicant in a project is the most preferred type of contribution, as it gives the study team the opportunity to involve the Biostatistician from the beginning of the work and get help with the design, ethical approvals, collection of data, analysing and reporting the findings.



It is, however, quite common for researchers to reach out for statistical advice later in the study and seek help for analysing data and reporting the findings, and we are happy to provide this type of service as well within the unit. Based on the work above, we have published a good number of papers, and this work is ongoing. A sample list of these papers is presented at the end of this report.

In addition, we have established collaborative arrangements with Mid-West Community Healthcare, mainly through two channels:

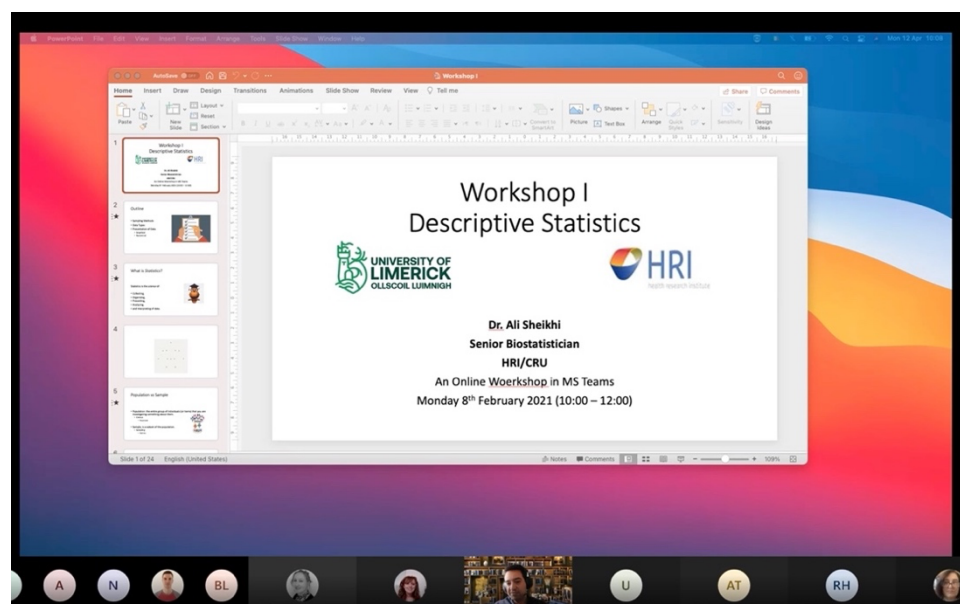
- National Institute of Health Sciences (NIHS – Aidan Hickey, Director), and,
- Milford Care Centre (Martina O’Reilly, Head of Education, Research and Quality).

Up to date, we have received queries from affiliated researchers to help with analysing data sets and writing reports/papers. The researchers come from a broad range of settings, to name a few, Ennis Hospital, Maternity Hospital Limerick, Emergency and Physiotherapy departments. Given the restrictions introduced since the beginning of the pandemic, we have arranged for video calls through different platforms in order to provide consultation and support for researchers. This method has continued to be a good way to interact with all these researchers, however, in person meetings are now being restored. It should be also noted that a large number of researchers affiliated to the community healthcare space might have reached out to the Biostatistician under UHL or HSE affiliations, so the number of queries might be underestimated at any given time.

Training:

In addition to providing support for projects, the Biostatistician spends considerable time providing relevant statistical training for researchers. The Biostatistician has developed a very popular series of five statistical workshops that are delivered to interested researchers over a year. These workshops serve as a beginner to intermediate program in statistics and cover a wide range of statistical methods commonly used in research and in particular medical research, from basic statistics to more sophisticated statistical methods and techniques.

The first series of these workshops started in 2020 in the CERC building in UHL, however after the introduction of restrictions due to the pandemic the workshops have been



delivered online. By the end of 2022, three series of these workshops will have been delivered. The list of the topics discussed in these workshops are

presented in a table below. These workshops are mainly advertised through UL, UHL and community healthcare channels. A statistical software, SPSS (Statistical Package for Social Sciences) is also used during these workshops. We have received excellent feedback from our participants, and we use it to further develop these workshops.

In addition to these, two extra workshops were specifically arranged for UHL researchers with a focus on basic and introductory topics in statistics and were delivered in 2022. Given the excellent feedback from the participants, we aim to continue these in the following year.

Training Workshops (3rd series - 2022)			
	Title	Date	Method/Location
Workshop 1	Descriptive Statistics	21/02/2022	Online
Workshop 2	Confidence Intervals: Construction and Interpretation	28/03/2022	Online
Workshop 3	An Introduction to SPSS (Statistical Package for Social Sciences)	02/05/2022	Online
Workshop 4	Regression and Prediction	03/10/2022	Online
Workshop 5	Hypothesis Testing	07/11/2022	Online

Communication & Networking:

The Biostatistician receives regular feedback from researchers, either after participation in training courses or providing statistical consultancy. As an effort to be more in touch with researchers in UHL, the Biostatistician attended some HSE clinics in UHL which were held in the CERC building on Monday afternoons. Unfortunately, these clinics are now stopped because of the pandemic. However, this effort has continued in a different form, and since March 2020 a significant number of video calls with researchers have been arranged by the Biostatistician. After lifting of the restrictions due to the pandemic, the in-person meetings have been restored, however, many researchers find the video calls a more convenient way to reach out for help and for that reason we have continued to provide our services through that method.

Live Projects (2022)

Project Title	PI	Source	Status	Role
Music and Movement for Health: The Feasibility of an Arts Based Programme for the Health and Wellbeing of Older Adults (DIFA)	Amanda Clifford	UL/UHL	Live	Co-Applicant Biostatistician
Children's Sport Participation and Physical Activity (CSPPA 2022)	Catherine Woods	UL	Live	Co-Applicant Biostatistician
Community-based Optimisation Programme for respiratory disease Management and Assessment (COPD-MAX)	Roisin Cahalan	UL	Live	Co-Applicant Biostatistician
Community Based Exercise for Older Adults with Chronic Musculoskeletal Pain	Karen McCreesh	UL/UHL		Co-Applicant Biostatistician
Outcomes among Older Adults Attending Orthogeriatric Services	Rose Galvin Tom Coney	UL/UHL		Biostatistician
Medical Device Innovation Project (StathGuard)	Leonard O'Sullivan Austin Stack	UL/UHL	Live	Data Monitoring Committee and Trial Steering Committee
The (T) Thrombosis (I) in Patients with (L) Lower (L) Limb (I) Injuries (R)Requiring (I) Immobilisation (TILLIRI) Study	Denis O'Keeffe	UL/UHL	Live	Biostatistician
Recurrent Urinary Tract Infection Health and Functional Impact	Hugh Flood	UHL	Live	Biostatistician

Set up a physiotherapist – led Triage Clinic with ED Pathway/on-call team for lower back pain assessment.	Dr ALAA MOHAMMAD MR F.Condon	UHL	Live	Biostatistician
HIST Intergenerational Discussion Café Survey	Dympna Touhy Aidan Buffey	UL	Live	Biostatistician
Workplace Health Promotion Study	Dr. Brian Carson Prof. Alan Donnelly	UL	Live	Biostatistician
Hepa Filtered Ventilation Units	Barbara Slevin Patrick	UHL	Live	Biostatistician
Comprehensive geriatric assessment in the emergency department	Rose Galvin Ida Carroll	UL/UHL	Live	Biostatistician
Redeployment of Healthcare Staff	Declan McNamera	UHL	Live	Biostatistician
Advice on Sample Size Calculations	Sile Griffin Phil Jakeman	UL	Live	Biostatistician

Finished Projects (2022)

Project Title	People	Source	Status	Role
HRB Feasibility Study (PIPPRA)	Norelee Kennedy	UL/UHL	Finished	Biostatistician
Prevalence of May-Thurner Syndrome in 1 st -degree relatives of symptomatic patients	Eamon Kavanagh Amy Fowler	UL/UHL	Finished	Biostatistician
Amputation Rates Before and After Covid	Prof. Kavanagh Siobhan Doyle	UHL	Finished	Biostatistician
Respiratory Illness	Paula Ryan Carmel McInerney	UHL	Finished	Biostatistician
HSCP Emergency Department	Ide O'Shaughnessy Aoife Synnott	UHL	Finished	Biostatistician
Towards An Integrated Blood Pressure Self-Monitoring SolutioN for Stroke/TIA: The TASMIN5S randomised controlled feasibility trial	Roisin Doogue Liam Glynn	UL/UHL	Finished	Biostatistician
Sun Awareness Campaign (SunSmart)	Emma Porter	UHL	Finished	Biostatistician

Body Composition Assessment in Adults with Cystic Fibrosis at University Hospital Limerick	Derbhla O'Sullivan	UHL	Live	Biostatistician
	Rose Galvin			
ED Frailty Data Analysis	Louise A Barry Ida Carroll	UL/UHL	Live	Biostatistician
The Role of Perceived Injustice in Patients with Intermittent Claudication	Pamela Ryan Eamon Kavanagh	UHL	Live	Biostatistician

A sample list of papers published in 2022:

1. **Íde O'Shaughnessy, Katie Robinson, Margaret O'Connor, Mairéad Conneely, Fiona Steed, Damien Ryan, Leonora Carey, Denys Shchetkovsky, Elaine Shanahan, Aoife Leahy, Colin Quinn, Ali Sheikhi, Rose Galvin.** *Comprehensive geriatric assessment in the emergency department: A protocol for a prospective cohort study.* HRB Open Research 5(26).
2. **Amanda M Clifford, Orfhlaith Ni Bhriain, Steven Byrne, Pui-Sze Cheung, Quinette Louw, Liam Glynn, Hilary Moss, Desmond O'Neill, Catherine B Woods, Ali Sheikhi, Rosemary Joan Gowran, Catherine Maher, Brendan Kennelly, Jon Salsberg, Lehana Thabane.** *Music and Movement for Health: Protocol for a pragmatic cluster-randomised feasibility pilot trial of an arts-based programme for the health and wellbeing of older adults.* HRB Open Research 5(42).
3. **Eileen Carey, Ruth Ryan, Ali Sheikhi, Liz Dore.** *Exercising autonomy—The effectiveness and meaningfulness of autonomy support interventions engaged by adults with intellectual disability. A mixed-methods review.* British Journal of Learning Disabilities (1:17).
4. **Máire Curran, Audrey C Tierney, Brenda Button, Louise Collins, Lauren Kennedy, Ciara McDonnell, Ali Sheikhi, Andrew Jurascheck, Brian Casserly, Roisin Cahalan.** *Physical Activity and Sedentary Behavior in Adults With Cystic Fibrosis: Association With Aerobic Capacity, Lung Function, Sleep, Well-Being, and Quality of Life.* Respiratory Care 67(3).
5. **Roisin Doogue, Peter Hayes, Robin Hebert, Ali Sheikhi, Tanvi Rai, Kate Morton, Cristian Roman, Richard J McManus, Liam G Glynn.** *Towards An Integrated Blood Pressure Self-Monitoring Solution for Stroke/TIA in Ireland: A Mixed Methods Feasibility Study for the TASMIN5S IRL Randomised Controlled Trial.* Research Square (1:24).

A sample of previously published papers:

1. **William Quirke, Siobhan Toomey and Ali Sheikhi.** *The stability of 'add-on' coagulation assays on refrigerated citrated plasma stored on a packed cellular fraction.* International Journal of Laboratory Hematology.
2. **Helen Meagher, Ali Sheikhi, Siobhan Egan, Niamh Keane, Eamon Kavanagh and Tony Molony.** *Wound Prevalence Survey in a Regional Integrated Care Organisation in the Mid-West of Ireland Nursing and Residential Care.* Journal of Nursing and Residential Care.
3. **Ahmad Bashir, Noreen Molony, Musaab Elzain, Isabelle Delaunois, Ali Sheikhi, Patrick O'Donnell, Colum Dunne, Brendan Kelly, Gautam Gulati.** *From Nowhere to Nowhere. Homelessness and Incarceration: A Systematic Review and Meta-Analysis.* International Journal of Prisoner Health.
4. **Curran, M., Tierney, AC., Collins, L., Kennedy, L., McDonnell, C., Sheikhi, A., Walsh, C., Casserly, B., Cahalan, R.** *Validity and reliability of the ActivPAL and Fitbit Charge 2 as a measure of step count in Cystic Fibrosis.* Journal of Physiotherapy Theory and Practice.