

# Nicholas Tierney

RESEARCH SOFTWARE ENGINEER

Telethon Kids Institute

✉ [nicholas.tierney@gmail.com](mailto:nicholas.tierney@gmail.com) | 🏠 [njtierney.com](http://njtierney.com) | 📷 [njtierney](https://www.instagram.com/njtierney) | 🐦 [nj\\_tierney](https://twitter.com/nj_tierney)

## Education

### Ph.D. Statistics

QUEENSLAND UNIVERSITY OF TECHNOLOGY

- Thesis Title: "Statistical Approaches to Revealing Structure in Complex Health Data"
- Primary Supervisor: Professor Kerrie Mengersen

Brisbane, QLD, Australia

2013 - 2018

### Bachelor of Psychological Science (Honours)

UNIVERSITY OF QUEENSLAND

- Thesis Title: "How sharp is sharp? The effect of monocular texture on enhancing sharpness"
- Primary Supervisor: Dr. Philip Grove

Brisbane, QLD, Australia

2008 - 2012

## Employment

### Research Software Engineer

TELETHON KIDS INSTITUTE

- Maintained {greta} and develop statistical software, develop and maintain COVID-19 modelling for Australian Government

Perth, WA, Aus

2021 - Current

### Lecturer

MONASH UNIVERSITY

- Taught ETC1010, developed assessment and lectures on introduction to data analysis

Melbourne, VIC, AUS

2019 - 2020

### Research Fellow

MONASH UNIVERSITY

- Created {visdat}, {nanianr}, and {brolgar} packages to explore data

Melbourne, VIC, AUS

2017 - 2019

## Published Articles

### Expanding Tidy Data Principles to Facilitate Missing Data Exploration, Visualization and Assessment of Imputations

N TIERNEY AND D COOK

Journal of Statistical Software

2023

### A Journey from Wild to Textbook Data to Reproducibly Refresh the Wages Data from the National Longitudinal Survey of Youth Database

D AMALIAH AND D COOK AND E TANAKA AND K HYDE AND N TIERNEY

Journal of Statistics and Data Science Education

2022

### The R Journal: Brolgar: An R Package to BRowse Over Longitudinal Data Graphically and Analytically in R

TIERNEY, NICHOLAS AND COOK, DIANNE AND PRVAN, TANIA

The R Journal

2022

### Missing Data: Current Practice in Football Research and Recommendations for Improvement

DAVID N. BORG AND ROBERT NGUYEN AND NICHOLAS J. TIERNEY

Science and Medicine in Football

2021

### Common-Sense Approaches to Sharing Tabular Data Alongside Publication

NICHOLAS J. TIERNEY AND KARTHIK RAM

Patterns

2021

### Comment On: Moving Sport and Exercise Science Forward: A Call for the Adoption of More Transparent Research Practices

BORG, DAVID N. AND BON, JOSHUA J. AND SAINANI, KRISTIN L. AND BAGULEY, BRENTON J. AND TIERNEY, NICHOLAS J. AND DROVANDI, CHRISTOPHER

Sports Medicine

2020

### A Bayesian Spatiotemporal Statistical Analysis of Out-of-Hospital Cardiac Arrests

PELUSO, STEFANO AND MIRA, ANTONIETTA AND RUE, HÅVARD AND TIERNEY, NICHOLAS J. AND BENVENUTI, CLAUDIO AND CIANELLA, ROBERTO AND CAPUTO, MARIA LUCE AND AURICCHIO, ANGELO

Biometrical Journal

2020

## Bayesian Modelling to Assist Inference on Health Outcomes in Occupational Health Surveillance

TIERNEY, NICHOLAS J. AND CLIFFORD, SAMUEL AND DROVANDI, CHRISTOPHER C. AND MENGENSEN, KERRIE L.

2020

## An Introduction to Software Tools, Data, and Services for Geospatial Analysis of Stroke Services

PADGHAM, MARK AND BOEING, GEOFF AND COOLEY, DAVID AND TIERNEY, NICHOLAS J. AND SUMNER, MICHAEL AND PHAN, THANH G. AND BEARE, RICHARD

2019

## Evaluating Health Facility Access using Bayesian Spatial Models and Location Analysis Methods

TIERNEY, NICHOLAS J. AND MIRA, ANTONIETTA AND REINHOLD, H. JOST AND ARBIA, GIUSEPPE AND CLIFFORD, SAMUEL AND AURICCHIO, ANGELO AND MOCCHETTI, TIZIANO AND PELUSO, STEFANO AND MENGENSEN, KERRIE L.

2019

## Novel Relocation Methods for Automatic External Defibrillator Improve Out-of-Hospital Cardiac Arrest Coverage under Limited Resources

TIERNEY, NICHOLAS J. AND REINHOLD, H. JOST AND MIRA, ANTONIETTA AND WEISER, MARTIN AND BURKART, ROMAN AND BENVENUTI, CLAUDIO AND AURICCHIO, ANGELO

2018

## Visdat: Visualising Whole Data Frames

TIERNEY, NICHOLAS J.

*The Journal of Open Source Software*

2017

## Visualisation and Statistical Modelling Techniques for the Management of Inventory Stock Levels

SWEATMAN, WINSTON L., AND MCGREE, JAMES AND CARSTENS, C. JACOBIE AND FOSTER, KYLIE J. AND LIU, SHEN AND TIERNEY, NICHOLAS J. AND TREDENICK, ELOISE AND ZAITOUNY, AYHAM

2016

## Using Decision Trees to Understand Structure in Missing Data

TIERNEY, NICHOLAS J. AND HARDEN, FIONA A. AND HARDEN, MAURICE J.

*BMJ Open*

2015

## Grants

### R Consortium

CONTINUING TO IMPROVE R'S ABILITY TO VISUALISE AND EXPLORE MISSING VALUES

- Develop and improve methods for exploring missing data in R
- Funding amount: \$5,000 USD

*Global*

2022

### Spark/Spectrum

EXTENDING AND COMPARING METHODS FOR PROJECTING SOCIAL CONTACT MATRICES

- Develop new methods and software for infectious disease modelling
- Funding amount:

*Australia*

2022

### R Consortium

A UNIFIED PLATFORM FOR MISSING VALUES METHODS AND WORKFLOWS

- Developed CRAN Task view and platform for sharing missing data methods
- Funding amount: \$20,000 USD
- Co-investigators: Josse, Julie, Nathalie Vialenix, Imke Mayer

*Global*

2018-2019

### ACEMS International Mobility Programme

MCMC DIAGNOSTICS & RESEARCH IMPACT

- Visited Johns Hopkins University and UC Berkeley to discuss MCMC diagnostics and research impact
- Funding amount: \$10,000 AU

*Australia - USA*

2019

### Government Scholarship

AUSTRALIAN POSTGRADUATE AWARD

- Funding amount: \$98,000

*Brisbane, QLD, Australia*

2013-2017

### Industry Scholarship

INDUSTRY DOCTORAL TRAINING CENTRE TOP UP

- Funding amount: \$40,000

*Brisbane, QLD, Australia*

2013-2017

## Invited Academic

## Prof. Michael Plank

UNIVERSITY OF CANTERBURY

- Visited to present invited talk on using {conmat} for infectious disease modelling

Christchurch, New Zealand

2022

## Prof. Thomas Lumley

UNIVERSITY OF AUCKLAND

- Visited to present invited talk on using {conmat} for infectious disease modelling

Auckland, New Zealand

2022

## Prof. Kerrie Mengersen

QUEENSLAND UNIVERSITY OF TECHNOLOGY

- Visited to present invited talk on using {greta} for scalable statistical computing

Brisbane, Australia

2021

## Dr. Karthik Ram

BERKELEY INSTITUTE OF DATA SCIENCE (BIDS)

- Visited annually for 1-3 weeks
- Develop best practices for publishing data sources
- Identify current technology issues in modern data science

Berkeley, CA, USA

2018 - 2020

## Prof. Roger Peng

JOHNS HOPKINS BLOOMBERG SCHOOL OF PUBLIC HEALTH

- Collaborate on understanding and measuring MCMC convergence.
- Develop MCMC diagnostics

Baltimore, MD, USA

2019

## Prof. Antonietta Mira and Professor Angelo Auricchio

INTER-DISCIPLINARY INSTITUTE OF DATA SCIENCE AT UNIVERSITÀ DELLA SVIZZERA ITALIANA (USI)

- Develop methods for optimal placement of Automatic Electronic Defibrillators (AEDs) in Switzerland

Lugano, Ticino, Switzerland

2016 - 2017

## Software

### conmat

CREATE CONTACT MATRICES FROM POPULATION DATA

- 11 stars

GitHub

2021

### yahtsee

PROVIDE TOOLS AROUND FITTING HIERARCHICAL TIME SERIES MODELS FOR DATA COMMONLY FOUND IN MALARIA.

- 2 stars

GitHub

2021

### brlgar

TOOLS TO BROWSE OVER LONGITUDINAL DATA GRAPHICALLY AND ANALYTICALLY. EXTENDS GGPLOT2, TSIBBLE, AND FEASTS

- 106 stars
- 14,307 downloads

GitHub

2019

### visdat

PRELIMINARY EXPLORATORY VISUALISATION OF DATA

- 440 stars
- 1,313,765 downloads

CRAN

2017

### naniar

TIDY DATA STRUCTURES, SUMMARIES, AND VISUALISATIONS FOR MISSING DATA. EXTENDS GGPLOT2 AND DPLYR.

- 631 stars
- 1,278,511 downloads

CRAN

2017

### maxcovr

TOOLS FOR LOCATION ANALYSIS AND SOLVING THE MAXIMAL COVERAGE LOCATION PROBLEM USING C++

- 41 stars

GitHub

2016

## Presentations

### Extending and Comparing Methods for Projecting Social Contact Matrices

SPARK SPECTRUM ANNUAL MEETING (LIGHTNING TALK)

Cape Schanck, Australia

2023-02-15

### Extendable Projection of Contact Matrices

UNIVERSITY OF AUCKLAND (INVITED SPEAKER)

Auckland, New Zealand

2022-09-14

### The Future of NA Data

RSTUDIOCONF::2022 (LIGHTNING TALK)

Online

2022-07-28

<b>Reflections One Year into Working as a Research Software Engineer</b> USER! (SPEAKER)	Online 2022-06-23
<b>Greta: Scalable Statistical Computing</b> QUT (INVITED SPEAKER)	Brisbane, QLD, Australia 2021-12-22
<b>Recognising Research Software in Academia</b> UNSW (INVITED SEMINAR)	Online 2021-10-29
<b>Tangling is Easy but Untangling is Hard. Some Advice on Exploratory Data Analysis for Longitudinal Data</b> JOINT STATISTICAL MEETINGS (INVITED TALK)	Online 2021-08-09
<b>The Use of Colour in Graphics: A Journey Through the Body &amp; Mind to the Screen</b> MONASH DATA FLUENCY (INVITED SEMINAR)	Online 2020-06-26
<b>Data! Data! Data!</b> UNIVERSITY OF WASHINGTON (INVITED SEMINAR)	Seattle, WA, USA 2020-02-14
<b>Making Better Spaghetti</b> RSTUDIO::CONF2020 (INVITED SPEAKER)	San Francisco, CA, USA 2020-01-29
<b>Exploring and Understanding the Individual Experience from Longitudinal Data, or...How to Make Better Spaghetti (Plots)</b> OzVis 2019 (KEYNOTE SPEAKER)	Brisbane, QLD, Australia 2019-11-21
<b>Are We There Yet? Testing the Effectiveness of Graphics as MCMC Diagnostics</b> JOHNS HOPKINS BLOOMBERG SCHOOL OF PUBLIC HEALTH (INVITED SEMINAR)	Baltimore, MD, USA 2019-01-09
<b>Empowering People with Community, Software, and Peer Review</b> RUCK: R USERS CONFERENCE KOREA (KEYNOTE SPEAKER)	Seoul, South Korea 2018-10-23
<b>Find the Best Locations for Facilities using ‘maxcovr’</b> USER! 2018 (SPEAKER)	Brisbane, QLD, Australia 2018-07-13

## Awards

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<b>ACEMS Impact and Engagement Award</b> FOR ACTIVELY TRANSLATING RESEARCH FINDINGS TO APPLICATIONS, USE, AND UPTAKE OUTSIDE OF ACADEMIA (\$1,000)	Australia 2019
<b>EJC Pitman Prize (Runner Up)</b> THE STATISTICAL SOCIETY OF AUSTRALIA	Melbourne, VIC, Australia 2018
<b>Thesis nominated for University Doctoral Outstanding Thesis Award</b> PHD THESIS EXAMINATION	Brisbane, QLD, Australia 2017
<b>Vice-Chancellor’s Performance Award</b> INNOVATION IN TEACHING IN SEB113 (\$7,500)	Brisbane, QLD, Australia 2015
<b>First Place for talk: “The Joy of Stats”</b> SESSIONAL TEACHING AND REFLECTION SHOWCASE (STARS)	Brisbane, QLD, Australia 2015

## Service

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I am an active member of the statistics and open source software communities. I have been an Associate Editor for the R Journal since 2021, served on the organising committee of User! in 2018, and was founding and principal organiser of the annual rOpenSci Ozunconference, from 2016 - 2018. I have been the organising chair of two university research groups, the Non-Uniform Monash Business Analytics Team (NUMBAT) group at Monash, and the Bayesian Research and Applications Group (BRAG) at Queensland University of Technology. I have served with the Statistical Society of Australia since 2013, as young statistician representative of Queensland, assistant chair of biostatistics (2013-2016), and co-founded the section “Statistical Computing and Visualisation” with Di Cook in 2021. I manage the adjudication of the annual student software award provided by this section.

## Teaching

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## Lecturer

MONASH UNIVERSITY

- Developed assessment and lectures for ETC1010, introduction to data analysis

Melbourne, VIC, Australia

2019 - 2020

## Teaching Assistant

QUEENSLAND UNIVERSITY OF TECHNOLOGY

- Tutor for course SEB113, an introductory course on statistics

Brisbane, QLD, Australia

2015

## Lab Content Creator

QUEENSLAND UNIVERSITY OF TECHNOLOGY

- Created award-winning practical lab content for course SEB113

Brisbane, QLD, Australia

2015

# Workshops

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## An introduction to Bayesian modelling using greta

SSA

- Teaching fundamental Bayesian statistics aimed at scientists needs

Global

2021

## R Markdown for Scientists

RMD4SCI.NJTIERNEY.COM

- Focussing on scientists needs (workflow, citations, references)
- Delivered 6 times in Melbourne, Canberra, and Seattle

Global

2018 -

## Software Carpentry Instructor Trainer

THE CARPENTRIES

- Teaching best practices on how to teach software coding to other instructors

Global

2018 - 2019

## Missing Data Imputations

USER!2018

- Joint course with Prof. Julie Josse, covering visualising, exploring, and imputing missing data.

Brisbane, QLD, Australia

2018

## Reproducible Reporting Using RMarkdown and GitHub

ANGELTR R CONFERENCE

- Course teaching basics of Rmarkdown and GitHub

Anglet, France

2017