

ACADEMIC: ORIGINAL RESEARCH

Twenty-year review of author characteristics and academic articles published in a medical student journal

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Abstract

Background

The aim of this study was to describe the characteristics of authors and their published academic articles within the New Zealand Medical Student Journal (NZMSJ).

Materials and Methods

All issues of the NZMSJ published prior to 2024 were retrospectively reviewed. Academic article characteristics and author demographics were described using counts and proportions. Characteristics were compared between the first and second decades of NZMSJ publication. For Issue 26 to Issue 36, journal metrics were also obtained.

Results

There were 144 academic articles published in the NZMSJ between 2004 and 2023. First authors tended to be medical students (74%), in their clinical years of medical school (56%), and from local universities (72%). There was a decline in the proportion of articles authored by preclinical students (from 25% to 6%) and with University of Otago affiliation (from 59% to 28%) when comparing the first and second decades of NZMSJ publication. Most articles had a single author (67%), were academic essays (38%), and were on a medical topic (58%). The median time between submission and acceptance was 3 months (IQR 2–6 months).

Conclusion

Most academic articles published in the NZMSJ were academic essays authored by clinically based medical students. Since 2014, there has been an increase in articles with authors affiliated with the University of Auckland. The median time from submission to acceptance in the NZMSJ is similar to other medical journals, despite being student-run.

Keywords

Medical Education (MeSH), Medical Student (MeSH), Medical Student Journal, Early Career Research

Introduction

Publication of student-authored research confers several benefits, both to the author and to the wider research community. Students who publish research improve their academic writing style, gain familiarity with the peer review process, and learn to critically appraise articles.^{1,2} For medical students these skills can be translated into clinical practice, helping them apply research to the clinical context, translate clinical questions into research projects, and maintain their continuing medical education.^{3,4} Furthermore, students often provide assistance

with data collection and analysis,⁵ and authors who collaborate with students have been found to have a higher scholarly impact.⁶ Another study has suggested that medical professionals involved in research make better professional decisions than those who are not, further supporting a need to encourage medical student research.⁷

Despite these benefits, there is a shortage of clinicians with dual training in medicine and research.^{8–12} A commonly cited barrier to pursuing an academic career is a negative experience with publication, specifically exclusion from authorship and rejection from journals.^{2,13} This is a significant concern, as most future dual-trained clinician-academics develop an interest in academic medicine during their medical training.¹³

Medical student journals (MSJs) can address this issue by providing fee-free article processing and a supportive submission process. These journals allow students to contribute to scientific literature, helping to ensure their research is disseminated and their work acknowledged. Unfortunately, despite published articles being peer-reviewed and expert-reviewed, MSJs struggle with a perceived conception of low quality and poor visibility, and a high turnover of editorial staff, many of whom volunteer their time.^{2,14,15}

As of 2018, 23 English-language MSJs existed worldwide.¹⁴ Of these, the New Zealand Medical Student Journal (NZMSJ) is one of the longest running MSJs, having started in 2004.¹⁶ It is open-access, peer-reviewed, and indexed in Google Scholar and the Directory of Open Access Journals (DOAJ). Unlike most open-access journals, publication is free, supporting students to disseminate their research.

There is a paucity of literature describing the characteristics of, and factors associated with, student-authored publications.^{1,17–19} Existing studies are limited to measuring student contributions to a non-MSJ or describing student projects that are published.^{17,18,20} We have found only one article that describes the characteristics of authors who have published in an MSJ.¹

The primary aim of this study was to describe the characteristics of authors who publish in the NZMSJ and the characteristics of research articles in the NZMSJ since the first issue. A secondary aim was to assess the NZMSJ using traditional journal quality assessment metrics.

Materials and Methods

SEARCH STRATEGY AND INCLUSION CRITERIA

This study was a retrospective review of the first 36 issues of the NZMSJ published since March 2004. Articles were included in the review if classified as an 'academic' article, as opposed to a 'feature' or 'editorial' article. Sixth-year elective reports (but not elective-based research), republished articles from the New Zealand Medical Journal (NZMJ), and clinical pearls were excluded from the study as they were inconsistently published as 'feature' rather than 'academic' articles.

DATA EXTRACTION

Author characteristics extracted included gender, year-level of medical student authors, whether they were preclinical (second or third years) or clinical (fourth, fifth and sixth years), institutional affiliation or university, whether the first author was a medical student, and qualifications at the time of publication. Article characteristics extracted included type of research (academic essay, audit, case study, cell research, cohort study, cross-sectional study, literature review, qualitative, and other), topic of research (laboratory, medical, medical education, mental health, public health, surgical), number of authors, funding declaration information, date of publication, and number of citations. When determining the research topic of each article, the two researchers (LP and AC) individually assessed the articles, resolving any discrepancies through mutual discussion. Articles published from 2004 to 2013 were considered part of the 'first decade' of publication, whereas articles published from 2014 to 2023 were considered part of the 'second decade' of publication. For articles published in Issue 26 to Issue 36, information regarding the date of article submission, time to first reply to the submitting author, and time to acceptance was also extracted. These data were obtained from Scholastica which has been used by the NZMSJ as the manuscript submission platform since Issue 26. Data acquired from Scholastica are not publicly available.

Information regarding the author's name, first author's gender, year in medical school (if applicable), institutional affiliation or university, and qualifications at the time of submission were extracted from both the authorship list and the short biography about the first author. The term 'research student' was used to describe a student completing a Bachelor of Medical Science (Honours) (BMedSc(Hon)) during their medical degree, or an intercalated Bachelor of Medicine and Bachelor of Surgery (MBChB) with a PhD. In contrast, the term 'science student' was used to describe a non-medical student completing a science degree, or a non-medical graduate with a science degree. Authors who were medical doctors were assumed to have either an MBChB or a Doctor of Medicine Degree (MD). Where provided, the student's year group was used to identify whether they were a preclinical or clinical student. 'Medical student' was used to describe any preclinical, clinical, or 'research student'. Only data relating to the first author were analysed, as data for subsequent authors were inconsistently available.

Data on most article-related characteristics were extracted from the publication itself. The research type was typically listed at the top of the article, and was confirmed by reading the article and checking the methodology matched that expected for the research type. Where the listed research type did not match the study methodology, the researchers revised the research type through mutual agreement. Funding information was recorded in a specific declaration at the bottom of the article. The publication date was taken as the publication date for the whole issue.

The number of article citations was extracted by identifying the article on Google Scholar. Some articles could not be identified on Google Scholar as the NZMSJ was indexed on Google Scholar in 2017. In this scenario, a broader search of ResearchGate and Google was conducted to identify the number of citations. Failing this, it was assumed that the article had no citations.

STATISTICAL ANALYSIS

Data were collected in a Microsoft Excel document and analysed using R Studio® (version 4.4.0). Categorical variables were described using counts and proportions, and continuous variables using both parametric and non-parametric tests. Variables were compared between the 'first decade' and 'second decade' of NZMSJ publication using χ -squared tests. Categories with low counts were grouped for analysis and χ -squared tests were performed on the highest-level groups in the hierarchy. The Holm-Bonferroni method of p-value adjustment was used post hoc to allow for multiple statistical comparisons.

Results

There were 144 academic articles published in the NZMSJ between 2004 and 2023. A flowchart illustrating the inclusion and exclusion of articles is shown in Figure 1. The median number of academic articles per issue was 4 (IQR 3-5) (Figure 2).

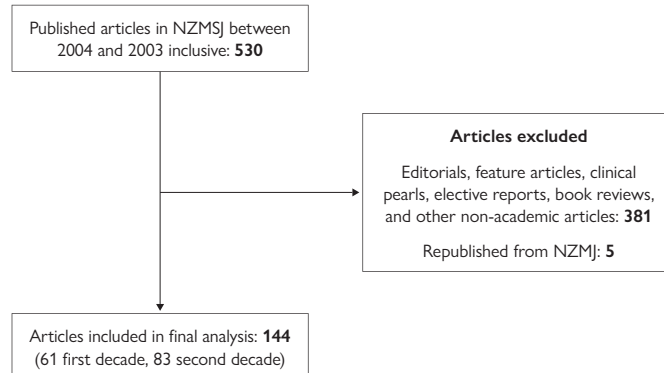
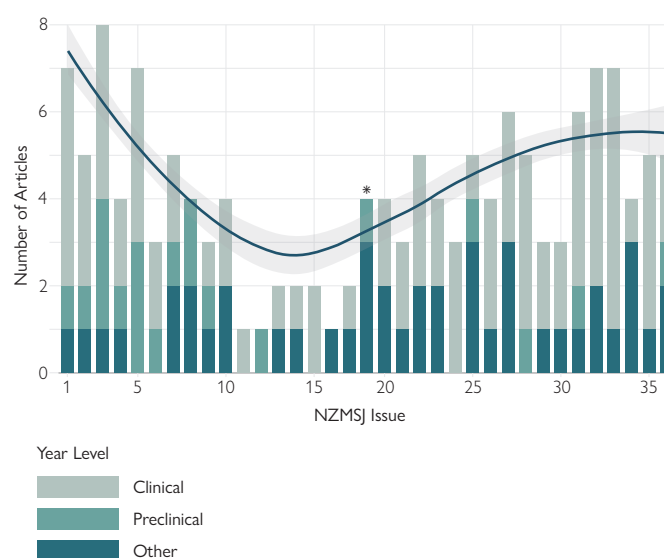


Figure 1: Flowchart of academic articles published in the NZMSJ between 2004 and 2023 included in the study.

The count of all published articles includes the editors' welcome, creative arts submissions, book reviews, conference and elective reports, invited editorials, feature articles, clinical pearls, abstract-only publications, and letters to the editor (included in seven issues, therefore counted as seven letters to the editor) from 2004 to 2023 (Issue 1 to Issue 36 inclusive).



*Issues 18 and 19 were published together as a joint issue.

Figure 2: Number of academic articles published per issue of the NZMSJ by student year level with LOESS line.

First authors who publish in the NZMSJ tend to be medical students (74%) (Table 1). Most first authors (56%) were in clinical training, with preclinical students comprising 14% and research students 5%. There was a slight predominance of first authors affiliated with the University of Otago compared to those affiliated with the University of Auckland (41% and 31% respectively), as well as male compared with female first authors (57% and 43%, respectively). The proportion of first authors who were preclinical students decreased by 19%, and the proportion who were affiliated with the University of Otago decreased by 31% between the first and second decades of NZMSJ publication.

The majority of authors (63%) did not have any qualifications listed. An MBChB or MD was held by 18% of first authors. Most academic

Table 1: Characteristics of authors of academic articles published in the first and second decades of NZMSJ publication, compared using χ -squared tests.

Characteristic	All articles N=144 (%)	First decade N=61 (%)	Second decade N=83 (%)	χ^2 (degrees of freedom), p-value
Gender of the first author				χ^2 (1) = 2.11, p = 0.15
Female	62 (43.1%)	22 (36.1%)	40 (48.2%)	
Male	82 (56.9%)	39 (63.9%)	43 (51.8%)	
Medical student first author				χ^2 (1) = 3.25, p = 0.07
Yes	107 (74.3%)	50 (82.0%)	57 (68.7%)	
No	37 (25.7%)	11 (18.0%)	26 (31.3%)	
Year level of the first author				χ^2 (2) = 10.39, p < 0.01 ^a
Preclinical	20 (13.9%)	15 (24.6%)	5 (6.0%)	
Second year	3 (2.1%)	2 (3.3%)	1 (1.2%)	
Third year	17 (11.8%)	13 (21.3%)	4 (4.8%)	
Clinical	80 (55.6%)	31 (50.8%)	49 (59.0%)	
Fourth year	19 (13.2%)	8 (13.1%)	11 (13.3%)	
Fifth year	29 (20.1%)	9 (14.8%)	20 (24.1%)	
Sixth year	32 (22.2%)	14 (23%)	18 (21.7%)	
Other	44 (30.6%)	15 (24.6%)	29 (34.9%)	
BMedSc(Hon)/intercalated PhD	7 (4.9%)	4 (6.6%)	3 (3.6%)	
Doctor	26 (18.1%)	4 (6.6%)	22 (26.5%)	
Other	11 (7.7%)	7 (11.5%)	4 (4.8%)	
Affiliation of the first author				χ^2 (2) = 14.42, p < 0.01 ^a
University of Otago	59 (41.0%)	36 (59.0%)	23 (27.7%)	
University of Auckland	44 (30.6%)	12 (19.7%)	32 (38.6%)	
Other	41 (28.5%)	13 (21.3%)	28 (33.7%)	
Hospital affiliation	21 (14.6%)	0 (0.0%)	21 (25.3%)	
Other/unknown	20 (13.9%)	13 (21.3%)	7 (8.4%)	

^a p<0.05 using Holm-Bonferroni corrected p-value for n=9 testsTable 2: Characteristics of academic articles in the first and second decades of NZMSJ publication, compared using χ -squared tests.

Characteristic	All articles N=144 (%)	First decade N=61 (%)	Second decade N=83 (%)	χ^2 (degrees of freedom), p-value ^a
Number of authors				χ^2 (2) = 1.42, p = 0.49
One	97 (67.4%)	44 (72.1%)	53 (63.9%)	
Two	25 (17.4%)	10 (16.4%)	15 (18.1%)	
Three or more	22 (15.3%)	7 (11.5%)	15 (18.1%)	
Article type				χ^2 (3) = 5.82, p = 0.12
Academic essay	55 (38.2%)	24 (39.3%)	31 (37.3%)	
Original research	59 (41.0%)	24 (39.3%)	22 (26.5%)	
Cohort study	13 (9.0%)	7 (11.5%)	6 (7.2%)	
Prospective	5 (3.5%)	3 (4.9%)	2 (2.4%)	
Retrospective	8 (5.6%)	4 (6.6%)	4 (4.8%)	
Cross-sectional	13 (9.0%)	7 (11.5%)	6 (7.2%)	
Qualitative	6 (4.2%)	3 (4.9%)	3 (3.6%)	
Audit	5 (3.5%)	1 (1.6%)	4 (4.8%)	
Cell research	4 (2.8%)	4 (6.6%)	0 (0.0%)	
Other ^b	5 (3.5%)	2 (3.3%)	3 (3.6%)	
Case study	26 (18.1%)	6 (9.8%)	20 (24.1%)	
Literature review ^c	17 (11.8%)	7 (11.5%)	10 (12.0%)	
Article topic				χ^2 (2) = 2.46, p = 0.29
Medical	84 (58.3%)	31 (50.8%)	53 (63.9%)	
Public health	28 (19.4%)	14 (23.0%)	14 (16.9%)	
Other	32 (22.2%)	16 (26.2%)	16 (19.3%)	
Surgery	12 (8.3%)	5 (8.2%)	7 (8.4%)	
Medical education	6 (4.2%)	1 (1.6%)	5 (6.0%)	
Laboratory	7 (4.9%)	6 (9.8%)	1 (1.2%)	
Mental health	7 (4.9%)	4 (6.6%)	3 (3.6%)	
Funded research				χ^2 (1) = 3.25, p = 0.07
Yes	32 (22.2%)	18 (29.5%)	14 (16.9%)	
No	112 (77.8%)	43 (70.5%)	69 (83.1%)	
Citations				χ^2 (2) = 6.19, p = 0.05
0 citations	104 (72.2%)	50 (82.0%)	54 (65.1%)	
1 citation	23 (16.0%)	8 (13.1%)	15 (18.1%)	
2+ citations	17 (11.8%)	3 (4.9%)	14 (16.9%)	

^a No p-value was <0.05 following Holm-Bonferroni correction for n=9 tests^b Includes crossover RCT (1), animal research (1), feasibility study (1), and protocol (2)^c Includes narrative review (14), scoping review (2), and systematic review (1)

articles published had a single author (67%) (Table 2). Academic essays and case studies were the most common types of articles published (38% and 18% respectively). Articles were frequently published on medical or public health topics, accounting for 58% and 19%, respectively. Most research was unfunded (78%) and remains uncited (72%). However, three articles achieved notable impact, receiving seven, nine, and 12 citations each.

When comparing the first to the second decade of NZMSJ publication, the absolute proportion of articles that were case studies increased by 14%, although the association between article type and decade of publication was not statistically significant (Table 2). There was no statistically significant difference in the number of authors or article topics between the first and second decade of NZMSJ publication.

Submitting authors who had their articles subsequently accepted typically received a first response within 7 days (IQR 3-14 days) and their manuscript was accepted in 88 days (IQR 54-188 days) (Table 3). Following acceptance, articles were typically published one month later (IQR 1-3 months).

Table 3: The NZMSJ traditional journal quality assessment metrics.

	Median (IQR) n=144
Time from submission to first action	7 days (3-14 days)
Time from submission to acceptance	88 days (54-188 days)
Time from submission to publication	6 months (3-8 months)
Time from acceptance to publication	1 month (1-3 months)

Discussion

Between 2004 (Issue 1) and 2011 (Issue 14), there was a decline in the number of academic articles published per issue. Following initial enthusiasm and support for the journal, the journal editors may have struggled to attract submissions of academic articles. An increasing number of non-academic articles such as feature articles, elective reports, and book reviews were published between 2004 and 2011, which were not captured in this study. Since 2011, there has been an increase in the number of academic articles published per issue of NZMSJ. One contributing factor may have been the NZMSJ's ongoing aim to become indexed in PubMed (personal communication, Gabrielle Sebaratnam, NZMSJ Indexing Manager, 2024), increasing the focus on academic publications to help achieve this goal. Another contributing factor may have been the introduction of the NZMSJ Blog in 2020, which was created to publish non-academic articles in an online-only format, increasing the focus of published issues on academic articles.

In the first decade, there were only slightly more academic articles with a male first author (male 57%, female 43%) and this improved to almost a 50:50 ratio in the second decade of publication (male 52%, female 48%). An article by Wells et. al. also found an equal distribution of male and female authorship rates (male 52%, female 48%) in the first 14 years of the NZMSJ when including non-academic articles.¹

A greater proportion of authors were affiliated with the University of Otago (41%) compared to the University of Auckland (31%). NZMSJ was founded by Hon Dr Ayesha Verrall from the University of Otago,²¹ and therefore publication may have been initially promoted more strongly to University of Otago students. An effort has been made to promote equal University of Otago and University of Auckland student engagement, and this is reflected by the increase in the proportion of academic articles with authors affiliated with the University of Auckland from 20% to 39% between the first and second decades of NZMSJ publication. In the last decade, more authors were affiliated with the University of Auckland than the University of Otago (39% compared with 28%, respectively). This may be due to a greater proportion of students from the University of Auckland submitting university assignments for publication, although there is no evidence to support this claim.

A greater number of academic articles were authored by clinical (56%) as opposed to preclinical (14%) students. These results are sim-

ilar to that of Wells et. al. who found in the first 14 years of NZMSJ publication, clinical students made up 74% of student authorship, while preclinical students represented 20% of student authorship, when including both academic and non-academic articles.¹ Similarly, Al-Busaidi et. al. found clinical students contributed 40% of student-authored articles in the NZMJ, compared with 28% from preclinical students, and 32% from research or science students.¹⁷ The discrepancy between preclinical and clinical students was expected, as senior students have greater opportunity to engage with clinical research, have more experience, and are at a stage of their training where research experience influences their job prospects. Publication of a first-authored article enhances students' Advanced Choice of Employment (ACE) application, which is the application most students based in New Zealand use to obtain their first job as a junior doctor.²² As students near the end of medical school, this can act as an incentive to submit research to the NZMSJ.

Academic essays were the most common type of academic article published, followed by case studies and literature reviews. Wells et. al. also found 'academic reviews' to be the most common type of academic article in the NZMSJ during the first 14 years of publication.¹ In contrast, Al-Busaidi found 'original articles' to be the most common (68%), with reviews being relatively uncommon (2%) in the NZMJ.¹⁷ Students may be motivated to complete literature reviews and case studies as these research projects require less clinical supervision. Students can then ensure their manuscript is submitted and published before ACE applications close in early July.²³ This is possibly supported by the low proportion of academic articles that were funded (22%).

Projects published in the NZMSJ were most commonly medical and public health topics, accounting for 58% and 19% of academic articles respectively. Medicine and public health projects were also popular in a study of medical student projects in the Netherlands, whereby 66% of projects involved clinical research and 11% involved public health research.³ However, 18% of students conducted laboratory-based research, compared with only 5% in our study.³

Articles published in recent years are more likely to have been cited than when NZMSJ was first founded, with a decline in the proportion of articles with no citations from 82% to 65% when comparing the first to the second decade of NZMSJ publication. Two of the three articles receiving seven or more citations were authored by doctors,^{24,25} and two focused on Pacific youth.^{24,26}

The median time from article submission to acceptance of 88 days is typical for medical journals, suggesting the unconventional approach NZMSJ uses to peer review articles does not significantly increase the time from submission to acceptance.²⁷⁻²⁹ Articles published in NZMSJ are peer-reviewed by two student reviewers, as well as an expert reviewer who is a specialist in the field, and proofread. After each review, students are requested to make changes to their articles. This peer review process is supportive towards students who are unfamiliar with article publication and requires a high level of engagement from editors and reviewers.

STRENGTHS AND LIMITATIONS

A strength of this study was the inclusion of all academic articles in NZMSJ Issues 1 to 36. This allowed us to compare trends in author and article characteristics over two decades. Another strength was the description of time from submission to first action, acceptance, and publication, as well as the time from acceptance to publication for the median academic article. Unfortunately, these data were only available for a subset of articles published in the NZMSJ, as submissions before Issue 26 were not completed using Scholastica. This reflects the changes in practices during a journal start-up, where submissions were initially conducted by email and then later moved to a more formal platform. We also did not compare these metrics to the timeframes published in other MSJs.

A limitation of this study was the method of data collection. Changes in the layout of the journal during earlier years of publication resulted in some information, although collected from authors, was not

routinely published by NZMSJ. Similarly, some students may have not declared their qualifications when submitting to the NZMSJ, leading to an underestimation of the proportion of first authors with a degree. In addition, earlier issues of the journal were not indexed, limiting our ability to measure the number of citations each article received. However, the lack of accessibility suggests these articles were unlikely to have been cited. Finally, students who conduct research in their last year of medical school may not have published until after graduation and would therefore be categorised as a doctor, as opposed to a medical student in our study. Hence the proportion of articles that were authored by medical students may be underestimated.

We recommend qualitative studies are conducted focusing on students' confidence in navigating academic publication, and their perception of their research skills following successful publication in an MSJ. This may better reflect the benefits of publishing in an MSJ rather than using the number of subsequent publications or citations a student obtains. Current research is limited to quantitatively describing the impact of publication in a MSJ on students' future publication and post-graduate degree attainment.³⁰ Finally, we suggest descriptive studies of other MSJs are conducted to allow comparisons to be made between MSJs internationally.

Conclusion

Most academic articles published in the NZMSJ are first authored by clinically based medical students and are academic essays, case studies, or literature reviews discussing medical or public health topics. Historically, authors were more commonly affiliated with the University of Otago; however, since 2014, there has been an increase in articles with authors affiliated with the University of Auckland. Despite being a student-run journal, the median time from submission to acceptance in the NZMSJ is similar to other medical journals.

Abbreviations

ACE - Advanced Choice of Employment
 BMedSc(Hon) - Bachelor of Medical Science (Honours)
 DOAJ – Directory of Open Access Journals
 MBChB – Bachelor of Medicine and Bachelor of Surgery
 MD - Doctor of Medicine Degree
 MSJ – Medical Student Journal
 NZMJ – New Zealand Medical Journal
 NZMSJ – New Zealand Medical Student Journal

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About the authors

> Lorna is an intercalated MBChB/PhD student at the University of Otago, Christchurch and was between her fifth and sixth year of medical school at the time of submission. Her PhD is in the field of medical informatics and her research uses electronic prescribing data to measure appropriate medicines use. In 2024 she was the Deputy Editor of the NZMSJ and is the elected Editor-in-Chief for 2025. Outside of university, she enjoys running and classical music.

> Angad is a recent MBChB graduate and at the time of submission was a trainee intern at the University of Otago, Wellington and the Editor-in-Chief of the NZMSJ. In 2025 he will be working as a house officer at Health New Zealand Te Whatu Ora – Capital and Coast. He is interested in pursuing a clinical and academic career in neurosurgery. He likes to dedicate his spare time to sustainability and climate action initiatives. He also enjoys travelling

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Declarations/funding

LP was the Deputy Editor of the New Zealand Medical Student Journal and AC was the Editor-in-Chief of the New Zealand Medical Student Journal during 2024. Neither author was involved in the peer review process or decisions made regarding the article. The article was handled by an academic editor of the journal. The authors have no sources of funding to declare.

Ethical approval/patient consent

Ethical approval and patient consent were not required for this research.

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Statement on data availability

Data are available at https://github.com/Pailo441/20_years_nzmsj_data