Tertiary Education Commission
Te Amorangi Mātauranga Matua

Report of the Moderation and Peer-Review Panels

PBRF 2018 Quality Evaluation

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Comments from the Principal Moderator

The Performance-Based Research Fund (PBRF) Quality Evaluation culminates in the allocation of over $1 billion over the six-year funding period and is one of New Zealand's largest research assessment exercises. I have been involved with the Quality Evaluation process since 2003: twice as a panel member, then as Chair of the Biological Sciences Panel in 2012 and, in 2018, as Principal Moderator. Over this time, I have noticed significant improvements to the assessment process. These changes have been to the benefit of the Chairs and panel members, and ultimately to the tertiary education organisations (TEOs).

I highlight two specific areas of improvement: training for Chairs and panel members using online modules and peer-to-peer learning; and changes to the PBRF IT System, which made for easier access to the nominated research outputs (NROs). The latter resulted in 96% of NROs being examined by panel members. However, these comments do not negate the sheer volume of work Chairs and panellists committed to during the second half of 2018. Without their commitment, the process, as currently designed, could not have been undertaken.

The following reports are the culmination of four years' work that began in 2014 with the Sector Reference Group chaired by Dr Ian Town. This group was tasked with developing the detailed Guidelines designed to assist both TEOs in preparing and submitting Evidence Portfolios (EPs) and panellists in their assessment of individual EPs.

Three Moderators were appointed in early 2015: myself, as Principal Moderator, along with two Deputy Moderators, Distinguished Professor Marston Conder and Professor Emerita Helen May.

We assisted the TEC with panel Chair appointments in late 2015, followed by the appointment of initial groups of panel members tasked with developing the *Performance-Based Research Fund Panel-Specific Guidelines for the 2018 Quality Evaluation*. Additional members were subsequently appointed based on their specific expertise and knowledge. The TEC tried, where possible, to ensure panels had an appropriate balance of gender and ethnicity, international panellists, panellists from a range of TEO types and a mix of new and previous panel members. During 2018, it was the Moderators' role before and during the panel meetings to ensure all panels were adhering to the standards and processes described in the *Performance-Based Research Fund Guidelines for the 2018 Quality Evaluation assessment process*.

The 13 panels and 266 panellists met over three weeks in November and December 2018 and assigned funded Quality Categories to 7,408.40 EPs. Chairs and panellists were very conscious of the importance of the Quality Evaluation results, not only in terms of funding for TEOs, but also for the individual researcher. I acknowledge and thank both Chairs and panellists for diligently and conscientiously undertaking their assessments.

I would like to take this opportunity to also acknowledge the TEC's PBRF project team for their leadership and expert knowledge of the Quality Evaluation process. The high-calibre team enabled the smooth running of a robust assessment process from panel appointments to providing expert advice and support leading up to and during the panel meetings.

Paula E Jameson
Principal Moderator, PBRF 2018 Quality Evaluation

Introduction

High-quality research is fundamental to our social and economic wellbeing. The research described by the peer-review panels offers insights into what this looks like, including an overview of the ground-breaking work New Zealand researchers are leading or participating in.

The following pages are a combination of individual reports written by each of the 13 panel Chairs (in consultation with their panels) alongside the report of the Moderation Panel. The purpose of the report is to provide greater insight into:

- how each panel operated, providing transparency in the process
- observations on what the results mean.

Panels, Chairs and Moderators

Peer-review panels consist of members who jointly represent a comprehensive range of subjects and interests. Panellists are appointed for their specific expertise and knowledge, as well as their proficiency in assessing research. The number of EPs projected to be submitted to a panel was also considered in determining panel numbers.

In 2018, there were 13 peer-review panels, which ranged in size from nine to 32 members. Each had their own Chair. The responsibilities of panel Chairs were multiple, including to:

- ensure the panel operated within the policies, guidelines and procedures established by the TEC
- manage any conflicts of interest as they related to panellists
- assign each EP to two panellists and assess EPs assigned to them
- chair meetings of the panel to review and calibrate the scores and to award a Quality Category to each EP assigned to the panel
- report back to the TEC at the end of the Quality Evaluation.

Alongside the peer-review panels, the Quality Evaluation process included a moderation function, designed to ensure that standards were consistent across peer-review panels and that the *Performance-Based Research Fund Guidelines for the 2018 Quality Evaluation assessment process* (the Guidelines) were properly adhered to. The Moderation Panel consisted of the Principal Moderator (Chair of the panel), the two Deputy Moderators and the 13 peer-review panel Chairs. The Moderators played an integral role in providing advice to Chairs, panellists and the TEC, while monitoring the consistent application of the Guidelines across panels.

The TEC contracted a Special Advisor for extraordinary circumstances, Dr Ian Town. His role as Special Advisor was to monitor the effectiveness of the extraordinary circumstances provision through the moderation of the assessment process, and to support the Moderators and peer-review panels in the assessment of both general and Canterbury extraordinary circumstances.

Standardising of reports

As noted above, the following pages are a combination of 14 panel reports (13 peer-review panels and the Moderation Panel). The TEC has standardised some portions of the report to provide consistent detail on how the panel processes were conducted; however, we hope the distinctive features of each panel remain.

This report is one of several publications relating to the results of the 2018 Quality Evaluation (Table 1). It should be read alongside the *Improving Research Quality: The interim results of the PBRF 2018 Quality Evaluation* and the *Project Report: PBRF 2018 Quality Evaluation*.

Table 1: Reporting publications for the 2018 Quality Evaluation

OUTPUT	DESCRIPTION	TEOs ONLY	TEOs AND PUBLIC
Improving Research Quality: The interim results of the PBRF 2018 Quality Evaluation	Presents the interim results of the PBRF 2018 Quality Evaluation and provides analysis and background		√
Report of the Moderation Panel and the Peer-Review Panels	**Overview of the process each panel undertook, and some analysis of the results within a panel context**		**√**
Project Report: PBRF 2018 Quality Evaluation	Outlines the process the TEC undertook to implement the 2018 Quality Evaluation		√
KPMG Performance-Based Research Fund Audit Report	Independent assurance that the Guidelines have been consistently and correctly applied		√
Quality Evaluation results and demographics applications available via Ngā Kete	Allows TEOs to analyse their results through the TEC's Ngā Kete platform. There are two: 1.Quality Evaluation (PBRF) – Final Results 2. Quality Evaluation (PBRF) – Researcher Demographics	√	
Quality Evaluation results interactive charts	Allows the public to view high-level results of individual TEOs, subsectors and the whole sector		√
Infographics	Overview of the results by subsector and across the four Quality Evaluation rounds (2003, 2006, 2012 and 2018)		√
Data visualisations	Traces knowledge pathways by looking at researcher collaboration and the reach of research outputs		√

Reporting on the outcome of the Quality Evaluation is limited to EPs that were awarded a funded Quality Category (A, B, C and C(NE)) weighted by the full-time equivalent (FTE) of PBRF-eligible staff. These numbers are reported to two decimal places. Unless otherwise stated, all numbers provided in this report are FTE weighted.

Thank you

In administering the Quality Evaluation, the TEC gathers world-class researchers within New Zealand (and internationally) to assess their peers' work. Their commitment to ensuring the growth of quality research, particularly by giving their time to be panellists, made the 2018 round a success. The TEC is immensely grateful for the willingness of these researchers to undertake the role of panellist, Chair, Moderator or Special Advisor.

Acknowledgements

We would like to acknowledge the dedication and work of Professor Keith Hunter, Chair of the Physical Sciences Panel, who passed away in October 2018. Professor Hunter was an esteemed colleague and served as panel Chair in both 2012 and 2018. We are grateful for his contributions to the Quality Evaluation.

Moderation Panel Report

Purpose

The purpose of the Moderation Panel report is to:

- outline the moderation process
- describe the issues the Moderation Panel considered
- provide recommendations to the TEC's Board of Commissioners.

Executive summary

The Moderation Panel (The Panel) [see Appendix 1 for list of members] is satisfied that the results of the 2018 Quality Evaluation are credible, fair and justified. Specifically:

- the moderation processes outlined in the Guidelines have been followed throughout the 2018 Quality Evaluation
- consistency of standards has been achieved within the confines of the Guidelines and the nature of a peer-review assessment process.

The Panel, in discussion with the Special Advisor for extraordinary circumstances, considers that the process for assessing extraordinary circumstances has been applied in accordance with the Guidelines. The Panel suggests making improvements to the process so that the impact of these circumstances on a researcher's outputs are more clearly articulated.

The Panel commends the work of the TEC PBRF Quality Evaluation project team. The Panel recommends maintaining the same high quality of TEC staff and contractors as in 2018 for any subsequent rounds.

The Panel draws the attention of the TEC to areas where the process could be improved, including (but not limited to) the following possibilities:

- improving the process for considering part-time/parental leave
- revising the extraordinary circumstances process
- revising the cross-referral process
- instituting succession planning for Chairs/Deputies and Moderators
- appointing a Māori Moderator
- restricting results for staff to the Quality Category awarded, noting that this would require a change to the Privacy Act
- equity weighting for Māori and Pacific staff.

The moderation process

The purpose of the moderation process is to scrutinise the assessment and calibration processes undertaken by each of the 13 peer-review panels to provide assurances to the TEC and the public that:

- the Guidelines have been applied
- the results of the Quality Evaluation are fair and consistent.

Moderation is designed to promote systematic reflection on the issues of consistency, standards and cross-panel calibration by:

- creating an environment in which the judgements of the peer-review panels generate consistency on a cross-panel basis, while at the same time not reducing the panel judgements to a mechanistic application of the assessment criteria
- providing an opportunity for independent review of the standards and processes being applied by panels
- ensuring the consistent application of the extraordinary circumstance provisions and the consistent assessment of new and emerging researchers
- establishing mechanisms and processes by which material differences or apparent inconsistencies in standards and processes can be addressed by panels
- advising the TEC Board on any issues regarding consistency of standards across panels.

The Moderation Panel was created for the 2006 Quality Evaluation to add a level of oversight and peer validation to the process. With each subsequent round, improvements have been made to enhance the Moderators' ability to deliberate on intra- and inter-panel consistency.

In 2018, this included the addition of helpful new PBRF IT System reports that enabled the TEC and Moderators to monitor scoring during the individual assessment period and panel meetings. In previous rounds, this was done after preliminary scoring and panel meetings were completed.

The ability to monitor and moderate scoring in real time meant that issues could be dealt with when they occurred. As such, the two Moderation Panel meetings (described in more detail below) allowed the Panel to focus its deliberation on the consistency of the results within and across panels.

Panel considerations

Assessment process

No substantive issues were identified as part of the TEC's monitoring of the individual assessment process. Where certain anomalies were found, such as similar scoring patterns among panellists, action was taken by the TEC to ensure that individual Chairs dealt with these prior to their panel meeting.

Because of the TEC's analysis of the individual assessment phase, the Moderation Panel was asked to focus on:

- subject areas with high/low average preliminary weighted scores:
  - High: Philosophy; English Language and Literature; and Pure and Applied Mathematics
  - Low: Nursing; Education; and Other Health Studies (including Rehabilitation Therapies)

- subject areas with increase/decrease in EPs awarded A or B Quality Categories:
  - Increase: Music, Literary Arts and Other Arts; and Religious Studies and Theology
  - Decrease: Chemistry; Biomedical; and Human Geography

- new and emerging researchers awarded A or B Quality Categories.

Changes to the 2018 Quality Evaluation

The Ministry of Education led a policy review of the PBRF following the 2012 Quality Evaluation. Cabinet[1] accepted the recommendations of this review, which included reducing TEO transaction costs and simplifying the process.

[1] Cabinet paper, Improving the Efficiency and Effectiveness of the PBRF: http://www.education.govt.nz/assets/Documents/Further-education/Policies-and-strategies/Performance-based-research-fund/PBRFCabinetPaper.pdf.

These changes fell under two broad headings. One, to reduce the size of the EP, including:

- combining the Contribution to the Research Environment and Peer Esteem components into a single Research Contribution component
- reducing the maximum number of other research outputs (OROs) from 30 to 12
- reducing the maximum number or research contributions from 60 to 15.

The second was to simplify the assessment of EPs, including:

- TEOs could not request a cross-referral assessment except to the Māori Knowledge and Development Panel and the Pacific Research Panel (through completing the Māori and/or Pacific Research elements of an EP).

The changes to the cross-referral process in the 2018 Quality Evaluation led to a significant decrease in the number of cross-referred EPs assessed. This is evident in the individual panel reports, which describe the effect of this policy shift on their panel. (See Table 3 for the Moderation Panel's recommendation on making further improvements to this change.)

For more information about changes made to the PBRF 2018 Quality Evaluation see the *Project Report: PBRF 2018 Quality Evaluation*.

First Moderation Panel Meeting – 15 November 2018

The initial Moderation Panel meeting was held in Wellington on 15 November 2018. The Panel reviewed the indicative weighted scores and Quality Categories and considered these in relation to previous rounds to assess shifts at the panel and subject-area level.

As part of this review, Chairs were asked to draw their panel's attention to any anomalies in the scoring distribution that might be apparent in the data provided. The Moderation Panel then discussed the recommendations made by the TEC, as outlined above, and agreed to address these as part of the panel meetings. The Moderation Panel also noted that attention would be paid to tie-points 2 and 6 for the component scores (or those with a weighted score that was on the C/R and A/B Quality Category boundaries) during panel calibration.

The Moderation Panel went through a similar calibration exercise to the one undertaken as part of panel training. Three EPs were selected across a range of Quality Categories, and panellists were asked to score these prior to the meeting and come prepared to discuss their assessment. The purpose of this was to refresh Chairs' memories on the importance of calibration, and to interrogate the tie-point descriptors to ensure a relatively consistent understanding and application of these.

During the meeting, the Moderation Panel also discussed:

- adopting a consistent approach to managing conflicts of interest
- the appropriate quorum needed for assessing panellists' EPs
- preparing the Chairs for the panel meetings by reviewing the guiding principles agreed at Chair training and the agreed framework for running each panel meeting.

Panel meetings – 19 November to 7 December 2018

Panel meetings were held in Wellington from 19 November to 7 December 2018. Table 2 outlines the dates when each of the 13 panels met.

Table 2: Panel meeting dates

MEETING DATES	NAME OF PANEL
19 – 22 November 2018	Mathematical and Information Sciences and Technology
19 – 23 November 2018	Education
19 – 23 November 2018	Business and Economics
20 – 22 November 2018	Pacific Research
26 – 28 November 2018	Māori Knowledge and Development
26 – 28 November 2018	Physical Sciences
26 – 29 November 2018	Creative and Performing Arts
26 – 30 November 2018	Biological Sciences
26 – 30 November 2018	Humanities and Law
3 – 6 December 2018	Health
3 – 7 December 2018	Medicine and Public Health
3 – 7 December 2018	Engineering, Technology and Architecture
3 – 7 December 2018	Social Sciences and Other Cultural/Social Studies

Moderators were present during all days of the panel meetings, and each of them attended parts of each panel meeting. As part of this process, Moderators observed how panels managed conflicts of interest, and were confident these were handled consistently and appropriately. A Moderator was also in attendance when the EPs of members of the panel were considered and felt that these were dealt with in a fair and consistent manner.

The Moderators took a more proactive approach to moderation in 2018 than in 2012. Along with the TEC's internal process auditor, the Moderators maintained a daily schedule that allowed them to have almost continuous attendance in meetings over the three weeks. This meant that they were on hand to answer questions, provide advice, or correct inconsistencies when they considered that statements being made by panellists did not align closely enough with the Guidelines. This level of oversight provided the Moderators with a level of certainty in the process and the achievement of intra- and inter-panel calibration.

The Moderators concluded that the assessment criteria in the Guidelines were applied in a broadly consistent manner. Further, it was apparent that matters raised at the November Moderation Panel meeting were being correctly addressed by the peer-review panels.

Second Moderation Panel Meeting – 11 December 2018

The second Moderation Panel meeting was held in Wellington on 11 December 2018. Two Panel Chairs joined virtually, and the Chair or Deputy were in attendance for every panel.

At this meeting, members of the Moderation Panel undertook the following tasks:

- reviewed the final Quality Categories awarded to ensure consistency across panels
- confirmed that there had been consistent application of the holistic assessment process, including the extraordinary circumstances provisions
- provided an opportunity for Chair and Moderator feedback on the Quality Evaluation
- reviewed recommendations for the Moderation Panel report, and reviewed reporting of the results.

At the meeting, the Panel reviewed a detailed panel-by-panel analysis of results. The Panel closely examined shifts in assessment between the preliminary and calibrated panel Quality Categories, and between the holistic and final Quality Categories. Because there were shifts in both directions, the

Panel gained assurance that the peer-review panels applied the standards in a relatively consistent manner.

The analysis required the Panel to consider information on the application of the assessment standards between Quality Evaluation rounds, particularly variances in scoring between the 2012 and 2018 rounds. Panel members were asked to reflect on how the standards were applied to EPs with extraordinary circumstances (more detail is provided below) and new and emerging researchers, particularly those who met the criteria for A or B Quality Categories.

The meeting also provided an opportunity for reflection on how the panel meetings went, including recommendations for improvements for any subsequent rounds. The Panel spent time outlining what might need to change.

Table 3 provides context and guidance on recommendations from the Panel.

Table 3: Moderation Panel recommendations with context and guidance

ITEM	CONTEXT	RECOMMENDATION
Assessment of researchers who are part-time or have taken parental leave	While the Guidelines consider extended personal leave, including parental leave, as a general extraordinary circumstance, this needed to be over a three-year period. Part-time was not considered an extraordinary circumstance in 2018 but could have been considered at the holistic stage. The consensus by panellists was that neither of these was sufficient, and that further consideration was needed to ensure researchers were not unduly disadvantaged, particularly women.	Improve the process for considering part-time/parental leave. Some panels suggested using a system similar to that applied in Australia, referred to as "achievement relative to opportunity".
Impact of extraordinary circumstances	Extraordinary circumstances detailed both the nature and impact of the circumstance(s) on the quantity of good quality outputs that researchers were able to produce. Frequently, the detail provided described the harrowing circumstances researchers faced. Panellists felt this re-traumatised the individual researchers, forcing them to articulate their stories to TEOs and then sharing these with a panel of their peers. Panellists also felt unable to gauge how to appropriately take these into account when the actual impact was not always well outlined.	Revise the process for considering extraordinary circumstances. This could include only showing the impact of the circumstance to panellists for their assessment and having an independent audit of the details as part of submission.
Cross-referrals	In 2018, the process for cross-referring EPs to other panels was greatly limited; TEOs could only seek a cross-referral to the Māori Knowledge and Development or Pacific Research panels. Unfortunately, it was not clear until assignment that the advice in the *Māori Knowledge and Development Panel-Specific Guidelines* was not entirely aligned with the TEO Guidelines as to when a referral to the Panel would be appropriate. This led to the Māori Knowledge and Development Panel Chair declining several EPs.	Revise the cross-referral process to ensure closer alignment between the Guidelines and the panel-specific guidelines.
Succession planning	The importance of identifying potential candidates for Moderators and Chairs was noted. Several	Implement succession planning for Chairs/Deputies and Moderators.

	members of the Moderation Panel have been involved across multiple rounds and will likely not wish to participate in the future. This should include consideration of the importance of the diversity of the Moderators.	Also consider the appointment of a Māori Moderator.
Reporting individual results	In general, panellists indicated that the release of individual scores to researchers places additional stress and pressure on them, as they worry about how the outcome will affect their peers. A few Chairs suggested not providing scores to researchers at all, as in the Hong Kong model, while others on the Panel suggested that a researcher's overall Quality Category acts as an incentive for researchers and drives performance.	Restrict results for staff to the Quality Category awarded, noting that this may require a change to (or an exemption from) the Privacy Act.
Increasing Māori and Pacific researcher participation	There has been very little growth in the number of EPs submitted by Pacific and Māori researchers across rounds. It was noted by some panels that the lack of explicit funding for equity (like the weightings applied in the Research Degree Completion component of the PBRF) means TEOs are not incentivised toward parity.	Implement an equity weighting for Māori and Pacific staff.

Holistic assessment

For the 2018 Quality Evaluation, changes were made to the categorisation and assessment of extraordinary circumstances (formerly special circumstances). These were considered at the holistic assessment stage, along with any other EPs flagged for a detailed holistic assessment.

In total, 137 EPs had their Quality Category increased as the result of a detailed holistic assessment. No EP was moved to a lower Quality Category in the holistic assessment phase.

Proportionally, of the 376 EPs that claimed extraordinary circumstances, 21.0% had their Quality Category increased at the holistic assessment stage. Quality Categories increased for 17.2% of EPs at this stage where there were no extraordinary circumstances claimed.

The Panel, in consultation with the TEC's Special Advisor, believe that panels gave due consideration to extraordinary circumstances as part of their assessment.

Recommendations to the TEC Board

Recommendation 1

That the TEC accepts the final Quality Categories confirmed by the 13 peer-review panels for the 2018 Quality Evaluation. It is the feeling of the Panel that these have been awarded in accordance with the Guidelines and that reasonable intra-panel consistency has been achieved.

Table 4 shows the results for all four Quality Evaluations and the shifts in funded Quality Categories over time.

Table 4: Distribution of funded Quality Categories over time

Quality Category	2003		2006		2012		2018	
	% (FTE weighted)	# (FTE weighted)	% (FTE weighted)	# (FTE weighted)	% (FTE weighted)	# (FTE weighted)	% (FTE weighted)	# (FTE weighted)

A	9.5%	424.55	11.0%	599.75	13.2%	835.83	15.8%	1,168.52
B	38.5%	1,716.06	37.9%	2,063.55	40.1%	2,531.92	40.2%	2,974.66
C	52.0%	2,320.90	36.8%	2,003.08	32.0%	2,020.24	29.1%	2,155.52
C(NE)	-	-	14.4%	782.99	14.7%	925.19	15.0%	1,109.70
TOTAL		4,461.51		5,449.37		6,313.18		7,408.40
A + B	48.0%	2,140.61	48.9%	2,663.30	53.3%	3,367.75	55.9%	4,143.18
A (universities only)	9.5%	423.55	11.0%	597.15	13.2%	832.33	15.6%	1,158.62

Recommendation 2

That the TEC consider the following operational changes for any subsequent Quality Evaluation:

- improve the process for considering part-time/parental leave
- revise the process for considering extraordinary circumstances
- revise the cross-referral process to ensure closer alignment between the Guidelines and panel-specific guidelines
- implement succession planning for Chairs/Deputies and Moderators
- appoint a Māori Moderator
- restrict results for staff to the Quality Category awarded, noting that this may require a change to (or exemption from) the Privacy Act
- introduce an equity weighting for Māori and Pacific staff.

Recommendation 3

That the TEC ensures a high-quality project team is assembled for any future Quality Evaluation rounds.

Biological Sciences Panel Report

Purpose of the report

The purpose of this report is to describe and contextualise the outcomes of the Biological Sciences Peer-Review Panel's (BIOS Panel's) results, including an overview of the assessment process. It is in two parts:

- summary of the assessment process
- commentary on the results.

BIOS Panel members are listed in Appendix 1. BIOS Panel recommendations are included in Appendix 2.

Executive summary

This report summarises the results of the assessment undertaken by the BIOS Panel during the PBRF 2018 Quality Evaluation and confirmed during the panel meeting. The BIOS Panel was made up of 24 experts across the three subject areas considered by the panel, including six panellists from outside New Zealand.

In accordance with the processes set out in the Guidelines, the BIOS Panel:

- managed conflicts of interest
- calibrated preliminary scores
- where appropriate or required by the Guidelines, incorporated holistic judgements in awarding final Quality Categories.

Key information

The BIOS Panel awarded funded Quality Categories to 704.82 EPs as part of the assessment process. Table 1 shows EPs awarded funded Quality Categories for the whole panel. Table 2 shows EPs awarded funded Quality Categories by subject area.

Table 1: EPs awarded funded Quality Categories by the BIOS Panel

QUALITY CATEGORY	EPs (FTE WEIGHTED)	PERCENTAGE PER QUALITY CATEGORY
A	141.09	20.0%
B	274.79	39.0%
C	158.61	22.5%
C(NE)	130.33	18.5%
TOTAL	**704.82**	

Table 2: EPs awarded funded Quality Categories by subject area

SUBJECT AREA	A	B	C	C(NE)	TOTAL
Agriculture and Other Applied Biological Sciences	38.96 (19.8%)	78.44 (39.9%)	55.96 (28.4%)	23.46 (11.9%)	**196.82**
Ecology, Evolution and Behaviour	63.57 (24.7%)	110.92 (43.1%)	41.64 (16.2%)	41.42 (16.1%)	**257.55**
Molecular, Cellular and Whole Organism Biology	38.56 (15.4%)	85.43 (34.1%)	61.01 (24.4%)	65.45 (26.1%)	**250.45**

There was an overall increase of 3.6% in the number of EPs awarded a funded Quality Category between 2012 (680.07 EPs) and 2018 (704.82 EPs). By subject area, the shift in the number of EPs awarded funded Quality Categories in 2012 and 2018 is more pronounced. These include:

- all subject areas recorded an increase in EPs awarded an A Quality Category between 2012 and 2018: Agriculture and Other Applied Biological Sciences increased from 21.20 to 38.96 (83.8%); Ecology, Evolution and Behaviour increased from 52.30 to 63.57 (21.5%); and Molecular, Cellular and Whole Organism Biology increased from 28.54 to 38.56 (35.1%).
- a 16.6% decrease in EPs awarded a funded Quality Category in Molecular, Cellular and Whole Organism Biology from 300.16 in 2012 to 250.45 in 2018
- a 36.1% increase in EPs awarded a funded Quality Category in Agriculture and Other Applied Biological Sciences
- a 7.6% increase in EPs awarded a funded Quality Category in Ecology, Evolution and Behaviour.

Researcher participation

Of the researchers submitting to the BIOS Panel in 2018, 37.3% were women, 62.0% were men and 0.7% were other. Between 2012 and 2018, the number of women researchers increased from 32.1% and the number of men researchers decreased from 67.9%.

A little under one-third (31.9%) of researchers were aged under 40, with 68.1% aged over 40 or unstated.

Most researchers (66.5%) identified as European and 88.4% of researchers were employed full-time.

Summary of the assessment process

Assignment

The Chair of the BIOS Panel assigned each EP to two panellists, ensuring that panellists did not assess EPs from their own departments and/or TEOs, or where conflicts of interest had been recognised. No EP was assessed by two panellists from the same TEO. EPs for which the Chair was conflicted were assigned by the Deputy Chair.

Individual assessment

On average, each panellist was involved in the preliminary assessment of approximately 66 EPs (not FTE weighted).

The BIOS Panel set a target of 100.0% of nominated research outputs (NROs) to be examined. The BIOS Panel nearly met this target by examining 99.8% of submitted NROs.

Cross-referrals

The following tables show the number of cross-referrals in and out of the BIOS Panel. Compared with the 2012 Quality Evaluation round, there was a 95.9% decrease in the number of EPs cross-referred to the BIOS Panel. There was a 76.3% decrease in the number of EPs cross-referred from the BIOS Panel to another panel.

Table 3: Number of cross-referred EPs assessed by the BIOS Panel

PRIMARY PANEL	SUBJECT AREA	# OF EPs
Education	Education	1
Business and Economics	Management, Human Resources, Industrial Relations, International Business and Other Business	1
Total		**2**

Note: not FTE weighted.

Table 4: Number of EPs cross-referred from the BIOS Panel to another panel

CROSS-REFERRAL PANEL	# OF EPs
Business and Economics	1
Education	1
Māori Knowledge and Development	6
Mathematical and Information Sciences and Technology	1
Pacific Research	4
Physical Sciences	1
TOTAL	**14**

Note: not FTE weighted.

Most EPs cross-referred to other panels went to the Māori Knowledge and Development and the Pacific Research panels. The assessment comments submitted by cross-referral panellists were considered when assigning preliminary and calibrated panel scores.

Panel assessment

The BIOS Panel met from 26 to 30 November 2018 in Wellington.

The BIOS Panel managed actual and perceived conflicts of interest during the meeting in accordance with the Guidelines and panel processes. The conflicts of interest the panellists identified in the PBRF IT System before the panel meeting were included in the assessment run sheets, along with the appropriate action. The BIOS Panel managed conflicts of interest during the meeting in the following ways:

- panellists absented themselves from discussing EPs originating from their department and/or institutions
- panellists left the room for the discussions of EPs presented by researchers with whom they had or were perceived to have a personal conflict, including their own EPs
- panellists left the room for conflicts that had been raised against them by TEOs
- the Deputy Chair facilitated the panel discussions where the Chair was conflicted.

At no stage did any panellist who had a declared conflict of interest participate in the assessment of the EP for which they were conflicted.

Calibration

Panel calibration was initially achieved through assessment of example EPs as part of panellist training. Each EP was separately assessed by two panellists against the tie-point descriptors.

Panellists then discussed their respective scores to reach an agreed preliminary score. In addition, most assessors were paired with the Chair and/or the Deputy Chair for preliminary scoring of at least one EP. Where applicable, panel-pairs took the comments of the cross-referral panellist into account in their scoring decisions.

At the panel meeting, several EPs that clearly represented each Quality Category were selected for in-depth discussion to ensure accurate calibration across the panel. High-scoring EPs were discussed first to enable the standards of quality research to be preeminent throughout the process. During the panel meeting, reference was made to tie-point descriptors on numerous occasions, for instance, when there were different views about the quality of elements of an EP.

To ensure consistent assessment of the EPs received, the BIOS Panel considered calibration as an ongoing exercise through preliminary assessment discussions and during the panel meeting.

Holistic assessment and extraordinary circumstances

All EPs that included extraordinary circumstances (general and/or Canterbury) were included in the holistic assessment stage. Additionally, the BIOS Panel undertook a detailed holistic assessment of EPs that had uncommon issues (as defined in the Guidelines) and those on, or close to, the boundaries between Quality Categories.

Following the holistic assessment, 18 EPs (not FTE weighted) moved up a Quality Category (no EPs moved down a Quality Category at the holistic assessment stage). This included:

- nine EPs identified by the panel for *detailed* holistic assessment
- nine EPs claiming extraordinary circumstances.

For each Quality Category change, the BIOS Panel referenced the Quality Category descriptors.

Awarding final Quality Categories

The BIOS Panel considered all EPs assigned to it and reached agreement on the final Quality Category for each.

The BIOS Panel assessed and awarded a funded Quality Category to 704.82 EPs.

Commentary on the results

Overall, panellists were impressed by the quality and range of biological research being carried out in New Zealand. The information provided in most EPs provided enough detail for a fair and rigorous awarding of a Quality Category. The changes in format of EPs between 2012 and 2018, notably the reduction in the number of other research outputs (OROs) and research contribution items, still allowed enough information for assessing EPs.

Overall, the percentage of EPs awarded an A Quality Category between 2012 and 2018 increased in all three subject areas. These variances are shown in Table 5.

Table 5: Percentage of EPs awarded funded Quality Categories by subject area, 2018 and 2012

SUBJECT AREA	YEAR	A	B	C	C(NE)
Agriculture and Other Applied Biological Sciences	2018	19.8%	39.9%	28.4%	11.9%
	2012	14.7%	39.0%	35.7%	10.6%
	Variance	+5.1	+0.9	-7.3	+1.3
Ecology, Evolution and Behaviour	2018	24.7%	43.1%	16.2%	16.1%
	2012	21.9%	43.9%	13.6%	20.6%
	Variance	+2.8	-0.8	+2.6	-4.5
Molecular, Cellular and Whole Organism Biology	2018	15.4%	34.1%	24.4%	26.1%
	2012	9.5%	35.9%	32.0%	22.6%
	Variance	+5.9	-1.8	-7.6	+3.5

Together, these figures imply that much of New Zealand's research across the range of biological sciences is world class. The subject area with the greatest proportional increase in EPs awarded the A Quality Category was Molecular, Cellular and Whole Organism Biology. In 2018, the high proportion of A Quality Category EPs in Ecology, Evolution and Behaviour (24.6%) suggests that these areas are particularly strong in New Zealand.

Reasons for the large increase (~52 FTE weighted) in the number of EPs in the Agriculture and Other Applied Biological Sciences subject area are not clear. Differential funding weightings attached to the BIOS subject areas may have been a factor in the increases or decreases across the three subjects assessed by the BIOS Panel.

New and emerging researchers

EPs from new and emerging researchers accounted for 22.1% (or 155.66) of awarded funded Quality Categories. Out of the 155.66 new and emerging researcher EPs, 83.7% were awarded a C(NE) Quality Category and 16.3% were awarded a B Quality Category.

The proportion of new and emerging researchers was lowest in Agriculture and Other Applied Biological Sciences (14.9%), higher for Ecology, Evolution and Behaviour (21.5%) and highest for Molecular, Cellular and Whole Organism Biology (28.3%). These figures suggest that fewer early-career researchers are working in Agriculture and Other Applied Biological Sciences. The relatively higher proportion of new and emerging researchers in Molecular, Cellular and Whole Organism Biology may also explain, in part, the lower proportion of researcher EPs awarded an A Quality Category in this subject area.

Māori research

The BIOS Panel cross-referred six EPs to the Māori Knowledge and Development Panel, requesting assessment comment as per that panel's specific guidelines. These EPs included a wide range of areas of research relevant to a Māori world view and/or Māori methodologies submitted to the BIOS Panel. The advice received was considered in determining the relevant EP's final Quality Category.

A significant number of EPs for which the TEO had requested a cross-referral to the Māori Knowledge and Development Panel were rejected (19 out of 24) by that panel as requiring such assessment. This pattern suggests that the criteria for cross-referral need to be clearer. Research that is relevant to Māori does not necessarily require cross-referral.

Pacific research

The BIOS Panel cross-referred four EPs to the Pacific Research Panel, noting both emerging and ground-breaking research by Pacific researchers, and requesting assessment comment as per the

Pacific Research Panel-Specific Guidelines. The BIOS Panel considered the advice received to determine the relevant EP's final Quality Category.

Researcher profile

This is the first time that the TEC has reported on demographic information for the Quality Evaluation, which allowed panels to consider trends following the assessment process. The researcher profile percentages in this section are derived from the FTE weighting of EPs that received funded Quality Categories.

The proportions of women researchers increased across all subject areas, although they remain well below 50.0%. Excluding those who did not state their gender, the 2018 proportions of women were: 32.9% for Agriculture and Other Applied Biological Sciences; 35.7% for Ecology, Evolution and Behaviour; and 42.5% for Molecular, Cellular and Whole Organism Biology. EPs of women researchers made up 16.0% of those that were awarded an A Quality Category relative to 84.0% of men, but for the C(NE) Quality Category, women made up 61.1% compared to 36.7% of men.

Of new and emerging researchers, 58.1% identified as women (39.5% as men, and 2.4% as other). Each of the subject areas had more than half new and emerging women researchers: Agriculture and Other Applied Biological Sciences with 63.5%; Ecology, Evolution and Behaviour with 54.9%; and Molecular, Cellular and Whole Organism Biology with 58.4%. Although these figures are no guarantee that in the near future equal numbers of men and women will be engaged in biological research in TEOs, they are trending in the right direction to achieve this goal.

The proportion of researchers in Agriculture and Other Applied Biological Sciences aged 50 or older was 54.8%; significantly greater than that in Ecology, Evolution and Behaviour at 36.7%; and Molecular, Cellular and Whole Organism Biology at 30.3%. These figures (as well as those for 60 or older, respectively, 26.0%, 9.8% and 11.6%) suggest that Agriculture and Other Applied Biological Sciences will see a significant change in personnel in the next 10 to 15 years. The low numbers (and proportion) of new and emerging researchers in this subject area (see above) means that there may need to be a greater effort to recruit researchers from overseas to replace those leaving the system.

The largest ethnicity identified was Europeans, 66.5%. The second largest proportion of researchers (15.3%) were those who did not identify an ethnicity. The BIOS Panel felt this limited their ability to draw any meaningful conclusions about ethnicity trends.

Most researchers (88.4%) were employed full-time. This trend was consistent across the subject areas.

Business and Economics Panel Report

Purpose of the report

The purpose of this report is to describe and contextualise the outcomes of the Business and Economics Peer-Review Panel's (BEC Panel's) results, including an overview of the assessment process. It is in two parts:

- a summary of the assessment process
- a commentary on the results.

BEC Panel members are listed in Appendix 1. BEC Panel recommendations are set out in Appendix 2.

Executive summary

This report summarises the results of the assessment undertaken by the BEC Panel during the PBRF 2018 Quality Evaluation and confirmed during the panel meeting. The BEC Panel was made up of 25 experts across the four subject areas considered by the panel, including 10 panellists from outside New Zealand.

In accordance with the processes set out in the Guidelines, the BEC Panel:

- managed conflicts of interest
- calibrated preliminary scores
- where appropriate or required by the Guidelines, incorporated holistic judgements in awarding final Quality Categories.

Key information

The BEC Panel awarded funded Quality Categories to 780.32 EPs as part of the assessment process. Table 1 shows EPs awarded funded Quality Categories for the whole panel. Table 2 shows EPs awarded funded Quality Categories by subject area.

Table 1: EPs awarded funded Quality Categories by the BEC Panel

QUALITY CATEGORY	EPs (FTE WEIGHTED)	PERCENTAGE PER QUALITY CATEGORY
A	62.90	8.1%
B	342.11	43.8%
C	251.71	32.3%
C(NE)	123.60	15.8%
TOTAL	**780.32**	

Table 2: EPs awarded funded Quality Categories by subject area

SUBJECT AREA	A	B	C	C(NE)	TOTAL
Accounting and Finance	14.00 (6.6%)	80.71 (38.1%)	73.29 (34.6%)	44.00 (20.8%)	**212.00**
Economics	11.57 (8.5%)	59.16 (43.3%)	50.91 (37.3%)	15.00 (11.0%)	**136.64**
Management, Human Resources, Industrial Relations, International Business and Other Business	23.01 (8.8%)	131.08 (50.4%)	78.13 (30.0%)	28.10 (10.8%)	**260.32**
Marketing and Tourism	14.32 (8.4%)	71.16 (41.5%)	49.38 (28.8%)	36.50 (21.3%)	**171.36**

There was an overall increase of 13.2% in the number of EPs awarded a funded Quality Category between 2012 (689.55 EPs) and 2018 (780.32 EPs). Broken down by subject area, the BEC Panel showed the following trends:

- Management, Human Resources, Industrial Relations, International Business and Other Business had the greatest number of EPs (260.32) that were awarded a funded Quality Category overall and the largest percentage of EPs that were awarded an A Quality Category (8.8%)
- Accounting and Finance and Marketing and Tourism had the largest percentages of EPs that were awarded a C(NE) Quality Category, 20.8% and 21.3%, suggesting more newer researchers than the other subject areas
- Economics had the smallest increase, 3.3% from 132.27 EPs in 2012 to 136.64 EPs in 2018
- Accounting and Finance had the greatest increase, 30.7% from 162.17 EPs in 2012 to 212.00 EPs in 2018.

Researcher participation

Of the researchers submitting to the BEC Panel in 2018, 39.3% were women, 60.5% were men and 0.1% were other.

A little over one-fifth (22.1%) of researchers were aged under 40, with 77.9% aged over 40 or unstated.

Most researchers (50.2%) identified as European and 95.3% of researchers were employed full-time.

Summary of the assessment process

Assignment

The Chair and Deputy Chair undertook the assignment process with consideration given to institutional conflicts of interest, subject-area expertise, and maintaining an equal workload among its 25 panellists. The BEC Panel's 10 international panel members greatly assisted in the management of conflicts of interest as they typically did not have conflicts arising from membership of the same academic unit.

In general, the Chair and Deputy Chair managed conflicts of interest when allocating EPs, which were assigned according to panellist expertise (ensuring that each EP was assessed by a panellist with topic expertise, methods expertise, or both). The Chair worked jointly with each panellist to assist in cross-panel calibration.

Individual assessment

On average, each panellist was involved in the preliminary assessment of approximately 65 EPs. Because of the need to ensure expert peers were assigned relevant EPs, some panellists assessed up to 80 EPs. Some panellists also assessed EPs cross-referred to the BEC Panel.

Each EP was assessed by two panellists, the lead and the second. Each panellist provided an independent preparatory score; EP assessors then agreed on a preliminary score to present at the panel meeting in November.

The BEC Panel aimed to examine all nominated research outputs (NROs). Final analysis shows 95.2% of NROs were examined.

Cross-referrals

The following tables show the number of cross-referrals in and out of the BEC Panel. Compared with the 2012 Quality Evaluation round, there was a 90.4% decrease in the number of EPs cross-referred to the BEC Panel. There was a 62.1% decrease in the number of EPs cross-referred from the BEC Panel to another panel.

Table 3: Number of cross-referred EPs assessed by the BEC Panel

PRIMARY PANEL	SUBJECT AREA	# OF EPs
Biological Sciences	Agriculture and Other Applied Biological Sciences	1
Humanities and Law	Philosophy	1
Social Sciences and Other Cultural/Social Studies	Sociology, Social Policy, Social Work, Criminology and Gender Studies; and Communications, Journalism and Media Studies	3
TOTAL		**5**

Note: not FTE weighted.

Table 4: Number of EPs cross-referred from the BEC Panel to another panel

CROSS-REFERRAL PANEL	# OF EPs
Biological Sciences	1
Creative and Performing Arts	1
Māori Knowledge and Development	11
Pacific Research	9
TOTAL	**22**

Note: not FTE weighted.

Panel assessment

The BEC Panel met from 19 to 23 November 2018 in Wellington.

The BEC Panel managed actual and perceived conflicts of interest during the meeting in accordance with the Guidelines and panel processes. The conflicts of interest the panellists identified in the PBRF IT System before the panel meeting were included in the assessment run sheets, along with the appropriate action. The BEC Panel managed conflicts of interest during the meeting in the following ways:

- panellists absented themselves from discussing EPs originating from their department and/or institutions
- panellists left the room for the discussions of EPs presented by researchers with whom they had or were perceived to have a personal conflict, including their own EPs
- panellists left the room for conflicts that had been raised against them by TEOs
- the Deputy Chair facilitated the panel discussions where the Chair was conflicted.

At no stage did any panellist who had a declared conflict of interest participate in the assessment of the EP for which they were conflicted.

Calibration

Panel calibration was initially achieved through assessment of example EPs as part of panellist training. The Chair and Deputy Chair ensured panellists were paired on EPs with several other panellists to ensure calibration continued throughout the assessment process. The Chair assessed at least one EP jointly with each panel member.

The panel meeting began with further calibration exercises; these required panellists to review EPs where the weighted preliminary scores were clear representatives of all Quality Categories in each sub-discipline area. High-scoring EPs were discussed first to enable the standards of quality research to be preeminent throughout the process. This session ensured panellists had applied the component tie-point descriptors consistently and in accordance with the Quality Category descriptions. Following this round of calibration, all other EPs were presented to the BEC Panel in the same Quality Category order as the calibration process, A to R.

To ensure consistent assessment of the EPs received, the BEC Panel considered calibration as an ongoing exercise through preliminary assessment discussions and during the panel meeting.

Holistic assessment and extraordinary circumstances

All EPs that included extraordinary circumstances (general and/or Canterbury) were included in the holistic assessment stage. Additionally, the BEC Panel undertook a detailed holistic assessment of EPs that had uncommon issues (as defined in the Guidelines) and those on, or close to, the boundaries between Quality Categories.

Following the holistic assessment, 13 EPs (not FTE weighted) moved up a Quality Category (no EPs moved down a Quality Category at the holistic assessment stage). This included:

- five EPs identified by the panel for *detailed* holistic assessment
- eight EPs claiming extraordinary circumstances.

For each Quality Category change, the BEC Panel referenced the Quality Category descriptors.

Awarding final Quality Categories

The BEC Panel considered all EPs assigned to it and agreed on the final Quality Category for each of these.

The BEC Panel assessed and awarded a funded Quality Category to 780.32 EPs.

Commentary on the results

Much of the work submitted to the BEC Panel related to applied research. For the Economics and Accounting and Finance subject areas, research outputs were predominantly quantitative in nature, whereas the other subject areas had a higher proportion of qualitatively based research. In terms of the geography of the applications, much of the work was, predictably, Australasian focused. This fact did not mean the research presented could not be considered world class, and much of it clearly was. The BEC Panel noted the relatively large number of outputs that focused on sustainability, the environment and energy. Such work indicates that the business and economics community is concerned with, and actively addressing, some of the most pressing issues of our time.

The BEC Panel assessed EPs in four subject areas (see Table 2). These subject areas varied in distribution of funded Quality Categories, although the differences between subject outcomes were less pronounced than in the 2012 round, see Table 5 below. In 2012, Economics had the highest ratio of EPs awarded an A Quality Category followed by Accounting and Finance. In 2018, Management, Human Resources, Industrial Relations, International Business and Other Business had the highest ratio of EPs awarded an A Quality Category, followed by Economics; Marketing and Tourism; and Accounting and Finance. It is worth noting that the distribution of EPs awarded an A Quality Category by subject area has narrowed considerably since the 2012 Quality Evaluation.

Table 5: Percentage of EPs awarded funded Quality Categories by subject area, 2018 and 2012

SUBJECT AREA	YEAR	A	B	C	C(NE)
Accounting and Finance	2018	6.6%	38.1%	34.6%	20.8%
	2012	10.5%	30.1%	42.2%	17.3%
	Variance	-3.9	+8.0	-7.6	+3.5
Economics	2018	8.5%	43.3%	37.3%	11.0%
	2012	12.6%	41.8%	33.6%	12.0%
	Variance	-4.1	+1.5	+3.7	-1.0
Management, Human Resources, Industrial Relations, International Business and Other Business	2018	8.8%	50.4%	30.0%	10.8%
	2012	5.3%	40.3%	42.8%	11.7%
	Variance	+3.5	+10.1	-12.8	-0.9
Marketing and Tourism	2018	8.4%	41.5%	28.9%	21.3%
	2012	8.9%	37.7%	37.1%	16.3%
	Variance	-0.5	+3.8	-8.2	+5.0

The reasons for such a narrowing of the differences between subject areas are likely to be complex. A concern of the 2012 round was that an emphasis on journal metrics could have potentially affected Management, Human Resources, Industrial Relations, International Business and Other Business subject area EPs, given the relatively small proportion of A-ranked journals in their field. The *Business and Economics Panel-Specific Guidelines* emphasised that while information, such as the relative ranking of a journal in its subfield might offer useful contextual details, it was the quality of the NRO that would be assessed. This could be one reason for the Management, Human Resources, Industrial Relations, International Business and Other Business subject area having such a strong performance in 2018. In Economics and Accounting and Finance, the global demand for high-quality scholars in these areas has likely led to some researchers whose EPs received an A Quality Category moving overseas, with high-quality replacements hard to attract to New Zealand, given their high cost.

The change in the average quality of research assessed in Management, Human Resources, Industrial Relations, International Business and Other Business also reflects an increase in the quality of work undertaken in this subject area. Overseas panellists with expertise in these disciplines were confident EPs in this subject area met the standards they would expect in their own respective countries. Overall, the number of EPs that were awarded A and B Quality Categories increased by 3.6 percentage points and 10.1 percentage points, respectively, between 2012 and 2018, while the number of EPs that were awarded C and C(NE) Quality Categories decreased 12.8 and 0.9 percentage points, respectively.

Accounting and Finance had fewer EPs that were awarded an A Quality Category, though more EPs that were awarded a B Quality Category. Alongside Marketing and Tourism, this subject area increased in the percentage of EPs awarded a C(NE), which may suggest recruitment in this discipline area has focused on more junior academics, potentially reflecting the cost of attracting and retaining top scholars.

Economics shifted from having the highest proportion of EPs awarded an A Quality Category in 2012 to the second highest in 2018, behind Management, Human Resources, Industrial Relations, International Business and Other Business and almost the same percentage as Marketing and Tourism. Within Economics, there was a growth in the percentage of EPs awarded B and C Quality Categories, and a very similar percentage of EPs awarded a C(NE). Collectively, the data suggests that it may be difficult to attract and retain top scholars in Economics.

Marketing and Tourism was consistent or grew in the overall distribution of funded Quality Categories, with the one exception being the 8.2 percentage point decrease in EPs awarded a C Quality Category. In general, EPs awarded the A and B Quality Categories accounted for almost half of the EPs funded. This shows two positive tendencies. Firstly, the number of EPs awarded an A or B Quality Category indicates a healthy and sustainable high-quality area. Secondly, Marketing and Tourism had the second largest growth in EPs that were awarded a C(NE) Quality Category; which suggests that new, younger researchers are being appointed to these fields.

New and emerging researchers

EPs from new and emerging researchers accounted for 18.3% (or 142.60) of awarded funded Quality Categories. Out of the 142.60 new and emerging researchers, 86.7% were awarded a C(NE) Quality Category and 13.3% were awarded a B Quality Category.

As suggested above, growth in Accounting and Finance appears to have been in the new and emerging group. By contrast, the subject areas Management, Human Resources, Industrial Relations, International Business and Other Business and Economics had the smallest percentages of new and emerging researchers, reflecting low growth in these areas. Like Accounting and Finance, Marketing and Tourism had a larger proportion of new and emerging researchers (24.1% and 23.6%, respectively).

Māori research

As noted in Table 4, the BEC Panel cross-referred 11 EPs (or parts thereof) to the Māori Knowledge and Development Panel because the research contained research representing a Māori world view and/or Māori methodologies. While the underlying subject areas pertained to BEC, the expertise to assess certain components did not exist on the BEC Panel and required a cross-referral. The input provided by Māori Knowledge and Development Panel was considered in the overall assessment process.

Pacific research

Similarly, the BEC Panel cross-referred nine EPs (or parts thereof) to the Pacific Research Panel. Like other EPs cross-referred this was done because, while the EPs were relevant to the BEC Panel, they also represented a Pacific world view and/or Pacific methodologies. Where expertise did not exist in the BEC Panel, EPs were cross-referred to the Pacific Research Panel and the input provided was considered in the overall assessment process.

Researcher profile

This is the first time that the TEC has reported on demographic information for the Quality Evaluation, which has allowed panels to consider trends following the assessment process. The researcher profile percentages in this section are derived from the FTE weighting of EPs that received funded Quality Categories.

Women researchers' EPs represented a larger portion of funded Quality Categories in Management, Human Resource, Industrial Relations, International Business and Other Business (45.4%) and Marketing and Tourism (45.2%) than Economics (24.8%) and Accounting and Finance (36.4%).

Of the researchers submitting to the BEC Panel in 2018, 39.3% were women; 60.5% were men; and 0.1% were other. Men researcher EPs were proportionally more likely to achieve all funded Quality Categories than women researcher EPs. The exception to this was women whose EPs were awarded a C(NE) Quality Category; they made up 52.9% of this Quality Category. Looking at the number of women researchers whose EPs were awarded funded Quality Categories, 5.4% were awarded an A Quality Category; 41.3% were awarded a B Quality Category; 32.0% were awarded a C Quality Category; and 21.3% were awarded a C(NE) Quality Category. Comparatively, looking at the number of men researchers whose EPs were awarded funded Quality Categories their profile was 9.8% were awarded an A Quality Category; 45.4% were awarded a B Quality Category; 32.5% were awarded a C Quality Category; and 12.3% were awarded a C(NE) Quality Category.

Nearly one-fifth (19.3%) of researchers were aged under 40, with 80.7% aged over 40 or unstated. Most researchers whose EPs were awarded an A Quality Category were 50 years and older, which mirrors the age profile of researchers whose EPs were awarded a C Quality Category at 55.9%. The age distribution evens out for researchers whose EPs were awarded a B Quality Category, with 47.4% aged 49 or younger and 52.0% aged 50 and over (0.6% are unknown). As expected, the youngest group of researchers were awarded a C(NE) Quality Category, 66.1% were 39 years and younger.

The researchers submitting to the BEC Panel identified as the following ethnicities: Asian 22.7%; European 50.2%; Māori 2.1%; Middle Eastern/Latin American/African 2.9%; Pacific 0.9%; and other ethnicities 2.6%. A further 18.5% did not state an ethnicity.

Overall, 95.3% of researchers who submitted an EP were employed full-time.

Creative and Performing Arts Panel Report

Purpose of the report

The purpose of this report is to describe and contextualise the outcomes of the Creative and Performing Arts Peer-Review Panel's (CPA Panel's) results, including an overview of the assessment process. It is in two parts:

- summary of the assessment process
- commentary on the results.

CPA Panel members are listed in Appendix 1. CPA Panel recommendations are set out in Appendix 2.

Executive summary

This report summarises the results of the assessment undertaken by the CPA Panel during the PBRF 2018 Quality Evaluation and confirmed during the panel meeting. The CPA Panel was made up of 19 panellists across the four subject areas submitted to the panel, including six panellists from outside New Zealand.

In accordance with the processes set out in the Guidelines, the CPA Panel:

- managed conflicts of interest
- calibrated preliminary scores
- where appropriate or required by the Guidelines, incorporated holistic judgements in awarding final Quality Categories.

Key information

The CPA Panel awarded funded Quality Categories to 462.26 EPs as part of the assessment process. Table 1 shows EPs awarded funded Quality Categories for the whole panel. Table 2 shows EPs awarded funded Quality Categories by subject area.

Table 1: EPs awarded funded Quality Categories by the CPA Panel

QUALITY CATEGORY	EPs (FTE WEIGHTED)	PERCENTAGE PER QUALITY CATEGORY
A	83.83	18.1%
B	204.55	44.2%
C	150.00	32.4%
C(NE)	23.88	5.2%
TOTAL	**462.26**	

Table 2: EPs awarded funded Quality Categories by subject area

SUBJECT AREA	A	B	C	C(NE)	TOTAL
Design	14.32 (14.0%)	38.11 (37.2%)	40.88 (40.0%)	9.00 (8.8%)	**102.31**
Music, Literary Arts and Other Arts	29.54 (21.6%)	69.05 (50.5%)	32.67 (23.9%)	5.60 (4.1%)	**136.86**
Theatre and Dance, Film and Television and Multimedia	12.64 (17.5%)	36.62 (50.7%)	20.44 (28.3%)	2.50 (3.5%)	**72.20**
Visual Arts and Crafts	27.33 (18.1%)	60.77 (40.3%)	56.01 (37.1%)	6.78 (4.5%)	**150.89**

There was an overall increase of 20.1% in the number of EPs awarded a funded Quality Category between 2012 (384.83 EPs) and 2018 (462.26 EPs). By subject area, the CPA Panel showed the following trends:

- all subject areas saw an increase in the number of EPs submitted between 2012 and 2018
- Visual Arts and Crafts was the largest subject area with 150.89 EPs awarded a funded Quality Category
- Music, Literary Arts and Other Arts showed the greatest increase from 108.54 EPs in 2012 to 136.86 EPs in 2018
- Music, Literary Arts and Other Arts had the highest proportion of EPs that were awarded an A Quality Category (21.6%) while Theatre and Dance, Film and Television and Multimedia had the largest proportion of EPs awarded a B Quality Category (50.7%)
- Design had the largest percentage of EPs that were awarded a C(NE) Quality Category (8.8%) suggesting more newer researchers than the other three subject areas.

Researcher participation

Of the researchers submitting to the CPA Panel in 2018, 45.2% were women and 54.8% were men.

Only 16.5% of researchers were aged under 40, with 82.9% aged over 40 and the remainder unstated. Overall, 81.8% of researchers who submitted were employed full-time.

Most researchers (67.8%) identified as European.

Summary of the assessment process

Assignment

The CPA Panel had 19 members, including six international panellists who brought breadth and insight from other international research assessment exercises, and ensured that conflicts of interest were managed in all cases.

EPs were assigned to panellists by the Chair, based on relevant skills and experience. Each EP was assigned to a lead and second assessor. No EP was assigned to a lead assessor based at the same institution. Where necessary, international panellists were paired with lead or secondary assessors whose experience within Māori, Pacific or New Zealand cultural contexts could assist in forming balanced evaluation of the research content.

Individual assessment

On average, each panellist was involved in the preliminary assessment of approximately 57 EPs.

The CPA Panel set a target of 75.0% of nominated research outputs (NROs) to be examined. The CPA Panel exceeded this target, with 98.7% of NROs examined.

Cross-referrals

The following tables show the number of cross-referrals in and out of the CPA Panel. Compared with the 2012 Quality Evaluation round, there was an 84.1% decrease in the number of cross-referred EPs submitted to the CPA Panel. There was a 44.4% decrease in the number of cross-referrals from the CPA Panel to another panel. Cross-referrals were requested when the EP contained research outputs published in other disciplinary contexts, or when input was required on interdisciplinary work outside the CPA Panel's core expertise.

Table 3: Number of cross-referred EPs assessed by the CPA Panel

PRIMARY PANEL	SUBJECT AREA	# OF EPs
Business and Economics	Marketing and Tourism	1
Education	Education	3
Engineering, Technology and Architecture	Architecture, Design, Planning, Surveying	1
Humanities and Law	Foreign Languages and Linguistics; English Language and Literature; and History, History of Arts, Classics and Curatorial Studies	4
Social Sciences and Other Cultural/Social Studies	Communications, Journalism and Media Studies	1
TOTAL		**10**

Note: not FTE weighted.

Table 4: Number of EPs cross-referred from the CPA Panel to another panel

CROSS-REFERRAL PANEL	# OF EPs
Education	8
Engineering, Technology and Architecture	1
Health	1
Humanities and Law	4
Māori Knowledge and Development	6
Mathematical and Information Sciences and Technology	1
Pacific Research	13
Social Sciences and Other Cultural/Social Studies	1
TOTAL	**35**

Note: not FTE weighted.

Panel assessment

The CPA Panel met from 26 to 29 November 2018 in Wellington.

The CPA Panel managed actual and perceived conflicts of interest during the meeting in accordance with the Guidelines and panel processes. The conflicts of interest the panellists identified in the PBRF IT System before the panel meeting were included in the assessment run sheets, along with the appropriate action. The CPA Panel managed conflicts of interest during the meeting in the following ways:

- panellists did not participate in the discussion of EPs with a declared conflict of interest
- panellists did not participate in the discussion of EPs from their own TEOs
- panellists left the room during discussion of a close family member's EP or the panellist's own EP

- the Deputy Chair led the meeting when EPs from the Chair's TEO were being reviewed, and the Chair did not participate in these discussions or comment on those EPs.

At no stage did any panellist who had a declared conflict of interest participate in the assessment of the EP for which they were conflicted.

Calibration

Panel calibration was initially achieved through assessment of example EPs as part of panellist training. Each EP was separately assessed by two panellists against the tie-point descriptors. Panellists then discussed their respective scores to reach an agreed preliminary score. Where applicable, panel-pairs took the comments of the cross-referral panellist into account in their scoring decisions.

The panel meeting began with further calibration exercises; these required panellists to review EPs where the weighted preliminary scores were clear representatives of all Quality Categories. High-scoring EPs were discussed first to enable the standards of quality research to be preeminent throughout the process. This session ensured panellists had applied the component tie-point descriptors consistently and in accordance with the Quality Category descriptions.

To ensure consistent assessment of the EPs received, the CPA Panel considered calibration as an ongoing exercise through preliminary assessment discussions and during the panel meeting.

Holistic assessment and extraordinary circumstances

All EPs that included extraordinary circumstances (general and/or Canterbury) were included in the holistic assessment stage. Additionally, the CPA Panel undertook a detailed holistic assessment of EPs that had uncommon issues (as defined in the Guidelines) and those on, or close to, the boundaries between Quality Categories.

Following the holistic assessment, 17 EPs (not FTE weighted) moved up a Quality Category (no EPs moved down a Quality Category at the holistic assessment stage). This included:

- 13 EPs identified by the panel for *detailed* holistic assessment
- four EPs claiming extraordinary circumstances.

For each Quality Category change, the CPA Panel referenced the Quality Category descriptors.

Awarding final Quality Categories

The CPA Panel considered all EPs assigned to it and reached agreement on the final Quality Category for each.

The CPA Panel assessed and awarded a funded Quality Category to 462.26 EPs.

Commentary on the results

The CPA Panel considered EPs from researchers across the full breadth of the creative and performing arts in New Zealand. CPA Panel members commented on the overall health, breadth, diversity and vitality of New Zealand creative and performing arts research. International panellists also commented on the distinctiveness of research related to New Zealand cultural contexts and noted that the best work, across multiple subject areas, was equivalent to the highest level of achievement elsewhere.

The CPA Panel awarded funded Quality Categories to 20.1% more EPs in 2018 than in the 2012 round, with increases in all subject areas and the highest increase occurring in Music, Literary Arts and Other Arts.

The results show a continuing increase in the quality of EPs across each subject. All subject areas have seen increases in the relative percentage of A and B Quality Categories awarded. EPs in the Music, Literary Arts and Other Arts subject saw the highest increase in the A and B Quality Categories, with literary research performing especially well.

Table 5: Percentage of EPs awarded funded Quality Categories by subject area, 2018 and 2012

SUBJECT AREA	YEAR	A	B	C	C(NE)
Design	2018	14.0%	37.2%	40.0%	8.8%
	2012	9.2%	32.2%	35.4%	23.2%
	Variance	+4.8	+5.0	+4.6	-14.4
Music, Literary Arts and Other Arts	2018	21.6%	50.5%	23.9%	4.1%
	2012	10.0%	40.4%	36.9%	12.7%
	Variance	+11.6	+10.1	-13.0	-8.6
Theatre and Dance, Film and Television and Multimedia	2018	17.5%	50.7%	28.3%	3.5%
	2012	17.0%	34.6%	30.4%	18.1%
	Variance	+0.5	+16.1	-2.1	-14.6
Visual Arts and Crafts	2018	18.1%	40.3%	37.1%	4.5%
	2012	9.8%	33.6%	46.8%	9.8%
	Variance	+8.3	+6.7	-9.7	-5.3

In the Design subject area, a surprisingly high proportion of journal articles and other published research was supplied across this field, with comparatively fewer design works presented for assessment. Design research has continued to develop across fashion, textile, industrial, service, media and communication design. Rapid advances in technology have opened new areas of research and new modes of production and dissemination, including design robotics, film, television and multimedia. Given the complexity of digital arts and their engagement with artificial intelligence, virtual reality and other new processes, it will be necessary in the future to carefully consider collaborations and the contributions that engineers and computer technicians make towards finished outputs. Increased difficulty is anticipated in assessing where the key creative drive of a project originates.

In the field of music, the CPA Panel was pleased to note the international outreach of many composers and performers, and the growing diversity of research areas across classical, jazz, pop, electroacoustic, experimental and performance art music. Growth was noted in musical work in cross-genre, collaborative, video and multimedia avenues, as well as in instrument fabrication.

In the literary arts, a significant number of EPs presented complex, original and innovative work, which had evidently attracted national or international attention. In other cases, however, competent literary work was difficult to recognise as research, especially when constrained by existing genre conventions.

Theatre and dance research continued to expand into broader areas of performance installation and time-based events, frequently addressing complex social and political concerns. Cultural activism is also finding its voice through research, performance and event curation.

The visual arts showed notable strength in terms of practices disseminated within national and increasingly impressive international contexts.

A significant increase in participation was noted from researchers based at institutes of technology and polytechnics; private training establishments; and wānanga. EPs from these institutions received higher proportions of A, B and C Quality Categories in 2018 than they had in 2012.

New and emerging researchers

EPs from new and emerging researchers accounted for 8.1% (or 37.23) of awarded funded Quality Categories. Out of the 37.23 new and emerging researcher EPs, 64.1% were awarded a C(NE) Quality Category. In addition, 5.4% were awarded an A Quality Category and 30.5% were awarded a B Quality Category. These highly scored new and emerging EPs were primarily from the subject areas of Music, Literary Arts and Other Arts, and Design, reflecting the vibrancy of emerging research in these fields and the strength of associated postgraduate environments.

Māori research

The strength of Māori creative and performing arts research is particularly notable both in terms of practices disseminated within the context of Aotearoa and ambitious profiling of work within international forums, including very generative collaborations and dialogues with First Nations practitioners from other centres of indigenous research.

The Māori Knowledge and Development Panel accepted six cross-referrals from the CPA Panel.

Pacific research

Thirteen EPs were cross-referred to the Pacific Research Panel indicating the influence of Pacific world views and methodologies across creative and performing arts research.

Researcher profile

This is the first time that the TEC has reported on demographic information for the Quality Evaluation, which has allowed panels to consider trends following the assessment process. The researcher profile percentages in this section are derived from the FTE weighting of EPs that received funded Quality Categories.

Of the researchers submitting to the CPA Panel in 2018, 45.2% were women and 54.8% were men. Women researcher EPs were more likely to achieve an A Quality Category than men researcher EPs (of the 83.83 EPs awarded an A Quality Category, 53.9% were women and 46.1% were men).

Only 16.5% of researchers were aged under 40, with 82.9% aged over 40 and the remainder unstated. Overall, 81.8% of researchers who submitted were employed full-time.

The researchers submitting to the CPA Panel identified as the following ethnicities: Asian 3.5%; European 67.8%; Māori 7.4%; Middle Eastern/Latin American/African 1.7%; Pacific 0.6%; and other ethnicities 2.1%. A further 16.9% did not state an ethnicity.

Of the researcher EPs submitted to the CPA Panel in 2018, 34.26 identified as Māori, a sharp increase from 20.81 in 2012. Māori researchers performed exceptionally well relative to other researcher demographics, with 36.8% awarded an A Quality Category. This is evidence of the prominence and influence of Māori world views across all subject areas in creative and performing arts.

Education Panel Report

Purpose of the report

The purpose of this report is to describe and contextualise the outcomes of the Education Peer-Review Panel's (EDU Panel's) results, including an overview of the assessment process. It is in two parts:

- summary of the assessment process
- commentary on the results.

EDU Panel members are listed in Appendix 1. EDU Panel recommendations are set out in Appendix 2.

Executive summary

This report summarises the results of the assessment undertaken by the EDU Panel during the PBRF 2018 Quality Evaluation and confirmed during the panel meeting. The EDU Panel had 17 members, including six international panellists.

In accordance with the processes set out in the Guidelines, the EDU Panel:

- managed conflicts of interest
- calibrated preliminary scores
- where appropriate or required by the Guidelines, incorporated holistic judgements in awarding final Quality Categories.

Key information

The EDU Panel awarded funded Quality Categories to 487.96 EPs as part of the assessment process. Table 1 shows EPs awarded funded Quality Categories by the EDU Panel.

Table 1: EPs awarded funded Quality Categories by the EDU Panel

QUALITY CATEGORY	EPs (FTE WEIGHTED)	PERCENTAGE PER QUALITY CATEGORY
A	51.53	10.6%
B	143.80	29.5%
C	238.50	48.9%
C(NE)	54.13	11.1%
TOTAL	**487.96**	

There was an overall decrease of 5.5% in the number of EPs awarded a funded Quality Category between 2012 (516.31 EPs) and 2018 (487.96 EPs).

Researcher participation

Of the researchers submitting to the EDU Panel in 2018, 69.4% were women, 30.4% were men and 0.2% were other. Only 7.0% of researchers were aged under 40, with 93.0% aged over 40.

Most researchers (71.1%) identified as European and 88.5% of researchers were employed full-time.

Summary of the assessment process

Assignment

The Chair of the EDU Panel assigned each EP to two panellists. Assignments were made according to areas of research expertise (topical as well as methodological) and to ensure panellists did not assess EPs from their own TEOs or where there were declared conflicts of interest.

The Chair assigned at least one EP to each panellist with herself as co-assessor to aid calibration across the EDU Panel.

Individual assessment

On average, each panellist was involved in the preliminary assessment of 70 EPs. Each EP was assessed by two panellists, who assigned an independent preparatory score; assessors then agreed on a preliminary score to present at the panel meeting in November.

The EDU Panel committed to examine a minimum of 50.0% of nominated research outputs (NROs). The EDU Panel exceeded this target and examined 98.3% of submitted NROs.

Cross-referrals

The following tables show the number of cross-referrals in and out of the EDU Panel. Compared with the 2012 Quality Evaluation round, there was an 86.1% decrease in the number of cross-referral EPs submitted to the EDU Panel. There was a 74.3% decrease in the number of cross-referrals from the EDU Panel to other panels.

Panel-pairs took the comments of the cross-referral panellist into account in their scoring decisions.

Table 2: Number of cross-referred EPs assessed by the EDU Panel

PRIMARY PANEL	SUBJECT AREA	# OF EPs
Biological Sciences	Molecular, Cellular and Whole Organism Biology	1
Creative and Performing Arts	Music, Literary Arts and Other Arts; Visual Arts and Crafts; and Theatre and Dance, Film and Television and Multimedia	8
Humanities and Law	History, History of Arts, Classics and Curatorial Studies	1
Social Sciences and Other Cultural/Social Studies	Psychology; and Communications, Journalism and Media Studies	2
TOTAL		**12**

Note: not FTE weighted.

Table 3: Number of EPs cross-referred from the EDU Panel to another panel

CROSS-REFERRAL PANEL	# OF EPs
Biological Sciences	1
Creative and Performing Arts	3
Health	3
Māori Knowledge and Development	7
Medicine and Public Health	2
Pacific Research	10
TOTAL	**26**

Note: not FTE weighted.

Panel assessment

The EDU Panel met from 19 to 23 November 2018 in Wellington.

The EDU Panel managed actual and perceived conflicts of interest during the meeting in accordance with the Guidelines and panel processes. The conflicts of interest the panellists identified in the PBRF IT System before the panel meeting were included in the assessment run sheets, along with the appropriate action. The EDU Panel managed conflicts of interest during the meeting in the following ways:

- panellists did not participate in the discussion of EPs with a declared conflict of interest
- panellists did not participate in the discussion of EPs from their own TEOs
- panellists left the room during discussion of a close family member's EP or the panellist's own EP
- the Deputy Chair led the meeting when EPs from the Chair's TEO were being reviewed, and the Chair did not participate in these discussions or comment on those EPs.

At no stage did any panellist who had a declared conflict of interest participate in the assessment of an EP for which they were conflicted.

Calibration

Panel calibration was initially achieved through assessment of example EPs as part of panellist training. During the individual assessment, each EP was separately assessed by two panellists. Panellists then discussed their respective scores to reach a calibrated pair-assessment. Where applicable, panel-pairs took the comments of the cross-referral panellist into account in their scoring decisions.

At the panel meeting, several EPs, which clearly represented each Quality Category and encompassed input from each panellist, were selected by the Chair for detailed discussion to ensure accurate calibration across the EDU Panel. High-scoring EPs were discussed first to enable the standards of quality research to be preeminent throughout the process.

To ensure consistent assessment of the EPs received, the EDU Panel considered calibration as an ongoing exercise through preliminary assessment discussions and during the panel meeting.

Holistic assessment and extraordinary circumstances

All EPs that included extraordinary circumstances (general and/or Canterbury) were included in the holistic assessment stage. Additionally, the EDU Panel undertook a detailed holistic assessment of EPs that had uncommon issues (as defined in the Guidelines) and those on, or close to, the boundaries between Quality Categories.

Following the holistic assessment, seven EPs (not FTE weighted) moved up a Quality Category (no EPs moved down a Quality Category at the holistic assessment stage). This included:

- four EPs identified by the panel for *detailed* holistic assessment
- three EPs claiming extraordinary circumstances.

For each Quality Category change, the EDU Panel referenced the Quality Category descriptors.

Awarding final Quality Categories

The EDU Panel considered all EPs assigned to it and reached agreement on the final Quality Category for each.

The EDU Panel assessed and awarded a funded Quality Category to 487.96 EPs.

Commentary on the results

The decrease in the number of EPs awarded a funded Quality Category in 2018 reflects the general decline of research funding across the discipline. Many areas of educational research require extensive research funding, yet such funding is limited for educational researchers. While educational researchers do compete for awards from such sources, it is relatively rare for researchers in an applied field such as education to win those funds. Research or evaluation awards available in education are typically highly directive in nature, often restricted to a set agenda from the funding agency. Research on learning and teaching in educational settings, classroom research, and research on student outcomes, particularly longitudinal research, are expensive endeavours not achievable without appropriate basic research funding.

There was a dominance of research on teaching (as opposed to learning) across the EPs, particularly qualitative research involving small samples within a sector, one TEO, or even a single programme. This may be related to the lack of outside funding opportunities, as this type of research can involve convenience samples and voluntary participation by a small number of participants. While such research can inform teaching and learning, such a focus can limit a researcher's ability to publish in major peer-reviewed journals, which prefer research that is generalisable to other contexts and the wider educational community. Thus, the small amount of funding for educational research is likely to limit high-quality research outputs that can demonstrate significance and value beyond one programme or TEO.

Panellists perceived a decrease in EPs in some areas in comparison to past years. Educational research areas that appeared to be under-represented included technology education, public intellectual research, STEM, health and wellbeing education, classroom research, longitudinal student outcomes, and special needs.

An A Quality Category was awarded to 10.6% of EPs in 2018, which was a slight increase from 9.6% in 2012. The number of EPs awarded a B Quality Category decreased from 34.9% in 2012 to 29.5% in 2018. The number of EPs in the C and C(NE) Quality Categories rose from 55.4% in 2012 to 60.0% in 2018.

Table 4: Percentage of funded Quality Categories, 2018 and 2012

SUBJECT AREA	YEAR	A	B	C	C(NE)
Education	2018	10.6%	29.5%	48.9%	11.1%
	2012	9.9%	35.1%	48.5%	6.6%
	Variance	+0.7	-5.6	+0.4	+4.5

New and emerging researchers

EPs from new and emerging researchers accounted for 12.0% (or 58.45) of awarded funded Quality Categories. Out of the 58.45 new and emerging researcher EPs, 92.6% were awarded a C(NE) Quality Category and 7.4% were awarded a B Quality Category. In 2012, 7.4% (or 36.71) of EPs awarded funded Quality Categories were new and emerging researchers. This represents an increase of 59.2% in new and emerging researchers awarded a funded Quality Category in Education between 2012 and 2018.

Māori research

The EDU Panel included two members with extensive background in Mātauranga Māori and additional members with experience serving on bicultural research teams and publishing in this area.

The seven EPs cross-referred to the Māori Knowledge and Development Panel included a wide range of areas of research relevant to a Māori world view and/or Māori methodologies submitted to the EDU Panel.

Pacific research

Ten EPs were cross-referred to the Pacific Research Panel and their guidance was considered as part of the assessment. Pacific education is an area of growing strength in New Zealand education research. As such, the EDU Panel included several panellists with experience and expertise conducting research with Pacific peoples and publishing with Pacific research colleagues.

Researcher profile

This is the first time that the TEC has reported on demographic information for the Quality Evaluation, which has allowed panels to consider trends following the assessment process. The researcher profile percentages in this section are derived from the FTE weighting of EPs that received funded Quality Categories.

Of the researchers submitting to the EDU Panel in 2018, 69.4% were women, 30.4% were men and 0.2% were other. Looking at the funded Quality Categories awarded, of the EPs that were awarded an A Quality Category, 56.3% were women researchers and 43.7% were men researchers. Of EPs that were awarded a B Quality Category, 62.8% were from women researchers and 36.5% were from men researchers. Of EPs that were awarded a C Quality Category, 76.0% were from women researchers and 24.0% were from men researchers. Finally, there was a split in EPs that were awarded a C(NE) Quality Category between women researcher EPs and men researcher EPs with 70.6% and 29.4%, respectively.

Almost all (93.0%) of the researchers submitting EPs to the EDU Panel were aged over 40, with the majority aged between 50 and 69 (69.3%). Only 6.5% of the researchers were between the ages of 30 and 39 and 0.5% of the researchers were 29 years or younger. The low number of younger researchers is a concerning statistic in this field.

The researchers submitting to the EDU Panel identified as the following ethnicities: Asian 5.5%; European 71.1%; Māori 3.8%; Middle Eastern/Latin American/African 1.4%; Pacific 1.2%; and other ethnicities 2.4%. A further 14.5% did not state an ethnicity.

Overall, 88.5% of researchers who submitted EPs were employed full-time.

Engineering, Technology and Architecture Panel Report

Purpose of the report

The purpose of this report is to describe and contextualise the outcomes of the Engineering, Technology and Architecture Peer-Review Panel's (ETA Panel's) results, including an overview of the assessment process. It is in two parts:

- summary of the assessment process
- commentary on the results.

ETA Panel members are listed in Appendix 1. ETA Panel recommendations are set out in Appendix 2.

Executive summary

This report summarises the results of the assessment undertaken by the ETA Panel during the PBRF 2018 Quality Evaluation and confirmed during the panel meeting. The ETA Panel had 24 panellists, including six panellists from outside New Zealand.

In accordance with the processes set out in the Guidelines, the ETA Panel:

- managed conflicts of interest
- calibrated preliminary scores
- where appropriate or required by the Guidelines, incorporated holistic judgements in awarding final Quality Categories.

Key information

The ETA Panel awarded funded Quality Categories to 732.04 EPs as part of the assessment process. Table 1 shows EPs awarded funded Quality Categories for the whole panel. Table 2 shows EPs awarded funded Quality Categories by subject area.

Table 1: EPs awarded funded Quality Categories by the ETA Panel

QUALITY CATEGORY	EPs (FTE WEIGHTED)	PERCENTAGE PER QUALITY CATEGORY
A	121.48	16.6%
B	297.89	40.7%
C	182.88	25.0%
C(NE)	129.79	17.7%
TOTAL	**732.04**	

Table 2: EPs awarded funded Quality Categories by subject area

SUBJECT AREA	A	B	C	C(NE)	TOTAL
Architecture, Design, Planning, Surveying	18.29 (12.3%)	60.03 (40.3%)	57.28 (38.4%)	13.50 (9.1%)	**149.10**
Engineering and Technology	103.19 (17.7%)	237.86 (40.8%)	125.60 (21.5%)	116.29 (19.9%)	**582.94**

There was an overall increase of 28.3% in the number of EPs awarded a funded Quality Category between 2012 (570.51 EPs) and 2018 (732.04 EPs). There were increases in both the number and quality of submissions in both subject areas. However, some concerns were noted about the decreasing proportion of women researchers and the continuing low representation of Māori and Pacific researchers within these disciplines.

Broken down by subject area, the ETA Panel showed the following trends:

- both subject areas saw an increase in the overall number of EPs submitted
- Engineering and Technology saw the largest increase in the number of EPs awarded a funded Quality Category in 2018, from 437.98 in 2012 to 582.94 in 2018; this was an increase of 33.1%
- the number of Architecture and Design EPs increased by 15.1% from 129.53 in 2012 to 149.10 in 2018
- Engineering and Technology had the highest number of EPs awarded an A Quality Category, 103.19 (17.7%).

Researcher participation

Of the researchers submitting to the ETA Panel in 2018, 17.6% were women, 81.6% were men and 0.8% other.

A little over one-third (34.0%) of researchers were aged under 40, with 66.0% aged over 40 or unstated.

Most researchers (48.9%) identified as European and 93.3% of researchers were employed full-time.

Summary of the assessment process

Assignment

The Chair assigned EPs to panellists for assessment based on subject-matter expertise and diversity of input. Each EP was assigned to a lead and second panellist. All identified conflicts of interest were managed throughout this process and no EP was assigned to a panellist working at the same institution. While the ETA Panel was unsuccessful in engaging panellists from outside academia, it was satisfied that its membership possessed sufficient experience in commercial and community impacts to address this shortfall.

Individual assessment

Each panellist was involved in preliminary assessment of approximately 65 EPs.

Each EP was assessed by two panellists, the lead and the second. Each panellist provided an independent preparatory score; EP assessors then agreed on a preliminary score to present at the panel meeting.

The ETA Panel set a target of 100.0% of nominated research outputs (NROs) to be examined. The ETA Panel examined 99.9% of submitted NROs.

Cross-referrals

The following tables show the number of cross-referrals into and out of the ETA Panel. Only one cross-referral was submitted to the ETA Panel (compared with 46 in 2012). There was a 43.0% decrease in the number of cross-referrals from the ETA Panel to other panels from 2012.

Table 3: Number of cross-referred EPs assessed by the ETA Panel

PANEL PRIMARY	SUBJECT AREA	# OF EPs
Creative and Performing Arts	Visual Arts and Crafts	1
TOTAL		**1**

Note: not FTE weighted.

Table 4: Number of EPs cross-referred from the ETA Panel to another panel

CROSS-REFERRAL PANEL	# OF EPs
Creative and Performing Arts	1
Humanities and Law	1
Māori Knowledge and Development	13
Mathematical and Information Sciences and Technology	1
Pacific Research	4
Physical Sciences	6
TOTAL	**26**

Note: not FTE weighted.

Panel assessment

The ETA Panel met from 3 to 7 December in Wellington.

The ETA Panel managed actual and perceived conflicts of interest during the meeting in accordance with the Guidelines and panel processes. The conflicts of interest the panellists identified in the PBRF IT System before the panel meeting were included in the assessment run sheets, along with the appropriate action. The ETA Panel managed conflicts of interest during the meeting in the following ways:

- panellists did not participate in the discussion of EPs with a declared conflict of interest[2]
- panellists did not participate in the discussion of EPs from their own TEOs
- panellists left the room during discussion of a close relation's (including family member, friend, or collaborator) EP or the panellist's own EP
- the Deputy Chair led the meeting when EPs from the Chair's TEO (and other significant conflicts) were being reviewed, and the Chair did not participate in these discussions or comment on those EPs.

At no stage did any panellist who had a declared conflict of interest participate in the assessment of the EP for which they were conflicted.

[2] Some minor conflicts were identified by the ETA Panel prior to EP discussions. Where this occurred, it was noted, and the ETA Panel determined whether or not further action was required. In most instances, the conflicts were sufficiently minor as to not warrant any action.

Calibration

Panel calibration was initially achieved through assessment of example EPs as part of panellist training. Each EP was separately assessed by two panellists against the tie-point descriptors. Panellists then discussed their respective scores to reach an agreed preliminary score. Where applicable, panel-pairs took the comments of the cross-referral panellist into account in their scoring decisions.

The panel meeting began with further calibration exercises; where the ETA Panel collectively considered exemplar EPs from a variety of disciplines with preliminary scores from across the range of Quality Categories. High-scoring EPs were discussed first to enable the standards of quality research to be preeminent throughout the process.

To ensure consistent assessment of the EPs received, the ETA Panel considered calibration as an ongoing exercise through preliminary assessment discussions and during the panel meeting.

Holistic assessment and extraordinary circumstances

All EPs that included extraordinary circumstances (general and/or Canterbury) were included in the holistic assessment stage. Additionally, the ETA Panel undertook a detailed holistic assessment of EPs that had uncommon issues (as defined in the Guidelines) and those on, or close to, the boundaries between Quality Categories.

Following the holistic assessment, 13 EPs (not FTE weighted) moved up a Quality Category (no EPs moved down a Quality Category at the holistic assessment stage). This included:

- six EPs identified by the panel for *detailed* holistic assessment
- seven EPs claiming extraordinary circumstances.

For each Quality Category change, the ETA Panel referenced the Quality Category descriptors.

Awarding final Quality Categories

The ETA Panel considered all EPs assigned to it and reached agreement on the final Quality Category for each.

The ETA Panel assessed and awarded a funded Quality Category to 732.04 EPs.

Commentary on the results

In general, the ETA Panel found the assessment process, Guidelines and supporting PBRF IT System to be appropriate and useful, and found significant improvements had been incorporated since 2012. The one area of note was the lack of non-traditional NROs provided in submitted EPs given the emphasis placed on it within the *Engineering, Technology and Architecture Panel-Specific Guidelines*. The ETA Panel assessed relatively few NROs in non-traditional channels or with a focus on commercial or community impacts. Where provided, the avenues of commercialisation or impact were often only vaguely described and lacked information on when, how and by whom the research had been used. The ETA Panel thought this could indicate a lack of confidence in using non-traditional outputs as NROs.

The ETA Panel awarded funded Quality Categories to 28.3% more EPs in 2018 than in the 2012 round, representing a 15.1% increase for Architecture, Design, Planning, Surveying and a 33.1% increase for Engineering and Technology. This suggests potential growth in student enrolments across both subjects, possibly because of the government's focus on STEM education and higher

staffing levels in research as a result. In the Engineering and Technology field, this may also reflect significant growth within biomedical engineering research.

The ETA Panel found excellent examples of world-class research within both subject areas, and the funded Quality Categories awarded to EPs show an increase in quality overall, as shown in Table 5.

Table 5: Percentage of EPs awarded funded Quality Categories by subject area, 2018 and 2012

SUBJECT AREA	YEAR	A	B	C	C(NE)
Architecture, Design, Planning, Surveying	2018	12.3%	40.3%	38.4%	9.1%
	2012	7.7%	36.9%	39.6%	15.7%
	Variance	+4.6	+3.4	-1.2	-6.6
Engineering and Technology	2018	17.7%	40.8%	21.5%	19.9%
	2012	15.1%	41.8%	24.8%	18.3%
	Variance	+2.6	-1.0	-3.3	+1.6

The Engineering and Technology subject area appears mature, yet also vibrant and sustainable. The increase in EPs awarded both the A and C(NE) Quality Categories demonstrates the development of individual researchers, and renewal of the research sector with a growth in junior academics.

While Architecture, Design, Planning, Surveying has previously shown lower average ratings than Engineering and Technology, this gap appears to be closing. However, as outlined in the researcher demographics section that follows, the ETA Panel noted that the number of new and emerging researchers in this field was proportionally quite small, while the proportion of Architecture, Design, Planning, Surveying researchers aged under 40 has more than doubled. This is reflected in the decline in EPs that were awarded a C(NE) Quality Category and suggests that growth in this field is potentially being driven by an influx of comparatively younger, yet experienced, research staff arriving from overseas.

New and emerging researchers

EPs from new and emerging researchers accounted for 21.4% (or 156.79) of awarded funded Quality Categories. Out of the 156.79 new and emerging researcher EPs, 82.8% were awarded a C(NE) Quality Category. In addition, 0.6% were awarded an A Quality Category and 16.6% were awarded a B Quality Category.

Of these new and emerging researcher EPs, 9.2% came from within the Architecture, Design, Planning, Surveying subject area, compared with 90.8% from Engineering and Technology. This contrasts with the overall percentage of EPs received, where 20.4% of EPs came from the Architecture, Design, Planning, Surveying subject area.

Māori research

The Māori Knowledge and Development Panel accepted 13 cross-referral requests from the ETA Panel. Advice from the cross-referral assessors was taken into consideration during assessment and awarding of Quality Categories for the relevant EPs.

The ETA Panel did not have any Māori research expertise within its membership and observed that Māori representation within the ETA Panel would be desirable for assessing research relating to Māori communities, issues and research methods.

Pacific research

A small number of EPs had research outputs relevant to Pacific communities, and four EPs were referred to the Pacific Research Panel for input in assessment of quality and impact of the research.

Researcher profile

This is the first time that the TEC has reported on demographic information for the Quality Evaluation, which has allowed panels to consider trends following the assessment process. The researcher profile percentages in this section are derived from the FTE weighting of EPs that received funded Quality Categories.

In Architecture, Design, Planning, Surveying, 20.4% of researchers were aged under 40 – a sharp increase from 2012, when only 10.3% were in this group. Engineering and Technology also saw an increase in younger researchers, with 37.4% aged under 40 compared with 30.7% in 2012.

While the number of women researchers increased across these subjects (from 109.4 in 2012, to 128.61 in 2018), the proportion of women in both subject areas decreased. Women made up 35.6% of Architecture, Design, Planning, Surveying researchers in 2018 (compared with 36.4% in 2012) and just 13.0% of Engineering and Technology researchers (down from 14.2% in 2012).

Researchers were most likely to identify as European (48.9%) and Asian (24.0%). The ETA Panel received a low proportion of EPs from Māori researchers (3.8% in Architecture, Design, Planning, Surveying and 1.2% in Engineering and Technology). While Māori researchers' representation has increased in the Engineering and Technology subject area since 2012, the continued low proportions of Māori and Pacific researchers demonstrates clear opportunities for ongoing improvement within the sector.

Engineering and Technology had a slightly younger profile with 37.4% of researchers being below 40 years of age compared with 20.4% in Architecture, Design, Planning, Surveying.

Most (93.3%) researchers were full-time.

Health Panel Report

Purpose of the report

The purpose of this report is to describe and contextualise the outcomes of the Health Peer-Review Panel's (Health Panel's) results, including an overview of the assessment process. It is in two parts:

- summary of the assessment process
- commentary on the results.

Health Panel members are listed in Appendix 1. Health Panel recommendations are set out in Appendix 2.

Executive summary

This report summarises the results of the assessment undertaken by the Health Panel during the PBRF 2018 Quality Evaluation and confirmed during the panel meeting. The Health Panel was made up of 24 experts across the six subject areas considered by the panel, including seven panellists from outside New Zealand.

In accordance with the processes set out in the Guidelines, the Health Panel:

- managed conflicts of interest
- calibrated preliminary scores
- where appropriate or required by the Guidelines, incorporated holistic judgements in awarding final Quality Categories.

Key information

The Health Panel awarded funded Quality Categories to 496.06 EPs as part of the assessment process. Table 1 shows EPs awarded funded Quality Categories for the whole panel. Table 2 shows EPs awarded funded Quality Categories by subject area.

Table 1: EPs awarded funded Quality Categories by the Health Panel

QUALITY CATEGORY	EPs (FTE WEIGHTED)	PERCENTAGE PER QUALITY CATEGORY
A	52.72	10.6%
B	168.17	33.9%
C	196.23	39.6%
C(NE)	78.94	15.9%
TOTAL	**496.06**	

Table 2: EPs awarded funded Quality Categories by subject area*

SUBJECT AREA	A	B	C	C(NE)	TOTAL
Dentistry	8.73 (19.5%)	10.06 (22.4%)	18.20 (40.6%)	7.88 (17.6%)	**44.87**
Nursing	4.51 (5.1%)	19.09 (21.7%)	49.09 (55.7%)	15.38 (17.5%)	**88.07**
Other Health Studies (including Rehabilitation Therapies)	12.18 (6.8%)	67.62 (37.5%)	71.29 (39.6%)	29.15 (16.2%)	**180.24**
Pharmacy	11.30 (24.3%)	20.02 (43.0%)	8.25 (17.7%)	7.00 (15.0%)	**46.57**
Sport and Exercise Science	7.00 (8.7%)	33.76 (42.0%)	26.40 (32.8%)	13.30 (16.5%)	**80.46**
Veterinary Studies and Large Animal Science	9.00 (16.4%)	17.62 (32.1%)	22.00 (40.1%)	6.23 (11.4%)	**54.85**

* Table 2 does not include one Biomedical EP assessed by the Health Panel that was awarded a C Quality Category.

There was an overall increase of 30.8% in the number of EPs awarded a funded Quality Category between 2012 (379.28 EPs) and 2018 (496.06 EPs). Broken down by subject area, the Health Panel showed the following trends:

- Other Health Studies (including Rehabilitation Therapies) had the greatest number of EPs awarded a funded Quality Category (180.24)
- Pharmacy had the highest proportion of EPs awarded an A Quality Category (24.3%), 11.30 out of 46.57
- Other Health Studies (including Rehabilitation Therapies) had the largest increase from 134.82 EPs in 2012 to 180.24 EPs in 2018
- Veterinary Studies and Large Animal Science had the smallest increase, from 53.45 EPs in 2012 to 54.85 EPs in 2018.

Researcher participation

Of the researchers submitting to the Health Panel in 2018, 59.1% were women and 40.9% were men; the number of women researchers increased from 202.78 in 2012 to 292.65 in 2018. There was a smaller increase in the number of men researchers from 177.70 in 2012 to 202.41 in 2018.

Under one-fifth (19.9%) of researchers were aged under 40, with 80.1% aged over 40 or unstated.

Most researchers (74.2%) identified as European and 83.6% of researchers were employed full-time.

Summary of the assessment process

Assignment

In general, the Chair allocated EPs according to panellist expertise (targeting the closest expertise possible in each panel-pair for topic and methodological expertise), whilst managing conflicts of interest, and ensured that each panellist was assigned EPs with the Chair or, at times, the Deputy Chair (in view of conflict management) to assist in intra-panel calibration.

The Health Panel took careful measures to prevent conflicts of interest in the assignment process. Panellists were advised to enter conflicts of interest in the system when they were recruited as panel members and reminded again at the start of the assignment process to advise the Panel Advisor and Chair if they had a conflict with an assignment.

The Health Panel had seven overseas panellists, which assisted in the management of conflicts of interest.

Individual assessment

On average, each panellist was involved in the assessment of approximately 50 EPs.

The Health Panel set a target of 100.0% of nominated research outputs (NROs) to be examined. The Health Panel narrowly fell short of this target at 96.5% of NROs examined.

Cross-referrals

The following tables show the number of cross-referrals in and out of the Health Panel. Compared with the 2012 Quality Evaluation round, there was an 83.0% decrease in the number of EPs submitted to the Health Panel for cross-referral. There was a 50.0% increase in the number of cross-referrals from the Health Panel to other panels. We note that actual cross-referral numbers are low.

Table 3: Number of cross-referred EPs assessed by the Health Panel

PRIMARY PANEL	SUBJECT AREA	# OF EPs
Creative and Performing Arts	Music, Literary Arts and Other Arts	1
Education	Education	3
Humanities and Law	Religious Studies and Theology	1
Social Sciences and Other Cultural/Social Studies	Sociology, Social Policy, Social Work, Criminology and Gender Studies; and Political Science, International Relations and Public Policy	3
TOTAL		**8**

Note: not FTE weighted.

Table 4: Number of EPs cross-referred from the Health Panel to another panel

CROSS-REFERRAL PANEL	# OF EPs
Māori Knowledge and Development	2
Medicine and Public Health	2
Pacific Research	2
TOTAL	**6**

Note: not FTE weighted.

Panel assessment

The Health Panel met from 3 to 6 December 2018 in Wellington.

The Health Panel managed actual and perceived conflicts of interest during the meeting in accordance with the Guidelines and panel processes. The conflicts of interest the panellists identified in the PBRF IT System before the panel meeting were included in the assessment run sheets, along with the appropriate action. The Health Panel managed conflicts of interest during the meeting in the following ways:

- panellists did not participate in the discussion of EPs with a declared conflict of interest
- panellists did not participate in the discussion of EPs from their own TEOs
- panellists left the room during discussion of a close family member's EP or the panellist's own EP
- the Deputy Chair led the meeting when EPs from the Chair's TEO were being reviewed, and the Chair did not participate in these discussions or comment on those EPs.

At no stage did any panellist who had a declared conflict of interest participate in the assessment of an EP for which they were conflicted.

Calibration

Panel calibration was initially achieved through assessment of example EPs as part of panellist training. During the individual assessment phase, each EP was separately assessed by two panellists against the tie-point descriptors. Panellists then discussed their respective scores to reach an agreed preliminary score. Panel-pairs took the comments of the cross-referral panellist into account in their scoring decisions.

At the panel meeting, several EPs were selected that clearly represented each Quality Category and were discussed in detail to ensure accurate calibration across the Health Panel. High-scoring EPs were discussed first to enable the standards of quality research to be preeminent throughout the process.

To ensure consistent assessment of the EPs received, the Health Panel considered calibration as an ongoing exercise through preliminary assessment discussions and during the panel meeting.

Holistic assessment and extraordinary circumstances

All EPs that included extraordinary circumstances (general and/or Canterbury) were included in the holistic assessment stage. Additionally, the Health Panel undertook a detailed holistic assessment of EPs that had uncommon issues (as defined in the Guidelines) and those on, or close to, the boundaries between Quality Categories.

Following the holistic assessment, eight EPs (not FTE weighted) moved up a Quality Category (no EPs moved down a Quality Category at the holistic assessment stage). All eight EPs that moved up a Quality Category claimed extraordinary circumstances.

For each Quality Category change, the Health Panel referenced the Quality Category descriptors.

Awarding final Quality Categories

The Health Panel considered all EPs assigned to it and reached agreement on the final Quality Category for each.

The Health Panel awarded funded Quality Categories to 496.06 EPs.

Commentary on the results

The Health Panel considered a wide range of disciplines including some with a long history of research activity, and some where research has been a part of the discipline for a much shorter period. In some cases, this may be limited to a matter of decades. The evolving nature of research in these disciplines is arguably reflected in the distribution of Quality Categories.

Health research includes many subjects where world-class research may be disseminated in New Zealand or Pacific region fora. Health research is also very frequently a collaborative exercise with multiple contributors, and many multi-authored research outputs.

Some Health Panel research subject areas are noted to have relatively few researchers who received an A Quality Category in the current Quality Evaluation. Movement of any one researcher (into a role not meeting eligibility for PBRF, to a different country, into retirement or, perhaps a senior researcher reducing their active research leadership) will appear as a significant change in the number of EPs awarded an A Quality Category.

Alternatively, some subject areas may have benefited from institutional support because of the last Quality Evaluation, where TEOs may have made specific investment to develop capability and capacity for research meeting the criteria.

Table 5 highlights the variation across the Health Panel, specifically the distribution of EPs awarded a funded Quality Category between 2012 and 2018.

Table 5: Percentage of EPs awarded funded Quality Categories by subject area, 2018 and 2012

SUBJECT AREA	YEAR	A	B	C	C(NE)
Dentistry	2018	19.5%	22.4%	40.6%	17.6%
	2012	21.5%	36.8%	29.5%	12.2%
	Variance	-2.0	-14.4	+11.1	+5.4
Nursing	2018	5.1%	21.7%	55.7%	17.5%
	2012	4.8%	24.0%	62.4%	8.8%
	Variance	+0.3	-2.3	-6.7	+8.7
Other Health Studies (including Rehabilitation Therapies)	2018	6.8%	37.5%	39.6%	16.2%
	2012	8.9%	31.9%	41.2%	18.0%
	Variance	-2.1	+5.6	-1.6	-1.8
Pharmacy	2018	24.3%	43.0%	17.7%	15.0%
	2012	18.3%	47.6%	16.5%	17.5%
	Variance	+6.0	-4.6	+1.2	-2.5
Sport and Exercise Science	2018	8.7%	42.0%	32.8%	16.5%
	2012	3.5%	25.0%	36.3%	35.1%
	Variance	+5.2	+17	-3.5	-18.6
Veterinary Studies and Large Animal Science	2018	16.4%	32.1%	40.1%	11.4%
	2012	11.3%	39.6%	37.9%	11.2%
	Variance	+5.1	-7.5	+2.2	+0.2

New and emerging researchers

EPs from new and emerging researchers accounted for 17.4% (or 86.20) of awarded funded Quality Categories. In most instances (91.6%), these researchers were awarded a C(NE) Quality Category. In addition, 8.4% were awarded a B Quality Category.

Sport and Exercise Science and Nursing had the largest percentage of new and emerging researchers, 20.3% and 18.6%, respectively. Dentistry and Other Health Studies (including Rehabilitation Therapies) were also slightly above the average at 18.1% and 17.8%, respectively. EPs of new and emerging researchers were awarded a B Quality Category across four of the six subject areas: Dentistry; Nursing; Other Health Studies (including Rehabilitation Therapies); and Sport and Exercise Science.

Māori research

Māori health is a major topic of interest within health research. To ensure this was covered within the Health Panel, two Māori health researchers with experience in both western health research and relevant Māori methodologies were panellists. Where appropriate, cross-referral was also made to the Māori Knowledge and Development Panel and their guidance was considered in the assessment of the relevant EPs and the awarding of Quality Categories.

Pacific research

Pacific health is an emerging area of strength in New Zealand health research. The Health Panel included one Pacific health researcher with experience in both western health research and relevant Pacific methodologies. Where appropriate, cross-referral was also made to the Pacific Research Panel and their guidance was considered in the assessment of the relevant EPs and the awarding of Quality Categories.

Researcher profile

This is the first time that the TEC has reported on demographic information for the Quality Evaluation, which has allowed panels to consider trends following the assessment process. The researcher profile percentages in this section are derived from the FTE weighting of EPs that received funded Quality Categories.

Health was one of the few panels that, overall, had a much higher percentage of women researchers whose EPs were awarded funded Quality Categories. In 2018, 59.1% (292.65) of EPs awarded funded Quality Categories were women researchers compared with 40.9% (202.41) for men.

However, EPs of men researchers were still more likely to be awarded an A Quality Category; 64.9% of EPs that received an A Quality Category were men and 35.1% were women. The inverse trend occurred across the rest of the funded Quality Categories. This trend was similar in 2012; however, there was an increase in women researcher EPs that were awarded a B Quality Category in 2018; 54.6% in 2018 compared with 47.6% in 2012.

At a subject-area level, the gender distribution differs. Women dominated in Nursing (83.4%) and Other Health Studies (including Rehabilitation Therapies) (68.8%), while men made up a larger proportion in Dentistry (65.5%) and Sport and Exercise Science (67.1%). Pharmacy and Veterinary Studies and Large Animal Science both had a more equal distribution at 53.4% women/46.6% men and 51.6% women/48.4%, respectively.

The researchers submitting to the Health Panel identified as the following ethnicities: Asian 7.1%; European 74.2%; Māori 2.8%; Middle Eastern/Latin American/African 2.4%; and other ethnicities 1.4%. A further 12.2% did not state an ethnicity.

The Health Panel noted that there is a need to develop Pacific research capability across the subject areas. Between 2012 and 2018, Pacific researcher participation moved from 0.3% in a single subject area – Other Health Studies (including Rehabilitation Therapies) – to none.

Those who identified as Māori were more represented across the subject areas, including Nursing; Other Health Studies (including Rehabilitation Therapies); Pharmacy; and Sport and Exercise Science. Across these subject areas, Māori new and emerging researchers were awarded Quality Categories in Other Health Studies (including Rehabilitation Therapies) and Sport and Exercise Science but were absent from Nursing and Pharmacy. Looking to the future, the Health Panel noted its concern for the number of Māori new and emerging researchers entering the system, particularly given the importance of Māori health research as noted above.

Looking at age, 19.9% of researchers were aged under 40, with 80.1% aged over 40. Sport and Exercise Science and Dentistry have the largest proportion of researchers under 40 at 33.6% and 27.7%, respectively.

Overall, 83.6% of researchers were employed full-time. However, almost one-quarter of Nursing and one-fifth of Other Health Studies (including Rehabilitation Studies) researchers whose EPs were awarded funded Quality Categories were part-time.

Humanities and Law Panel Report

Purpose of the report

The purpose of this report is to describe and contextualise the outcomes of the Humanities and Law Peer-Review Panel's (HAL Panel's) results, including an overview of the assessment process. It is in two parts:

- summary of the assessment process
- commentary on the results.

HAL Panel members are listed in Appendix 1. HAL Panel recommendations are set out in Appendix 2.

Executive summary

This report summarises the results of the assessment undertaken by the HAL Panel during the PBRF 2018 Quality Evaluation and confirmed during the panel meeting. The HAL Panel had 22 members, including eight international panellists.

In accordance with the processes set out in the Guidelines, the HAL Panel:

- managed conflicts of interest
- calibrated preliminary scores
- where appropriate or required by the Guidelines, incorporated holistic judgements in awarding final Quality Categories.

Key information

The HAL Panel awarded funded Quality Categories to 633.29 EPs as part of the assessment process. Table 1 shows EPs awarded funded Quality Categories for the whole panel. Table 2 shows EPs awarded funded Quality Categories by subject area.

Table 1: EPs awarded funded Quality Categories by the HAL Panel

QUALITY CATEGORY	EPs (FTE WEIGHTED)	PERCENTAGE PER QUALITY CATEGORY
A	118.89	18.8%
B	332.16	52.4%
C	127.13	20.1%
C(NE)	55.11	8.7%
TOTAL	**633.29**	

Table 2: EPs awarded funded Quality Categories by subject area

SUBJECT AREA	A	B	C	C(NE)	TOTAL
English Language and Literature	15.31 (21.2%)	41.94 (58.0%)	12.10 (16.7%)	3.00 (4.1%)	**72.35**
Foreign Languages and Linguistics	16.60 (13.2%)	58.30 (46.5%)	29.18 (23.3%)	21.24 (16.9%)	**125.32**
History, History of Arts, Classics and Curatorial Studies	30.61 (20.6%)	78.54 (52.9%)	34.27 (23.1%)	5.05 (3.4%)	**148.47**
Law	31.07 (16.7%)	107.14 (57.5%)	29.10 (15.6%)	19.00 (10.2%)	**186.31**
Philosophy	17.30 (28.7%)	33.24 (55.1%)	6.88 (11.4%)	2.92 (4.8%)	**60.34**
Religious Studies and Theology	8.00 (19.8%)	13.00 (32.1%)	15.60 (38.5%)	3.90 (9.6%)	**40.50**

There was an overall decrease of 2.4% in the number of EPs awarded a funded Quality Category between 2012 (649.10 EPs) and 2018 (633.29 EPs). Broken down by subject area, the HAL Panel showed the following trends:

- Law; Philosophy; and Religious Studies and Theology all saw modest increases in the number of EPs submitted between 2012 and 2018
- in Law, the number of EPs rose from 177.05 in 2012 to 186.31 in 2018 (a 5.2% increase)
- Foreign Languages and Linguistics saw the largest decrease (-19.4%) in the number of EPs submitted between 2012 and 2018, from 155.47 to 125.32.

Researcher participation

Of the researchers submitting to the Humanities and Law Panel in 2018, 45.3% were women, 54.0% were men and 0.6% were other.

A little over one-sixth (16.9%) of researchers were aged under 40, with 83.1% aged over 40.

Most researchers (66.4%) identified as European and 92.5% of researchers were employed full-time.

Summary of the assessment process

Assignment

The Chair of the HAL Panel assigned each EP to two panellists, ensuring that panellists were not the lead assessor for EPs from their own TEOs. Panellists did not assess EPs where a conflict of interest had been listed.

To achieve a high level of cross-panel calibration, the Chair ensured a wide range of panel-pairings. In addition, the Chair or Deputy Chair co-assessed at least one EP with each panellist.

Individual assessment

On average, each panellist was involved in the preliminary assessment of approximately 60 EPs.

The HAL Panel set a minimum target of examining 50.0% of nominated research outputs (NROs). The HAL Panel exceeded this target and overall, examined 91.2% of submitted NROs.

Cross-referrals

The following tables show the number of cross-referrals in and out of the HAL Panel. Compared with the 2012 Quality Evaluation round, there was a 93.0% decrease in the number of cross-referrals submitted to the HAL Panel. There was a 74.3% decrease in the number of cross-referrals from the HAL Panel to other panels.

Panel-pairs took the comments of the cross-referral panellist into account in their scoring decisions.

Table 3: Number of cross-referred EPs assessed by the HAL Panel

PRIMARY PANEL	SUBJECT AREA	# OF EPs
Creative and Performing Arts	Music, Literary Arts and Other Arts; Theatre and Dance, Film and Television and Multimedia; and Visual Arts and Crafts	4
Engineering, Technology and Architecture	Architecture, Design, Planning, Surveying	1
Social Sciences and Other Cultural/Social Studies	Political Science, International Relations and Public Policy	1
TOTAL		**6**

Note: not FTE weighted.

Table 4: Number of EPs cross-referred from the HAL Panel to another panel

CROSS-REFERRAL PANEL	# OF EPs
Business and Economics	1
Creative and Performing Arts	4
Education	1
Health	1
Māori Knowledge and Development	4
Mathematical and Information Sciences and Technology	1
Medicine and Public Health	1
Pacific Research	12
Social Sciences and Other Cultural/Social Studies	1
TOTAL	**26**

Note: not FTE weighted.

Panel assessment

The HAL Panel met from 26 to 30 November 2018 in Wellington.

The HAL Panel managed actual and perceived conflicts of interest during the meeting in accordance with the Guidelines and panel processes. The conflicts of interest the panellists identified in the PBRF IT System before the panel meeting were included in the assessment run sheets, along with the appropriate action. The HAL Panel managed conflicts of interest during the meeting in the following ways:

- panellists did not participate in the discussion of EPs with a declared conflict of interest
- panellists did not participate in the discussion of EPs from their own TEOs
- panellists left the room during discussion of a close family member's EP or of the panellist's own EP
- the Deputy Chair led the meeting when EPs from the Chair's TEO were being reviewed, and the Chair left the room for these discussions.

At no stage did any panellist who had a declared conflict of interest participate in the assessment of the EP for which they were conflicted.

Calibration

Panel calibration was initially achieved through assessment of example EPs as part of panellist training. During the individual assessment phase, each EP was separately assessed by two panellists against the tie-point descriptors. Panellists then discussed their respective scores to reach an agreed preliminary score. Panel-pairs took the comments of the cross-referral panellist into account in their scoring decisions.

At the panel meeting, several EPs were selected which clearly represented each Quality Category and were discussed in detail to ensure accurate calibration across the HAL Panel. High-scoring EPs were discussed first to enable the standards of quality research to be preeminent throughout the process.

To ensure consistent assessment of the EPs received, the HAL Panel considered calibration as an ongoing exercise through preliminary assessment discussions and during the panel meeting.

Holistic assessment and extraordinary circumstances

All EPs that included extraordinary circumstances (general and/or Canterbury) were included in the holistic assessment stage. Additionally, the HAL Panel undertook a detailed holistic assessment of EPs that had uncommon issues (as defined in the Guidelines) and those on, or close to, the boundaries between Quality Categories.

Following the holistic assessment, 12 EPs (not FTE weighted) moved up a Quality Category (no EPs moved down a Quality Category at the holistic assessment stage). All 12 EPs that moved up a Quality Category claimed extraordinary circumstances.

For each Quality Category change, the HAL Panel referenced the Quality Category descriptors.

Awarding final Quality Categories

The HAL Panel considered all EPs assigned to it and reached agreement on the final Quality Category for each.

The HAL Panel assessed and awarded a funded Quality Category to 633.29 EPs.

Commentary on the results

The number of EPs awarded a funded Quality Category in the HAL Panel decreased slightly over the past six years, from 649.10 in 2012 to 633.29 in 2018 (a decrease of 2.4%). The number of EPs being scored an A or B Quality Category has increased over the same period, however. EPs awarded a C or C(NE) Quality Category decreased quite significantly.

- In 2012, 80.32 EPs were awarded an A Quality Category, compared to 118.89 EPs in 2018, representing a 48.0% increase.
- In 2012, 320.81 EPs were awarded a B Quality Category, compared to 332.16 EPs in 2018. This was a 3.5% increase.
- In 2012, 257.47 EPs were awarded either a C or C(NE) Quality Category, compared to 182.24 EPs in 2018. This was a decrease of 29.2%.

All subject areas saw an increase in the number of EPs awarded an A Quality Category from 2012 to 2018 and most had a decrease in the number of EPs awarded a C Quality Category. Table 5 below

shows the distribution of EPs that received a funded Quality Category for each subject area and changes between the 2012 and 2018 Quality Evaluations.

Table 5: Percentage of EPs awarded funded Quality Categories by subject area, 2018 and 2012

SUBJECT AREA	YEAR	A	B	C	C(NE)
English Language and Literature	2018	21.2%	58.0%	16.7%	4.1%
	2012	9.4%	48.2%	32.7%	9.7%
	Variance	+11.8	+9.8	-16.0	-5.6
Foreign Languages and Linguistics	2018	13.2%	46.5%	23.3%	16.9%
	2012	7.7%	40.4%	41.2%	10.7%
	Variance	+5.5	+6.1	-17.9	+6.2
History, History of Arts, Classics and Curatorial Studies	2018	20.6%	52.9%	23.1%	3.4%
	2012	11.4%	52.7%	28.5%	7.4%
	Variance	+9.2	+0.2	-5.4	-4.0
Law	2018	16.7%	57.5%	15.6%	10.2%
	2012	16.9%	51.2%	20.7%	11.2%
	Variance	-0.2	+6.3	-5.1	-1.0
Philosophy	2018	28.7%	55.1%	11.4%	4.8%
	2012	18.4%	51.3%	21.7%	8.5%
	Variance	+10.3	+3.8	-10.3	-3.7
Religious Studies and Theology	2018	19.8%	32.1%	38.5%	9.6%
	2012	7.8%	52.2%	32.4%	7.6%
	Variance	+12.0	-20.1	+6.1	+2.0

The HAL Panel was aware of the increase in higher Quality Category scores and felt that this accurately reflected the overall quality of EPs assessed in this round.

New and emerging researchers

EPs from new and emerging researchers accounted for 12.0% (or 75.75) of awarded funded Quality Categories. Out of the 75.75 new and emerging researcher EPs, 72.8% were awarded a C(NE) and 27.2% were awarded a B Quality Category. In 2012, 12.2% of EPs awarded funded Quality Categories were from new and emerging researchers. Overall, this represents a 5.7% decrease in the number of new and emerging researchers over the six-year period.

Of the subject areas, Foreign Languages and Literature saw the largest increase in number of new and emerging researcher EPs awarded Quality Categories between 2012 and 2018, with an increase of 19.4%.

The HAL Panel thought the difference in the number of EPs submitted by new and emerging researchers does not reflect any discernible trend of growth or decline in these areas. It is heartening; however, to note a significant increase in the number of new researchers in the field of Foreign Languages and Linguistics.

Māori research

EPs cross-referred to the Māori Knowledge and Development Panel included a wide range of areas of research relevant to a Māori world view and/or Māori methodologies. Areas of research included Māori customary law, history of Māori language use, British colonial policies, Treaty of Waitangi claims and settlements, criminal law and youth justice, Māori artwork of the 19th century, language revitalisation, Māori philosophy, Māori cinema, international indigenous rights, indigenous water

rights and management, historical Māori interactions with the church, and indigenous oral history methods.

Pacific research

Areas of research relevant to Pacific methodologies and themes included the history of Pacific missions, history of Germans in Samoa, Pacific migration, Pacific community identity in New Zealand, cultural memory and narratives, Pacific postcolonial literature, linguistic revitalisation of Cook Islands Māori, Pacific art since World War II, disaster risk management, judicial neo-colonialism in the Pacific region, international dispute settlements in the Pacific region, linguistic structure of Samoan and New Caledonian history, linguistics, literature and migration.

Cross-fertilisation of Māori research methodologies and Pacific research methodologies with more traditional Humanities and Law methodologies is a positive reflection of an invigorating research culture in New Zealand.

Researcher profile

This is the first time that the TEC has reported on demographic information for the Quality Evaluation, which has allowed panels to consider trends following the assessment process. The researcher profile percentages in this section are derived from the FTE weighting of EPs that received funded Quality Categories.

Of the researchers submitting to the HAL Panel in 2018, 45.3% were women, 54.0% were men and 0.6% were other. Looking at the number of women researchers whose EPs were awarded a funded Quality Category, 17.0% were awarded an A Quality Category; 52.8% were awarded a B Quality Category; 19.1% were awarded a C Quality Category; and 11.1% were awarded a C(NE) Quality Category. Comparatively, looking at the number of men researchers whose EPs were awarded a funded Quality Category their profile was: 20.5% were awarded an A Quality Category; 52.1% were awarded a B Quality Category; 21.1% were awarded a C Quality Category; and 6.2% were awarded a C(NE) Quality Category.

A little over one-sixth (16.9%) of researchers were aged under 40, with 83.1% aged over 40 or unstated. Most A Quality Category researchers, 65.3%, were 50 years and older. The age distribution evens out for B Quality Category researchers, with 45.5% aged 49 or younger and 54.5% aged 50 and over. As expected, a large proportion of researchers (63.9%) whose EPs were awarded a C(NE) Quality Category were aged 39 years and younger.

The researchers submitting to the HAL Panel identified as the following ethnicities: Asian 5.3%; European 66.4%; Māori 2.5%; Middle Eastern/Latin American/African 1.9%; Pacific 0.6%; and other ethnicities 2.1%. A further 21.2% did not state an ethnicity.

Most (92.5%) researchers submitting EPs to the HAL Panel were employed full-time. This was a slight decrease from 95.2% in 2012.

Māori Knowledge and Development Panel Report

Purpose of the report

The purpose of this report is to describe and contextualise the outcomes of the Māori Knowledge and Development Peer-Review Panel's (MKD Panel's) results, including an overview of the assessment process. It is in two parts:

- summary of the assessment process
- commentary on the results.

MKD Panel members are listed in Appendix 1. MKD Panel recommendations are set out in Appendix 2.

Executive summary

This report summarises the results of the assessment undertaken by the MKD Panel during the PBRF 2018 Quality Evaluation and confirmed during their panel meeting. The MKD Panel was made up of 10 members, including one panellist from outside New Zealand.

In accordance with the processes set out in the Guidelines, the MKD Panel:

- managed conflicts of interest
- calibrated preliminary scores
- where appropriate or required by the Guidelines, incorporated holistic judgements in awarding final Quality Categories.

Key information

The MKD Panel awarded funded Quality Categories to 174.87 EPs as part of the assessment process. Table 1 shows EPs awarded funded Quality Categories by the MKD Panel.

Table 1: EPs awarded funded Quality Categories by the MKD Panel

QUALITY CATEGORY	EPs (FTE WEIGHTED)	PERCENTAGE PER QUALITY CATEGORY
A	26.12	14.9%
B	59.12	33.8%
C	64.57	36.9%
C(NE)	25.06	14.3%
TOTAL	**174.87**	

There was an overall increase of 39.0% in the number of EPs awarded a funded Quality Category between 2012 (125.83 EPs) and 2018 (174.87 EPs).

Researcher participation

Of the researchers submitting to the MKD Panel in 2018, 58.0% were women and 42.0% were men; there was little change from these percentages from 2012 which were 58.6% and 41.4%, respectively.

Only 15.5% of researchers were aged under 40, with 84.5% aged over 40.

Most researchers (88.6%) identified as Māori and 89.8% of researchers were employed full-time.

Summary of the assessment process

Assignment

The Chair undertook the assignment process with consideration for institutional conflicts of interest, iwi affiliations, subject-area expertise, consideration for the need to assess EPs and outputs submitted in te reo Māori, and the workloads of the 10 panellists. Conflicts were managed by assigning EPs to panellists at other institutions, including to the international panellist. EPs were assigned to at least one panellist with specialties in the subject area where possible.

Individual assessment

On average, each panellist was involved in the preliminary assessment of approximately 45 EPs as either the lead or second assessor, including 78 EPs cross-referred from other panels.

The MKD Panel set a target of 100.0% of nominated research outputs (NROs) to be examined. The MKD Panel examined 97.7% of submitted NROs.

Cross-referrals

The following tables show the number of cross-referrals in and out of the MKD Panel. Compared with the 2012 Quality Evaluation round, there was a 135.9% increase in the number of EPs submitted to the MKD Panel as cross-referrals, but a 33.3% decrease in the number accepted.

The Chair accepted and assigned cross-referral requests based on the research aligning with the criteria outlined in the *Māori Knowledge and Development Panel-Specific Guidelines*, the expertise of the primary panel to assess the EP, and the expertise available in the MKD Panel. Between 2012 and 2018 the proportions of the underlying subject areas of cross-referred EPs shifted substantially. In 2012, 45.0% of accepted cross-referrals came from the Creative and Performing Arts and Education panels, dropping to 16.7% in 2018. Instead, the Biological Sciences and Medicine and Public Health panels comprised 32.1% of accepted cross-referrals in 2018.

The MKD Panel accepted 19 EPs cross-referred from the Medicine and Public Health Panel. These EPs represent 1.6% of the Medicine and Public Health Panel's EPs and comprised 24.4% of the MKD Panel's accepted cross-referrals, the greatest proportion of any panel. The EPs cross-referred to the MKD Panel contributed to the field of Public Health, indicating that this field has reached an understanding of the relevance of Māori knowledge to research.

Table 2: Number of cross-referred EPs assessed by the MKD Panel

PRIMARY PANEL	SUBJECT AREA	# OF EPs
Biological Sciences	Ecology, Evolution and Behaviour	6
Business and Economics	Economics; Management, Human Resources, Industrial Relations, International Business and Other Business; and Marketing and Tourism	11
Creative and Performing Arts	Music, Literary Arts and Other Arts; Theatre and Dance, Film and Television and Multimedia; and Visual Arts and Crafts	6
Education	Education	7
Engineering, Technology and Architecture	Architecture, Design, Planning, Surveying; and Engineering and Technology	13
Health	Nursing	2
Humanities and Law	History, History of Arts, Classics and Curatorial Studies; and Law	4
Medicine and Public Health	Biomedical; Clinical Medicine; and Public Health	19
Physical Sciences	Chemistry and Earth Sciences	2
Social Sciences and Other Cultural/Social Studies	Human Geography; Political Science, International Relations and Public Policy; Psychology; and Sociology, Social Policy, Social Work, Criminology and Gender Studies	8
TOTAL		**78**

Note: not FTE weighted.

Table 3: Number of EPs cross-referred from the MKD Panel to another panel

CROSS-REFERRAL PANEL	# OF EPs
Pacific Research	3
TOTAL	**3**

Note: not FTE weighted.

Cross-referrals caused significant challenges for the MKD Panel during the assignment and assessment phases. Underestimating the volume of cross-referrals in relation to previous years created additional work for the Chair and panellists.

Panel assessment

The MKD Panel met from 26 to 28 November 2018 in Wellington.

The MKD Panel managed actual and perceived conflicts of interest during the meeting in accordance with the Guidelines and panel processes. The conflicts of interest the panellists identified in the PBRF IT System before the panel meeting were included in the assessment run sheets, along with the appropriate action. The MKD Panel managed conflicts of interest during the meeting in the following ways:

- panellists did not participate in the discussion of EPs with a declared conflict of interest
- panellists did not participate in the discussion of EPs from their own TEOs
- panellists left the room during discussion of a close family member's EP or of the panellist's own EP
- the Deputy Chair led the meeting when EPs from the Chair's TEO were being reviewed, and the Chair did not participate in these discussions or comment on those EPs.

At no stage did any panellist who had a declared conflict of interest participate in the assessment of an EP for which they were conflicted.

Calibration

Panel calibration was initially achieved through assessment of example EPs as part of panellist training. During the individual assessment phase, each EP was separately assessed by two panellists against the tie-point descriptors. Panellists then discussed their respective scores to reach an agreed preliminary score and then presented their recommendations to the whole panel. This additional step in the process ensured each EP submitted to the panel received greater scrutiny.

At the panel meeting, several EPs that clearly represented each Quality Category were selected for in-depth discussion to ensure accurate calibration across the panel. High-scoring EPs were discussed first to enable the standards of quality research to be preeminent throughout the process. During the panel meeting, reference was made to tie-point descriptors on numerous occasions, for instance, when there were different views about the quality of elements of an EP.

To ensure consistent assessment of the EPs received, the MKD Panel considered calibration as an ongoing exercise through preliminary assessment discussions and during the panel meeting.

Holistic assessment and extraordinary circumstances

All EPs that included extraordinary circumstances (general and/or Canterbury) were included in the holistic assessment stage. Additionally, the MKD Panel undertook a detailed holistic assessment of EPs that had uncommon issues (as defined in the Guidelines) and those on, or close to, the boundaries between Quality Categories.

Following the holistic assessment, two EPs (not FTE weighted) moved up a Quality Category (no EPs moved down a Quality Category at the holistic assessment stage). The two EPs that moved up a Quality Category were identified by the MKD Panel for *detailed* holistic assessment.

For each Quality Category change, the MKD Panel referenced the Quality Category descriptors.

Awarding final Quality Categories

The MKD Panel considered all EPs assigned to it and reached agreement on the final Quality Category for each.

The MKD Panel awarded a Quality Category to 174.87 EPs.

Commentary on the results

Due to its cross-disciplinary coverage, the MKD Panel assessed EPs across a wide range of subject areas where the research and research approaches were based on traditional and contemporary Māori world views.

Overall, the EPs assessed drew on Māori methodologies to various extents. Many of the EPs explicitly presented Mātauranga Māori and Mātauranga Māori methodologies at the core of their work, while others were less explicit.

Between 2012 and 2018, EPs awarded funded Quality Categories by the MKD Panel increased by:

- 118.4% for the A Quality Category
- 41.4% for the B Quality Category
- 38.2% for the C Quality Category
- 12.6% for the C(NE) Quality Category.

Table 4 provides the percentage point variances between 2018 and 2012.

Table 4: Percentage of funded Quality Categories, 2018 and 2012

SUBJECT AREA	YEAR	A	B	C	C(NE)
Māori Knowledge and Development	2018	15.0%	33.8%	36.9%	14.3%
	2012	9.7%	34.1%	38.1%	18.1%
	Variance	+5.3	-0.3	-1.2	-3.8

New and emerging researchers

EPs from new and emerging researchers accounted for 17.2% or 30.06 EPs of awarded funded Quality Categories. This was a small decrease from 18.9% in 2012. Out of the 30.06 new and emerging researcher EPs, 83.4% were awarded a C(NE) Quality Category and 16.6% were awarded a B Quality Category (an increase from 4.3% in 2012).

Researcher profile

This is the first time that the TEC has reported on demographic information for the Quality Evaluation, which has allowed panels to consider trends following the assessment process. The researcher profile percentages in this section are derived from the FTE weighting of EPs that received funded Quality Categories.

Demographic shifts in the EPs assessed were minimal in the 2018 Quality Evaluation. In 2018, 58.0% of EPs the MKD Panel assessed belonged to women, comparable with 58.6% in 2012. Women comprised 71.4% of C(NE) researchers, again representing numbers consistent to 2012. Notably, 55.4% of A Quality Category researchers in 2018 were women, marking a 65.9% increase since 2012 when 33.2% of A Quality Category researchers were women.

Māori researchers comprised 88.6% of those submitting to the MKD Panel in 2018, an increase from 74.5% in 2012.

Only 15.5% of researchers were aged under 40, with 84.5% aged over 40 or unstated, and 89.8% of researchers were employed full-time.

Mathematical and Information Sciences and Technology Panel Report

Purpose of the report

The purpose of this report is to describe and contextualise the outcomes of the Mathematical and Information Sciences and Technology Peer-Review Panel's (MIST Panel's) results, including an overview of the assessment process. It is in two parts:

- summary of the assessment process
- commentary on the results.

MIST Panel members are listed in Appendix 1. MIST Panel recommendations are set out in Appendix 2.

Executive summary

This report summarises the results of the assessment undertaken by the MIST Panel during the PBRF 2018 Quality Evaluation and confirmed during the panel meeting. The MIST Panel was made up of 17 members, including seven panellists from outside New Zealand.

In accordance with the processes set out in the Guidelines, the MIST Panel:

- managed conflicts of interest
- calibrated preliminary scores
- where appropriate or required by the Guidelines, incorporated holistic judgements in awarding final Quality Categories.

Key information

The MIST Panel awarded funded Quality Categories to 526.89 EPs as part of the assessment process. Table 1 shows EPs awarded funded Quality Categories for the whole panel. Table 2 shows EPs awarded funded Quality Categories by subject area.

Table 1: EPs awarded funded Quality Categories by the MIST Panel

QUALITY CATEGORY	EPs (FTE WEIGHTED)	PERCENTAGE PER QUALITY CATEGORY
A	86.90	16.5%
B	220.05	41.8%
C	143.42	27.2%
C(NE)	76.52	14.5%
TOTAL	**526.89**	

Table 2: EPs awarded funded Quality Categories by subject area

SUBJECT AREA	A	B	C	C(NE)	TOTAL
Computer Science, Information Technology, Information Sciences	40.75 (12.2%)	136.44 (41.0%)	104.08 (31.3%)	51.72 (15.5%)	**332.99**
Pure and Applied Mathematics	34.06 (28.1%)	54.35 (44.8%)	18.02 (14.9%)	14.80 (12.2%)	**121.23**
Statistics	12.09 (16.6%)	29.26 (40.3%)	21.32 (29.3%)	10.00 (13.8%)	**72.67**

There was an overall increase of 14.0% in the number of EPs awarded a funded Quality Category between 2012 (462.13 EPs) and 2018 (526.89 EPs). Broken down by subject area, the MIST Panel showed the following trends:

- Pure and Applied Mathematics had the largest percentage of EPs awarded an A Quality Category (28.1%)
- Computer Science, Information Technology and Information Science had the largest percentage of EPs awarded a C(NE) Quality Category (15.5%)
- Computer Science, Information Technology and Information Science had the greatest increase in EPs that received a funded Quality Category, up 22.4% from 2012
- Statistics had a slight increase (0.8%) in EPs that received a funded Quality Category between 2012 and 2018.

Researcher participation

Of the researchers submitting to the MIST Panel in 2018, 22.1% were women, 76.4% were men and 1.5% were other. The percentage of women researchers increased from 19.1% of the total in 2012.

A little under one-third (31.8%) of researchers were aged under 40, with 68.2% aged over 40 or unstated.

Nearly half (49.9%) of researchers identified as European and 94.1% of researchers were employed full-time.

Summary of the assessment process

Assignment

The Chair undertook the assignment process with consideration given to institutional conflicts of interest, subject-area expertise, and maintaining an equal workload among the panel's 17 members.

Conflicts were managed by assigning each EP to panellists at other institutions to the researcher, including assessors from five different international institutions. EPs were assigned to at least one panellist with specialties in the subject area where possible.

Individual assessment

On average, each panellist was involved in the preliminary assessment of approximately 67 EPs as either the lead or second assessor, including EPs cross-referred from other panels.

The MIST Panel set a target of 100.0% of nominated research outputs (NROs) to be examined. The MIST Panel examined 98.5% of submitted NROs.

Cross-referrals

The following tables show the number of cross-referrals in and out of the MIST Panel. Compared with the 2012 Quality Evaluation round, there was a 92.0% decrease in the number of cross-referrals assessed by the MIST Panel. The Chair accepted and assigned cross-referral requests based on the expertise of panellists to assess the EP's subject area.

Three EPs from the MIST Panel were cross-referred to the Pacific Research and Physical Sciences panels. The volume marks a 93.8% decrease from the 2012 Quality Evaluation.

Table 3: Number of cross-referred EPs assessed by the MIST Panel

PRIMARY PANEL	SUBJECT AREA	# OF EPs
Biological Sciences	Ecology, Evolution and Behaviour	1
Creative and Performing Arts	Theatre and Dance; Film and Television and Multimedia	1
Engineering, Technology and Architecture	Architecture, Design, Planning, Surveying	1
Humanities and Law	Law	1
TOTAL		**4**

Note: not FTE weighted.

Table 4: Number of EPs cross-referred from the MIST Panel to another panel

CROSS-REFERRAL PANEL	# OF EPs
Pacific Research	2
Physical Sciences	1
TOTAL	**3**

Note: not FTE weighted.

Panel assessment

The MIST Panel met from 19 to 22 November 2018 in Wellington.

The MIST Panel managed actual and perceived conflicts of interest during the meeting in accordance with the Guidelines and panel processes. The conflicts of interest the panellists identified in the PBRF IT System before the panel meeting were included in the assessment run sheets, along with the appropriate action. The MIST Panel managed conflicts of interest during the meeting in the following ways:

- panellists did not participate in the discussion of EPs with a declared conflict of interest
- panellists did not participate in the discussion of EPs from their own TEOs
- panellists left the room during discussion of a close family member's EP or of the panellist's own EP

- where possible, the Deputy Chair led the meeting when EPs from the Chair's TEO were being reviewed, and the Chair did not participate in these discussions or comment on those EPs.

At no stage did any panellist who had a declared conflict of interest participate in the assessment of an EP for which they were conflicted.

Calibration

Panel calibration was initially achieved through assessment of example EPs as part of panellist training. During the individual assessment phase, each EP was separately assessed by two panellists against the tie-point descriptors. Panellists then discussed their respective scores to reach an agreed preliminary score. Panel-pairs took the comments of the cross-referral panellist into account in their scoring decisions.

At the panel meeting, several EPs that clearly represented each Quality Category were selected for in-depth discussion to ensure accurate calibration across the panel. High-scoring EPs were discussed first to enable the standards of quality research to be preeminent throughout the process. During the panel meeting, reference was made to tie-point descriptors on numerous occasions, for instance, when there were different views about the quality of elements of an EP.

To ensure consistent assessment of the EPs received, the MIST Panel considered calibration as an ongoing exercise through preliminary assessment discussions and during the panel meeting.

Holistic assessment and extraordinary circumstances

All EPs that included extraordinary circumstances (general and/or Canterbury) were included in the holistic assessment stage. Additionally, the MIST Panel undertook a detailed holistic assessment of EPs that had uncommon issues (as defined in the Guidelines) and those on, or close to, the boundaries between Quality Categories.

Following the holistic assessment, five EPs (not FTE weighted) moved up a Quality Category (no EPs moved down a Quality Category at the holistic assessment stage). This included:

- one EP identified by the panel for *detailed* holistic assessment
- four EPs claiming extraordinary circumstances.

For each Quality Category change, the MIST Panel referenced the Quality Category descriptors.

Awarding final Quality Categories

The MIST Panel considered all EPs assigned to it and reached agreement on the final Quality Category for each.

The MIST Panel awarded a funded Quality Category to 526.89 EPs.

Commentary on the results

Overall, 2018 results for the MIST Panel indicate an improvement over previous Quality Evaluation rounds. The MIST Panel was responsible for three distinct subject areas: Pure and Applied Mathematics; Computer Science, Information Technology, Information Sciences; and Statistics. As is evident in Table 5 below there was variation across the subject areas between the 2012 and 2018 Quality Evaluations.

Table 5: Percentage of EPs awarded funded Quality Categories by subject area, 2018 and 2012

SUBJECT AREA	YEAR	A	B	C	C(NE)
Computer Science, Information Technology, Information Sciences	2018	12.2%	41.0%	31.3%	15.5%
	2012	8.5%	41.6%	39.4%	10.6%
	Variance	+3.7	-0.6	-8.1	+4.9
Pure and Applied Mathematics	2018	28.1%	44.8%	14.9%	12.2%
	2012	26.5%	42.2%	23.7%	7.6%
	Variance	+1.6	+2.6	-8.8	+4.6
Statistics	2018	16.6%	40.3%	29.3%	13.8%
	2012	16.6%	39.7%	29.1%	14.6%
	Variance	0.0	+0.6	+0.2	-0.8

Overall, the 2018 results indicate:

- There continue to be clear strengths in both Pure and Applied Mathematics, where 72.9% of EPs were awarded either an A or B Quality Category, a figure that has increased when compared to 2012 (68.7%).
- There were small percentage increases in the number of A and B Quality Categories awarded in both Statistics (56.9% up from 56.3% in 2012) and Computer Science, Information Technology, Information Sciences (53.2% up from 50.0% in 2012).
- As in 2012, there were many outstanding examples of world-class research being done in New Zealand.

In 2018, there were almost three times as many EPs in the subject area of Computer Science, Information Technology, Information Sciences as there were in Pure and Applied Mathematics, which had nearly twice as many as Statistics. Part of this asymmetry may be due to the breadth of topics covered by the three subject areas. Statistics is reasonably clear cut – recognising the two primary threads of applied and theoretical work. Pure and Applied Mathematics covers a range of topics. Computer Science, Information Technology, Information Sciences is different, as it embraces the three discrete but interrelated foci of its designation, which each have theoretical and applied strands plus an intersection with the more technical aspects of business-related endeavours.

The MIST Panel noted that EPs in the new subject area of Data Science were submitted in 2018. Data Science is a fast-emerging science, and, within a few years, it will be necessary to decide about its future placement in the Quality Evaluation.

The concern raised in 2012 about succession planning in Pure and Applied Mathematics now needs to be made more strongly, as it is evident that there is a growing proportion of mathematicians who are still working beyond 65 and who will retire in due course. Many of these in the 2018 Quality Evaluation had EPs that were awarded A or B Quality Categories. There is a real danger that the world-class strengths of New Zealand Pure and Applied Mathematics will be lost if succession planning actions are not taken quickly.

It is particularly satisfying that the considerable investment into Computer Science, Information Technology, Information Sciences after the 2006 Quality Evaluation is paying dividends. The pace of improved productivity has accelerated during the six years from 2012 to 2018, compared with the period from 2006 to 2012.

New and emerging researchers

EPs from new and emerging researchers accounted for 18.6% (or 98.12) of awarded funded Quality Categories. Out of the 98.12 new and emerging researcher EPs, 78.0% were awarded a C(NE) Quality

Category. In addition, 2.0% were awarded an A Quality Category and 20.0% were awarded a B Quality Category. The results highlighted significant depth in new and emerging researchers across the subject areas.

The distribution of A and B Quality Categories awarded to new and emerging researchers was different within each of the subject areas: 19.3% of new and emerging researchers were awarded funded Quality Categories in Computer Science, Information Technology, Information Sciences, and of those, 19.6% received an A or B Quality Category (12.60); 17.2% of new and emerging researchers were awarded funded Quality Categories in Pure and Applied Mathematics, and of those, 28.8% received a B Quality Category (6.00); and 17.9% of new and emerging researchers were awarded funded Quality Categories in Statistics, and of those, 23.1% received a B Quality Category (3.00).

Pure and Applied Mathematics had the smallest proportion of new and emerging researchers across the MIST Panel but the largest percentage of those who met the criteria for the award of a B Quality Category. Interestingly, the proportion of new and emerging researchers in Pure and Applied Mathematics awarded this Quality Category decreased by 25.0% between 2012 and 2018, while the C(NE) Quality Category for this subject increased. Taken with the ageing demographic of many researchers whose EPs were awarded an A or B in Pure and Applied Mathematics, this could suggest a change in the distribution of Quality Categories in future Quality Evaluations.

Māori research

The MIST Panel had no cross-referrals assessed by the Māori Knowledge and Development Panel in 2018. That is not to say that EPs assessed by the MIST Panel did not include any reference to or use of Māori methodologies or paradigms. It does indicate that the EPs did not include these to a sufficient degree to meet the criteria for a cross-referral.

Pacific research

The Pacific Research Panel accepted two EPs cross-referred from the MIST Panel. These EPs represented 0.4% of the MIST Panel's EPs and comprised 1.8% of the Pacific Research Panel's accepted cross-referrals.

The EPs cross-referred to the Pacific Research Panel contributed to the field of Computer Science, Information Technology, Information Sciences and represent research focused and localised to Pacific communities.

Researcher profile

This is the first time that the TEC has reported on demographic information for the Quality Evaluation, which has allowed panels to consider trends following the assessment process. The researcher profile percentages in this section are derived from the FTE weighting of EPs that received funded Quality Categories.

Several demographic shifts in the MIST Panel can be perceived in the 2018 Quality Evaluation. In 2018, 22.1% of EPs awarded a funded Quality Category belonged to women, a slight increase from 19.1% in 2012 and 18.0% in 2006. Proportionately, women researchers were more likely to be awarded C and C(NE) Quality Categories (26.9% and 25.2%, respectively) compared to A and B Quality Categories (15.4% and 20.5%, respectively).

Across all the panels, there were slightly higher numbers of new and emerging women researchers than men. In the MIST Panel, however, women comprised only 24.7% of the new and emerging researchers. This is a slight decrease from 25.1% of all new and emerging researchers in MIST in 2012.

Māori and Pacific researchers comprised 0.2% and 1.1%, respectively, of those submitting to the MIST Panel in 2018. This number represents a decrease of Māori researchers (1.1% in 2012), but an increase in Pacific researchers (0.9% in 2012), suggesting researchers continued to submit research to the MIST Panel instead of the inaugural Pacific Research Panel in 2018.

A little under one-third (31.8%) of researchers were aged under 40, with 68.2% aged over 40 or unstated.

Almost half (49.9%) of researchers identified as European and 94.1% of researchers were employed full-time.

Medicine and Public Health Panel Report

Purpose of the report

The purpose of this report is to describe and contextualise the outcomes of the Medicine and Public Health Peer-Review Panel's (MEDPH Panel's) results, including an overview of the assessment process. It is in two parts:

- summary of the assessment process
- commentary on the results.

MEDPH Panel members are listed in Appendix 1. MEDPH Panel recommendations are set out in Appendix 2.

Executive summary

This report summarises the results of the assessment undertaken by the MEDPH Panel during the PBRF 2018 Quality Evaluation and confirmed during the panel meeting. The MEDPH Panel was made up of 32 members, including four panellists from outside of New Zealand.

In accordance with the processes set out in the Guidelines, the MEDPH Panel:

- managed conflicts of interest
- calibrated preliminary scores
- where appropriate or required by the Guidelines, incorporated holistic judgements in awarding final Quality Categories.

Key information

The MEDPH Panel awarded funded Quality Categories to 1,016.88 EPs as part of the assessment process. Table 1 shows EPs awarded funded Quality Categories for the whole panel. Table 2 shows EPs awarded funded Quality Categories by subject area.

Table 1: EPs awarded funded Quality Categories by the MEDPH Panel

QUALITY CATEGORY	EPs (FTE WEIGHTED)	PERCENTAGE PER QUALITY CATEGORY
A	151.62	14.9%
B	361.51	35.6%
C	296.62	29.2%
C(NE)	207.13	20.4%
TOTAL	**1,016.88**	

Table 2: EPs awarded funded Quality Categories by subject area

SUBJECT AREA	A	B	C	C(NE)	TOTAL
Biomedical	64.25 (13.7%)	161.89 (34.4%)	120.17 (25.5%)	124.47 (26.4%)	**470.78**
Clinical Medicine	50.00 (20.9%)	93.44 (39.0%)	70.49 (29.4%)	25.86 (10.8%)	**239.79**
Public Health	37.37 (12.2%)	106.18 (34.7%)	105.96 (34.6%)	56.80 (18.5%)	**306.31**

There was an overall increase of 40.8% in the number of EPs awarded a funded Quality Category between 2012 (722.36 EPs) and 2018 (1,016.88 EPs). By subject area, the MEDPH Panel showed the following trends:

- Clinical Medicine had the largest percentage of EPs awarded an A Quality Category (20.9%), while Biomedical had the largest percentage of EPs awarded a C(NE) Quality Category (26.4%)
- Biomedical had the greatest increase in EPs awarded funded Quality Categories, a 64.5%[3] increase between 2012 and 2018
- Public Health had considerable growth in EPs awarded funded Quality Categories, 29.2%, between 2012 and 2018
- Clinical Medicine had the smallest increase (19.3%) in EPs awarded funded Quality Categories in the three subject areas.

Researcher participation

Of the researchers submitting to the MEDPH Panel in 2018, 51.1% were women, 48.6% were men and 0.3% were other.

A little under one-third (29.7%) of researchers were aged under 40, with 70.3% aged over 40 or unstated.

Most researchers (63.0%) identified as European and 75.0% of researchers were employed full-time.

Summary of the assessment process

Assignment

The Chair undertook the assignment process with consideration of institutional conflicts of interest, which would inevitably be greater for the MEDPH Panel than for other panels, with 21 of 32 panellists affiliated with one of New Zealand's two medical schools, at the University of Auckland and the University of Otago. Conflicts were managed by assigning EPs to panellists at other New Zealand and international institutions, or at minimum to panellists located at different campuses and departments. EPs were assigned to at least one panellist with specific expertise in the subject area where possible.

Individual assessment

On average, each panellist was involved in the preliminary assessment of approximately 77 EPs as either the lead or second assessor, including five EPs cross-referred from other panels.

[3] Note this percentage does not include the one EP assessed by the Health Panel. The Biomedical EP assessed by the Health Panel was cross-referred to the MEDPH Panel.

The MEDPH Panel set a target of 50.0% of nominated research outputs (NROs) to be examined. The MEDPH Panel surpassed this target, examining 93.8% of submitted NROs.

Cross-referrals

The following tables show the number of cross-referrals in and out of the MEDPH Panel. Compared with the 2012 Quality Evaluation round, there was a 91.8% decrease in the number of cross-referrals assessed by the MEDPH Panel. The Chair accepted and assigned cross-referral requests based on the expertise of panellists to assess the EP's subject area.

Thirty EPs from the MEDPH Panel were cross-referred to the Māori Knowledge and Development or Pacific Research panels.

Table 3: Number of cross-referred EPs assessed by the MEDPH Panel

PRIMARY PANEL	SUBJECT AREA	# OF EPs
Education	Education	2
Health	Pharmacy; Biomedical	2
Humanities and Law	Philosophy	1
TOTAL		**5**

Note: not FTE weighted.

Table 4: Number of EPs cross-referred from the MEDPH Panel to another panel

CROSS-REFERRAL PANEL	# OF EPs
Māori Knowledge and Development	19
Pacific Research	11
TOTAL	**30**

Note: not FTE weighted.

Panel assessment

The MEDPH Panel met from 3 to 7 December in Wellington.

The MEDPH Panel managed actual and perceived conflicts of interest during the meeting in accordance with the Guidelines and panel processes. The conflicts of interest the panellists identified in the PBRF IT System before the panel meeting were included in the assessment run sheets, along with the appropriate action. The MEDPH Panel managed conflicts of interest during the meeting in the following ways:

- panellists did not participate in the discussion of EPs with a declared conflict of interest
- panellists left the room during discussion of a close family member's EP or the panellist's own EP
- the Deputy Chair led the meeting when EPs from the Chair's colleagues were being reviewed, and the Chair did not participate in these discussions or comment on those EPs.

At no stage did any panellist who had a declared conflict of interest participate in the assessment of an EP for which they were conflicted.

Calibration

Panel calibration was initially achieved through assessment of example EPs as part of panellist training. During the individual assessment phase, each EP was separately assessed by two panellists against the tie-point descriptors. Panellists then discussed their respective scores to reach an agreed preliminary score. Panel-pairs took the comments of the cross-referral panellist into account in their scoring decisions.

High-scoring EPs were discussed first to enable the standards of quality research to be preeminent throughout the process. The MEDPH Panel ran its meeting by separating into discussion groups of three to four panellists to review the preliminary scores assigned to each EP. Each discussion group then presented their recommendations to the whole panel at the panel meeting, which either endorsed the discussion group recommendation, or discussed the scoring further until a decision on the calibrated scoring was reached. This additional step in the process ensured each EP received thorough scrutiny despite the high volume of EPs dealt with by the MEDPH Panel.

To ensure consistent assessment of the EPs received, the MEDPH Panel considered calibration as an ongoing exercise through preliminary assessment discussions and during the panel meeting.

Holistic assessment and extraordinary circumstances

All EPs that included extraordinary circumstances (general and/or Canterbury) were included in the holistic assessment stage. Additionally, the MEDPH Panel undertook a detailed holistic assessment of EPs that had uncommon issues (as defined in the Guidelines) and those on, or close to, the boundaries between Quality Categories.

Following the holistic assessment, 16 EPs (not FTE weighted) moved up a Quality Category (no EPs moved down a Quality Category at the holistic assessment stage). This included:

- seven EPs identified by the panel for *detailed* holistic assessment
- nine EPs claiming extraordinary circumstances.

For each Quality Category change, the MEDPH Panel referenced the Quality Category descriptors.

Awarding final Quality Categories

The MEDPH Panel considered all EPs assigned to it and reached agreement on the final Quality Category for each.

The MEDPH Panel awarded a funded Quality Category to 1,016.88 EPs.

Commentary on the results

The number of EPs awarded a funded Quality Category for the MEDPH Panel increased 40.8% from 2012, indicating an expansion of the workforce in this area. Increases above 2012 levels were 64.1% for Biomedical, 20.0% for Clinical Medicine and 29.2% for Public Health.

Overall, Biomedical was the largest subject area (46.4% of EPs), followed by Public Health (30.1% of EPs) and Clinical Medicine (23.6% of EPs). In 2012, Biomedical accounted for 39.6% of EPs, while Clinical Medicine and Public Health were 27.6% and 32.8%, respectively.

Overall, the awarding of funded Quality Categories by subject area indicates the following:

- The number of EPs that received C and C(NE) Quality Categories doubled for Biomedical, suggesting that the expansion in that discipline was mainly in new and emerging staff. Some of this expansion could be technical staff entering the PBRF for the first time, but data addressing this are not available.
- The fall in the percentage of EPs awarded an A Quality Category within the Biomedical subject area may be accounted for by the increase in EPs awarded a C Quality Category. The number of EPs awarded a Quality Category in the Biomedical subject area increased by 24.9%.
- The percentage of EPs awarded an A Quality Category in Clinical Medicine and Public Health increased by 26.4% and 37.4%, respectively.

Table 5 illustrates the variation in the proportion of funded Quality Categories between the two most recent Quality Evaluation rounds.

Table 5: Percentage of EPs awarded funded Quality Categories by subject area, 2018 and 2012

SUBJECT AREA	YEAR	A	B	C	C(NE)
Biomedical	2018	13.6%	34.3%	25.5%	26.4%
	2012	17.9%	40.5%	19.8%	21.8%
	Variance	-4.3	-6.2	+5.7	+4.6
Clinical Medicine	2018	20.9%	39.0%	29.4%	10.8%
	2012	19.8%	41.3%	30.9%	8.0%
	Variance	+1.1	-2.3	-1.5	+2.8
Public Health	2018	12.2%	34.7%	34.6%	18.5%
	2012	11.5%	35.6%	27.4%	25.5%
	Variance	+0.7	-0.9	+7.2	-7.0

New and emerging researchers

EPs from new and emerging researchers accounted for 22.3% (or 227.49) of awarded funded Quality Categories. This is like 2012 when 22.3% of EPs awarded a funded Quality Category were from new and emerging researchers. Out of the 227.49 new and emerging researcher EPs, 91.1% were awarded a C(NE) Quality Category. In addition, 0.4% were awarded an A Quality Category and 8.5% were awarded a B Quality Category.

Nearly two-fifths (or 7.34) of EPs awarded a B Quality Category to new and emerging researchers were in Public Health, despite this subject area having only 28.2% of new and emerging EPs. The proportion of new and emerging Public Health EPs decreased by 5.0% between 2012 and 2018, suggesting a decrease in the number, but not quality, of public health scholarship by new and emerging researchers. Comparatively, in 2018, 58.2% of new and emerging researcher EPs awarded a funded Quality Category were in Biomedical (6.0% of these were awarded a B) and 13.6% in Clinical Medicine (16.3% of these were awarded an A or B).

Māori research

The Māori Knowledge and Development Panel accepted 19 EPs cross-referred from the MEDPH Panel. These EPs represented 1.6% of the MEDPH Panel's EPs and comprised 24.4% of the Māori Knowledge and Development Panel's accepted cross-referrals, the greatest proportion of any panel. The EPs cross-referred to the Māori Knowledge and Development Panel contributed to the field of Public Health, indicating the prominence of Māori world views and methodologies in this research area.

Pacific research

The Pacific Research Panel accepted 11 EPs cross-referred from the MEDPH Panel. These EPs represented 0.9% of the MEDPH Panel's EPs and comprised 9.8% of the Pacific Research Panel's accepted cross-referrals. The EPs cross-referred to the Pacific Research Panel contributed to the field of Public Health and highlight the importance of focused and localised health research to Pacific communities.

Researcher profile

This is the first time that the TEC has reported on demographic information for the Quality Evaluation, which has allowed panels to consider trends following the assessment process. The

researcher profile percentages in this section are derived from the FTE weighting of EPs that received funded Quality Categories.

Several demographic shifts in the MEDPH Panel can be perceived in the 2018 Quality Evaluation. In 2018, 51.1% of EPs the MEDPH Panel assessed belonged to women researchers, an increase from 42.7% in 2012 and from 36.4% in 2006. In this current round, women comprised 67.5% of C(NE) Quality Category, and 64.6% of Public Health researchers. Men comprised 71.1% of A Quality Category researchers and 63.3% of Clinical Medicine researchers. The age and seniority of women submitting to the MEDPH Panel (66.2% were under 50, compared to 48.3% of men) suggests the proportion of A, B, and C Quality Categories awarded to EPs of women researchers may increase in any subsequent Quality Evaluations.

Māori and Pacific researchers comprised 3.6% and 1.7%, respectively, of those submitting to the MEDPH Panel in 2018. This number represents a small increase of Māori researchers (3.0% in 2012). The decrease of Pacific researchers since 2012, from 2.5%, might be attributable to researchers instead submitting to the inaugural Pacific Research Panel in 2018.

Under one-third (29.7%) of researchers were aged under 40, with 70.3% aged over 40 or unstated, and 75.0% of researchers were employed full-time.

Pacific Research Panel Report

Purpose of the report

The purpose of this report is to describe and contextualise the outcomes of the Pacific Research Peer-Review Panel's (Pacific Panel's) results, including an overview of the assessment process. It is in two parts:

- summary of the assessment process
- commentary on the results.

Pacific Panel members are listed in Appendix 1. Pacific Panel recommendations are set out in Appendix 2.

Executive summary

This report summarises the results of the assessment undertaken by the inaugural Pacific Panel during the PBRF 2018 Quality Evaluation and confirmed during the panel meeting. The Pacific Panel was made up of nine members, including two panellists from outside of New Zealand.

In accordance with the processes set out in the Guidelines, the Pacific Panel:

- managed conflicts of interest
- calibrated preliminary scores
- where appropriate or required by the Guidelines, incorporated holistic judgements in awarding final Quality Categories.

Key information

The Pacific Panel awarded funded Quality Categories to 54.61 EPs as part of the assessment process. Table 1 shows EPs awarded funded Quality Categories by the Pacific Panel.

Table 1: EPs awarded funded Quality Categories by the Pacific Panel

QUALITY CATEGORY	EPs (FTE WEIGHTED)	PERCENTAGE PER QUALITY CATEGORY
A	5.61	10.3%
B	23.70	43.4%
C	15.80	28.9%
C(NE)	9.50	17.4%
TOTAL	**54.61**	

The Pacific Panel also provided 112 cross-referral assessments to other panels with the largest volume coming from the Social Sciences and Other Cultural/Social Studies Panel.

Researcher participation

Of the researchers submitting to the Pacific Panel in 2018, 71.1% were women, 27.1% were men and 1.8% were other.

Almost one-fifth (18.3%) of researchers were aged under 40, with 81.7% aged over 40 or unstated.

Most researchers (71.8%) identified as Pacific and 93.4% of researchers were employed full-time.

Summary of the assessment process

Establishment of the Pacific Research Panel

The original 2002 Performance-Based Research Fund Working Group identified that the PBRF needed to fully recognise quality in Pacific research and contribute to the development of Pacific research capability.

A Pacific Advisory Group developed guidelines on Pacific research, which were included in the PBRF's general guidelines. In the 2003 and 2006 rounds, members of this Advisory Group were appointed as specialist advisors to provide additional input on Pacific research as required. An Expert Advisory Group (EAG) was established to focus on Pacific research in the 2012 round.

Following the 2012 Quality Evaluation, the EAG noted that 88 of the 131 EPs the group considered during this round could have been assigned to a Pacific Research Panel as their primary panel. Considering this, the EAG recommended that consideration be given to establishing such a panel, and in 2015 this proposal was supported by the PBRF Sector Reference Group, leading to the establishment of the current Pacific Panel.

The establishment of the Pacific Panel provides an opportunity to increase the understanding and credibility of this interdisciplinary research field within the tertiary education sector and recognises the importance of research that is based on Pacific research methodologies and methods, which involves Pacific-centred subject matter, and/or which impacts on Pacific communities. The Pacific Panel recognises the importance of Pacific research pedagogies and ensures that the impacts and outcomes of Pacific research are assessed by a researcher's peers.

This is the outcome of more than a decade of analysis and planning, and a major step forward to ensuring that the contribution of Pacific research to the breadth and diversity of research excellence in New Zealand is recognised and encouraged. The Pacific Panel extends its thanks to all those involved in the spirit and the detail of the establishment and continued advancement of Pacific research within New Zealand's PBRF system.

In appointing the Pacific Panel's membership, a variety of factors were considered, including scholarly expertise, ancestral links to Pacific nations and language competencies. In determining Pacific Panel membership, we also aimed for gender balance, diverse representation across both senior and emerging researchers, and New Zealand and international researchers from a range of domestic and overseas institutions.

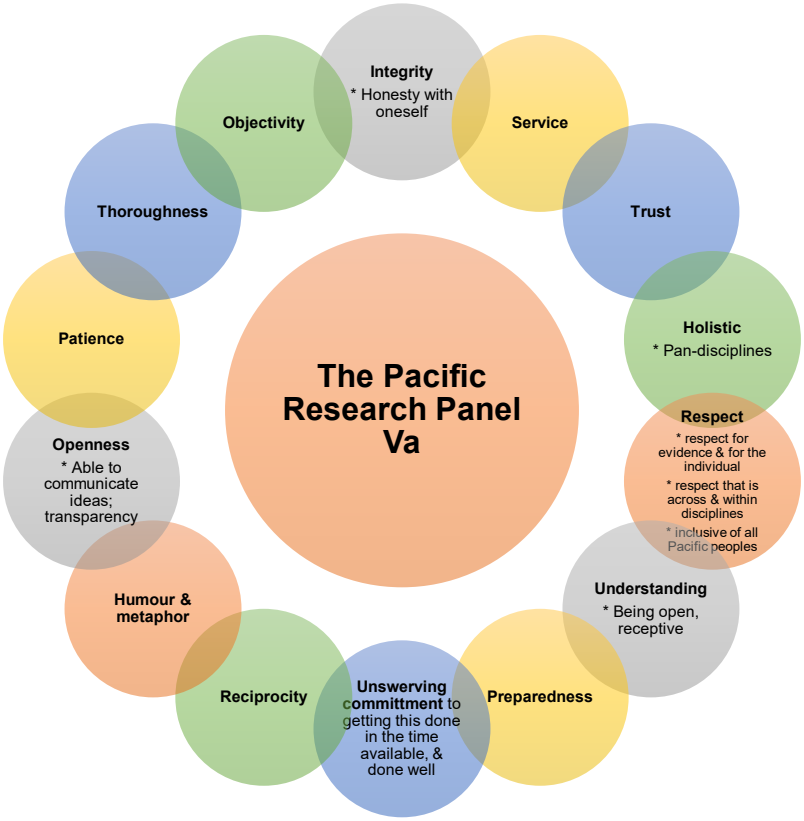
The Pacific Panel's work was underpinned by their va, the principles and practices they created to collectively work together.

Pacific Research Panel Va

Vision

Lifting Pacific research to new levels

Transforming – Embracing the diversity of disciplines –
Pacific research belonging with the very best, nationally and globally



Relationships

TEC – Pacific Research Panel – EPs – Individual researcher – PBRF Panels

Assignment

The Chair assigned EPs to panellists for assessment based on subject-matter expertise and diversity of input. The Deputy Chair was consulted during this process. Each EP was assigned to a lead and second assessor. All identified conflicts of interest were managed throughout this process and no EP was assigned to a lead assessor working within the same academic unit of the same institution.

Individual assessment

On average, each panellist was involved in the preliminary assessment of approximately 25 EPs, including cross-referrals.

The Pacific Panel set a target of 100.0% of nominated research outputs (NROs) to be examined. The Pacific Panel examined 98.7% of NROs.

Cross-referrals

The Pacific Panel provided assessment to 112 cross-referred EPs. An EP could be nominated for cross-referral and was accepted for assessment if the Chair judged that it:

- was based on Pacific research methodologies and methods
- involved Pacific-centred subject matter
- impacted on Pacific communities.

The following table shows the number of cross-referrals accepted and assessed by the Pacific Panel. The Pacific Panel's combined primary assessments and cross-referral assessments represent a 26% increase in total submissions compared to the total EPs (131) assessed by the Pacific Research Expert Advisory Group in 2012.

No EPs were cross-referred by the Pacific Research Panel to another panel.

Table 2: Number of cross-referred EPs assessed by the Pacific Panel

PRIMARY PANEL	SUBJECT AREA	# OF EPs
Biological Sciences	Agriculture and Other Applied Biological Sciences; Ecology, Evolution and Behaviour; and Molecular, Cellular and Whole Organism Biology	4
Business and Economics	Accounting and Finance; Economics; Management, Human Resources, Industrial Relations, International Business and Other Business; and Marketing and Tourism	9
Creative and Performing Arts	Design; Music, Literary Arts and Other Arts; Theatre and Dance; Film and Television and Multimedia; and Visual Arts and Crafts	13
Education	Education	10
Engineering, Technology and Architecture	Architecture, Design, Planning, Surveying; and Engineering and Technology	4
Health	Nursing; and Other Health Studies (including Rehabilitation Therapies)	2
Humanities and Law	Foreign Languages and Linguistics; History, History of Arts, Classics and Curatorial Studies; Law; and Religious Studies and Theology	12
Māori Knowledge and Development	Māori Knowledge and Development	3
Mathematical and Information Sciences and Technology	Computer Science, Information Technology, Information Sciences	2
Medicine and Public Health	Biomedical; Clinical Medicine; and Public Health	11
Physical Sciences	Chemistry; and Earth Sciences	2

Social Sciences and Other Cultural/Social Studies	Anthropology and Archaeology; Communications, Journalism and Media Studies; Human Geography; Political Science, International Relations and Public Policy; Psychology; and Sociology, Social Policy, Social Work, Criminology and Gender Studies	40
TOTAL		**112**

Note: not FTE weighted.

The Pacific Panel notes that the *Pacific Research Panel-Specific Guidelines* state "the Pacific Research Panel will evaluate all EPs where there is evidence of research that reflects any or all of the following: is based on Pacific research methodologies and methods; involves Pacific-centred subject matter; impacts on Pacific communities." Considering this, it was expected that all such EPs would be submitted to the Pacific Panel as primary panel; however, in this Quality Evaluation many of the EPs received which contained Pacific-centred subject matter or which impacted on Pacific communities were received by the Pacific Panel as cross-referrals rather than as primary panel assignments.

It is hoped that in future Quality Evaluation rounds the Pacific Panel will receive a higher number of primary submissions based on an increased understanding of the Pacific Panel's areas of expertise and remit. Recommendations about this are provided in Appendix 2.

Panel assessment

The Pacific Panel met from 20 to 22 November 2018 in Wellington.

The Pacific Panel managed actual and perceived conflicts of interest during the meeting in accordance with the Guidelines and panel processes. The conflicts of interest the panellists identified in the PBRF IT System before the panel meeting were included in the assessment run sheets, along with the appropriate action. The Pacific Panel managed conflicts of interest during the meeting in the following ways:

- panellists did not participate in the discussion of EPs with a declared conflict of interest
- panellists did not participate in the discussion of EPs from their own TEOs
- panellists left the room during discussion of a close family member's EP or the panellist's own EP
- the Deputy Chair led the meeting when EPs from the Chair's former TEO were being reviewed, and the Chair did not participate in these discussions or comment on those EPs.

At no stage did any panellist who had a declared conflict of interest participate in the assessment of an EP for which they were conflicted.

Calibration

Panel calibration was initially achieved through assessment of example EPs as part of panellist training. As part of the individual assessment, each EP was separately assessed by two panellists against the tie-point descriptors. Panellists then discussed their respective scores to reach an agreed preliminary score. When the Pacific Panel convened for the panel meeting, EPs were selected based on their preliminary scores as exemplars from a range of indicative Quality Categories and used for an initial calibration exercise. High-scoring EPs were discussed first to enable the standards of quality research to be preeminent throughout the process.

To ensure consistent assessment of the EPs received, the Pacific Panel considered calibration as an ongoing exercise through preliminary assessment discussions and during the panel meeting.

Holistic assessment and extraordinary circumstances

All EPs that included extraordinary circumstances (general and/or Canterbury) were included in the holistic assessment stage. Additionally, the Pacific Panel undertook a detailed holistic assessment of

EPs that had uncommon issues (as defined in the Guidelines) and those on, or close to, the boundaries between Quality Categories.

Following the holistic assessment, one EP moved up a Quality Category (no EPs moved down a Quality Category at the holistic assessment stage). The one EP that moved up a Quality Category claimed extraordinary circumstances.

For the EP that received a Quality Category change, the Pacific Panel referenced the Quality Category descriptors.

Awarding final Quality Categories

The Pacific Panel considered all EPs assigned to it and reached agreement on the final Quality Category for each.

The Pacific Panel assessed and awarded a funded Quality Category to 54.61 EPs.

Commentary on the results

The assessments conducted by the Pacific Panel represent the first time the PBRF assessment process has been explicitly applied to research using Pacific methodologies, focusing on Pacific subject matter or impacting upon Pacific communities.

The Pacific Panel welcomed the opportunity to read and assess the submissions provided. These presented the Pacific Panel with unprecedented exposure to a wide range of Pacific research. The panellists noted the high quality, depth and innovation of research drawing on impactful research. Outstanding Pacific research was also found being conducted under the auspices of other panels, in a diverse range of fields.

New and emerging researchers

EPs from new and emerging researchers accounted for 26.6% (or 10.30) of awarded funded Quality Categories. Out of 10.30 new and emerging researchers, 82.5% were awarded a C(NE) Quality Category and 17.5% were awarded a B Quality Category.

The proportion of new and emerging researchers within the Pacific Panel was noticeably higher than the overall proportion across all panels and subject areas (17.8%). This suggests that new Pacific researchers in New Zealand TEOs are increasing and that Pacific Research in New Zealand is growing as a research discipline.

Researcher profile

This is the first time that the TEC has reported on demographic information for the Quality Evaluation, which has allowed panels to consider trends following the assessment process. The researcher profile percentages in this section are derived from the FTE weighting of EPs that received funded Quality Categories.

Among the researchers who attained funded Quality Categories in Pacific Research:

- 52.2% were aged 49 or under
- 71.8% identified their ethnicity as Pacific.

There was a strong predominance, in both the A and B Quality Categories, of researchers aged between 40 and 69. Conversely, younger researchers made up more of the C and C(NE) Quality Categories, with the latter category consisting entirely of researchers aged between 30 and 49.

Pacific ethnicity researchers not only made up most researchers in this field but comprised the entirety (where ethnicity was stated) of both the A and C(NE) Quality Categories.

This suggests that the Pacific research field, as represented by the EPs assigned to the Pacific Panel as primary panel, is currently comprised of both a mature cohort of mainly Pacific ethnicity researchers, and a younger cohort of almost entirely Pacific new and emerging researchers. This outcome may have changed had all EPs with research that is based on Pacific research methodologies and methods, involved Pacific-centred subject matter, and/or had impacts on Pacific communities been submitted to the Pacific Panel as the primary panel.

Most (93.4%) researchers were employed full-time and most (71.1%) were women.

Physical Sciences Panel Report

Purpose of the report

The purpose of this report is to describe and contextualise the outcomes of the Physical Sciences Peer-Review Panel's (PHYSC Panel's) results, including an overview of the assessment process. It is in two parts:

- summary of the assessment process
- commentary on the results.

PHYSC Panel members are listed in Appendix 1. PHYSC Panel recommendations are set out in Appendix 2.

Executive summary

This report summarises the results of the assessment undertaken by the PHYSC Panel during the PBRF 2018 Quality Evaluation and confirmed during the panel meeting. The PHYSC Panel was made up of 14 members, including two panellists from outside of New Zealand.

In accordance with the processes set out in the Guidelines, the PHYSC Panel:

- managed conflicts of interest
- calibrated preliminary scores
- where appropriate or required by the Guidelines, incorporated holistic judgements in awarding final Quality Categories.

Key information

The PHYSC Panel awarded funded Quality Categories to 513.07 EPs as part of the assessment process. Table 1 shows EPs awarded funded Quality Categories for the whole panel. Table 2 shows EPs awarded funded Quality Categories by subject area.

Table 1: EPs awarded funded Quality Categories by the PHYSC Panel

QUALITY CATEGORY	EPs (FTE WEIGHTED)	PERCENTAGE PER QUALITY CATEGORY
A	110.93	21.6%
B	212.99	41.5%
C	83.20	16.2%
C(NE)	105.95	20.7%
TOTAL	**513.07**	

Table 2: EPs awarded funded Quality Categories by subject area

SUBJECT AREA	A	B	C	C(NE)	TOTAL
Chemistry	31.70 (15.1%)	84.15 (40.2%)	44.93 (21.4%)	48.79 (23.3%)	**209.57**
Earth Sciences	47.26 (27.1%)	71.16 (40.8%)	24.95 (14.3%)	31.16 (17.9%)	**174.53**
Physics	31.97 (24.8%)	57.68 (44.7%)	13.32 (10.3%)	26.00 (20.2%)	**128.97**

There was an overall increase of 20.4% in the number of EPs awarded a funded Quality Category between 2012 (426.16 EPs) and 2018 (513.07 EPs). Broken down by subject area, the PHYSC Panel showed the following trends:

- Earth Sciences had the largest percentage of EPs awarded an A Quality Category (27.1%), while Chemistry had the largest percentage of EPs awarded a C(NE) Quality Category (23.3%)
- Physics had the greatest increase in EPs awarded funded Quality Categories, up 23.4% between 2012 and 2018
- Chemistry also had considerable growth in EPs awarded funded Quality Categories, up 21.9%, between 2012 and 2018
- Earth Sciences had the smallest increase in EPs awarded funded Quality Categories across the three subject areas, 18.6%. However, overall it had the highest quality with 67.9% of funded EPs awarded an A or B Quality Category.

Researcher participation

Of the researchers submitting to the Physical Sciences Panel in 2018, 27.1% were women, 72.5% were men and 0.4% were other.

A little over one-third (35.5%) of researchers were aged under 40, with 64.5% aged over 40.

Most researchers (68.3%) identified as European and 91.0% of researchers were employed full-time.

Acknowledgement of Professor Keith Hunter

In late October 2018, PHYSC Panel Chair Professor Keith Hunter died unexpectedly. For the first part of the First Moderation Panel Meeting and PHYSC Panel meeting commemoration and reflection sessions were held to acknowledge the crucial role that Professor Hunter played on the PHYSC Panel and his wider contribution to research across Aotearoa New Zealand and the world.

Following Professor Hunter's death, panellist Professor Shane Cronin was appointed to the role of Chair.

Summary of the assessment process

Assignment

In general, the Chair allocated EPs according to panellist expertise (ensuring that at least one member of a panel-pair had relevant expertise when possible) and conflict of interest management. The Chair assigned himself as a panel-pair to each panellist for at least one EP to assist in cross-panel calibration.

The assignment process was undertaken with knowledge of initially stated conflicts of interest. As additional conflicts were identified by panel members after assignment, these were immediately re-assigned to other panel members.

The general principle in the PHYSC Panel was to allocate EPs with lead assessors in the appropriate subject area groups. However, to ensure consistency of evaluation across the PHYSC Panel, cross-assignment of EPs to a secondary panellist in a different field was carried out for over 20% of EPs.

Following Professor Hunter's death, EPs assigned to him were reassigned if scoring had not been completed. If scoring had been agreed between Professor Hunter and the other panel-pair member, the EPs went to panel discussion as part of the regular process, with Professor Hunter's notes used to inform the discussion.

Individual assessment

On average, each panellist was involved in the preliminary assessment of approximately 78 EPs.

The PHYSC Panel set a target of 100.0% of nominated research outputs (NROs) to be examined. The PHYSC Panel narrowly fell short of this target at 92.2% of NROs examined.

Cross-referrals

The following tables show the number of cross-referrals in and out of the PHYSC Panel. Compared with the 2012 Quality Evaluation round, there was a 31.0% decrease in the number of EPs cross-referred to the PHYSC Panel. There was an 88.0% decrease in the number of cross-referrals from the PHYSC Panel to other panels.

Table 3: Number of cross-referred EPs assessed by the PHYSC Panel

PRIMARY PANEL	SUBJECT AREA	# OF EPs
Biological Sciences	Ecology, Evolution and Behaviour	1
Engineering, Technology and Architecture	Engineering and Technology	6
Mathematical and Information Technology and Sciences	Computer Science, Information Technology, Information Sciences	1
TOTAL		**8**

Note: not FTE weighted.

Table 4: Number of EPs cross-referred from the PHYSC Panel to another panel

CROSS-REFERRAL PANEL	# OF EPs
Māori Knowledge and Development	2
Pacific Research	2
TOTAL	**4**

Note: not FTE weighted.

Panel assessment

The PHYSC Panel met from 26 to 28 November 2018 in Wellington.

The PHYSC Panel managed actual and perceived conflicts of interest during the meeting in accordance with the Guidelines and panel processes. The conflicts of interest the panellists identified in the PBRF IT System before the panel meeting were included in the assessment run sheets, along with the appropriate action. The PHYSC Panel managed conflicts of interest during the meeting in the following ways:

- panellists did not participate in the discussion of EPs with a declared conflict of interest
- panellists did not participate in the discussion of EPs from their own TEOs
- panellists left the room during discussion of a close family member's EP or the panellist's own EP
- the Deputy Chair led the meeting when EPs from the Chair's TEO were being reviewed, and the Chair did not participate in these discussions or comment on those EPs.

At no stage did any panellist who had a declared conflict of interest participate in the assessment of an EP for which they were conflicted.

The Chair sought verbal affirmation for all EP final scores and Quality Category assignments and all decisions were unanimous.

Calibration

Panel calibration was initially achieved through assessment of example EPs as part of panellist training. As part of the individual assessment, each EP was separately assessed by two panellists against the tie-point descriptors. Panellists then discussed their respective scores to reach an agreed preliminary score. Where applicable, panel-pairs took the comments of the cross-referral panellist into account in their scoring decisions. As part of the individual assessment, the Chair assigned himself as part of a panel-pair with each panel member for at least one EP.

The panel meeting started with a calibration session with EPs picked for each subject area that represented each of the Quality Categories. High-scoring EPs were discussed first to enable the standards of quality research to be preeminent throughout the process. During this session, the PHYSC Panel came to a common understanding of what the markers of quality were (in accordance with the tie-point descriptors and Quality Category descriptions). This common understanding enabled the PHYSC Panel to assess the EPs effectively and accurately.

To ensure consistent assessment of the EPs received, the PHYSC Panel considered calibration as an ongoing exercise through preliminary assessment discussions and during the panel meeting.

Holistic assessment and extraordinary circumstances

All EPs that included extraordinary circumstances (general and/or Canterbury) were included in the holistic assessment stage. The PHYSC Panel undertook a detailed holistic assessment of EPs that had uncommon issues (as defined in the Guidelines) and those on, or close to, the boundaries between Quality Categories.

Following the holistic assessment, eight EPs (not FTE weighted) moved up a Quality Category (no EPs moved down a Quality Category at the holistic assessment stage). This included:

- four EPs identified by the panel for *detailed* holistic assessment
- four EPs claiming extraordinary circumstances.

For each Quality Category change, the PHYSC Panel referenced the Quality Category descriptors.

Awarding final Quality Categories

The PHYSC Panel considered all EPs assigned to it and reached agreement on the final Quality Category for each.

The PHYSC Panel assessed and awarded a funded Quality Category to 513.07 EPs.

Commentary on the results

The PHYSC Panel covered three general topic areas in order of decreasing cohort size: Chemistry, Earth Sciences, and Physics. Chemistry research covered a broad range of food, synthetic, industrial, materials, health and fundamental chemical science. Of note was the extent of applied science and commercial-related research in this group. Earth Sciences research covered a range of topics including: climate/atmospheric, Antarctic and glacial, volcanic, earthquake, landscape and land stability, geologic, mineral/ore, oceanic, planetary studies, and remote sensing and natural hazard research. The research was balanced between applied and theoretical/process-based research, with little commercial-related research. Physics research included fundamental physics, geophysics, biophysics, materials science, theoretical physics, and astronomy. A small amount of commercial-related research was included in the Physics area. In addition, several EPs overlapped between these subject areas.

The cohort of all three subject areas grew on average by 21.2% since 2012. Notably, the cohort of new and emerging researchers grew by 30.2% overall, reflecting a healthy entry of new researchers.

Table 5 evidences the shifts discussed below, comparing results in 2018 with the 2012 round broken down by funded Quality Categories.

Table 5: Percentage of EPs awarded funded Quality Categories by subject area, 2018 and 2012

SUBJECT AREA	YEAR	A	B	C	C(NE)
Chemistry	2018	15.1%	40.2%	21.4%	23.3%
	2012	19.3%	37.1%	24.1%	19.5%
	Variance	-4.2	+3.1	-2.6	+3.7
Earth Sciences	2018	27.1%	40.8%	14.3%	17.9%
	2012	11.8%	46.3%	26.4%	15.6%
	Variance	+15.3	-5.5	-12.1	+2.3
Physics	2018	24.8%	44.7%	10.3%	20.2%
	2012	20.9%	51.1%	10.5%	17.5%
	Variance	+3.9	-6.4	-0.2	+2.7

Chemistry showed a drop in the number of EPs awarded an A Quality Category, which appears to be due to retirements from the system since 2012 that are not being replaced at the same pace. This, coupled with a large rise in EPs that were awarded a B Quality Category, shows that there is a considerable cohort of mid-career researchers captured in this timeframe. Part of the slower progress to higher-quality levels may be due to the demanding teaching loads in this discipline. A further characteristic of the Chemistry cohort, evident in 2012, but stronger in the 2018 Quality Evaluation was the large number of EPs that were awarded C(NE) and C Quality Categories.

The overall high number of B, C and C(NE) Quality Categories could reflect the many researchers that work in large centres or laboratories run by a few high-level senior staff. Some of these groupings involve 15 to 20 dependent researchers, all operating under a single research leader. These arrangements may not allow individual achievements to stand out, because research is often geared towards a collective group outcome, product or commercial service. At least 20% of the Chemistry researchers involved in the 2018 Quality Evaluation were involved in industry-applied or commercially oriented research.

The overall quality of Earth Sciences research and researchers has grown substantially since 2012. This appears to reflect both the continued performance of high-achieving researchers from 2012, along with the maturity and development of formerly high-performing new and emerging

researchers who were in highly productive mid-career positions for this assessment period. A healthy cohort of new and emerging researchers bodes well for the future.

Specifically, EPs awarded an A Quality Category for Earth Sciences increased by 15.3 percentage points, which reflects a recent evaluation of New Zealand published research outputs (including Crown research institute (CRI) research) by the Ministry of Business, Innovation and Employment. These high rates of international recognition reflect the last six years of global growth in the Earth Sciences with intense focus on issues such as climate change, sea-level rise, Antarctic/glacial/oceanic research, natural hazards (especially volcanoes, earthquakes and tsunami) and sustainable landscape/water management. It also reflects major international funding into these issues in New Zealand and Antarctica in collaboration with New Zealand researchers, often channelled by CRI-university partnerships.

Physics showed strong growth in the number of EPs that received a funded Quality Category. A notable increase in the number of EPs awarded an A Quality Category reflects recruitment of new internationally recognised researchers, as well as rapid progression of those who were new and emerging and mid-Quality Category researchers from the 2012 Quality Evaluation. Several New Zealand physicists are involved in major international collaborative initiatives that help to boost their international outputs and standing, including particle accelerator experiments, astronomical and global observation networks. Researchers may work individually or in small, tight collaborative partnerships.

New and emerging researchers

EPs from new and emerging researchers accounted for 22.5% (or 115.35) of awarded funded Quality Categories. Out of 115.35 new and emerging researchers, 91.9% were awarded a C(NE) Quality Category and 8.1% were awarded a B Quality Category.

Strong growth in the number of new and emerging researchers in the Physical Sciences, coupled with increases in the overall cohort, shows that there are many opportunities for research in these areas. Importantly, all three subject areas are experiencing a healthy growth and replacement.

The PHYSC Panel noted that the overall high quality of new and emerging scientists demonstrates how much more rapidly careers and reputations can be built. With high-profile international issues under research, global connectedness in research funding, the accessibility and speed of publication in high-profile journals and the increasing impact factors of these show that New Zealand physical sciences are in good shape to support new researchers into strong internationally relevant careers.

Māori research

The Māori Knowledge and Development Panel accepted two EPs cross-referred from the PHYSC Panel. These EPs represent half of all EPs cross-referred to another panel.

Pacific research

The PHYSC Panel cross-referred the same number of EPs, two, to the Pacific Research Panel as it did to the Māori Knowledge and Development Panel. These made up the other half of the EPs cross-referred by the PHYSC Panel to another panel.

Researcher profile

This is the first time that the TEC has reported on demographic information for the Quality Evaluation, which has allowed panels to consider trends following the assessment process. The researcher profile percentages in this section are derived from the FTE weighting of EPs that received funded Quality Categories.

Chemistry and Earth Sciences had the greatest gender diversity, although in both, the higher Quality Categories continue to be awarded to EPs of men researchers. Looking across the women researchers whose EPs received a funded Quality Category, 64.8% were awarded either a B (33.4%) or a C(NE) (31.4%). A slightly different distribution emerges when looking just at the men researchers whose EPs received a funded Quality Category: 68.0% were awarded either a B (44.8%) or an A (23.2%).

Chemistry had the greatest range of ethnic diversity, with the highest percentage of Māori researchers (3.2%) and the only PHYSC subject area with Pacific researchers (1.0%). Earth Science was 69.1% European and Physics was similarly dominated by European (68.9%).

All three subject areas appear to show a healthy range of researcher ages, with good rates of refresh into the system. Across all of them, 30.0% were aged 40 to 49, with 35.5% under 40 and the rest 50 years and older.

While the next six years will likely see several senior researchers retire from the system (for example, in the Earth Sciences), overall there are many high-quality researchers to take their place. For Chemistry, although the cohort is largest, the volume would appear to reflect the high numbers of researchers operating under large semi-commercial research groups. These researchers mainly occupy the B, C, and C(NE) Quality Categories, which reflect that their priorities are often focused on end users, such as commercial/product or industry outcomes. This may limit the volume of research outputs produced during any future Quality Evaluation cycle.

Most (91.0%) funded Quality Category researchers were employed full-time.

Social Sciences and Other Cultural/Social Studies Panel Report

Purpose of the report

The purpose of this report is to describe and contextualise the outcomes of the Social Sciences and Other/Cultural Social Studies Peer-Review Panel's (SSOCSS Panel's) results, including an overview of the assessment process. It is in two parts:

- summary of the assessment process
- commentary on the results.

SSOCSS Panel members are listed in Appendix 1. SSOCSS Panel recommendations are set out in Appendix 2.

Executive summary

This report summarises the results of the assessment undertaken by the SSOCSS Panel during the PBRF 2018 Quality Evaluation and confirmed during the panel meeting. The SSOCSS Panel was made up of 26 members, including six panellists from outside New Zealand.

In accordance with the processes set out in the Guidelines, the SSOCSS Panel:

- managed conflicts of interest
- calibrated preliminary scores
- where appropriate or required by the Guidelines, incorporated holistic judgements in awarding final Quality Categories.

Key information

The SSOCSS Panel awarded funded Quality Categories to 825.33 EPs as part of the assessment process. Table 1 shows EPs awarded funded Quality Categories for the whole panel. Table 2 shows EPs awarded funded Quality Categories by subject area.

Table 1: EPs awarded funded Quality Categories by the SSOCSS Panel

QUALITY CATEGORY	EPs (FTE WEIGHTED)	PERCENTAGE PER QUALITY CATEGORY
A	154.90	18.8%
B	333.82	40.4%
C	246.85	29.9%
C(NE)	89.76	10.9%
TOTAL	**825.33**	

Table 2: EPs awarded funded Quality Categories by subject area

SUBJECT AREA	A	B	C	C(NE)	TOTAL
Anthropology and Archaeology	15.68 (23.1%)	30.53 (44.9%)	14.00 (20.6%)	7.79 (11.5%)	**68.00**
Communications, Journalism and Media	12.00 (10.3%)	45.19 (38.9%)	45.05 (38.8%)	14.00 (12.0%)	**116.24**
Human Geography	16.29 (21.7%)	36.27 (48.3%)	13.62 (18.1%)	8.94 (11.9%)	**75.12**
Political Science, International Relations and Public Policy	13.79 (11.8%)	65.39 (55.7%)	27.85 (23.7%)	10.27 (8.8%)	**117.30**
Psychology	70.28 (28.2%)	86.76 (34.8%)	66.68 (26.7%)	25.75 (10.3%)	**249.47**
Sociology, Social Policy, Social Work, Criminology and Gender Studies	26.86 (13.5%)	69.68 (35.0%)	79.65 (40.0%)	23.01 (11.6%)	**199.20**

There was an overall increase of 16.7% in the number of EPs awarded a funded Quality Category between 2012 (707.05 EPs) and 2018 (825.33 EPs). Broken down by subject area, the SSOCSS Panel showed the following trends:

- Psychology and Anthropology and Archaeology had the largest percentages of EPs awarded an A Quality Category (28.2% and 23.1%, respectively)
- Human Geography had the largest percentage of EPs awarded a C(NE) Quality Category (19.4%)
- Communications, Journalism and Media had the greatest increase in EPs awarded a funded Quality Category, 34.7%, between 2012 and 2018
- Sociology, Social Policy, Social Work, Criminology and Gender Studies had considerable growth in EPs awarded a funded Quality Category, 27.7%, between 2012 and 2018.

Researcher participation

Of the researchers submitting to the Social Sciences and Other Cultural/Social Studies in 2018, 53.1% were women, 46.5% were men and 0.4% were other.

A little over one-fifth (21.5%) of researchers were aged under 40, with 78.5% aged over 40.

Most researchers (67.1%) identified as European and 91.2% of researchers were employed full-time.

Summary of the assessment process

Assignment

The Chair of the SSOCSS Panel assigned each EP to two panellists, ensuring that panellists did not assess EPs from their own department and/or TEOs where possible, or where conflicts of interest had been listed. Some flexibility was required; however, given the spread of disciplinary/sub-disciplinary EPs and the size of some disciplinary communities.

The SSOCSS Panel had 26 members, with assessment expertise in Anthropology and Archaeology; Communications, Journalism and Media Studies; Human Geography; Political Science, International Relations and Public Policy; Psychology; and Sociology, Social Policy, Social Work, and Criminology and Gender Studies.

Individual assessment

On average, each panellist was involved in the preliminary assessment of approximately 66 EPs.

The SSOCSS Panel set a minimum target of 50.0% of nominated research outputs (NROs) to be examined. The SSOCSS Panel exceeded this target and assessed 92.7% of submitted NROs.

Cross-referrals

The following tables show the number of cross-referrals in and out of the SSOCSS Panel. Compared with the 2012 Quality Evaluation, there was a 98.8% decrease in the number of EPs submitted to the SSOCSS Panel. There was a 28.4% decrease in the number of cross-referrals from the SSOCSS Panel to other panels.

Table 3: Number of cross-referred EPs assessed by the SSOCSS Panel

PRIMARY PANEL	SUBJECT AREA	# OF EPs
Creative and Performing Arts	Design	1
Humanities and Law	English Language and Literature	1
TOTAL		**2**

Note: not FTE weighted.

Table 4: Number of EPs cross-referred from the SSOCSS Panel to another panel

CROSS-REFERRAL PANEL	# OF EPs
Business and Economics	3
Creative and Performing Arts	1
Education	2
Health	3
Humanities and Law	1
Māori Knowledge and Development	8
Pacific Research	40
TOTAL	**58**

Note: not FTE weighted.

Most EPs cross-referred to other panels went to the Māori Knowledge and Development and the Pacific Research panels. The assessment comments submitted by cross-referral panellists were considered when assigning the calibrated panel scores and, in several cases, follow-up discussions were had with the given cross-referral panellists.

Panel assessment

The SSOCSS Panel met from 3 to 7 December in Wellington.

The SSOCSS Panel managed actual and perceived conflicts of interest during the meeting in accordance with the Guidelines and panel processes. The conflicts of interest the panellists identified in the PBRF IT System before the panel meeting were included in the assessment run sheets, along with the appropriate action. The SSOCSS Panel managed conflicts of interest during the meeting in the following ways:

- panellists did not participate in the discussion of EPs with a declared conflict of interest
- panellists did not participate in the discussion of EPs from their own TEOs
- panellists left the room during discussion of a close family member's EP or the panellist's own EP
- the Deputy Chair led the meeting when EPs from the Chair's TEO were being reviewed, and the Chair did not participate in these discussions or comment on those EPs.

At no stage did any panellist who had a declared conflict of interest participate in the assessment of an EP for which they were conflicted.

Calibration

Panel calibration was initially achieved through assessment of example EPs as part of panellist training. As part of the individual assessment, each EP was separately assessed by two panellists against the tie-point descriptors. Panellists then discussed their respective scores to reach an agreed preliminary score. Where applicable, panel-pairs took the comments of the cross-referral panellist into account in their scoring decisions. In addition, each panellist was paired with the Chair and/or the Deputy Chair for preliminary scoring of at least one EP.

At the panel meeting several EPs that clearly represented each Quality Category were selected for in-depth discussion to ensure accurate calibration across the SSOCSS Panel. High-scoring EPs were discussed first to enable the standards of quality research to be preeminent throughout the process.

To ensure consistent assessment of the EPs received, the SSOCSS Panel considered calibration as an ongoing exercise through preliminary assessment discussions and during the panel meeting.

Holistic assessment and extraordinary circumstances

All EPs that included extraordinary circumstances (general and/or Canterbury) were included in the holistic assessment stage. Additionally, the SSOCSS Panel undertook a detailed holistic assessment of EPs that had uncommon issues (as defined in the Guidelines) and those on, or close to, the boundaries between Quality Categories.

Following the holistic assessment, 17 EPs (not FTE weighted) moved up a Quality Category (no EPs moved down a Quality Category at the holistic assessment stage). This included:

- seven EPs identified by the panel for *detailed* holistic assessment
- 10 EPs claiming extraordinary circumstances.

For each Quality Category change, the SSOCSS Panel referenced the Quality Category descriptors.

Awarding final Quality Categories

The SSOCSS Panel considered all EPs assigned to it and reached agreement on the final Quality Category for each.

The SSOCSS Panel assessed and awarded a funded Quality Category to 825.33 EPs.

Commentary on the results

The research covered by the panel spanned an incredibly diverse set of disciplines, sub-disciplines, methodologies, and conceptual approaches. Attention was paid to the possibility of implicit bias in relation to disciplinary, conceptual or methodological approaches. Care was taken to ensure non-standard EPs were given due consideration.

Overall, there was a 16.7% increase in the number of EPs awarded a funded Quality Category between 2012 (707.05 EPs) and 2018 (825.33 EPs). By subject area, the shift in the percentage of EPs receiving funded Quality Categories in 2012 and 2018 is more pronounced. This includes:

- a 12.1% decrease in Anthropology and Archaeology
- the remaining five subject areas all saw an increase in funded Quality Categories:
    - Communications, Journalism and Media Studies increased by 34.7%, the largest across the SSOCSS Panel's six subject areas
    - Sociology, Social Policy, Social Work, Criminology and Gender Studies was up 27.7%

- Human Geography was awarded 14.7% more funded Quality Categories
- Political Science, International Relations and Public Policy increased by 15.7%
- Psychology increased by 11.8%.

Table 5 shows how these percentages compare with the 2012 round broken down by funded Quality Categories.

Table 5: Percentage of EPs awarded funded Quality Categories by subject area, 2018 and 2012

SUBJECT AREA	YEAR	A	B	C	C(NE)
Anthropology and Archaeology	2018	23.1%	44.9%	20.6%	11.5%
	2012	21.1%	44.4%	19.7%	14.8%
	Variance	+2.0	+0.5	+0.9	-3.3
Communications, Journalism and Media	2018	10.3%	38.9%	38.8%	12.0%
	2012	5.2%	52.2%	33.3%	9.3%
	Variance	+5.1	-13.3	+5.5	+2.7
Human Geography	2018	21.7%	48.3%	18.1%	11.9%
	2012	26.4%	41.9%	15.3%	16.4%
	Variance	-4.7	+6.4	+2.8	-4.5
Political Science, International Relations and Public Policy	2018	11.8%	55.7%	23.7%	8.8%
	2012	16.0%	49.4%	22.2%	12.4%
	Variance	-4.2	+6.3	+1.5	-3.6
Psychology	2018	28.2%	34.8%	26.7%	10.3%
	2012	23.9%	42.2%	22.5%	11.3%
	Variance	+4.3	-7.4	+4.2	-1.0
Sociology, Social Policy, Social Work, Criminology and Gender Studies	2018	13.5%	35.0%	40.0%	11.5%
	2012	7.8%	39.3%	38.2%	14.7%
	Variance	+5.7	-4.3	+1.8	-3.2

The results reflect a combination of factors including: the lifecycle of disciplines (the ageing of a discipline, the arrival of a newer/younger cohort), the funding and appointment decisions of TEOs, the number of enrolled students, research funding support and experience with the PBRF.

New and emerging researchers

EPs from new and emerging researchers accounted for 14.6% (or 120.41) of awarded funded Quality Categories. Out of 120.41 new and emerging researchers, 74.5% were awarded a C(NE) Quality Category, 1.7% were awarded an A Quality Category, and 23.8% were awarded a B Quality Category.

Māori research

The SSOCSS Panel included two members with extensive background in Mātauranga Māori. The SSOCSS Panel cross-referred eight EPs to the Māori Knowledge and Development Panel. These EPs included a wide range of areas of research relevant to a Māori world view and/or Māori methodologies that could not be assessed by the Māori members of the SSOCSS Panel due to subject-area expertise and/or the management of conflicts of interest. The SSOCSS Panel considered the advice received to determine the relevant EP's final Quality Category.

Pacific research

The SSOCSS Panel cross-referred 40 EPs to the Pacific Research Panel, requesting assessment comment as per the *Pacific Research Panel-Specific Guidelines*. The SSOCSS Panel considered the advice received to determine the relevant EP's final Quality Category.

Researcher profile

This is the first time that the TEC has reported on demographic information for the Quality Evaluation, which has allowed panels to consider trends following the assessment process. The researcher profile percentages in this section are derived from the FTE weighting of EPs that received funded Quality Categories.

Of the researchers submitting to the SSOCSS Panel in 2018, 53.1% were women, 46.5% were men and 0.4% were other. Only two subject areas, Communications, Journalism and Media Studies; and Political Science, International Relations and Public Policy had fewer than half women researchers. Looking at the funded Quality Categories awarded, men still made up the majority of researchers whose EPs received an A Quality Category (55.0%), but women researchers' EPs made up the larger percentage of EPs to receive C and C(NE) Quality Categories at 61.0% and 59.4%, respectively. There was relative parity for men and women researchers whose EPs were awarded a B Quality Category.

Over half (57.5%) of all the researchers submitting EPs to the SSOCSS Panel were between 40 and 59 years of age. Over one-fifth (21.5%) were between the ages of 30 and 39. Researchers aged 60 to 69 made up 17.3% of those receiving funded Quality Categories and 3.7% were aged 70 and over. Only 1.9% of the researchers were 29 years or younger.

The researchers submitting to the SSOCSS Panel identified as the following ethnicities: Asian 5.9%; European 67.1%; Māori 4.1%; Middle Eastern/Latin American/African 2.5%; Pacific 1.5%; and other ethnicities 2.9%. A further 16.0% did not state an ethnicity.

Overall, 91.2% of researchers who submitted EPs were employed full-time.

Appendix 1: List of Panel Members

PANEL MEMBERSHIP OF MODERATION PANEL AND 13 PEER-REVIEW PANELS	
Professor Emerita Paula Jameson (Principal Moderator)	University of Canterbury
Distinguished Professor Marston Conder (Deputy Moderator)	University of Auckland
Professor Emerita Helen May (Deputy Moderator)	Victoria University of Wellington
Professor Hamish Spencer (Chair of the Biological Sciences Panel)	University of Otago
Professor Les Oxley (Chair of the Business and Economics Panel)	University of Waikato
Distinguished Professor Anne Noble (Chair of the Creative and Performing Arts Panel)	Massey University
Professor Emerita Luanna Meyer (Chair of the Education Panel)	Formerly Victoria University of Wellington
Professor Don Cleland (Chair of the Engineering, Technology and Architecture Panel)	Massey University
Professor Kath McPherson (Chair of the Health Panel)	University of Auckland
Professor Lydia Wevers (Chair of the Humanities and Law Panel)	Victoria University of Wellington
Dr Shane Edwards (Chair of the Māori Knowledge and Development Panel)	Self-employed
Professor Vernon Squire (Chair of the Mathematical and Information Sciences and Technology Panel)	University of Otago
Distinguished Professor Ian Reid (Chair of the Medicine and Public Health Panel)	University of Auckland
Professor Airini (Chair of the Pacific Research Panel)	Thompson Rivers University, Canada
Professor Shane Cronin[4] (Chair of the Physical Sciences Panel)	University of Auckland
Distinguished Professor Paul Spoonley (Chair of the Social Sciences and Other Cultural/Social Studies Panel)	Massey University

BIOLOGICAL SCIENCES PANEL	
Professor Hamish Spencer (Chair)	University of Otago
Professor Hugh Blair (Deputy Chair)	Massey University
Professor David Ackerley	Victoria University of Wellington
Professor Sassan Asgari	University of Queensland, Australia
Professor Michael Bennett	University of Queensland, Australia
Professor Dianne Brunton	Massey University
Professor Dee Carter	University of Sydney, Australia
Professor John Carver	Australian National University, Australia
Dr Tony Conner	AgResearch Limited
Professor Catherine Day	University of Otago
Professor Kath Dickinson	University of Otago
Professor Charlie Eason	Cawthron Institute and Lincoln University
Professor Brendan Hicks	University of Waikato
Professor Phil Lester	Victoria University of Wellington
Professor Joanne Meers	University of Queensland, Australia
Professor Derrick Moot	Lincoln University
Professor Jo Putterill	University of Auckland
Associate Professor Jasna Rakonjac	Massey University
Distinguished Professor Jim Reid	University of Tasmania, Australia
Distinguished Professor David Schiel	University of Canterbury
Professor Warren Tate	University of Otago
Professor Qiao Wang	Massey University

[4] Professor Cronin was appointed Chair of the Physical Sciences Panel upon the death of Professor Keith Hunter in October 2018.

Dr Maren Wellenreuther	University of Auckland and Plant & Food Research
Professor Owen Young	Auckland University of Technology

BUSINESS AND ECONOMICS REVIEW PANEL	
Professor Les Oxley (Chair)	University of Waikato
Professor Janet Hoek (Deputy Chair)	University of Otago
Professor Rowena Barrett	Queensland University of Technology, Australia
Professor Tom Baum	University of Strathclyde, United Kingdom
Professor Liliana Bove	University of Melbourne, Australia
Professor John Brocklesby	Victoria University of Wellington
Professor Pavel Castka	University of Canterbury
Emeritus Professor John Davies	Victoria University of Wellington
Professor Robert Durand	Curtin University, Australia
Associate Professor Christine Eckert	University of Technology Sydney, Australia
Professor John Gibson	University of Waikato
Professor James Higham	University of Otago
Emeritus Professor Sumner La Croix	University of Hawai'i, United States of America
Professor Morten Lau	Copenhagen Business School, Denmark and Durham University, United Kingdom
Professor David Lont	University of Otago
Professor Alan Lowe	RMIT University, Australia
Professor Dimitris Margaritis	University of Auckland
Professor Deryl Northcott	Auckland University of Technology
Professor Dorian Owen	University of Otago
Professor Gail Pacheco	Auckland University of Technology
Professor Jane Parker	Massey University
Professor Kathryn Pavlovich	University of Waikato
Professor Adrian Sawyer	University of Canterbury
Professor Alison Sheridan	University of New England, Australia
Professor Rhodri Thomas	Leeds Beckett University, United Kingdom

CREATIVE AND PERFORMING ARTS PANEL	
Distinguished Professor Anne Noble (Chair)	Massey University
Emeritus Professor Christopher Baugh (Deputy Chair)	University of Leeds, United Kingdom
Associate Professor Karen Barbour	University of Waikato
Professor Sandy Black	University of the Arts London, United Kingdom
Professor Paul Chamberlain	Sheffield Hallam University, United Kingdom
Professor Juan Cruz	Royal College of Art, United Kingdom
Associate Professor Eve de Castro-Robinson	University of Auckland
Associate Professor Douglas Easterly	Victoria University of Wellington
Dr Dominique Falla	Griffith University, Australia
Professor Heather Galbraith	Massey University
Professor Annie Goldson	University of Auckland
Associate Professor Anna Jackson	Victoria University of Wellington
Professor Bob Jahnke	Massey University
Associate Professor Glenda Keam	University of Canterbury
Anne Kennedy	Manukau Institute of Technology
Associate Professor Sharon Mazer	Auckland University of Technology
Associate Professor Paula Jane Kiri Morris	University of Auckland
Professor Paul Seawright	University of Ulster, United Kingdom
Dr Inge van Rij	Victoria University of Wellington

EDUCATION PANEL	
Professor Emerita Luanna Meyer (Chair)	Victoria University of Wellington
Professor Stephen May (Deputy Chair)	University of Auckland
Professor Glenda Anthony	Massey University
Professor Roseanna Bourke	Massey University
Professor Carmen Dalli	Victoria University of Wellington
Distinguished Professor Niki Davis	University of Canterbury
Professor Ann Farrell	Queensland University of Technology, Australia
Professor Jane Gilbert	Auckland University of Technology
Dr Grace Grima	Pearson UK, United Kingdom
Professor Ruth Kane	University of Ottawa, Canada
Professor Kwok-Wing Lai	University of Otago
Distinguished Professor John Loughran	Monash University, Australia
Associate Professor Sonja Macfarlane	University of Canterbury
Professor Liz McKinley	University of Melbourne, Australia
Professor Peter O'Connor	University of Auckland
Professor Judy Parr	University of Auckland
Professor Hayo Reinders	Unitec New Zealand

ENGINEERING, TECHNOLOGY AND ARCHITECTURE PANEL	
Professor Don Cleland (Chair)	Massey University
Professor Dale Carnegie (Deputy Chair)	Victoria University of Wellington
Distinguished Professor Geoff Chase	University of Canterbury
Professor Peter Chong	Auckland University of Technology
Professor Grant Covic	University of Auckland
Professor Rajesh Dhakal	University of Canterbury
Associate Professor Mike Duke	University of Waikato
Professor Robert Freestone	University of New South Wales, Australia
Professor Errol Haarhoff	University of Auckland
Professor Enrico Haemmerle	Auckland University of Technology
Professor Eileen Harkin-Jones	Ulster University, United Kingdom
Associate Professor Jonathan Leaver	Unitec New Zealand
Associate Professor Terry Lucke	University of the Sunshine Coast, Australia
Professor Andrew McCulloch	University of California San Diego, United States of America
Professor Rick Millane	University of Canterbury
Professor Robyn Phipps	Massey University
Professor Pierre Quenneville	University of Auckland
Associate Professor Christoph Schnoor	Unitec New Zealand
Professor Andy Shilton	Massey University
Emeritus Professor Janis Swan	University of Waikato
Professor Brenda Vale	Victoria University of Wellington
Professor SueAnne Ware	University of Newcastle, Australia
Professor Neville Watson	University of Canterbury
Professor Laurence Weatherley	University of Kansas, United States of America

HEALTH PANEL	
Professor Kath McPherson	Health Research Council
Professor Merryn Gott	University of Auckland
Dr Chris Baldi	University of Otago
Professor David Baxter	University of Otago
Professor Glenn Browning	University of Melbourne, Australia

Professor Marie Crowe	University of Otago
Dr Ofa Dewes	University of Auckland
Dr Hinemoa Elder	Te Whare Wānanga o Awanuiārangi
Professor Pauline Ford	University of Queensland, Australia
Dr Matire Harwood	University of Auckland
Professor Keith Hill	Curtin University, Australia
Professor Eleanor Holroyd	Auckland University of Technology
Professor Annette Huntington	Massey University
Professor Paula Kersten	University of Brighton, United Kingdom
Professor Marlena Kruger	Massey University
Associate Professor William Levack	University of Otago
Professor Rich Masters	University of Waikato
Professor Paul Mills	University of Queensland, Australia
Professor Paul Moughan	Massey University
Professor Christopher Peck	University of Sydney, Australia
Professor Michael Robb	University of Canterbury
Professor Michael Roberts	University of Queensland and University of South Australia, Australia
Professor Janie Sheridan	University of Auckland
Associate Professor Melody Smith	University of Auckland

HUMANITIES AND LAW PANEL	
Professor Lydia Wevers (Chair)	Victoria University of Wellington
Professor Karen Scott (Deputy Chair)	University of Canterbury
Professor Martine Antle	University of Sydney, Australia
Professor Sekhar Bandyopadhyay	Victoria University of Wellington
Professor David Britain	University of Bern, Switzerland
Associate Professor David Brown	University of Adelaide, Australia
Associate Professor Alex Calder	University of Auckland
Professor Paul Clark	University of Auckland
Professor Deirdre Coleman	University of Melbourne, Australia
Associate Professor Lisa Ellis	University of Otago
Associate Professor Lisa Ford	University of New South Wales, Australia
Professor Susy Frankel	Victoria University of Wellington
Professor Andrew Geddis	University of Otago
Professor Kris Gledhill	Auckland University of Technology
Associate Professor Birgit Lang	University of Melbourne, Australia
Professor Peter Lineham	Massey University
Professor Edwin Mares	Victoria University of Wellington
Professor Alfredo Martinez-Exposito	University of Melbourne, Australia
Professor Elizabeth Minchin	Australian National University, Australia
Associate Professor Linda Tyler	University of Auckland
Professor Susan Watson	University of Auckland
Professor Cynthia White	Massey University

MĀORI KNOWLEDGE AND DEVELOPMENT PANEL	
Dr Shane Edwards (Chair)	Independent consultant
Professor Rawinia Higgins (Deputy Chair)	Victoria University of Wellington
Dr Aroha Harris	University of Auckland
Dr Ross Hemera	Retired
Dr Ella Henry	Auckland University of Technology

Professor Brendan Hokowhitu	University of Waikato
Professor Huia Jahnke	Massey University
Dr Sheryl Lightfoot	University of British Columbia, Canada
Professor Tracey McIntosh	University of Auckland
Professor Poia Rewi	University of Otago

MATHEMATICAL AND INFORMATION SCIENCES AND TECHNOLOGY PANEL	
Professor Vernon Squire (Chair)	University of Otago
Professor Andrew Cockburn (Deputy Chair)	University of Canterbury
Professor Benoit Aubert	Dalhousie University, Canada
Professor Jennifer Brown	University of Canterbury
Professor Michael Cowling	University of New South Wales, Australia
Professor Gill Dobbie	University of Auckland
Professor Lisa Given	Swinburne University of Technology, Australia
Professor Robert McLachlan	Massey University
Professor Antonija (Tanja) Mitrovic	University of Canterbury
Professor Eamonn O'Brien	University of Auckland
Professor Helen Partridge	University of Southern Queensland, Australia
Dr Michael Plank	University of Canterbury
Dr Diane Strode	Whitireia Community Polytechnic
Professor Felix B Tan	Excelsia College, Australia
Professor Michael Winikoff	University of Otago
Professor Yingcun Xia	National University of Singapore, Singapore
Professor Yanchun Zhang	Victoria University, Australia

MEDICINE AND PUBLIC HEALTH PANEL	
Distinguished Professor Ian Reid (Chair)	University of Auckland
Professor Mark Richards (Deputy Chair)	University of Otago
Professor Max Abbott	Auckland University of Technology
Professor Alan Barber	University of Auckland
Professor Laura Bennet	University of Auckland
Professor Colin Brown	University of Otago
Dr John Bruning	University of Adelaide, Australia
Professor Winston Byblow	University of Auckland
Professor Vicky Cameron	University of Otago
Professor Sunny Collings	University of Otago
Professor Nathan Consedine	University of Auckland
Professor Garth Cooper	University of Auckland and University of Manchester, United Kingdom
Professor Gregor Coster	Victoria University of Wellington
Professor Lin Fritschi	Curtin University, Australia
Professor Paul Glue	University of Otago
Professor Alistair Gunn	University of Auckland
Professor Paul Hofman	University of Auckland
Professor Martin Kennedy	University of Otago
Professor Vivian Lin	La Trobe University, Australia
Associate Professor Dong-Xu Liu	Auckland University of Technology
Professor Lesley McCowan	University of Auckland
Professor Murray Mitchell	Queensland University of Technology, Australia
Professor David Murdoch	University of Otago
Associate Professor Patricia Priest	University of Otago

Professor Elaine Rush	Auckland University of Technology
Professor Philip Schluter	University of Canterbury
Professor Colin Simpson	Victoria University of Wellington
Professor Lisa Stamp	University of Otago
Dr Kathryn Stowell	Massey University
Professor Peter Thorne	University of Auckland
Professor Rob Walker	University of Otago
Professor Alistair Woodward	University of Auckland

PACIFIC RESEARCH PANEL	
Professor Airini (Chair)	Thompson Rivers University, Canada
Associate Professor Yvonne Underhill-Sem (Deputy Chair)	University of Auckland
Dr Melani Anae	University of Auckland
Dr Teuila Percival	University of Auckland
Dr Semisi (James) Prescott	Unitec New Zealand
Professor Steven Ratuva	University of Canterbury
Dr Mele Taumoepeau	University of Otago
Dr El-Shadan (Dan) Tautolo	Auckland University of Technology
Professor Kirsten Thompson	Seattle University, United States of America

PHYSICAL SCIENCES PANEL MEMBERS	
Professor Shane Cronin (Chair)	University of Auckland
Professor Lionel Carter (Deputy Chair)	Victoria University of Wellington
Professor Nicola Brasch	Auckland University of Technology
Distinguished Professor Margaret Brimble	University of Auckland
Professor Sally Brooker	University of Otago
Professor Anthony Fairbanks	University of Canterbury
Professor Richard Furneaux	Victoria University of Wellington
Professor Gerry Gilmore	University of Cambridge, United Kingdom
Professor Kate Jolliffe	University of Sydney, Australia
Professor Timothy Naish	Victoria University of Wellington
Professor David Prior	University of Otago
Distinguished Professor Peter Schwerdtfeger	Massey University
Professor Cather Simpson	University of Auckland
Professor Moira Steyn-Ross	University of Waikato

SOCIAL SCIENCES AND OTHER/CULTURAL STUDIES PANEL	
Distinguished Professor Paul Spoonley (Chair)	Massey University
Professor Lisa Matisoo-Smith (Deputy Chair)	University of Otago
Associate Professor Maria Bargh	Victoria University of Wellington
Professor Stuart Carr	Massey University
Professor Jennifer Curtin	University of Auckland
Associate Professor Sharyn Davies	Auckland University of Technology
Professor Kevin Dew	Victoria University of Wellington
Professor Julie Fitness	Macquarie University, Australia
Professor Garth Fletcher	Victoria University of Wellington
Professor Randolph Grace	University of Canterbury
Professor Steve Jackson	University of Otago
Professor Bob Knight	University of Otago
Professor Robyn Longhurst	University of Waikato

Associate Professor Donald Matheson	University of Canterbury
Professor Tracey McIntosh	University of Auckland
Professor Robyn Munford	Massey University
Professor John Overton	Victoria University of Wellington
Associate Professor Evangelia Papoutsaki	Unitec New Zealand
Dr Mel Pipe	City University of New York, United States of America
Professor Poia Rewi	University of Otago
Professor Rick Richardson	University of New South Wales, Australia
Associate Professor Verica Rupar	Auckland University of Technology
Professor Peter Sheppard	University of Auckland
Professor Jacqui True	Monash University, Australia
Professor Rob White	University of Tasmania, Australia
Professor Charlotte Williams	RMIT University, Australia

Appendix 2: General and panel-specific recommendations

Here we have summarised more common and general recommendations that peer-review panels made.

These recommendations reflect some of those made to the TEC by the Moderation Panel but are broader in scope. These should be read in conjunction with the Moderation Panel's recommendations (see page 11).

Below this section, we list more detailed recommendations from individual panels.

Overall, panel recommendations encompassed the following themes.

Cross-referral process

- Additional guidance on the cross-referral process. Specifically, better signalling what EP components are being cross-referred.
- More formalised communication and consistency across panels for cross-referral assessment. In addition, some panels noted the challenges in scoring across panels with limited experience/understanding of panel-specific methodologies or paradigms, for example, Māori methodologies.
- More clarification on the criteria for EPs that should be cross-referred to the Māori Knowledge and Development Panel. Clarify the number of research outputs underpinned by Māori methodologies that are required for a cross-referral (see panel-specific recommendations below).

Extraordinary circumstances

- Do not include details of extraordinary circumstances in an EP, instead describe them in terms of impact on research over the assessment period. Any more detail required should only be accessible to the panel Chair and the TEC. In addition, the TEC should provide institutions with better guidelines on this issue.
- More clarity and guidance about how to handle part-time research claims if these are not to be included under extraordinary circumstances. Several panels recommended a system of awarding merit relative to opportunity, to alleviate the ambiguity around part-time status and other extraordinary circumstances.

EP presentation

- More consistency in the Contextual Summary, NRO descriptions, and Research Contribution item descriptions. There was significant variety in the intent, character and coverage of these items, making comparative assessment difficult. Some panels suggested the TEC provide a more standardised format for these EP sections.
- In some cases, TEOs need to pay greater attention to the presentation of EPs – poor presentation could negatively affect the assessment of the EP.
- Better descriptions of quality assurance, particularly of non-traditional research outputs. Many obvious channels of quality assurance had not been identified and that meant many non-standard quality assurance processes were left unexplained.
- More guidance for TEOs to ensure that the research rationale is clearly articulated. In some cases, panellists asked, "Is this research?"

- Clearer guidance to TEOs on the minimum standard of supporting documentation as EP evidence. Some EPs, particularly for the Creative and Performing Arts Panel, did not provide evidence that allowed the research to be assessed.
- Clearer statements of contribution for multi-authored research outputs, including items authored by PhD students. Contribution statements required by many journals were suggested as an appropriate way to provide this information.

Additional panel-specific guidance

- More clarification on the criteria for EPs that should be submitted to the Māori Knowledge and Development Panel as the primary panel. Clarify the number of research outputs underpinned by Māori methodologies that are required for primary panel submissions.
- Clearer description in the panel-specific guidelines about the breadth and quality of research contributions expected for each Quality Category score.

More Māori representation on panels

- More Māori representation on panels to provide better advice on interpreting and assessing Māori-relevant research, especially how it engages with and impacts upon Māori.

Increase the size of the Pacific Research Panel and representation of Pacific expertise in other panels

- The range of expertise needed by the Pacific Panel is significant and diverse. Increase the size of the Pacific Research Panel, and representation of Pacific research expertise on other peer-review panels. Disciplinary coverage, as well as diverse representation in terms of gender, ancestry and level of seniority is essential.

Panel-specific recommendations

PANEL	PANEL-SPECIFIC RECOMMENDATIONS
Biological Sciences	• Additional advice and clarification to TEOs about which panel is appropriate to submit EPs to.
Business and Economics	• Implement a standard identifier system and ensure all EPs have unique identifiers (EP numbers). • Move forward the audit process of EPs to just prior to final submission. This would limit the possibility that NROs or OROs are removed during assessment and would allow publication dates to be clarified and replacement items to be inserted, if required.
Creative and Performing Arts	• Researchers should be advised to consider how their research contributions express a proactive dissemination of research, rather than simply receive coverage and invitations. Recommend a clearer description in the panel-specific guidelines about the breadth and quality of contributions, including student factors and discipline contributions that are expected for an EP to be awarded an A Quality Category. • In some disciplines, researchers did not sufficiently articulate the research rationale underpinning the creative works presented for assessment. Recommend emphasising to TEOs that this is an integral aspect of assessing EPs. • Any future assessments will need to carefully consider the impact of new technologies on research output types, as well as publication and dissemination practices.
Education	• There are likely to be cohort effects that differ across disciplines and across panels. These should be analysed by the TEC to note any patterns, such as

PANEL	PANEL-SPECIFIC RECOMMENDATIONS
	traditional disciplines shrinking with retirements and no replacements in comparison to "newer" disciplines and research areas growing due to the effective hiring of active researchers nationally and internationally. Trends in the New Zealand tertiary and higher education sectors with respect to human resources could signal important areas for development and concern.
Engineering, Technology and Architecture	• The guidance provided to TEOs should reinforce that evidence supplied for each NRO should identify the original or critical elements for that output (for example, the significance of the key granted claims for a patent). For creative works, evidence should explicitly identify the research content. • The reduced number of OROs in the 2018 Quality Evaluation, and the consolidation of the Peer Esteem and Contribution to the Research Environment components into the single Research Contribution component should be kept. Further consolidation for research contributions should be considered, and a standardised format for research contribution elements would be particularly useful for descriptions of external funding and postgraduate supervision. • All NROs should be provided electronically. The process of requesting physical NROs resulted in unnecessary delays and communication gaps. • Representation of Māori research expertise within the ETA Panel is desirable. This should be a focus for any future panel selection process. • Better guidance to TEOs on the selection of subject areas. The ETA Panel noted that EP content was not always well aligned to the subject area chosen.
Health	• Recommend additional guidance to ensure EPs provide clear evidence of how the research outputs meet the definition of research and illustrate the quality. For instance, text books as NROs. Whilst these may have been highly cited, and comparatively highly rated, the Health Panel frequently wished greater description of the research component, or for this to be more visible on examining the work itself. The Health Panel considered that, at times, these works may have been better listed as research contributions.
Humanities and Law	• A more accurate method of identifying EPs in foreign languages should be used to predict language requirements across panellists more effectively. • Clear guidance should be given in identifying work derived from a thesis in a previous Quality Evaluation round, and how this might affect assessment. • The HAL Panel raised concerns about the academic weight of edited volumes relative to monographs and peer-reviewed journal articles. Recommend clearer advice in the Guidelines about their standing for any future Quality Evaluation rounds.
Māori Knowledge and Development Panel	• Additional guidance be provided on cross-referrals to address and clarify the following: – the benefit of cross-referral scoring to researchers and institutions – the impact of cross-referral scoring on the final Quality Categories awarded – the commenting and/or scoring expectations of individual EP components – the challenges in scoring across panels with limited experience/understanding of Māori methodologies. • Removing "and Development" from the panel's title. • Schedule the assessment phase and the panel meeting to fit with tertiary education sector timelines. International panellists should be notified that PBRF timelines coincide with the beginning of the academic year. • A Māori moderator. • Review the incentives for TEOs to submit EPs to specific panels and try to better align these with Māori research strategies.
Mathematical and Information Sciences and Technology	• Additional guidance on the holistic assessment process. • All universities now offer data science degrees and are recruiting for data science lecturers using that title. The MIST Panel recommends renaming the subject area "Statistics and Data Science". Because of this breadth, simply adding it into the subject area of Computer Science, Information Technology, Information Sciences will not necessarily provide panellists with the right expertise.

PANEL	PANEL-SPECIFIC RECOMMENDATIONS
Medicine and Public Health	• Remove extraordinary circumstances from the assessment exercise. • Eliminate calibrated panel scoring from the information available to individual researchers, instead only provide the Quality Category awarded.
Pacific Research	• In most cases of cross-referral, panellists were asked to comment on one or more items within the EP, rather than the whole EP. In the Pacific Panel's view, greater value could be added to this assessment had the entire EP been submitted for cross-referral. • Where possible retain most/all of the 2018 panellists and augment with further members to support succession planning, and to build capacity available to other panels. • It should be possible for Pacific Research Panel members to also sit as members of other panels. • Clarify the value of research as/within community engagement, and diversified types of such outputs to attract both "traditional" academic research outlets and community-based outlets. • Strengthen advice about the scope of the Pacific Research Panel. This could include guidance on what the Pacific Research Panel expects to evaluate as the primary panel. • Clarify the intention of the Pacific Research's subject area weighting of 1. The Pacific Panel noted that other panel subject areas that contain elements of Pacific research could have a higher weighting relative to that subject area. We recommend an equity weighting for Pacific staff.
Physical Sciences	• In the case of patents, much more attention needs to be paid to clearly outlining the quality of research represented, including details on how the work is taken up. • For journal articles, clear evidence of the journal standing is important to clarify, especially due to the broad range of journals, including new journals in the field of Physical Sciences.
Social Sciences and Other/Cultural Social Studies	• Additional guidance on the cross-referral process. The Chair struggled to understand when an EP met the criteria for a Māori Knowledge and Development Panel cross-referral.