

Presenting a new NEO-PI-3 International Senior Manager Norm for a post-Covid-19 world

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1. Executive summary

The *NEO-PI-3* provides a reliable and comprehensive tool to measure personality traits and can be used by individuals and organisations involved in selection, assessment, coaching, and development. It can also be used to help individuals with clinical, mental, and personality disorders get the support, monitoring, and treatment that they need.

The new *NEO-PI-3* International Senior Manager Norm provides up-to-date data to support the assessment and is beneficial for those working with multi-national clients who are interested in looking at personality and work behaviours in a post-pandemic world.

Following on from decades of research into the Five Factor Model of personality and the development of Costa and McCrae's first *NEO* personality inventory in the mid-1980s, a new post-pandemic International Senior Manager Norm was collected by Hogrefe Ltd for the current UK version, the *NEO-PI-3*, in spring 2022. The purpose of this was to meet the needs of users of the *NEO-PI-3* in a global setting. The sample comprises just under 500 managers from the United Kingdom (UK), Hong Kong, Australia, Singapore, India, and New Zealand. We also wanted to examine personality traits, demographics, and organisational factors in a post-Covid world.

Data analysis of the new norm shows *NEO-PI-3* profiles similar to those from previous norm samples, collected in 2015 and 2016. However, differences were found in the domains of *Openness*, *Agreeableness*, and *Conscientiousness*. Some age and country differences were found and are presented in the current paper.

Further analysis looked at various work factors, including where managers are currently working, job satisfaction and work performance, and pre- and post-pandemic wellbeing. The vast majority of managers said they were satisfied in their jobs and had high ratings of work performance. More than half of the sample reported they were working at their place of work, with most of the remainder working two or three days a week remotely and a small number working fully remotely. Almost one third of the sample said that their wellbeing had been negatively impacted since the pandemic began.

2. Introduction

2.1. The Five Factor Model of personality

There has been growing support over the past few decades among researchers and psychologists for a Five Factor Model (FFM) of personality, or a Big Five (Terracciano & McCrae, 2006). Such models describe five dimensions that encompass all aspects of personality, specifically *Neuroticism* (N), *Extraversion* (E), *Openness to Experience* (O), *Conscientiousness* (C), and *Agreeableness* (A).

Research on the Five Factor Model has found that these dimensions are relatively stable throughout the lifespan, have a strong genetic basis, and can be indicative of a variety of important traits such as emotional wellbeing, academic and job performance, and a range of health and clinical conditions (Terracciano & McCrae, 2006). Personality is strongly related to work factors, including job satisfaction, performance, and career choice. These relationships will be of interest to HR professionals who manage selection and development in organisations. Research in this area has demonstrated that personality characteristics are important predictors of job performance. Of course, different features of personality will be relevant to

different types of jobs and the practitioner must determine the optimal combination of traits for each position. The fact that the *NEO* tests look at the full range of personality traits makes them well suited for such applications. These may require comparisons between individuals, so professionals need to be aware of good ethical practice and legal issues related to ensuring fairness in such contexts.

2.2. NEO Personality Inventory Third Edition UK

The *NEO* inventories assess and provide interpretation of the five domains in the Five Factor Model. This can be a valuable resource for professionals, giving a comprehensive and detailed assessment of normal adult personality. There are different approaches to exploring *NEO* test scores. The *NEO* domains can be looked at how they each influence work behaviour. The traits described by the *NEO* domains and sub-scales, or facets, can be interpreted in combinations to support particular hypotheses about an individual or team in a work setting (Lord, 2017). Or high or low scores on each domain provide insight into personality traits that may be problematic at work (Carrillo, 2020). Since the introduction of the *NEO* tests, psychologists have accumulated a wealth of data on the validity of the tests and their use in occupational, clinical, and research contexts.

The value of the *NEO* tests has therefore grown as a result of these contributions. To date, the *NEO* has been translated into over 50 languages and the resulting data has helped to inform practice and to document the universality of the traits in the Five Factor Model (McCrae & Costa, 2010).

The *NEO Personality Inventory Third Edition UK (NEO-PI-3; McCrae & Costa, 2010)* is a 240-item personality measure constructed on a five-point, Likert-type scale on which the individual endorses each statement as ‘Strongly Disagree’, ‘Disagree’, ‘Neutral’, ‘Agree’, or ‘Strongly Agree’. The UK edition of the *NEO-PI-3* also contains one validity question for online administration and three for paper and pencil administration. It takes most individuals approximately 30 to 40 minutes to complete.

The items on the *NEO-PI-3* are designed to target the five domains of personality and have been adapted to be more readable for non-native English speakers. Each domain features six facets (see **Table 1**), and eight statements target each facet. Facet scores are summed to assess the five domains.

Table 1. The *NEO-PI-3* domains and facets

Domains	
N	Neuroticism
E	Extraversion
O	Openness
A	Agreeableness
C	Conscientiousness
Facets	
N1	Anxiety
N2	Angry Hostility
N3	Depression
N4	Self-Consciousness
N5	Impulsiveness
N6	Vulnerability

E1	Warmth
E2	Gregariousness
E3	Assertiveness
E4	Activity
E5	Excitement Seeking
E6	Positive Emotions
O1	Openness to Fantasy
O2	Openness to Aesthetics
O3	Openness to Feelings
O4	Openness to Actions
O5	Openness to Ideas
O6	Openness to Values
A1	Trust
A2	Straightforwardness
A3	Altruism
A4	Compliance
A5	Modesty
A6	Tender-Mindedness
C1	Competence
C2	Order
C3	Dutifulness
C4	Achievement Striving
C5	Self-Discipline
C6	Deliberation

The *NEO-PI-3* can be delivered to individuals or groups in an easy, flexible and secure way by the qualified test user for the purposes of recruitment, development or coaching. In addition to technical and personal insight reports which are provided for feedback, the *NEO-PI-3* can be used with supporting materials that aid interpretation and communication of results, such as the *NEO-PI-3 Feedback Chart*, *NEO-PI-3 Guide to Interpretation and Feedback in a Work Context*, and *NEO-PI-3 Feedback Cards*.

3. A new post-pandemic International Senior Manager Norm

Due to demand and in the interests of providing updated data in a post-Covid-19 world in 2022, a new *NEO-PI-3* International Senior Manager Norm was obtained in the spring of 2022. The norm comprises countries with ties to the UK as well as respondents from the UK itself, through the use of a professional and independent research panel company based in the UK. These countries had also been selected for the *NEO-PI-3* International Professional Norm data in 2016. The new norm is intended for use with individuals in mid-level to senior managerial positions. This will have significant international utility, and in addition it may be preferred over local norms for some UK applications of the *NEO-PI-3*, such as when recruiting into, or from, international or multicultural settings.

3.1. Data collection

Qualifying criteria for the data collection stipulated that respondents must have line management responsibility and have a minimum level of senior manager experience. The overall target for the data

collection was approximately 500 respondents, with an approximately even distribution between gender and geographical location, and, critically, sufficient numbers of employees in senior positions in their work sectors or organisations.

The survey included 25 detailed demographic questions including age and number of years of work experience both overall and in the current role, as well as a small number of questions relating to current ways of working and attitudes to work.

The research panel company issued invitations to complete the survey, applying the filtering criteria as outlined above. Potential respondents were offered incentives to complete the survey. The data collection was monitored on a daily basis to ensure that the sampling targets were being met, so, for example, if one group, such as males from the UK, had reached a sufficient number then data collection from that group was stopped. Data collection was carried out over a three-week period in late spring 2022.

3.1.1. Validity checks

In surveys, inattentive respondents can be common; those who do not pass the questions which are included to 'trap' respondents tend to interact with the survey instrument in distinctive ways – they take less time to respond, are more likely to answer with 'neutral' responses and display lower consistency in their responses (Alvarez et al., 2019). It is therefore important to properly account for inattentive responses in order to provide accuracy in outcomes.

Inattention items and response times

In this survey a number of separate items were distributed throughout to check for inattention. Missing responses and excessively fast single-item responses were prevented by the Hogrefe software, and responses which were deemed too fast overall were filtered out by the research panel company. The remaining response times were checked to see if there were still any which were extremely fast or slow, and, based on this criterion, nine respondents were excluded.

Response patterns

The data was also checked for repetitive random responding and extreme acquiescing or nay saying. A further nine respondents were found to have answered only to one option throughout the entire survey, so they were excluded from the sample. Acquiescent response patterns (agreement with at least 150 items) were noted, mainly in the Indian and Hong Kong samples, and these were retained on the grounds that valid variance is expected in such response patterns. Further to this, the demographic data was checked for anomalies or inconsistent responses, for example if a respondent had given more leadership experience than work experience in their answer. One example of this was found, giving a final total of 490. The following section describes the composition and profile of the norm.

3.2. Norm group description

The norm includes 490 individuals from Australia, Hong Kong, India, New Zealand, Singapore, and the UK. The data collection yielded approximately even representations of the countries included, in the time and with the respondents available. The gender split is two thirds male and one third female, which may well be a reflection of who tends to hold the senior manager positions in these countries at this time. Over half of the norm is in the 35 to 49 age range. Around 70% of the norm group responded that English was their first language, and of those who responded no, two thirds reported that they had been speaking English for 16

years or more. Almost 90% of the norm group had a first degree and 40% had an additional postgraduate/professional degree or doctorate.

In this sample, the majority was employed full-time, with only a very small proportion in part-time, self-employed or consultant roles. Over half the sample reported having a senior, chief or executive manager role, and the rest were in mid-level manager roles; 80% of the sample had a minimum of 6 years' experience in a leadership/management role, nearly 20% had 11 to 15 years' experience and 13% had 16 years or more. The majority of the sample worked in the private sector (81%), with the remaining in the public sector (17%) and third (voluntary, not-for-profit, social enterprise) sector (2%). A wide range of industries was represented, with public services and infrastructure, finance and IT services, and business and professional services comprising 67% of the sample.

The demographic breakdown of the sample including educational and employment characteristics is summarised in **Table 2**.

Table 2. Demographics of the *NEO-PI-3* International Senior Manager Norm (*N* = 490)

Country	Percentage
Australia	15.9%
Hong Kong	16.3%
India	19.8%
New Zealand	12.2%
Singapore	15.1%
UK	20.6%
Gender	
Male	67.3%
Female	32.7%
Age	
18–24 years	1.8%
25–34 years	20.0%
35–49 years	53.9%
50–64 years	22.4%
65–74 years	1.8%
Education level	
Secondary School/High School	4.1%
Some College/Technical/University	7.8%
Bachelor’s Degree or equivalent	48.6%
Master’s Degree or equivalent	27.1%
Professional Degree (e.g. DDS, JD, MD)	8.0%
Doctoral Degree or equivalent	1.2%
Postdoctoral Degree or equivalent	3.3%
Work experience	
1–5 years	5.3%
6–10 years	22.7%
11–15 years	21.2%
16–20 years	20.0%
21–30 years	22.0%
30+ years	8.8%
Working role	
Mid-level Manager	42.9%
Senior Manager/Director	49.4%
Chief or Executive Manager	7.8%
Years of leadership/management experience	
1–5 years	19.6%
6–10 years	47.6%
11–15 years	19.6%
16–20 years	9.0%
21–30 years	3.1%
30+ years	1.2%

Work sector categories	
Business/Professional Services	18.2%
Finance/IT Services	20.8%
Health/Education and Social Services	14.7%
Hospitality/Retail	11.6%
Public Services/Infrastructure	27.8%
Other	6.9%
Work sector	
Accountancy, banking, and finance	9.0%
Business, consulting, and management	12.9%
Charity and voluntary work	1.4%
Creative arts and design	2.0%
Education	9.6%
Energy and utilities	3.1%
Engineering and manufacturing	11.2%
Environment, agriculture, and food production	1.4%
Healthcare	3.7%
Hospitality	2.0%
Information technology	11.8%
Law	0.6%
Law enforcement, security, and armed forces	0.8%
Leisure, sport, and tourism	0.8%
Marketing, advertising, and public relations	1.4%
Media and internet	0.6%
Pharmaceuticals and biotechnology	0.8%
Property and construction	2.9%
Public services and administration	3.5%
Publishing	0.4%
Retail	8.8%
Transport and logistics	4.3%
Other	6.9%
Time in current job	
Less than 6 months	1.4%
6–12 months	1.6%
1–3 years	8.0%
3–10 years	47.8%
More than 10 years	41.2%

4. Data analysis

4.1. Norm group profile

The means and standard deviations for the new *NEO-PI-3* International Senior Manager Norm are presented in **Table 3**.

Table 3. Means and standard deviations (*SDs*) of the *NEO-PI-3* International Senior Manager Norm (*N* = 490)

Domain/facet	M	SD
Domains		
Neuroticism	89.78	19.55
Extraversion	108.41	20.02
Openness	107.42	16.92
Agreeableness	110.59	16.52
Conscientiousness	120.27	20.35
Neuroticism facets		
N1 Anxiety	15.83	4.38
N2 Angry Hostility	15.05	4.32
N3 Depression	16.08	5.23
N4 Self-Consciousness	15.03	4.49
N5 Impulsiveness	16.16	3.59
N6 Vulnerability	11.63	4.47
Extraversion facets		
E1 Warmth	20.30	4.68
E2 Gregariousness	15.75	5.10
E3 Assertiveness	17.61	4.48
E4 Activity	17.23	4.00
E5 Excitement Seeking	18.92	4.61
E6 Positive Emotions	18.59	4.65
Openness facets		
O1 Openness to Fantasy	17.48	4.44
O2 Openness to Aesthetics	18.49	5.33
O3 Openness to Feelings	19.76	3.94
O4 Openness to Actions	14.79	3.51
O5 Openness to Ideas	20.00	4.59
O6 Openness to Values	16.91	4.13
Agreeableness facets		
A1 Trust	18.14	4.49
A2 Straightforwardness	16.30	4.52
A3 Altruism	21.13	4.58
A4 Compliance	15.93	3.90
A5 Modesty	17.53	4.14
A6 Tender-Mindedness	21.56	4.42
Conscientiousness facets		
C1 Competence	20.60	4.04
C2 Order	18.99	5.01
C3 Dutifulness	21.28	3.82
C4 Achievement Striving	20.25	4.42
C5 Self-Discipline	19.98	4.71
C6 Deliberation	19.18	3.79

Note: Domains (min: 0, max: 192)

4.2. Relationships of the *NEO-PI-3* to age, gender, geographical location and level of seniority

As it may be necessary to assess individuals from many different backgrounds, the effects of demographic variables such as age, gender, geographical location, and level of seniority on test scores should be examined to determine what influence these variables have. When effect sizes are large, relations between trait scores and other criteria may be confounded by demographic influences. The following outlines some of the differences, mostly small, which were found in the International Senior Manager Norm data.

Age

The *NEO-PI-3* domain and facet means were compared across age groups:

- 18–34 years: $n = 107$.
- 35–49 years: $n = 264$.
- 50–74 years: $n = 119$.

Effect sizes as calculated by Cohen's d showed that:

- For *Neuroticism*, there was a moderate difference¹ between the scores of the two younger age groups and the older age group ($d = 0.71$ for 18–34 years, $d = 0.53$ for 35–49 years). Older managers were mainly less likely to report feeling Angry Hostility, Depression, Self-Consciousness, and Vulnerability.
- For *Extraversion*, there was a small difference between the middle and older age groups ($d = 0.27$). Older managers were less likely to have a tendency for Excitement Seeking.
- For *Openness*, a small difference was detected between the younger and older age groups ($d = 0.45$) and the middle and older age groups ($d = 0.31$). Older managers were more likely to be open to imagination (Openness to Fantasy) and to values (Openness to Values).
- For *Agreeableness*, there was a large difference between the younger and older age groups ($d = 0.96$), a moderate difference between the middle and older age groups ($d = 0.65$), and a small difference between the younger and middle age groups ($d = 0.31$). Older managers were more likely to score higher for Straightforwardness, Altruism, and Modesty.
- For *Conscientiousness*, there was a moderate difference between the younger and older age groups ($d = 0.65$) and a small difference between the middle and older age groups ($d = 0.35$). Older managers were more likely to have self-belief (Competence), a sense of duty (Dutifulness), and Self-Discipline.

Gender

Only minor differences in personality traits were found between females and males in this sample. Mean scores are the same for *Agreeableness* and *Conscientiousness*. For *Openness*, female managers scored slightly higher for Openness to Feelings and Openness to Values. For *Extraversion*, male managers scored slightly higher for Excitement Seeking. For *Neuroticism*, females scored slightly higher than males overall ($d = 0.25$), scoring slightly higher on Anxiety, Angry Hostility, and Impulsiveness.

¹ As suggested by Cohen (1988), effect sizes can be considered as small ($d = 0.2$), moderate ($d = 0.5$), and large ($d = 0.8$).

Geographical location

The largest differences at the domain level between the respondents in the six countries as observed in this sample (although it must be noted that the subgroups are small, and therefore only give a rough indication) are as follows:

- *Neuroticism*: Managers in Hong Kong scored higher than those in the UK ($d = 0.63$) and India ($d = 0.49$).
- *Extraversion*: Managers in India scored higher than those in all the other countries (mean $d = 0.87$). Those in the UK scored higher than managers in New Zealand ($d = 0.55$) and Singapore ($d = 0.46$).
- *Openness*: Managers in both the UK and India scored higher than managers in the other countries, with a mean effect size of $d = 0.66$ (UK) and $d = 0.62$ (India).
- *Agreeableness*: Managers in the UK scored higher than managers in Hong Kong, Singapore, and Australia (mean $d = 0.71$). Managers in India scored higher than those in Hong Kong ($d = .68$) and Singapore ($d = 0.46$). And managers in New Zealand scored higher than managers in Hong Kong ($d = 0.61$).
- *Conscientiousness*: Managers in both the UK and India scored higher than managers in Hong Kong, Australia, and New Zealand, with a mean effect size of $d = 0.89$ (India) and $d = 0.76$ (UK). Managers in Singapore scored higher than managers in Hong Kong ($d = 0.71$).

Level of seniority

Minor differences were found between the scores of mid-level managers and senior managers. There were small differences for *Extraversion* ($d = 0.34$) and *Conscientiousness* ($d = 0.25$), with senior managers scoring higher than mid-level managers on both domains. At the facet level, these higher scores were mainly for Assertiveness and Positive Emotions (*Extraversion*) and Competence and Achievement Striving (*Conscientiousness*).

These differences in age, gender, geographical location and seniority were not found to be large enough to warrant separating out the norms into different categories. The *NEO-PI-3* scores for this norm group were therefore largely independent of these demographic variables. However, there were some interesting patterns to note with the scores of managers of different ages in the domains of *Agreeableness*, *Conscientiousness* and *Neuroticism*, as outlined above.

4.3. Comparison of the *NEO-PI-3* norm groups

A comparison of the four norm groups to date – International Senior Managers (2022), International Professional (2016), UK Managerial and Professional (2015), and UK Working Population (2015) – is presented in **Table 4**.

Table 4. Comparison of means (and *SDs*) across the four *NEO-PI-3* norm groups to date

Domain	International Senior Managers (2022)	International Professional (2016)	UK Managerial/ Professional (2015)	UK Working Population (2015)
Neuroticism	89.78 (19.55)	93.03 (22.81)	89.57 (24.96)	94.88 (24.65)
Extraversion	108.41 (20.02)	105.50 (19.06)	106.84 (20.16)	102.88 (19.83)
Openness	107.42 (16.92)	108.50 (18.26)	114.80 (21.06)	108.57 (19.16)
Agreeableness	110.59 (16.52)	112.70 (17.49)	115.66 (17.82)	114.92 (18.11)
Conscientiousness	120.27 (20.35)	117.05 (17.67)	119.87 (19.55)	116.96 (18.71)

Note: Domains (min: 0, max: 192)

The differences in *NEO-PI-3* domain scores between the current norm and the previous International Professional Norm (2016) are very small (mean $d = 0.15$, range $d = 0.12$ – 0.17). The differences in *NEO-PI-3* domain scores between the current norm and the UK Managerial and Professional Norm (2015) are only significant for *Openness* and *Agreeableness* with relatively small effect sizes. The current norm has slightly lower mean scores on both *Openness* ($d = 0.39$) and *Agreeableness* ($d = 0.30$). Within the domain *Openness*, a large effect was found for the facet Openness to Values ($d = 0.91$). Within the domain *Agreeableness*, a medium effect was found for the facet Straightforwardness ($d = 0.50$).

The differences in *NEO-PI-3* domain scores between the current norm and the UK Working Population Norm (2015) are significant for *Neuroticism*, *Extraversion*, *Agreeableness*, and *Conscientiousness*, with small effect sizes (mean $d = 0.23$, range $d = 0.17$ – 0.28). Medium effects were found for the facets Impulsiveness (*Neuroticism*), Openness to Values (*Openness*), and Straightforwardness (*Agreeableness*), where the current norm scores lower, and for Openness to Aesthetics (*Openness*), where the current norm scores higher.

5. Reliability and validity

5.1. Reliability

In order to ascertain whether or not the new norm data is reliable, Cronbach's alpha was measured on each *NEO-PI-3* domain (see **Table 5**) and facet. Alpha values over .70 are usually considered to be acceptable, over .80 considered to be good and over .90 excellent (Cronbach, 1951). The range for the current sample, at the domain level, is .82 to .90. Similar values are reported in the UK edition of the *NEO-PI-3* for the International Professional Norm 2016 (.86–.91) and the UK Working Population and Managerial/Professional norms from 2015 (.88–.94).

Table 5. Internal consistency reliability (alpha) and standard error of measurement (SEM) for the *NEO-PI-3* domains in the International Senior Manager Norm

Domain	Cronbach's α	SEM
Neuroticism	.87	7.02
Extraversion	.88	6.99
Openness	.84	6.83
Agreeableness	.82	7.01
Conscientiousness	.90	6.37

5.2. Validity

5.2.1. Intercorrelations

Mean correlations as presented below in **Table 6** show a moderate to good relationship between the *NEO-PI-3* facets and their corresponding domain: *Neuroticism* .73 (with a range of .53–.84), *Extraversion* .72 (range .65–.79), *Openness* .65 (range .53–.75), *Agreeableness* .63 (range .54–.77), and *Conscientiousness* .79 (range .69–.86).

Table 6. Intercorrelations between the *NEO-PI-3* domains and facets for the International Senior Manager Norm

Domain/facet	N	E	O	A	C
Neuroticism	-				
Extraversion	-.28	-			
Openness	-.30	.53	-		
Agreeableness	-.24	.33	.35	-	
Conscientiousness	-.62	.34	.37	.34	-

	N	E	O	A	C	N1	N2	N3	N4	N5	N6
N1 Anxiety	.74	-.12	-.08	.02	-.27	-					
N2 Angry Hostility	.71	-.20	-.25	-.49	-.41	.35	-				
N3 Depression	.84	-.15	-.26	-.14	-.54	.59	.51	-			
N4 Self-Consciousness	.78	-.39	-.39	-.20	-.48	.51	.46	.58	-		
N5 Impulsiveness	.53	-.05	.05	-.02	-.35	.31	.30	.31	.28	-	
N6 Vulnerability	.78	-.30	-.34	-.23	-.67	.48	.48	.59	.57	.26	-

	N	E	O	A	C	E1	E2	E3	E4	E5	E6
E1 Warmth	-.23	.79	.48	.50	.32	-					
E2 Gregariousness	-.11	.78	.32	.26	.09	.58	-				
E3 Assertiveness	-.44	.68	.45	.15	.45	.48	.40	-			
E4 Activity	-.07	.65	.18	.08	.23	.39	.37	.36	-		
E5 Excitement Seeking	.01	.67	.37	.03	.04	.37	.49	.27	.39	-	
E6 Positive Emotions	-.38	.78	.50	.39	.35	.60	.51	.48	.40	.39	-

	N	E	O	A	C	O1	O2	O3	O4	O5	O6
O1 Openness to Fantasy	-.18	.26	.75	.23	.22	-					
O2 Openness to Aesthetics	-.07	.52	.67	.04	.15	.35	-				
O3 Openness to Feelings	-.05	.44	.65	.36	.32	.44	.36	-			
O4 Openness to Actions	-.25	.36	.53	.21	.09	.26	.21	.19	-		
O5 Openness to Ideas	-.42	.45	.74	.27	.43	.43	.52	.35	.28	-	
O6 Openness to Values	-.24	.00	.53	.32	.22	.44	-.02	.24	.29	.23	-

	N	E	O	A	C	A1	A2	A3	A4	A5	A6
A1 Trust	-.12	.54	.23	.54	.09	-					
A2 Straightforwardness	-.12	-.23	.03	.58	.19	-.03	-				
A3 Altruism	-.32	.49	.49	.77	.43	.38	.28	-			
A4 Compliance	-.17	.15	.02	.58	.11	.25	.28	.30	-		
A5 Modesty	-.07	-.20	.07	.57	.11	.01	.45	.28	.17	-	
A6 Tender-Mindedness	-.12	.47	.45	.76	.34	.41	.22	.66	.27	.28	-

	N	E	O	A	C	C1	C2	C3	C4	C5	C6
C1 Competence	-.60	.35	.36	.25	.85	-					
C2 Order	-.43	.16	.27	.24	.77	.55	-				
C3 Dutifulness	-.38	.26	.30	.46	.77	.61	.47	-			
C4 Achievement Striving	-.44	.44	.41	.24	.78	.59	.51	.54	-		
C5 Self-Discipline	-.65	.28	.30	.29	.86	.71	.61	.59	.62	-	
C6 Deliberation	-.44	.08	.08	.15	.69	.56	.38	.49	.41	.51	-

5.2.2. Factor analysis

The factor structure of the *NEO* instruments has been consistently recovered in different translations and a diversity of populations (e.g. McCrae & Terracciano, 2005). To ascertain that the structure had been replicated with the *NEO-PI-3* (UK edition) in this new international sample of senior managers, an exploratory factor analysis (EFA) was conducted, as reported in **Table 7** and **Table 8**. In most cases, the factor has relatively high loadings, with relatively low loadings on the other factors.

Table 7. Exploratory factor analysis for the *NEO-PI-3* International Senior Manager Norm

Facet	N	E	O	A	C
N1 Anxiety	.72	.07	.05	.11	-.04
N2 Angry Hostility	.52	-.20	.04	-.45	-.06
N3 Depression	.70	.17	-.11	-.02	-.28
N4 Self-Consciousness	.63	-.13	-.14	.03	-.13
N5 Impulsiveness	.28	-.04	.45	.03	-.36
N6 Vulnerability	.42	.04	-.09	.00	-.52

E1 Warmth	.08	.79	.02	.11	.08
E2 Gregariousness	-.09	.84	-.11	-.08	-.23
E3 Assertiveness	-.27	.36	.11	-.22	.23
E4 Activity	.12	.54	-.24	-.27	.21
E5 Excitement Seeking	.08	.55	.09	-.34	-.09
E6 Positive Emotions	-.17	.66	.08	-.02	.05
O1 Openness to Fantasy	-.10	.00	.75	.00	-.02
O2 Openness to Aesthetics	.05	.42	.23	-.37	.05
O3 Openness to Feelings	.30	.28	.43	.04	.26
O4 Openness to Actions	-.31	.30	.28	.03	-.24
O5 Openness to Ideas	-.16	.25	.29	-.10	.25
O6 Openness to Values	-.20	-.22	.64	.34	-.04
A1 Trust	-.01	.76	-.16	.18	-.17
A2 Straightforwardness	.06	-.19	.12	.62	.15
A3 Altruism	.05	.50	.19	.44	.19
A4 Compliance	-.08	.39	-.25	.50	-.09
A5 Modesty	.08	-.16	.22	.63	.04
A6 Tender-Mindedness	.30	.55	.16	.41	.20
C1 Competence	-.15	-.02	.01	-.03	.79
C2 Order	-.06	-.15	.12	.07	.63
C3 Dutifulness	.20	.06	-.03	.24	.79
C4 Achievement Striving	-.01	.12	.05	-.12	.70
C5 Self-Discipline	-.24	-.05	-.03	.06	.74
C6 Deliberation	-.04	-.11	-.28	.05	.74
Sum of squared loadings	2.81	4.47	2.08	2.28	4.55
% of Variance	9.38	14.91	6.94	7.60	15.15
Cumulative %	9.38	24.29	31.23	38.83	53.98

Note: N = Neuroticism; E = Extraversion; O = Openness; A = Agreeableness; C = Conscientiousness. Those cells with lighter shading represent the facets for the corresponding domain. Exploratory factor analysis (EFA). Promax rotation (extraction method 'minimum residuals') based on eigenvalue > 1.

The goodness-of-fit statistics for this model are presented in **Table 8**. The Root Mean Square Error of Approximation (RMSEA) indicates an acceptable fit, according to Hu and Bentler (1999), who state that values less than .05 are good, values between .05 and .08 are acceptable, values between .08 and .10 are marginal, and values greater than .10 are poor. Tucker–Lewis Index (TLI) is also an acceptable fit, according to Vandenberg & Lance (2000), who say that values > .90 indicate an acceptable fit (and > .95 indicates a good fit).

Table 8. Goodness-of-fit statistics for the *NEO-PI-3* International Senior Manager Norm

Model Fit Measures	
χ^2	765
df	295
p	<.001
RMSEA	.057
TLI	.903

Note: RMSEA; TLI.

6. Ways of working and wellbeing

Respondents were asked various questions about the way they work and their levels of job satisfaction, work performance, and pre- and post-pandemic wellbeing.

6.1. Ways of working

Over half of the sample (53%) reported working entirely at their place of work, with 9% working remotely and 38% in hybrid. Of those working in hybrid, 33% reported working remotely three days a week, with 27% working two days a week, 12% four days, and 12% one day.

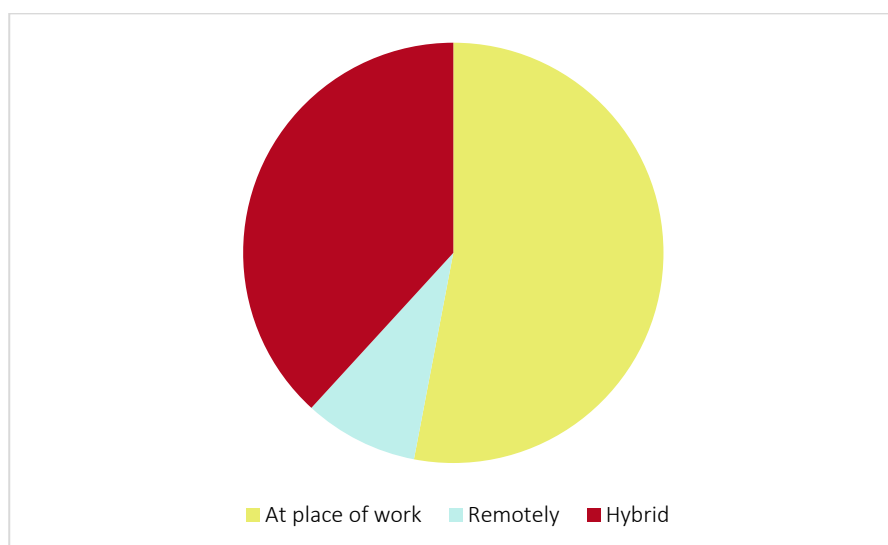


Figure 1. Where managers are working in 2022

Table 9 shows how this looks by gender, age, and geographical location. Female and male managers are equally likely to be working in their workplace, remotely or in hybrid. Managers of all ages are more likely to be working in their workplace than remotely or in hybrid. Managers aged 25 to 34 represent the largest proportion of this, and managers aged 35 to 49 represent the largest number working in hybrid. India and Singapore have the lowest proportion of managers working in the workplace.

Table 9. Where managers are working in 2022 by gender, age, and geographical location

Gender	Workplace	Remote	Hybrid
Female	52%	11%	37%
Male	53%	9%	38%
Age			
25–34 years	65%	5%	30%
35–49 years	51%	7%	42%
50–64 years	48%	13%	39%

Country			
Australia	65%	4%	31%
Hong Kong	61%	5%	34%
India	48%	16%	36%
New Zealand	58%	7%	35%
Singapore	34%	6%	60%
UK	52%	13%	35%
Overall	53%	9%	38%

The number of hours spent on videoconferencing or video calls was typically (45%) reported to be 1 to 2 hours per working day. Of the remaining sample, 20% spent less than 1 hour per day on video calls, 16% spent 3 hours, 16% spent 4 to 6 hours, and 3% spent 7 or more hours each day videoconferencing.

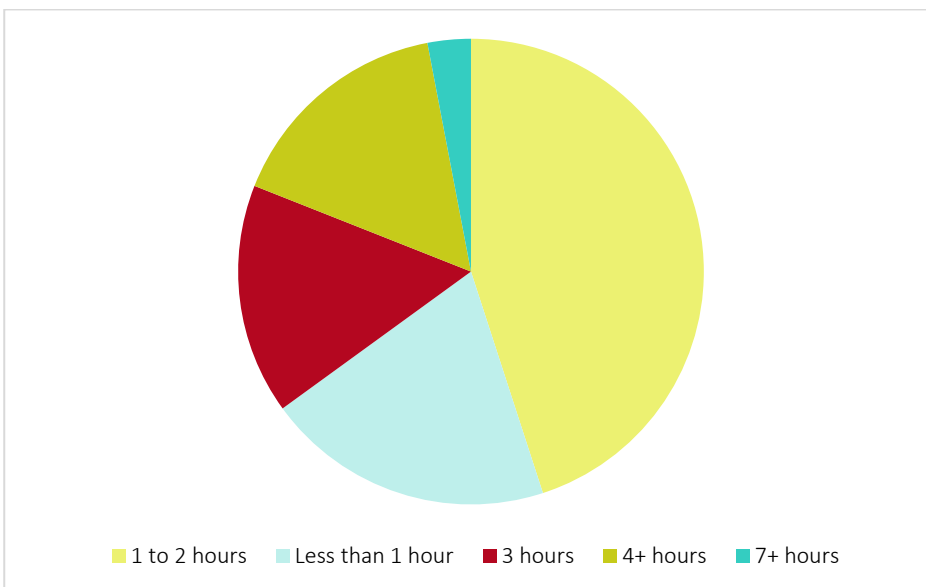


Figure 2. Number of hours per day managers spend videoconferencing

6.2. Work and wellbeing

6.2.1. Job satisfaction and work performance

Most of the sample reported being either satisfied or very satisfied with their jobs (81.5%) and 92.8% perceived that their line manager would rate their performance as good or very good. A small number of managers were not satisfied with their jobs and 2.4% said they were looking for a new job.

Job satisfaction was rated highest by respondents from the UK, India, and Australia. Only a very small number of managers from Singapore, the UK, and New Zealand reported that they were not satisfied and looking for a new job. Males rated slightly higher on job satisfaction than females.

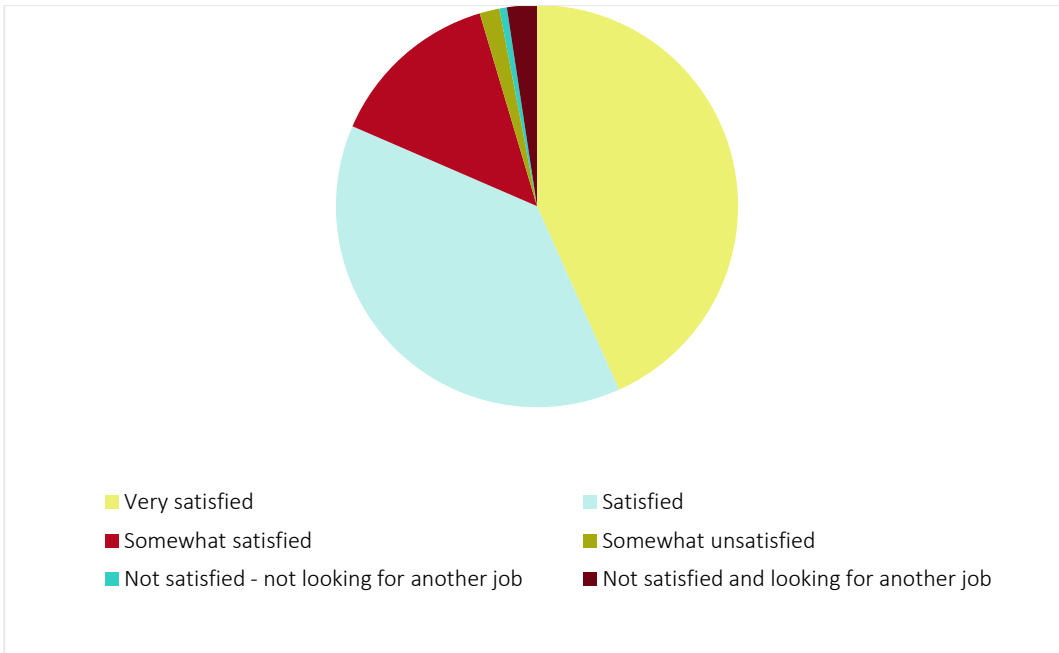


Figure 3. Job satisfaction of managers

Respondents were asked how their line manager would rate their performance. This was reported highest from the UK, India, Australia, and Hong Kong. Male and female managers reported identical results for work performance, giving 93% good or very good self-ratings. Work performance was also rated consistently across the age groups (an average of 94% good or very good self-ratings).

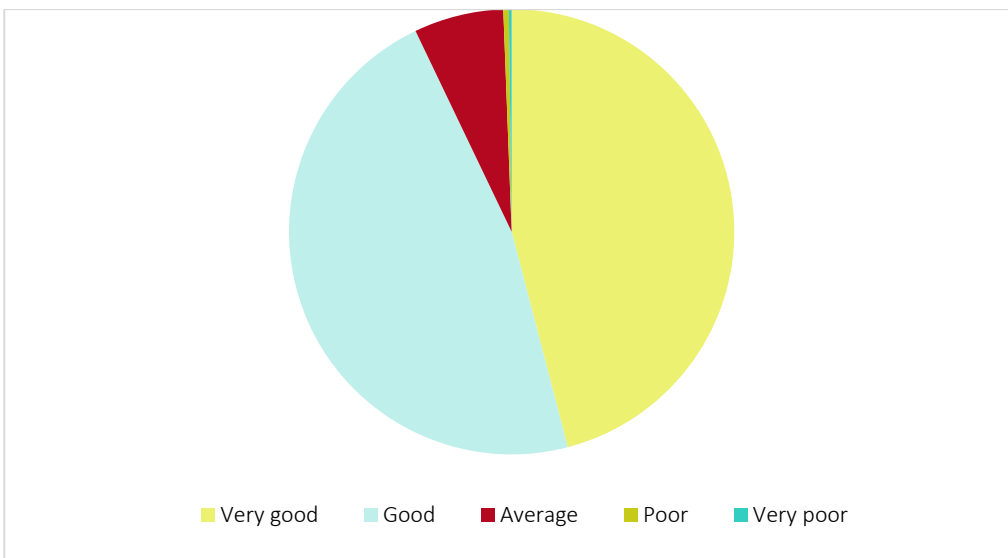


Figure 4. Work performance of managers

6.2.2. Wellbeing

Perhaps not surprisingly, wellbeing has been affected by the Covid-19 pandemic. In this sample, 29% of managers reported that their wellbeing had worsened since the pandemic began, 60% reported the same

wellbeing and only 11% reported increased wellbeing. The proportion of managers who rated their wellbeing as poor increased from 1.8% pre-pandemic to 4.5% post-pandemic (see **Figure 5**).

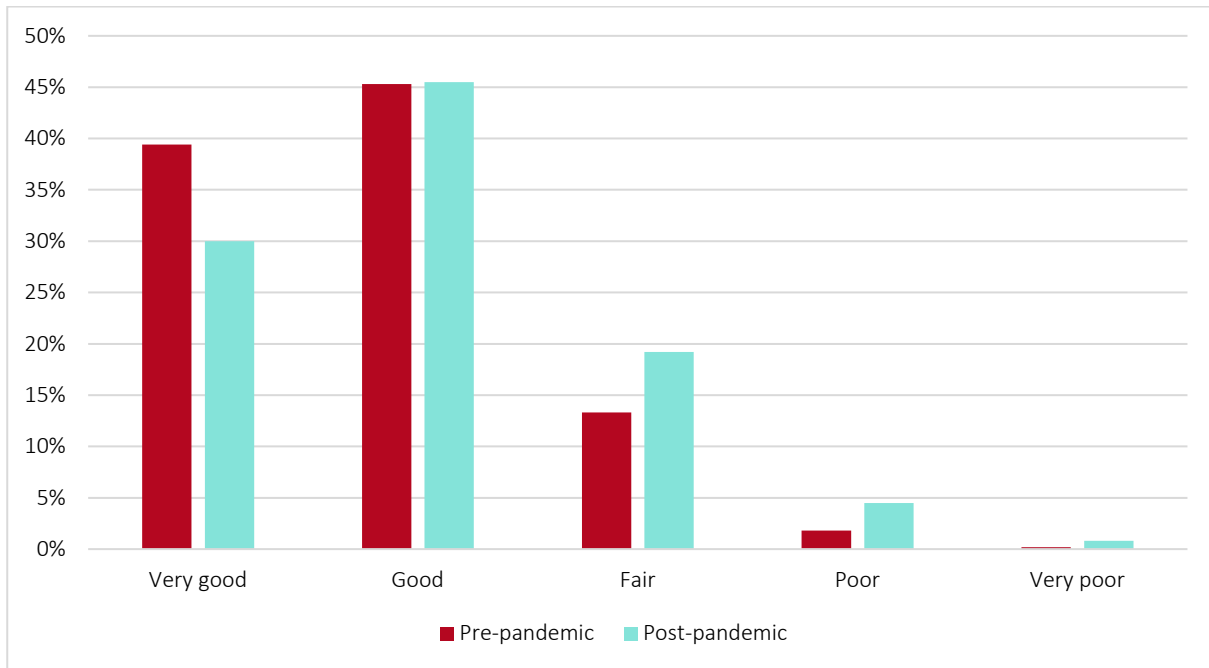


Figure 5. Pre- and post-pandemic physical and mental wellbeing of managers

Overall, 29% of the senior managers said that their wellbeing had been negatively impacted since the pandemic began.

The male managers appear to be slightly more affected than the female managers in this sample. Managers from New Zealand reported the biggest drop in wellbeing, but it should be noted that New Zealand managers are the smallest proportion in the international sample.

6.3. Personality and work factors

6.3.1. Ways of working

Managers in hybrid work or completely working remotely scored higher on *Openness* than those working in their workplace ($d = 0.38$). At the facet level this was found to be most prevalent for Openness to Fantasy, Openness to Feelings, Openness to Ideas, and Openness to Values. No other *NEO-PI-3* domain effects were found for this sample.

6.3.2. Work and wellbeing

Mean *NEO-PI-3* scores in this sample were looked at in relation to job satisfaction and work performance, but, due to the high number of respondents who gave very high ratings for both questions, this could not be investigated.

For pre- and post-pandemic wellbeing the following outcomes were found from the data:

- Managers who rated better post-pandemic wellbeing score higher on *Neuroticism* ($d = 0.43$) than managers whose wellbeing had not changed.
- Managers whose wellbeing had increased since the pandemic began score lower on *Openness* ($d = 0.40$) than managers whose wellbeing had decreased.
- Managers whose wellbeing had increased since the pandemic began score lower on *Agreeableness* than managers whose wellbeing had decreased ($d = 0.51$) or stayed the same ($d = 0.44$).
- And managers whose wellbeing had increased since the pandemic began score lower on *Conscientiousness* than managers whose wellbeing had decreased ($d = 0.40$) or stayed the same ($d = 0.46$).

No differences for *Extraversion* were found for this sample.

7. Conclusions

Five Factor Model personality measures, such as the *NEO-PI-3*, can provide individuals with valuable information about themselves and the employees or clients they are working with in selection or development. They can also help those working in, or with, organisations to gain insights into how employees might use their natural behavioural preferences by way of their personality at work.

The new International Senior Manager Norm presented in the current paper is made up of just under 500 responses to the *NEO-PI-3* from managers from six countries, including the UK. The results show that their *NEO-PI-3* profiles are similar to those from the previous norm samples, collected in 2015 and 2016. Some differences were found in the *Openness*, *Agreeableness*, and *Conscientiousness* domains, with the managers in the current norm group scoring lower than those in the previous norm groups. Data analysis has shown that the new data is a reasonable fit to the Five Factor Model and can be considered to be reliable. Some analyses were presented to show differences in personality profiles between age groups and geographical location.

In addition to the *NEO-PI-3* questionnaire responses, respondents were asked a number of questions relating to ways of working and work and wellbeing. The vast majority of managers said they were satisfied in their jobs and had high ratings of work performance. Over half of the sample reported working at their place of work, with most of the remainder working two or three days a week remotely, and a small number working solely remotely. Almost one third of the sample said that their wellbeing had been negatively impacted since the pandemic began.

The new *NEO-PI-3* International Senior Manager Norm can be used by individuals and organisations for the purposes of selection and development, particularly those working in a global context. It provides up-to-date reliable and valid reference data, giving confidence to the user that this is representative of a current population.

Further development could include giving additional support to the *NEO-PI-3* by extending the collection of data to different countries and by conducting more analyses of interesting and relevant demographic and organisational factors to provide even deeper insights into work behaviours.

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