

3Cs Variation & Correlation Assessment

As part of the development of multipliers for the 3Cs Staffing level Tool, testing was done using the participating rosters of the 2023 National Run. There were four methodologies used to calculate a recommended whole time equivalent (rWTE) for each team, which are detailed below:

1. Direct Care & Associated Workload are the main drivers. All other workload activities are calculated as a percentage of the total workload and then added on to the calculation.
2. Indirect Care & Associated Workload are the main drivers. All other workload activities are calculated as a percentage of the total workload and then added on to the calculation.
3. Direct Care & Indirect Care are the main drivers. All other workload activities are calculated as a percentage of the total workload and then added on to the calculation.
4. Direct Care & Indirect Care are the main drivers. The average time per day for AWL, Clinics, Travel & Exceptions is added on to the calculation.

For each of the four calculated outputs, the Professional Judgement (PJ) figure was subtracted, measuring the difference. The variation of these differences was calculated and from there, the Standard Error (SE) of variation was determined for each method.

The SE of variation is a useful measure when comparing the variance of each method. A smaller standard error indicates that the sample variance is a more accurate estimate of the population.

The correlation coefficient was calculated to assess the strength of the relationship between each calculated output and the PJ. The standard error of correlation was calculated, which is used to determine confidence intervals (CI) for the correlation coefficient. A smaller standard error suggests that the sample correlation is a more reliable estimate of the population estimate.

During analysis it was noted that travel time varied significantly between boards. When removing the average travel time from the Workload Index calculation and applying the actual travel time, variation was reduced. This increased the accuracy of the outputs and lent to a better fit model.

The Community Nursing SLT has three distinct specialties within it; District Nursing, School Nursing and Health Visiting. Each of these specialties have a separately calculated Workload Index due to the variation in workload which represents the differences between the roles.

Direct and Indirect Care interventions (face to face and non-face to face) were the highest combined proportion of workload within each of the SLT analyses, and therefore should serve as the main workload drivers for the Workload Index calculator. Considering feedback from the 3Cs Task and Finish Group, the workload drivers of direct and indirect care interventions are in line with their expectations of the tool and their expert knowledge of the way their services operate. Method 4 uses direct and indirect care interventions as its main workload drivers.

For the Workload Index calculations for District Nursing, Health Visiting, Community Children’s & Children’s Specialist Nurse, and Clinical Nurse Specialist, Method 1 gave the lowest variation and standard error of variation, and Method 4 had the highest correlation coefficient. For the School Nursing Workload Index calculations, Method 4 gave the lowest standard error of variation and had the highest correlation coefficient.

Please see tables below; a lower standard error (SE) indicates less variation around the median, demonstrating a better fit. A correlation of 1 indicates a perfect relationship and 0 indicates no relationship.

Community Nursing

District Nursing

District Nursing	Method 1	Method 2	Method 3	Method 4
Variance	68.6	84.0	206.3	90.9
STDev	8.3	9.2	14.4	9.5
Median	-3.0	-4.3	2.8	0.9
Count	871.0	871.0	871.0	871.0
SE	3.3	4.0	9.9	4.4
Lower 95% CI	62.1	76.1	186.9	82.4
Upper 95% CI	75.0	91.8	225.6	99.5

District Nursing	Correlation	SE	Lower 95% CI	Upper 95% CI
PJ	1.00	0.02	0.96	1.04
Method 1	0.74	0.03	0.69	0.79
Method 2	0.64	0.02	0.59	0.68
Method 3	0.73	0.02	0.69	0.77
Method 4	0.77	0.03	0.71	0.84

Health Visiting

Health Visiting	Method 1	Method 2	Method 3	Method 4
Variance	103.6	108.8	257.9	166.6
STDev	10.2	10.4	16.1	12.9
Median	-2.3	-2.8	6.2	4.0
Count	492.0	492.0	492.0	492.0
SE	6.6	6.9	16.5	10.6
Lower 95% CI	90.6	95.2	225.6	145.7
Upper 95% CI	116.5	122.4	290.1	187.4

Health Visiting	Correlation	SE	Lower 95% CI	Upper 95% CI
PJ	1.00	0.04	0.92	1.08
Method 1	0.49	0.04	0.41	0.56
Method 2	0.46	0.04	0.38	0.54
Method 3	0.48	0.04	0.40	0.55
Method 4	0.50	0.05	0.42	0.59

School Nursing

School Nursing	Method 1	Method 2	Method 3	Method 4
Variance	94.7	115.1	159.1	87.6
STDev	9.7	10.7	12.6	9.4
Median	-4.2	-3.8	4.1	0.2
Count	121.0	121.0	121.0	121.0
SE	12.2	14.9	20.5	11.3
Lower 95% CI	70.7	85.9	118.9	65.4
Upper 95% CI	118.6	144.2	199.4	109.8

School Nursing	Correlation	SE	Lower 95% CI	Upper 95% CI
PJ	1.00	0.07	0.86	1.14
Method 1	0.65	0.08	0.50	0.80
Method 2	0.53	0.07	0.39	0.67
Method 3	0.62	0.07	0.49	0.75
Method 4	0.69	0.09	0.51	0.87

Community Children’s and Children’s Specialist Nurse

CCSN	Method 1	Method 2	Method 3	Method 4
Variance	95.1	102.2	327.7	159.1
STDev	9.8	10.1	18.1	12.6
Median	-3.0	-3.1	3.7	1.5
Count	113.0	113.0	113.0	113.0
SE	12.7	13.7	43.8	21.3
Lower 95% CI	70.2	75.5	241.9	117.4
Upper 95% CI	120.0	129.0	413.5	200.8

CCSN	Correlation	SE	Lower 95% CI	Upper 95% CI
PJ	1.00	0.08	0.85	1.15
Method 1	0.60	0.08	0.45	0.75
Method 2	0.58	0.08	0.43	0.73
Method 3	0.59	0.07	0.44	0.74
Method 4	0.61	0.09	0.43	0.80

Clinical Nurse Specialist

CNS	Method 1	Method 2	Method 3	Method 4
Variance	30.7	37.1	76.5	55.6
STDev	5.5	6.1	8.7	7.5
Median	-2.0	-2.2	-0.3	0.2
Count	753.0	753.0	753.0	753.0
SE	1.6	1.9	3.9	2.9
Lower 95% CI	27.6	33.4	68.8	50.0
Upper 95% CI	33.9	40.9	84.2	61.3

CNS	Correlation	SE	Lower 95% CI	Upper 95% CI
PJ	1.00	0.03	0.93	1.07
Method 1	0.41	0.03	0.35	0.48
Method 2	0.38	0.03	0.31	0.45
Method 3	0.40	0.03	0.33	0.46
Method 4	0.44	0.04	0.36	0.51

Recommendation

it is recommended that Method 4 should be applied to each of the 3Cs Staffing Level Tools given the feedback from the Task & Finish Group, the statistical outputs and the actual workload proportion.