Healthcare Improvement Scotland

Healthcare Staffing Programme

Staffing level tool methodologies and multipliers

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Introduction

The Healthcare Staffing Programme (HSP) own a suite of staffing level tools which support boards with workforce planning by providing recommended Whole Time Equivalents (WTE), based on patient acuity or patient interventions. These tools were developed independently of each other and use several different methodologies to derive the multipliers which produce the WTE output.

NB: A 'multiplier' is the term used to describe the numeric value that is multiplied by the average or total number of patients, per level of care, to derive a recommended Whole Time Equivalent (rWTE).

Data collected from observation studies were used to create the database that these methodologies have been applied to unless otherwise stated.

This document describes each of the methodologies used, their resulting multipliers, and which staffing level tools they align to.

Methodologies

Methodology A

Multiplier calculation for one patient at each level of dependency/acuity over a 24-hour period

WTE = WI * hmh1 * (ho / 60 * do) / dc * (1+(paa-b)) / ch

Where:

WTE = whole time equivalent

WI = workload index = sum of (number of patients at each dependency/acuity level * (hourly minutes per hour for each dependency/acuity level/hourly minutes per hour for dependency/acuity level 1))

hourly minutes per hour = the number of minutes on average per hour spent on direct care by dependency/acuity = specialty specific data from observation studies

hmh1 = hourly mins per hour for dependency/acuity level 1

ho = hours open = number of hours per day the service/ward is open

do = days open = number of days the service/ward is open

dc = direct care = percentage of time spent on direct care as a proportion of all time observed in the study

paa = predicted absence allowance = percentage to cover planned and unplanned leave, for example study leave, annual leave, maternity leave, sickness absence

b = breaks = percentage to allow for breaks/unproductive time

ch = contracted hours worked per week by 1 WTE

The results of the above formula calculates the multiplier for one patient at each level of dependency over a 24-hour period. This value is multiplied by the average number of patients, per level of care, within a staffing level tool to derive a recommended Whole Time Equivalent (rWTE).

Methodology B

Multiplier calculation for one patient at each level of acuity per episode of care

WTE = ((WI * dt) * hmh1* (ho / 60 * do) / dc * (1+(paa-b)) * sm / ch

Where:

WTE = whole time equivalent

WI = workload index = sum of (number of patients at each acuity level * (hourly minutes per hour for each acuity level/hourly minutes per hour for acuity level 1))

dt = daily total = total number of average patients per day

hourly minutes per hour = the number of minutes on average per hour spent on direct care by acuity = specialty specific data from observation studies

hmh1 = hourly mins per hour for acuity level 1

ho = hours open = number of hours per day the service/ward is open

do = days open = number of days the service/ward is open

dc = direct care = percentage of time spent on direct care as a proportion of all time observed in the study

sm = skill mix percentage depending on whether nursing or medical

paa = predicted absence allowance = percentage to cover planned and unplanned leave, for example study leave, annual leave, maternity leave, sickness absence

b = breaks = percentage to allow for breaks/unproductive time

ch = contracted hours worked per week by 1 WTE

The results of the above formula calculates the multiplier for one patient at each level of acuity per episode of care. This value is multiplied by the total number of patients, per level of acuity to derive a recommended Whole Time Equivalent (rWTE).

Methodology B1 (skill mix removed)

Multiplier calculation for one patient at each level of acuity per episode of care

WTE = ((WI * dt) * hmh1* (ho / 60 * do) / dc * (1+(paa-b)) / ch

Where:

WTE = whole time equivalent

WI = workload index = sum of (number of patients at each acuity level * (hourly minutes per hour for each acuity level/hourly minutes per hour for acuity level 1))

dt = daily total = total number of average patients per day

hourly minutes per hour = the number of minutes on average per hour spent on direct care by acuity = specialty specific data from observation studies

hmh1 = hourly mins per hour for acuity level 1

ho = hours open = number of hours per day the service/ward is open

do = days open = number of days the service/ward is open

dc = direct care = percentage of time spent on direct care as a proportion of all time observed in the study

paa = predicted absence allowance = percentage to cover planned and unplanned leave, for example study leave, annual leave, maternity leave, sickness absence

b = breaks = percentage to allow for breaks/unproductive time

ch = contracted hours worked per week by 1 WTE

The results of the above formula calculates the multiplier for one patient at each level of acuity over a 24-hour period. This value is multiplied by the total number of patients, per level of acuity to derive a recommended Whole Time Equivalent (rWTE).

Methodology C

Multiplier calculation for one intervention at each level of acuity

rWTE = WI * (dci + ici) * hmh1 * (ho / 60 * do) / (dc + ic) + tt * paa / ch

Where:

rWTE = recommended Whole Time Equivalent

WI = Workload Index = sum of (number of interventions at each acuity level * (hourly minutes per hour for each level of acuity / hourly mins per hour for acuity level 1))

dci = average number of direct care interventions at each level of care

ici = average number of indirect care interventions at each level of care

hmh1 = hourly mins per hour for dependency level 1

hmph = the number of minutes on average per hour spent on direct and indirect care by dependency

ho = hours open = number of hours per day the service is open

do = days open = number of days the service is open

dc = direct care = percentage of time spent on direct care as a proportion of all time observed in the national run

ic = indirect care = percentage of time spent on direct care as a proportion of all time observed in the national run

tt = travel time = actual travel time in hours

paa = Predicted absence allowance = percentage to cover planned and unplanned leave, for example study leave, annual leave, maternity leave, sickness absence

ch = hours worked per week by 1 WTE

The results of the above formula calculates the multiplier for one intervention at each level of acuity. This value is multiplied by the total number of interventions, per level of acuity to derive a recommended Whole Time Equivalent (rWTE).

Methodology C1

Multiplier calculation for one intervention at each level of acuity

rWTE = WI * dci * hmh1 * (ho / 60 * do) / dc + tt * paa / ch

Where:

rWTE = recommended Whole Time Equivalent

WI = Workload Index = sum of (number of interventions at each acuity level * (hourly minutes per hour for each level of acuity / hourly mins per hour for acuity level 1))

dci = average number of direct care interventions at each level of care

hmh1 = hourly mins per hour for dependency level 1

hmph = the number of minutes on average per hour spent on direct and indirect care by dependency

ho = hours open = number of hours per day the service is open

do = days open = number of days the service is open

dc = direct care = percentage of time spent on direct care as a proportion of all time observed in the national run

tt = travel time = actual travel time in hours

paa = Predicted absence allowance = percentage to cover planned and unplanned leave, for example study leave, annual leave, maternity leave, sickness absence

ch = hours worked per week by 1 WTE

The results of the above formula calculates the multiplier for one intervention at each level of acuity. This value is multiplied by the total number of interventions, per level of acuity to derive a recommended Whole Time Equivalent (rWTE).

Methodology D

This methodology was last utilised in the Mental Health and Learning Disability Staffing Level Tool (Version 3) which was superseded by the Mental Health and Learning Disability Inpatient Nurse Staffing Level Tool Version 1 on 30 October 2025.

Whole time equivalent calculation for a time-task based calculator.

WTE = th * (1 +paa) / ch

Where:

th = sum (total task time)

paa = predicted absence allowance = percentage to cover planned and unplanned leave, for example study leave, annual leave, maternity leave, sickness absence

ch = contracted hours worked per week by 1 WTE

Methodology E

Where Additional Activity exists within a staffing level tool, this is calculated separately by the following formula:

rWTE = ((AA staff * AA hours) / 1WTE) * paa

where:

rWTE = recommended whole time equivalent

AA staff = number of staff

AA hours = number of hours of activity

paa = predicted absence allowance = percentage to cover planned and unplanned leave, for example study leave, annual leave, maternity leave, sickness absence

Methodology F

Calculation to transform a headcount into a whole time equivalent.

rWTE = ns * ph * (1+paa) / ch

where:

rWTE = recommended whole time equivalent

ns = number of staff recorded

ph = paid hours worked

paa = predicted absence allowance = percentage to cover planned and unplanned leave, for example study leave, annual leave, maternity leave, sickness absence

ch = contracted hours worked per week by 1 WTE

Methodology G

Calculation to transform a number of hours into a whole time equivalent.

rWTE = nh / (ch / dw / 1+paa)

where:

rWTE = recommended whole time equivalent

nh = number of hours required

ch = contracted hours worked per week by 1 WTE

dw = number of days in a week

paa = predicted absence allowance = percentage to cover planned and unplanned leave, for example study leave, annual leave, maternity leave, sickness absence

The results of the above formula calculates the multiplier for 1 nurse to 1 patient (1:1) ratio when 26 hours are required. The 26 hours value is made up of 24 hours direct care time + one hour of paid breaks + one hour of handover periods. To provide for 2:1 care, 3:1 care and 4:1 care, the output should be multiplied by 2, 3, and 4 respectively.

Multipliers

A 'multiplier' is the term used to describe the numeric value that is multiplied by the average or total number of patients, per level of care, to derive a recommended Whole Time Equivalent (rWTE).

All multipliers are based on contracted hours of 1 WTE being equal to 36 hours per week for 2026/27, except for medical within Emergency Care Provision which is based on 40 hours per week.

Table 1

Adult Inpatient

	Dep.1	Dep.2	Dep.3	Dep.4	Dep.5
Admission and Assessment Units	1.15	1.56	2.52	3.11	6.19
Cardiology Wards	0.62	1.20	1.66	3.41	6.19
Medical Elderly Care Wards (Acute Hospitals)	0.50	0.75	1.32	1.69	6.19
Long-Stay Elderly Care (Community Hospitals)	0.52	0.94	1.36	1.96	6.19
Gynaecology	0.81	1.08	1.59	2.28	6.19
Hospices - Adult	1.30	1.36	2.39	3.59	6.19
General Medical Wards	0.43	0.90	1.58	2.67	6.19
Medical Gastrointestinal	0.43	0.90	1.58	2.67	6.19
Medical Vascular	0.51	0.61	1.82	3.76	6.19
Neurology Wards	0.60	0.90	2.07	3.76	6.19
Oncology/Haematology	0.71	1.25	2.05	3.21	6.19
Elective Orthopaedic	0.58	0.96	1.51	2.43	6.19
Trauma Orthopaedic	0.77	1.09	1.69	2.99	6.19
Rehabilitation Wards	0.51	0.97	1.62	2.26	6.19
Respiratory Wards	0.43	0.90	1.58	2.67	6.19
Infectious Diseases	0.86	0.75	1.64	3.39	6.19
Stroke Wards	0.62	0.66	1.25	1.77	6.19
Surgical Wards	0.74	1.01	1.89	3.01	6.19
Surgical/Vascular Wards	0.74	1.01	1.89	3.01	6.19

Table 2

Small Wards

Dep.1	Dep.2	Dep.3	Dep.4	Dep.5
1.80	1.75	2.90	4.02	6.19

Table 3

Neonatal

Low	Med/HDU	High/ITU	ECMO
1.55	3.10	6.19	12.39

Table 4

Scottish Children's Acuity Measurement in Paediatric Settings (SCAMPS)

Level 0	Level 1a	Level 1b	Level 2	Level 3a	Level 3b	Level 4
1.04	3.37	4.00	4.57	5.38	5.49	11.43

Table 5

Maternity Services

	Core	Enhanced	Complex
Triage	0.27	0.30	0.48
Hospital outpatients	0.27	0.32	0.40
Intrapartum	6.19		

Inpatient	Core	Enhanced	Complex
Antenatal	1.65	1.86	2.33
Postnatal Mum	1.52	1.78	3.74
Postnatal Baby	1.39	1.55	1.80

Community/Integrated	Core	Enhanced	Complex
Antenatal	0.38	0.47	0.53
Postnatal Mum	0.29	0.35	0.53
Postnatal Baby	0.24	0.28	0.41

Table 6

Mental Health and Learning Disabilities Inpatient Nurse

	Low	Medium	High	1:1	2:1	3:1	4:1
Adult Acute Admissions	0.90	1.24	3.28	6.19	12.39	18.58	24.77
Child and Adolescent MH	1.17	1.60	4.55	6.19	12.39	18.58	24.77
Eating Disorder	1.14	1.64	3.63	6.19	12.39	18.58	24.77
Forensic The State Hospital	1.90	2.74	4.23	6.19	12.39	18.58	24.77
Forensic Low	1.46	1.71	3.70	6.19	12.39	18.58	24.77
Forensic Medium/High	1.47	1.77	3.83	6.19	12.39	18.58	24.77
Inpatient Addictions	1.30	1.87	4.12	6.19	12.39	18.58	24.77
Learning Disability	1.17	1.75	3.01	6.19	12.39	18.58	24.77
Older Adult Acute	1.18	1.71	3.76	6.19	12.39	18.58	24.77
Older Adult Dementia	1.15	1.67	3.67	6.19	12.39	18.58	24.77
Perinatal Mother and Baby	1.49	2.14	4.72	6.19	12.39	18.58	24.77
Psychiatric Intensive Care Unit	2.43	3.48	5.59	6.19	12.39	18.58	24.77
Rehabilitation	1.53	1.93	4.19	6.19	12.39	18.58	24.77

Table 7

Community Nursing

	Level 1	Level 2	Level 3	Level 4
District Nursing	0.20	0.26	0.28	0.32
Health Visiting	0.25	0.41	0.48	0.57
School Nursing	0.28	0.34	0.57	0.69

Table 8

Community Children's & Children's Specialist Nurse

Level 1	Level 2	Level 3	Level 4
0.33	0.37	0.49	0.54

Table 9

Clinical Nurse Specialist

Level 1	Level 2	Level 3	Level 4
0.16	0.22	0.25	0.35

Table 10

Emergency Care Provision

	Level 1	Level 2	Level 3	Level 4
Nursing	0.24	0.50	0.56	1.53
Medical	0.12	0.24	0.27	0.73

Staffing Level Tool alignment

Staffing Tool	Development methodology	Table of multipliers
Adult Inpatient Staffing Level Tool (Version 5)	Methodology A Methodology G	Table 1
Small Wards Staffing Level Tool (Version 4)	Methodology A Methodology G	Table 2
Neonatal Staffing Level Tool Version 4	Uses British Association of Perinatal Medicine (BAPM) standard patient ratios as multipliers and Methodology G for High/ITU multiplier.	Table 3
Scottish Children's Acuity Measurement in Paediatric Settings (SCAMPS) (Version 4)	Methodology A	Table 4
Scottish Children's Acuity Measurement in Paediatric Settings (SCAMPS) (Version 4) – additional activity	Methodology E	N/A
Maternity Services Staffing Level Tool Version 1 – Inpatient	Methodology A	Table 5
Maternity Services Staffing Level Tool Version 1 – Intrapartum Core	Methodology G	Table 5
Maternity Services Staffing Level Tool Version 1 – Triage	Methodology B1	Table 5
Maternity Services Staffing Level Tool Version 1 – Hospital Outpatients	Methodology C1	Table 5
Maternity Services Staffing Level Tool Version 1 – Community/Integrated	Methodology C1	Table 5
Mental Health and Learning Disabilities Inpatient Nurse Staffing Level Tool Version 2	Methodology A Methodology G	Table 6
Community Nurse Staffing Level Tool (Version 4)	Methodology C	Table 7
Community Children's & Children's Specialist Nurse Staffing Level Tool (Version 4)	Methodology C	Table 8
Clinical Nurse Specialist Staffing Level Tool (Version 4)	Methodology C	Table 9
Emergency Care Provision Staffing Level Tool Version 4	Methodology B	Table 10

Professional Judgement Tool (Version 5)	Methodology F	N/A

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