Appendices

Supplemental Table 1. Estimated new and review patient load, Australia, 2020.

	Initial					Review					
	patients					patients					
			Incidenc								
	Prop.	Initial	e rate		Initial case	Prop.		Review			
	Likely to	encount	per		durational	likely to	Review	encount	Prevalence		Review
	see	er	100,000		load,	see	encounte	er	per		case
	neurolog	duration	person-	Initial case	hours	neurologis	r	duration	100,000	Review case	duration
	ist	, min.	years	load		t	frequency	, min.	persons	load	load, hours
Autoimmune											
encephalitis	30%	60	0.80^{1}	61.69	61.69	30%	3	30	13.70¹	3,169.38	554.64
Nervous system											
cancers	60%	60	7.20^{2}	1,110.44	1,110.44						
Traumatic			939.00						12111.08		
brain injury	5%	60	3	12,068.31	12,068.31	5%	1	30	4	155,655.31	77,827.66

CIDP and											
chronic											
neuropathies	100%	40	0.33^{5}	84.83	56.55	100%	2	20	2.815	1,444.60	481.53
Encephalitis,											
infectious	5%	60	5.00 ²	64.26	64.26	0%					
			61.44						638.00		
Epilepsy	100%	40	6	15,792.91	10,528.61	50%	2	20	6	163,995.37	54,665.12
Functional											
neurological			29.50								
disorders	100%	60	7	7,582.86	7,582.86	20%	2	30	37.20^7	3,824.84	286.86
Guillain-Barre	100%	40	1.118	285.32	190.21	50%	2	20	1.909	488.39	24.42
			810.00						15000.00		
Migraine	15%	40	10	31,231.09	20,820.73	15%	2	20	11	1,156,707.1	385,569.05
Motor neurone									4.50		
disease	100%	40	0.78^{12}	200.50	133.66	100%	3	30	12	3,470.12	1,735.06

Multiple											
sclerosis and											
neuroimmunol									103.70		
ogy	100%	60	3.30^{2}	848.25	848.25	100%	2	30	13	53,311.35	26,655.67
Myasthenia											
gravis	100%	60	0.5314	136.23	136.23	100%	2	30	7.7714	3,994.50	1,997.25
Myopathies,											
inflammatory	50%	60	0.80^{15}	102.56	102.56	0%					
			923.06						13402.35		
Neurocognitive			16						17		
disorders	20%	60	(60+yo)	10,615.09	10,615.09	10%	1	30	(65+yo)	57,577.14	28,788.57
Optic neuritis	50%	60	3.7018	475.54	475.54	0%					
Pain											
(neuropathic,			820.00							2,519,051.0	
vertebrogenic)	5%	40	19	10,538.89	7,025.92	5%	2	20	$9,800.00^{20}$	9	83,968.37

Parkinson's											
disease &											
Movement			13.43						106.28		
disorders	90%	60	21	3,106.92	3,106.92	90%	2	60	21	124,574.40	124,574.40
Peripheral			13.90								
nerve injuries	50%	60	22	1,786.47	1,786.47	0%					
Peripheral											
neuropathy/									2360.00		
neuritis	10%	60	790.00 ²³	20,306.64	20,306.64	10%	2	30	23 24	121,325.73	60,662.86
									6947.17		
Sleep disorders						5%	1	20	25	89,287.18	29,762.39
Obstructive			139.2								
sleep apnoea	5%	40	0^{26}	1,789.04	1,192.69						
			1842.95								
			27								
Insomnia	5%	40	(35+yo)	12,933.84	8,622.56						

Spinal cord											
injury	5%	60	1.45 ²⁸	372.72	18.64	0%					
			159.00						1316.30		
Stroke	95%	40	29	38,762.54	36,824.41	5%	1	20	29	2,043.50	681.17
Transverse											
myelitis	95%	60	3.1030	796.84	757.00	0%					
Trigeminal											
neuralgia	50%	40	9.9031	2,544.76	1,272.38	50%	4	20	9.90^{32}	7,922.16	2,640.72
				172,099.0	134,447.2					2,200,696.2	
Total				8	9					0	880,875.74
Abbreviations:											
CIDP= Chronic											
inflammatory											
demyelinating											

Supplemental	material

polyradiculoneuro						
pathy.						

Supplemental Table 2. Estimated new and review patient load, Australia, 2034. This estimate is based on the current epidemiological data, projected for the forecasted population growth.

	Initial					Review					
	patients					patients					
					Initial case						
	Prop.				durational	Prop.					Review
	likely see	Consult			load,	likely see		Consult			case
	neurologis	duration	Incidenc	Initial case	hours	neurologis	Consult	duration		Review case	duration
	t	, min.	e rate	load		t	frequency	, min.	Prevalence	load	load, hours
Autoimmune											
encephalitis	30%	60	0.80^{1}	78.52	78.52	30%	3	30	13.70¹	4,033.87	705.93
Nervous											
system											
cancers	60%	60	7.20^{2}	1,413.33	1,413.33						0.00
Traumatic											
brain injury	5%	60	939.00³	15,360.11	15,360.11	5%	1	30	12111.08 ⁴	198,112.46	99,056.23

Supplemental material

			_								
CIDP and											
chronic											
neuropathies	100%	40	0.33^{5}	107.96	71.97	100%	2	20	2.815	1,838.63	612.88
Encephalitis,											
infectious	5%	60	5.00^{2}	81.79	81.79	0%					
Epilepsy	100%	40	61.446	20,100.64	13,400.43	50%	2	20	638.00 ⁶	208,727.38	69,575.79
Functional											
neurological											
disorders	100%	60	29.50 ⁷	9,651.19	9,651.19	20%	2	30	37.20 ⁷	4,868.12	365.11
Guillain-Barre	100%	40	1.118	363.15	242.10	50%	2	20	1.909	621.60	31.08
									15000.00¹	1,472,215.0	
Migraine	15%	40	810.0010	39,749.81	26,499.87	15%	2	20	1	5	490,738.35
Motor											
neurone											
disease	100%	40	0.7812	255.18	170.12	100%	3	30	4.5012	4,416.65	2,208.32

Multiple											
sclerosis and											
neuroimmuno											
1.	100%	60	3.30^{2}	1,079.62	1,079.62	100%	2	30	103.70^{13}	67,852.76	33,926.38
Myaesthenia											
gravis	100%	60	0.5314	173.39	173.39	100%	2	30	7.77^{14}	5,084.05	2,542.02
Myopathies,											
inflammatory	50%	60	0.80^{15}	130.54	130.54	0%					
									13402.35¹		
Neurocognitiv			923.0616						7		
e disorders	20%	60	(60+yo)	13,510.48	13,510.48	10%	1	30	(65+yo)	73,282.11	36,641.05
Optic neuritis	50%	60	3.70^{18}	605.24	605.24	0%					
Pain											
(neuropathic,											
vertebrogenic											
)	5%	40	820.0019	13,413.51	8,942.34	5%	2	20	9,800.00 ²⁰	320,615.72	106,871.91

Parkinson's &											
Movement											
disorders	90%	60	13.43 ²¹	3,954.37	3,954.37	90%	2	60	106.28 ²¹	124,574.40	124,574.40
Peripheral											
nerve injuries	50%	60	13.9022	2,273.75	2,273.75	0%					
Peripheral											
neuropathy/									2360.00 ²³		
neuritis	10%	60	790.00 ²³	25,845.55	25,845.55	10%	2	30	24	154,419.00	77,209.50
Sleep											
disorders						5%	1	20	6947.17 ²⁵	113,641.49	37,880.50
Obstructive											
sleep apnoea	5%	40	139.20 ²⁶	2,277.03	1,518.02						
			1842.95								
			27								
Insomnia	5%	40	(35+yo)	16,461.72	10,974.48						

Spinal cord											
injury	5%	60	1.45 ²⁸	23.72	23.72	0%					
Stroke	95%	40	159.00 ²⁹	49,417.07	32,944.71	5%	1	20	1316.30 ²⁹	2,600.90	866.97
Transverse											
myelitis	95%	60	3.10^{30}	963.48	963.48	0%					
Trigeminal											
neuralgia	50%	40	9.9031	1,619.44	1,079.62	50%	4	20	9.90^{32}	10,083.04	3,361.01
				219,041.4	171,119.6					2,766,987.2	1,087,167.
Total				7	3					2	43
Abbreviations:											
CIDP= Chronic											
inflammatory											
demyelinating											
polyradiculoneur											
opathy.											

Supplemental Table 3. Estimating number of Active Neurology Consultant Fellows of the RACP, practicing in Adult Neurology in Australia from RACP Internal Membership Reports.

	2020 ³³	2019³⁴
RACP Members	27,843	26,761
In Australia	23,303 (83.7%)	22,330 (83.4%)
RACP Fellows	18,863 (67.8%)	18,071 (67.5%)
Active RACP Fellows	17,160 (61.6%)	16,435 (61.4%)
	(91.0% of Fellows)	(91.0% of Fellows)
Australian RACP Fellows	15,641 (82.9%)	14,919 (66.8%)
Australian Active RACP Fellows	14,436 (51.8%)	13,774 (51.5%)
Australian Active RACP Fellows	14,436	13,774
Major Urban	12,685 (87.9%)	12,133 (88.1%)
Inner Regional	1,235 (8.6%)	1,150 (8.3%)
Outer Regional	445 (3.1%)	424 (3.1%)

Remote	70 (0.5%)	65 (0.5%)
Neurology	960	901
rveurology	700	501
Adult Neurology practitioners	852 (88.8%)	800 (88.8%)
(including non-fellows)		
Neurology Fellows	756 (78.8%)	710 (78.8%)
Neurology RACP Fellows x % in	756x83.7%x91.0%x88.8%	710x83.4%x91.0x88.8%
Australia x % Active x % Adult		
Neurology		
Number of Active,	511	479
Neurology RACP Fellows		
working in Australia who		
work in Adult Neurology		
(does not include neurology		
trainees)		

Supplemental Table 4. Allocation of model parameters based on data from MBA, RACP, Medical Deans ANZ Student Statistics, and ANZAN survey.

	μ	α	M(0)	λ_{m}	T(0)	$\lambda_{\rm t}$	E(0)	$\lambda_{ m e}$	L(0)	s_1	S(0)	$s_2 + \gamma$	Total
													neurologists
2020	0.38	3,637	4,155	0.44	106	47	208	35	299	3.5 (0.9% PY)	4	0.46	617
2019	0.53	3,693	3,996	0	96	47	195		280		4	0.40	575
2018	0.48	3,475	4,052	2	90	45	193		277		3		564
2017		3,569	3,569		83	22	187		267		3		540
2016		3,547				1							422
2015		3,437				25							421

Number of Advanced Physician Trainees in neurology (T); Number of Early-Career neurology consultants (E): from the 2020 ANZAN survey; Number of Mid/Late-Career neurology consultants (L): from the 2020 ANZAN survey; Number of semi-retired (S): From the 2020 ANZAN survey; Immigration (μ): μ is derived from data from the Medical Board of Australia international medical graduate applications; Rate of Basic Physician Trainees admitted into Advanced Neurology Trainees (λ_m): from ANZAN records; Rate of Retirement: from RACP annual reports; Rates of transition from Advanced Neurology Trainee to Early-Career Neurologist (λ_t) and from Early-Career Neurologist to Mid/Late-Career Neurologist (λ_e) are dynamically estimated within the

function by the Total Neurology Consultant numbers and the values of the other model components; Rate of conversion from semi-retired to retired (s2) and rate of conversion to retired, emigrated, and left neurology (γ).

Supplemental Table 5. ANZAN survey respondent characteristics.

	n ((%)
		Australian, Active,
		Working in last 12
		months, Works with
	Total survey sample	adults
	(n=738)	(n=577)
Sex		
Male	472 (64.0%)	370 (64.1%)
Female	265 (35.9%)	206 (35.7%)
Unspecified	1 (0.1%)	1 (0.2%)

ANZAN member		
No	6 (0.8%)	5 (0.9%)
Yes	732 (99.2%)	572 (99.1%)
Working status		
Active	714 (96.8%)	577 (100%)
TNIP	9 (1.2%)	
Semi-retired	13 (1.8%)	
Retired	2 (0.3%)	
Country of		
secondary school		
Australia	236 (68.2%)	214 (72.8%)
New Zealand	30 (8.7%)	9 (3.1%)
Other	80 (23.1%)	71 (24.2%)
(Missing)	(392 (53.1%))	(283 (49.1%))
Country of		
medical school		

Australia	378 (70.9%)	332 (76.2%)
New Zealand	42 (7.9%)	8 (1.8%)
Other	113 (21.2%)	96 (22.0%)
(Missing)	(205 (27.8%))	(141 (24.4%))
Country of		
specialist training		
Australia	362 (81.0%)	325 (87.8%)
New Zealand	25 (5.6%)	3 (0.8%)
Other	60 (13.4%)	42 (11.4%)
(Missing)	(291 (39.4%))	(207 (35.9%))
Country of current		
work		
Australia	649 (879%)	577 (100%)
New Zealand	58 (7.9%)	
Other	31 (4.2%)	

Adult/paediatric				
neurology				
Neither	29 (3.9%)	14 (2.4%)		
Adult only	692 (93.8%)	558 (96.7%)		
Paediatric only	11 (1.5%)	0 (0%)		
Both	6 (0.8%)	5 (0.9%)		
Advanced				
physician trainee?				
No	565 (76.6%)	447 (77.5%)		
Yes	173 (23.4%)	130 (22.5%)		
	Mean (SD; range)			
Age (missing 2)	44.68 (12.43; 20-85)	44.26 (11.96; 26-84)		
Abbrariations, ANZ	AN = Australia Naw Za]		

Abbreviations: ANZAN = Australia New Zealand Association of

Neurologists; TNIP = Temporarily not in practice.

Supplemental Table 6. Neurology specialisations and mean patient numbers/FTE fractions from 2020 ANZAN survey, restricted to 577 respondents who were active, adult neurologists, working in Australia.

			Number of REVIEW		
	Number of	Number of NEW	encounters seen per		
	practitioners who	encounters per clinic	clinic (0.1 FTE) and	Number of inpatients	Average total FTE
	work in a neurological	(0.1 FTE) and week	week for	seen per 0.1 FTE for	(public+private) for
	specialty (out of 577)?	for specialisation	specialisation	specialisation	each specialisation
	n (percentage)		mean (SI	D; range)	
Epilepsy					
	138 (23.9%)	1.84 (1.89; 0-12)	4.28 (5.71; 0-45)	1.12 (1.85; 0-12)	0.32 (0.27; 0-1)
MS/neuroimmunology					
	133 (23.1%)	1.16 (1.19; 0-6)	3.46 (3.67; 0-20)	0.42 (1.31; 0-12)	0.21 (0.17; 0-1)
Neuromuscular					
	101 (17.5%)	1.55 (1.86; 0-10)	2.99 (3.94; 0-24)	0.20 (0.68; 0-5)	0.17 (0.15; 0.1-0.9)
Movement disorders					
	108 (18.7%)	1.66 (1.83; 0-10)	4.11 (6.35; 0-50)	0.57 (1.64; 0-10)	0.27 (0.23; 0-1)

Stroke					
	153 (26.5%)	1.50 (2.93; 0-30)	1.86 (2.82; 0-20)	3.81 (6.02; 0-36)	0.33 (0.28; 0-1)
Clinical					
neurophysiology					
	154 (26.7%)	5.01 (5.14; 0-32)	0.33 (1.22; 0-10)	0.53 (1.42; 0-10)	0.24 (0.22; 0-1)
Cognitive/behavioural					
neurology					
	43 (7.5%)	1.02 (1.18; 0-5)	2.09 (3.56; 0-20)	0.77 (2.07; 0-12)	0.17 (0.08; 0.1-0.3)
Headache					
	94 (16.3%)	1.54 (1.56; 0-6)	3.35 (5.46; 0-45)	0.49 (1.20; 0-6)	0.21 (0.22; 0-1)
Neuro-ophthalmology					
	32 (5.6%)	0.91 (1.28; 0-5)	1.66 (2.18; 0-7)	0.16 (0.37; 0-1)	0.15 (0.14; 0-0.5)
Neuro-otology					
	29 (5.0%)	2.03 (2.85; 0-12)	3.17 (5.99; 0-30)	0.28 (0.53; 0-2)	
General neurology					
	387 (67.1%)	2.65 (3.83; 0-40)	4.94 (6.95; 0-60)	2.82 (4.61; 0-30)	0.42 (0.31; 0-1)

Other					
	17 (3.0%)	1.94 (3.29; 0-12)	2.82 (5.78; 0-22)	0.35 (1.22; 0-5)	0.2 (0.13; 0.1-0.5)

Supplemental Table 7. Estimation of supply and demand of neurological care in Australia in 2020 and 2034 including interventions.

	2020	2034	+5 neurologists per	+10 neurologists per	+20 neurologists per
			year, 2022-2031	year, 2022-2031	year, 2022-2031
Supply of					
neurological care					
Neurologists	620	896	935	973	1051
Weeks/year	43	43	43	43	43
Initial Pts per	16.56	16.56	16.56	16.56	16.56
week (2.75 per					
clinic) ^a					

Review Pts per	32.94	32.94	32.94	32.94	32.94
week (5.49 per					
clinic) ^a					
Initial Pts/year ^b	441,489.60	638,023.68	665,794.80	692,853.84	748,396.08
Review	878,180.40	1,269,112.32	1,324,352.70	1,378,176.66	1,488,657.42
Pts/year ^c					
Demand for					
neurological					
care ^d					
Initial					
encounters/year	172,099.08	219,041.47	219,041.47	219,041.47	219,041.47
Review	2,200,696.20	2,766,987.22	2,766,987.22	2,766,987.22	2,766,987.22
encounters/year					

Difference					
between supply					
and demand of					
neurological					
care ^d					
Initial	Demand fully met				
encounters/year					
Review	-1,322,515.80	-1,497,874.90	-1,442,634.52	-1,388,810.56	-1,278,329.80
encounters/year					
Supply vs					
Demand based					
on Australia					
national disease-					
specific patient					
counts ^d , 10%					

Initial allocation					
first, then					
remaining					
capacity to					
Review					
Initial	-154,889.17	-197,137.32	-197,137.32	-197,137.32	-197,137.32
encounters/year					
Review	-898,236.11	-881,755.37	-798,743.87	-717,860.87	-551,837.87
encounters/year					
a Initial and review	u nationt numbers derived fro	m 2020 ANZAN Member Sur	L	<u> </u>	

a. Initial and review patient numbers derived from 2020 ANZAN Member Survey.

b. Patient capacity for Initial encounters estimated as: Number of neurologists *x* FTE fraction *x* Weeks/year *x* # Initial Patients per week.

c. Patient capacity for Review encounters estimated as: Number of neurologists *x* FTE fraction *x* Weeks/year *x* # Review Patients per week.

d. Estimated new and review patient load based on disease-specific patient counts as in Supplemental Table 1.

Supplemental Table 8. Estimation of durational supply and demand for neurological care in Australia, 2020 to 2034 with intervention scenarios.

	2020	2034	+5 neurologists per	+10 neurologists per	+20 neurologists per
			year, 2022-2031	year, 2022-2031	year, 2022-2031
Supply of					
neurological care					
Neurologists	620	896	935	973	1051
Weeks/year	43	43	43	43	43
Initial Pts per	16.56	16.56	16.56	16.56	16.56
week (2.75 per					
clinic) ^a					
Review Pts per	32.94	32.94	32.94	32.94	32.94
week (5.49 per					
clinic) ^a					
Initial	441,489.60	638,023.68	665,794.80	692,853.84	748,396.08
encounters/year ^b					

Review	878,180.40	1,269,112.32	1,324,352.70	1,378,176.66	1,488,657.42
encounters/year ^c					
Patient					
Durational					
Supply, Hours					
(60 min per new,					
30 min per					
review)					
Initial	344,361.89	497,658.47	519,319.94	540,426.00	583,748.94
encounters/year ^b					
Review	342,490.36	494,953.80	516,497.55	537,488.90	580,576.39
encounters/year ^c					

Durational					
demand for					
neurological care ^d					
Initial	134,447.29	171,878.64	171,878.64	171,878.64	171,878.64
encounters/year					
Review	880,875.74	1,087,167.43	1,087,167.43	1,087,167.43	1,087,167.43
encounters/year					
Supply vs 1-year					
average					
Durational					
Demand based on					
Australia national					
disease-specific					
patient counts ^d .					

Initial	Demand fully met				
encounters/year					
Review	-538,385.39	-592,213.62	-570,669.87	-549,678.53	-506,591.03
encounters/year					
Supply vs 1-year					
average					
Durational					
Demand based on					
Australia national					
disease-specific					
patient counts ^d ,					
10% Initial					
allocation first,					
then remaining					

capacity to					
Review					
Initial	-121,002.56	-154,007.67	-154,007.67	-154,007.67	-154,007.67
encounters/year					
Review	-207,468.23	-111,667.12	-68,461.89	-26,364.50	Demand fully met
encounters/year					

- a. Initial and review patient numbers derived from 2020 ANZAN Member Survey.
- b. Patient capacity for Initial encounters estimated as: Number of neurologists *x* FTE fraction *x* Weeks/year *x* # Initial Patients per week.
- c. Patient capacity for Review encounters estimated as: Number of neurologists x FTE fraction x Weeks/year x # Review Patients per week.
- d. Estimated new and review patient load based on disease-specific patient counts as in Supplemental Table 1.

Supplemental Table 9. Neurology patient supply and demand estimation, regional Australia, 2020 to 2034, updated prevalence and incidence-based demand estimates with intervention scenarios.

	2020	2034	+2 neurologists per	+5 neurologists per	+10 neurologists per
			year, 2022-2031	year, 2022-2031	year, 2022-2031
Supply of					
neurological care					
Neurologists	25	33	46	65	97
Weeks/year	43	43	43	43	43
Initial Pts per	16.56	16.56	16.56	16.56	16.56
week (2.75 per					
clinic) ^a					
Review Pts per	32.94	32.94	32.94	32.94	32.94
week (5.49 per					
clinic) ^a					

Initial	17,802.00	23,498.64	32,755.68	46,285.20	69,071.76
encounters/year ^b					
Review	35,410.50	46,741.86	65,155.32	92,067.30	137,392.74
encounters/year ^c					
Demand for					
neurological care ^d					
Initial	53,350.71	67,902.86	67,902.86	67,902.86	67,902.86
encounters/year					
Review	682,215.82	857,766.04	857,766.04	857,766.04	857,766.04
encounters/year					
Supply vs Demand					
based on Australia					
national disease-					

specific patient					
counts ^d .					
Initial	-35,548.71	-44,404.22	-35,147.18	-21,617.66	Demand fully met
encounters/year					
Review	-646,805.32	-811,024.18	-792,610.72	-765,698.74	-720,373.30
encounters/year					
Supply vs Demand					
based on Australia					
national disease-					
specific patient					
counts ^d , 10% Initial					
allocation first, then					
remaining capacity					
to Review					

Initial	-48,015.64	-61,112.57	-61,112.57	-61,112.57	-61,112.57
encounters/year					
Review	-634,356.88	-794,315.82	-766,645.32	-726,203.82	-658,091.82
encounters/year					

- a. Initial and review patient numbers derived from 2020 ANZAN Member Survey.
- b. Patient capacity for Initial encounters estimated as: Number of neurologists x FTE fraction x Weeks/year x # Initial Patients per week.
- c. Patient capacity for Review encounters estimated as: Number of neurologists x FTE fraction x Weeks/year x # Review Patients per week.
- d. Estimated new and review patient load based on disease-specific patient counts as in Supplemental Table 1.

Supplemental Table 10. Estimation of durational supply and demand for neurological care in regional Australia, 2020 to 2034, with intervention scenarios.

2020	2034	+2 neurologists per	+5 neurologists per	+10 neurologists per
		year, 2022-2031	year, 2022-2031	year, 2022-2031

Supply of					
neurological care					
Neurologists	25	33	46	65	97
Weeks/year	43	43	43	43	43
Initial Pts per	16.56	16.56	16.56	16.56	16.56
week (2.75 per					
clinic) ^a					
Review Pts per	32.94	32.94	32.94	32.94	32.94
week (5.49 per					
clinic) ^a					
Initial	17,802.00	23,498.64	32,755.68	46,285.20	69,071.76
encounters/year ^b					
Review	35,410.50	46,741.86	65,155.32	92,067.30	137,392.74
encounters/year ^c					

Patient Durational					
Supply, Hours (60					
min per new, 30					
min per review)					
Initial	17,802.00	23,498.64	32,755.68	46,285.20	69,071.76
encounters/year ^b					
Review	17,705.25	23,370.93	32,577.66	46,033.65	68,696.37
encounters/year ^c					
Durational demand					
for neurological					
care ^d					
Initial	13,885.56	18,328.94	25,549.43	36,102.46	53,875.97
encounters/year					
Review	13,810.10	18,229.33	25,410.57	35,906.25	53,583.17
encounters/year					

Supply vs 1-year					
average Durational					
Demand based on					
Australia national					
disease-specific					
patient counts ^d .					
Initial	-27,793.10	-34,718.15	-27,497.66	-16,944.63	Demand fully met
encounters/year					
Review	-259,261.39	-318,792.58	-311,611.33	-301,115.66	-283,438.73
encounters/year					
Supply vs 1-year					
average Durational					
Demand based on					
Australia national					

disease-specific					
patient counts ^d ,					
10% Initial					
allocation first, then					
remaining capacity					
to Review					
Initial	-37,510.79	-47,742.38	-47,742.38	-47,742.38	-47,742.38
encounters/year					
Review	-249,543.69	-305,768.35	-291,366.61	-270,317.91	-234,867.47
encounters/year					
. I.::::.]	1 1	16 2020 431743	1.1.0		

- a. Initial and review patient numbers derived from 2020 ANZAN Member Survey.
- b. Patient capacity for Initial encounters estimated as: Number of neurologists *x* FTE fraction *x* Weeks/year *x* # Initial Patients per week.
- c. Patient capacity for Review encounters estimated as: Number of neurologists x FTE fraction x Weeks/year x # Review Patients per week.
- d. Estimated new and review patient load based on disease-specific patient counts as in Supplemental Table 1.

Supplemental Table 11. Estimation of patient supply/demand for Australia, 2020, assessing different fractions of Initial encounter demand allocation.

		Allocation of Initial demand of neurology care before remaining capacity preferentially allocated to							
		Review demand of neurology care							
	Simple difference	10%	20%	30%	40%	50%			
Supply vs									
demand									
Initial met	172,099.08	17,209.91	34,419.82	51,629.72	68,839.63	86,049.54			
Initial not met	0.00	154,889.17	137,679.26	120,469.35	103,259.45	86,049.54			
Review met	878,180.4	1,302,400.46	1,285,130.92	1,267,861.37	1,250,591.83	1,233,322.29			
Review not	-1,322,515.80	-898,295.74	-915,565.28	-932,834.83	-950,104.37	-967,373.91			
met									
Durational									
supply vs									
demand									
Initial met	134,447.29	13,444.73	26,889.46	40,334.19	53,778.92	67,223.64			
Initial not met	0.00	121,002.56	107,557.83	94,113.10	80,668.37	67,223.64			

Review met	342,490.36	673,407.52	659,962.79	646,518.06	633,073.33	619,628.60
Review not	-538,385.39	-207,468.23	-220,912.96	-234,357.69	-247,802.41	-261,247.14
met						

References

- 1. Dubey D, Pittock SJ, Kelly CR, et al. Autoimmune encephalitis epidemiology and a comparison to infectious encephalitis. *Annals of neurology* 2018;83(1):166-77. doi: 10.1002/ana.25131 [published Online First: 2018/01/03]
- 2. Feigin VL, Vos T, Alahdab F, et al. Burden of Neurological Disorders Across the US From 1990-2017: A Global Burden of Disease Study. *JAMA neurology* 2021;78(2):165-76. doi: 10.1001/jamaneurol.2020.4152 [published Online First: 2020/11/03]
- 3. Dewan MC, Rattani A, Gupta S, et al. Estimating the global incidence of traumatic brain injury. *Journal of neurosurgery* 2018:1-18. doi: 10.3171/2017.10.Jns17352 [published Online First: 2018/04/28]
- 4. Frost RB, Farrer TJ, Primosch M, et al. Prevalence of traumatic brain injury in the general adult population: a meta-analysis. *Neuroepidemiology* 2013;40(3):154-9. doi: 10.1159/000343275 [published Online First: 2012/12/22]
- 5. Broers MC, Bunschoten C, Nieboer D, et al. Incidence and Prevalence of Chronic Inflammatory Demyelinating Polyradiculoneuropathy: A Systematic Review and Meta-Analysis. *Neuroepidemiology* 2019;52(3-4):161-72. doi: 10.1159/000494291 [published Online First: 2019/01/23]
- 6. Fiest KM, Sauro KM, Wiebe S, et al. Prevalence and incidence of epilepsy: A systematic review and meta-analysis of international studies. Neurology 2017;88(3):296-303. doi: 10.1212/wnl.0000000000003509 [published Online First: 2016/12/18]
- 7. Garrett AR, Hodges SD, Stahlman S. Epidemiology of functional neurological disorder, active component, U.S. Armed Forces, 2000-2018. *Msmr* 2020;27(7):16-22. [published Online First: 2020/07/30]
- 8. Sejvar JJ, Baughman AL, Wise M, et al. Population incidence of Guillain-Barré syndrome: a systematic review and meta-analysis. *Neuroepidemiology* 2011;36(2):123-33. doi: 10.1159/000324710 [published Online First: 2011/03/23]

- 9. Bragazzi NL, Kolahi AA, Nejadghaderi SA, et al. Global, regional, and national burden of Guillain-Barré syndrome and its underlying causes from 1990 to 2019. *Journal of neuroinflammation* 2021;18(1):264. doi: 10.1186/s12974-021-02319-4 [published Online First: 2021/11/13]
- 10. Lyngberg AC, Rasmussen BK, Jørgensen T, et al. Incidence of primary headache: a Danish epidemiologic follow-up study. *American journal of epidemiology* 2005;161(11):1066-73. doi: 10.1093/aje/kwi139 [published Online First: 2005/05/20]
- 11. Burch RC, Buse DC, Lipton RB. Migraine: Epidemiology, Burden, and Comorbidity. *Neurologic clinics* 2019;37(4):631-49. doi: 10.1016/j.ncl.2019.06.001 [published Online First: 2019/09/30]
- 12. GBD 2016 Motor Neuron Disease Collaborators. Global, regional, and national burden of motor neuron diseases 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. *The Lancet Neurology* 2018;17(12):1083-97. doi: 10.1016/s1474-4422(18)30404-6 [published Online First: 2018/11/10]
- 13. Campbell JA, Simpson S, Jr., Ahmad H, et al. Change in multiple sclerosis prevalence over time in Australia 2010-2017 utilising disease-modifying therapy prescription data. *Multiple sclerosis (Houndmills, Basingstoke, England)* 2019;26(11):1315-28. doi: 10.1177/1352458519861270 [published Online First: 2019/07/28]
- 14. Carr AS, Cardwell CR, McCarron PO, et al. A systematic review of population based epidemiological studies in Myasthenia Gravis. *BMC neurology* 2010;10:46. doi: 10.1186/1471-2377-10-46 [published Online First: 2010/06/23]
- 15. Meyer A, Meyer N, Schaeffer M, et al. Incidence and prevalence of inflammatory myopathies: a systematic review. *Rheumatology (Oxford, England)* 2015;54(1):50-63. doi: 10.1093/rheumatology/keu289 [published Online First: 2014/07/30]
- 16. Satizabal CL, Beiser AS, Chouraki V, et al. Incidence of Dementia over Three Decades in the Framingham Heart Study. *The New England journal of medicine* 2016;374(6):523-32. doi: 10.1056/NEJMoa1504327 [published Online First: 2016/02/11]
- 17. Akushevich I, Yashkin AP, Kravchenko J, et al. Time Trends in the Prevalence of Neurocognitive Disorders and Cognitive Impairment in the United States: The Effects of Disease Severity and Improved Ascertainment. *Journal of Alzheimer's disease : JAD* 2018;64(1):137-48. doi: 10.3233/jad-180060 [published Online First: 2018/06/06]
- 18. Braithwaite T, Subramanian A, Petzold A, et al. Trends in Optic Neuritis Incidence and Prevalence in the UK and Association With Systemic and Neurologic Disease. *JAMA neurology* 2020;77(12):1514-23. doi: 10.1001/jamaneurol.2020.3502 [published Online First: 2020/10/06]
- 19. Dieleman JP, Kerklaan J, Huygen F, et al. Incidence rates and treatment of neuropathic pain conditions in the general population. *Pain* 2008;137(3):681-88. doi: 10.1016/j.pain.2008.03.002 [published Online First: 2008/04/29]
- 20. Yawn BP, Wollan PC, Weingarten TN, et al. The prevalence of neuropathic pain: clinical evaluation compared with screening tools in a community population. *Pain medicine (Malden, Mass)* 2009;10(3):586-93. doi: 10.1111/j.1526-4637.2009.00588.x [published Online First: 2009/04/01]
- 21. Ou Z, Pan J, Tang S, et al. Global Trends in the Incidence, Prevalence, and Years Lived With Disability of Parkinson's Disease in 204 Countries/Territories From 1990 to 2019. Frontiers in public health 2021;9:776847. doi: 10.3389/fpubh.2021.776847 [published Online First: 2021/12/25]
- 22. Asplund M, Nilsson M, Jacobsson A, et al. Incidence of traumatic peripheral nerve injuries and amputations in Sweden between 1998 and 2006. Neuroepidemiology 2009;32(3):217-28. doi: 10.1159/000197900 [published Online First: 2009/01/29]

- 23. Hanewinckel R, van Oijen M, Ikram MA, et al. The epidemiology and risk factors of chronic polyneuropathy. *European journal of epidemiology* 2016;31(1):5-20. doi: 10.1007/s10654-015-0094-6 [published Online First: 2015/12/25]
- 24. Kruja J, Beghi E, Zerbi D, et al. High prevalence of major neurological disorders in two Albanian communities: results of a door-to-door survey. Neuroepidemiology 2012;38(3):138-47. doi: 10.1159/000336348 [published Online First: 2012/03/22]
- 25. Sleep Health Foundation. Rise and try to shine: The social and economic cost of sleep disorders in Australia, 2021.
- 26. Rogers AE, Stahlman S, Hunt DJ, et al. Obstructive sleep apnea and associated attrition, active component, U.S. Armed Forces, January 2004-May 2016. *Msmr* 2016;23(10):2-11. [published Online First: 2016/10/30]
- 27. Perlis ML, Vargas I, Ellis JG, et al. The Natural History of Insomnia: the incidence of acute insomnia and subsequent progression to chronic insomnia or recovery in good sleeper subjects. *Sleep* 2020;43(6) doi: 10.1093/sleep/zsz299 [published Online First: 2019/12/19]
- 28. O'Connor P. Incidence and patterns of spinal cord injury in Australia. *Accident; analysis and prevention* 2002;34(4):405-15. doi: 10.1016/s0001-4575(01)00036-7 [published Online First: 2002/06/18]
- 29. GBD 2016 Motor Neuron Disease Collaborators. Global, regional, and national burden of stroke and its risk factors, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019. *The Lancet Neurology* 2021;20(10):795-820. doi: 10.1016/s1474-4422(21)00252-0 [published Online First: 2021/09/07]
- 30. Bhat A, Naguwa S, Cheema G, et al. The epidemiology of transverse myelitis. *Autoimmunity reviews* 2010;9(5):A395-9. doi: 10.1016/j.autrev.2009.12.007 [published Online First: 2009/12/29]
- 31. Laakso SM, Hekali O, Kurdo G, et al. Trigeminal neuralgia in multiple sclerosis: Prevalence and association with demyelination. *Acta neurologica Scandinavica* 2020;142(2):139-44. doi: 10.1111/ane.13243 [published Online First: 2020/03/19]
- 32. Manzoni GC, Torelli P. Epidemiology of typical and atypical craniofacial neuralgias. *Neurological sciences : official journal of the Italian Neurological Society and of the Italian Society of Clinical Neurophysiology* 2005;26 Suppl 2:s65-7. doi: 10.1007/s10072-005-0410-0 [published Online First: 2005/06/01]
- 33. Royal Australasian College of Physicians. RACP Member Statistics and Insights, 2020. Sydney, 2020.
- 34. Royal Australasian College of Physicians. RACP Member Statistics and Insights, 2019. Sydney, 2019.