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To admit or not admit: the utility of structured decision-making tools in forensic mental health services in Aotearoa New Zealand

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A naturalistic, retrospective, whole-cohort design study was undertaken on all service users presented to an Admissions Panel at a forensic service in Auckland, Aotearoa New Zealand, for consideration of admission to an extended forensic care and rehabilitation (EFCR) pathway, over a six-year period ($n = 141$). Comparisons were made between those offered EFCR, and those not, to determine key socio-demographic, clinical, cultural, and offence-related variables including the use of the DUNDRUM-1 triage security scale in terms of their capacity to differentiate between the two groups. EFCR was offered in 64% of cases, or 55% for those not mandated by the Courts. We found a service user offered an EFCR pathway was more likely to be male, Māori (of Indigenous heritage), suffering from a psychotic illness and a substance use disorder, and to have a history of serious violent offending. However, those declined an EFCR still typically had complex forensic mental health needs but varied with respect to seriousness of their offending. We were also able to compare and contrast results to a similar UK study but also highlight that those declined EFCR still typically had complex forensic mental health needs.

Keywords: Forensic; DUNDRUM; D1; triage; security; rehabilitation; Māori; admissions; panel; ARFPS.

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Introduction

Studies have consistently demonstrated serious mental illness (psychotic, manic, and major depressive illness) to be of higher prevalence amongst prison populations. Studies from Aotearoa (New Zealand) are included in these projections (1). Aotearoa has a prison population of more than 10,000 remand and sentenced prisoners (2). In addition, like many countries, Aotearoa has an ethnic over-representation within its criminal justice system. While 17.8% of the population identify as Māori (the Indigenous people of

New Zealand), they make up 52.5% of sentenced prisoners (2,3), while also being shown to suffer a higher prevalence of mental health disorders, including serious disorders such as schizophrenia (4). Similar over-representation patterns are also present for the Pacific peoples of Aotearoa, a pan-ethnic group of people in Aotearoa who identify and associate with, or descend from, the Pacific Islands outside of Aotearoa itself (3,5).

On occasion, a secure (forensic mental health service) inpatient admission is required to provide treatment for those suffering from

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serious mental illness in prison, and believed to pose a significant risk of harm to others, and on occasion to themselves. These secure forensic mental health beds serve a dual purpose – of short-term care (STC), and extended forensic care and rehabilitation (EFCR). The combination of STC and EFCR beds service not only on remand and sentenced prisoners, but also court ordered or diverted offenders, forensic community readmissions, and on occasion civil mental health patients, whose need for therapeutic security exceeds that of general or non-secure mental health services.

There is evidence that patients discharged from EFCR tend to have lower offending outcomes than many comparative groups released from prison (6,7). However, for the entire Aotearoa population there are just 288 forensic secure beds, spread across five regional services (8). At a cost of roughly NZ\$500,000 per annum per person, for a medium secure bed (9), appropriate allocation is essential to ensure the efficient use of this limited resource, while being mindful that inappropriate allocation of an individual not requiring that intensity of service could compromise the rights of that individual and prospects for their recovery (10).

To triage and assess those who have the need for an EFCR pathway from such a diverse range of individuals is challenging. Historically, decisions with respect to access were commonly based on unstructured professional judgement, perhaps by a single clinician. This could lead to disagreement between clinicians in the absence of objective measures (11). This process, of applying unstructured clinical judgement, to decisions with far-ranging ramifications, is subject to criticism, in that it is arbitrary, and open to poor inter-rater reliability (12).

An alternative approach is that of utilising a structured professional judgement (SPJ) tool to understand (and mitigate) the risk for violence posed by individuals. Using evidence-based SPJ tools, to systematise the exercise of clinical discretion, is recognised as an effective

way to improve the quality, consistency, and transparency of decision-making and obviating disadvantages of an unstructured approach (13,14).

A development in the field, related to the assessment of an individual's need for specialist forensic mental health services, has been the use of a suite of four SPJ metrics from the 'Dangerousness Understanding, Recovery and Urgency Manual' (DUNDRUM), developed for forensic mental health services in Ireland (12).

The first of this quartet, the DUNDRUM-1 (D1), is the triage (security) component, and considers the need for secure care based on 'dangerousness'. This 'dangerousness' has been defined as a product of both probability (risk) and gravity (seriousness) of future offending, and has been seen as a core component in identifying those who most meet the need for an EFCR pathway (15,16). 'Risk' is often substantially reduced by the time an individual is admitted from a waitlist to a secure hospital, but D1 fulfils the criteria of assessment of both the risk and severity of offending across an individual's lifetime, and so is superior to other SJPs in assessing if someone is 'dangerous to others' and so in greater need of an EFCR pathway.

The items in D1 are often abbreviated to TS1 to TS11, the TS standing for 'Triage Security'. The developers suggest that a patient who mainly scores 4 across the range of items will initially require high therapeutic security. A patient who mainly scores 3 on most of the items is likely to require medium therapeutic security. A service user who mainly scores 2 is likely to require psychiatric intensive care. While a patient who mainly scores 1 on most of the items could be safely treated in an open (relationally secure) care setting (12).

Clinical evidence has emerged supporting the validity and utility of D1 (11,17–19). However, it is unclear whether the items show discriminant validity in an Aotearoa population. In 2016, the Auckland Regional Forensic

Psychiatry Service (ARFPS) adopted the D1 as part of a multidisciplinary ‘admissions panel’ process, to aid discussion amongst clinicians as to who has the greatest need of an EFCR pathway. This formed part of a wider service redesign which focused on the identification of ‘milestones’, which are objective criteria featuring an SJP approach including the DUNDRUM quartet across the whole forensic pathway (from admission to discharge) (18). The first milestone, ‘milestone 1’, is met when a patient is accepted into one of the ARFPS’s three EFCR pathways (male only, mixed gender, or Kaupapa Māori (a rehabilitative pathway which integrates a clinical and cultural response to Māori in its care delivery)).

Similar processes to operationalise access to forensic mental healthcare have been reported internationally (11,19–22). However, within Aotearoa, studies have focused on the characteristics of those in forensic hospitals rather than what characteristics led to their admission, and equally as important, what are the characteristics of those not admitted (23,24).

This study was designed to explore the socio-demographic, clinical, cultural, and offence-related factors associated with admission to an EFCR pathway in Aotearoa and the utility of D1 scores in this context.

Methods

Research question

1. What socio-demographic, clinical, cultural, or offence-related variables determine an offer of admission to an extended forensic care and rehabilitation (EFCR) pathway in the context of forensic mental health service delivery in Aotearoa?
2. Do D1 scores demonstrate predictive validity with regard to an offer of admission to an EFCR pathway in this context?

Study design

This study was a naturalistic, retrospective, whole-cohort design. All patients who were presented to the Admissions Panel over a six-year period (1 April 2016 to 31 March 2022) for acceptance into an EFCR pathway were considered in the study. Comparisons were made between those offered admission to an EFCR pathway and those not, to determine key socio-demographic, clinical, cultural, and offence-related variables, influencing such decisions.

Setting

At the time of this study, the ARFPS was an inpatient hospital stratified by medium and low (minimum) secure settings on a single campus with bed numbers ranging between roughly 100 and 110 during that time (25). It serves a geographical region with the biggest catchment area in Aotearoa with a population of nearly two million people (3). Patients are referred from prison, courts, or a hospital (either general mental health or other secure hospitals). Once admitted, the acute patients reside in either an all-male or a mixed-gender unit. Patients that require EFCR are admitted to one of the three rehabilitation pathways.

Data collection

A comprehensive file is compiled for each patient, prior to their discussion at the Admissions Panel. This file features most of the variables indicated and the subsequent admission decision. Any additional data was sourced from the person’s electronic file (HealthCare Community: HCC) where all patient mental health clinical notes for the Auckland region are securely stored.

Measures

Socio-demographic data was gathered on the age the person was at the time of presentation to the Admissions Panel; dichotomised gender, which is a reflection of what is recorded in the source files; and ethnicity, based on patient

identification. Patients could only identify with one ethnicity and for data analysis purposes this was further divided into three categories; 'Māori', 'Pacific Peoples', or 'other' ethnicity (26).

With regard to clinical data, primary diagnosis was collapsed to categorisation of the presence of a 'psychotic spectrum disorder', a 'bipolar spectrum disorder', and a 'depressive disorder'. Co-existing diagnoses related to a 'substance use disorder' were also collected.

The D1 score of 'dangerousness' quantifies the therapeutic security needs of patients referred to forensic mental health services. An ordinal score of 0 to 4 is applied to the following 11 triage security (TS) items: seriousness of violence, seriousness of self-harm, immediacy of risk of violence, immediacy of risk of self-harm, specialist forensic need, absconding/eloping, preventing access, victim sensitivity and public confidence, complex risk of violence, institutional behaviour, and legal process.

Other studies have found that two D1 sub-items that concern self-harm and suicide have poor internal consistency and are poor differentiators across levels of therapeutic security or strata. (11,17,21,22). Therefore, the measure is often reduced to a 9-item measure with a score ranging from 0 to 36 for research purposes (11). The ARFPS Pathways and Admissions Panel guidance states that 'it is expected that need for a forensic rehabilitation pathway will generally be indicated by a score of ≥ 18 on the 9 items of TS (omitting items 2 and 4 related to self-harm)' (18). Data was therefore collected for each of the D1 scores, the totals with and without TS2 and TS4, and for this 'cut off' of greater than or equal to 18.

Although most people were located in the forensic acute inpatient service prior to consideration for an EFCR pathway, they could also directly enter this pathway from prison, from general mental health services throughout the region, or other regional forensic mental health services elsewhere in the country. Data on the location of referral was collected.

Offence-related variables considered legal status at the time of presentation to the admissions panel and the nature of the index offence. Legal status dichotomised the cohort into 'Special Patients' compared to those who are not 'Special Patients'. 'Special Patients' refer to patients found unfit to stand trial or not criminally responsible (insane) at the time of the index offence (under the Criminal Procedures (Mentally Impaired Persons) Act 2003), or who received an outcome of guilt by criminal courts and were at the same time made subject to care under specialist forensic mental health services as a 'Special Patient' (under the Mental Health (Compulsory Assessment and Treatment) Act 1992).

In categorising the index offence, the Australian and New Zealand Standard Offence Classification (ANZSOC), third edition, was used (27). This categorises offences across 16 divisions, in descending order of perceived seriousness, and so in the case of multiple offences, the lowest division number is taken. On collecting the data it was noted that the majority of cases were concentrated in divisions 1 to 3, ('homicide and related offences', 'acts intended to cause injury', and 'sexual assault and related offences') and so divisions 4 to 16 were categorised together with those with no index offence, as 'no offence/all other offences'.

Data analysis

SAS Statistics software (www.sas.com) was used to undertake bivariate logistic regression analyses examining the associations between the outcome variable of an offer of admission to an EFCR pathway or not, and the individual variables of interest. The binary logistic regression was undertaken, including variables with a p value < 0.05 to determine the key variables impacting on the outcome. This was followed up with a multiple variable logistic regression to identify the best subset of variables to describe the outcome.

Ethics

An application was made to the Ministry of Health's Health and Disability Ethics Committee (HDEC) which concluded this is low-risk research, and so did not require a full application. Subsequently this study was approved, via receiving locality sign off, by the ARFPS. All those collecting data were required to sign a confidentiality agreement, and all data was then de-identified into a spreadsheet for aggregate analysis only.

Results

Sample description

The sample initially comprised 153 Admissions Panel referrals. However seven were declined on the basis that the patient was deemed to be from outside the ARFPS catchment area and would need to return to their referral region, and a further five were duplicate presentations which were removed for statistical analysis, using only their first referral.

As demonstrated by Table 1, most of the referrals ($N = 141$) were male with a mean age of 36.3 years. Approximately half of the referrals were Māori, which is consistent with their overrepresentation in the criminal justice system (2). Nearly all had experienced a psychotic illness, with a small subset having received a related diagnosis. About 70% of referrals had a co-existing 'Substance Use Disorder' diagnosis. Two-thirds were residing in an ARFPS inpatient unit or another secure hospital prior to referral, with the others being referred from prison, general mental health services, or the community. Just under a quarter of referrals were either 'Special Patients' or later saw disposition as 'Special Patients' as a result of their index offence.

In considering index offence-related variables, 17% had committed homicide or related offences. Of the referrals, 60% had an index offence involving serious acts of violence, or 85% when considering all previous offences. Of referrals, 30% had no index offence of a

violent or sexual nature, though this was only 8.5% when considering all previous offences. Although not presented in the table, two referrals had no previous offences; both were declined an EFCR pathway.

Bivariate analysis

Table 2 presents the socio-demographic, clinical, and offence-related data of those presented to the ARFPS Admissions Panel, comparing those offered an EFCR pathway to those declined. A pathway was offered 90 times (64%), and declined 51 times (36%). When removing 'Special Patients' a pathway was offered 60 times (55%), and declined 49 times (45%).

There were limited findings of significant difference within socio-demographic variables between those offered an EFCR pathway and those declined; although there were slightly lower rates of offers to women and Pacific peoples, and a higher rate for 'Special Patients' as demonstrated in Table 2.

A referral to the rehabilitation pathway was strongly associated with index offending-related variables ($p = 0.04$). Accepted referrals were approximately five-fold more likely to have committed an index offence of 'homicide or related offences', approximately three-fold more likely to have committed an index offence of 'sexual assault or other offences', and nearly two-fold more likely to have committed less serious violent offences, all when compared to minor offending or no offending. Furthermore, they are more likely to have a score above the threshold of 18 on their D1 at admission.

Considering the impact of demographic, clinical, cultural, and offence-related data on the decision of the Admissions Panel to offer of an EFCR pathway, it was not statistically significant when considering age, gender, ethnicity, legal status, HCR-20 version 2 risk level, or the presence of an affective disorder or a substance-use disorder (28). However, it was statically significant when considering the most serious index offence ($p = 0.04$), the

Table 1. Socio-demographic, clinical, cultural, and offence-related data characteristics of presentations to the ARFPS Admissions Panel (01/04/2016–31/03/2022).

		ALL	
		<i>n</i>	%
Total		141	
Age	Mean age at presentation	36.34	
Gender	Men	119	81.5
	Women	27	18.5
Ethnicity	Māori	69	48.9
	Pacific Peoples	33	23.4
	Other	39	27.7
Psychosis	History	136	96.5
	No history	5	3.5
Affective disorder	History of bipolar	34	24.0
	History of unipolar depression	2	1.4
	No history	105	74.7
Substance use disorder	History	99	70.2
	No history	42	29.8
Location at time of presentation	ARFPS inpatient	94	66.7
	Prison	18	12.8
	General MH unit	19	13.5
	Community	6	4.3
	Out of area forensic unit	4	2.8
‘Special Patient’	Were, or became one	32	22.7
ANZSOC MSIO	Homicide and related offences	24	17.0
	Acts intended to cause injury	60	42.6
	Sexual assault and related offences	16	11.3
	No offence/all other offences	41	29.1
ANZSOC MSEO	Homicide and related offences	24	17.0
	Acts intended to cause injury	96	68.1
	Sexual assault and related offences	9	6.4
	No offence/all other offences	12	8.5
Total D1 scores	Presentations with missing data	14	
	Mean score	23.78	
Total D1 scores (NOT including TS2 & TS4)	Presentations with missing data	12	
	Mean score	21.62	
	Total less than 18	18	14.0
	Total greater than or equal to 18	111	86.0
Total HCR-20 v2 scores	Presentations with missing data	19	
	Mean score for all	24.49	

Note: *n* = number of cases; ‘Psychosis’ includes schizophrenia, drug-induced psychosis, and psychosis not otherwise specified, as well as psychosis associated with either an affective illness, or a personality disorder.

ANZSOC = Australian and New Zealand Standard Offence Classification; <https://www.abs.gov.au/ausstats/abs@.nsf/2f762f95845417aeca25706c00834efa/6E55333A45BBD87FCA2578A200140F90?opendocument>. MSIO = Most Serious Index Offence; MSEO = Most Serious Ever Offence.

D1 = DUNDRUM-1 Scoring; TS = Triage Security, and are numbered to refer to each of the eleven DUNDRUM-1 measures; HCR-20 v2 = Historical Clinical and Risk Management, Version 2.

Table 2. Descriptive data, bivariate analysis, and logistic regression of socio-demographic, clinical, cultural, and offence-related data from presentations to the ARFPS admissions Panel: EFCR pathway offered versus declined: (1 April 2016–31 March 2022).

		n	% offered a	Unadjusted/Bivariate			Adjusted/Multiple Variable		
				OR	95% CI	p-value	OR	95% CI	p-value
Gender	Male	117	66.7%	1.00	–	0.13			
	Female	24	50.0%	0.50	[0.21, 1.22]				
Ethnicity	Māori	69	65.2%	0.83	[0.36, 1.93]	0.41			
	Pacific Peoples	33	54.6%	0.53	[0.20, 1.40]				
	Other	39	69.2%	1.00	–				
Age Group	≤ 28	32	59.4%	1.00	–	0.64			
	29–34	36	58.3%	0.96	[0.36, 2.52]				
	35–43	35	71.4%	1.71	[0.62, 4.73]				
	>43	38	65.8%	1.32	[0.50, 3.48]				
Age (continuous)				1.01	[0.98, 1.05]	0.44			
Psychosis	No History	5	20.0%	1.00	–	0.07			
	History	136	65.4%	7.57	[0.82, 69.61]				
Affective disorder	No History	105	66.7%	1.00	–	0.48			
	History – Bipolar	34	55.9%	0.63	[0.29, 1.39]				
	History – Unipolar	2	50.0%	0.50	[0.03, 8.23]				
Substance Use Disorder	No History	42	64.3%	–	–	0.94			
	History	99	63.6%	0.97	[0.46, 2.06]				
D1 Scores (dichotomous)	<18	18	16.7%	–	–	0.0003			
omitting TS2 & TS4*	≥18	111	69.4%	11.32	[3.08, 41.70]				
D1 Scores (Quartiles)	<18	18	15.8%	–	–	<0.0001	1.00	–	0.0006
omitting TS2 & TS4	19–21	39	50.0%	5.26	[1.31, 21.12]		4.34	[1.07, 17.68]	
	22–24	38	75.0%	14.00	[3.34, 58.77]		9.78	[2.27, 42.08]	
	>24	34	85.7%	28.99	[6.09, 138.13]		21.78	[4.50, 105.31]	
D1 Scores (continuous) omitting TS2 & TS4				1.35	[1.19, 1.52]	<0.0001			
‘Special Patient’	No	109	55.1%	1.00	–	0.0009	1.00	–	0.02
	Yes	32	93.8%	12.25	[2.79, 53.81]		6.00	[1.29, 27.95]	

(Continued)

Table 2. (Continued).

		n	% offered a EFCR pathway	Unadjusted/Bivariate		Adjusted/Multiple Variable	
				OR	95% CI	OR	95% CI
Legal Status	No index offence	19	57.9%	1.00	–		
	Sentenced prisoner	31	71.0%	1.78	[0.54, 5.88]		0.24
	Unsentenced/pending charges	62	56.5%	0.94	[0.33, 2.67]		
	Already disposed	29	75.9%	2.29	[0.66, 7.95]		
Most Serious Index Offence	None/Other	41	48.8%	1.00	–		0.04
	Homicide	24	83.3%	5.25	[1.53, 18.07]		
	Serious violence	60	63.3%	1.81	[0.81, 4.06]		
	Sex offending	16	75.0%	3.15	[0.87, 11.41]		
Most Serious Ever Offence	None/Other	12	25.0%	1.00	–		0.02
	Homicide	24	83.3%	15.00	[2.77, 81.38]		
	Serious violence	96	63.5%	5.23	[1.33, 20.60]		
	Sex offending	9	66.7%	6.00	[0.89, 40.31]		
HCR-20 v2 Total Score	<21	29	55.2%	1.00	–		0.66
	21–23	26	69.2%	1.83	[0.60, 5.54]		
	24–28	34	58.8%	1.16	[0.43, 3.16]		
	>28	33	66.7%	1.63	[0.58, 4.55]		
HCR-20 v2 Total Score				1.02	[0.96, 1.09]		0.48

Note: OR = odds ratio; CI = confidence interval; p-value taken to be statistically significant when <0.05.
*When considering total D1 scores when TS2 and TS4 omitted, 12 presentations were omitted due to absent or incomplete data.

most serious ever offence ($p = 0.02$), and for 'Special Patients' ($p = 0.0009$). When considering the impact of total D1 scores, omitting TS2 and TS4, it was statistically significant for quartiles ($p < 0.0001$), continuous scores ($p < 0.0001$), and dichotomous categories when using a 'cut off' score of greater than or equal to 18 ($p < 0.0003$).

Logistic regression

Table 2 also presents the multiple variable logistic regression analyses, and finds significance for 'Special Patients' ($p = 0.02$) and total D1 scores quartiles, omitting TS2 and TS4 ($p = 0.0006$) as the best set of variables of interest to explain the likelihood of an offer of an EFCR pathway.

Predictive validity of D1 scores

Table 3 presents the total D1 scores (including and omitting TS2 and TS4), and TS sub-scales. Incomplete D1 scores were removed from the data ($n = 127$ with complete data; $n = 129$ when TS2 and TS4 were omitted).

When comparing those offered an EFCR pathway against those declined, the AUC for total D1 scores was 0.76 (95% CI 0.67–0.85) and was significant ($p < 0.0001$). When TS2 and TS4 were omitted the AUC was 0.78 (95% CI 0.71–0.87) and was again significant ($p < 0.0001$). However there was not a statistical difference between the AUC for total D1, in comparison to when TS2 and TS4 were omitted.

Seven of the eleven sub-scales demonstrated significance ($p < 0.05$). In the case of TS1 'seriousness of violence', TS3 'immediacy of violence', and TS6 'absconding/elopeing' the probability-value (of chance) was very small ($p < 0.0001$), indicating strong evidence for prediction of an offer to an EFCR pathway. Given that the aim of EFCR is to rehabilitate those that have a mental impairment (effectively a prerequisite before a presentation is made) and are dangerous to others, it may be expected that the offer

of a pathway is more likely if their violence is severe (homicide as an example gives the maximum score) and had immediacy ('still in the mental state that led to serious violence' gives the maximum score). While absconding or eloping may be a proxy for patients who cannot be managed by general mental health services.

The four sub-scales that did not demonstrate significance were TS2 'seriousness of self-harm' ($p = 0.12$), TS4 'immediacy of self-harm' ($p = 0.12$), TS9 'complex risk of violence' ($p = 0.13$), and TS11 'legal process' ($p = 0.14$). This may be expected, as although self-harm/suicidality is a key consideration in factoring acute admissions from prison to inpatient units, it is not determinative of the need for EFCR (11,21). While it might be expected for 'legal process' to be significant, it may be that it distinguishes poorly between patients across various settings, mental health statuses, and different parts of their criminal justice journeys in an Aotearoa population.

The total D1 score was 68.4% for sensitivity and 64.6% for specificity, and when TS2 and TS4 were omitted, sensitivity increased to 71.3%, and specificity to 69.4%. The highest sensitivity for the sub-scales was TS6 'absconding/elopeing' (93.9%), TS1 'seriousness of violence' (88.0%), and TS7 'preventing access' (86.7%), while the lowest was TS2 'seriousness of self-harm' (56.1%) and TS4 'immediacy of self-harm' (59.8%). TS2 'seriousness of self-harm' (65.1%) had highest specificity, while TS7 'preventing access' (18.0%) had the lowest specificity.

Assuming a midpoint median split ($<\text{median}/\geq\text{median}$), only TS2 'seriousness of self-harm' had a percentage correctly classified (PCC) of less than 50%, while the PCC for total scores was 66.9%, and when omitting TS2 and TS4 was 70.5%.

Not presented in any table, but for total D1 scores the cut-off score for optimal discrimination was 22, giving a PCC of 76.4%, a sensitivity of 87.3%, and a specificity of 58.3%. When TS2 and TS4 were omitted the cut-off

Table 3. Statistical data and predictive values of DUNDRUM-1 measures for presentations to the ARFPS Admissions Panel: EFCR pathway offered versus declined: (1 April 2016–31 March 2022).

	Mean	SD	Median	AUC	95% CI	<i>p</i> -value*	Sensitivity (%)**	Specificity (%)**	PCC**
TS1: Seriousness of violence	3.05	0.87	3	0.73	[0.64, 0.81]	<0.0001	88.0	50.0	73.7
TS2: Seriousness of self-harm	1.22	1.25	1	0.57	[0.48, 0.67]	0.12	56.1	65.1	40.8
TS3: Immediacy of violence	2.57	0.97	3	0.70	[0.62, 0.78]	<0.0001	75.9	58.0	69.2
TS4: Immediacy of self-harm	0.97	1.09	1	0.57	[0.48, 0.67]	0.12	59.8	49.0	55.7
TS5: Specialist forensic need	1.91	0.94	2	0.66	[0.57, 0.75]	0.0005	68.7	55.1	63.6
TS6: Absconding/ eloping	2.31	0.77	2	0.71	[0.62, 0.79]	<0.0001	93.9	26.0	68.2
TS7: Preventing access	2.19	0.76	2	0.64	[0.55, 0.72]	0.002	86.7	18.0	60.9
TS8: Victim sensitivity	2.02	0.88	2	0.63	[0.54, 0.72]	0.006	80.7	42.0	66.2
TS9: Complex risk of violence	2.63	0.70	3	0.57	[0.48, 0.66]	0.13	67.9	42.0	58.0
TS10: Institutional behaviour	1.99	0.98	2	0.62	[0.53, 0.72]	0.01	70.7	48.0	62.1
TS11: Legal process	3.05	1.02	3	0.57	[0.48, 0.67]	0.14	79.5	36.0	63.2
Total***	23.78	5.10	24	0.76	[0.67, 0.85]	<0.0001	68.4	64.6	66.9
Total without TS2 & TS4***	21.62	4.35	22	0.78	[0.71, 0.87]	<0.0001	71.3	69.4	70.5

Note: SD = standard deviation; AUC = area under the curve; PCC = percentage correctly classified.
*Testing that AUC is significantly different than 0.5.
**Assuming a midpoint/median split (<median vs ≥ median).
***When considering total D1 scores 14 presentations had either absent or incomplete data, and when TS2 and TS4 was omitted 12 presentations had either absent or incomplete data.

score for optimal discrimination was 21, with a PCC of 76.0%, a sensitivity of 83.8%, and a specificity of 63.3%.

Discussion

In this study, we set out to identify what socio-demographic, clinical, cultural, or offence-

related variables might determine an offer of admission to an EFCR pathway in the context of forensic mental health service delivery in Aotearoa. This is the first study of this kind in this country. In addition, we questioned whether D1 scores show predictive validity for offer of admission to an EFCR pathway in this same context.

Ethnicity and gender did not make a measurable impact on decision-making, which is consistent with a prospective study conducted at an adult forensic service on an urban UK population by Freestone et al. (11). However, there are no comparator studies with a significant Indigenous population, in New Zealand or otherwise.

Half of the referrals were Māori, which is consistent with their overrepresentation in the criminal justice system, while the percentage of Māori offered an EFCR pathway was also consistent with the overall offer rate (2). However it could be interpreted that this falls short of aims to eliminate health inequities for Māori, who experience significant health and incarceration disparities in comparison to other ethnic groups (2,29). To help progress or achieve this aim, this study underlines the need for care pathways that are responsive to the needs of Māori and the need for cultural expertise to assist in care planning and care delivery.

Importantly, our study has confirmed the predictive validity of the total D1 tool (with or without self-harm measures) and of seven of the eleven items of the D1 in the New Zealand context. Again these results are similar to Freestone et al. (11). In this study, total D1 scores, without TS2 and TS4, were predictive of an offer of an EFCR pathway, and had a similar overall AUC score to our study, while finding the same median score of 24. It suggests forensic mental health cohorts across these jurisdictions share commonalities in terms of indicated levels of therapeutic security. Our study demonstrated the significance for six of the same eleven TS subscales as the UK study. It also similarly demonstrated TS2 and TS4, the seriousness and immediacy of self-harm, to not be significant. As referred to previously, self-harm/suicidality is not determinative of the need for EFCR. While variables that might be expected to have an impact like the presence of a psychotic disorder, having committed more serious

violent offences, and ‘Special Patient’ status did show statistical significance (11).

For those patients not court ordered as a ‘Special Patient’, roughly half were declined an EFCR pathway. However, all those referred to the admissions panel were done so due to perceived ‘forensic’ need. The average D1 score of those referred was more than 21 which indicates that this cohort of patients are already exceeding the capacity of non-forensic services in at least one domain (12). Furthermore, only 8.5% of those referred did not have a history of violent criminal offending indicating that even non-forensic services must have capability in the ongoing management of complex people with propensity for violence.

We also note that a high proportion (85%) of those with a TS score within the upper quartile (>24) were offered an EFCR pathway. We find this encouraging in terms of what we consider the ‘core’ business of forensic secure services, i.e. treatment and management of those with ‘true’ dangerousness in the longer term to communities and societies. It also bears out investment by ARFPS towards development of a high secure unit due to open in early 2026 with capability to offer enhanced care to a small proportion of patients presenting with the highest or most serious dangerousness.

With such limited resources, an EFCR pathway cannot be offered to everyone with serious mental illness who commits violence. It is also in many cases unethical to subject someone to an EFCR pathway which typically lasts several years (30). In most cases, optimising the treatment of psychotic symptoms and substance use, while aiding the patient and their family to understand early warning signs and early management to reduce risk of future violence, can be best addressed with no more than a brief admission and community care, as opposed to an EFCR pathway (31).

For the patients declined an EFCR pathway, other services will need to provide for their care. For some this may be prison, at least

initially, but it typically falls to general ‘non-forensic’ mental health services that may not have the forensic expertise to best assess, manage, and rehabilitate serious violent offenders who still have high and complex forensic mental health needs. Not an insignificant number, this could be equivalent.

These needs may be better met by increasing the capacity of forensic mental health services beds, or increasing outreach forensic services in to prisons and general mental health services to supply an overlap of expertise (8). With 51 individual patients declined an EFCR pathway in just a six-year period this may equate to an entire assertive outreach service caseload. Otherwise, the alternative could be an increase in prison capacity to respond to higher rates of reincarceration in this population, if they are poorly managed (32,33).

Limitations

As a naturalistic retrospective study, the findings are limited by the following considerations. Firstly, data such as the D1 was not compiled by an individual or team of researchers, but was collected for clinical purposes by various clinicians of differing roles. Interrater reliability has not been examined for D1 scores or other clinical data in this study.

Furthermore, this study only accounted for those actively referred to the Admissions Panel rather than total caseload within the referring services. A study that examines patients not referred and analyses similar cultural, clinical, and D1 data would provide a fuller picture in terms of the extent to which D1 scores mediated a clinician’s decision not to refer.

A major limitation of the study is that the Admissions Panel were not blinded to the D1 triage scores, a bias that was not controlled for and so the decision to offer an EFCR pathway is not an independent outcome. Another potential source of bias again pertains to the relatively small service, as clinicians on the Admissions Panel may know the patient, through either direct or indirect clinical

interactions, or form a view based on allegiance to the presenting clinician, which could influence their decision-making. Trying to eradicate such bias was one of the reasons for the creation of the Admissions Panel and the DUNDRUM scales (12,18). We are assured, however, to see that this was not the case in terms of the findings which suggest that degree of dangerousness and seriousness of offending are key factors affecting admission.

Future research

Investigation of the pathway and outcomes for those declined an EFCR pathway could elucidate clinical need for patients with serious mental illness and significant risk to others, but not deemed sufficiently ‘dangerous to others’, to be offered an EFCR pathway.

Conclusions

We suggest this study adds to the growing body of literature pertaining to use of structured decision-making tools in aiding admission decisions to EFCR. In this study, we were able to demonstrate that a patient, offered an EFCR pathway, was more likely to be male, Māori, suffering from psychotic illness and substance use disorder, and have a history of serious violent offending. However, those factors were overrepresented in the referral group and poorly discriminant of those admitted, indicating that a broader range of considerations as captured in the D1 tool were of relevance to decision-makers.

Aotearoa’s forensic services have an ethical requirement to best allocate a highly limited and expensive, publicly-funded resource, in the form of secure rehabilitation beds (34). The use of an evidence-based structured clinical judgement tool, such as the D1, supports decision-making, and provides the basis for a reliable, accountable, and transparent process that generalises to other services. Similar to international comparators, we were able to demonstrate the validity of the D1 tool in the prediction of need for extended forensic care

on a cohort of New Zealanders with mental health and criminal justice needs (11,17,22).

Ethical standards

Declaration of conflicts of interest

James Chaffe has declared no conflicts of interest.

Krishna Pillai has declared no conflicts of interest.

Rajan Gupta has declared no conflicts of interest.

Brian McKenna has declared no conflicts of interest.

Nick Garrett has declared no conflicts of interest.

Ethical approval

An application was made to the Ministry of Health's Health and Disability Ethics Committee (HDEC) which concluded this is low-risk research, and so did not require a full application. Subsequently this research proposal was reviewed and supported by the Auckland Regional Forensic Psychiatry Service (ARFPS) research committee, receiving locality sign-off.

All procedures performed in studies involving human participants were in accordance with the ethical standards of the Ministry of Health's Health and Disability Ethics Committee (HDEC) and Auckland Regional Forensic Psychiatry Service (ARFPS) research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent

Informed consent was not obtained from all individual participants included in the study as their data was fully anonymised. This was the recommendation from the Ministry of Health's Health and Disability Ethics Committee (HDEC) and the Auckland Regional Forensic Psychiatry Service (ARFPS) research committee. All those collecting data were required to

sign a confidentiality agreement, and all data was then de-identified into a spreadsheet for aggregate analysis only.

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