Research Brief

Identification of criminogenic needs using the PARRCC assessment tool

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AIMS To examine how the Planning for Adjustment, Responsivity, Reintegration, Criminogenic Need and Communication (PARRCC) tool assesses criminogenic needs and incorporates them into assessment outcomes for people serving custodial sentences, using the Level of Service Inventory – Revised (LSIR) as a benchmark for comparison.

FINDINGS AND CONCLUSIONS Outcomes of PARRCC and LSI-R assessments for 10,008 people in custody completed between June 2020 and June 2022 were examined. Results indicate that overall, the PARRCC tended to allocate more individuals to higher levels of service when compared to the LSI-R. This was associated with larger proportions of people with no, or few severe criminogenic needs being allocated to higher levels of service by the PARRCC relative to the LSI-R.

A series of correlation analyses between PARRCC items pertaining to criminogenic needs and corresponding LSI-R domains showed associations which ranged between weak and strong. While the PARRCC allocated larger proportions of people to higher levels of service, the PARRCC tended to under-identify criminogenic needs relative to the LSI-R. This was in part due to detection bias in the determination of needs by the PARRCC.

The findings of this study illustrate a number of differences in how the PARRCC assesses criminogenic needs for case management purposes relative to previous standards. While it is important to acknowledge that the PARRCC was designed to assess a range of functional needs among people in custody and was not intended to act as a substitute for the LSI-R, the results raise implications about best practice in identifying criminogenic needs to inform current case management processes.

CORRECTIONS RESEARCH EVALUATION AND STATISTICS | CORRECTIVE SERVICES
NSW RESEARCH BRIEF No. 23 | AUGUST 2025 | ISSN 2642-8789

INTRODUCTION

The Risk Needs Responsivity (RNR) model provides a systematic framework for the management of people in correctional centres by outlining what programs and services should be delivered, who it should be delivered to, and how it should be delivered (Bonta & Andrews, 2016). Although it is established that fidelity to RNR principles can have a positive effect on reducing reoffending and influencing behaviour change (Bonta & Andrews, 2007; Dowden & Andrews, 2000), there are practical challenges within the custodial environment that can impact adherence to RNR principles. For example, a central component of RNR-based case management is reliable identification of a person's criminogenic needs, which requires accurate and timely assessment to allow for appropriate allocation of limited intervention resources within the timeframe of their sentence (Mahajan et al., 2020; 2021; Bower et al., 2024). Additionally, many people in custody have a complex range of both criminogenic and non-criminogenic needs (Russo et al., 2017) which, if unmanaged, can interact to impact how they adjust to the prison environment, their prospects for reintegration into the community, and their motivation for and engagement in custody-based interventions (Adams, 1992; Gonçalves, 2014).

Reflecting the importance of needs assessment in effective delivery of programs and services, Corrective Services NSW has historically employed the Level of Service Inventory – Revised (LSI-R; Andrews & Bonta, 2000) as a key determinant of how the agency manages people in custody. The LSIR is one of the most widely used and validated actuarial risk assessment tools across international jurisdictions (e.g. Lutz et al., 2022). Administration of the tool's 54 items derives an estimate of the individual's likelihood of general recidivism, in addition to assessments of their criminogenic needs across 10 domains. In the context of Corrective Services NSW, LSI-R assessments of risk and need have informed case management decision-making at multiple points, including eligibility for formal behaviour change programs, treatment targets at the time of case formulation, and overall intensity of case management (e.g. Watkins, 2011).

In recent years, evolution of custodial case management systems within Corrective Services NSW have necessitated changes in assessment strategy and procedure. For example, in 2020 Corrective Services NSW implemented the Intervention Pathways (IP) model, which aimed to streamline people's allocation to various behaviour change programs in order to optimise delivery of treatment dosage to those at higher risk of reoffending, including people serving short custodial sentences (see Mahajan et al., 2024). Among other changes and innovations, this model utilised new automated and non-automated assessment tools to expedite determinations of eligibility for programs. Central among these is the Custody TRAS (Raudino et al., 2019), an automated actuarial tool which uses readily available administrative data to derive static risk factors and estimate likelihood of general recidivism. Implementation of the Custody TRAS was partly informed by the substantial time and other resource costs associated with administration of the LSI-R (Raudino et al., 2019; see also Bonta et al, 2001; Flores et al., 2006) and corresponded with a phasing out of use of this tool for people in custody.

Another relevant innovation is the introduction of the improved Custodial Case Management model across NSW correctional centres. This model introduced specialist case management units (CMUs) and officers (CMOs) to provide holistic assessments of people's needs and manage the priority and sequencing of delivery of various programs and services over the course of their sentence (see Tran et al., 2020; Tran & Howard, 2021). To assist with this process, Corrective Services NSW developed a new assessment tool, which after multiple iterations is now called the Planning for Adjustment, Responsivity, Reintegration, Criminogenic Needs, and Communication (PARRCC) tool. The PARRCC is designed to assess a range of functional needs that are relevant to how the individual adjusts to life in custody, engages in interventions and reintegrates into the community, in addition to criminogenic needs (Tran & Howard, 2021). PARRCC assessments intersect with the IP model to determine eligibility for flagship behaviour change programs, such as by informing Most Appropriate Program Pathway (MAPP) assessments[1]. In addition to giving

[1] The MAPP is an assessment tool that is used to identify the programs and interventions that are most appropriate for addressing an inmate's needs. The MAPP is completed using historical and self-reported information obtained from sources such as the PARRCC.

information about specific needs, the PARRCC also calculates an overall level of service index which determines the intensity of case management, contingent upon the individual's time left to serve in custody.

AIMS

Development and implementation of new assessment tools such as the PARRCC represent innovations to service the changing case management needs and procedures of corrections agencies such as Corrective Services NSW. The PARRCC also represents a shift from internationally established gold standards for assessing criminogenic needs, in the form of the LSI-R and its variants. While it should be noted that the PARRCC is intended to assess a range of functional needs among people in custody, it currently serves similar purposes to historical uses of the LSI-R by providing insights about an individual's needs that inform eligibility for offence-or need-specific programs, and guiding decisions about the overall intensity of case management service delivery required. However, little research has been conducted to explore the validity of PARRCC assessments of criminogenic needs or whether it provides information about these needs in a similar way to previous standards.

The aim of the current study is to examine how the PARRCC assesses criminogenic needs and incorporates them into assessment outcomes, using the LSI-R as a benchmark and source of comparison. To achieve this, we compared the outcomes of a sample of PARRCC assessments against the LSI-R for a cohort of individuals in custody. Specifically, we examined the level of agreement between the PARRCC and the LSI-R in identifying the level of service required, how level of service corresponded with the presence of criminogenic needs, and the level of agreement between the PARRCC and the LSI-R in identifying domains of criminogenic needs.

METHODS

Data

Outcomes of the most recent PARRCC[2] assessment administered to individuals held in Corrective Services NSW correctional centres between June 2020 and 2022 were extracted from the Offender Integrated Management System (OIMS). OIMS is Corrective Services NSW's central administrative database which collates demographic and other case management information on people managed by Corrective Services NSW. This extraction additionally included outcomes of an LSI-R assessment which was completed most recently to the time of the index PARRCC assessment. Only LSI-R assessments that were completed within 12 months[3] of the PARRCC assessment were retained. Excluded from the current study were incomplete PARRCC and LSI-R assessments. The final dataset examined in this study contained 10,008 records.

Measures

PARRCC

The PARRCC consists of 34 items which measure needs across three major domains: Offence Related; Reintegration; and Adjustment, Responsivity and Communication. There are five possible responses for each item (No Need, Historical Low Need, Current Moderate Need, Historical High Need, Current High Need). A numeric score is assigned to each item, and a domain score is derived by aggregating the score of items within that domain.

[2] The PARRCC has been updated since its implementation and the current extraction was restricted to the iteration of the PARRCC (version 2) which was in use at time of observation.

[3] The LSI-R closest in time proximity can include LSI-R assessments administered before the index PARRCC assessment.

Depending on the individual's time left to serve in custody, an overall PARRCC score is derived by aggregating scores across different combinations of domains. For those who are within one year of their earliest possible release date (EPRD), only items from the Reintegration domain of the PARRCC are used to derive the overall PARRCC score. For those who have between one and three years to EPRD, only items on the Offence Related domain are used. For those with greater than three years to EPRD, the domains of Adjustment, Responsivity, and Communication are used to derive overall PARRCC score. The use of different domains in deriving overall PARRCC scores allows the sequencing of targeted interventions and services that are appropriate to the person's stage of incarceration and proximity to release from custody.

Thresholds are applied to overall PARRCC scores to further categorise individuals into three levels of service (No Needs, Standard Needs, Complex Needs). The scheduling and intensity of case management activities by CMOs, and types of services made available to an individual is determined by their overall PARRCC score and time left to EPRD.

LSI-R

The LSI-R consists of 54 items which assesses 10 domains[4] of criminogenic needs (Andrews & Bonta, 2000). These domains are Criminal History, Education/Employment, Family/Marital, Accommodation, Financial, Leisure/Recreation, Companions, Alcohol/Drug, and Attitudes/Orientation. A domain score is obtained by aggregating scores of items within the domain. Domain scores of the LSI-R can be further aggregated to produce an overall score to give an index of risk of general recidivism. Thresholds can be applied to these summary scores to categorise people into five levels of reoffending risk: Low, Low/Medium, Medium, Medium/High and High.

Corrective Services NSW has historically applied thresholds to continuous domain scores to indicate severity of needs for case management purposes (see Howard & Corben, 2019; Howard & Nahleen, 2024). If a domain score falls within the highest range of possible scores, the domain is considered to have 'considerable need for improvement'. A domain with 'considerable' need is defined as indicating that the measured domain had caused serious adjustment problems and contributed markedly to the individual's offending and should therefore be factored into case plan formulation for intervention. For the purposes of this study, scores that exceeded the threshold for 'considerable' need for improvement were used as a binary indicator of the presence of need in that particular domain.

Analytical Plan

The degree of agreement between the PARRCC and LSI-R in allocating inmates into differing levels of service was examined through descriptive statistics. A series of clustered bar charts were generated to support comparison of the distribution of inmates across the different PARRCC (No Needs, Standard Needs, and Complex Needs) and LSI-R risk categories (Low, Low/Medium, Medium, Medium/High, and High). As the scoring of PARRCC is contingent on a person's time remaining to serve, this analysis was stratified by the time remaining on their sentence until their EPRD. Discrepancies in the distribution of allocations were further examined descriptively.

The degree of agreement between the LSI-R and PARRCC in identifying domains of criminogenic needs was examined using correlation statistics. As not all items on the PARRCC can be mapped to an LSI-R domain, only a subset of items where a link was established were examined (see Appendix A for linkage between PARRCC items and LSI-R domains)[5]. As no PARRCC items corresponded with the Criminal History domain, this domain was dropped from analysis. Given that PARRCC and LSI-R domain scores are measured on an ordinal scale, Spearman's rho was applied to test the strength of the correlation between these measures.

[4] Criminogenic need domains assessed by the LSI-R will be referred to as LSI-R domains.

[5] Linkage between individual PARRCC items and LSI-R domains of need were subject to review and confirmation by case management subject matter experts within Corrective Services NSW, including the original developer of the PARRCC, prior to conduct of this study.

Further supporting the correlational statistics, Signal Detection Theory (SDT) approaches, were utilised to examine the performance of the PARRCC at identifying domains of criminogenic need when compared to the LSI-R. We determined the 'hit', 'miss', 'false positive' and 'correct rejection' rates of the PARRCC in reference to LSI-R outcomes as the criterion. Where a single item of the PARRCC corresponded to an LSI-R domain, a need was identified by the PARRCC if the PARRCC item was given the maximum possible score (scored as current or historical high need). Similarly, where multiple PARRCC items corresponded to an LSI-R domain, a need was identified if at least one of those items was given the maximum possible score. As for the LSI-R, a need was identified if a domain score indicated 'considerable need for improvement'. Contingency tables, sensitivity (d') and bias statistics were derived for each of the nine LSI-R domains.

RESULTS

What is the level of agreement between the PARRCC and LSI-R in allocating inmates to different levels of service?

Figure 1 shows the distribution of people across the different levels of service on the PARRCC and LSIR. It is clear from Figure 1 that there was skewness in the data, where a large proportion of the sample (59.4%, n = 5,948) was categorised by the PARRCC to have Complex Needs. About 34.9% of the sample (n = 3,489) was identified as having Standard Needs while only a very small percentage (5.7%, n = 571) were identified as having No Needs.

In contrast, the distribution of people across the LSI-R categories followed a normal distribution. The majority of inmates were classified as Medium (33.6%, n = 3,359), while the smallest proportions were classified as Low (6.9%, n = 688) or High (11.8%, n = 1,180). When comparing the patterns of distributions in figure 1, the negative skew in PARRCC outcomes suggests that the PARRCC may be allocating a larger proportion of inmates into the higher levels of service when compared to the LSI-R.

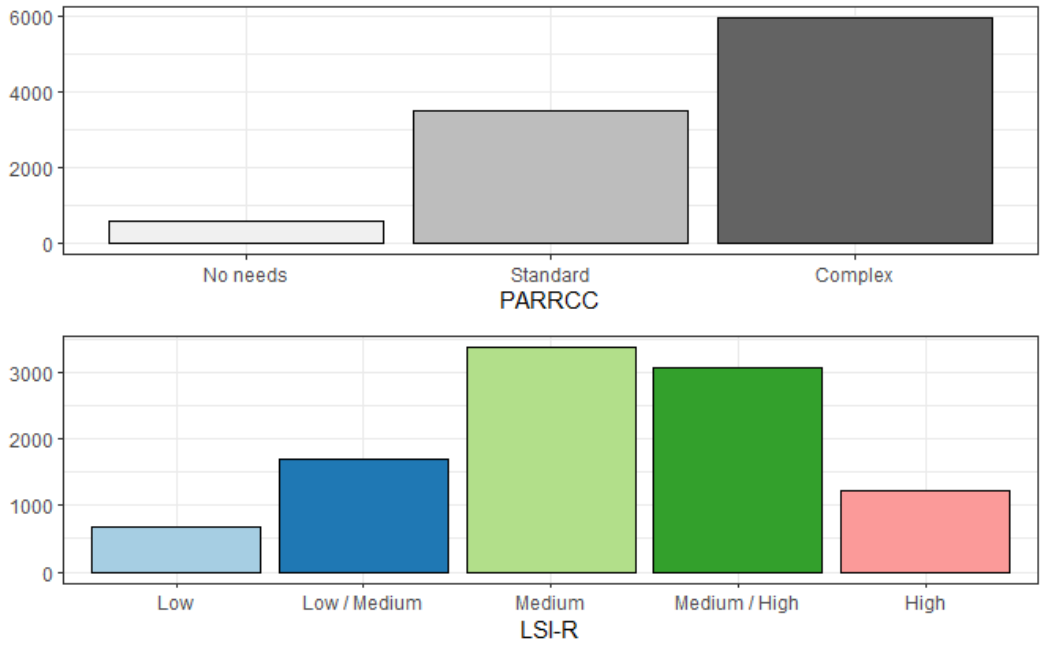
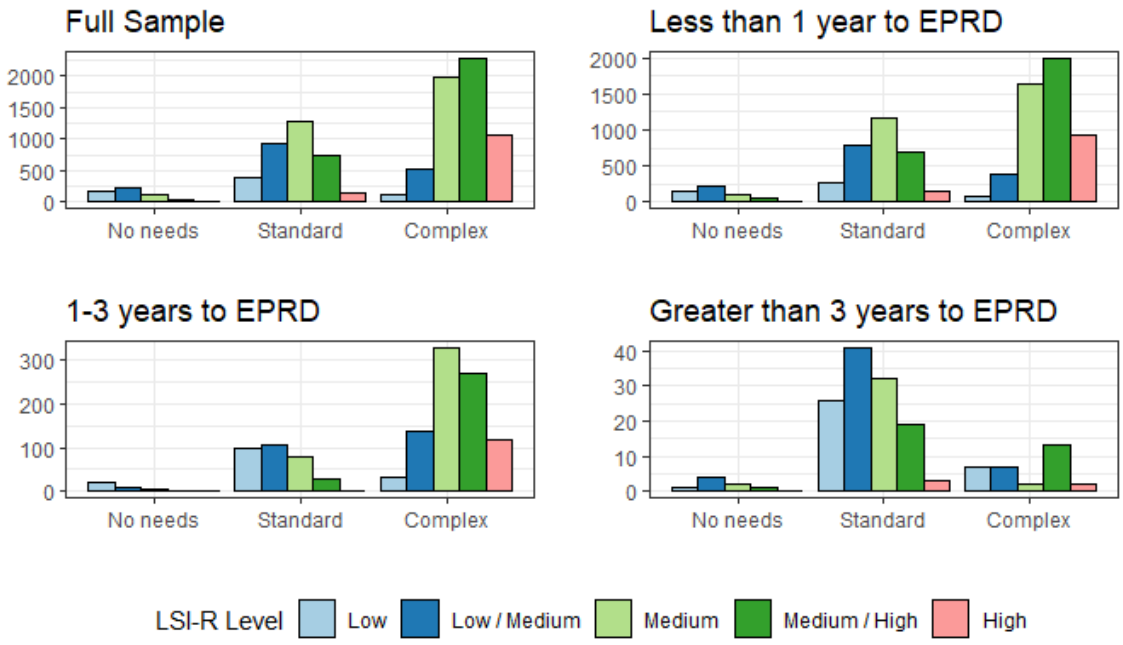


Figure 1. Distribution of inmates across the different PARRCC and LSI-R levels of service



Note. Depending on time left to serve, different domains are used to derive overall PARRCC scores.

Figure 2. Clustered bar chart of LSI-R levels of service across PARRCC levels of service and time left to serve

When considering the full sample across all sentence lengths, there was a general correspondence between PARRCC level of service and LSI-R risk. For example, the Complex Needs category appeared to be capturing a large proportion of those with LSI-R Medium and above (89.1% of those with Complex Needs). The Standard Needs grouping captured cohorts of people with LSI-R Low/Medium to Medium/High estimates of risk (36.3% of those with Standard Needs). Although there were fewer people within the No Needs grouping, there was some indication that the PARRCC was generally capturing larger cohorts of inmates with LSI-R Low/Medium and below (71.3%).

Similar trends were observed in PARRCC assessment outcomes for people with less than one year to EPRD and people with between one to three years to EPRD; in the latter case, however, there appeared to be a flatter distribution of various LSI-R categories in the Standard Needs grouping, marked by larger allocations of people with Low and Low/Medium risk into this grouping. For those with more than three years to EPRD, there was a marked tendency for the PARRCC to allocate people to the Standard Needs grouping, and there appeared to be little relationship between LSI-R risk category and allocation to the Complex Needs grouping.

How does overall level of service correspond with the presence of criminogenic needs?

The above analyses indicated that the PARRCC was more likely to allocate people to the highest overall levels of service compared to the LSI-R, when considering the sample in aggregate. This may suggest that the PARRCC may prioritise service for individuals who have different profiles of need compared to those who are prioritised by the LSI-R. To explore this further, we examined how allocation to a high level of service corresponded with the extent of criminogenic needs experienced by the individual, using number of LSI-R domains with 'considerable need for improvement' as our benchmark index of need.

Table 1 shows the distribution of severe needs among individuals who were assessed as having Complex Needs by the PARRCC and those who were assessed as having Medium or higher risk by the LSI-R. It can be seen that whereas few people (6.6%) with 0 domains of need were assessed by the LSIR as having higher risk/levels of service, almost one in four (24.9%) of these individuals were assessed by the PARRCC as having Complex Needs. Conversely, individuals with 3 or more domains of severe need were almost all identified as being in higher risk categories of the LSI-R (97.0%), while the PARRCC allocated almost three in four (71.3%) to the Complex Needs grouping.

Table 1. Counts of LSI-R domains with considerable need for improvement for those assessed to require high levels of service

Number of LSI-R domains with considerable need for improvement	LSI-R Medium and above (%)	PARRCC Complex Needs (%)
0	6.6	24.9
1-2	44.6	39.8
3-9	97.0	71.3

What is the level of agreement between the PARRCC and LSI-R in identifying domains of criminogenic needs?

While the previous analyses looked at how the PARRCC and LSI-R allocated people to different levels of service, the following analyses examined the extent of concordance in how the PARRCC identified domains of criminogenic needs when compared to the LSI-R. The following analyses examined a subset of PARRCC items where linkage with LSI-R domains were identified.

Table 2 shows the correlation statistics for LSI-R domains and corresponding PARRCC items. Where multiple PARRCC items map onto the same LSI-R domain, correlation scores for those items were presented individually and in aggregate. The strength of correlation across all items were statistically significant and ranged from weak (0.19) to strong (0.50)[6]. The strongest association found was observed between PARRCC items 6 and 7 in aggregate and the LSI-R Emotional/Personal domain (r_s = 0.50; p <.001). The weakest association was observed for PARRCC item 15, which corresponds to the Attitudes/Orientation domain (r_s = 0.19; p <.001). Where multiple PARRCC items map onto a single domain, the largest associations were observed when those PARRCC items were aggregated.

Table 2. Correlation statistics of PARRCC items corresponding to LSI-R domains

LSI-R Domain	PARRCC Item(s)	rho	p-value
Emotional/Personal	6	.49	<.001
	7	.34	<.001
	6,7 (in aggregate)	.50	<.001
Education/Employment	13	.26	<.001
	14	.25	<.001
	33	.40	<.001
	13,14,33 (in aggregate)	.41	<.001
Attitudes/Orientation	15	.19	<.001
	17	.32	<.001
	18	.33	<.001
	19	.32	<.001
	15,17,18,19 (in aggregate)	.36	<.001
Alcohol/Drug	16	.44	<.001
Leisure	23	.25	<.001
Family/Marital	27	.32	<.001
	28	.23	<.001
	27,28 (in aggregate)	.34	<.001
Company	29	.30	<.001
Accommodation	32	.34	<.001
Financial	34	.28	<.001

[6] According to established guidelines for interpreting correlation coefficients, values ranging from 0 to .29 suggest a weak or small association, between .30 and .49 indicate a moderate association, and values of .50 or higher indicate a strong or large association (Cohen, 1988).

To further examine the performance of the PARRCC, we generated contingency tables for each LSI-R domain[7]. This was utilised to compare the hit, miss, false alarm and correct rejection rates of the PARRCC using the LSI-R threshold for 'considerable need for improvement' as the reference signal. The sensitivity and bias statistics in Table 3 were derived from these contingency tables. Sensitivity or d' can be interpreted as the degree of agreement between the PARRCC and LSI-R at identifying criminogenic needs. A greater magnitude of d' is indicative of greater agreement between the PARRCC and the LSI-R. While there is no theoretical upper limit, a d' of 4 is indicative of a near perfect agreement, and a d' of close to zero is interpreted as chance agreement.

The observed d' scores ranged from 0.57 to 0.85 and the highest d' scores were observed for the domains of Accommodation (d' = 0.85) followed by Alcohol/Drug (d' = 0.77), and the lowest for Family/Marital, Company and Finance (d' = 0.57 for all).

Table 3. Sensitivity and bias statistics for the PARRCC

LSI-R Domain	Sensitivity (d')	Bias
Emotional/Personal	0.75	1.31
Education/Employment	0.76	0.43
Attitudes/Orientation	0.66	-0.05
Alcohol/Drug	0.77	0.12
Leisure	0.63	0.99
Family/Marital	0.57	0.64
Company	0.57	0.39
Accommodation	0.85	0.77
Finance	0.57	0.84

The d' scores, however, need to be interpreted together with the bias statistics shown in Table 3. Deviations away from zero in the bias statistic gives an indication of whether the PARRCC was over or under identifying a need. Within the context of this study, greater deviation from zero in a positive direction is indicative of larger positive bias where the PARRCC applied higher thresholds for identifying a need resulting in a smaller proportion of the sample being identified with the need (under-identification). On the other hand, greater deviation from zero in a negative direction is indicative of larger negative bias resulting in a larger proportion of the sample being identified with the need (overidentification). Across all domains, bias scores were generally positive with several of them approaching 1. This suggests that with the exception of Attitudes/Orientation, all domains showed some degree of under-identification.

To better understand patterns in detection of needs across the PARRCC and the LSI-R, the following sections give a detailed description of signal detection outcomes for two exemplar domains. We explored the Emotional/Personal domain as it showed the highest magnitude of bias and the greatest strength of correlation. We also examined the Alcohol/Drug domain as a basis of contrast, in that the PARRCC demonstrated a sensitivity score for this domain that was comparable to the Emotional/Personal domain but with a smaller amount of bias. Contingency tables showing the signal detection results for other domains are given in Appendix B.

Considering the Emotional/Personal domain, the direction of bias suggests that the PARRCC was under-identifying needs. It can be observed that the PARRCC did not detect need in 91% of assessments (9,077 of 10,008 assessments). In contrast, the LSI-R returned a null outcome in only 64% of assessments (6,382 of 10,008 assessments). Given the high prevalence of null outcomes by the PARRCC, it was not surprising that the PARRCC showed a high correct rejection (95.4%), poor hit (17.6%) and high miss (82.4%) rates. Hence,

[7] Where multiple PARRCC items map onto a single criminogenic domain, these items were aggregated for this analysis.

while the PARRCC showed overall accuracy[8] of 67% and a relatively high d' value, this can be largely attributed to functions of bias resulting in high levels of agreement when the need was not present.

Table 4. Contingency table for the Emotional/Personal domain

PARRCC	LSI-R		Total
	Identified	Not Identified	
Identified	638 (17.6%)	293 (4.6%)	931
Not Identified	2,988 (82.4%)	6,089 (95.4%)	9,077
Total	3,626	6,382	10,008

Table 5 shows the contingency matrix for the Alcohol/Drug domain. On accuracy, the PARRCC agreed with the LSI-R in 63% of cases, which was similar to the performance on the Emotional/Personal domain. However, unlike the earlier results, agreements were driven by comparable hit and correct rejection rates (60.5% and 69.1% respectively). By extension, similar proportions of misses and false positives were observed among disagreements. The balance between hits and correct rejections, and between misses and false positives were indicative of negligible bias in the PARRCC which returned about equal proportions of positive and negative identifications of need.

Table 5. Contingency table for the Alcohol/Drug domain

PARRCC	LSI-R		Total
	Identified	Not Identified	
Identified	3,698 (60.5%)	1,202 (30.9%)	4,900
Not Identified	2,416 (39.5%)	2,692 (69.1%)	5,108
Total	6,114	3,894	10,008

CONCLUSIONS

Evolution of case management practice in NSW correctional centres has been supported by the development of new ways of assessing people's risk and needs. While the PARRCC was developed to give a more comprehensive assessment of functional needs among people in custody, it currently contributes to an understanding of and decision-making in relation to criminogenic needs in ways that are similar to and supersede previous usages of the LSI-R. The current study aimed to explore how the PARRCC assesses criminogenic needs and integrates them into assessment outcomes, using the LSI-R as a basis of comparison.

We found some indication that overall, the PARRCC tends to allocate more people to higher levels of service when compared to the LSI-R. This was observed across all sentence length stratifications except for those individuals with more than three years to EPRD. This may have implications for the profile of criminogenic needs among people who are prioritised for service; consistent with this, we found that greater proportions of individuals with no or few domains of need with 'considerable need for improvement' on the LSI-R were assessed as having Complex Needs on the PARRCC, relative to those who were assessed as having Medium or higher risk on the LSI-R.

The allocation of a larger proportion of people into higher levels of service may be attributable to various psychometric properties of the PARRCC. Overall level of service is informed by a relatively sensitive scoring system whereby severe needs on a single item can effectively result in a global determination of Complex Needs. Calculations are also dependent on the individual's time left to serve in custody; for example, overall PARRCC score is derived solely from Reintegration domain items for those within 12 months of their EPRD, and from Offence Related domain items for those with one to three years remaining to EPRD. In this regard,

[8] Accuracy is the proportion of hits and correct rejections.

the PARRCC scoring system is dynamic and can fluctuate depending on combinations of needs considered at a given time in the person's sentence, often including functional needs that are not assessed by the LSI-R. In contrast, determination of the level of service by the LSI-R is consistently based on scores derived from an aggregate of the domains of criminogenic need. Different determinations of level of service across assessments are therefore unsurprising and consistent with the intended functioning of the PARRCC. However, there remains the implication that people who receive higher levels of service may not necessarily be those who have more severe criminogenic needs or likelihood of recidivism.

Interestingly, signal detection analyses had indicated that while the PARRCC was more likely to allocate people to higher levels of overall service, it also tended to under-identify specific criminogenic needs relative to the LSI-R. There were acceptable levels of agreement across assessments for many domains of need; however, this tended to be driven by bias in PARRCC assessments towards indicating an absence of need. This meant that while the PARRCC was able to identify when a need was not present, it was often not sufficiently sensitive to identify when the need was present. Extreme examples of under-identification may be likened to a hypothetical scenario where an assessment tool is calibrated to only return negative results, with corresponding implications for discrimination power and opportunities for people to be allocated to suitable need-specific interventions.

A possible explanation of this tendency towards under-identification relates to how PARRCC items are constructed and scored to indicate the presence of needs. In many cases we were able to identify a single item on the PARRCC corresponding to a domain of need on the LSI-R (see Appendix A), which are assessed by up to 10 individual items (Andrews & Bonta, 2000). Fewer assessment items for a given factor result in fewer opportunities to identify indicators of need and may increase the likelihood of error leading to detection failures. Conversely, individual items on the PARRCC often require a relatively global clinical assessment of the presence of a need, which may be subject to higher diagnostic thresholds when compared to more discrete indicators of functioning represented in LSI-R items. It is debatable if single item measures can offer similar precision, validity and reliability to validated multiitem measures (see Diamantopoulos et al., 2012 on the strengths of using multi-item measures). We also acknowledge that the PARRCC was not developed for equivalence with the LSI-R, and our analyses were limited in that they considered only a subset of PARRCC items and domains of need and relied on post-hoc correspondences between the assessments.

To conclude, the outcomes of this study indicate that when compared to the LSI-R, the PARRCC may be systematically over-allocating inmates to higher overall levels of service while under-identifying individual criminogenic needs. This may be driven by how the PARRCC assigns weights to different domains of needs according to the individual's sentence length and how items are currently calibrated to identify severity of needs. It is important to recognise that these observations may be consistent with the design of the PARRCC as a functional needs assessment tool that was not intended to be a direct substitute for the LSI-R. Nonetheless, the results have implications for the extent and validity of information derived about criminogenic needs from current case management systems, relative to previous standards. Further research into the PARRCC and other tools would be beneficial to help integrate consideration of criminogenic needs into case management decisions in a way that optimises both efficiency and accuracy.

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APPENDIX A

Correspondence between PARRCC items and LSI-R domains

PARRCC Domain	PARRCC Question	Corresponding LSI-R Domain
Communication	1-2	N/A
Adjustment	3-5, 8	N/A
	6-7	Emotional/Personal
Responsivity	9-12	N/A
	13-14	Education/Employment
Offence Related	20-22, 24-26	N/A
	15, 17-19	Attitudes/Orientation
	16	Drug/Alcohol
	23	Leisure
Reintegration	30-31	N/A
	27-28	Family/Marital
	29	Companions
	32	Accommodation
	33	Education/Employment
	34	Financial

APPENDIX B

Contingency table for LSI-R domains

LSI-R Domain	Hits	Misses	Correct Rejections	False Alarms
Emotional/Personal	638 (6.4%)	2,988 (29.9%)	6,089 (60.8%)	293 (2.9%)
Education/Employment	1,749 (17.5%)	1,893 (18.9%)	5,035 (50.3%)	1,331 (13.3%)
Attitudes/Orientation	2,936 (29.3%)	1,606 (16.0%)	3,339 (33.4%)	2,127 (21.3%)
Alcohol/Drug	3,698 (37.0%)	2,416 (24.1%)	2,692 (26.9%)	1,202 (12.0%)
Leisure	1,858 (18.6%)	5,548 (55.4%)	2,353 (23.5%)	249 (2.5%)
Family/Marital	956 (9.6%)	1,694 (16.9%)	6,046 (60.4%)	1,312 (13.1%)
Company	494 (4.9%)	586 (5.9%)	6,712 (67.1%)	2,216 (22.1%)
Accommodation	467 (4.7%)	776 (7.8%)	7,695 (76.9%)	1,070 (10.7%)
Finance	1,556 (15.5%)	3,810 (38.1%)	4,033 (40.3%)	609 (6.1%)

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