

ATTACHMENT 6

Crown Model validation test results

Licensing's background notes re the Crown Model validation process

1. The baseline data for the Crown model was drawn from the historical gaming data of approximately 1100 patrons who self-excluded between July 2012 and December 2016 as required by recommendation 8. Crown analysed the historical gaming data of these self-excluded patrons to identify potential variables which could be used in predicting the likelihood of persons showing problem gambling behaviour. A combination of patron demographics and gambling behaviour (18 months up to the point of self-exclusion) were applied, and over 200 variables were analysed, out of which the best 50 were chosen to build the models.
2. Two dataset models were developed, one to build the Crown model (Model build dataset) and the other to validate it (Model validation dataset). Both datasets used 5000 randomly selected patrons from the Crown Rewards database (which included persons who had subsequently self-excluded as well as ongoing players), and the 1100 persons who self-excluded between July 2012 and December 2016 to validate the models. The 1100 persons were split evenly between the two datasets.
3. Licensing summarised the Crown model validation test results in the table below.

Table Games	Results for the 418 patrons that were identified for analysis from the total number of 5560 patrons in the validation set		
Model threshold ¹	60%	70%	80%
Patrons correctly predicted/identified to self exclude	219 or 52%	200 or 48%	175 or 42%
Self excluded patrons not captured by the model	199 or 48%	218 or 52%	243 or 58%
Patrons incorrectly predicted to self exclude	27 or 11%	20 or 9%	10 or 5%
Gaming Machines	Results for the 141 patrons that were identified for analysis from the total number of 5560 patrons in the validation set		
Model threshold	60%	70%	80%
Patrons correctly predicted/identified to self exclude	73 or 52%	61 or 43%	50 or 35%
Self excluded patrons not captured by the model	68 or 48%	80 or 57%	91 or 65%
Patrons incorrectly predicted to self exclude	28 or 28%	17 or 22%	7 or 12%

Source: Attachment A of Crown's 30 December 2019 submission on recommendations 7 and 8

¹ The 'Model thresholds' refer to the probability thresholds which are how accurate a model has the potential to be. Setting the 'Model thresholds' at 60%, 70% and 80% results in different outcomes in relation to correctly or incorrectly identifying those gamblers who subsequently self-excluded (were confirmed problem gamblers). The accuracy of making correct predictions decreases as the probability threshold increases.

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4. The results show that the Crown model has typically predicted around half of the sample that ultimately self-excluded, plus a few patrons who did not self-exclude. This suggests that the model is producing a list of patrons for intervention that is valid, even though it has missed others who should also be the subject of intervention.