Response to Ministry of Health Advice to Ministers on the TDB Advisory Gambling Report

A report prepared for the Gaming Machine Association of New Zealand

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1. Summary

The Ministry of Health (MoH) published a study in July 2017 on gambling harm in New Zealand. The study was commissioned by MoH from Central Queensland University and Auckland University of Technology (the CQU/AUT study). CQU/AUT found gambling-related losses of life quality in New Zealand exceed those from diabetes or arthritis. Low-risk gamblers were found to suffer the greatest overall losses.

Last year, the Gaming Machine Association of New Zealand (GMANZ) commissioned TDB Advisory Ltd (TDB) to review the CQU/AUT study. TDB considered whether the methods used by CQU and AUT are capable of informing policy, and whether the analysis is competent and reasonable. TDB's report was published in August 2019. The report concluded the CQU/AUT study is seriously flawed and unreliable.

In November 2019, MoH sent advice to ministers summarising and responding to the TDB report. The MoH advice was released under the Official Information Act.[1] GMANZ has asked TDB to review MoH's advice. TDB finds:

- MoH misrepresents the TDB report and attacks arguments TDB did not make. In effect, MoH creates a 'strawman' and then knocks it down;
- MoH does not contest TDB's criticism that the findings by CQU/AUT have been used in a misleading way; and
- MoH does not provide a convincing defence of any of the problems in CQU/AUT's analysis which exaggerate the study's estimates of gambling harms.

The conclusions of TDB's August 2019 report stand.

TDB's criticisms of the CQU/AUT study were in two parts. First, TDB took issue with the decision to present estimates of gambling harm as estimates of quality of life effects. Gambling has costs, including harms,[2] but also provides gamblers with benefits including entertainment. Gambling's overall effect on quality of life is the difference between costs and benefits. CQU/AUT recognises costs in its analysis but excludes benefits entirely. As a result, the analysis by CQU/AUT does not measure the overall quality of life effects of gambling.

The problem is CQU/AUT's findings are presented as a comprehensive analysis of wellbeing.[3] For example, MoH told ministers "a low-risk gambler has about 20% of their quality of life 'subtracted' by gambling". That statement, based on CQU/AUT's analysis of costs, is incorrect. It is also misleading. Gambling participation by non-problem gamblers is *prima facie* evidence of large gambling benefits. When benefits are important, costs are a biased and unreliable proxy for quality of life (benefits minus costs). MoH's decision to use costs as a proxy for wellbeing effects had the effect of exaggerating wellbeing losses from gambling, potentially by

[1] Released in March 2020. Available from: https://www.dropbox.com/s/3albeuzjvuku5cv/1_MoH_Advice_17_Nov_19.pdf

[2] CQU/AUT defines gambling harm so broadly that their findings are essentially costs. CQU/AUT counts less spending money for other things as a result of gambling as a harm. Throughout this report we use costs to refer to harms.

[3] Throughout this report, we use wellbeing and quality of life interchangeably.

an order of magnitude or more (see Figure 1 on page 9). In addition, MoH's approach created a strong likelihood of reporting large wellbeing losses from gambling for the large majority of gamblers (non-problem gamblers) who actually receive wellbeing gains. Gambling almost certainly *raises* the quality of life of low-risk gamblers, contrary to what MoH told ministers. MoH misled ministers by misrepresenting CQU/AUT's analysis and findings and by not warning of the limitations of one-sided analysis.

In its advice to ministers in November, MoH defends its approach as consistent with its mandate. However, TDB has not questioned MoH's right to commission research on any aspect of gambling including harms. Studies should be rigorous, balanced and suitably caveated. Findings should be accurately presented. Misinterpretations should be avoided and corrected when found. MoH has not met these basic standards. No mandate justifies misleading ministers.

MoH has also misrepresented TDB's position in its advice to ministers. Ministers are not told of TDB's concerns that MoH has made misleading statements. Without making TDB's position clear, MoH:

- does not contest that comparisons of gambling harm with the effects of diseases on quality of life is spurious;
- does not disagree CQU/AUT's findings are the product of its one-sided method, not a reflection of the wellbeing effects of gambling; and
- does not dispute it has misled ministers.

The second part of TDB's criticisms concerned details of CQU/AUT's estimate of gambling harm. TDB found many problems in CQU/AUT's analysis:

1. The use of a biased population sample.
2. The use of biased survey tools.
3. Failure to conduct sensitivity testing and standard checks for robustness.
4. Failure to verify the reliability of novel methods.
5. Selective reporting and use of findings from the academic literature.
6. Omitted variables in econometric models leading to biased results.
7. Incomplete reporting of methods and empirical findings.
8. Exclusion of data suggesting unexpectedly small harms from gambling.
9. One-sided and implausible treatment of attribution and causation.
10. Failure to adequately warn of the study's limitations.

Together, these problems have the effect of exaggerating CQU/AUT's estimates of gambling harms. Documents released under the Official Information Act show some of TDB's concerns were raised within MoH before the CQU/AUT study was published.[4]

MoH responds to only some of the problems found by TDB. Most of the responses by MoH are off-point or irrelevant. For example, TDB criticised the use of a biased population sample in Phase 4 of the CQU/AUT study. In reply, MoH says health effects must be understood by asking those affected. It is not clear what that has to do with sampling bias. Other responses by MoH follow a similar pattern, or reply to arguments TDB did not make. MoH does not provide a convincing response to any of TDB's criticisms.

The simple fact is that gambling does not reduce the quality of life of low-risk gamblers by 20%, as MoH told ministers in 2017. Declaring wellbeing losses based on an analysis of costs is like a company declaring tax losses based on expenses and ignoring revenues. As a measure of gambling harm, CQU/AUT's estimates should be considered exaggerated and unreliable. MoH has rebutted none of TDB's concerns.

TDB recommends the following next steps. First, MoH should withdraw its claims about the effects of gambling on quality of life for gamblers based on the CQU/AUT study.

Second, MoH should withdraw the CQU/AUT study. It does not reliably measure gambling harms and gives the misleading impression that its analysis measures gambling's overall quality of life impacts.

Third, MoH should incorporate benefits into its health approach on social issues to make its analysis consistent with what people experience. MoH risks further misleading ministers and the public, or supporting policies which do more harm than good, by persisting with a one-sided approach. MoH can give greater effect to its mandate by taking into account all information.

Fourth, MoH should publish the full calculations behind all future studies funded by the Problem Gambling Levy. Transparency supports rigour.

Finally, MoH should make clear to ministers and the public how the findings of one-sided estimates of the burden of harm should be interpreted:

- burden of harm studies capture only some of an activity's effects on quality of life;
- all the excluded effects on quality of life are positive;
- findings must not be interpreted as a measure of an activity's overall quality of life effects; and
- as a result, the findings are insufficient in their own right to be used as a basis for public policy.

[4] Documents released under the Official Information Act, Ministry of Health, 2017. Available from https://www.dropbox.com/s/umcuipy4fwmp90m/6_MoH_OIA_Redacted.pdf

2. TDB Advisory's criticisms of methodology and Ministry of Health's response

In July 2017, the Ministry of Health (MoH) published a study on gambling harm in New Zealand it had commissioned from Central Queensland University and Auckland University of Technology (the CQU/AUT study). CQU/AUT found:

- gambling-related losses of life quality in New Zealand exceed those from diabetes or arthritis;
- low-risk gamblers suffer the greatest overall losses;
- low-risk gambling is worse for the gambler than the untreated amputation of a leg; and
- problem gambling is worse for the gambler than terminal cancer or a severe stroke, and nearly as bad as untreated AIDS.

Last year, the Gaming Machine Association of New Zealand (GMANZ) commissioned TDB Advisory Ltd (TDB) to review the CQU/AUT study. GMANZ asked TDB to consider whether the methods used by CQU and AUT are capable of informing policy, and whether the analysis is competent and reasonable. TDB concluded the CQU/AUT study is seriously flawed and unreliable. TDB's report was published in August 2019.

In November 2019, the Mental Health and Addiction group in MoH sent advice to ministers that summarised and responded to the TDB report. That advice was released under the Official Information Act in March 2020.[5] GMANZ has asked TDB to review the MoH advice. In this section of the report, we review MoH's response to TDB's concerns around the one-sided method used by CQU/AUT. The next section of the report covers MoH's responses to TDB's technical criticisms of the analysis by CQU/AUT.

Before reviewing MoH's response, we briefly summarise the findings from TDB's August 2019 report regarding the decision to use estimates of gambling harm as measures of quality of life effects. Gambling has costs, and can lead to harms, which lower the quality of life of gamblers. Gambling also provides entertainment, mental health and other benefits which increase quality of life. In addition, gambling provides community benefits through charitable distributions, employment and public revenues.

CQU/AUT acknowledges the existence of gambling benefits but only considers gambling's costs in its analysis. Benefits are entirely excluded. Gambling's quality of life effects are measured as the difference between benefits and costs. On their own, neither costs or benefits measure changes in quality of life (unless one number is zero). Accordingly, CQU/AUT's analysis of costs cannot measure gambling's quality of life effects.

The problem is that CQU/AUT presents its analysis as if it is a comprehensive assessment of quality of life effects. For example, CQU/AUT compares its estimates of gambling harm to estimates of the burden of diseases and medical conditions (CQU/AUT study, Figure 13, p.

[5] Available from: https://www.dropbox.com/s/3albeuzjvuku5cv/1_MoH_Advice_17_Nov_19.pdf

177). These estimates are all based on the same (or a similar) one-sided method. However, the comparisons are spurious and misleading because gambling, unlike diseases, has both costs and benefits. As a result, estimates of the burden of diseases are comprehensive in the sense that a one-sided analysis of costs takes into account all the effects of diseases on quality of life. Gambling estimates, by contrast, are only partial because a one-sided analysis counts costs but excludes all gambling benefits. The benefits from gambling are as relevant to quality of life as costs. Furthermore, as we argue below, benefits may be large enough to mostly or fully offset gambling's costs. Thus, excluding benefits had a dramatic impact on CQU/AUT's findings.

The end result of comparing partial and comprehensive estimates is to create the appearance of large wellbeing losses from gambling. Figure 13 of CQU/AUT's report shows quality of life losses due to low-risk gambling (18%) are considerably greater than from an untreated amputation (13%). CQU/AUT presents these findings without two crucial caveats:

a) while the full effects of diseases are counted, gambling losses are before taking into account offsetting gambling benefits; and

b) gambling benefits may be large enough to partly or wholly offset gambling losses.[6]

Given the material effects of excluding benefits for findings, these caveats were essential. The caveats would also have made clear the meaningless nature of the comparisons. Unfortunately, CQU/AUT did not provide such statements.

MoH also treats CQU/AUT's analysis as a comprehensive estimate of quality of life effects. Shortly before the CQU/AUT study was published in 2017, MoH told ministers "a low-risk gambler typically has about 20% of their quality of life 'subtracted' by gambling" and "a problem gambler experiences about half the quality of life compared to ideal health and wellbeing" based on CQU/AUT's findings. These statements, based on CQU/AUT's partial analysis, are not correct. Without benefits, the CQU/AUT study is not capable of supporting any conclusion about changes in quality of life due to gambling.

It is important to understand how misleading harm is as a measure of quality of life when benefits are important. Participation in a voluntary activity like gambling is *prima facie* evidence of significant benefits. For many gamblers, including low-risk gamblers but not problem gamblers, gambling is likely to be a source of net benefits on average. That is, gambling is likely to provide many gamblers with benefits which are large enough to more than offset costs including harms. Net benefits arguably explain participation in gambling by most low-risk gamblers.[7]

Benefits make costs an unreliable proxy for gambling's effects on wellbeing. As Figure 1 shows, when costs and benefits of an activity are both important, costs in isolation do not

[6] For low-risk gamblers.

[7] Even if gamblers do not receive a net benefit from gambling, that is costs are greater than benefits, costs (i.e. harms) alone are an unreliable measure of wellbeing. Costs measures effects on wellbeing only when (gross) benefits are zero. As we said in our August 2019 report, even if the decision to gamble is irrational, in the sense that gamblers receive costs greater than benefits from their gambling, a one-sided analysis which excludes benefits will not measure or approximate the wellbeing effects of gambling. TDB's criticisms depend only on the existence of gambling benefits, and do not depend on any assumption of perfect rationality.

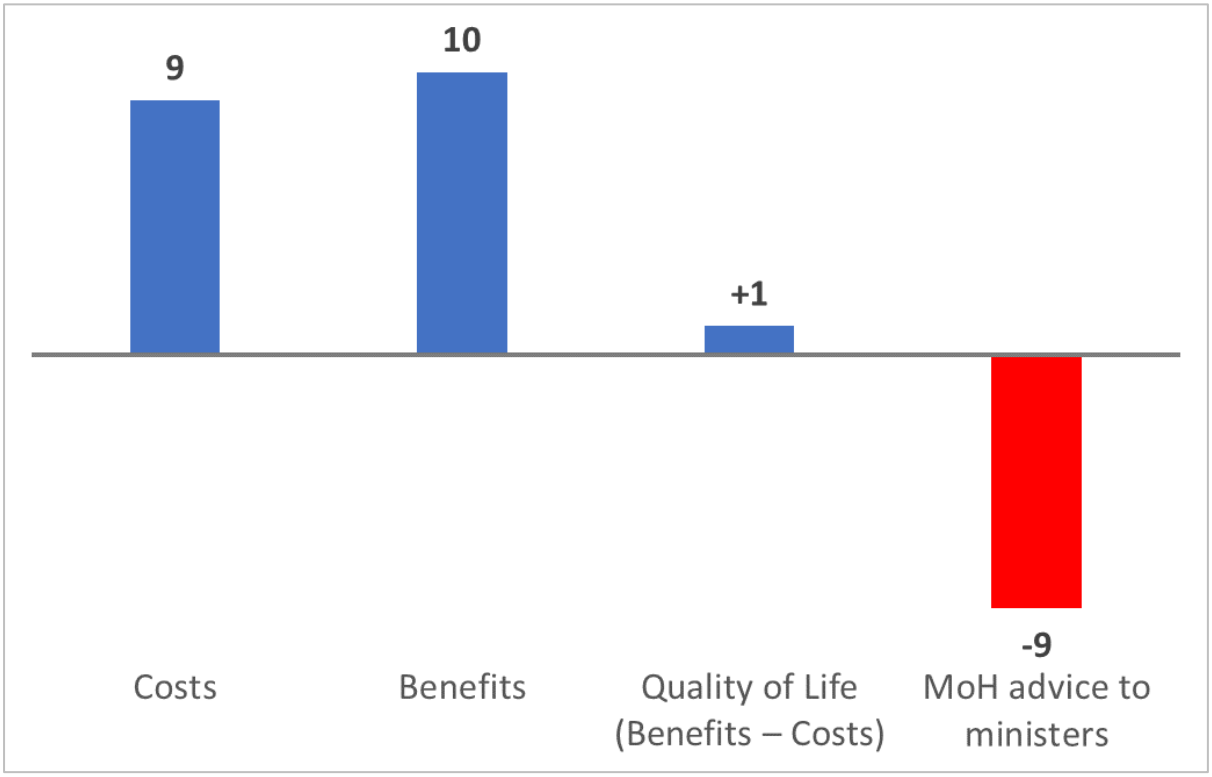
measure, even approximately, quality of life effects (benefits minus costs).[8] Using costs as a proxy for changes in wellbeing, without taking into account offsetting benefits, has the effect of exaggerating wellbeing losses, potentially by an order of magnitude or more depending on the size of benefits. Moreover, a one-sided analysis of costs is likely to report large wellbeing losses for groups who enjoy overall gains in wellbeing from gambling. MoH advised ministers low-risk gamblers suffer large quality of life losses due to gambling based costs. Yet gambling's overall quality of life effects are almost certainly positive for low-risk gamblers. Costs are an input into the calculation of quality of life effects but do not measure quality of life, a distinction both CQU/AUT and MoH have failed to make. Using one-sided estimates of harm to measure quality of life is like confusing company expenses for earnings. In accounting terms, advising ministers of wellbeing effects based on costs is like commissioning a forensic examination of a company's expenses, ignoring revenues entirely, and declaring huge losses. The problem is not the one-sided analysis but the declaration of losses.

MoH's decision to present estimates of gambling harm as effects on quality of life was misleading. This is not some philosophical point about methods or language, as MoH has claimed. MoH told ministers low-risk gamblers suffer large wellbeing losses from gambling. That advice was not correct. It was based on research that ignored an important category of gambling effects – benefits – which gamblers do, in fact, receive.[9] There is no evidence ministers were told of the material effects that excluding benefits could have on findings, or of the likelihood that a one-sided analysis could misrepresent the experience of gamblers.

[8] Costs are an unreliable measure of wellbeing wherever benefits ae greater than zero, regardless of whether benefits exceed costs or costs exceed benefits. Costs in isolation can only measure wellbeing when benefits are zero.

[9] CQU/AUT and MoH have acknowledged gambling benefits.

Figure 1: Costs do not measure or approximate quality of life effects when benefits are important[10]



TDB's concern is not the use of the one-sided epidemiological approach *per se*. Nor has TDB questioned MoH's right to commission studies on any aspect of gambling including gambling harms. The problem is that CQU/AUT and MoH have misrepresented what was measured.

In the next section, we respond to the MoH's comments on TDB's critique of the CQU/AUT's methodology and finding. For each issue, we reproduce MoH's summary of TDB's critique and MoH's response in a table and then provide our assessment of MoH's comments.

2.1 Response to MoH's comments on methodology and findings.

MoH summary of TDB Advisory critique	**MoH response[11]**
Considered costs but not benefits.	The report is not a cost/benefit study. The Ministry accepts that for some low risk behaviours, participation in gambling may have a small health benefit as presented by Korn & Schaffer. However, for other riskier gambling behaviours this benefit is substantially outweighed by the harm that accrues.

[10] The numbers in this chart are hypothetical.

[11] For this response, have combined MoH's comments from the summary and the body of its advice to ministers.

	In the report, health loss is measured in disability-adjusted life years (DALYs) that moves from a scale of 0 to 1, where the higher number represents more loss (for example a loss of 0.7 is more severe than 0.1). One DALY represents the 3 loss of one year lived in full health. Health expectancy is a generalisation of life expectancy that estimates how long a person can expect to live in good health. The scale recognises that the experience of health varies in severity, type of health event and between population groups. These factors are all acknowledged, adjusted for and discussed in the report using epidemiological concepts.

MoH presents TDB's concerns as being about one-sided analysis *per se*, a significant misrepresentation of TDB's concerns. As we have said, TDB's concern is that MoH has treated CQU/AUT's partial analysis as a comprehensive assessment of gambling's quality of life effects. MoH has not conveyed TDB's main criticism to ministers. Nor has MoH made clear that TDB has alleged MoH misled ministers.

By presenting our criticisms as directed at one-sided analysis *per se*, MoH is able to dismiss TDB's concerns as merely a difference in world views. Earlier in its advice, MoH told ministers:

> *The TDB Advisory critique is based on a standard socio-economic trade-off research within the economics discipline… The TDB Advisory critique does not recognise the different scientific disciplinary frames of reference between the economic social trade-off approach and epidemiological health burden approach.*

As we have previously said, the issue is not some philosophical point about methods. MoH made incorrect statements to ministers about large wellbeing losses suffered by low-risk gamblers. That advice was not correct. It was based on research which ignored offsetting benefits, something gamblers do, in fact, receive from their gambling. Benefits are as relevant to quality of life as costs, and are likely significant.[12] Clearly, MoH is entitled under its mandate to use a non-economic framework to assess gambling. The issue is that MoH has misled ministers about what was measured.

MoH's formal acknowledgement of some gambling benefits is significant as it confirms the CQU/AUT study as a partial measure of gambling's effects on quality of life. However, it is unclear what could justify only recognising health benefits of gambling when MoH recognises health and non-health harms, an apparent double standard. CQU/AUT recognises harms to finances, work, relationships and emotions. Only 16 of the 83 harms identified by CQU/AUT are categorised under health. The seminal paper by Korn and Shaffer (1999), cited by MoH to support health benefits from gambling, also recognises economic effects, social interaction

[12] CQU/AUT and MoH have acknowledged gambling benefits.

and “fun and excitement” as gambling benefits. Gambling can be “a healthy change and respite from the demands of everyday life or social isolation” says Korn and Shaffer. While MoH’s acknowledgement of benefits is welcome, and the reasons for only partial recognition of benefits by MoH is unclear, TDB’s view is that MoH and its consultants should be clear about what has been measured in any analysis.

The final two paragraphs of MoH’s response above are irrelevant.

MoH summary of TDB Advisory critique	**MoH response**
Biggest finding, high total cost of low risk gambling, is the most wrong.	The finding is extensively discussed in the report. The interpretation of ‘most wrong' in the critique is incorrect in research terms and overlooks the public health approach mandated in Section 317 of the Gambling Act, and good public health policy. The finding in the report simply reflects the underlying aggregate statistical results, namely that a larger number of people being affected by a lower level of harm contributes more in accumulated harm than a small number of people who are severely affected in epidemiology and public health this dynamic is well understood. This finding has been replicated in Australia and Finland using the same methodology, as well as alternative methodologies as reported in peer-reviewed research articles. In gambling harm reduction, an important policy discussion is whether to focus solely upon the very small number of gamblers with very risky behaviour and associated levels of harm, or whether to include actions that include the larger number of people who have lower levels of risk and harm. Inherent in the critique is an argument that harm prevention should only focus on the most harmed. In public health terms this narrow view is not supported by the Ministry in terms of good harm prevention, nor does it reflect the approach set out in Section 317 of the Gambling Act, which refers to a public health approach.

MoH misrepresents TDB’s concerns by failing to mention why TDB expressed doubts about the main finding of the CQU/AUT study regarding the losses borne by low-risk gamblers. Compared with high-risk gamblers, low-risk gamblers likely receive benefits which are large relative to costs. A comprehensive analysis which equally recognises costs and benefits of

gambling would likely find low-risk gamblers enjoy wellbeing gains from gambling, reversing the main finding of the CQU/AUT study. As TDB said:[13]

> *CQU/AUT's conclusion that aggregate harm is greatest among low-risk gamblers is almost certainly the product of its one-sided method… It is not clear [this finding] would survive the introduction of benefits into the analysis.*

Disappointingly, MoH does not give ministers any indication that this is TDB's position. Having misrepresented TDB's concerns, much of what MoH says has no bearing on our concerns. We offer only brief comments on MoH's response:

- TDB has not alleged MoH has breached its mandate under the Gambling Act. MoH was within its authority to commission a study of gambling harms. However, MoH's mandate does not entitle MoH to commission research and give advice to ministers while being unclear about how gambling benefits have been treated and the consequences for findings.

- TDB covered the provisions of the Gambling Act in its August report. This coverage should have made clear to MoH that TDB had not "overlook[ed] the public health approach mandated in Section 317 of the Gambling Act".

- We see no provision in the Gambling Act that prevents MoH from taking gambling benefits into account. MoH's harm-reduction strategy could be improved by recognising all of gambling's effects. Harms almost certainly affect gamblers who receive an overall benefit from their gambling.

- The fact that similar studies elsewhere have reached similar conclusions tends to support TDB's concern that CQU/AUT's findings are mainly the product of not counting the benefits gamblers receive from gambling.

- MoH's statement to ministers, "Inherent in the critique [by TDB] is an argument that harm prevention should only focus on the most harmed," is incorrect.

The second, fourth and fifth paragraphs of MoH's response above are not relevant to TDB's criticisms.

The end result of MoH's decision to present a version of TDB's position that bears little relation to our stated position is that MoH has not disputed our concerns.

[13] TDB August report, p. 21.

3. TDB Advisory's technical critique and Ministry of Health's response

In August 2019, TDB reported a series of problems in the empirical analysis by CQU/AUT. Together, these problems exaggerate CQU/AUT's estimates of gambling harm. MoH responds to only some of the problems found by TDB.

In the discussion below, for each technical critique raised by MoH, we reproduce MoH's summary of TDB's critique and MoH's response in a table and then provide our assessment of MoH's comments.

MoH summary of TDB Advisory critique	**MoH response**
Used a biased population sample.	The report (sic) approach is the correct approach as the method requires understanding the experience of health from the most impacted — the gambler and affected others. This approach provides an appropriate method for checking bias and validation of the estimates of health loss, which is consistent with internationally recognised best practice epidemiological research.

To restate our concerns about sampling bias, Phase 4 of the CQU/AUT study aimed to quantify the effect of harms on life quality. About two-thirds of the Phase 4 sample had a connection to gambling harm: participants were either gamblers or treatment professionals. By comparison, 7% of the adult population in New Zealand experiences own-gambling harm, 14% is affected by the gambling of others, according to CQU/AUT, and MoH data suggests about 0.3% of New Zealand adults have at least one gambling-related intervention each year. TDB's concern is that the substantial over-representation of people connected to gambling harm in the Phase 4 sample could result in bias estimates of gambling's effects relative to other diseases. CQU/AUT reports doing no checks for bias.

MoH offers no response to these concerns. The first sentence in MoH's response quoted above seems irrelevant. The second sentence simply asserts the method is appropriate.

MoH summary of TDB Advisory critique	MoH response
One-sided treatment of attribution of gambling harm to other comorbidities. One-sided treatment of causation.	The report does not make any claims to causation or attribution. The field of gambling research is relatively new. The Ministry accepts that the research is unclear about direct causal relationships between health comorbidities. It is worth noting that for decades, both tobacco and alcohol health research were subject to similar ambiguities regarding establishing direct causality. However, at this point the research is clear that the relationships exist between gambling and is strong for several other mental health and addiction issues as referenced in the critique. Furthermore, the Ministry's view is that since the report cited was published, the evidence has grown stronger. The report approach relies on the harms reported by gamblers and affected others, and a combined community and expert evaluation of the impact of those harms on health and wellbeing. The Ministry accepts that the subjective experience of health and wellbeing is complex, but also that gambling behaviour is integral to that experience, and is both a trigger and a response to other events happening in their lives. This reinforces the value and merit of the Ministry's approach to gambling harm minimisation which is to treat the whole person in their context.

To repeat our concerns about treatment of attribution and causation, gambling does not occur in isolation but in association with other behaviours and disorders, called comorbidities. Gambling and its comorbidities lead to harms. The problem is how to separate the harms that are attributable to and caused by gambling from other harms.

The problem is difficult and calls for a conservative approach. Gambling has a long list of comorbidities, as CQU/AUT acknowledges, so failing to adjust for attribution risks exaggerating gambling harms. According to CQU/AUT, comorbidities include: social impairment, age-related health impairments, physical health, mental health including depression, psychological disorders, suicide and suicidal ideation, and anxiety, tobacco use, cannabis use, sedentary behaviour, employment, income, family, neighbourhood, social cohesion, financial problems, and other addictions.

CQU/AUT also acknowledges causation issues, noting that the relationship between gambling and harm is probably not uni-directional (p.44). Gambling can cause harm, but harm can also cause gambling because for some people gambling is a coping mechanism.

Given CQU/AUT acknowledges attribution and causation issues, we should expect to see controls for attribution and causation in the analysis, where possible, and *ex post* adjustments to results to correct for, or protect against, the risk of excessive attribution and correct for reverse causation. These adjustments are normal and consistent with a conservative approach in analysis.

TDB found no controls or adjustments for attribution or causation in CQU/AUT's analysis. Without controls or adjustments, calculations default to the strongest possible association between gambling and harm. For example:

- with no adjustment for attribution, all of the harms suffered by a person who is depressed, sedentary, unemployed and who gambles are attributed to gambling, none to those other factors; and
- with no adjustment for causation, gambling harms reported by CQU/AUT combines both the harm caused by gambling and the gambling caused by a person trying to cope with harms.

QU/AUT expressly acknowledges the lack of adjustment for attribution to comorbidities and exaggerating effect this will have on findings (p.180):

> *The present study… makes not [sic] adjustment for comorbidities due to the difficulty of implementing such an adjustment for gambling-related harm… estimates will be somewhat inflated*

In our August 2019 report, TDB concluded CQU/AUT's failure to make any adjustment for attribution or causation was neither reasonable nor prudent.

In its response, MoH points to the protections against the causation and attribution problems offered by CQU/AUT's use of evidence directly reported by gamblers and affected others. TDB acknowledged that protection in our August 2019 report and our criticisms took the effects of direct reporting into account. As we said, direct reporting could not be expected to completely solve the problem.

MoH's statement to ministers that "The [CQU/AUT] report does not make any claims to causation or attribution" is not correct. For example, CQU/AUT says (p.199):

> *"There was an estimated 161,928 years of healthy life lost (QALY1)* ***due to*** *harms from gambling in 2012. Subjectively, this can be interpreted as a total of 1,374 that were perceived as barely worth living* ***due to*** *the experience of gambling problems." [****our emphasis****]*

The rest of MoH's response is mostly irrelevant. MoH says there are links between gambling and mental health and addiction, a redundant point that is not in dispute. MoH's reference to tobacco and alcohol is gratuitous. TDB's criticisms of the technical treatment of causation and attribution by CQU/AUT do not parallel arguments over the link between smoking and health. TDB has not questioned whether gambling leads to harms, as MoH's reference to tobacco

implies. As we said in August 2019 (p. 11): “We do not doubt that gambling is associated with or causes harm.”

MoH summary of TDB Advisory critique	**MoH response**
Failed to conduct sensitivity testing and standard checks for robustness.	The critique uses standard economic methods language, which is appropriate for economics, however epidemiological research has the same concepts but a different language. The report did conduct statistical tests, appropriate for epidemiological research, which are fully reported in the research results. The report shows confidence intervals for their DALY estimates, and gives separate estimates for community and expert ratings, thus illustrating uncertainty associated with different groups.

MoH’s response is entirely off-point. The concerns raised by TDB are not about language. TDB has not alleged no statistical tests occurred, as the response by MoH implies. TDB’s concern is with CQU/AUT’s sporadic use of checks and reporting. The results of the CQU/AUT study are the product of a long sequence of calculations over many steps. Undetected errors at any part of this chain of calculations could compromise the final result. Inconsistent checks and reporting are therefore a problem. It is not clear what confidence one can have in CQU/AUT’s empirical results given only limited reporting and checks.

MoH summary of TDB Advisory critique	**MoH response**
Failed to verify the reliability of novel methods.	The report [sic] methods are not novel in the context of the WHO global burden of disease research. The report is novel only in the context of gambling research. In this context the report is world leading, and helps illustrate the Ministry's leadership, capability and capacity in commissioning gambling research of international standard to inform NZ policy and operational decision-making. The research is internationally recognised in the gambling research area. The Ministry does not rely solely upon the report to inform its thinking about gambling harm minimisation policy and operational decision-making. However, as noted, the core results of the

	report are consistent with subsequent international findings.

Only the first two quoted sentences of MoH's response quoted above are relevant, the rest is off-point. CQU/AUT lists novel methods at page 161 of its report, apparently contradicting the first sentence of MoH's response. In any case, regardless of whether the method is novel or its application to gambling is novel, TDB's critique stands: CQU/AUT reports doing no checks to confirm the novel aspects of its analysis, reducing confidence in the robustness of CQU/AUT's findings.

MoH helps make our case by insisting the application to gambling was novel. As we showed earlier in this report, the application of a one-sided method to two-sided gambling is what led to exaggerated estimates of wellbeing losses. The failure to check this novel aspect of the report has led to incorrect and misleading findings. As we have said, when used as a proxy for wellbeing one-sided analysis is vulnerable to confounding by benefits. One might therefore have expected checks for the presence of gambling benefits. There is no evidence these checks occurred, or that CQU/AUT or MoH was even aware of the risk of confounding posed by benefits.

MoH's statements quoted above suggest complacency and a rather cavalier attitude to risk. There is no indication that MoH made any attempt to recognise and manage risks around the novel use of methods. This failure has led to misleading and incorrect statements to ministers.

MoH summary of TDB Advisory critique	**MoH response**
Selective use of data to significantly over estimate the prevalence of risky gambling behaviour in the population	The report [sic] authors used the most recent and most reliable estimates of the prevalence of gambling harm in the population available to them at the time, which were the 2012 NGS results. These results were generated from a much larger population sample than the HLS. Subsequent to the report, the Ministry in 2017/18 commissioned a meta-analysis that examined the various results from the HLS and NGS surveys to compare the differences and produce more reliable estimates. The results of the report showed that the HLS and the NGS were in fact producing similar estimates and collectively the result was consistent with that used in the report at the time. The results of an earlier HPA meta-analysis of HLS results at the same time period and the Health Survey have been published. The earlier meta-analysis indicated that the HLS and NGS results were comparable, however the Health Survey results were different. On reviewing the results, and in discussion (sic) the Health Survey team, the Ministry has concluded that the

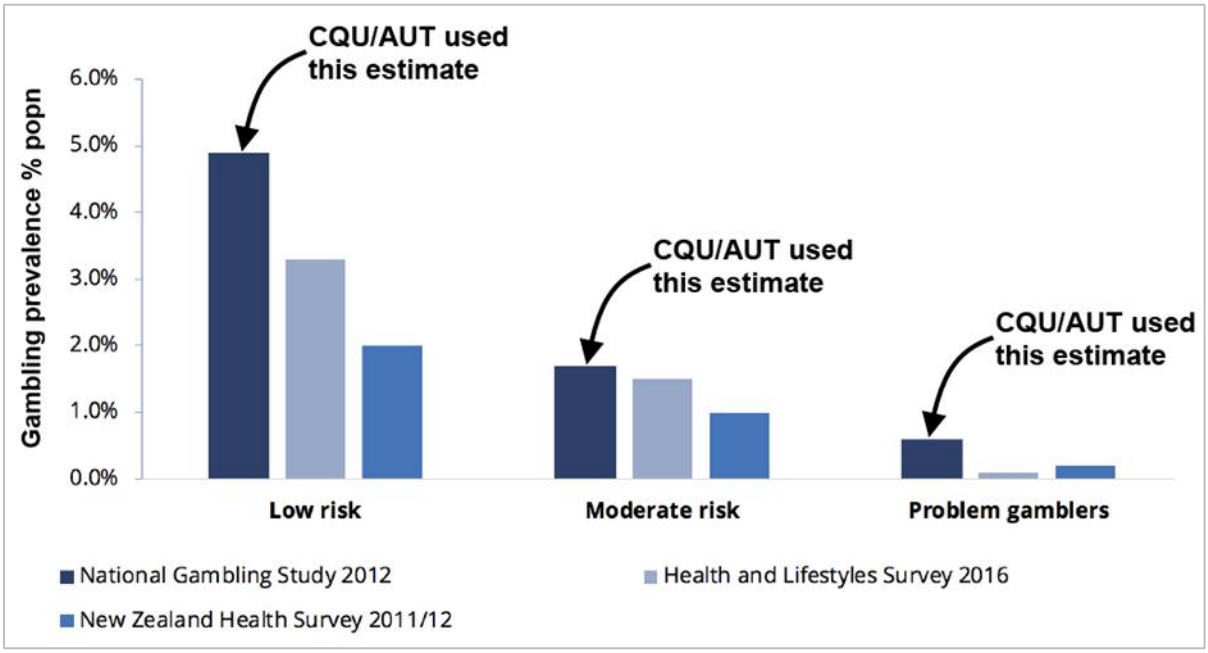
	NGS and HLS results used in the report are the most robust.

In order to estimate aggregate harm from gambling, CQU/AUT needed an estimate of the prevalence of gambling in the New Zealand population. Aggregate harm is calculated by multiplying CQU/AUT's per-person estimate of gambling harm by gambling prevalence. As a result, higher estimates of gambling prevalence translate directly to greater estimated gambling harm. Our report identified three survey estimates of gambling prevalence in New Zealand:

- National Gambling Study (NGS) Wave 1, 2012, used by CQU/AUT;
- Health and Lifestyles Survey (HLS), 2016; and
- New Zealand Health Survey (NZHS), 2011/12.

TDB showed that the survey selected by CQU/AUT, the NGS, reported the highest estimates of gambling prevalence (Figure 2). The NGS estimates the prevalence of high-risk gamblers in the population as six times greater than the HLS. TDB estimated that by using the higher estimates of prevalence in the NGS, CQU/AUT's estimates of gambling harm were 55% or 123% higher than if the prevalence estimates in the HLS or NZHS had been used, respectively.

Figure 2: Comparison of estimates of gambling prevalence



Source: TDB (2019).

The second paragraph of MoH's advice to ministers is irrelevant. MoH tells ministers "HLS and the NGS were in fact producing similar estimates," a conclusion that referred to a collection of statistics. Gambling prevalence is the only relevant statistic to the TDB concerns. As Figure 2 makes clear, HLS and NGS were not producing similar estimates of prevalence.

Another study commissioned by MoH, which MoH does not refer to in its advice to ministers in November, is Uniservices (2015). According to Uniservices, the low response rate of the NGS, and the fact that the NGS presented to participants as a gambling study rather than health study, "may have resulted in more interest in the National Gambling Study by people who are involved in gambling and therefore a higher rate of participation amongst this target population".[14] In other words, the high prevalence reported by the NGS compared to the HLS and NZHS could be the result of bias from self-selection.

To restate our main concern, CQU/AUT used relatively high estimates of gambling prevalence without providing any objective reason for doing so. The decision to use NGS prevalence rates over alternatives significantly increased CQU/AUT's gambling harm estimates. MoH defends the decision to use the NGS based on its greater sample (6,251 vs 3,854 for HLS). However, MoH does not respond to the problems found by Uniservices (2015) which TDB quoted in its August 2019 report. It seems unlikely that the problems found by Uniservices, which suggest the high prevalence rates in the NGS may be the result of bias, are more than compensated for by the statistical benefit of a larger sample. In any case, no objective and convincing reason for CQU/AUT's decision to choose the NGS over alternatives, or a weighted average of alternatives, has been provided.

MoH summary of TDB Advisory critique	**MoH response**
Omitted variables in econometric models leading to biased results.	The report is not an econometric analysis. This critique involves a misapplication of econometric ideas to a health research, and misunderstanding of direct elicitation statistical methods.

MoH's response is unrelated to TDB's criticism. Regardless of whether the study by CQU/AUT is an "econometric analysis", CQU/AUT uses a cornerstone tool of econometrics called regression or "least squares estimation". The regression technique is subject to known statistical biases, one being due to the omission of significant explanatory variables. In essence, the link between harms and gambling could have been exaggerated by CQU/AUT's failure to include controls for gambling comorbidities in its Phase 4 regressions. Nothing in MoH's response addresses that point.

[14] Uniservices (2015), "Gambling and Problem Gambling: Results of the 2011/12 New Zealand Health Survey," report for the Ministry of Health, July, p.110.

MoH summary of TDB Advisory critique	MoH response
Incomplete reporting of methods and empirical findings.	The report is not an econometric analysis. The report is an academic level research report, and as such correctly assumes the reader has some fundamental knowledge of the scientific discipline and associated methods used, reported and discussed in the report. The critique that the report does not include the 'standard diagnostics' is incorrect, they are in the report using standard epidemiological terms - not econometric ones — which are well recognised by the reader with a fundamental understanding of epidemiological research methods. The same applies to the critique that it is not clear how the metric of 1,374 lives (sic) calculated: the informed reader with a sound epidemiological research background automatically knows the principles of how the number was calculated — i.e. simple summation of DALYs over the population and as such it does not need an explanation. The Ministry acknowledges that if a summary report was published for the general reader, then it might be useful to explain how the number was calculated.

Consider the following example of incomplete reporting by CQU/AUT. At page 181 of its report, CQU/AUT mentions a data matching problem when calculating DALYs.[15] CQU/AUT said:

> *An extensive search was conducted to source matching prevalence figures for the health states of interest to compare against gambling-related harms. This exercise proved challenging… As a result, some health states of interest (such as cardiovascular diseases) were excluded from the analysis due to the inability to source matching prevalence figures. In other cases, reasonable approximations were assumed, and this is noted where appropriate.*

CQU/AUT's use of the term "challenging" hints at real problems. From this brief description, we cannot rule out the possibility that CQU/AUT's findings have been compromised by an undisclosed decision to combine data that is strongly incompatible.[16] Data limitations mean most analyses require decisions that are specific to that piece of work. An awareness of epidemiological methods, while helpful, cannot fully solve the problem. Transparency depends on full disclosure. CQU/AUT has almost certainly made many undisclosed decisions during its

[15] Disability Adjusted Life Years.
[16] MoH declined our request under the Official Information Act for access to CQU/AUT's calculations.

analysis, with material consequences on findings. Given the extent of other problems in CQU/AUT's analysis, full disclosure is appropriate.

4.Context for commissioning the CQU/AUT study

MoH's misleading statements to ministers might be understandable had MoH not been warned about the limitations of one-sided analysis five years before it commissioned the CQU/AUT study.

In 2009, MoH published a one-sided analysis of the costs of alcohol and drug use it had commissioned from economic consultants BERL.[17] BERL calculated annual social costs of alcohol and drug use of $6.9 billion. BERL's analysis was the subject of an unpaid review co-authored by the lead author of this report. Burgess and Crampton (2009) warned that a one-sided analysis of costs that does not measure wellbeing effects, should not be used to guide policy unless combined with a comparable analysis of benefits, and should include clear caveats to avoid misleading policy makers.[18] Documents released under the Official Information Act at the time showed MoH was aware of the Burgess and Crampton review.

Based on this experience, MoH could reasonably anticipate similar criticisms of the analysis it commissioned from CQU/AUT in 2014. Specifically, MoH could have expected:

- estimates of gambling harm by CQU/AUT, isolated from all offsetting benefits in a one-sided analysis, would be substantial;
- to most readers, the findings would appear nearly indistinguishable from the results of a full cost-benefit analysis;
- without prompting, policy makers including ministers, local politicians and officials, and the general public, would almost universally misinterpret estimates of harm as measures of wellbeing effects. This interpretation would persist even if it was made clear the analysis only considered harms; and
- this misinterpretation and the substantial size of the estimates would make the CQU/AUT study a powerful call for further action by policy makers.

Based in part on the findings of the CQU/AUT study, MoH signalled a potential shift in its focus towards lower-risk mass market gambling products such as Lotto and Instant Kiwi.[19]

Given prior experience with the BERL study in 2009, and the end result of the CQU/AUT study was misleading statements made to ministers by MoH, it is worth considering what were MoH's intensions when it commissioned the CQU/AUT study. Since it was published in 2017,

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[17] BERL (2009), "Costs Of Harmful Alcohol And Other Drug Use," Final Report (March). Study commissioned by the Ministry of Health and the Accident Compensation Corporation. Available from https://www.dropbox.com/s/4rje8ieqh34lmhy/BERL_%282009%29_Costs_of_Harmful_Alcohol_and_Other_Drug_Use.pdf

[18] Burgess, Matt and Eric Crampton (2009), "The Price of Everything, The Value of Nothing: A (Truly) External Review Of BERL's Study Of Harmful Alcohol and Drug Use," University of Canterbury working paper 10/2009, 16 June, p. 39. Available from: https://ir.canterbury.ac.nz/handle/10092/2599

[19] Ministry of Health (2017), "Publication: Measuring the Burden of Gambling Harm in New Zealand," ministerial advice, p. 2. Available from https://www.dropbox.com/s/d1le36wd3p8gxsu/5_Min_advice_June_2017.pdf

the CQU/AUT study has been used to support policy changes and cited in a number of submissions to council policy processes. These uses of the CQU/AUT study are based on a misunderstanding of what CQU/AUT measured. To the best of our knowledge, the CQU/AUT study has not been used in a way that is consistent with the limitations of its one-sided analysis. Nor has the CQU/AUT study been paired with a comparable study of gambling benefits, making it a comprehensive basis for policy. Nor has MoH taken any action, as far as we are aware, to correct clear misinterpretations of the CQU/AUT study.

Did the Ministry of Health intend to misrepresent a partial analysis of gambling's quality of life effects as comprehensive, after being made aware of the misleading nature of that approach and knowing this would give the appearance of large wellbeing losses, when it commissioned the CQU/AUT study in 2014?

5.Conclusions and recommendations

Gambling does not reduce the quality of life of low-risk gamblers by 20%, as MoH told ministers in 2017. That statement was based on a one-sided analysis which could not support that conclusion. Without benefits, costs are an unreliable proxy for wellbeing and are likely to create a misleading impression of wellbeing losses. MoH was warned about the misleading nature of its approach before it commissioned the CQU/AUT study. As a measure of gambling harm, CQU/AUT's estimates are exaggerated by problems in their analysis. MoH has not been able to counter TDB's concerns.

TDB recommends the following next steps. First, MoH should acknowledge it misled ministers in 2017 about the effects of gambling on gamblers' quality of life based on the CQU/AUT study. MoH should formally withdraw those claims.

Second, MoH should withdraw the CQU/AUT study. It does not reliably measure gambling harms and invites misinterpretation that it measures the quality of life effects of gambling.

Third, MoH should incorporate benefits into its health approach on social issues and into its policy advice. MoH risks further misleading ministers and the public by continuing to ignore the benefits of gambling for low-risk gamblers. It is almost inconceivable that MoH's harm-reduction strategy would not be improved by an awareness of gambling's benefits.

Fourth, MoH should publish the full calculations behind all future studies funded by the Problem Gambling Levy. Transparency supports rigour.

Finally, MoH should make clear to ministers and the public how the findings of one-sided burden of harm should be interpreted:

- burden of harm studies capture only some of an activity's effects on quality of life;
- all the excluded effects on quality of life are positive;
- the findings do not measure an activity's overall quality of life effects; and
- as a result, they are insufficient in their own right to be used as a basis for public policy.