



# **Auckland Regional Exit Breath Survey 2005**

**Centre for Social and Health Outcomes  
Research and Evaluation**  
Te Runanga, Wananga, Hauora me te Paekaka

**&  
Te Ropu Whariki**

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## SUMMARY

The Auckland Regional Exit Breath Survey investigated breath alcohol levels of people under the age of 25 years exiting On Licence premises (nightclubs, taverns and rural hotels) in the Auckland Region. The selected premise types included those premises commonly referred to as bars and pubs. Data collection took place over four successive weekends in 2004. Two hundred and fifty On Licence premises were randomly selected to be visited.

### Breath test readings (BTR)

- § Nearly half of the breath test readings (BTR) for those aged under 25 years in the Auckland region (42%) were over the legal limit for driving (for people aged 20 years and over; 400mcg/l).
- § Fourteen percent of the BTR were 600 mcg/l or above. Of these, 12% were between 601mcg/l and 800mcg/l. This is the equivalent to more than 6 drinks for an average man and more than 4 drinks for an average woman.<sup>1</sup>
- § Two percent of the BTR taken were over 800mcg/l, this is the equivalent of more than 8 drinks for an average man and more than 5 drinks for an average woman.
- § The average BTR for men for the Auckland region was significantly higher than the average BTR for women (these averages include BTR readings of zero).

### Levels of intoxication

- § Over 40% of participants reported that they were moderately intoxicated and approximately 8% reported that they were extremely intoxicated.
- § Approximately 34% of participants were rated by data collection field workers to be moderately intoxicated; approximately 8% of participants were rated as extremely intoxicated.

### Premises with patrons showing signs of intoxication

- § Fifty percent of premises visited in the Auckland region had at least one patron who showed visible signs of intoxication.

### Other key results

- § The average number of drinks that participants had consumed at the premise they were leaving was 4. The total average that participants reported consuming over the night was around 9.
- § Thirty seven percent of participants reported that they would usually drink more alcohol than they had consumed at the time of data collection.
- § Half of the participants who had a BTR of over 400mcg/l were moving on to another licensed premise, 13% of people with a BTR of over 600mcg/l reported they were going to do the same.
- § Average BTR significantly increased over the night.

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<sup>1</sup> This calculation is an estimate based on the average weight of a man and woman in New Zealand (Male 80.4; Female 69.7) (Ministry of Health, 1999) and does not take into account actual body weight of participants. A drink is 15mls of absolute alcohol.

## Introduction

The Auckland Regional Exit Breath Survey investigated breath alcohol levels of people under the age of 25 years exiting On Licence premises (nightclubs, taverns and rural hotels) in the Auckland Region. The selected premise types included those premises commonly referred to as bars and pubs. Data collection took place over four successive weekends in 2004. Two hundred and fifty On Licence premises were randomly selected to be visited.

International evidence has linked licensed premises to intoxication, drink driving and problem behaviours such as violence and aggression (Babor et al., 2003). Similar relationships have been identified in New Zealand. One study found that 17 percent of assaults in or around hotels resulting in hospitalisation involved people under 20, illustrating a link between harm and licensed premises (and young people) (Langley et al., 1996). The Auckland Region Last Drink Survey Annual Report 2002 stated that 16% of alleged offenders who reported consuming their last drink at a licensed premise were assessed as having an intoxication level of extreme, 8 or higher (on a scale of 1 to 10). Previously unpublished results from the National New Zealand Alcohol Survey 2000 (Habgood et al., 2001) showed that those under 25 years of age consume heavier quantities of alcohol in some On licence premises e.g. greater than 6 drinks on a typical drinking occasion.

Exit breath surveys similar to this survey have been conducted internationally (Lang et al 1998, Krass et al 1994, Rydon et al 1993, Stockwell et al 1992).

There are several offences under the Sale of Liquor Act 1989 (SOLA) regarding intoxicated patrons in New Zealand, these include; selling alcohol to patrons who are already intoxicated, allowing patrons to become intoxicated in a licensed premise and allowing an intoxicated patron to be or remain in a licensed premise.

An exit breath survey will provide data for the Auckland region on the present level of compliance with the Sale of Liquor Act and will assist in assessing the effectiveness of host responsibility compliance efforts across the region.

## **Methodology**

The methodology used for the Auckland Regional Exit Breath Survey was based on similar surveys that have been conducted internationally (Stockwell et al., 1992, Krass and Flaherty, 1994, Lang et al., 1998).

### **Sample**

A list of On Licence premises in the Auckland region was obtained from the Liquor Licensing Authority (LLA). From this list the total population of taverns, nightclubs and rural hotels was identified. The selected premise types included those premises commonly referred to as bars and pubs. Hotels were limited to those in the Rodney and Franklin Districts as those in City areas were assumed to be establishments where the principal purpose was to provide accommodation. Papakura District is also a rural area however there were no hotel licences on the LLA list for Papakura.

A second list of premises known to be frequented by people under the age of 25 years was identified by Liquor Licensing Police and District Licensing Inspectors (DLI). The premises that were identified by the licensing staff were removed from the LLA list of taverns, nightclubs and rural hotels. This gave two independent lists.

A representative sample of 250 premises, half from each of the LLA list and half from the Police/DLI lists was selected from the 490 eligible taverns, night clubs and rural hotels<sup>2</sup>. Premises located on islands were excluded from the sample due to their inaccessibility.

At the time of data collection, some premises were found to be closed, ineligible due to the demographic profile of patrons (did not have people aged under 25 inside them) or could not be sampled for other reasons such as the safety of field workers. This reduced the number of premises in the original sample that breath test readings could be obtained from. Therefore a secondary sample of 69 premises was randomly taken from the 250 bars originally selected. The secondary sample was taken for all areas except for Papakura as the quota of breath test readings for this area had been obtained.

### **Data Collection Teams**

Each data collection team consisted of 1) a male field worker who took the breath sample, 2) a female field worker who approached those exiting the premise and conducted a short interview, and 3) a supervisor who maintained the safety of the field workers at all times (following the safety protocol developed for the survey that was based on NDARC interviewer guidelines (Day et al., 2002) and further developed by consultation with two Health Protection Officers in New Zealand).

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<sup>2</sup> The Massey University Ethics Committee provided ethics approval for the Auckland Regional Exit Breath Survey in 2004. The ethical requirements for the survey state that reporting of aggregate data is permitted. No individual premise will be identified publicly or to Police and/or other relevant stakeholders.

## **Data Collection**

Data collection took place over four successive weekends (Friday and Saturday nights) typically between 10pm and 4am. These hours had been identified from police data as times where young people were likely to be apprehended after consuming alcohol (Greenaway et al., 2002). This meant that some premises were visited later in the evening than others.

Teams stood outside the selected premise and approached the first person or group who exited who appeared to be under the age of 25. Participants were eligible to participate if they were under the age of 25 and had consumed an alcoholic or non-alcoholic drink inside the selected premise. Where a group exited a premise the person with the closest birthday to the current days date was selected. A male and a female BTR were obtained from each premise where possible.

Participants were invited to have a free breath test and to participate in a short interview about alcohol. Participants were provided with their own water bottle and asked to rinse their mouth, gargle and spit twice prior to giving the breath sample to remove any residual alcohol in the mouth.

Once the process was completed the team approached the next person or group to exit the premise.

## **Breath Sample**

The Alcolizer HH1 was used to take breath samples following the recommendation of ESR. All breathalysers were calibrated by the manufacturer before data collection commenced. Recalibration during data collection was not required as the breathalysers required re-calibration after 6 months or 300 breath tests. The accuracy of this breathalyser model was better than 5% at 400 micrograms of alcohol per litre of breath.

The standard warning for the model is that alcohol should not be consumed for ten minutes prior to taking the breath sample. The manufacturer advised that this was to allow time for residual breath alcohol in the mouth to dissolve. The manufacturer advised that the same effect would occur if a person rinsed their mouth with water prior to taking the breath sample. Participants were therefore provided with their own water bottle and asked to rinse their mouth, gargle and spit twice prior to giving the breath sample. This would eliminate the possibility of a higher reading due to residual breath alcohol.

The breathalyser provided a reading in micrograms of alcohol per litre of breath (mcg/l). The participant was told their approximate BTR; they were given a range which was 50mcg/l either side of their actual reading. Prior to the administration of the breath test participants were told that the breath sample they gave was not a legal breath test for driving and that it was only an indication of what it might be if the participant was stopped and breath tested by the police. Participants were also told that even if the reading was under the legal limit, they may still be over the legal limit, and that the breath sample was for that moment in time and should not be used as a future indicator for whether or not they are over the legal limit. Finally participants

were told that at any level of alcohol consumption it may not be safe for them to drive.

### **Exclusion of participants who were too intoxicated to give consent**

If a person was selected to participate and was rated by the male field worker who collected the breath sample as being too intoxicated to *give consent* then they were not asked to participate. These people were only asked if they were under 25 and if they had had a drink inside the premise and were then thanked for their time. Nine potential participants who exited the selected premises, were under the age of 25 and had had a drink in the premise were assessed as being too intoxicated to give informed consent. These people were not asked to participate.

### **Interview**

The topics covered in the interview were derived from Rydon et al. (1993). Liquor Licensing Police and Council District Licensing Inspectors throughout the Auckland Region and the Regional Alcohol Project contributed to the development of the interview. This process of consultation enabled the modification of the interview to the New Zealand context and more specifically to the Auckland Regional environment. Questions resulting from this process were primarily about host responsibility including whether participants had eaten at the premise. Participants were asked to rate their own level of intoxication on a four point scale; Extremely, Moderately, Slightly, Not at all intoxicated. This was the scale used by Rydon et al. (1994) and developed by Teplin and Lutz (1985).

### **Ratings of Intoxication**

The rating was a four point scale (as above); Extremely, Moderately, Slightly, Not at all intoxicated. The field worker who conducted the interview made the observational rating and were extensively trained and instructed how to rate each participant on a four point scale.

### **Analysis**

The survey was a complex design that allowed for obtaining sufficient numbers of premises in each city and district, especially the smaller areas. This meant that there were different probabilities of premise selection by area strata and that some area strata had a high proportion of coverage. An added complexity was the repeated measures taken at each On Licence (where possible), one by a male and one by a female. The survey analysis software package, SUDAAN, was used to calculate survey estimates.

To determine differences in average breath test readings (BTR); significance testing was undertaken using two tailed t-tests. Significant differences are reported when they are statistically significant at the 0.05 level.

## **Results**

### **Coverage of the selected On Licences**

Of the 250 premises selected, 111 were open and were eligible; that is, had people aged under 25 years of age exiting the premise.

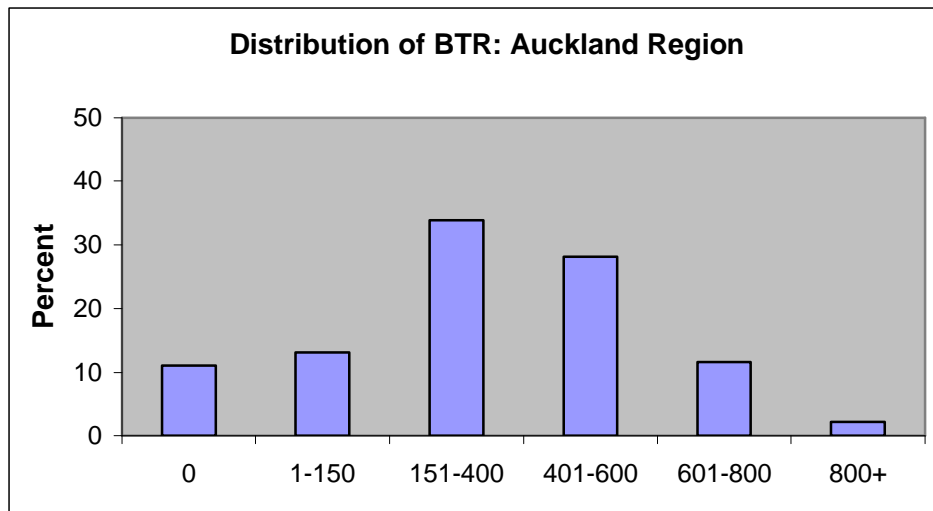
Of the 319 visits to premises, 171 (54%) were eligible visits where patrons who were under the age of 25 were seen inside or exiting the premise. Of the 171 eligible visits, 64% returned valid breath test readings.

### **Response Rate**

The main focus of this project was the breath sample given by eligible patrons exiting chosen premises. The response rate gives a measure of the number of people that gave a breath test reading from patrons selected to participate. Three hundred and fifty BTR were obtained from 403 eligible potential participants. This gives a response rate of 87%.

## BREATH TEST READINGS (BTR)

Figure 1

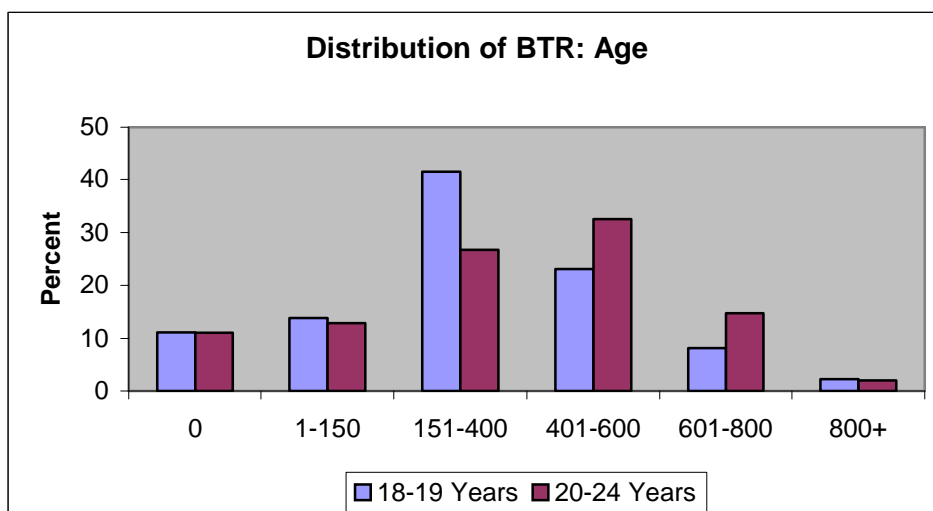


Nearly half of the breath test readings (BTR) for those aged under 25 years in the Auckland region (42%) were over the legal limit for driving (for people aged 20 years and over; 400mcg/l).

Fourteen percent of the BTR were 600 mcg/l or above. Of these, 12% were between 601mcg/l and 800mcg/l. This is the equivalent to more than 6 drinks for an average man and more than 4 drinks for an average woman.<sup>3</sup>

Two percent of the BTR taken were over 800mcg/l, this is the equivalent of more than 8 drinks for an average man and more than 5 drinks for an average woman (Figure 1).

Figure 2



Breath test readings were separated into two age groups; 18-19 and 20-24 years.

<sup>3</sup> This calculation is an estimate based on the average weight of a man and woman in New Zealand (Male 80.4; Female 69.7) (Ministry of Health, 1999) and does not take into account actual body weight of participants. A drink is 15mls of absolute alcohol.

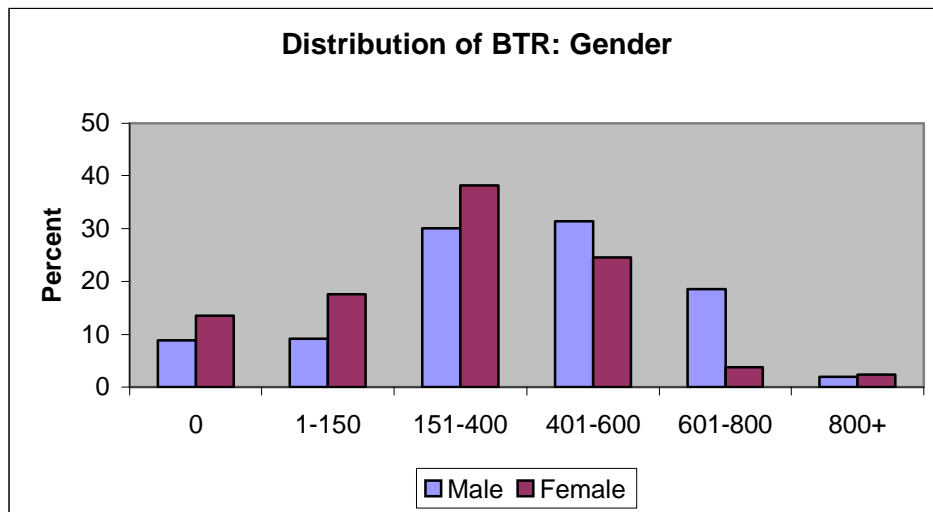
Approximately 75% of those aged 18 or 19 were over the legal driving limit of 150mcg/l for their age group.

Nearly one half (49%) of 20-24 year olds had BTR over 400mcg/l the legal limit for driving for those aged 20 years and over. One third of those aged 18-19 years (33.5%) had a BTR over 400mcg/l.

Nearly 20% of 20 to 24 year olds had breath test readings over 600mcg/l, for 18-19 year olds this proportion was 10%. This is the equivalent to more than 6 drinks for an average man and more than 4 drinks for an average woman.

Two percent of 18 -19 year olds and 2% of 20 - 24 year olds had breath test readings over 800mcg/l (Figure 2).

**Figure 3**

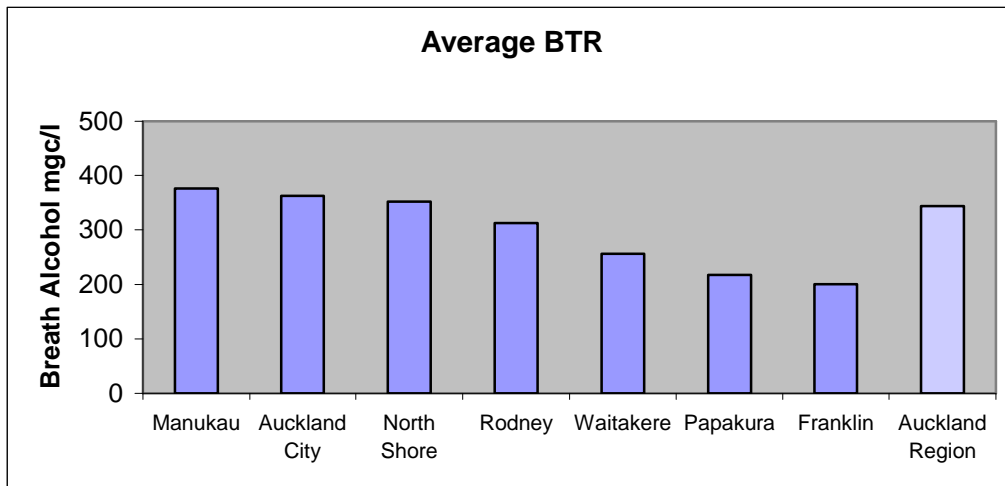


Fifty six percent of participants were men and 43% were women. Just over half of the men (51%) and 31% of females had a BTR over 400mcg/l

Approximately 20% of males and 6% of females were over 600mcg/l. Approximately 2 percent of males and 2% of females were over 800mcg/l (Figure 3).

The average BTR for men for the Auckland region was 392mcg/l, and this was significantly higher than the average BTR for women (291mcg/l) (these averages include BTR readings of zero).

**Figure 4**

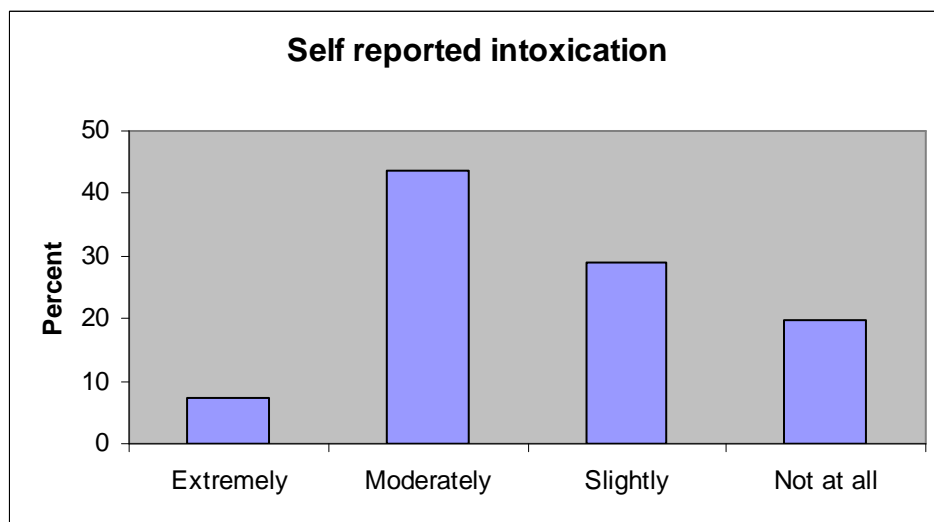


The average BTR for the Auckland region was 343.3mcg/l (this included participants who had a BTR of zero). When participants who had a BTR of zero were excluded the average was 386.1mcg/l.

Of the premises visited, the average breath test reading for Council areas were as follows (in descending order): Manukau City 376mcg/l; Auckland City 362mcg/l; North Shore City 352mcg/l; Rodney District 313mcg/l; Waitakere City 256mcg/l; Papakura District 217mcg/l; Franklin District 201mcg/l.<sup>4</sup>

## LEVEL OF INTOXICATION

**Figure 5**



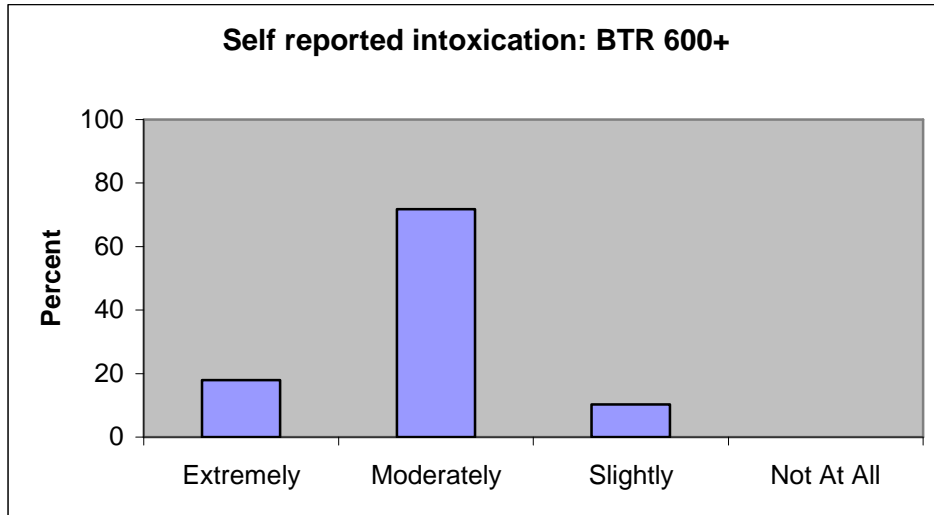
\* Participants who rated themselves as extremely intoxicated were eligible to participate if they could provide informed consent

Over 40% of participants reported that they were moderately intoxicated and approximately 8% reported that they were extremely intoxicated.

<sup>4</sup> These averages include readings of 0mcg/l.

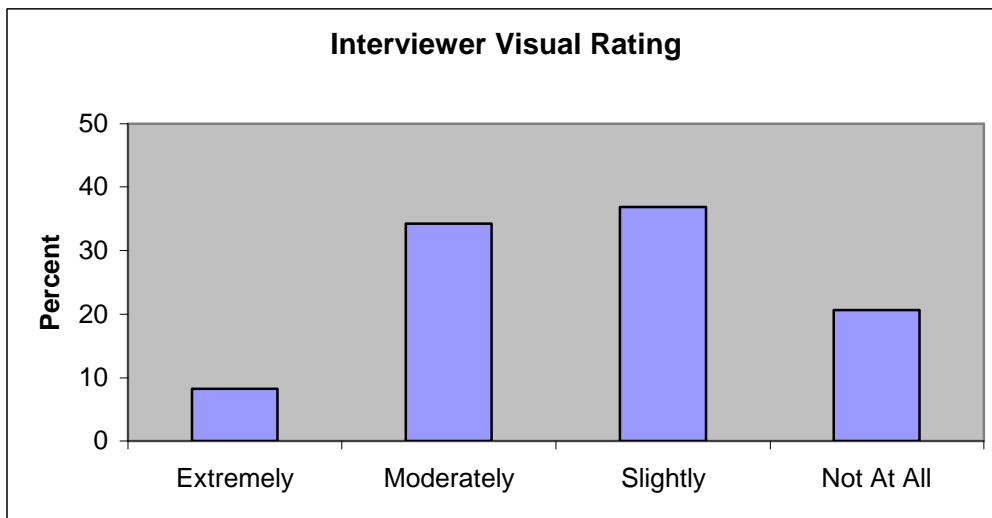
**Figure 6**

Analysis was conducted to determine the self-reported intoxication ratings of participants with a BTR of 600mcg/l and above (Figure 7).



Of participants with a BTR of 600mcg/l or above, the vast majority reported that they were moderately or extremely intoxicated.

**Figure 7**



\* Participants who were rated as extremely intoxicated were eligible to participate if they could provide informed consent

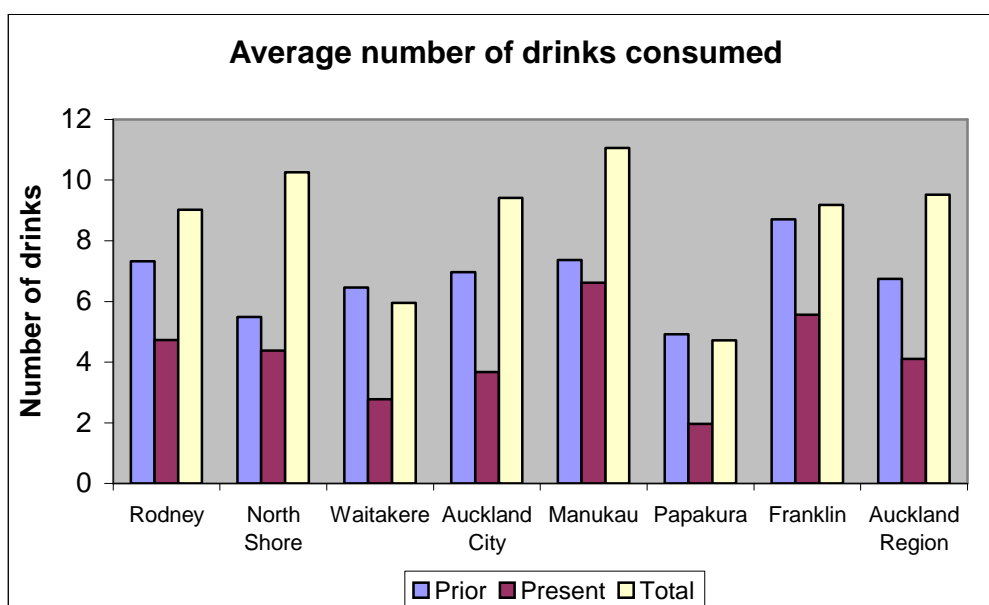
Approximately 34% of participants were rated by interviewers to be moderately intoxicated; approximately 8% of participants were rated as extremely intoxicated.

## SELF-REPORTED ALCOHOL CONSUMPTION

Participants were asked how many drinks with alcohol in them they had consumed prior to arriving at the premise they had just left. They were also asked how many drinks they had consumed in the premise.<sup>5</sup> A drink is 15 mls of absolute alcohol.

Data in these graphs have been subject to logarithmic transformation and are presented in the form of geometric means. The geometric mean is a good representation of the typical drinker's behaviour as it reduces the influence of extreme values in the data.

**Figure 8**



Prior = Drinks consumed prior to current premise  
 Present = Drinks consumed at current premise  
 Total = Total number of drinks consumed

\*This analysis does not take into account time. Analysis only includes drinkers; defined as participants who reported consuming at least one drink containing alcohol.

The average number of drinks that participants had consumed prior to arriving at the current licensed premise was almost 7 drinks (in the Auckland Region). The average number of drinks consumed at the current premise was 4. A total average of around 9<sup>6</sup> drinks was consumed by participants (prior to arriving at and during time spent in current premise). There was some variation across the region (please note that

<sup>5</sup> Measures used to collect alcohol consumption data in the Auckland Regional Exit Breath Survey were similar to the measures used in the National New Zealand Alcohol Survey 2000 (Habgood et al., 2001).

<sup>6</sup> There are a number of cases where the people drank a lot more either prior to going to the premise or once they had exited, this skewed the data slightly and moved the prior and present averages. For the total drinks both prior and at the present premise are being averaged and creating a different distribution or shape for the total data, this lowering the overall average.

although results have been reported for cities and districts separately, that numbers of drinkers in some areas are small and therefore cannot be considered representative).

## RURAL AND URBAN AREAS

Analysis was conducted to compare the average BTR in rural areas (Rodney, Franklin and Papakura) to the average BTR in urban areas (Auckland, Waitakere, North Shore and Manukau cities). The average BTR was significantly higher in urban areas compared to rural areas.

**Table 1: Average BTR: Rural and Urban**

	Total	Male	Female
Rural	255.64	338.97	170.12
Urban	333.72	377.18	289.46

## BTR OF DRIVERS

Participants were asked, as part of a short interview, where they were going and how they were getting there (once they had left the premise); 284 participants out of 350 participants (81%) completed the interview, however not every participant may have answered every question.

Analysis was conducted to investigate the average BTR of participants who were driving (after leaving the premise). The average BTR including and excluding breath readings of zero and the numbers of people in each category can be seen in Table 2 and 2a. Please note that numbers are small.

**Table 2 & 2a: Average BTR of drivers (including and excluding BTR of zero)**

### Including zeros

	Total	Male	Female	Total (n)	Male	Female
Drive myself	312.39	365.25	269.28	27	13	14
Drive myself and others	243.64	199.78	322.34	35	22	13

### Excluding zeros

	Total	Male	Female	Total (n)	Male	Female
Drive myself	364.38	453.45	299.33	22	10	12
Drive myself and others	352.2	330.16	380.44	27	17	10

\*This data could not be broken down by age as numbers of those who drove themselves, and drove themselves and others who reported their actual age were too small.

## MOVING ON TO ANOTHER LICENSE PREMISE

**Table 3: Participants with higher BTR moving on to another licensed premise**

BTR	Percent %
BTR above 400mcg/l	51
BTR above 600mcg/l	13

Half of the participants who had a BTR of over 400mcg/l were moving on to another licensed premise, for people with a BTR of over 600mcg/l this proportion was 13% (Table 3).

## TIME OF BTR

**Table 4: Time of BTR and average BTR**

Time	Average BTR
9pm-11.59pm	248.9
12am-1.59am	366.7
1am-4am	413.8

Average BTR significantly increased over the night. Other research from New Zealand has found in the Central Business District in Auckland that nearly two thirds of alcohol-related violent offences in 2001 occurred between midnight and 4am for those aged 16-24 years.

## AREA

Respondents were asked in which area they lived (Rodney, Papakura, Franklin, Auckland, Waitakere, Northshore and Manukau). This was compared with the area of the premise that they had left. Forty four percent of participants were at a licensed premise in the area in which they lived.

**Table 5: Area where people live compared to area of licensed premise**

At licensed premise in area where lived	Percent %
Yes	44
No	56

## PROPORTION OF PREMISES WITH PATRONS EXHIBITING SIGNS OF INTOXICATION

The proportion of premises where the interviewer (who made an observational rating of intoxication) made a rating of moderately or extremely intoxicated for a participant was determined. Fifty percent of premises visited had at least one patron who showed visible signs of intoxication.

## INTERVIEW DATA

The following are selected data obtained during the short interview administered at the time of data collection. 284 participants out of 350 participants (81%) completed the interview, however not every participant may have answered every question.

### *Alcohol consumption*

**Table 6: Consumed Alcohol**

Have you had any drinks with alcohol in them tonight?\*

	Total %	Male %	Female %
Yes	95	98	93
No	5	2	7

\*Columns in tables may not exactly add to 100% due to rounding.

**Table 7: Usual alcohol consumption on a night out**

On an average night out at a pub/bar/nightclub, would you usually drink.....?

	Total %	Male %	Female %
More alcohol than you drank tonight	37	36	39
The same amount of alcohol as you drank tonight	40	42	38
Less alcohol than you drank tonight	22	22	23
Don't know	1	1	1

### ***Activities prior to being at current premise***

**Table 8: Location before arriving at current premise**

	Total %	Male %	Female %
Own House	42	39	47
Others House	20	22	17
Another Pub/Bar/Night Club	28	29	27
Another licensed premise	1	1	2
Sports club	0	1	0
Public place	1	0	1
Work place	5	6	4
Motor Vehicle	2	2	2
Other	0	0	1

**Table 9: Transport to premise**

	Total %	Male %	Female %
Drove myself	11	9	13
Drove myself and others	12	14	10
Passenger in car	41	40	43
Taxi	15	11	18
Walk	15	18	11
Bus	5	7	3
Other	0	0	1

### ***Activities after premise***

**Table 10: Location after premise**

	Total %	Male %	Female %
Own House	36	34	39
Others House	6	5	7
Another Pub/Bar/Night Club	46	46	46
Another licensed premise	1	0	2
Public place	1	1	1
Work place	0	1	0
Other	4	7	1
Don't know	4	5	3
Staying	1	1	2

**Table 11: Transport away from premise**

	Total %	Male %	Female %
Drive myself	5	3	8
Drive myself and others	7	10	3
Passenger in car	24	25	23
Taxi	18	15	22
Dial a driver	0	0	0
Walk	38	38	39
Bus	3	4	2
Other	2	1	2
Don't Know	2	4	0
Staying at current premise	1	1	2

***Host responsibility*****Table 12: Food consumed at this bar**

	Total %	Male %	Female %
Yes	5	4	7
No	95	96	93

**Table 13: Different food available**

If no/ Would you if there were different food available?	Total	Male	Female
Yes	27	26	29
No	73	74	71

**SUMMARY**

The Auckland Regional Exit Breath Survey collected breath test readings across the Auckland region. Key results include: 14% of participants had a BTR of over 600mcg/l; 40% of participants reported that they felt moderately intoxicated and 8% extremely intoxicated; observational ratings of intoxication by data collection field workers show that 34% of participants were assessed as being moderately intoxicated and 8% as extremely intoxicated; and 50% of premises visited had at least one participant who exhibited visible signs of intoxication.

These results suggest that half of licensed premises in the Auckland region may be allowing patrons on their premises and/or continuing to serve them despite patrons showing visible signs of being intoxicated.

## REFERENCES

- Babor, T., Caetano, R., Casswell, S., Edwards, G., Giesbrecht, N., Graham, K., Grube, J., Gruenevald, P. J., Hill, L., Holder, H., Homel, R., Osterberg, E., Rehm, J., Room, R. and Rossow, I. (2003) *Alcohol: No Ordinary Commodity - Research and Public Policy*, Oxford University Press, Oxford.
- Day, C., Topp, L., Swift, W., Kaye, S., Breen, C., Kimber, J., Ross, J. and Dolan, K. (2002) *Interviewer Safety in the Drug and Alcohol Field: A Safety Protocol and Training Manual for Staff of the National Drug and Alcohol Research Centre*. National Drug and Alcohol Research Centre, Sydney:
- Greenaway, A., Conway, K., Field, A., Edwards, S., Bhatta, K., Huckle, T. and Butcher, A. (2002) *Young People, Alcohol and Safer Public Spaces*. Alcohol & Public Health Research Unit, University of Auckland
- Habgood, R., Casswell, S., Pledger, M. and Bhatta, K. (2001) *Drinking in New Zealand: National Surveys Comparison 1995 & 2000*. Alcohol & Public Health Research Unit, University of Auckland, Auckland
- Krass, I. and Flaherty, B. (1994) The impact of responsible service training on patron and server behaviour: a trial in Waverley (Sydney). *Health Promotion Journal of Australia*, **4**, 51-58.
- Lang, E., Stockwell, T., Rydon, P. and Beel, A. (1998) Can training bar staff in responsible serving practices reduce alcohol-related harm? *Drug and Alcohol Review*, **17**, 39-50.
- Langley, J., Chalmers, D. and Fanslow, J. (1996) Incidence of death and hospitalisation from assault occurring in and around licensed premises: a comparative analysis. *Addiction*, **91**, 985-993.
- Ministry of Health (1999) *Key Results of the 1997 National Nutrition Survey - NZ Food: NZ People*. Wellington
- Rydon, P., Stockwell, T., Ovenden, C. and Gianatti, S. (1994) *Methods of Determining Patron Intoxication Levels After Leaving Licensed Premises in Perth, Western Australia (unpublished paper)*. National Centre for Research into the Prevention of Drug Abuse, Curtin University, Perth
- Rydon, P., Stockwell, T., Syed, D. and Jenkins, E. (1993) Blood alcohol levels of patrons leaving licensed premises in Perth, Western Australia. *Australian Journal of Public Health*, **17**, 339-345.
- Stockwell, T., Somerford, P. and Lang, E. (1992) The relationship between licence type and alcohol-related problems attributed to licensed premises in Perth, WA. *Journal of Studies on Alcohol*, **53**, 495-498.
- Teplin, L. and Lutz, G. (1985) Measuring alcohol intoxication: the development, reliability and validity of an observational instrument. *Journal of Studies on Alcohol*, **46**, 459-466.