

The point prevalence of smoking in selected sports fields and downtown locations in Wellington:

Observations in November 2015



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Summary

Aim

To observe and report on the point prevalence of smoking at sports grounds and three downtown open spaces of Wellington City (Midland Park, Civic Square and Te Aro Park). Point prevalence is the proportion of people smoking at a particular time.

Methods

Five minute scans were used to count the number of smokers, those aged over 12 years, and those aged 12 years or under. Observations were carried out in the three downtown locations during four weekdays, and seven Wellington city sports grounds (three cricket grounds and four softball), over two Saturdays.

Results

From 321 five minute scans, a total of 13,581 people aged over 12 years were observed, with 396 smokers recorded (an average point prevalence of smokers of 2.9% for a five minute scan). The point prevalence at sports grounds was 2.4%, and 3.1% at the downtown locations (this was not quite statistically significant for the difference: $p=0.064$).

Smoking differed by the type of sport and the presence of children. The observations of cricket grounds indicated a point prevalence of 1%, compared to 3.9% for softball grounds ($p=0.000$ for the difference). Where the population were children aged 12 or under was more than 30% of the population, the point prevalence of smoking on the sports grounds was 0.6%, compared to 3.2% when less than 30% ($p=0.000$). The point prevalence at Te Aro Park was 3.9%, at Midland Park 3.3%, and 2.5% at Civic Square.

Discussion

Smoking was observed at sports grounds, sometimes even with a high proportion of children, despite the official smokefree status. There was more smoking observed at the officially smokefree Midland Park, compared to Civic Square, where there was no smokefree policy.

Introduction

Observing the point prevalence of smoking for a location enables policymakers to compare the extent of smoking with other places, and to observe changes over time (especially if there has been an intervention such as smokefree policy). Point prevalence is the proportion of people smoking at a particular time (eg, those that can be seen smoking in a particular area while watching for a short time).

Previous observation studies in Wellington city have found a wide range of smoking point prevalences, from one to 18%, depending on the location, type of place and time of day.

While the data in Table 1 below indicates an overall outdoor point prevalence of about 3-4%, the small amount of data means this is only indicative. However, it is supported by data from the same types of sites across New Zealand for the same period. In the overall New Zealand study, 3.5% of 2959 people over the age of 12 years were seen smoking, with a point prevalence of 3% in shopping streets and city pedestrian areas, 2% in parks and 11% in transport waiting areas smoking.¹

Table 1: Point prevalence of people seen smoking in Wellington City outdoor areas in April, November and December 2011, and January-February 2012

Type of site	Number of sites	Total people	Children	Smoking	Adult* point prevalence
Shopping streets, pedestrian areas	11	1313	48	51	4%
Parks or playgrounds	6	542	98	6	1.4%
Transport waiting areas	3	111	1	7	6.3%
Total	20	1966	147	64	3.5%

* Adults and teenagers aged over 12 years

Larger amounts of point prevalence data was gathered in 2013 and 2014 for areas outside of bars. In a study of 14 downtown bars/café in April 2013, of 2600 people, 15.8% were observed smoking (95% confidence interval (CI): 14.5%–17.5%); 18.5% in the evening (95% CI: 16.8%–20.4%) compared to 9.1% at midday (95% CI: 7.2%–11.4%). The places had both an alcohol licence and a pavement lease serviced area in use between the hours of 11 am and 11 pm.²

In a second study during March 2014, of 19,189 patrons at 55 CBD bars/café, 1357 smokers were observed – 7.1% (95% CI: 4.9–9.2%). This was at a wider sample, of all places in three CBD areas with outdoor tables visible from the footpath. The point prevalence was highest at Courtenay Place (13%), followed by Cuba Street (12%) and the Waterfront area (3%).³ The study also found a sharp difference in the level of smoking when children were present, with a 9.2% point prevalence when there were no children, and 3.2% point prevalence when one or more children were present.

To further explore the extent of smoking in public outdoor places, and to gauge the adherence to current smoke-free areas in Wellington City, the aim of this project was to observe and report on the point prevalence of smoking at sports grounds and three downtown open spaces (Midland Park, Civic Square and Te Aro Park).

Methods

Observations were made over four weekdays in central city open space locations, and two Saturdays at sports parks within Wellington City (see Table 2). Each city location and park was divided into sections for observation, according to the concentration of people, and the feasibility of scanning the areas accurately. Details of the sections were recorded for later mapping.

The sports ground locations were chosen according to the sports in season (cricket and softball), and because grounds had games on the Saturday of observation. The city centre locations were chosen because of their relatively high use and strategic location.

Table 2: Locations and sports observed

Centre city locations (weekdays)	Sports grounds (Saturdays)
Civic Square	Alex Moore Park softball pitches (Johnsonville)
Midland Park (Lambton Quay)	Hataitai Park softball pitches
Te Aro Park (Courtney Place)	Ian Galloway Park (Karori) – cricket
	Karori Park – cricket
	Kilbirnie Park – cricket
	Martin Luckie Park (Berhampore) – softball
	Newlands Park – softball

Observation was trialled at the three downtown locations by two observers counting separately, until the inter-observer variation was zero. From then, each of the observation sections at each location or park was scanned two or three times for each observation session, by a single observer. A scan involved a five minute period in which the number of ‘adults/teenagers’, children, and smokers were counted. The data was recorded using the ‘Touch Counter’ app (published by ‘*tampopolabo*’ on the Google Play Store) for Android, on a smartphone. A child was defined as someone who subjectively looked to be 12 years old or under. A smoker was defined as someone in possession of a lit cigarette (whether in their mouth or hand). We counted smokers rather than cigarettes. This meant that, if in a 5 minute scan, one person consumed from more than one cigarette, they were only counted as one smoker. If, for example, two people shared the same cigarette, they were counted as two smokers. Users of vapour products (eg, e-cigarettes) or inhalers were not counted as smokers. Observation scans were done from a stationery point or along a line of movement (see Appendix), as was necessary to have a good enough view of all people in the section.

For an observation session, observation sections were rotated through until a maximum of three scans per section were completed, before moving onto the next location or park. That is, in a location with three sections, the sections would each be scanned consecutively for five minutes, and then the sequence would be repeated.

At centre city locations, scans were done between 9:45am and 5:30pm, on weekdays with no rain. Except when prevented by rain, two observation sessions (sets of scans) were done for each location; one before lunch to lunchtime (generally from 9:45am-1:30pm) and another after lunchtime (1:30pm-5:30pm). At the sports grounds, scans were done between 8:30am and 5:30pm, when there were sports teams on the fields (which may have been warming up or playing a game). Players were counted, as were spectators. Only one observation session per ground was done.

Data was transferred from the smartphone onto an Excel spreadsheet. Numbers were collated for each location, and the prevalence calculated, by dividing the number of smokers by the number of those over the age of 12.

Images of each of the locations and parks were found on Google Maps and captured. The observation sections were mapped on to the images and the observation points marked for the central city locations (see Appendix). Weather data for observation days was obtained from the Metrological Service website.

To provide socio-economic context, information for suburbs where sports grounds were observed was taken from the 2013 Social Deprivation Index, by the University of Otago.⁴

Results

Over six days of observation, 13,581 people aged over 12 years were observed, with 396 smokers recorded (a point prevalence of smokers of 2.91% for a five minute scan). A total of 1210 children who appeared to be age 12 and under were observed.

The observation results were from 321 five-minute scans – totalling 26 hours and 45 minutes observation. Full details of the observations are in the accompanying Excel sheets. All observations were done in the absence of rain, but in a variety of temperatures (ranging from 13 to 19 degrees Celsius), wind (ranging from 39 to 96km/h) and cloud levels (from overcast to clear).

This total of 321 scans excluded one scan for which information was lost (a scan of Midland Park area C, see Excel sheets), and six sportsground scans (five in Karori, one in Ian Galloway), which were not done, as the games on those pitches were completed before the observation session was over, and the pitch vacated.

Point prevalences

A point prevalence of 2.41% (2,950 adults/teenagers and 71 smokers) was observed at sports grounds, and 3.06% (10,631 adults/teenagers and 325 smokers) was observed in the centre city locations. The difference was not statistically significantly different for 95% confidence intervals ($p= 0.064$).

At the sports grounds, there was variation in smoking prevalence with the sport played, and the proportion of children playing at the ground (see Table 3). There was a point prevalence of 0.98% at cricket grounds (Karori Park, Kilbirnie Park, Ian Galloway) almost a quarter of the 3.93% prevalence at softball grounds (Hataitai Park, Alex Moore Park, Martin Luckie Park, Newlands Park) ($p= 0.000$ for the difference). In observation sessions where greater than 30% of the population were children aged 12 or under (which were often children's sporting events), the point prevalence on the sports grounds was 0.56%, compared to 3.2% when less than 30% of the population were children (significantly different – $p= 0.000$).

Table 3: Smoking point prevalence from observations at sportsgrounds*

	All sportsgrounds	Softball grounds	Cricket grounds	Grounds with >30% children	Grounds with <30% children
Smokers	71	56	15	5	66
Adults/teenagers	2950	1424	1526	886	2064
Children	979	364	615	758	221
Prevalence (%)	2.41%	3.93%	0.98%	0.56%	3.20%

* Smoking point prevalence of the population over 12 years of age during five minute scans

The point prevalence of smoking where the proportion of those aged 12 or under was more than 30% was zero at cricket grounds (0/466), and 1.2% at softball grounds (5/420).

The effect of the proportion of children at the sports grounds was also apparent when comparing two different recordings on the same ground. For example, on Saturday 7th November, observations at Karori Park yielded a point prevalence of 0%, on a morning with three junior age grade cricket games running (and 51% of the population being aged 12 or under). On the afternoon of Saturday 14th November, when there were five senior cricket

games running (and 15% aged 12 or under), the point prevalence was 2.71%. Likewise, at Hataitai Park, on 7th November, when there was one senior men's and one senior women's softball match running (and 11% of the population being aged 12 or under), there was a prevalence of 2.10%, while on the morning of 14th November, during three junior softball games (and 38% aged 12 or under), the prevalence of 1.19%.

The differences in the smoking point prevalence between the centre city locations studied were smaller. The highest was found to be in Te Aro Park, with 3.89% of those over 12 years smoking. Midland Park was second highest, with 3.26%, and then Civic Square with 2.47%. The proportion of children at each of the three locations studied during November weekdays was less than 4%. However, in line with the difference in point prevalence between the parks, the proportion of children was lowest at Te Aro Park, and highest in the Civic Square (see Table 4).

Table 4: Smoking point prevalence from observations at centre city locations*

	All Centre City Locations	Civic Square	Midland Park	Te Aro Park
Smokers	325	102	154	69
Adults and teenagers	10631	4125	4731	1775
Prevalence (%)	3.06%	2.47%	3.26%	3.89%
Children	231	137	77	17
% Population children	2.13%	3.21%	1.60%	0.95%

* Smoking point prevalence of the population over 12 years of age during five minute scans

Other findings

Though not formally assessed in this investigation, we found specific areas within the centre city locations where smokers were more likely to be. In the Civic Square, the areas where the highest smoking point prevalence was found are approximately outlined in Figure 1. Area A is part of a walkway connecting the Wellington City Council offices to one of the openings of the Civic Square to the streets, between the library and the i-Site. This area is covered, and relatively removed from the rest of the square with a high wall. Area B is connected to the rest of the square by a number of steps, is on a significantly lower level and is surrounded by high walls and thus partly separated from the Square. However, both are



Figure 1: Areas noted to have particularly high point prevalences of smokers.

potentially in thoroughfares as people exit Wellington City Council buildings.

In Midland Park, smokers were most commonly found in the covered café areas. Across all locations, it was noted that smokers tended to be standing or sitting in one place. This was even seen at locations like Te Aro Park, where most of the population counted were walking through the park.

Vapour products such as e-cigarettes, and inhalers were observed, especially in Midland Park. They were not recorded, as prevalence of the use of these products was outside the scope of this study.

No children aged 12 years or under were seen smoking. While we made no effort to count the number of those smoking who were judged to be between the age of 12 and 18 years (the age for the legal supply of tobacco products), at least one person appearing to be well under the age of 18 was observed to be smoking.

Socio-economic context and smoking

There was no clear pattern between the socio-economic levels for the suburbs in which the sports grounds were, and the smoking observed. The sports grounds we studied were in the suburbs of Berhampore (Martin Luckie), Hataitai (Hataitai Park), Johnsonville (Alex Moore Park), Karori (Karori Park and Ian Galloway Park), Kilbirnie (Kilbirnie Park) and Newlands (Newlands Park). See Table 5 for the levels of deprivation and the observed point prevalence at the sports grounds in each of these areas.

Table 5: Suburbs with sports ground observations in order of increasing social deprivation index levels,⁴ and average observed smoking point prevalence at the local grounds

Area	Index#	Average prevalence observed *
Karori	907	0.1%
Hataitai	930	1.5%
Newlands-Ngauranga	946	9.5%
Johnsonville	955	4%
Berhampore	1024	6%
Kilbirnie	1044	0.6%

A lower number indicates less deprivation

* Not corrected for age structure of the populations at each ground

Discussion

Current Wellington City smokefree policies do not prevent smoking at sports grounds and Midland Park, although they may reduce it. There have been no comparable pre-policy studies of these areas.

Smoking was observed at sports grounds, even sometimes when there was a high proportion of children, despite the official smokefree status for the grounds. There was more smoking observed at the officially smokefree Midland Park, compared to Civic Square, where there was no smokefree policy.

Children and observed smoking

As with previous observations outside Wellington cafés and bars,³ the presence of children appeared to make a difference to smoking levels. We found significantly lower smoking point prevalences at parks when more children were present. Possible reasons for this include: (i) a reluctance by smokers to smoke around children, or social pressure on smokers to not smoke; (ii) differences in the socio-economic background of adults who attended the children's sports events, compared to the adult sports events; or (iii) smokefree policies implemented by clubs.

Possible socio-economic effects

The observed differences between smoking at softball and cricket games may be due to the socio-economic differences in the populations at the games, or possibly because of the cultures of the sports clubs involved. There was no clear gradient relating the socio-economic deprivation scores of the *suburbs* where the games were played (see Table 5). This appears partly due to the placing of two sports grounds (Hataitai and Kilbirnie) at the boundary between two suburbs of differing deprivation. The data in Table 5 were not corrected for other factors that might have affected the smoking point prevalence, such as the sport played and the age structure of those at the parks.

Strengths and weaknesses

The methods used were simple and cost effective, enabling the project field work to be completed in a short period of time. The methods were tested with two people before commencing recording, to ensure a high level of accuracy before the project data was collected. Observation locations were divided according to population density, to ensure small enough pedestrian numbers for accurate observation. However, even with this subdivision, sudden groups of moving pedestrians could be difficult to count completely accurately.

The difficulty of judging if someone is 12 years old or younger simply by looking at them must be acknowledged. The point prevalences found are conservative. They would be different if a higher age for 'children' had been set than at 12 years or under, and the 'smoking population' denominator against which the number of smokers set was therefore smaller. For instance, if the denominator had been the population 15 years or over, the point prevalences found would be lightly higher.

The observations at the centre city locations (four days, with a total of eight observation sessions per location), provided higher observed populations compared to the sports grounds. Observations at different times of the year, and across seasons when a wider range of sports were played, may give different results to those we found. At downtown locations, weekend and/or evening observations might give different results, as were found for smoking outside bars and cafes.^{3, 5}

The structure of some locations made them difficult to observe. For example, at Midland Park there were large pillars that could obscure people sitting in the café areas. This posed a challenge for observation from a stationary position, and may have affected the results. Some movement in the observation point was allowed for in order to try and mitigate this. Another example is the Hataitai Softball Pitch. It was difficult to see people smoking in the stands and in the boxes for teams, but it was not feasible to go any closer, as the pitch was fenced, and an ideal view could not be obtained from the stands.

Further research

The previous section comments on the opportunities from observations at different times of the year, and across seasons, and for downtown, at weekends and/or evenings. In order to further investigate the effect of the presence of children, further observation research could study more areas with higher proportions of children, such as the waterfront, Frank Kitts Park, outside Te Papa and at markets, or at times when there were more children in the city centre (such as weekends). Such areas (and others) could also be studied to find the extent of smoking that tourists are exposed to. More accurate results could be obtained by sampling from more Wellington locations, for longer periods and for a wider variety of sports.

Policy implications

The observed concentrations of smokers in Civic Square outside the entrance to Wellington City Council premises, and at the cafés at Midland Park, suggested that particular efforts would be required to get effective smokefree policies. These efforts could include further work with the café managements, and cessation work and incentives with City staff.

References

1. Thomson G, Russell M, Jenkin G, et al. Informing outdoor smokefree policy: methods for measuring the proportion of people smoking in outdoor public areas. *Health Place* 2013;20:19-24.
2. Pearson AL, Nutsford D, Thomson G. Measuring visual exposure to smoking behaviours: a viewshed analysis of smoking at outdoor bars and cafes across a capital city's downtown area. *BMC Public Health* 2014;14:300.
3. Martin N, McHugh H, Murtagh J, et al. Observational study of the visibility of branded tobacco packaging and smoking at outdoor bars/cafes in Wellington, New Zealand. *N Z Med J* 2014;127:27-36.
4. I D Consulting Pty Ltd. Wellington City deprivation index I D Consulting Pty Ltd. Melbourne. 2014. Accessed October 29, 2015. <http://profile.idnz.co.nz/wellington/deprivation-index?WebID=220>.
5. Chan J, Burnett T, Baillie R, et al. Smoking in outdoor areas of bars and cafés: Large differences between midday and evening prevalences. *Drugs: education, prevention and policy* 2014:Online May 2014.

Appendix

Divisions of and details for observed locations in Wellington City, November 2015

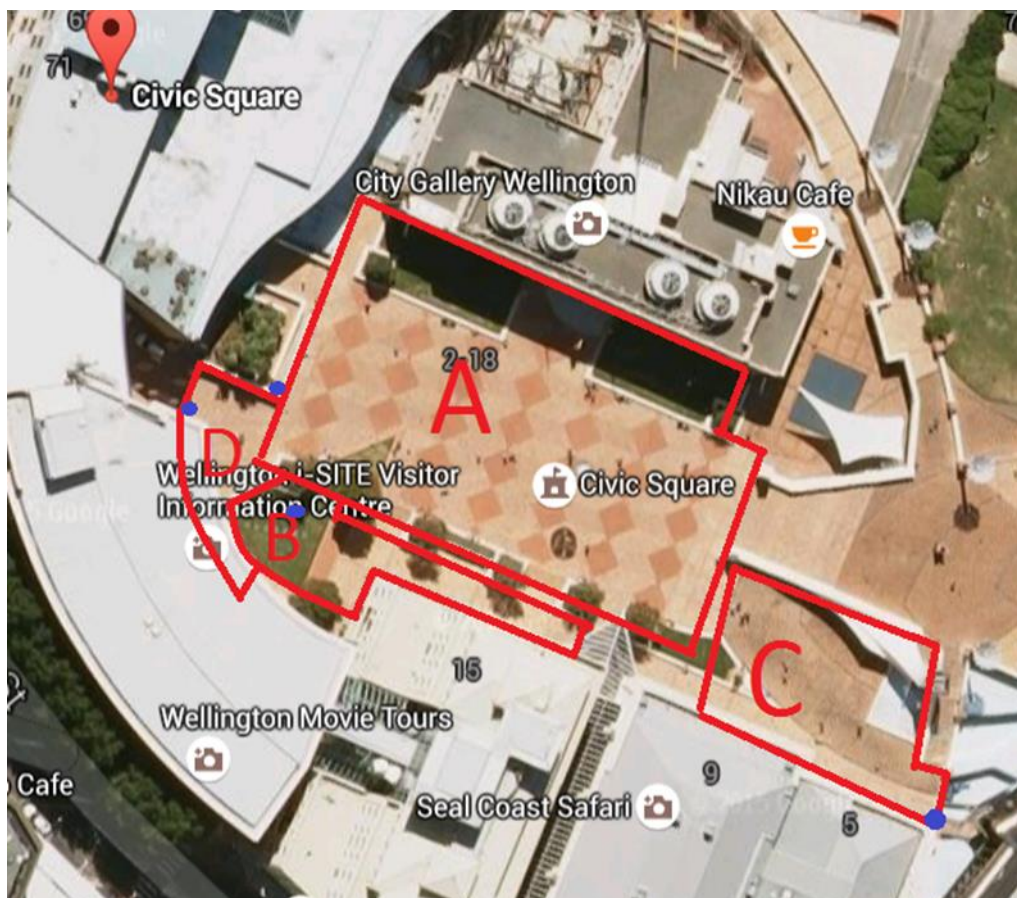
The maps are best observed electronically.

Civic Square

For observation Civic Square was divided into four sections. One covered most of the square proper, which had an artificial mini football pitch (A). Another covered a larger grass patch and section down some steps, outside the council office entrance (B). Another covered an entry/exit point by Michael Fowler Centre, towards Wakefield Street (C). Another covered another entry/exit point, between the i-Site and Library, as well as some of the covered pathway to the council offices (D).

The blue dots on the diagram indicate fixed observation positions. Observations occurred during 11.30am – 12.30pm, 3.00 – 4.00pm Monday 9th, 11.20 – 11.20am, 2.25 – 3.25pm Tuesday 10th; 11.20am – 1.30pm, 3.51 – 5.03pm Friday 13th; 11.23am - 12.37pm, 2.55 – 4.30pm Monday 16th. Area D was not observed on Monday morning 9th.

Three scans per session (six per day) for a total of 24 scans, except for Area D which had 21 scans.



Midland Park

Midland Park was divided into four sections for observation, two of which covered the cafés and entrance to the office building on site (A, B). A covered the seats on the entrance from Waring Taylor Street. B covered the seats on the Johnson street side. Neither of these locations covered people on the footpaths. C and D both covered the grass patches and seats in the centre of the park, as well as the covered walkway parallel to Lambton Quay. Outside this cover, no footpath was included as part of the park.

The blue dots indicate fixed observation positions. At margin of areas B and C, the blue dot indicates fixed observation position for C, and where most observation was completed for B. Some movement along the short blue line was required for area B observation.

Observations occurred during: 9.45 -10.45am, 1.40 – 2.40pm, Monday 9th November; 9.50 – 10.50am, 1.35 – 2.30pm, Tuesday 10th November; 9.56am – 11.10am, 2.15 – 3.43pm Friday 13th November; 10.00 – 11.09am, 1.35 – 2.45pm, Monday 16th November. Three scans per session (six per day) except for one scan with lost data on the morning of the 13th. Total – 23 scans.

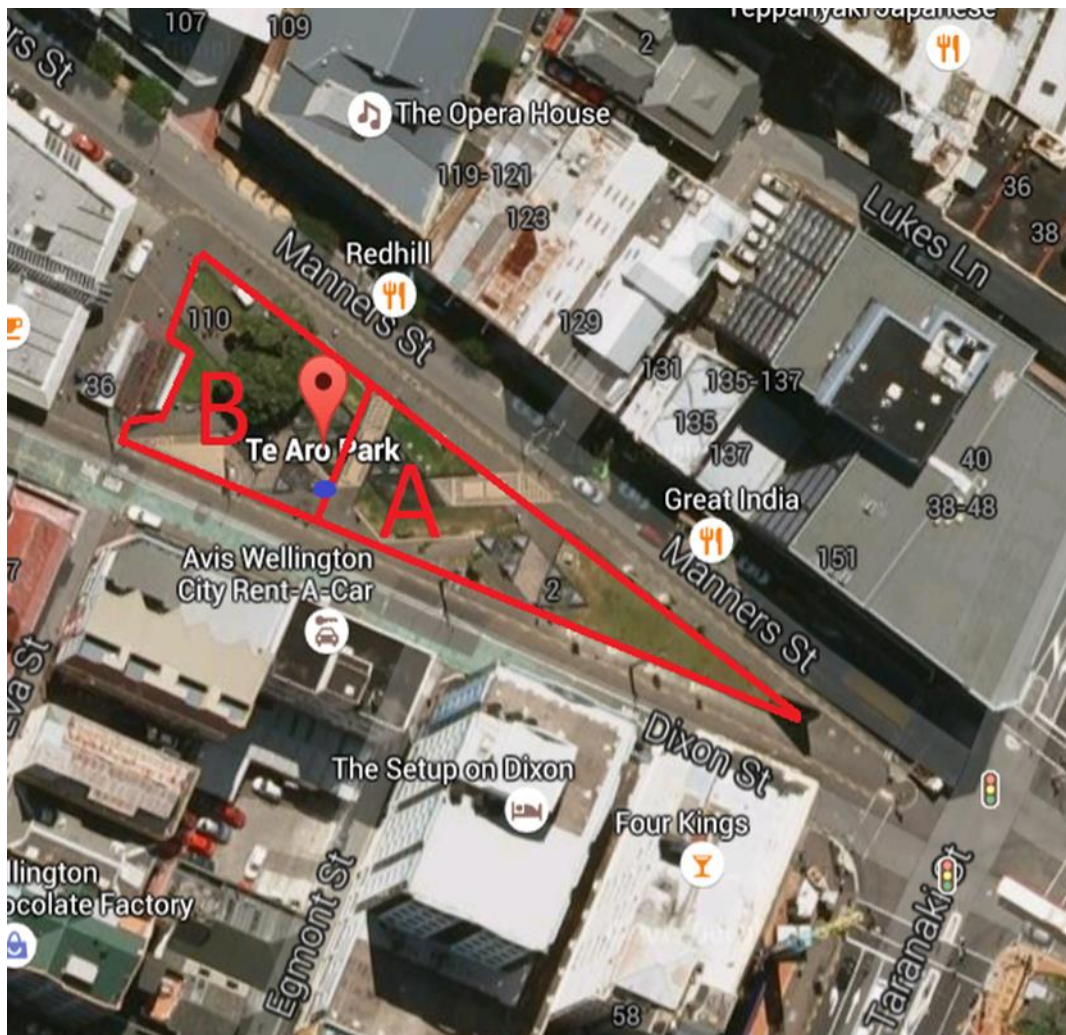


Te Aro Park (Courtney Place)

Te Aro Park was divided into two sections. It is an A shaped park, with a number of walkways through it, but only one goes straight from one side to the other. This walkway, and everything until the sculpture at the vertex of the A, was considered section A. Everything from before this walkway, until the public toilet building and the end of the grass patch was considered section B. The footpaths at the perimeter of the park were excluded.

The blue spots indicate observation points. Observations occurred at 1.15 – 2.15pm, 4.40 – 5.40pm, Monday 9th; 12.35 – 1.20pm, 4.25 – 5.15pm Tuesday 10th; 1.40 – 2.10pm Friday 13th; 12.45 – 1.17pm, 4.20 – 5.25pm Monday 16th.

Three scans per session (six per day) except for Friday 13th when there was only one session due to rain, and Monday 16th, when six scans were done in the last session to compensate for the lost session on the 13th. Total – 24 scans.



Sportsgrounds

Sportsgrounds were divided according to where on the field games were being played. One section generally covered one game and its spectators. This was the cause of the changes in sectioning between the two Saturdays of observation, at Hataitai Park, Karori Park and Kilbirnie Park. The exception to having one game in each section was Hataitai sections A and B on Saturday 14th November. Here, one game was split across two sections, as it was too difficult to observe all the players and spectators of that match in one scan.

Karori Park: Saturday 7th November, 9-10am

Three games of junior cricket in these three areas, with some practices happening around the areas. Some people were jogging/walking/biking around the perimeter of the field. Nothing of note was happening beyond these areas. The blue dots mark fixed observation points. There were three scans in each of the three areas (for a total of nine scans).



Karori Park: Saturday 14th November, 4.15 – 5.30pm

H = Outside clubhouse plus game, P = Outside pavilion plus game.

Five games of senior men's club cricket, with joggers, walkers (with or without pets) and cyclists on the perimeter path. Games were finishing during the observation period, so second and third scans were not possible for some areas. The blue dots indicate stationary observation points. There were a total of 10 scans.



Ian Galloway Park (Karori): Saturday 7th November, 10-11am

Five games of club cricket, and it was difficult to tell the ages of players. By the time of the second scan of area D, the game there had finished and the ground empty. Blue dots mark fixed observation points, and blue line marks where observer moved around to observe. Two scans in each of the areas (except for area D) for a total of nine scans.



Kilbirnie Park: Saturday 7th November: 11.45am – 12.30pm

Two games of senior club cricket were being played. Blue lines mark observation points (observer moved along these lines). Three scans in each of the two areas (so six scans).



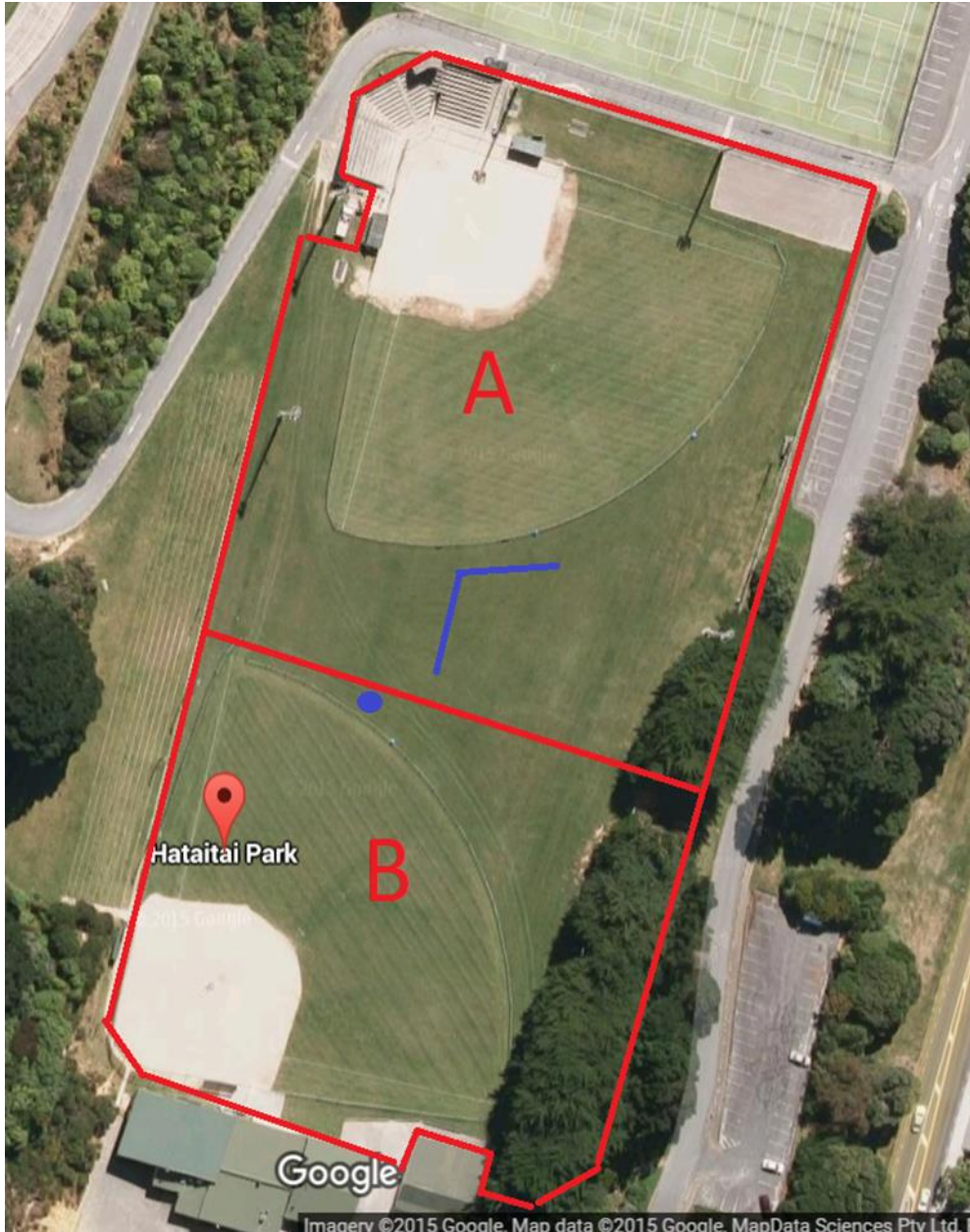
Kilbirnie Park: Saturday 14th November: 11.10am – 12.35pm

One game of college cricket (A), two games of senior club cricket (B, D) and one game of age grade club cricket (C). Blue dots indicate stationary observation points, and the blue line in D mobile observation. Three scans in each area (total of 12 scans).



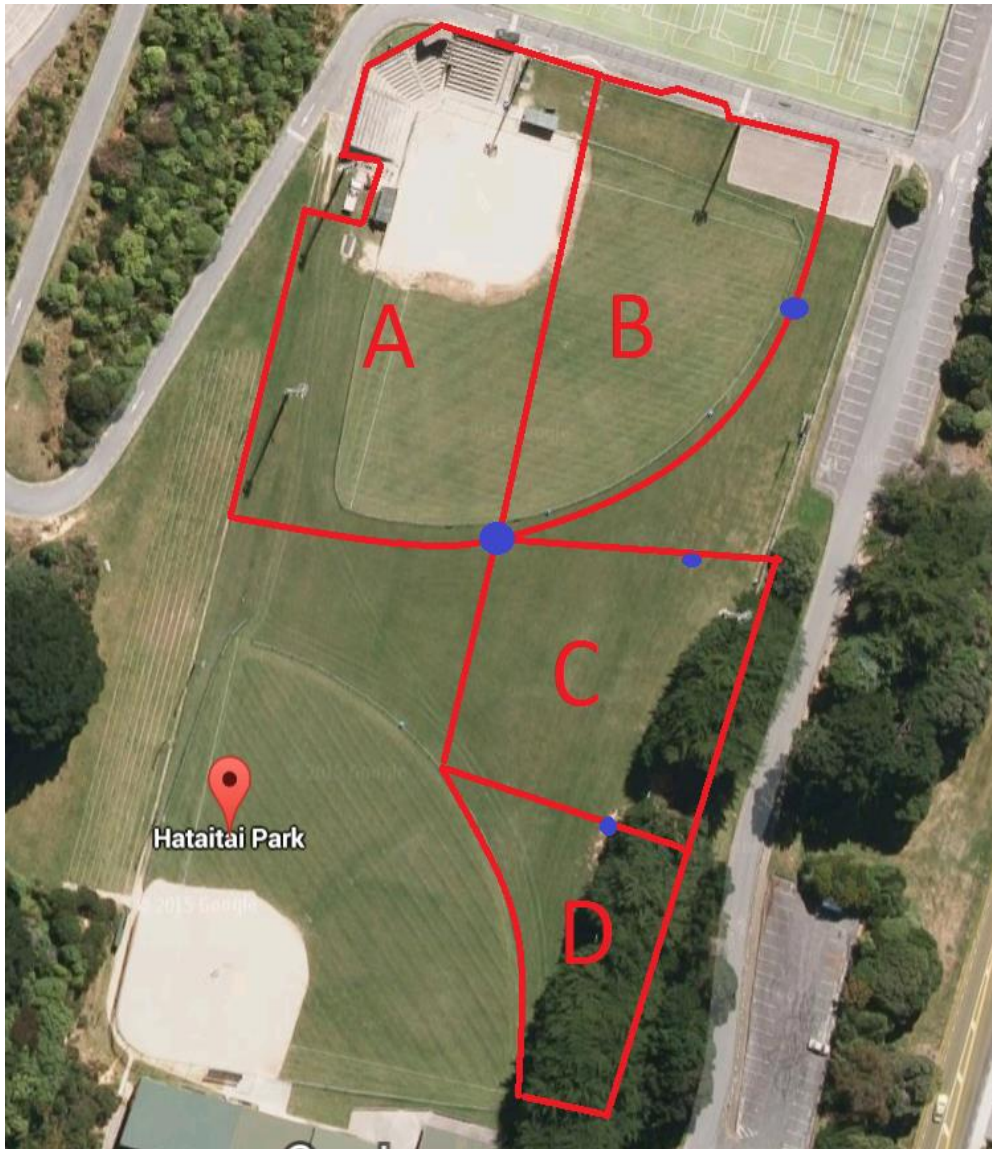
Hataitai Park: Saturday 7th November: 12.45 – 1.40pm

Two games of senior club softball, with one team practicing outside the perimeter of the pitch in area A (but within area A outlined.) Blue dots at observation points. Three scans in each of the two areas (six scans).



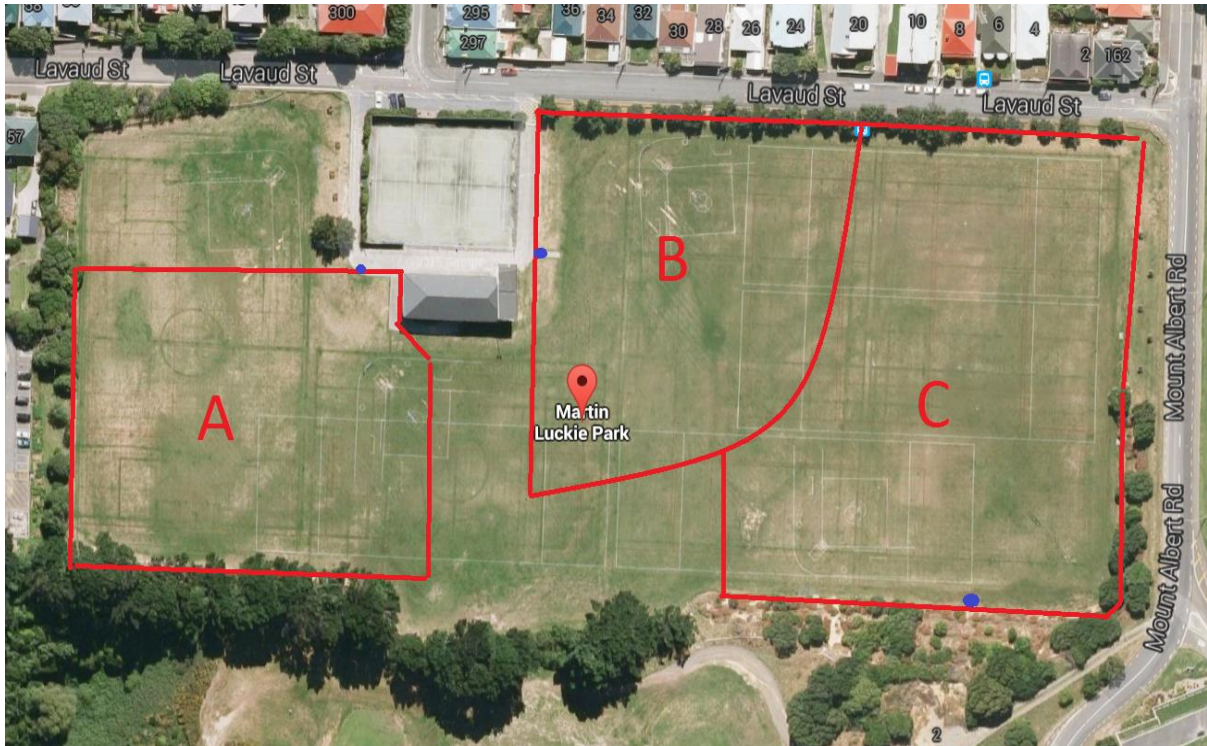
Hataitai Park: Saturday 14th November: 9.35 – 10.55am

Split into four parts, age grade softball match in A+B, Children's Softball match in C and children's T ball match in D. Activity outside these areas were negligible. B includes sausage sizzle by footpath, but does not include cars parked by road. Blue dots indicate stationary observation points. Three scans of each area (total of 12 scans).



Martin Luckie Park (Berhampore): 12.56 – 2pm, Saturday 14th November

Three games of senior club softball. Activity outside of these areas was negligible. Margins are approximate. Blue dots indicate stationary observation points. Three scans per area (nine scans).



Alex More Park (Johnsonville): Saturday 14th November, 2.32 – 3.06pm

One game of club softball (A), and a warm up area for teams playing in the next game (B). Margins are approximate: actual margins defined by wire fence around perimeter of softball grounds. Activity outside these areas, including artificial football field, was negligible. Blue dots indicate stationary observation points. Three scans per area (total six scans).



Newlands Park: Saturday 14th November, 3.25 – 3.42 pm

One game of senior men's club softball. The blue dot indicates the stationary observation point. There were three scans of the area.

