Playground drinking fountains in 17 local government areas: survey methods and results

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ABSTRACT

Appropriate public access to water is an increasing concern, and to further explore field observation methods for assessing such access, we aimed to survey drinking fountains in playgrounds across many local government areas. We systematically collected data (including photographs) of drinking fountains in randomly selected public playgrounds in 17 local government areas (TLAs) in New Zealand. The time for playground surveys was always less than 15 minutes. We found only one of the 17 TLAs had working drinking fountains in all the playgrounds sampled, and 11 working fountains in all 54 playgrounds (20%). Three had metal discolouration within 1cm of the nozzle. The systematic observation method was relatively quick, making it suitable for local officials and health promoters.

The supply of drinking water is a civic and public health issue, due to the need to re-normalise water use and protect against heatwave effects. Advocates and policymakers need accurate information on the prevalence, distribution and quality of water supplies accessible by the public, so as to better plan, maintain and advocate for them. Outdoor field observation can provide objective data on the presence and functionality of assets and infrastructure.

While there is a literature on drinking water availability and standards in schools there is less on the prevalence of drinking fountains in urban public places. We found two objective evaluations of the availability of fountains in non-school (public) locations; a 2013 study of parks in a North Carolina city and a previous 2014 New Zealand study in one city. Neither study reported on the time taken to access an area.

We aimed to survey fountains in playgrounds across a larger number of local government areas, so as to better determine their distribution and functionality, and to further develop the methods used. Our methodological aims included simplicity of data collection, methods that could be used with a minimum of training, the ability to check the data, testing the method across many jurisdictions and a short field data collection time per site.

Methods

The study involved systematic outdoor field observation by solo observers. We used a convenience sample of 17 contiguous Territorial Local Authorities (TLAs) in the lower North Island of New Zealand (see Table 1). Within each TLA a random selection of playgrounds was made from a denominator list generated from information from TLA websites or by identifying playgrounds from Google Maps. We sampled either 10% of the playgrounds or two per TLA, whichever figure was higher. Field observations were conducted between December 2016 and May 2017 by observers who walked around the perimeter of each playground area, surveying the area within 100 metres of the play equipment.
Each fountain found was photographed for each of the following aspects:

- From a distance (20–30m) and from between 5–10m, to provide locational and other context to the fountain.
- Close up to show any features such as side taps or attached basins for facilitating drinking by pet dogs.
- A close photograph (side-on and level with the drinking nozzle) of the water stream to allow assessment of the water flow.
- A close photograph of the nozzle where the water leaves the fountain—to assess for discolouration (eg, from biofilm).
- A photo of the playground or park name, or a nearby street name.

All of the taps were tested. Notes were taken on any features of the fountains or their context that might affect the fountains’ usage.

Results

All playground surveys took less than 15 minutes to conduct per site. The analysis of photographs and notes for the features of interest and other relevant aspects of fountain context and design (see Figure 1), took approximately 10 minutes per fountain.

Figure 1: Poorly maintained fountain with grass growing in the drainage sink.
Only 20% (11) of the 54 playgrounds had a working drinking fountain within 100 metres of the playground equipment. Two other playgrounds had non-functioning fountains, although one of these had a side tap working. Eight of the TLAs sampled (47%) had working fountains in only some (9/33) of the playgrounds sampled, and another eight TLAs had none in the playgrounds sampled (Table 1).

Of the 11 working fountains, nine (82%) had side taps for filling water bottles or bowls (Figure 2). The water stream in Figure 1 was the most marginal for drinking. The working fountains appeared to be well maintained, albeit with the exception of grass growing out of one (Figures 1 and 2). Three fountains had discolouration on the metal surround (eg, from biofilm) within 1cm of the nozzle of the fountain (Figure 3).

Fountains varied in the type of nozzle surround used (Figures 2 and 3). The nature and extent of such surrounds appeared to affect the ability to clean around the nozzle, to allow sunlight exposure and to increase the likelihood of discolouration.
Figure 3: Example of discolouration (probably from biofilm) around a drinking fountain nozzle.

Table 1: Results for the 17 local government areas in the lower North Island of New Zealand.

<table>
<thead>
<tr>
<th>Local government area (CC: City Council; DC: District Council)</th>
<th>Playgrounds with or without working drinking fountains within 100m of playground equipment</th>
<th>Total (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No fountain (N)</td>
<td>Working fountain present (N)</td>
</tr>
<tr>
<td>Carterton DC</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Central Hawkes Bay DC</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Gisborne DC</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Hastings DC</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Horowhenua DC</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Kapiti Coast DC</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Lower Hutt CC</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Manawatu DC</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Masterton DC</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Napier CC</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Palmerston North CC</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Porirua CC</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>South Wairarapa DC</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Tararua DC</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Upper Hutt CC</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Wairoa DC</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Wellington CC</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>43</strong></td>
<td><strong>11</strong></td>
</tr>
</tbody>
</table>
Discussion

While access to sites across a number of jurisdictions can take time and resources, within jurisdictions this method could be a simple and easy way for local health promoters and local government workers to assess fountains (and other health-related assets such as signage). Such inspections could be part of a parks and playground audit. Photographs provide data that can be checked and interpreted by multiple observers.

There appears to be a need in New Zealand (as in other countries) for the systematic requirement and provision of drinking water in public places. Civic authorities need strong procedures in place for the monitoring, maintenance, repair and replacement of drinking fountains and the water provided, reinforced by required national standards.

Further research could use similar methods to examine the presence, quality and operation of more drinking fountains per jurisdiction, across larger numbers of local government areas and larger cities, and to compare drinking water access between countries. While children’s playgrounds seem a relative priority area for the presence of drinking fountains, other relatively high priority sites for such research include parks with sports fields, public squares and popular beach locations.

The limitations to this research include the lack of testing to see if Google Street View (GSV) could supplement or replace the field data collection. While GSV is increasingly being used for field research in the built environment, our preliminary work found it of limited value with this type of fountain (and so we did not evaluate it formally in this study). The utility of GSV was limited because some fountains were located relatively deep in parks and away from roads. But when the ‘footpath view’ function of GSV is more widely available in such parks, then this tool could be studied more formally for this purpose.

Further limitations include the lack of research into the types of people who use fountains, the nature of fountain use, the causes of the nozzle surround discolouration and the microbiological quality of the water. Further research could look at possible algal growth and degradation of the nozzle metal components as possible causes of the observed discoloration.

Further information on the methods and results from this study is available in an online report (http://www.otago.ac.nz/wellington/otago660055.pdf).

Competing interests:
Nil.

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