

**Submission
No 18**

PREFERENCE COUNTING IN LOCAL GOVERNMENT ELECTIONS IN NSW

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Submission to the Joint Standing Committee on Electoral Matters Inquiry into Preference Counting in Local Government Elections in NSW

Introduction

Thank you for the opportunity to make a submission to the Joint Standing Committee on Electoral Matters Inquiry into Preference Counting in Local Government Elections in NSW.

I am writing as a candidate at the Local Government election held on September 9, for the Northern Beaches Council, Pittwater Ward. The ward had an unusually large number of candidates at 26, arranged in eight groups on the ballot paper. I was the lead candidate for the Greens ticket and was eliminated after the 24th count by a margin of 116 votes.

Following the count, I requested a recount which was rejected.

During the count a number of people scrutineered for me, including Simon Wild, an expert in software development who until recently was the Director of Engineering at a security software firm. Comments further in this submission are based on his input.

I also scrutineered on a recount for another Greens candidate.

My observations are based on these experiences and two papers:

- A blog by ABC election analyst Antony Green: *NSW Electoral Law and the Problem of Randomly Elected Candidates* (January 13, 2016)
<http://blogs.abc.net.au/antonygreen/2016/01/nsw-electoral-law-and-the-problem-of-randomly-elected-candidates.html#more>
- an academic paper, *An analysis of New South Wales electronic vote counting*, by Andrew Conway, Michelle Blom, Lee Naish, and Teague, (first published at arXiv.org in November 2016) and on media reports of that paper.

a) the current system of “random selection” in the counting of preferences in local government elections

Antony Green explains that the use of “random selection” is enshrined in NSW legislation and originates from the time when vote counting and preference distribution was carried out manually. However, he points out that the use of random sampling means that the count in any seat is non-reproducible.

“Re-running the 2012 local government elections has found around 90% of contests always elected the same councillors no matter how many times you ran the count. The problem was the one in ten contests where outcomes were not always repeatable,” Green says.

Furthermore, Conway et al, say that because the process is now carried out by computer, it is not transparent.

“...neither the source code for the count nor the method choosing the randomness are observable by the public. Without a transparent process showing that the randomness is fairly generated, the outcome could be accidental or deliberately biased”, the authors say.

As a candidate, the fact that experts have questioned such a fundamental part of the count undermines my confidence in it and preference distribution. It is particularly frustrating, given that the process is computerized and scrutineers are unable to observe it.

b) whether this system delivers fair results in all cases for candidates
The outcome of local government elections are potentially unreliable in about 10 per cent of seats in local government elections because of random selection, according to the above authors. Green says “there were Councillors elected in 2012 with less than 50% probability of being elected if the distribution of preferences were repeated”. He notes that if a seat came down to less than 200 votes in Legislative Council elections using a similar system, then random selecting might play a part in electing a particular candidate.

The problems are potentially amplified with greater numbers of iterations of counts and distributions. As Green says: “Indeterminacy created by random sample stems from the point where random sampling takes place, but then propagates through the count by its impact on subsequent exclusions.” So that in the case of Pittwater Ward for the Northern Beaches Council, by the time of the 24th count when I was excluded the results could have been quite different from an exhaustive count.

Therefore, as a candidate at the recent council elections with:

- a large number of candidates standing
- complicated preference flows
- and having been eliminated by a margin of 116 votes on the last count

I do not have confidence in the outcome of the count or its fairness.

c) whether there are any alternative methods of ballot counting which would produce more accurate preference flows

Given that data for all preferences are now entered digitally and the availability of modern powerful computers, I believe the most appropriate way to solve the problem of unreliability due to random selection is to allow full and exhaustive counts carried out by computers – which are designed to do this type of work. Instead of random selection, fractional transfers of all votes should be carried out for preferences - as described by Green. This would ensure counts were reproducible and reliable, giving voters assurance that their individual preferences have actually been taken into account – and candidates security in the knowledge that the

count isn't just a fluke. To enable this, the legislation governing elections should be changed accordingly.

d) any other related matter

Preferencing Software and its Underlying Algorithms Should Be Publicly Available to Ensure Transparency and Reliability

Another issue discussed by Conway et al is the fact that the software used to allocate preferences inevitably contains bugs, despite certification, which may have affected some results. The authors also point out inconsistencies between the legislation, underlying algorithm and software itself.

Because the source code is not publicly available, those bugs remain hidden from public sight.

Simon Wild spent time trying to find the algorithm underlying preference distribution on the NSW Electoral Commission website. However, he was unable to do so. This was one of the grounds I gave in an unsuccessful bid for a recount.

The NSWEC did send us the link to the algorithm when it rejected the recount, however, it is obscurely named which explains our difficulties locating it.

The argument that the software should be kept out of the public domain for security reasons is spurious. Security by obfuscation is not security. The software should be public because voting is meant to be a transparent process.

If the NSW EC is worried about someone hacking into the software to attack the code, it means that the data is equally vulnerable. If there was a break in, the attacker could do all sorts of other damage, such as change votes.

For the sake of transparency, we therefore follow most of Conway et al's reasons (see their section 6) for making the preferencing software publicly available and believe the algorithm underlying it should also be more accessible because:

- "It enables external people to notice bugs before the software is used in an election.
- "It makes it easier for external people to verify bugs.
- "It makes it easier for the electoral commission to demonstrate and defend its integrity."

Given doubts about reliability of random selection and the software used for second and later preferencing, I believe when a recount is requested in the case of a close final count (with a difference of less than 200 votes), the electoral commission should offer a recount to candidates free of charge to demonstrate the reliability of the result. This might need to be done repeatedly to confirm the outcome - until such time that the system is changed to guarantee a repeatable outcome.

Treatment of Informal Votes

During scrutineering for the recount for Parramatta Council, I was surprised to discover that data for preferences from informal votes was entered into the system, along with that from formal votes. When electoral commission staff were reading back the data to check against ballot papers, I asked them randomly to tell me how the system had classified informal ballot papers, and on most occasions I was told it was “formal”.

This raised several questions for me about how ballots are determined as formal or informal. First of all, it was clear that large numbers of voters did not understand how to fill in their ballot papers. The instructions are clear that the voter should mark either above the line or below. However, the system (and Returning Officers) are prepared to accept a combination of both “if intention is clear”.

However, accepting papers with multiple markings of 1, 2, 3, 4, 5 etc is ambiguous and begs the question: how is the computer software actually treating this data once it is entered and how is it affecting preferencing?

If, however, the software treats informal votes as informal, why then spend time and therefore public money, entering the redundant data into the system (involving two rounds of data entry and its reconciliation)?

This also demonstrates that the attempt to simplify voting by introducing above the line voting has made the ballot paper even more confusing for many people – and better education is needed to help voters understand how to allocate preferences.

(In Pittwater at pre-poll and on polling day, with 26 candidates and the large amount of material being handed out, it was clear that voters were extremely confused about what they were meant to be doing. Many took all the How to Vote papers then said they were going home/away to study them to try to work out what to do. In this situation it was unsurprising that we had an informal vote of nearly 12 per cent and failure to vote of around 20 per cent.)

Conclusion

My experience as a candidate in the recent local government elections - after reading reports of random selection and software bugs reducing the reliability of preference distribution – has been to leave me with doubts about the outcome of the count in my ward. These doubts are increased by the lack of transparency inherent in the system, because scrutineers cannot observe a computerised count, and the software used to count votes is publicly unavailable. Although the algorithm is available, it is so obscurely named that a highly experienced software engineer who scrutineered for me couldn't find it.

I would therefore like to see a computerized count and allocation of preferences using a fractional method replace random selection. This

would require a change in NSW electoral legislation. The software and its algorithm should then be made publicly available to ensure transparency.

Consideration of the need for entering informal votes into the database should be carried out - if retained, how these are treated in allocating preferences should be made clear.

Finally, redesign of ballot papers and education about how to fill them in should also be considered to enable voters to allocate their preferences as intended, making a formal vote.

I include - on following pages - a copy of my request for a recount and the NSW EC's denial of that request.

Yours faithfully,

Miranda Korzy

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