

Gender-Inclusive Legislation Associated With Increased Harm to Women

Introduction

On Tuesday, February 28, 2017¹ the Honorable Senator Lillian Eva Dyck rose to speak in support of Bill C-16 in the Canadian Senate. In a speech marred by numerous and unfortunate errors, she sought to debunk the argument that Bill C-16 gives greater opportunities to male sexual predators in women's spaces.² In rebutting this concern she firstly quoted Senator Mitchell, saying "I'm not aware of these kinds of episodes", and Senator Petitclerc stating, "even with my best efforts, I could find no indication that these fears, which have been maintained for so many years, are founded". Sen. Dyck summarizes, "the predicted increase in sexual predation in public bathrooms as an undue consequence of providing human rights protection for transgender people has not happened."

While I wouldn't want to question the best efforts of our Honorable Senators, the WOMAN Means Something campaign has catalogued 255 incidents in which males have perpetrated violence against women in non-sex-segregated spaces as of Apr 30/2017.³ Using even the most stringent category of offenses--those in which biological males identified or expressed (clothing, wig, etc.) as women, the database yields 29 incidents in the UK, USA and Canada.

¹ https://sencanada.ca/en/content/sen/chamber/421/debates/099db_2017-02-28-e#63

² A few of these are as follows:

1. "If we assume 1 victim per perpetrator, then in 1 year, 1,017 females were victims of indecent acts or indecent exposure. That is only about 1,000 females out of about 17.5 million in Canada. A woman has a 1 in 17,000 chance of being the victim of an exhibitionist"
 - a. Krueger, in *Noncontact Paraphilic Sexual Offenses* (2016) says, "In a survey of 13,551 women and 11,375 men in Great Britain (Walby & Allen, 2004), 12.8 % of women reported being the victim of indecent exposure.... Cox (1988) reported on a sample of 846 college women taking general psychology at nine universities randomly selected from across the United States; 33 % reported being victims of indecent exposure and one-third of these at least twice. Only 15 % of these episodes were reported to police (Cox, Tsang, & Lee, 1982). Abel (*Multiple Paraphilic Diagnoses Among Sex Offenders*, 1988): "Exhibitionistic and voyeuristic acts occurred up to 150 times more often than official police arrest statistics indicated." Examples from our own database show that many perpetrators (in this case of voyeurism) have hundreds or thousands of victims.
2. "Colleagues, how many transgender people are there in Canada?" she states. She then goes on to quote from a Forum Research poll done in 2012 which states that 5% of Canadians identify as LGBT.
 - a. This conflates two categories of vastly different sizes. According to the Williams Institute, 0.6% of the US population identifies as trans, a number that is likely here in Canada as well. In light of no Canadian data, this number should be accepted. However, even the poll Dyck chooses to use of the broader LGBT population is problematic, given that their findings are much higher than the Canadian Community Health Survey numbers, which have ranged from between 2 and 3% for the last decade, and that the Forum Poll only samples 2,694, while the CCHS samples 65,000.
3. "It should also be noted that according to the American Psychiatric Association, exhibitionists rarely do anything else but expose themselves", Dyck states.
 - a. Krueger (2016): "One-hundred and forty-two subjects were diagnosed with exhibitionism; of these, only 7% had this as a sole diagnosis. Forty-six percent were also diagnosed with female nonincestuous pedophilia, 28 % with voyeurism, and 25 % with rape." Langevin (*Erotic Preference, Gender Identity, and Aggression in Men*, 1985, p34): "Exhibiting, peeping, obscene call, toucheurism, and rape coocurred in the rapists, supporting Freund et al.'s (1983) theory."

³ <http://womanmeanssomething.com/violencedatabase/>

Examples from Canada alone include:

1. [Christopher/Jessica Hambrook \(2012\)](#): assaulted two women in Toronto shelters, in at least one case after *three weeks* identifying as a woman.
2. [Darren Cottrelle \(2013\)](#): dressed as a woman and committed voyeurism in a woman's washroom at Dufferin Mall in Toronto.
3. [Xingchen Liu \(2105\)](#): dressed as a woman and committed video voyeurism at Leduc Recreation Centre in a woman's change room in Edmonton.
4. [Unknown male identified as woman \(2014\)](#): ogled elderly woman while having an erection in woman's change room in Toronto.



While not in a woman's space, the University of Toronto debacle (Oct, 2015) also illustrates the very same predator problem in which bathrooms which were made gender-neutral in order to facilitate inclusivity led to at least three women being the victims of voyeurism in showers.⁴ An elderly woman in a unisex changing area at the new Grandview Heights Aquatic Centre in Surrey, BC was also the victim of voyeurism in June 2016.⁵ Thus there are many examples, even in Canada, of the kind of predatory events of which Senators Mitchell, Pettitclerc and Dyck say they are unaware.

As a second piece of evidence Senator Dyck references a Media Matters website which purports to debunk what they call "the bathroom predator myth". She says, "All of them [US authorities] stated that protecting transgender individuals through legislation has not led to any increase in sexual predation in public washrooms, change rooms and so on. There were no observed increases in 16 states, 23 school districts and 4 universities." This Media Matters article has been referenced by many mass media outlets over the years, including Time magazine.⁶ It our goal, firstly, to survey the evidence offered by Media Matters, and then secondly to test their claim of "no increase" by a statistical and geographical analysis of our violence database.

Our analysis will show that by every meaningful query, regions which have gender legislation in place (18 states, 9 provinces/territories) have a significantly greater likelihood of predatory incidents in women's safe spaces than those which do not (32 states, 4 provinces/territories). While there are limitations to our analysis, this data is superior to the anecdotal evidence thus far available and supports the contention that there is a significant correlation between gender legislation like Bill C-16, and increased harm to women.

In addition we will consider Target stores as a case study in comparing predatory incidents in their stores to other's.

⁴ There are two different news reports of incidents at [Whitey Hall](#), and at [Sir Daniel Wilson](#).

⁵ <https://archive.is/QJtqC>, also <https://archive.is/2gidi>

⁶ <http://time.com/4314896/transgender-bathroom-bill-male-predators-argument/>

Debunking the Debunkers

Media Matters' page, "*15 Experts Debunk Right-Wing Transgender Bathroom Myth*", is a frequently referenced resource for gender-policy supporters.⁷ The summary states

Experts in 12 states -- including law enforcement officials, government employees, and advocates for victims of sexual assault -- have debunked the right-wing myth that sexual predators will exploit transgender non-discrimination laws to sneak into women's restrooms, calling the myth baseless and "beyond specious."

What follows is a collection of quotes by officials and advocates in 12 of the 18 states in the USA with gender legislation, stating the alleged safety of the legislation. However, in surveying the quotes given, a number of significant problems emerge.

Firstly, there are methodological concerns. Did they have standardized questions that they asked of officials? Given the variety of individuals referenced, from government officials to sex-assault advocates, how did MM pursue their enquiry? Is it possible to rule out a selective representation of the responses received? And how were their questions worded? For instance, many of the statements given are cause-and-effect opinions which are highly subjective. Those who have conducted studies or are familiar with poll methodology know well that the precise framing of a question can yield vastly disparate results.

For instance, if you ask "has your gender inclusion policy led to any (relevant) violent incidents in washrooms or change rooms?", you are asking a cause-and-effect question which may yield a "no incident" response. However, if the question is worded "has there been any (relevant) violent incidents in washrooms or change rooms?", the same respondent with the same data may potentially give a different answer.⁸

Secondly, a number of the statements address a straw-man argument that few, if any, women's-protections advocates are making-- that trans individuals are particularly dangerous. For instance Cassandra Thomas, a Houston Sexual Assault Victims' Advocate is quoted saying, "so all of a sudden women are in danger because of transgender people?" The DC Trans Coalition is cited similarly, "All over the world, anti-trans bigots try to convince the public that trans people are somehow a "threat" in public bathrooms." It is highly prejudicial to conflate the argument that gender legislation grants greater opportunities to male predators with the idea that trans people are a "threat in public bathrooms." This kind of category confusion does not lend itself to confidence in the evidence presented.

⁷ <https://mediamatters.org/research/2014/03/20/15-experts-debunk-right-wing-transgender-bathro/198533>, along with the similar page Sen. Dyck mentions: <https://mediamatters.org/research/2016/05/05/comprehensive-guide-debunked-bathroom-predator-myth/210200>

⁸ Two examples will suffice: "Law enforcement officials (Washington D.C., Delaware, and Maryland) reported that their civil rights laws hadn't been linked to any crime", and "In an email to *Media Matters*, Jim O'Neill, legislative liaison and spokesman for the Connecticut Commission on Human Rights in Opportunities, reported no problems as a result of the state's non-discrimination law".

In fact, in at least one case, this straw-man argument hides, albeit barely, a very serious incident of the kind that pro-protections advocates warn about. Oregon Bureau of Labor and Industries spokesman Charlie Burr is cited saying, "Our agency has encountered zero allegations of LGBT assault related to this public accommodation protection." However, on July 2011, predatory sex offender Thomas Lee Benson, dressed as a female and entered the women's change room at North Clackamas Aquatic Park. Oregonlive.com states that Benson " who was convicted of sexually abusing children 17 years ago, has a long history of dressing as a female and using women's dressing areas", and "was wearing a bra, lipstick and eye-liner when he was arrested."⁹ While it is just possible that this event would not be seen by some gender policy advocates as an incident by an LGBT individual, it is certain that Benson was expressing as a woman by his clothing, something overtly protected by gender legislation like Bill C-16.



Thirdly, the states which have gender legislation but which were not surveyed or reported by Media Matters are a notable group. Of these six states, five are among the most populous states with gender legislation: California, Maryland, New Jersey, New York, and Washington. Is there a reason the most populous states wouldn't be included in their survey?

Furthermore, and most problematically, some of the states which Media Matters have left out are *precisely* the States where incidents and problems have arisen. California has more incidents of sexual violence in women's spaces by those dressed or identified as women than any other state--five. These are incidents that Media Matters claim *do not exist*. Washington has 3 incidents perpetrated in women's spaces by males. Moving into the category of incidents by males in unisex spaces, examples balloon, with California represented in our violence database by 19 incidents, Washington by 9, and New York by 7.

To say that the evidence provided by Media Matters is highly problematic would be charitable. The presentation of their data, and omission of other evidence, calls into question motive and methodology. Even if one were to overlook these concerns, we would be left with no more than a collection of anecdotal testimony in a variety of jurisdictions. Although this is marginally better than mere opinion, as presumably officials *ought* to be more knowledgeable than the general public, is there a way to at least move a little closer to an objective analysis? Our violence database offers us the potential to do this and potentially draw some helpful conclusions.

⁹ <https://archive.is/ZvG5D>

Summary of Findings

- Total database incidents were almost twice as likely (1.8x) to occur in regions with gender legislation.
- Incidents where bio-males identified or expressed (clothing, wig, etc.) as women were more than twice as likely (2.1x) to happen in regions with gender legislation.
- Regions with the highest incidents per population (per million) are all regions with gender-inclusive legislation*
 1. Connecticut (1.40)
 2. Ontario (1.36)
 3. Washington (1.23)
 4. Maryland (1.00)
 5. Alberta (0.98)
- Out of the regions with no incidents, four out of the five regions with the highest population are those without gender-inclusive legislation (Nevada being the exception)
 1. Quebec (8.16 million)
 2. Utah (3.05 million)
 3. Arkansas (2.99 million)
 4. Mississippi (2.99 million)
 5. Nevada (2.94 million)

Methodology and Limitations

Our geographical analysis¹⁰ of the violence database available at www.WOMANmeanssomething.com was accomplished by firstly noting those regions (states, provinces and territories) with gender legislation and those without. We then sorted the incidents according to region in order to determine the amount of incidents in each region. We used population data available at Wikipedia in order to analyze incidents per population.¹¹

We also took note of a few different queries which we thought may help analyze the data: date (prior to 2014, or equal to or after 2014), single-user unisex spaces omitted, and whether the event occurred in

The Violence Database is a database of violent incidents compiled by Paul Dirks of the WOMAN Means Something Campaign. The criteria for inclusion in the database is that the incidents are perpetrated by biological males against females in "safe spaces" such as change rooms, bathrooms, and shelters which have not been segregated by sex.

The database is useful in establishing that, 1) Sexual violence happens against females when they are vulnerable and not segregated from males, and 2) Unisex spaces are more dangerous for females

Examples include voyeurism in unisex locker rooms at pools and recreation centres, voyeurism in unisex change rooms in clothing stores like Target, and hidden camera voyeurism within single-user unisex spaces in medical facilities , businesses and restaurants.

While it has been challenging to know exactly where to draw the lines for inclusion in the database, we have not included examples of teacher's voyeurism in classrooms where they have been used as change rooms, or personnel like janitors using their unique positions of greater access to perpetrate hidden camera voyeurism.

We relied on journalists to be our "verification" source for these stories and feel that to do otherwise would be to presumptuously disbelieve a woman's sexual assault testimony, an ongoing problem that society has been trying to correct for decades.

¹⁰https://docs.google.com/spreadsheets/d/1cB2hfBSNMvt0EfoVeLF1Vm9MONw1pDR_m0DnTbCHYko/edit?usp=sharing

¹¹https://en.wikipedia.org/wiki/List_of_Canadian_provinces_and_territories_by_population_growth_rate
https://en.wikipedia.org/wiki/List_of_U.S._states_and_territories_by_population

a woman's space or by someone who identified or expressed "female". All analysis was done per population.

There are a number of limitations to our approach. Firstly, it is not obvious which kinds of incidents may be correlated to gender policy. The clearest correlation would be incidents where biological males have committed violence in women's spaces in situations where they have expressed or identified, in some measure, as feminine or a woman. We made a query for this, but as a small group of incidents (29) it lacks in statistical power.

Unisex facilities have sometimes proliferated because of gender concerns and policies,¹² but not always, as in the example of the UK, where unisex change spaces have been around for a long time (and, consequently, where predators have been active for a long time).¹³ We surmised that single-stall unisex spaces (coffee shops, medical facilities) are perhaps the least likely to be strongly correlated to gender policy, and so designed a query to remove these incidents.

There may be regional differences in reporting of incidents in the news. In less populous regions there may be a greater likelihood to report voyeurism incidents in the news as a function of less news to report, or more relevancy to smaller, more tightly-knit communities. In more progressive gender-policy regions, some incidents may possibly go underreported due to their possibly inflammatory nature. In total, we think it likely that if there are regional biases, it is more likely that it minimizes, rather than exaggerates the disparity seen in our conclusions than otherwise.

Another possible limitation that may affect regional comparison is the likelihood of search engines returning incidents closer in proximity to the user/researcher. We attempted to mitigate this by including major cities in all regions throughout Canada and the USA in our search terms.

Findings

- Every query returned a greater likelihood of incidents per population in regions that had gender policies than for those which did not. This consistency suggests that the findings are significant. Furthermore, there are no significant outliers, with even smaller regions such as Rhode Island returning no more than 3.77 incidents/million. Thus the range of data provides confidence in the results.
- Regions with gender legislation (0.65 incid./mill) were 1.8x as likely to have violent incidents than those without (0.36 incid./mill).
- The regions with the highest amount of incidents were California (19) and Ontario (19), followed by Florida (11), and three regions with 7; Texas, New York and Pennsylvania. A significant population effect exists in this list, with only Ontario having a very high incident level per population.

¹² See the two examples mentioned earlier at University of Toronto and the Grandview Aquatic Centre.

¹³ Forty-five of the 59 incidents at pools or recreation centers in our database happened in the UK.

- Not counting states and provinces with less than 2 million people (which screened out four higher S/P¹⁴), the five highest incident rates per population were in regions that had gender identity laws, with Indiana being the only one without gender policy in the top ten.
 1. Connecticut (1.40)
 2. Ontario (1.36)
 3. Washington (1.23)
 4. Maryland (1.00)
 5. Alberta (0.98)
 6. Oregon (0.98)
 7. Iowa (0.96)
 8. Indiana (0.90)
 9. Massachusetts (0.88)
 10. British Columbia (0.86)
- Of the most populous regions with no incidents found, four out of the five do not have gender policy, with Nevada being the exception.
 1. Quebec (8.16 million)
 2. Utah (3.05 million)
 3. Arkansas (2.99 million)
 4. Mississippi (2.99 million)
 5. Nevada (2.94 million)
- Regions with gender legislation (0.095 incid./mill) were 2.1x as likely to have violent incidents perpetrated by those who expressed or identified as women than those without (0.045 incid./mill).¹⁵ However, this masks an even greater disparity as a significant amount of these events in non-gender-legislation regions occurred in *specific* places that did have gender policies (Target stores, prisons, etc.)
- The regions with the highest amounts of these "women's spaces" incidents were California (5), Ontario (4, 2 by same perp.), Washington (3) and Virginia (3- all by same perp.).
- Incidents prior to 2014 took place 2.7x more in regions with gender policy, while those in 2014 or after took place 1.6x more.
- When removing single-user unisex space incidents, the overall finding (1.8x) between gender legislation and none, narrowed, to 1.4x. While still returning a greater likelihood in gender legislation regions, the narrowed margin reflects a minor surprise given the overall findings.

¹⁴ These include Delaware (4 incid., 2.1 incid./million, gender policy), Rhode Island (4 incid., 3.8 incid./million, gender policy), North Dakota (1 incid., 1.3 incid./million, no gender policy), Nova Scotia (1 incid., 1.1 incid./million, no gender policy)

¹⁵ As noted, this is a relatively small group of incidents (29). The irony here, of course, is that this represents 29 more incidents than most gender-policy advocates recognize.

Target Stores: A Comparative Case Study

In April 2016, Target stores became a lightning-rod of controversy after touting its gender-inclusive policies for its washrooms and change rooms.¹⁶ While Target claims that these policies had long been in place, the visibility of their stance caused many to boycott the supermarket giant who competes with Costco and Wal-Mart. Target, of course, is not the only retailer to have non-sex-segregation policies.¹⁷ And indeed many clothing stores have long had unisex changing spaces with individual stalls.

In an article in the Wall Street Journal on April 5, 2017 Khadeeja Safdar wrote, "Earlier this year, a coalition of about 50 companies, including Amazon, Williams-Sonoma Inc. and Gap Inc., signed a document saying their gender-inclusive policies haven't contributed to an increase in sexual assaults or other incidents. Target didn't sign the document."

It seems likely that Target didn't sign the document because of the surprising amount of violent incidents that have taken place in their change rooms and washrooms.¹⁸ Our violence database allows us to make some comparisons between Target and other clothing stores. Target has 13 incidents listed in our database. The next highest is Asda (UK) with 7, then Old Navy with 6. Goodwill Thrift Stores has 5, while H&M and Forever 21 have 4 each.

Moreover, it seems as if there is a correlation between the timing of Target's announcement and the incidents. From Apr 2016 to Apr 2017, Asda (UK) had two incidents, as had Old Navy. Target had seven! There have been three incidents in 2017 alone at Target stores.

One of the most notable of these Target incidents occurred in July 2016 at the Target in Ammon, Idaho. Shauna Smith, a transwoman, perpetrated voyeurism against an eighteen-year old woman by videotaping her on her cellphone while she changed. The teenage victim related that she "has not entered any public restrooms or dressing rooms" since, and "won't go into stores alone. 'I live with anxiety and fear that men will only focus on my body,' she said. 'I have felt emotional mutilation.'"¹⁹



¹⁶ " In April last year, Target Corp. published a blog post welcoming transgender employees and shoppers to use restrooms and fitting rooms corresponding with their gender identities. 'Everyone deserves to feel they belong,' read the post, which turned half of Target's red bullseye logo into a gay-pride rainbow." <https://www.wsj.com/articles/how-target-botched-its-response-to-the-north-carolina-bathroom-law-1491404107>

¹⁷ Gender inclusion policies are one form of non-sex-segregation, while unisex change rooms are another. Ideally, the two categories would not be conflated, even in a case study, but lack of statistical power and lack of knowledge in the date of other store's gender-inclusion policies make a more detailed analysis impossible.

¹⁸ I have only counted incidents here adhering to the criteria set out in our violence database. There are other incidents at Target which include upskirt voyeurism, change room masturbation, and more. I am not counting these.

¹⁹ <https://www.eastidahonews.com/2017/01/target-voyeur-sentenced-victim-says-felt-emotional-mutilation-following-incident/>

At the sentencing of Smith in January of this year, Judge Joel Tingey stated, “I, perhaps along with others, thought that Target has now adopted a questionable policy (and wondered) is someone going to come in and victimize someone because of that,” Tingey said. “You took advantage of that and victimized this young lady.” The data supports Judge Tingey. Target's gender-inclusion policy has seemingly been an invitation to predators, and women, include teenagers, have paid the price.

Conclusion

Our geographical analysis of the violence database provides the best evidence yet that gender-inclusive policies and legislation are correlated to increased harm against women. While limitations exist to our analysis, and it may not meet the rigor of peer-reviewed research, it constitutes significantly better evidence than that which was previously available, which tends to be anecdotal and circumstantial.

The case study of Target stores also supports this contention, as violent incidents have been comparatively greater than other stores, and especially in the year since the public announcement of their policy.

An infographic is also available that presents key findings of this article in a summary and graphical form.

Appendix 1: Geographical Analysis of Violence Database

		Number of Incidents					Incidents per Million							
		State/Province	Incidents	< 2014	> 2014	Non-single stall	Wom	<2014 Inc./pop	>2014 Inc./pop	NSS Inc./pop	Wom Inc./pop	Total Incid./pop	Population	
USA	Gender Policy	California	19	7	12	9	5	0.1783	0.3057	0.2293	0.1274	0.4841	39,250,000	39.25
	18	Colorado	1	0	1	1		0.0000	0.1805	0.1805		0.1805	5,540,000	5.54
		Connecticut	5	2	3	4		0.5602	0.8403	1.1204		1.4006	3,570,000	3.57
		Delaware	2	0	2	1		0.0000	2.1053	1.0526		2.1053	950,000	0.95
		Illinois	4	0	4	3		0.0000	0.3125	0.2344		0.3125	12,800,000	12.8
		Iowa	3	1	2	2	1	0.3195	0.6390	0.6390	0.3195	0.9585	3,130,000	3.13
		Maine	0	0	0			0.0000	0.0000	0.0000		0.0000	1,330,000	1.33
		Maryland	6	0	6	4		0.0000	0.9967	0.6645		0.9967	6,020,000	6.02
		Massachusetts	6	1	5	6		0.1468	0.7342	0.8811		0.8811	6,810,000	6.81
		Minnesota	1	1	0	1		0.1812	0.0000	0.1812		0.1812	5,520,000	5.52
		Nevada	0	0	0			0.0000	0.0000	0.0000		0.0000	2,940,000	2.94
		New Jersey	3	0	3	3		0.0000	0.3356	0.3356		0.3356	8,940,000	8.94
		New Mexico	0	0	0			0.0000	0.0000	0.0000		0.0000	2,080,000	2.08
		New York	7	3	4	3		0.1519	0.2025	0.1519		0.3544	19,750,000	19.75
		Oregon	4	2	2	3	1	0.4890	0.4890	0.7335	0.2445	0.9780	4,090,000	4.09
		Rhode Island	4	2	2	1		1.8868	1.8868	0.9434		3.7736	1,060,000	1.06
		Vermont	0	0	0			0.0000	0.0000	0.0000		0.0000	620,000	0.62
		Washington	9	3	6	5	3	0.4115	0.8230	0.6859		1.2346	7,290,000	7.29
		Total	74	22	52	46	10	0.167059002	0.394866732	0.349305186	0.07593591	0.5619	131,690,000	131.69
		None	Alabama	1	0	1	1		0.0000	0.2058	0.2058		0.2058	4,860,000
	32	Alaska	0	0	0			0.0000	0.0000	0.0000		0.0000	740,000	0.74
		Arizona	4	2	2	3		0.2886	0.2886	0.4329		0.5772	6,930,000	6.93
		Arkansas	0	0	0			0.0000	0.0000	0.0000		0.0000	2,990,000	2.99
		Florida	11	4	7	9	1	0.1941	0.3396	0.4367	0.0485	0.5337	20,610,000	20.61
		Georgia	5	1	4	5	1	0.0970	0.3880	0.4850	0.0970	0.4850	10,310,000	10.31

USA	Hawaii	0	0	0			0.0000	0.0000	0.0000		0.0000	1,430,000	1.43	
	Idaho	1	0	1	1	1	0.0000	0.5952	0.5952	0.5952	0.5952	1,680,000	1.68	
	Indiana	6	2	4	4	1	0.3017	0.6033	0.6033	0.1508	0.90498	6,630,000	6.63	
	Kansas	1	0	1	1		0.0000	0.3436	0.3436		0.3436	2,910,000	2.91	
	Kentucky	2	0	2	1		0.0000	0.4505	0.2252		0.4505	4,440,000	4.44	
	Louisiana	2	0	2	2		0.0000	0.4274	0.4274		0.4274	4,680,000	4.68	
	Michigan	2	0	2	1		0.0000	0.2014	0.1007		0.2014	9,930,000	9.93	
	Mississippi	0	0	0			0.0000	0.0000	0.0000		0.0000	2,990,000	2.99	
	Missouri	1	0	1	1		0.0000	0.1642	0.1642		0.1642	6,090,000	6.09	
	Montana	1	0	1	1		0.0000	0.9615	0.9615		0.9615	1,040,000	1.04	
	Nebraska	1	0	1	1		0.0000	0.5236	0.5236		0.5236	1,910,000	1.91	
	New Hampshire	0	0	0			0.0000	0.0000	0.0000		0.0000	1,330,000	1.33	
	North Carolina	2	0	2	1		0.0000	0.1970	0.0985		0.1970	10,150,000	10.15	
	North Dakota	1	0	1	1		0.0000	1.3158	1.3158		1.3158	760,000	0.76	
	Ohio	6	0	6	4		0.0000	0.5168	0.3445		0.5168	11,610,000	11.61	
	Oklahoma	2	1	1	1	1	0.2551	0.2551	0.2551	0.2551	0.5102	3,920,000	3.92	
	Pennsylvania	7	1	6	6	1	0.0781	0.4688	0.4688	0.0781	0.5469	12,800,000	12.8	
	South Carolina	2	0	2	2		0.0000	0.4024	0.4024		0.4024	4,970,000	4.97	
	South Dakota	0	0	0			0.0000	0.0000	0.0000		0.0000	860,000	0.86	
	Tennessee	2	0	2			0.0000	0.3008	0.0000		0.3008	6,650,000	6.65	
Texas	7	1	6	6	*	0.0359	0.2154	0.2154		0.2513	27,860,000	27.86		
Utah	0	0	0			0.0000	0.0000	0.0000		0.0000	3,050,000	3.05		
Virginia	4	0	4	4	3	0.0000	0.4756	0.4756		0.4756	8,410,000	8.41		
West Virginia	0	0	0			0.0000	0.0000	0.0000			1,830,000	1.83		
Wisconsin	1	1	0			0.1730	0.0000	0.0000		0.1730	5,780,000	5.78		
Wyoming	0	0	0			0.0000	0.0000	0.0000		0.0000	590,000	0.59		
Total		72	13	59	56	9	0.068155604	0.30932159	0.293593373	0.047184649	0.3775	190,740,000	190.74	
0														
CAN	Gender Policy													
	9	Alberta	4	3	1	3	1	0.7371	0.2457	0.7371		0.9828	4,070,000	4.07
		British	4	1	3	2		0.2151	0.6452	0.4301		0.8602	4,650,000	4.65

CAN	Columbia												
	Manitoba					0.0000	0.0000	0.0000		0.0000	1,280,000	1.28	
	Newfoundland					0.0000	0.0000	0.0000		0.0000	520,000	0.52	
	Northwest Territories					0.0000	0.0000	0.0000		0.0000	40,000	0.04	
	Nova Scotia	1	0	0		0.0000	0.0000	0.0000		1.0870	920,000	0.92	
	Ontario	19	2	17	12	4	0.1431	1.2160	0.8584	0.2861	1.3591	13,980,000	13.98
	Prince Edward Island						0.0000	0.0000	0.0000		0.0000	140,000	0.14
	Saskatchewan	1		1			0.0000	0.9091	0.0000		0.9091	1,100,000	1.1
	Total	29	6	22	17	5				0.187265918	1.0861	26,700,000	26.7
	None												
4	New Brunswick						0.0000	0.0000	0.0000		750,000	0.75	
	Nunavut						0.0000	0.0000	0.0000		30,000	0.03	
	Quebec						0.0000	0.0000	0.0000		8,160,000	8.16	
	Yukon						0.0000	0.0000	0.0000		30,000	0.03	
	Total	0	0	0	0	0				0	0.0000	8,970,000	8.97
TOTAL	Total Gender Policies US & Can	103	28	74	63	15	0.176778837	0.467201212	0.397752383	0.094702948	0.6503	158,390,000	158.39
	Total Non-Gender Policies US & Canada	72	13	59	56	9	0.065094387	0.295428371	0.28040659	0.045065345	0.3605	199,710,000	199.71
Comparison- How much more likely?							2.715730888	1.58143651	1.418484437	2.101458425	1.803751815		

* Three incidents from a Texas woman's prison were not counted in our analysis, as the prison was clearly operating under gender-inclusive policies, in contradistinction to the state's lack of them. A more rigorous future analysis could differentiate not only at the state level, but also other levels- prison, municipal, school and university policies, etc.

Appendix 2: Independent Results Confirmation

Data source: “Geographical Analysis Violence Database“

Location: https://docs.google.com/spreadsheets/d/1cB2hfBSNMvt0EfoVeLF1Vm9MONw1pDR_m0DnTbCHYko/edit#gid=1140585300

Turned into a tab separated file (tsv) at <https://docs.google.com/spreadsheets/d/12UAX6p0YzKzqCdmuFDrBTA22QMjWYGc-7lZbz6cuR9c/edit#gid=0>

Procedure: Put data into CSV file (paul_dirks_data.tsv) and analyze with a model appropriate for count data (a poisson generalized linear model and a contingency table test)

Statistical analysis: Fit Poisson GLM model to incidents within nations

Dependent variable: Incident counts total, up to 2014, after 2014, non-single stalls.

Independent variables: State policy on trans bathrooms and state/province populations

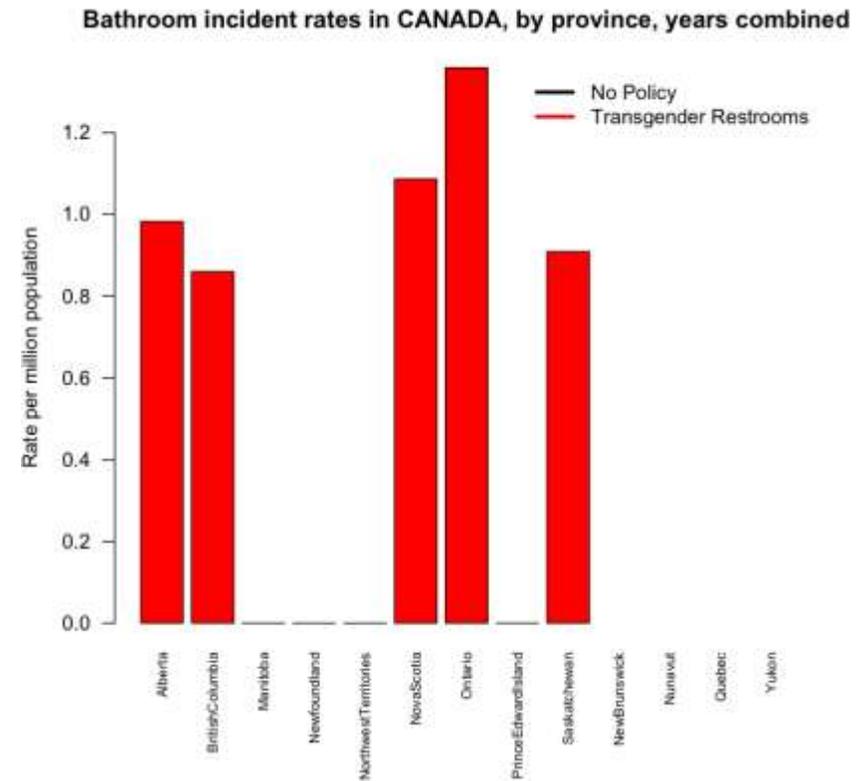
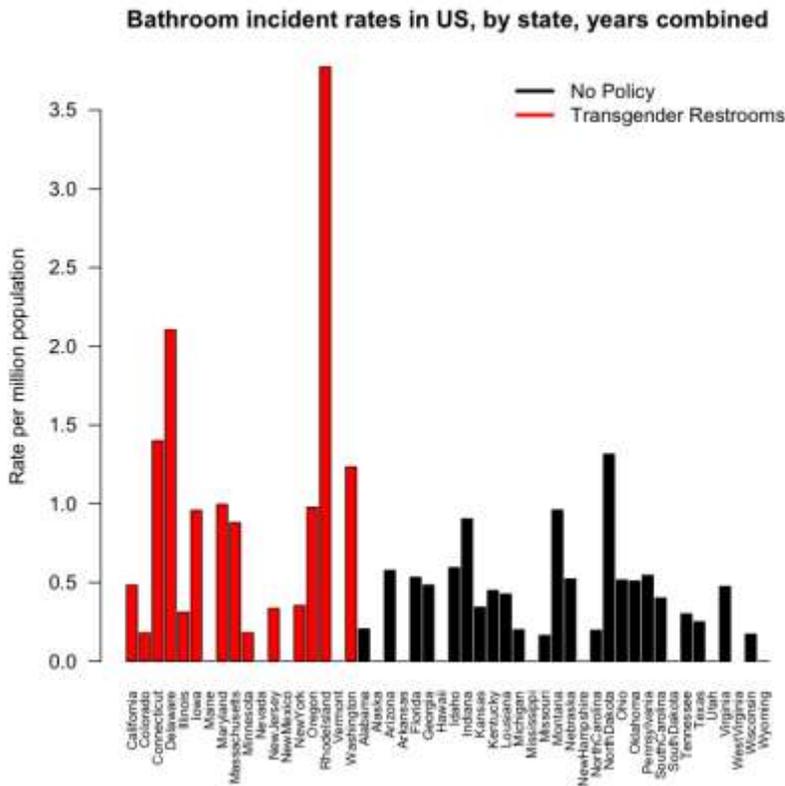
Findings:

- Within the US, the count model indicates a transgender bathroom policy is associated with a significantly increased rate of total incidents (<2014 and >2014 data combined). We estimate this as a 48% rate increase (1.48, p=0.016) with 95% confidence interval 1.08-2.06.
- Using a more robust “overdispersed” model does not substantially change this conclusion but makes the estimate less certain and marginally significant (p=0.056, 1.48, 95% CI 1.0-2.2).
- For US incidents <2014, a transgender bathroom policy is associated with a significantly increased risk of total incidents. We estimate this risk as a 145% increase (2.45, p=0.01) with 95% CI 1.23-2.06.
- For US incidents >2014, a transgender bathroom policy is associated with non-significantly increased risk of total incidents (1.07, 95% CI 0.72-1.58)
- For US incidents we do not see an association between non-single stall incidences and bathroom policies.
- Within Canada, we do not have enough data to fit this model as there are all zeros for provinces without a gender bathrooms policy
- If we assume that Canadian states that do not have recorded incidents have zero counts, then contingency table tests (chi-square) indicate a statistically significant association between policy and total incident counts for Canadian provinces, grouped by gender policy. The p-value is the likelihood that the data could be observed if there were no association between gender policy and bathroom incidents (the null hypothesis). For combined year incident count the p-value of the association is 0.003. For <2014 incidents the p-value is non-significant (0.3). For >2014 incidents, the p-value is 0.013. We would reject the null hypothesis at a cut-off of 0.05 for all years combined and for >2014 incidents.
- We can combine the US and Canada and use Nation as another independent variable in a multivariate analysis.
- For the combined nations, and for combined years, there was a strong association between gender bathroom policy and incident rates with gender-neutral policies associated with increased bathroom incidents (p=0.00078, effect size 1.65, 95% CI 1.25-2.31). The US had a lower rate than Canada (est. 66%)

- For the combined nations, and for years < 2014, there was a strong association between gender bathroom policy and increased incident rates ($p=0.0041$, effect size 2.66, 95% CI 1.31-5.42)
- For the combined nations, and for years > 2014, there was a significant association between gender bathroom policy and increased incident rates ($p=0.03$, effect size 1.45, 95% CI 1.04-2.1)
- These findings for combined nations remained substantially unchanged on using a more robust dispersed model.

Caveats:

- These findings do not necessarily mean there is a causal link between bathroom policies and incidents. They could be explained by a confounding variable such as reporting rates, police report policy or social conditions that affect both bathroom policies and incidents. A longitudinal time series analysis to see how within-state incident rates changed in response to policy would be more appropriate. We do not have that data here.
- State populations have changed over time so that might affect the offset (but probably not by much)
- The choice of model might be inappropriate although results seem to be stable to using more robust models.
- I have not personally checked the data source. Any errors in Paul Dirks' original data may affect the conclusions.



Software used: R version 3.4.0 (free download at <https://www.r-project.org/>)

References for statistical model: <http://www.stat.umn.edu/geyer/5931/mle/seed2.pdf>
<https://cran.r-project.org/web/packages/pscl/vignettes/countreg.pdf>

Statistical analysis code:

```
dat = read.table("paul_dirks_data.tsv", sep="\t", header=T,
check.names=F)
glm1 = glm(Incidents ~ Policy+ offset(log(Population)),
data=dat[dat$Nation=='US',], family=poisson)
summary(glm1)

#Coefficients:
#              Estimate Std. Error  z value Pr(>|z|)
#(Intercept) -14.7898      0.1179  -125.495  <2e-16 ***
#PolicyY      0.3979       0.1655    2.403   0.0162 *

# test for overdispersion
glm2 = glm(Incidents~ Policy+ offset(log(Population)),
data=dat[dat$Nation=='US',], family=quasipoisson)
summary(glm2)
# PolicyY      0.3979      0.2045    1.946   0.0575 .

glm1a = glm(<2014~ Policy+ offset(log(Population)),
data=dat[dat$Nation=='US',], family=poisson)
glm1b = glm(>2014~ Policy+ offset(log(Population)),
data=dat[dat$Nation=='US',], family=poisson)
glm1c = glm(Non-singlestall~ Policy+
offset(log(Population)), data=dat[dat$Nation=='US',],
family=poisson)

summary(glm1a)
#              Estimate Std. Error  z value Pr(>|z|)
#(Intercept) -16.5015      0.2773  -59.498  <2e-16 ***
#PolicyY      0.8966       0.3498    2.563   0.0104 *

summary(glm1b)
#Coefficients:
#              Estimate Std. Error  z value Pr(>|z|)
#(Intercept) -14.9889      0.1302 -115.132  <2e-16 ***

#PolicyY      0.2442      0.1902    1.284   0.199

summary(glm1c)
#Coefficients:
#              Estimate Std. Error  z value Pr(>|z|)
#(Intercept) -14.8808      0.1336 -111.358  <2e-16 ***
#PolicyY      0.0679       0.1990    0.341   0.733

# Get standard errors and estimates
get_ci <- function(mod){
  cf = (coef(summary(mod))['PolicyY',1:2])
  exp(cf[1] + c(0, -1.96*cf[2], 1.96*cf[2]))
}
get_ci(glm1)
# 1.488635  1.076169  2.059188
get_ci(glm2)
# 1.4886349  0.9971106  2.2224556
get_ci(glm1a)
# 2.451141  1.234793  4.865666
get_ci(glm1b)
# 1.2765573  0.8792859  1.8533204
get_ci(glm1c)
# 1.0702545  0.7246111  1.5807718

# Contingency table tests
# USA >2014
chisq.test(matrix(c(52, 131690000, 59, 190740000), c(2,2)))
# p = 0.223

# USA <2014
chisq.test(matrix(c(74, 131690000, 72, 190740000), c(2,2)))
# p = 0.019
```

```

# USA total
chisq.test(matrix(c(22, 131690000, 13, 190740000), c(2,2)))
# p =0.013

# CAN total
chisq.test(matrix(c(29, 26700000, 0, 8970000), c(2,2)))
# p = 0.003

# CAN < 2014
chisq.test(matrix(c(6, 26700000, 0, 8970000), c(2,2)))
# p = 0.34 (probably not valid but not significant anyway)

# CAN > 2014
chisq.test(matrix(c(22, 26700000, 0, 8970000), c(2,2)))
# p = 0.013

# Combining US and CAN and using Nation as dependent variable
glm1.all = glm(Incidents~ Policy+ Nation +
offset(log(Population)), data=dat, family=poisson)
#Coefficients:
#           Estimate Std. Error z value Pr(>|z|)
#(Intercept) -14.4428    0.2276 -63.465 < 2e-16 ***
#PolicyY      0.5294     0.1576  3.360 0.00078 ***
#NationUS    -0.4158     0.2086 -1.994 0.04620 *
get_ci(glm1.all)
# 1.697961  1.246778  2.312417

glm2.all = glm(Incidents~ Policy+ Nation +
offset(log(Population)), data=dat, family=quasipoisson)
# p-value for policy-y = 0.00567
get_ci(glm2.all)
# 1.697961  1.182653  2.437800

```

```

glm1a.all = glm(`<2014`~ Policy+ Nation +
offset(log(Population)), data=dat, family=poisson)
#Coefficients:
#           Estimate Std. Error z value Pr(>|z|)
#(Intercept) -16.4069    0.5085 -32.267 <2e-16 ***
#PolicyY      0.9797     0.3413  2.870 0.0041 **
#NationUS    -0.1476     0.4494 -0.329 0.7425

glm2a.all = glm(`<2014`~ Policy+ Nation +
offset(log(Population)), data=dat, family=quasipoisson)
# p for policyY = 0.00895
get_ci(glm2a.all)
# 2.663701  1.308749  5.421438

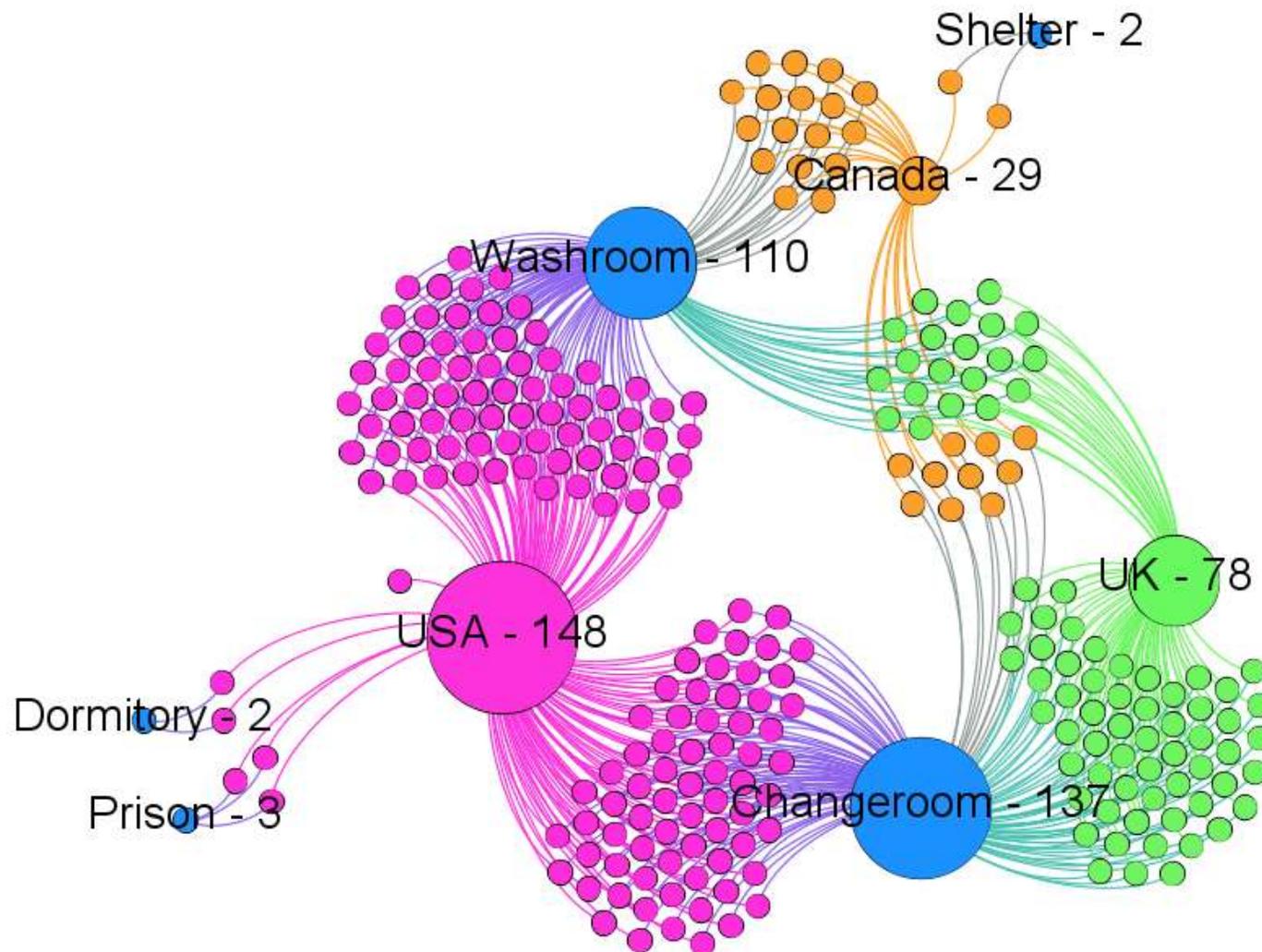
get_ci(glm1a.all)
#2.663701  1.364369  5.200429
glm1b.all = glm(`>2014`~ Policy+ Nation +
offset(log(Population)), data=dat, family=poisson)
#           Estimate Std. Error z value Pr(>|z|)
#(Intercept) -14.6050    0.2585 -56.497 <2e-16 ***
#PolicyY      0.3911     0.1794  2.180 0.0293 *
#NationUS    -0.4554     0.2399 -1.898 0.0576 .
get_ci(glm1b.all)
# 1.478627  1.040251  2.101741
glm2b.all = glm(`>2014`~ Policy+ Nation +
offset(log(Population)), data=dat, family=quasipoisson)
# p = 0.0441 *
get_ci(glm2b.all)
# 1.478627  1.018489  2.146650

# Bar plot code
with(dat[dat$Nation=='US',], barplot(`TotalIncid./pop`,
col=Policy, names.arg = State, las=2, cex.names=0.7,
main="Bathroom incident rates in US, by state, years
combined", ylab="Rate per million population"))
legend('topright', col=c("black", "red"), legend=c("No
Policy", "Transgender Restrooms"), bty="n", lwd=3)

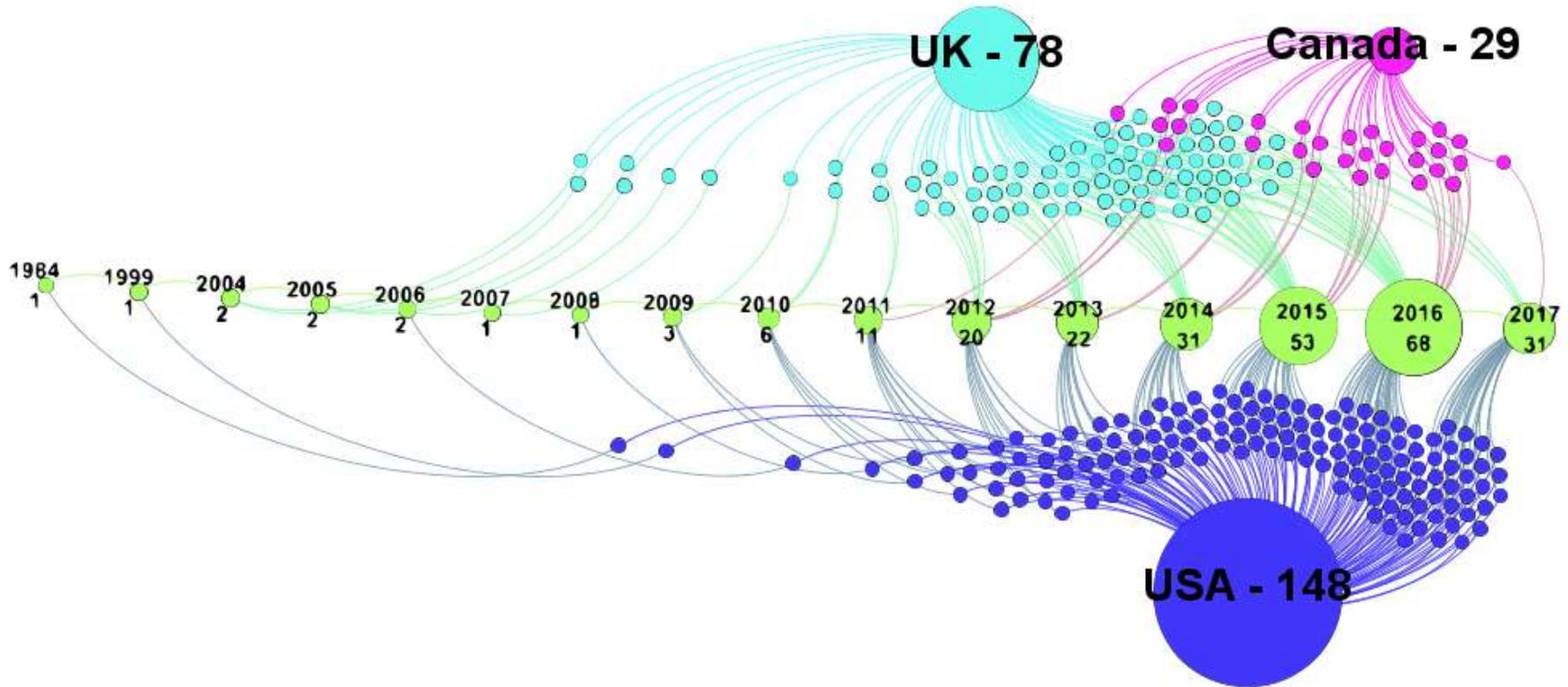
```

Appendix 3: Violence Database Visualizations

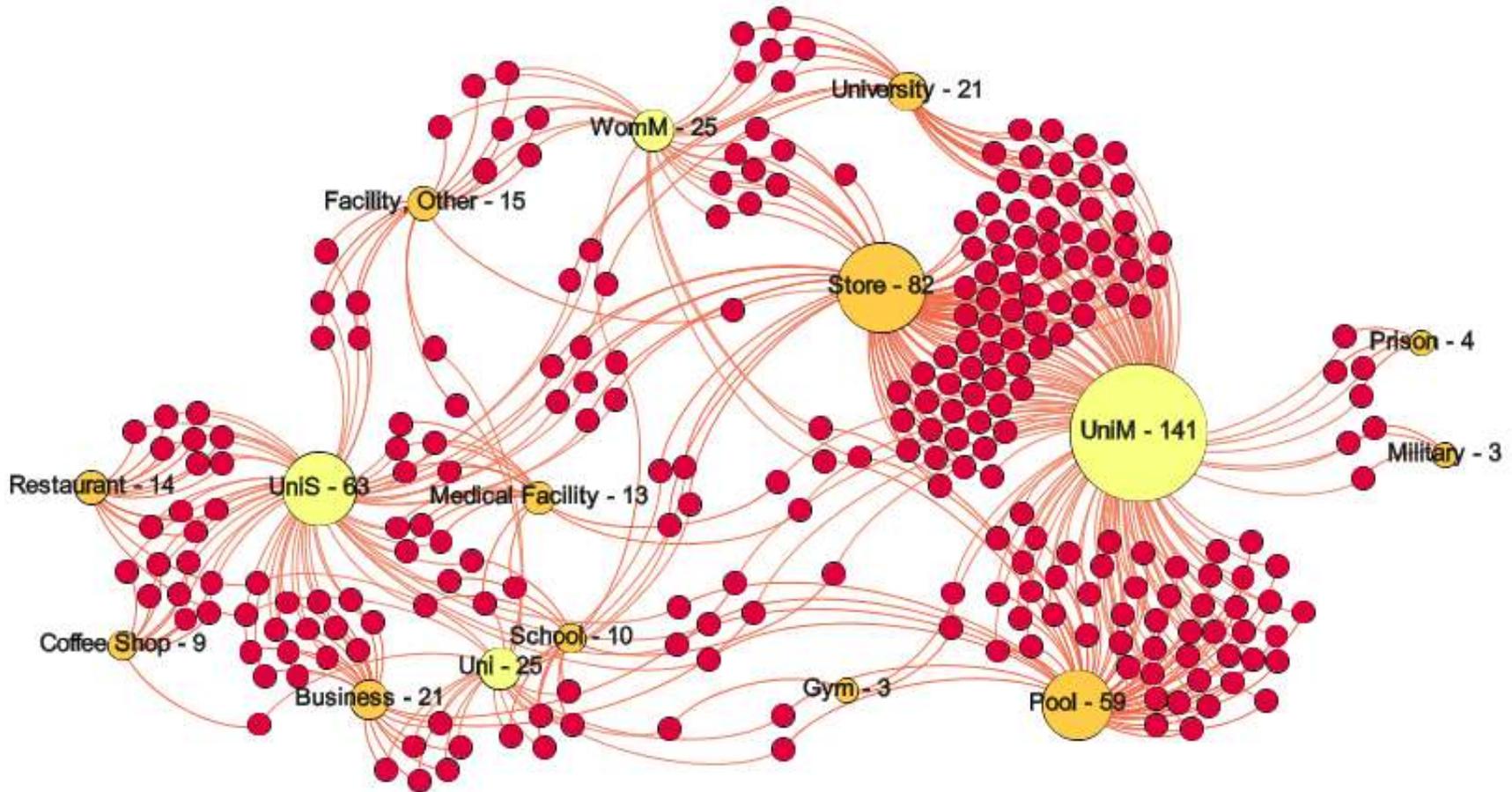
1. Location Type and Country



2. Timeline by Country



3. Facilities and Gendered Spaces (Women's or Unisex)



4. Geographical Visualization of Incidents

