Published in final edited form as:
Environ Sci Technol. 2008 August 1; 42(15): 5407–5414.

Environmental Justice Implications of Reduced Reporting Requirements of the Toxics Release Inventory Burden Reduction Rule

Marie Lynn Miranda[*], **Martha H. Keating**, and **Sharon E. Edwards**
Nicholas School of the Environment and Earth Sciences, Duke University, Durham, NC 27708-0328

Abstract

This paper presents a geographic information systems (GIS) methodology for evaluating the environmental justice implications of the Toxics Release Inventory (TRI) Burden Reduction Rule, which was issued by the U.S. Environmental Protection Agency in December 2006 under the authority of the Emergency Planning and Community Right-to-Know Act of 1986. This rule exempts industrial facilities meeting certain higher reporting thresholds from filing detailed reports about the quantities of chemicals used, released, or managed as waste. Our analytical approach examines demographic characteristics within a 1 km, 3 km, and 5 km buffer around a georeferenced facility location, applied on a national, regional, and state scale. The distance-based GIS analysis demonstrates that TRI facilities that are eligible for reduced reporting are more likely to be located in proximity to communities with a higher percentage of minority and low-income residents. The differences are more pronounced for percent minority and percent minority under age 5 in comparison to percent in poverty, and the demographic differences are more apparent at increasingly resolved geographic scales.

Introduction

In 1986, following catastrophic releases of methyl isocyanate by Union Carbide facilities in Bhopal, India, and Institute, West Virginia, Congress passed the Emergency Planning and Community Right-to-Know Act of 1986 (1). The purpose of EPCRA is to provide individuals, communities, and government agencies with information about the use, storage, and release of hazardous materials by manufacturing and industrial facilities. Section 313 of EPCRA applies to manufacturing facilities with more than 10 full-time employees, and that process more than 10,000 pounds of any of 581 individual chemicals and 30 chemical categories, or more than 25,000 pounds in the aggregate of any of these chemicals or chemical categories. Manufacturing facilities meeting these criteria are required to annually report to EPA the amount of those chemicals released to the environment, transferred off-site, managed as waste, recycled, treated, or burned for energy recovery (2). Reporting requirements cover emissions from routine and accidental releases as well as the amount of chemicals present in waste streams. The reporting requirements are limited to businesses belonging to Standard Industrial Classification (SIC) codes 10,12, 20-39, 49, and 51, which include metal ore and coal mining, electric utilities that burn coal and/or oil for the purpose of generating electricity, printing, chemical manufacture, pulp and paper, electronics, plastics, primary and secondary metal processing, and refining.

[*]Corresponding author phone 919-613-8023, fax 919-684-3227, mmiranda@duke.edu.

The EPA is required by EPCRA to make chemical release information accessible to the public and does so through a national database known as the Toxics Release Inventory (TRI). In addition to a national annual report, EPA maintains a searchable online database, which can aggregate data by chemical, individual facility, industry type, zip code, county, state, and nation. The TRI is an information disclosure law, not an emissions control regulation. Nevertheless, the TRI has been credited with achieving large reductions in toxics releases. Since the inception of the TRI in 1987, the EPA estimates that toxic releases of covered compounds have declined by 49% or 1.59 billion pounds (3).

Facilities subject to the reporting requirements of EPCRA are required to submit annual reports for each eligible chemical to the EPA and to the state or tribal government where the facility is located. A Form R is required for each TRI-listed chemical released in excess of certain thresholds. Form R provides detailed information about the chemical, including the amount released to air, land, water, underground injection, or transferred off-site. The facility must also provide its address, parent company, and longitude and latitude on Form R. In 1995, EPA began allowing the use of a 2-page Certification Statement (Form A) for chemicals that are not persistent, bioaccumulative toxics (PBT), provided a facility does not release more than 500 total pounds, and does not manufacture, process, or use more than 1 million pounds of the chemical (4). Form A contains the facility identification information and the identity of the chemical, but does not contain any of the Form R details about how much of the chemical is used, released, or managed as waste.

The EPA claims that the TRI provision of EPCRA has proved to be “among the most successful stimuli for reducing the amount of toxic materials that enter the environment” (5). The required disclosure of chemical releases has provided the incentive for industries to reduce their emissions due to the ability of the public to use the data to compare information across firms, and the ongoing attention that is paid to the highest-emitting or worst performers (6). Between 1988 and 1991, facilities whose emissions resulted in higher estimates of potential cancer cases were more likely to reduce their emissions at a higher rate (7). New or unexpected reports of a company’s emissions have also reverberated in the market place with negative, statistically significant abnormal losses in stock value for firms on the first day that TRI releases were made public (8). Industry concerns over liability, consumer and marketplace reaction, as well as collaborative actions by citizen and interest groups, continue to push companies to improve their environmental performance (6). As a result of the TRI, numerous industries began to embrace pollution prevention, which has subsequently resulted in the development of numerous voluntary emission reduction programs at the federal and state level (e.g., EPA’s 33/50 program and Massachusetts’ Toxics Use Reduction Act). Indeed, the success of the TRI for promoting voluntary emission reduction led to international efforts to emulate this approach, which culminated in the adoption of the Kiev Protocol on Pollutant Release and Transfer Registers by 36 nations and the European Community in 2003 (9,10).

In December 2006, the EPA finalized the TRI Burden Reduction Rule which changed the reporting requirements of the TRI (11). The TRI Burden Reduction Rule raised the reporting threshold for the short Form A for non-PBT chemicals from 500 pounds to 5,000 pounds of total annual waste management (including releases, recycling, energy recovery and treatment), provided that total annual releases comprise no more than 2,000 pounds of the 5,000 pound limit (11). Use of Form A is also allowed for the first time for PBT chemicals when total annual releases are zero and the total annual amount of the PBT chemical recycled, used for energy recovery, or treated is no more than 500 pounds (11).

In an analysis of potential environmental justice impacts of the rule, the EPA concluded that the reporting changes do not have a disproportionate impact on minority and low-income

communities in proximity to TRI facilities since facilities in these communities are no more likely than elsewhere to become eligible to use Form A as a result of the rule (12).

Other analyses of the effects of the TRI Burden Reduction Rule have focused on the number of Form Rs that potentially would not be reported to the TRI if eligible facilities chose to use Form A. The U.S. Government Accountability Office (GAO) estimated that detailed information from nearly 22,000 Form Rs from thousands of facilities would no longer be reported to the TRI if all eligible facilities used Form A. The GAO concluded that the reporting changes “will likely have a significant impact on environmental information available to the public”(13). The National Environmental Trust conducted an analysis at the zip code level and also found that thousands of facilities would no longer have to report any quantitative information to TRI, all quantitative information about certain chemicals would be lost to a varying degree in multiple states, and numerous states would lose at least a third of their Form R reports (14).

In this paper, we use a distance-based GIS methodology to describe the demographics of communities in proximity to facilities eligible to reduce or eliminate detailed reporting of chemical releases under the new TRI Burden Reduction Rule. We hypothesize that conducting the analysis at finer geographic resolutions will provide a more detailed assessment of the demographics of affected communities than a national aggregate analysis.

Experimental Section

To examine the demographic and socioeconomic characteristics of neighborhoods affected by the TRI Burden Reduction Rule, we first georeferenced (assigned a geographic location; in this case, latitude and longitude) all of the facilities that reported to TRI in 2005. We chose to use 2005, as it was the most recent public data available at the time the rule was proposed Facilities were georeferenced using the latitude and longitude coordinates submitted by the facility and recorded in the facility identification information section in both Form A and Form R. The facilities that would be eligible for reduced reporting requirements under the TRI Burden Reduction Rule were identified based on facility emissions and releases in the 2005 TRI (reporting year 2005). In 2005, 21,151 of the 23,461 facilities reporting to the TRI submitted an R-form for at least one chemical. In this analysis, facilities in U.S. territories, federal facilities, facilities only reporting dioxins, and facilities submitting only A-forms were excluded. Under these restrictions, 20,682 facilities qualified for inclusion in the analysis. Of these, 20,521 had sensible latitude and longitude values; these were georeferenced and included in the buffer analysis described below.

The number of chemicals requiring R-forms and the total reported releases of all chemicals as reported in 2005 were calculated for each facility. Based on the new TRI Burden Reduction Rule reporting requirements, those R-forms submitted in 2005 that could be converted to A-forms under the new rule were identified. For each facility, the total reported releases and number of R-forms that would have been required had the Burden Reduction Rule been in place during reporting year 2005 were calculated. A change in R-form reporting is used to classify each facility into one of three categories: 1) *no change in reporting*: facilities that would be required to submit the same number of R-forms under the new regulation as were required in 2005; 2) *limited reporting*: facilities that would be required to submit fewer R-forms under the new regulation, but would still submit a Form R for at least one chemical; 3) *no longer reporting*: facilities that would no longer be required to submit a Form R for any chemical.

We identify areas around TRI facilities using circular buffers centered at each georeferenced facility. Buffers were constructed at 1 km, 3 km, and 5 km around these facilities. Although

populations are not necessarily evenly distributed across the area of each block group, it may be reasonable to consider most of the population as within the buffer zone if most of the unit's area is contained by the buffer. Thus, populated Census block groups with at least 50% of the area within a buffer were considered to be within the buffer zone and included in the analysis.

Demographic and socioeconomic data were extracted from the 2000 U.S. Census at the block group level. We then compared the demographics of the buffer communities near TRI facilities that were required to report in 2005, and experience no change in reporting under the new rule, with the demographics of buffer communities surrounding facilities that are now eligible to report less detailed information. The comparisons were done for percent minority, percent minority under age 5, and percent in poverty. These three Census variables were selected as standard metrics for assessing differential policy impacts across race and income groups. In addition, we selected three buffer distances around each facility (1 km, 3 km and 5 km) to represent different "proximate" populations, given differing interpretations as to what constitutes "proximate" (e.g., EPA chose 1 mile to represent the proximate population). In addition to a national analysis, we conducted sub-analyses for each of the ten EPA regions separately, and for North Carolina alone. These sub-analyses were designed to evaluate whether the substantial differences in the demographics and socioeconomics of different states and regions of the United States, if analyzed at a finer geographic scale, would reveal different results from a national aggregate analysis. (15)

Results

In this study, Census block groups in proximity to TRI facilities, and the number and percent of R-forms each facility need no longer report were identified. Demographic characteristics of areas surrounding facilities that are now eligible to report their releases using Form A were compared to the demographic characteristics of areas with facilities reporting an R-Form in 2005, and with facilities that (based on their 2005 releases) would continue to report using Form R under the new rule. Table 1 provides data on the national analysis of demographics of surrounding buffers for: 2005 reporters; those facilities whose reporting requirements would not change under the TRI Burden Reduction Rule; those who would be required to provide limited reporting; and those who would no longer be required to report. The analyses are presented for 1, 3, and 5 km buffer areas.

Table 1 clearly shows that facilities within 1, 3, and 5 km that reported in 2005 had higher percent minority, percent minority under age 5, and percent in poverty compared to national averages. The fact that toxics-releasing facilities are located in predominantly minority communities is well-established in the literature (16-18). The key question associated with the TRI Burden Reduction Rule is whether poor and minority communities lose more information than other communities do under the new reporting requirements. As Table 1 demonstrates, block groups where facilities are no longer required to report have higher percent minority, percent minority under age 5, and percent in poverty compared to those block groups where there is no change in reporting at all three buffer distances. For example, Census blocks within 1 km of a facility that has no change in reporting are 47.45% minority, 61.55% minority under age 5, and 18.62% in poverty. In contrast, those block groups that are within 1 km of a facility that is no longer required to report are 52.70% minority, 66.85% minority under age 5, and 19.46% in poverty. Using two-proportion Z-tests to compare these percentages, all comparisons were significant at 0.01. When performing multiple tests simultaneously, significance due to chance is a particular concern, thus we used the conservative Bonferroni correction method to control the overall error rate at 0.01. With this adjustment, all comparisons remained significant.

Disaggregating the analysis to the ten EPA regions provides additional insights. Table 2 lists the states and territories covered by each EPA region, as well as how these areas were treated in our analysis. Table 3 presents the results of the analyses for each of the EPA regions. Again, with very few exceptions, those block groups in proximity to facilities that are no longer required to report are characterized by higher percent minority, percent minority under age 5, and percent in poverty.

The rather dense information in Table 3 is summarized graphically in Figure 1. Figure 1 shows the difference in Census demographics in buffers surrounding facilities that are no longer required to report versus those with no change in reporting requirements. Figure 1 depicts differences in percent minority (panel a), percent minority under age 5 (panel b), and percent in poverty (panel c) using the 1 km (column 1), 3 km (column 2), and 5 km (column 3) buffers. The diagonal hash marks indicate regions where block groups in proximity to facilities that are no longer required to report are characterized by as much as a 4% lower percent minority, percent minority under age 5, or percent in poverty compared to block groups in proximity to facilities that are still required to submit all Form Rs. Note there are few such regions. Those regions in which the difference in these demographics is not significant within a specific buffer area are displayed in white. The progressively darker grey tones that dominate the maps in Figure 1 indicate regions in which the percent minority, percent minority under age 5, or percent in poverty is up to 12% higher in those block groups that are proximate to facilities no longer required to report compared to facilities still required to report at the 2005 level.

To demonstrate the potential for substantial within-region variation, we also conducted the analysis for the State of North Carolina. North Carolina is relatively comparable to national data on percent minority (29.82% versus 30.88%), percent minority under age 5 (38.67% versus 41.35%), and percent in poverty (12.28% versus 12.38%). North Carolina, not surprisingly, is even more closely comparable to EPA Region 4 with respect to percent minority (30.75% regionally), percent minority under age 5 (39.42% regionally), and percent in poverty (13.72% regionally).

Table 4 presents the results for North Carolina. This analysis reveals even more significant differences in surrounding demographics between facilities no longer required to report versus those with no change in reporting. For example, in Region 4, block groups within 1 km of facilities were characterized by 55.60% minority for facilities with no change in reporting and 61.30% for facilities no longer reporting - a 5.7% difference. By comparison, in North Carolina, block groups within 1 km of facilities with no change in reporting are 49.79% minority and those within 1 km of facilities that are no longer reporting are 65% minority - a 15.21% difference.

Discussion

Previous studies have shown that hazardous waste and industrial facilities are commonly sited in communities with populations that are disproportionately minority or low income relative to the general U.S. population (16-18). The EPA's environmental justice analysis of the TRI Burden Reduction Rule concluded that the rule does not have a disproportionate impact on poor and minority communities (13). In contrast, this study suggests that the TRI Burden Reduction Rule does in fact have a disproportionate impact on minority and low-income communities because facilities eligible to file Form A under the new rule are more likely to be located in neighborhoods where the proportion of minority and low income residents is significantly higher than neighborhoods with facilities still required to submit Form R. Thus, low income and minority communities appear to be losing disproportionately more information under the TRI Burden Reduction Rule. These differences become more apparent at more resolved geographic scales. The regional analysis provides some key insights. Even in those

areas of the country characterized by lower percent minority, percent minority under age 5, and percent in poverty compared to national averages (see, for example, Region 8), poor and minority communities still tend to lose more information. The differences are more pronounced using percent minority and percent minority under age 5 in comparison to percent in poverty.

Our study differs from the EPA's in several ways. First, the Agency identified proximate Census block groups as those whose centroid was within 1 mile of a TRI facility. In contrast, our study included block groups for which 50% or more of the area fell within the designated buffer. While both methods are fairly standard in geographic analyses, we prefer the 50% of area method because it better captures the population facing potential exposures related to TRI facility releases. In addition, our decision to use 1, 3, and 5 km buffers allows multiple definitions of the proximate population, as well as comparison of populations closest to the facility to those that are farther away. Our study showed that block groups within 1 km (~ 0.6 miles) of a facility have a higher percentage of minority populations, populations in poverty, and minority children under age 5, than block groups that are farther away.

Second, the EPA conducted its analysis on a national basis only. Because of profound differences in percent minority population between states and regions of the United States, we considered the impact of the rule separately for the United States in aggregate, for each of the ten EPA regions, and for North Carolina. As shown in Table 1, our national-level analysis in fact demonstrates significantly higher percent minority, percent minority under age 5, and percent in poverty for those block groups proximate to facilities that are no longer required to report (i.e., those block groups that lose information under the TRI Burden Reduction Rule). In addition, these differences are more variable when analyses are conducted at the regional or state level (see Tables 3 and 4). For example, the overall national difference between percent minority at the 1 km buffer is 5.45% between areas where facilities are no longer required to report versus those that have no change in reporting. This percentage ranges from a low of −1.32% in Region 10 to a high of 10.34% in Region 8.

The state level analysis allows for important nested comparisons. For example, the overall national difference between percent minority under age 5 at the 1 km buffer is 5.30% between areas where facilities are no longer required to report versus those that have no change in reporting. The equivalent statistic is 5.02% for the combined eight states in Region 4. In North Carolina, which is in Region 4, the equivalent statistic is 14.34%.

The EPA's conclusion that the TRI Burden Reduction Rule does not have a disproportionate impact on poor and minority communities is based on the Agency's national analysis. This analysis found that the population within 1 mile of affected TRI facilities was 43.8% minority, or "slightly higher" than the 41.8% minority population within 1 mile of all TRI facilities (13). The Agency's interpretation of its own analysis is in direct contrast to our analyses which show statistically higher percent minority, percent minority under age 5, and percent in poverty at the national level. Our analysis also highlights important regional and state-level differences.

The EPA received comments opposing the rule change from more than 100,000 individuals, many of whom participated in mail-in campaigns coordinated by environmental advocacy groups (19). Also unanimous in their opposition to the rule change were faith-based organizations, public interest groups, public health organizations, state and local governments, researchers, financial investment firms, and labor organizations. Despite the fact that the TRI is a disclosure law that does not have traditional accountability requirements such as permits, emission limits, or regulatory timetables, the accessibility of TRI information has enabled stakeholders to use it as leverage to improve the environmental performance of industry. Public perception of a company's management and performance now encompasses not only environmental compliance with mandated emission limits or other regulatory requirements,

but with environmental stewardship (a company's willingness and actions to emit less pollution) (20).

The public health or environmental impacts of the loss of detailed chemical information are difficult to ascertain. The EPA argues that detailed information will be lost for less than 1 percent of the releases reported to the TRI and that there is no change in the level of releases from a facility, only information about that release. Thus, EPA concludes that the loss of information will have no direct impact on public health or the environment in a community. However, TRI information has provided citizens the leverage to demand reductions in industrial releases. Industries that are no longer required to report have no further incentive for reducing releases. TRI data, when combined with toxicity information, allows citizens, researchers and regulators to assess health risks in different communities. These types of assessments will now be more difficult and less complete. In fact, there is no way to determine if releases of most chemicals increase or decrease if the facility's total releases remain under the 2,000 pound threshold.

Regardless of how much or how little information is lost nationally, this analysis demonstrates that poor and minority communities stand to lose disproportionately more detailed Form R information about chemical releases, leaving them less empowered to advocate for public health or environmental protections in their communities.

Brief: Loss of information under the Toxics Release Inventory Burden Reduction Rule disproportionately impacts low income and minority communities.

Acknowledgments

The project described was supported by Grant Number 5P42ES010356-08 from the National Institute of Environmental Health Sciences. The content is solely the responsibility of the authors and does not represent the official views of the National Institute of Environmental Health Sciences or the National Institutes of Health.

Literature Cited

(1). Emergency Planning and Community Right-to-Know Act (EPCRA). 42 U.S.C. 11011 et seq. 1986.

(2). Emergency Planning and Community Right-to-Know Act. 42 U.S.C 11023(j). 1986.

(3). Pelley J. EPA proposes to relax TRI reporting rules. Environ. Sci. Technol 2005;39(23):479A. [PubMed: 15707047]

(4). U.S. Environmental Protection Agency Alternate Threshold for Facilities With Low Annual Reportable Amounts; Toxic Chemical Release Reporting; Community Right-To-Know. Fed. Regist. 1994. 59 FR 61488

(5). U. S. Environmental Protection Agency. Toxics Release Inventory. 1997. EPA 749-R-97-001b

(6). Stephan M. Environmental information disclosure programs: They work, but why? Soc. Sci. Quart 2002;83(1):190–205.

(7). Hamilton JT. Exercising property rights to pollute: do cancer risks and politics affect plant emission reductions? J. Risk Uncertainty 1999;18(2):105–124.

(8). Hamilton JT. Pollution as news: Media and stock market reactions to the Toxics Release Inventory data. J. Environ. Econ. Manage 1995;28:98–113.

(9). Dahl R. Now that you know. Environ. Health Perspect 1997;105(1):38–42. [PubMed: 9074878]

(10). United Nations Economic Commission for Europe Kiev Protocol on Pollutant Release and Transfer Registers. Available at http://www.unece.org/env/pp/prtr.htm

(11). U. S. Environmental Protection Agency Toxics Release Inventory Burden Reduction Rule: Final Rule. Fed. Regist. 2006. 71 FR 76932

(12). U. S. Environmental Protection Agency. Memorandum: EJ analysis of the Phase II and alternative Phase II rules. 2006. Docket No. TRI-2005-0073-5007

(13). U.S. Government Accountability Office. EPA Actions Could Reduce the Availability of Environmental Information to the Public. 2007. GAO-07-44T

(14). National Environmental Trust. EPA's proposed TRI rule changes benefit large companies and provide no burden reduction for small businesses. Washington, DC: 2006.

(15). Dolinoy DC, Miranda ML. GIS modeling of air toxics releases from TRI-reporting and non-TRI-reporting facilities: Impacts for environmental justice. Environ. Health Perspect 2004;112(17): 1717–1724. [PubMed: 15579419]

(16). Ringquist EJ. Assessing evidence of environmental inequities: A meta-analysis. J. Policy Anal. Manage 2005;24(2):223–247.

(17). Mohai P, Saha R. Racial Inequality in the Distribution of Hazardous Waste: A National-Level Reassessment. Soc. Probl 2007;54(3):343–370.

(18). Bryant, B.; Mohai, P. Race and the incidence of environmental hazards. Westview Press; Boulder, CO: 1992.

(19). U. S. Environmental Protection Agency Response to Comments: Toxics Release Inventory Phase 2 Burden Reduction Rule. 2006. Docket No. TRI-2005-0073-5008

(20). Sarokin D, Schulkin J. Environmentalism and the right-to-know: Expanding the practice of democracy. Ecolog. Econ 1991;4(3):175–189.

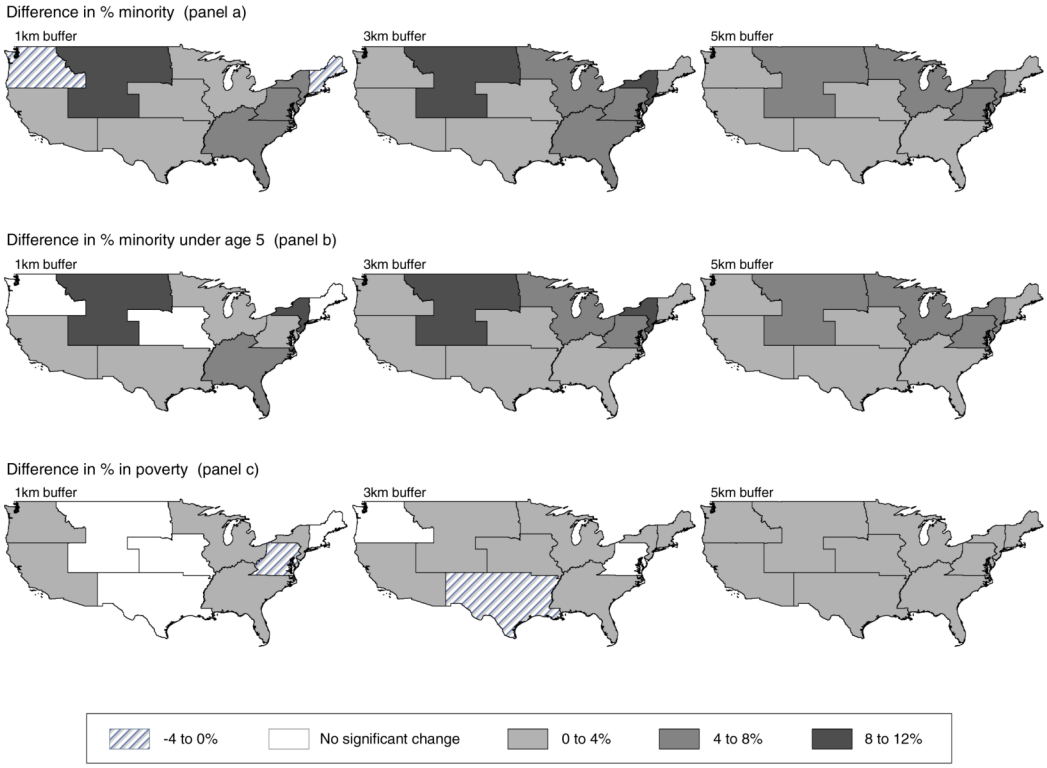

Figure 1.
Difference in Census demographic characteristics in buffers surrounding facilities that are no longer reporting versus facilities with no change in reporting under the TRI Burden Reduction Rule.

Table 1

National analysis of change in TRI reporting requirements.

	Number of populated block groups	Total population	% minority	% minority under age 5	% in poverty
National	207,748	281,421,906	30.88	41.35	12.38
1 km Buffer					
2005 Reporting Facilities	15,536	17,782,706	47.33	61.52	18.64
No change in reporting	8,225	9,373,050	47.25	61.55	18.62
Limited reporting	4,920	5,476,120	47.94	56.57	19.50
No longer reporting	4,550	5,191,594	52.70	66.85	19.46
3 km Buffer					
2005 Reporting Facilities	83,012	105,628,842	40.79	53.61	15.26
No change in reporting	58,246	73,800,647	41.70	54.85	15.54
Limited reporting	40,458	49,509,213	43.08	56.57	16.28
No longer reporting	39,059	49,032,875	46.58	60.10	16.67
5 km Buffer					
2005 Reporting Facilities	126,076	167,029,815	37.32	49.21	13.67
No change in reporting	100,919	132,438,913	38.61	50.92	14.14
Limited reporting	76,247	97,000,923	40.51	53.16	14.86
No longer reporting	75,373	97,773,562	42.79	55.55	14.92

Table 2

Geographic coverage of this analysis.

EPA Region	Geographic coverage	Geographic coverage of this analysis
1	Connecticut, Massachusetts, Maine, New Hampshire, Rhode Island, Vermont	Included all Region 1 states
2	New Jersey, New York, Puerto Rico, U.S. Virgin Islands	Excluded Puerto Rico and U.S. Virgin Islands
3	Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, West Virginia	Included all Region 3 states and District of Columbia
4	Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee	Included all Region 4 states
5	Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin	Included all Region 5 states
6	Arkansas, Louisiana, New Mexico, Oklahoma, Texas	Included all Region 6 states
7	Iowa, Kansas, Missouri, Nebraska	Included all Region 7 states
8	Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming	Included all Region 8 states
9	American Samoa, Arizona, California, Guam, Hawaii, Nevada, Northern Mariana Islands, Trust Territories	Excluded Guam, Trust Territories, American Samoa, Northern Mariana Islands
10	Alaska, Idaho, Oregon, Washington	Included all Region 10 states

Table 3

Population demographics within 1, 3, and 5 kilometer buffers of a facility: Regional analysis of change in reporting requirements.

	Number of populated block groups	Total population	% minority	% minority under age 5	% in poverty
Region 1					
1 km buffer					
2005 Reporting Facilities	1,427	1,630,799	34.14	49.46	16.90
No change in reporting	725	811,003	37.07	52.80	17.74
Limited reporting	444	517,934	33.57	47.97	16.92
No longer reporting	502	576,630	36.67	52.96	17.88
3 km buffer					
2005 Reporting Facilities	5,806	7,150,558	22.96	33.95	11.43
No change in reporting	4,131	5,036,370	25.23	37.13	12.31
Limited reporting	3,190	3,806,633	28.37	41.33	13.94
No longer reporting	3,353	4,048,416	26.62	39.73	13.10
5 km buffer					
2005 Reporting Facilities	7,916	10,073,246	19.98	29.24	9.97
No change in reporting	6,518	8,241,083	21.85	32.29	10.69
Limited reporting	5,400	6,640,792	24.77	36.15	11.83
No longer reporting	5,629	7,049,642	23.16	34.06	11.17
Region 2					
1 km buffer					
2005 Reporting Facilities	2,131	2,402,141	51.73	63.61	18.88
No change in reporting	977	1,095,649	49.35	60.45	17.64
Limited reporting	563	634,350	49.04	60.58	19.45
No longer reporting	851	941,650	56.89	70.42	20.08

	Number of populated block groups	Total population	% minority	% minority under age 5	% in poverty
3 km buffer					
2005 Reporting Facilities	10,490	12,891,625	48.60	59.58	16.50
No change in reporting	6,570	7,872,029	45.39	56.14	15.32
Limited reporting	5,009	6,008,644	47.69	59.36	16.21
No longer reporting	6,089	7,438,571	56.04	67.27	18.93
5 km buffer					
2005 Reporting Facilities	15,378	19,531,306	44.60	54.47	14.83
No change in reporting	12,127	15,250,130	44.48	54.42	15.12
Limited reporting	9,226	11,394,047	47.82	58.46	16.24
No longer reporting	10,593	13,355,965	51.92	62.32	17.15
Region 3					
1 km buffer					
2005 Reporting Facilities	1,698	1,713,345	30.66	44.50	18.69
No change in reporting	875	877,150	30.32	45.81	20.49
Limited reporting	488	487,794	29.07	42.41	17.94
No longer reporting	504	480,675	34.83	48.80	18.70
3 km buffer					
2005 Reporting Facilities	8,518	9,889,838	29.10	40.50	14.24
No change in reporting	5,620	6,312,285	28.86	41.04	15.15
Limited reporting	4,116	4,628,402	29.75	41.45	15.26
No longer reporting	4,010	4,492,639	33.46	46.04	15.09
5 km buffer					
2005 Reporting Facilities	12,733	15,701,465	28.04	38.21	12.36
No change in reporting	9,681	11,524,692	28.06	38.82	13.22

	Number of populated block groups	Total population	% minority	% minority under age 5	% in poverty
Limited reporting	8,012	9,334,776	30.09	41.05	14.01
No longer reporting	7,811	9,121,059	33.31	44.83	13.84
Region 4					
1 km buffer					
2005 Reporting Facilities	1,353	1,535,309	55.80	69.19	23.81
No change in reporting	699	782,564	55.60	68.02	24.23
Limited reporting	347	381,305	59.20	71.56	25.40
No longer reporting	362	415,447	61.30	73.04	24.87
3 km buffer					
2005 Reporting Facilities	10,211	13,880,779	44.23	56.08	18.10
No change in reporting	6,933	9,424,965	45.33	57.28	18.58
Limited reporting	4,085	5,261,132	47.36	59.21	19.62
No longer reporting	4,122	5,508,220	49.60	61.27	19.47
5 km buffer					
2005 Reporting Facilities	17,360	25,343,367	38.87	49.74	15.57
No change in reporting	13,224	19,144,487	40.49	51.52	16.07
Limited reporting	8,844	12,164,128	42.30	53.90	17.18
No longer reporting	8,840	12,606,214	44.30	55.39	16.78
Region 5					
1 km buffer					
2005 Reporting Facilities	4,732	5,008,356	38.26	52.51	16.60
No change in reporting	2,687	2,835,777	38.36	52.81	16.41
Limited reporting	1,851	1,893,826	41.91	56.68	18.51
No longer reporting	1,092	1,120,244	39.80	53.59	16.68

	Number of populated block groups	Total population	% minority	% minority under age 5	% in poverty
3 km buffer					
2005 Reporting Facilities	20,265	23,666,094	29.83	41.61	12.93
No change in reporting	15,300	17,855,315	30.76	42.99	13.30
Limited reporting	12,139	13,554,445	33.69	46.84	14.70
No longer reporting	9,183	10,422,486	35.25	48.25	14.35
5 km buffer					
2005 Reporting Facilities	27,787	33,786,286	26.22	36.89	11.36
No change in reporting	23,871	28,724,971	27.18	38.39	11.84
Limited reporting	19,950	23,322,392	30.16	42.13	12.83
No longer reporting	17,205	20,277,606	32.00	44.33	12.79
Region 6					
1 km buffer					
2005 Reporting Facilities	1,013	1,178,640	62.08	75.14	21.83
No change in reporting	530	642,664	65.22	78.12	22.86
Limited reporting	299	335,585	58.97	72.66	21.34
No longer reporting	253	301,856	66.73	79.28	22.96
3 km buffer					
2005 Reporting Facilities	7,593	9,768,608	53.75	66.94	18.37
No change in reporting	5,201	6,736,186	56.53	69.64	19.05
Limited reporting	3,171	4,129,718	53.00	66.62	18.03
No longer reporting	2,819	3,612,606	56.78	71.09	18.93
5 km buffer					
2005 Reporting Facilities	12,730	16,893,541	49.94	62.91	16.82
No change in reporting	9,837	12,999,312	52.43	65.59	17.33

Environ Sci Technol. Author manuscript; available in PMC 2010 March 31.

	Number of populated block groups	Total population	% minority	% minority under age 5	% in poverty
Limited reporting	6,906	9,168,273	50.47	63.96	16.89
No longer reporting	6,176	8,038,762	53.83	67.50	17.44
Region 7					
1 km buffer					
2005 Reporting Facilities	646	610,244	28.13	39.29	17.63
No change in reporting	349	334,356	28.92	40.53	17.66
Limited reporting	210	186,939	28.54	41.23	19.65
No longer reporting	134	113,294	30.75	40.39	18.06
3 km buffer					
2005 Reporting Facilities	4,047	4,454,399	22.11	32.41	13.53
No change in reporting	2,920	3,155,983	23.87	34.61	14.46
Limited reporting	1,954	2,012,858	26.32	37.23	15.52
No longer reporting	1,654	1,704,448	25.64	36.89	15.17
5 km buffer					
2005 Reporting Facilities	6,051	7,123,298	19.44	28.78	11.71
No change in reporting	4,773	5,483,943	21.04	30.88	12.67
Limited reporting	3,654	4,032,259	22.50	32.85	13.39
No longer reporting	3,260	3,618,855	23.17	33.45	13.21
Region 8					
1 km buffer					
2005 Reporting Facilities	205	257,326	34.56	44.90	16.57
No change in reporting	106	132,927	30.03	41.38	16.78
Limited reporting	46	49,820	38.30	45.96	18.39
No longer reporting	51	67,612	40.37	50.57	17.14

	Number of populated block groups	Total population	% minority	% minority under age 5	% in poverty
3 km buffer					
2005 Reporting Facilities	1,772	2,320,857	26.94	37.25	13.07
No change in reporting	1,238	1,669,458	27.54	38.01	12.85
Limited reporting	604	771,640	31.96	41.52	14.49
No longer reporting	702	908,486	36.03	47.46	15.39
5 km buffer					
2005 Reporting Facilities	3,306	4,420,972	23.21	32.86	11.33
No change in reporting	2,546	3,452,497	24.32	34.20	11.74
Limited reporting	1,516	1,976,927	27.28	37.02	12.90
No longer reporting	1,650	2,200,407	30.31	41.40	12.78
Region 9					
1 km buffer					
2005 Reporting Facilities	1,986	3,033,203	73.24	84.67	19.72
No change in reporting	1,079	1,621,907	72.88	84.61	19.13
Limited reporting	593	891,886	76.39	87.50	21.14
No longer reporting	723	1,088,269	76.82	87.31	20.51
3 km buffer					
2005 Reporting Facilities	11,590	18,055,677	63.13	76.70	16.71
No change in reporting	8,453	13,291,794	65.89	78.82	17.15
Limited reporting	5,197	8,035,665	70.28	82.96	18.23
No longer reporting	6,142	9,633,941	68.17	80.75	18.04
5 km buffer					
2005 Reporting Facilities	18,187	28,089,989	58.13	72.24	15.28
No change in reporting	14,854	23,059,495	60.51	74.43	15.76

	Number of populated block groups	Total population	% minority	% minority under age 5	% in poverty
Limited reporting	10,496	16,067,697	65.03	78.43	16.61
No longer reporting	12,026	18,691,292	62.43	76.01	16.20
Region 10					
1 km buffer					
2005 Reporting Facilities	345	413,343	25.62	38.71	15.19
No change in reporting	198	239,053	25.34	37.93	14.63
Limited reporting	79	96,681	28.42	44.07	16.07
No longer reporting	78	85,917	24.66	37.55	15.45
3 km buffer					
2005 Reporting Facilities	2,720	3,550,407	23.58	35.60	13.28
No change in reporting	1,880	2,446,262	23.20	34.71	13.16
Limited reporting	993	1,300,076	25.70	38.38	14.49
No longer reporting	985	1,263,062	23.93	36.84	13.20
5 km buffer					
2005 Reporting Facilities	4,628	6,066,345	21.91	33.27	11.89
No change in reporting	3,488	4,558,303	21.96	33.08	11.96
Limited reporting	2,243	2,899,632	23.71	35.62	13.11
No longer reporting	2,183	2,813,760	23.45	35.55	12.15

Table 4

Population demographics within 1,3 and 5 kilometer buffers of a facility: North Carolina analysis of change in reporting requirements.

	Number of populated block groups	Total population	% minority	% minority under age 5	% in poverty
North Carolina					
1 km buffer					
2005 Reporting Facilities	**194**	**211,320**	**54.67**	**69.91**	**22.48**
No change in reporting	**93**	**97,795**	**49.79**	**64.19**	**20.78**
Limited reporting	**51**	**53,911**	**56.07**	**74.45**	**23.64**
No longer reporting	**47**	**51,057**	**65.00**	**78.53**	**26.05**
3 km buffer					
2005 Reporting Facilities	**1,462**	**1,991,331**	**42.71**	**54.74**	**16.06**
No change in reporting	**932**	**1,265,821**	**41.36**	**53.69**	**15.89**
Limited reporting	**550**	**695,925**	**47.73**	**61.48**	**18.51**
No longer reporting	**595**	**783,795**	**49.27**	**61.34**	**17.58**
5 km buffer					
2005 Reporting Facilities	**2,558**	**3,694,600**	**36.52**	**47.60**	**13.98**
No change in reporting	**1,815**	**2,592,846**	**37.06**	**48.52**	**13.95**
Limited reporting	**1,167**	**1,615,783**	**40.63**	**52.24**	**15.53**
No longer reporting	**1,256**	**1,780,545**	**42.42**	**53.15**	**15.31**