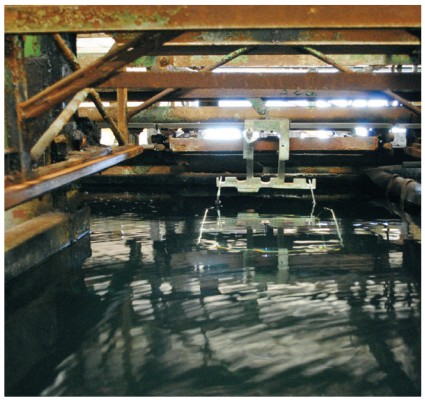
EXECUTIVE SUMMARY

OPPORTUNITIES FOR CANCER PREVENTION:

Trends in the Use and Release of Carcinogens in Massachusetts



TURI
TOXICS USE REDUCTION INSTITUTE
UMASS LOWELL

METHODS & POLICY REPORT #29

JUNE 2013

Molly Jacobs
Lowell Center for Sustainable Production

Heather Tenney
Rachel Massey
Elizabeth Harriman
Toxics Use Reduction Institute

University of Massachusetts Lowell

ACKNOWLEDGMENTS

The authors gratefully acknowledge the following individuals for helpful comments and guidance in the development of this report: Richard Clapp, Polly Hoppin and David Kriebel (Lowell Center for Sustainable Production); Mary Butow, Stacie Caldwell, Pamela Eliason and Felice Kincannon (Toxics Use Reduction Institute); Rick Reibstein (Office of Technical Assistance and Technology); Susan Peck (Massachusetts Department of Environmental Protection); and staff members at the Massachusetts Department of Public Health: Bureau of Environmental Health (Community Assessment and Environmental Toxicology Programs), Bureau of Health Information Research Statistics and Evaluation (Massachusetts Cancer Registry), and Bureau of Community Health and Prevention (Comprehensive Cancer Prevention and Control).

OUTLINE OF REPORT CONTENTS

Toxics use reduction (TUR) is one part of a comprehensive cancer prevention strategy. TUR emphasizes reducing the use of cancer causing chemicals by improving manufacturing processes and adopting safer alternatives. This report draws on 20 years of data collected from industries reporting to the Massachusetts Toxics Use Reduction Act program to assess trends in the use and release of chemicals associated with cancer. The analysis shows that reported use and releases of carcinogens among Massachusetts companies have decreased dramatically over time. Reported use declined 32% from 1990 to 2010, and reported releases declined 93% from 1991 to 2010. The report also identifies opportunities for the program to achieve further successes in preventing exposure to cancer-causing substances.

Introduction

In Massachusetts, the Toxics Use Reduction Act (TURA) program is an important facet of the state's capacity to prevent cancer. TURA is designed to protect public health and the environment, while promoting the competitiveness of Massachusetts businesses, by helping companies and communities to reduce their use of chemicals that are associated with cancer and other diseases. The TURA program works with both large and small businesses. These businesses' efforts to reduce toxics have benefits for workers as well as the general public.

Under TURA, facilities in certain industry sectors that use more than a specified amount of toxic chemicals and have 10 or more full-time employee equivalents are required to submit annual data on their use of toxic chemicals. This report uses data submitted under TURA to analyze use and release patterns for chemicals associated with cancer. The report is intended as a resource both for professionals working in the area of toxics use reduction and for those working in the area of cancer prevention.

Background

Cancer in Massachusetts: Cancer incidence rates have increased since the 1980s. Every day nearly 100 Massachusetts residents are diagnosed with cancer. According to data collected by the Massachusetts Department of Public Health, cancer incidence rates in Massachusetts have increased 14% among men and 19% among women since the mid-1980s, when surveillance efforts in the state first began. Incidence rates of many types of cancer have increased dramatically since the mid-1980s, including breast cancer, kidney cancer, leukemia, and non-Hodgkin's lymphoma, as well as childhood cancers, such as leukemia and brain and central nervous system cancer. The good news is that some cancers, such as bladder cancer and lung cancer among men and non-Hodgkin's lymphoma among women, show declines in recent years. However, others continue to rise; these include kidney cancer and liver cancer.

Cancer prevention requires a comprehensive approach, including efforts to reduce chemical carcinogens in workplaces and the environment.

Risk factors for cancer act within complex causal webs reflecting the cumulative and combined effect of multiple factors across an individual's life. Factors affecting cancer risk include genetic inheritance, lifestyle factors such as diet and tobacco use, infectious disease agents, and industrial chemicals in workplaces and communities, among others. Science has yet to fully reveal all the mechanisms by which these factors interact to affect the development of cancer. However, there are many straightforward opportunities for prevention, including reducing or eliminating exposure to industrial carcinogens.

Primary prevention focuses on preventing healthy people from developing cancer in the first place. This is in contrast to secondary prevention activities, such as screening to detect early-stage cancers. The World Health Organization has noted that primary prevention strategies that eliminate or reduce exposure to recognized risk factors of cancer are the most cost-effective way to reduce the global burden of cancer.

In 2012, Massachusetts released its Comprehensive Cancer Prevention and Control Plan for 2012–2016. The plan outlines a broad array of prevention activities to reduce cancer risk associated with risk factors including tobacco, alcohol, poor nutrition, physical inactivity, and infectious disease agents as well as environmental and occupational exposures. Specific objectives and strategies are outlined for each. Regarding environmental and occupational risk factors, the plan includes objectives focused on educating both consumers and health care providers about industrial and environmental carcinogens.

Toxics Use Reduction: A core primary prevention strategy. Toxics Use Reduction (TUR) is a form of primary prevention. TUR focuses on minimizing the use of industrial carcinogens through process redesign and substitution with safer alternatives, rather than just controlling "end of pipe" emissions. By reducing or eliminating carcinogens at their source, TUR reduces the opportunity for exposure to industrial carcinogens in the workplace, in the environment, and in consumer products and is among the array of cancer prevention strategies outlined in the 2012–2016 Comprehensive Cancer Prevention and Control Plan for Massachusetts.

Methodology

To assess trends in the use and release of industrial carcinogens, this study used several authoritative sources to create a Master Carcinogen List of chemicals considered to be known or suspected carcinogens, and matched this list with the list of chemicals that are reportable under TURA.

Based on the carcinogens that have been reported by TURA filers at some point in the program during the period 1990 to 2010, a list of carcinogens with known or suspected links to specific types of cancer was generated. Eleven cancer sites were chosen as a focus for this report: bladder, brain and other central nervous system (CNS), breast, kidney, blood/bone marrow (leukemia), liver, lung, immune system (non-Hodgkin's lymphoma), pancreas, prostate, and testis.

The trend analysis examined annual quantities of industrial carcinogens that were used and released to the environment over the period 1990 to 2010. Trends were also examined for the use and environmental releases of chemicals grouped by their association with specific cancer types.

As background, the report also reviews trends in cancer incidence rates for these specific cancer types and provides information about the range of important risk factors for each, including lifestyle and dietary factors as well as specific chemicals. Where relevant, the report provides a brief description of other factors influencing trends in cancer incidence rates, such as screening or diagnostic changes.

Results

The Master Carcinogen List shows that 200 known or suspected industrial carcinogens are reportable under the TURA program. Seventy-four of these chemicals have been reported at some point over the period 1990 to 2010. The trend analysis examined use and environmental release patterns for these 74 chemicals.

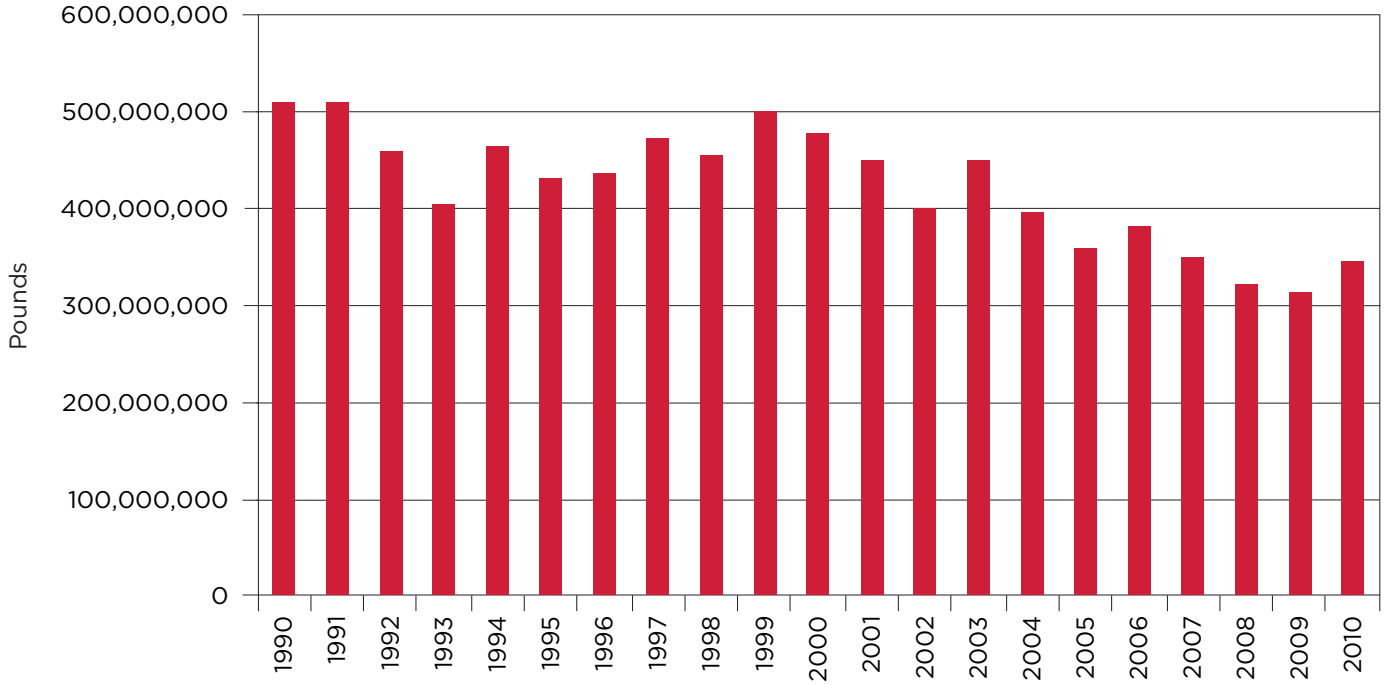
Overall trends: Use and releases of carcinogens have declined. From 1990 to 2010, facilities reporting to the TURA program documented significant reductions in their use and releases of known and suspected carcinogens. Overall, reported use of carcinogens declined 32% (Figure A). The chemical used in the largest amount was styrene monomer, which accounted for 76% of the total known and suspected carcinogen use from 1990 to 2010. Excluding styrene from the analysis, reported use of the remaining group of known and suspected carcinogens declined 53%. Reported releases have declined 93% since 1991, when reporting by electric utilities was phased into the TURA program (Figure B).

Looking individually at the 74 known or suspected carcinogens that have been reported to the TURA program over the last twenty years, all show significant declines in reported environmental releases.

As shown in Table A, some of the declines have been quite significant—over 90% for nearly a dozen chemicals. Moreover, the total amounts reduced are quite striking for some of these chemicals. For example,

FIGURE A

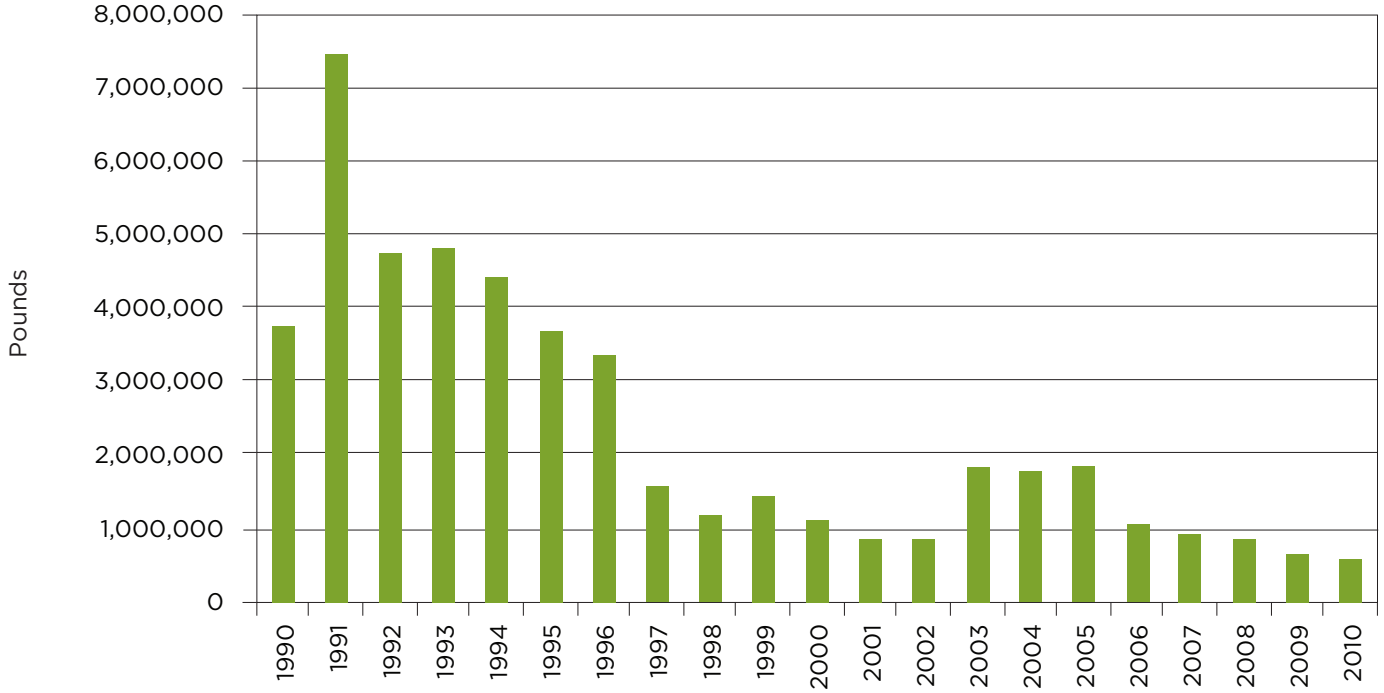
Total Use of Known and Suspected Carcinogens TURA Program, 1990–2010



Based on publicly available data. Data claimed trade secret are not included in these figures.

FIGURE B

Total Environmental Releases of Known and Suspected Carcinogens TURA Program, 1990–2010



Based on publicly available data. Data claimed trade secret are not included in these figures.

reported releases of trichloroethylene declined from 1.3 million pounds in 1990 to 51,000 pounds in 2010.

For most of the 74 chemicals, reported use also declined. Notable declines from 1990-2010 included a 92% reduction in trichloroethylene use, an 85% reduction in tetrachloroethylene use, and a 69% reduction in the use of cadmium and cadmium compounds. However, some known and suspected carcinogens continued to be used in large amounts, despite overall declines. For example, in 2010 the chemicals with the highest reported use included styrene (291.9 million pounds), sulfuric acid (28.0 million pounds), toluene diisocyanate (6.7 million pounds), epichlorohydrin (4.2 million pounds), and lead and lead compounds (3.9 million pounds). In addition, some known and suspected carcinogens showed notable increases in reported use, including dioxin and dioxin-like compounds (unintentionally manufactured), ethylene oxide and hydrazine. With regard to dioxins, some of this increase may be the result of imprecise estimation techniques used by Waste to Energy (WtE) facilities (incinerators) to estimate their annual dioxin generation.

Trends in carcinogens associated with specific cancer sites: Use and releases have declined for most of the groups examined, but amounts are still large. As shown in Table B, reported use of the group of chemicals associated with each type of cancer decreased over the period 1990 to 2010. The group of chemicals associated with testicular cancer showed the largest decline in reported use, a decline of 88%.

All but one of the groups declined in releases. Reported releases of the group of chemicals associated with bladder cancer rose 18%. However, this is an understatement of actual progress; it reflects the addition of combustion-related emissions from Waste-to-Energy facilities (incinerators) to TURA reporting in 2003. If these reported releases are excluded, there was a 94% reduction in the releases of the group of bladder carcinogens. Reductions in releases for the group of chemicals associated with cancers of the breast/mammary gland, liver, pancreas, prostate and testis all exceeded 90%.

While the declines in reported use and release of known and suspected carcinogens by facilities reporting to TURA are promising, large amounts of carcinogens continue to be used and released. In 2010, nearly 350 million pounds of known and suspected carcinogens were used and over 500,000 pounds were released to the environment.

Table A.
Known and Suspected Carcinogens with over 90% Declines in Reported Environmental Releases

Chemical	Percent Decline 1990–2010
Cadmium and cadmium compounds	94%
Chromium and chromium compounds	91%
Di(2-ethylhexyl) phthalate	99%
Ethylene oxide	96%
Formaldehyde	91%
Methylene chloride	98%
Toluene diisocyanate	96%
Trichloroethylene	96%
Tetrachloroethylene	96%

Table C shows the top three chemicals used or released in the largest quantities for each specific cancer type. As shown in the table, certain chemicals appear repeatedly, as they are associated with multiple types of cancer and are used or released in large quantities. These chemicals include persistent bioaccumulative toxic (PBT) chemicals such as lead and lead compounds and polycyclic aromatic compounds; solvents such as trichloroethylene and methylene chloride; feedstock chemicals such as formaldehyde and styrene monomer; and others. Most of these chemicals show significant declines in reported use and environmental releases since 1990. Yet many continue to be used in large amounts, as of 2010.

Limitations of the analysis. This analysis has several limitations. First, the TURA program does not capture chemical use and environmental release data from all facilities in the Commonwealth that use, manufacture or release chemicals. In particular, facilities that do not meet the reporting thresholds, sectors such as health care and higher education that are not subject to TURA, and small facilities with fewer than 10 full-time employee equivalents are not included in the TURA data. The TURA data also do not reflect emissions from consumer products imported into the Commonwealth, which can also contain known or suspected carcinogens.

Second, data used in this report are not adjusted to reflect changes in production. Given the focus on cancer prevention opportunities, this analysis focuses on total use and releases, and does not analyze

whether declines in use and releases were due to TUR activity or changes in production activity.

Third, some facilities subject to TURA requirements have made trade-secret claims, rendering their data inaccessible for this analysis.

Fourth, environmental release quantities are only those released on-site at the facility. Waste transferred off-site for treatment or disposal is not included, even though in some cases that will result in an eventual release to the environment.

Finally, this report does not investigate the relationship between the use and release of chemical carcinogens by TURA filers and cancer incidence rates in Massachusetts. Such an assessment would require information about exposure and would need to account for chemical carcinogens beyond those sources tracked by the TURA program, as well as such complex factors as susceptibility, other risk factors (such as diet and lifestyle factors), and long, variable latency periods.

Table B.
Use and Environmental Releases of Carcinogens associated with Specific Cancer Types
Percent Change, 1990-2010, TURA Program

Type of Carcinogen	Use % Change, 1990–2010	Environmental Releases % Change, 1990–2010
Bladder	-49%[a]	+18%[b]
Brain/CNS	-51%	-78%[b]
Breast/Mammary Gland	-26% (-21% excluding styrene monomer[b])	-97%
Kidney	-62%	-86%[b]
Leukemia	-28% (-59% excluding styrene monomer)	-86%[b]
Liver	-58%	-97%
Lung	-29%[a] (-33% excluding styrene monomer)	-77%[b]
Non-Hodgkin's Lymphoma	-28%[a] (-58% excluding styrene monomer)	-86%[b]
Pancreas	-28% (-53% excluding styrene monomer)	-97%
Prostate	-65%[a]	-97%
Testis	-88%	-96%

a Overall program progress is underestimated due to changes in reporting for polycyclic aromatic compounds.

b Overall trend is influenced by changes in TURA reporting requirements that eliminated the exemption for reporting combustion-related emissions by Waste to Energy (WtE) incinerators resulting in an increase in reported releases of lead and lead compounds beginning in 2003. Overall program progress is underestimated.

Table C.
Top Three Chemicals by Amount Used/Released: Trends by Specific Cancer Type
TURA Program, 1990–2010[a]

	Use			Environmental Releases		
Specific Cancer Type	Top 3 Carcinogens (1990–2010)	% Change (1990–2010)	Total Use (2010)	Top 3 Carcinogens (1990–2010)	% Change (1990–2010)	Total Releases (2010)
Bladder	1. Lead and lead compounds	-81%[b]	3,910,928	1. Methylene chloride	-98%	24,087
	2. Methylene chloride	-55%	3,530,716	2. Lead and lead compounds[b]	-60%	347,103
	3. Polycyclic aromatic compounds[e]	-97%[b]	382,534	2. Tetrachloroethylene	-96%	13,194
Brain/CNS	1. Lead and lead compounds	-81%[b]	3,910,928	1. Methylene chloride	-98%	24,087
	2. Formaldehyde[c]	-73%	2,517,014	2. Lead and lead compounds[b]	-60%	347,103
	3. Methylene chloride	-55%	3,530,716	3. Formaldehyde	-91%	16,100
Breast	1. Styrene monomer	-26%	291,850,681	1. Methylene chloride	-98%	24,087
	2. Toluene diisocyanate	+29%	6,741,872	2. Styrene monomer	-80%	20,976
	3. Methylene chloride	-55%	3,530,716	3. Acetaldehyde[d]	-100%	8,071 (2005)
Kidney	1. Lead and lead compounds	-81%[b]	3,910,928	1. Trichloroethylene	-96%	50,555
	2. Methylene chloride	-55%	3,530,716	2. Methylene chloride	-98%	24,087
	3. Nickel compounds	-66%	661,211	3. Lead and lead compounds[b]	-60%	347,103
Leukemia	1. Styrene monomer	-26%	291,850,681	1. Trichloroethylene	-96%	50,555
	2. Lead and lead compounds	-81%[b]	3,910,928	2. Methylene chloride	-98%	24,087
	3. Formaldehyde[c]	-73%	2,517,014	3. Lead and lead compounds[b]	-60%	347,103
Liver	1. Toluene diisocyanate	+29%	6,741,872	1. Trichloroethylene	-96%	50,555
	2. Methylene chloride	-55%	3,530,716	2. Methylene chloride	-98%	24,087
	3. Di(2-ethylhexyl) phthalate	-88%	1,166,842	3. Tetrachloroethylene	-96%	13,194
Lung	1. Styrene monomer	-26%	291,850,681	1. Sulfuric acid	-63%	67,293
	2. Sulfuric acid	-36%	27,938,964	2. Methylene chloride	-98%	24,087
	3. Lead and lead compounds	-81%[b]	3,910,928	3. Lead and lead compounds[b]	-60%	347,103
Non-Hodgkin's Lymphoma	1. Styrene monomer	-26%	291,850,681	1. Trichloroethylene	-96%	50,555
	2. Formaldehyde[c]	-73%	2,517,014	2. Formaldehyde	-91%	16,100
	3. Methylene chloride	-55%	3,530,716	3. Tetrachloroethylene	-96%	13,194
Pancreas	1. Styrene monomer	-26%	291,850,681	1. Methylene chloride	-98%	24,087
	2. Toluene diisocyanate	+29%	6,741,872	2. Styrene monomer	-80%	20,976
	3. Methylene chloride	-55%	3,530,716	3. Nickel compounds	-4%	1,318
Prostate	1. Methylene chloride	-55%	3,530,716	1. Trichloroethylene	-96%	50,555
	2. Polycyclic aromatic compounds[e]	-97%[b]	382,534	2. Methylene chloride	-98%	24,087
	3. Trichloroethylene	-92%	294,836	3. Polycyclic aromatic compounds[e]	-82%	13,194
Testis	1. Di(2-ethylhexyl) phthalate	-88%	1,166,842	1. Trichloroethylene	-96%	50,555
	2. Trichloroethylene	-92%	294,836	2. Di(2-ethylhexyl) phthalate	-99%	112
	3. Cadmium and cadmium compounds	-69%	266,672	3. Cadmium and cadmium compounds	-94%	70

a Based on publicly available data. Data claimed trade secret are not included in these figures.

b Percent change excludes reporting by Waste to Energy (WtE) incinerators; reporting of combustion-related emissions were phased into the program in 2003.

c An understanding of the temporal trends for formaldehyde is incomplete due to a facility claiming trade secret status for all years except 2008.

d 2005 was the last year facilities reported use of acetaldehyde.

e Based on data for polycyclic aromatic compounds beginning in 2000 (not 1990).

Opportunities

The material presented in this report suggests a number of avenues for continued work to protect workers and the public from exposure to industrial carcinogens. These include policy activities within the TURA program, opportunities to encourage toxics use reduction by facilities in TURA-covered sectors, and opportunities that are not directly covered by TURA. These avenues are briefly described here.

TURA Program Policy Activities. The analysis in this report suggests a number of information and policy activities that can be undertaken by the TURA program. These include:

1. **Evaluate additional carcinogens for possible addition to the TURA list.** Approximately 30 known and suspected carcinogens are not currently reportable under TURA. These substances can be evaluated for possible addition to the TURA list of Toxic or Hazardous Substances in order to facilitate toxics use reduction activities by Massachusetts companies.

2. **Update and maintain the Carcinogen Master List.** The Carcinogen Master List was created as part of the background work for this report. Massachusetts companies, policymakers and the public are encouraged to use this Master List as an informational resource. Resources permitting, it would be useful to update this list routinely over time to incorporate new findings by the authoritative bodies on which it relies.

3. **Evaluate additional carcinogens for designation as Higher Hazard Substances.** Designating a chemical as a Higher Hazard Substance under TURA lowers the reporting threshold for that chemical, and highlights the chemical for particular attention by TURA filers and the TURA implementing agencies. Several carcinogens have already been designated as Higher Hazard Substances and it may be appropriate for the TURA program to designate additional carcinogens for this list. For example, the TURA program could reexamine the group of known and suspected carcinogens that emerged as primary contributors to the use and release totals.

4. **Focus on high-priority groups of carcinogen users by designating Priority User Segments and/or lowering quantity thresholds under TURA, when appropriate.** The TURA Administrative Council, the governing body for the program, has the authority to designate a Priority User Segment under some circumstances. This designation extends TURA requirements to facilities with fewer than 10 full-time employee equivalents for a specified industry category. The Administrative Council also has the authority to lower reporting thresholds in some cases. Both of these authorities can be used to extend TURA reporting and planning requirements to additional facilities.

5. **Under the leadership of the TURA Administrative Council, partner with the Massachusetts Department of Public Health to incorporate TUR strategies into cancer education.** Educating consumers and medical providers about environmental causes of cancer is a specific focus of the 2012–2016 Massachusetts Comprehensive Cancer Control Plan.

Facilitating Toxics Use Reduction. This report also suggests a number of program-related activities that can be undertaken by the TURA program to enhance cancer prevention, including:

6. **Work to address key carcinogens discussed in this report.** This report can be used to identify key carcinogens that warrant additional attention, based on high volumes used or released, links to multiple types of cancer, or other factors. The TURA program may be able to prioritize TUR activities for the group of known and suspected carcinogens that are primary contributors to the use and environmental-release totals. For example, past successes with other halogenated solvents could be leveraged to help facilities reduce their use of methylene chloride.

7. **Work to help small businesses reduce carcinogen use.** The TURA program has achieved significant results in its work with large and medium-sized chemical users. In addition, the TURA program works with a number of small-business sectors to help them protect workers, customers and others from exposure to carcinogens. Examples include

ongoing work with small metal finishers, dry cleaners, auto shops and nail salons. Going forward, there may be opportunities to expand the program's work to reduce carcinogen use in these sectors, where total quantity of use may be relatively small but potential exposures may be significant.

8. **Work to reverse rising use of certain carcinogens.** This report notes that while reported use of most carcinogens under TURA has declined over time, reported use of a few carcinogens has risen. The TURA program may be able to work with users of these chemicals to identify options for reducing use going forward.

Beyond TURA Reporting and Planning: Other Opportunities. There are many other opportunities to prevent cancer through TUR that go beyond the sectors and firms covered by TURA reporting and planning. These opportunities include:

9. **Work to address exposure to carcinogens in consumer products.** A variety of consumer products contain known or suspected carcinogens. There are significant opportunities to protect human health and the environment by redesigning consumer products, and Massachusetts companies and communities may be in a good position to lead some of these efforts. Lessons learned from the TURA program over the last 20 years may be informative for a range of activities including those of companies, non-governmental organizations, state government, and the public.

10. **Work to address carcinogens in sectors not covered under TURA.** These sectors include health care and higher education. For example, ethylene oxide and formaldehyde are two known carcinogens that are relevant to the health care sector and for which TUR strategies are available.

Directions for Future Research: A number of additional research questions were generated as a result of this report. Examples include the following.

11. **Examine the flow of known and suspected carcinogens in consumer and industrial products.** Facilities reporting to the TURA program are required to report the amount of toxics that are "shipped in product." These data could be examined further to document TURA program results and to identify TUR opportunities relevant to reducing exposure to carcinogens further down the supply chain.

12. **Compile and review case studies of companies that have reduced carcinogen use.** The TURA program has developed case studies of a wide variety of companies that have successfully reduced their use of carcinogens while maintaining or enhancing their economic competitiveness. It would be useful to compile and categorize these existing case studies, and to gather additional data to reveal the variety of ways in which Massachusetts companies have reduced the use of carcinogens.

13. **Analyze opportunities for an epidemiological study.** This study does not examine associations between chemical use and release and cancer incidence. Future studies could potentially undertake this question. It could be helpful to assess the usefulness of the TURA data for an epidemiological study of chemical use and cancer incidence in Massachusetts. Such an analysis could determine what research design would be most appropriate and what resources would be needed in order to complete the study successfully. It could examine the relative merits of considering statewide data versus data at the municipal or regional level, and identify factors that would need to be accounted for, such as exposure measurements, latency and a variety of potential confounding factors, as well as inherent limitations in the data. An appropriate first step could be to convene an expert panel to examine the possible ways in which the TURA data could be analyzed in relation to cancer data.

Conclusion

The Importance of Toxics Use Reduction for Cancer Prevention

Cancer prevention remains the most cost-effective and humane policy response available in the "war on cancer." Toxics use reduction, which prevents carcinogenic exposures at their source, is a powerful tool for cancer prevention. The large reductions in use and releases of known and suspected carcinogens by facilities reporting to the TURA program shows that when companies are required to examine their use of a chemical, many find ways to use it more efficiently, others find options for replacing the chemical with a safer substitute, and others change their manufacturing process altogether to eliminate the need for the chemical. Important lessons can be drawn from the success of these tools in reducing the use and release of carcinogens. Continued work to minimize the use of carcinogens in manufacturing and services can help to reduce the burden of cancer in Massachusetts.

The Toxics Use Reduction Institute is a multi-disciplinary research, education, and policy center established by the Massachusetts Toxics Use Reduction Act of 1989. The Institute sponsors and conducts research, organizes education and training programs and provides technical support to help Massachusetts companies and communities reduce the use of toxic chemicals. For more information, visit our website (*www.turi.org*), write to the Toxics Use Reduction Institute (University of Massachusetts Lowell, 600 Suffolk St., Suite 501, Wannalancit Mills, Lowell, Massachusetts 01854), or call 978-934-3275.

This report is part of the Institute's series on Toxics Use Reduction and Disease Prevention. Other publications in this series include *Asthma-Related Chemicals in Massachusetts: An Analysis of Toxics Use Reduction Data* (2009) and *TUR and Disease Prevention Fact Sheet: Asthma (2012).*

OPPORTUNITIES FOR CANCER PREVENTION:

Trends in the Use and Release of Carcinogens in Massachusetts

Toxics use reduction (TUR) is one part of a comprehensive cancer prevention strategy. TUR emphasizes reducing the use of cancer causing chemicals by improving manufacturing processes and adopting safer alternatives. This report draws on 20 years of data collected from industries reporting to the Massachusetts Toxics Use Reduction Act Program to assess trends in the use and release of chemicals associated with cancer.

The analysis shows that reported use and releases of carcinogens among Massachusetts companies have decreased dramatically over time. The report also identifies opportunities for the TURA program to achieve further successes in preventing exposure to cancer-causing substances. This report is designed to be a resource both for professionals working in the areas of toxics use reduction and for those working in the area of cancer prevention.

This report is available at www.turi.org/carcinogens2013report.

FOR INQUIRIES ABOUT THE REPORT CONTACT:

Toxics Use Reduction Institute
University of MassachusettsLowell
600 Suffolk Street, Wannalancit Mills, Suite 501
Lowell, MA 01854
978-934-3275 • www.turi.org

TURI TOXICS USE REDUCTION INSTITUTE UMASS LOWELL

University of Massachusetts UMASS Lowell