

## Prudent Disposal of Unwanted Medications (RxMEDS)

### Final Report

Today's Date: July 13, 2009

Signature:



Recipient: **Area Resources for Community and Human Services (ARCHS)**

Agreement Number: **CH-83335901**

Report Number: **Final Report**

Recipient Contact Person: **Dr. Dianne Benjamin**

Principal Investigator/Project Director: **Dr. Sterling Hayden**

### Introduction/Background

The Mississippi and Missouri Rivers supply water to more than 14 million people in the river basin. Among those drawing water resources from the rivers are the residents of St. Louis, Missouri and the Metro East Illinois area. St. Louis has received good marks in its traditional water treatment procedures but new challenges have arisen due to enhanced chemical identification techniques that are discovering misguided dumping of medications into these major waterways. The current acceptable and promoted method of disposal of outdated/unused medications is to flush them down the toilet or deposit in the trash.

The amount of medications going into the rivers and thus flowing past additional millions of people, who draw their drinking water downstream, is not known. This **Regional eXcess Medication Disposal Service (RxMEDS)** project provided the EPA with the ability to collect data on potential medication contamination by tabulating the quantity of expired or excess medications held by a sample population. In addition the public, especially youth and senior citizens, learned safe medicine disposal procedures -- making their own homes and lives safer.

The RxMEDS project model was conceived following discussions with a family-owned regional supermarket chain having multiple locations and full-time pharmacies. Their initial reaction was very positive, in part because they had been considering a similar medication collection effort. Within a very short time, a diverse regional partnership of pharmacies, disposal services, senior service agencies, and the St. Louis College of Pharmacy (COP) was created.

### Scope of the Project

**Duration:** The RxMEDS project partnership conducted the medication collection program over a 24-month period. This time-period was selected to allow for start-up and organizational issues, program promotion, and planning. It was estimated that since this was a completely new concept to the region, it would take several months to convince people to take advantage of the opportunity and to obtain the necessary approvals required from various government and regulatory agencies.

The actual medication collection period was for 12 months commencing in January 2008 and ending in December 2008.

**Goals and Objectives/Accomplishments**

<b>Regional eXcess Medication Disposal Service (RxMEDS)</b>		
<b>Goal: Create an efficient regional model that removes and disposes of unwanted medications and informs the citizens of related health and environmental issues.</b>		
<i>Objectives:</i>	<i>Results:</i>	<i>Status of Objective:</i>
<ul style="list-style-type: none"> <li>• Identify 25 regional supermarkets that will serve as collection centers.</li> <li>• Establish an environment friendly methodology to dispose of unwanted medications.</li> <li>• Plan and present a major regional workshop for seniors through our senior services partners.</li> <li>• Provide educational programs to 10-20 regional schools on drug safety, etc. using St. Louis College of Pharmacy students.</li> <li>• Conduct relevant research on the topic, e.g.,               <ul style="list-style-type: none"> <li>• Demographics of patrons</li> <li>• Previous disposal methods</li> <li>• Program’s “Best Practices”</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Collection sites reduced to 20 locations based on mandated staffing requirements by BNDD and the DEA.</li> <li>• An approved method for collection, data collection, and disposal of collected medications was developed.</li> <li>• In cooperation with AARP-Missouri, RxMEDS participated in a regional senior conference for 1,000 seniors.</li> <li>• A program was developed and presented to 15 elementary classrooms for 387 students and 15 teachers.</li> <li>• 58% age 60+</li> <li>• 66% female</li> <li>• 85% Caucasian</li> <li>• Previous disposal methods               <ul style="list-style-type: none"> <li>• 37% flushed down toilet</li> <li>• 21% threw into trash</li> </ul> </li> <li>• 296,650 medication doses collected</li> <li>• See section “Overall Conclusions and Recommendations, pages 17-19.</li> </ul>	<p><b><u>Objective Met:</u></b> 20 sites operated for 220 collection days over 12 months.</p> <p><b><u>Objective Met:</u></b> See section “Medications authorized for collection”, page 5.</p> <p><b><u>Objective Met:</u></b> See section “Senior workshop”, page 8.</p> <p><b><u>Objective Met:</u></b> Classroom materials were provided to numerous interested parties. Available on request.</p> <p><b><u>Objective Met:</u></b> Two surveys were conducted. The Primary Survey was for those who returned medications and the Secondary Survey was for those who may or may not have returned medications. See Appendices for survey results.</p>

**Geographic area served:** The RxMEDS pilot project was centered in the St. Louis metro region. The target communities consisted of five counties and two states: four counties in Missouri and one in Illinois. The geographic region had a population of 2.7 million people and was economically and racially diverse. The counties were:

- St. Louis City, MO (considered a county)
- St. Louis County, MO
- St. Charles County, MO
- Jefferson County, MO
- Metro East, IL (many counties merged for statistical purposes)

**Selected collection sites:** Within this targeted region, Schnuck Markets, Inc. operated 66 community stores. Schnucks identified stores in each county based on customer count, location within the county, and diversity of the customer base. These locations were designated as collection points for the RxMEDS project. This method selected locations that were convenient to the patrons, closely represented the counties’ demographics, and offered full-time pharmacies at each of the sites. The pharmacies operated daily from 9:00 a.m. to 9:00 p.m. The hours of collection were set from 10:00 a.m. to 1:00 p.m. on the second and fourth Thursdays of each

month. Ten stores were scheduled for each of the respective days during the month. The original premise of the grant was to operate at 25 locations; this was not possible due to mandated changes in the proposed collection method by the U.S. Drug Enforcement Agency (DEA) and the Missouri Bureau of Narcotics and Dangerous Drugs (BNDD).

**Collection site staffing:** The original concept was to utilize store pharmacy staff (technicians or pharmacists) to oversee the collection of medications. The actual collection and recording of data was the responsibility of sixth year pharmacy students from the St. Louis College of Pharmacy (COP). These students were registered/licensed pharmacists. They were enrolled in a series of assignments their last year, one of which was a five-week community outreach assignment. The number of students enrolled in this assignment was relatively small at any one time, so the idea was to have one student at each store location, working with that store's technician or pharmacist to collect the medications.



### Collection Day Setup

During our discussions with the various agencies and boards that needed to approve the RxMEDS project, a major concern was the staffing issue of having only one person, with support, at the collection sites to review and collect the medications. The concern was the possibility that with only one person responsible there could be some diversion of drugs collected, thus jeopardizing the project, the future of the pharmacy student, and the store pharmacist's license. The approving agencies required that at least two students be assigned to each location along with the support of a technician or pharmacist to collect and record the unwanted medications. In order for this to be possible with the number of students available, we had to reduce the number of locations originally suggested from 25 to 20 to have sufficient students for each assignment. This was also the reason collection days were held on the second and fourth Thursday of each month. A pair of students could work both days during the month. If collections were on the same day, then the RxMEDS project would have been single-staffed and thus out of compliance with the two student mandate.

**Staff training:** The RxMEDS project created a policy and procedures manual on collecting, recording, and processing of unwanted medications. This manual was provided to each location

and student. It was supplemented with classroom instructions from COP/RxMEDS staff, and a video and PowerPoint presentation was created to train students as they enrolled in the community outreach assignment. This allowed for a standardization of the physical locations and for procedures of uniform medication collection and reporting. Policies and procedures were adjusted as new issues were encountered and challenges resolved.

**Method of collection:** The RxMEDS project designated one day a month for the collection of medications at each of the 20 sites on either the second and fourth Thursday of each month. In addition to the staffing limitations explained above, we thought this method simplified media efforts so that information material was prepared in a cost-effective and timely manner.

Patrons brought their medications to the store during collection hours where the College of Pharmacy students interviewed them, reviewed their medications, and collected the data. The actual medicines were removed from their plastic containers or packages. These items were deposited separately and sent for recycling. A form was developed that allowed for the systematic recording of medications by the students. The interview consisted of:

- A review of all medications with an emphasis on what can safely be kept or disposed
- Information about which medications should not be taken in combination with others
- Listing of all medications brought in for disposal
- Listing of quantity or volume of medication
- Listing of type of medication (pill, patch, capsule, etc.)
- Information from the patron about why medications have not been used

The first form was a combination Excel and Word spreadsheet. Although it allowed for the collection of data, it was cumbersome and hard to transfer data for analysis. The form was revised and created in Access which proved to be more flexible in the compiling of the information collected.

It was originally thought that the students would have sufficient time to review the medications and record the data during a patron visit. This was possible at some of the slower and less active locations. Most of the students ended up using paper forms, wrote in the information, and later transferred it to their computer.

One of the quantifiable outputs anticipated was to serve 250-375 patrons per month at the 25 locations. Thus the total anticipated to be served was 3,000-4,500 patrons. This number was not reached first because of the reduction in sites but also due to such things as: 1) inclement weather on several collection days, and 2) reluctance of some store patrons who knew about the program but believed that they could not afford to buy more drugs and should keep drugs in case needed later. This was particularly true of store patrons in low social economic areas of the project. In actuality, the collection program interviewed 892 participants through the drug collection phase and another 675 through a secondary survey.

Even though the number of participants was lower than expected, the amount of drugs collected exceeded expectations. It was not unusual for a patron to bring in a plastic bag full of medications, which in some cases took several hours to review and record.



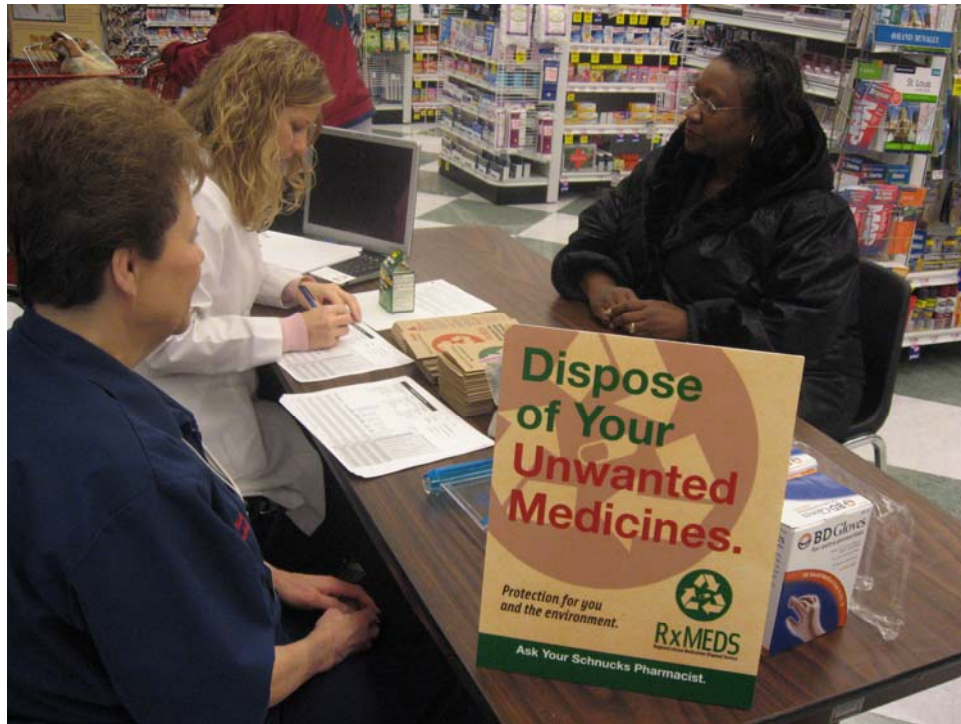
### **Entering Collection Day Information**

This process was time consuming, but approaching at a very personal level was intended to lead gain greater trust and create lifelong habits in dealing with medications. If a senior felt that they had been served honestly and with respect, then perhaps they were the greatest advertisement for others to participate and even participate again themselves.

**Medications authorized for collection:** A major hurdle in the approval process for the RxMEDS project was the collection method that was used to collect or not collect medications classified as “controlled substances.” The original plan was to collect them and a tentative agreement was reached with the DEA. When the plan was presented to BNDD, we were told that this was not possible under state law and had to modify our plans. As a compromise, we decided to revise the collection process, enabling us to record data about any medication that was presented for disposal but without out taking possession of any medication identified as a controlled substance. In this manner we collected the necessary information on the drugs presented but did not violate the state law. The procedure established that the collection site staff first reviewed all medications presented for disposal. Those identified as a non-controlled medication were collected, medications removed from their package or container, counted, and data entered. Controlled substances were not opened or unwrapped. Information about the drug was recorded and the unopened container was returned to the patron with a brochure (available upon request) and a demonstration (video available upon request) on how to properly dispose of the drug so it would have little or no impact on the environment. This process was acceptable to local, state, and federal agencies that had jurisdiction over medications.

In reality, what was considered a setback actually was a benefit to the collection and disposal process. Once the stores were identified and we first considered collecting controlled substances, the plan was to have the cooperation of the local police department to collect the controlled substances after each collection day and either dispose of them or give them to a licensed disposal agent for incineration. The concept was to have a law enforcement representative take possession of these drugs, thus meeting the rule of law. In reality, the 20 stores were located in 14 different police departments. It would have been impossible to get the cooperation of all, much less some, of these departments to make the collections and disposal their responsibility for a 12-month period. Following the decision not to collect controlled substances, all of these police departments were invited to attend a meeting to be informed about

the RxMEDS project and the “who, what, when, where, and how” of the collections. Every department was very supportive of the program and many even said they would participate by bringing their medication for disposal. However, none of them wanted to be responsible for the collection and disposal of the controlled substances.



### Collection Day

**Tabulation of data collected:** Following the collection days, the pharmacy students recorded all information in the data base. Each student was provided a flash drive that was used to retrieve the data to the master file for compilation. A COP student was hired to compile and analyze the preliminary data (see Appendices).

**School/community outreach:** Fourth year COP students enrolled in Introductory Practice Experience (IPE) volunteered to present at a drug safety program at elementary schools focused on the following:

- What is a pharmacist?
- Drug safety
- Appropriate drug disposal
- Accidental poisoning prevention
- Harmful effects of illegal drugs

This program was developed by the students and RxMEDS project staff as a part of this grant. COP faculty and RxMEDS staff coordinated and trained the IPE students and attended the presentations as needed. In all, 15 programs were presented to a total of 387 students and 15 teachers. A PowerPoint of the elementary school presentation is available upon request.

**Waste disposal/recycling:** Cintas Corporation provided environmental waste containers for each collection location. All medications collected were picked up within 24 hours of the collection period. In addition to the medications, the project sorted the various plastics, paper, and cardboard for recycling. Over a ton of materials was collected and recycled. All medications were incinerated. See Appendices for detailed results.

### **Substantial Involvement of Older Adults**

**Community need:** The geographic area targeted for the RxMEDS pilot project represented the highest concentration of senior citizens in the State of Missouri. The St. Louis metro region had 2.7 million people and 276,599 (11.4%) seniors over age 65. Although the primary focus of the project was to inform and educate seniors in regards to a healthier respect and understanding of their medications, all citizens were encouraged to participate in the program.



### **Missouri AARP Senior Day**

**Community involvement:** In determining the makeup of the project partnership, it was evident that a strong presence of organizations representing the senior community was essential. With this as the goal, two local and two national senior services organizations were asked to participate in the project. The following community senior service organizations were active partners:

- American Association of Retired Persons-Missouri (AARP) – national affiliation
- OASIS-St. Louis Region – national affiliation
- Mid-East Area Agency on Aging (MEEA) – local Missouri agency
- Senior Services Plus – local Illinois agency







These organizations met with the planning team to review the program concepts and make suggested modifications on how to attract seniors to participate, timing of the pilot program, etc. They also determined the level of support to provide volunteers and publicity for the project. It was anticipated that each agency could provide volunteers for the collection days at each site. In reality this did not happen. Even though these organizations made repeated requests of their membership only one volunteer was recruited from their ranks during the entire program.

**Senior workshop:** The original consensus was to have one large workshop or series of workshops for all the senior partners based on home hazards, accidental poisonings, and environmental and safety factors related to the use and disposal of medications. It was soon evident that the various senior partners had their own programs and interests and that one workshop topic would not meet all their needs.

Several workshops were offered by the COP about the medication disposal program. To meet this objective, RxMEDS worked with the AARP-Missouri and participated in their annual Senior Day held at the Missouri Botanical Garden. RxMEDS project staff and COP students and faculty participated in the event that registered over 1,000 seniors during the day.

**Collaborative /Partnership and Leveraged Resources**

The RxMEDS partnership secured the participation of seven major businesses and non-profit organizations in the St. Louis metro area. The following table identifies the project partners.

Partner		Project Role
Schnuck Markets, Inc.		Collection points, pharmacists, public relations, incentives
Cintas Corporation		Waste disposal equipment, medication disposal, public relations, recycling
American Association of Retired Persons (AARP)-Missouri Chapter		Workshop(s), volunteers, public relations, planning
OASIS – St. Louis Chapter		Workshop(s), volunteers, public relations, planning
Mid-East Area Agency on Aging (MEAAA)		Workshop(s), volunteers, public relations, planning
Senior Services Plus (Illinois Agency)		Workshop(s), volunteers, public relations, planning
St. Louis College of Pharmacy		Research, education outreach to schools and community organizations
Area Resources for Community & Human Services (ARCHS)		Project coordination, fiscal management

**Partner profiles (based on information current at the time of the project):**

**Schnuck Markets, Inc.** is a St. Louis based company and currently the 11th largest privately owned grocers in the U.S. and 85<sup>th</sup> on the list of the nation's largest family-owned and operated companies. The selected target area for this project includes 66 stores.

**Cintas Corporation** is headquartered in Cincinnati, Ohio and operates 350 facilities in the U.S. and Canada, including 14 manufacturing plants and seven distribution centers that employ more than 32,000 people. It provides ongoing waste disposal services to all Schnucks' stores and serves over 70,000 other clients in the St. Louis area.

**American Association of Retired Persons (AARP)** has over 35 million members nationally. AARP is the leading nonprofit, nonpartisan membership organization for people age 50 and over in the U.S. They have 160,000 registered members in the Missouri service area.

**The Mid-East Area Agency on Aging (MEAAA)** is a not-for-profit agency providing programs and services for older adults at 23 locations. Funding is provided under the amended Older Americans Act of 1965 and administered by the Missouri Department of Health and Senior Services. MEAAA programs and services are available to anyone age 60 and older that lives in the counties of St. Louis, Franklin, Jefferson, and St. Charles.

**OASIS** is a national nonprofit educational organization designed to enhance the quality of life for mature adults. OASIS serves nearly 100,000 members in the St. Louis, MO and Alton, IL areas with a broad range of programs in the arts, humanities, health, technology, and volunteering.

**Senior Services Plus, Inc.** serves Madison County, Illinois as the official "Senior Health Assistance Program" (SHAP) office of the Illinois Department on Aging. Madison County has the highest percentage of senior citizens of any of the Metro East counties.

**St. Louis College of Pharmacy** is a private and independent non-sectarian college located in St. Louis' Central West End medical community. Founded in 1864, the St. Louis College of Pharmacy is the oldest college of pharmacy west of the Mississippi River. The College's 5,000 living alumni represent 49 states and seven foreign countries. More than 90 percent of the pharmacists in the St. Louis area are St. Louis College of Pharmacy graduates.

**Area Resources for Community and Human Services (ARCHS)** serves as the State of Missouri's Official Community Partnership for the St. Louis region. In this role, ARCHS is an intermediary, bringing organizations together to enhance the delivery of community and human services. Since 1998, ARCHS has been credited with positively impacting the lives of more than 1 million area residents by improving access to human services, education, healthcare, and jobs. ARCHS' resume includes regional partnerships with such organizations as the U.S. EPA, the U.S. Department of Labor, the U.S. Department of Justice, the State of Missouri, Missouri Foundation for Health, and the City of St. Louis.

ARCHS is a 501(c) 3 non-profit organization with a \$5.4 million operating budget (FY09) serving St. Louis City, St. Louis County, and St. Charles County. ARCHS secures financial

services through Leveraged Resource Management, LLC (LRM). LRM provides financial services to 21 St. Louis area nonprofit organizations with a focus on fiscal agent functions. LRM manages \$30 million in area funds (FY09). LRM is a wholly owned, for-profit subsidiary of ARCHS. Funding is managed by ARCHS/LRM in compliance with federal rules and regulations.



**“Thank You” Reception for RxMEDS Partnership**

### **Project Finances and Cost of Services**

**Budget:** The amount requested for the RxMEDS project from the U.S. EPA was \$150,570, but the project came in under budget because the senior partners declined to invoice for their allotted advertising expenses. Therefore the entire cost for the RxMEDS project was \$137,849. Of this total, 89% was for the reimbursement of pharmacy personnel, publicity, and collection and incineration of medications collected. If we base the cost of the project on the number of participants, then it may seem like a high program cost of \$155 per participant (based on 892 participants who actually returned medicines). However, if we look at the cost per medications removed from the participants’ homes, then the cost is only \$.56 per dose (based on 244,708 doses collected). If the project had been able to collect the estimated 51, 942 doses of controlled substances recorded but not collected, then the cost per dose would have been even lower.

If we include the elementary school students and teachers, people surveyed who did not turn in medications, people contacted through various media and public relation efforts who where informed about the program (402 students and teachers + 547 surveys + 704,300 publications/media + 3,331 community outreach programs = 708,581 total), then the cost is \$.20 per contact. The amount of impact the environmental information they received and how it will affect their future handling of unwanted medications is immeasurable.

**Medication costs (estimate):** The medications collected were of different dosages, types, etc. and it would be too laborious to determine the retail value of a single dose of each medication. If in determining the value of the medications collected we used a conservative estimate of an average retail value of \$5.00 per dose, then over \$1,223,540 in drugs were collected and disposed of in an environmental-friendly program.

**Leveraged resources:** The partners identified over \$400,000 of in-kind services necessary to make this program successful that represented non-reimbursed labor costs, advertising, volunteer

time, and office/warehouse facilities. This in-kind funding level represents a 265 % match to the federal funds requested. In addition, all partners collaborated successfully in obtaining local news and TV coverage for the program.

**Community Outreach and Education Programs**

**School outreach:** As stated earlier, an elementary education component was developed and implemented as part of the grant’s community outreach effort. A copy of the program is available upon request.

**Program summary:** The elementary school education component of the RxMEDS program was executed between February 2008 and May 2008. A total of 15 classrooms were reached comprising seven schools. Fourth year students, six in total, from the St. Louis College of Pharmacy gave all but one presentation. In addition to a pair of students giving each presentation, Dr. Nicole Gattas or Dr. Amy Tiemeier (COP faculty) were present at each presentation to ensure quality and answer questions. The final presentation was given by Dr. Tiemeier.

**Overall demographics:** The table below summarizes the key demographic information of the school presentations.

RxMEDS Presentations	
Participating schools	<ul style="list-style-type: none"> <li>• Danforth Intermediate               <ul style="list-style-type: none"> <li>○ 4<sup>th</sup> grade – 4 classes</li> <li>○ 5<sup>th</sup> grade – 3 classes</li> </ul> </li> <li>• Hamilton Elementary               <ul style="list-style-type: none"> <li>○ 4<sup>th</sup> grade – 1 class</li> <li>○ 5<sup>th</sup> grade – 1 class</li> </ul> </li> <li>• Walbridge Elementary               <ul style="list-style-type: none"> <li>○ 5<sup>th</sup> grade – 1 class</li> <li>○ 6<sup>th</sup> grade – 1 class</li> </ul> </li> <li>• Lyons Elementary               <ul style="list-style-type: none"> <li>○ 4<sup>th</sup>-6<sup>th</sup> grade – after school program</li> </ul> </li> <li>• New City School               <ul style="list-style-type: none"> <li>○ 4<sup>th</sup> grade – 1 class</li> </ul> </li> <li>• Froebel Elementary               <ul style="list-style-type: none"> <li>○ 5<sup>th</sup> grade – 1 class</li> </ul> </li> <li>• Ford Elementary               <ul style="list-style-type: none"> <li>○ 3<sup>rd</sup> -6<sup>th</sup> grade – after school program</li> </ul> </li> </ul>
Grade levels of students involved	4 <sup>th</sup> grade: 115 students 5 <sup>th</sup> grade: 132 students 6 <sup>th</sup> grade: 140 students Total: 387 students
Evaluations by teachers	Received: 11 of 15 Ratings: for all questions, only three scores of 3 (somewhat agree) were given; all the rest of the questions were rated as a 4 (strongly agreed)

**Lessons learned:** We found that the presentation worked best with students (4<sup>th</sup> or 5<sup>th</sup> grade) who were covering or who had recently covered the environment and ecosystems in their science modules. Letting students know that there would be a game at the end pertaining to the information really helped the students focus and pay attention. The Jeopardy game concept (inquiry based learning) was not one that many of the students were aware of and some found it challenging to remember to phrase their answer in the form of a question. However, as the game proceeded, many of them improved.

### **Conclusions and Recommendations**

**Elementary education program:** Overall, we believe the education portion of the RxMEDS project was a success. Of the evaluations we received, the teachers ranked the program very high and had positive comments regarding the program and how their students interacted. Having active learning components, such as the plaster of Paris demonstration and the Jeopardy game at the end, were key to keeping the students' attention as well as helping to reinforce the key concepts in the presentation.

**Senior services workshop:** During the first planning meeting with the senior service providers, it was evident that creating and holding one major event for all agencies to attend would be difficult if not impractical. Each of the agencies had multiple events planned that could incorporate the message of the project without the necessity of adding another event.

In lieu of a single event for the providers, programming and information was provided to any organization that requested it. The COP made several presentations throughout the tenure of the project to the senior partners.

The RxMEDS staff and the COP did participate in the annual AARP-Missouri Senior Conference at which over 1,500 seniors were registered. An information booth and demonstrations were set up and students, faculty, and staff manned them for the day.

### **Advertising, Media, Public Relations**

**Advertising:** The major contribution to paid advertising was in the form of ads run in the weekly newspaper inserts provided as in-kind by Schnucks. These ads were run several times during the RxMEDS project tenure and reminders were also placed with other health-related promotions.

**Media:** An attempt was made to utilize all forms of media and resources in the region to promote the project. This effort was met with mixed success. On the one hand, we were successful in publicizing through local network television, major radio, several articles in major and community newspapers, blogs, internet newsletters, City of St. Louis newsletters, professional journals, local cable television, and numerous community outreach programs.

On the other hand, during the first months of the RxMEDS project it was a struggle to find local media interested enough to do a story or promote the project. Only after a national Associated Press article on "drugs in the water" appeared in the local newspaper, did people start checking to see what safe medication disposal options were available in the St. Louis metro region.

**Questions About Your Health?**

**Schnucks Pharmacy**  
Pharmacists You Know, Care You Can Trust

Our friendly, knowledgeable pharmacists are ready to answer questions about symptoms, a diagnosis, prescribed medications, over-the-counter recommendations and more. We make it easy!

**Why Is Medicine Disposal A Concern?**

The Environmental Protection Agency (EPA) has recognized that **unused prescription and over-the-counter medicines pose a hazard if left in the home** because:

1. Possible poisoning or harmful side effects can occur following inappropriate ingestion, particularly among the elderly, children and pets.
2. Theft of medicines may lead to inappropriate use or identity theft.
3. Medicines flushed down the toilet contaminate rivers and streams. This causes growth and reproductive problems in fish and other aquatic wildlife.

**DO NOT FLUSH your old medicines!**

Schnucks is partnering with the EPA and others to provide a medicine disposal program at 20 locations around the metro area. There are specific drop off times once a month. For times, locations, directions and more information see [www.schnucks.com/pharmacy](http://www.schnucks.com/pharmacy).

**How Do I Dispose Of My Expired Or Unwanted Medicine Safely?**

To dispose of unwanted medicines at home, do the following:

1. Add water to the medicine container to dissolve the tablets or dilute the liquid.
2. Empty medicine and water from its container into a disposable and sealable bag.
3. Mix in a handful of undesirable solid substance such as kitty litter or coffee grounds.
4. Remove and destroy ALL identifying personal information from the prescription label of the original medicine container.
5. Place bag in trash on trash pick-up day. Recycle plastic or glass container.

If you have more questions, talk to your Schnucks pharmacist. As a medicine expert, pharmacists are available to guide you on how to properly dispose of your unused medicines.

### Ad in Weekly Store Newspaper Insert

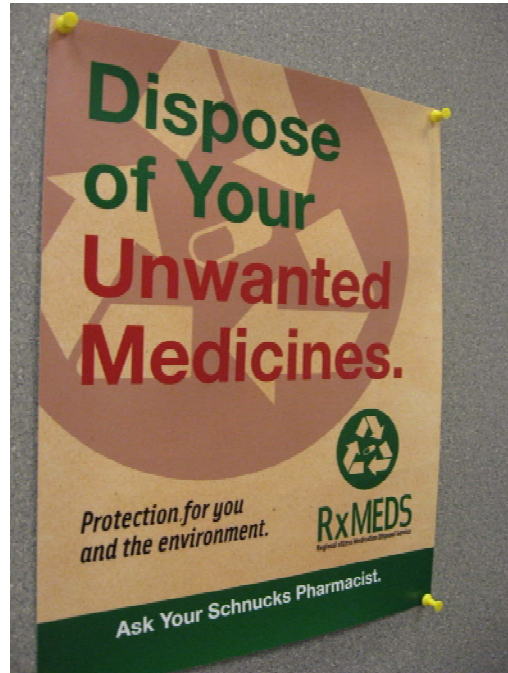
Initial contacts were made with the regional water company, electric company, and sewer district to get them involved. This also met with mixed success. All of them thought it was a great idea and the medication collection services were needed, but were not initially interested in providing any assistance. Not until half way through the collection year did the water company again become interested after a second television network affiliate story on drugs in our water which highlighted the RxMEDS project as a local solution. Following this program the water company agreed to send out a flier in their fall billing to promote RxMEDS and other local environmental efforts. These fliers reached over 380,000 households but came at the end of the one-year RxMEDS project.

We were approached by a national cable program. They wanted to film the RxMEDS program as part of a “green living” cable program. The major drawback was that we had to pay them \$50,000 to do the filming. Needless to say, the cable program was not produced by us.

Media materials were developed or obtained to promote the project. A considerable amount of materials were obtained from local health agencies, poison control centers, etc. that focused on drug safety in the home. These materials were primarily utilized in the school outreach presentations. Additional materials such as fliers, store signage, bag stuffers, and project logos were created. The fliers and signage were also translated into Spanish. All of these materials are available upon request.

Information about the RxMEDS was placed on ARCHS and Schnucks’ Web-sites. We also installed a hotline number that could be called to volunteer or to get more information about the project. The ARCHS’ Web-site and hotline phone number were printed on all brochures, etc.

**Public relations and community outreach:** RxMEDS partners and additional ARCHS’ staff participated in over 25 various health fairs, community meetings, teacher training conferences, church and school health programs, environmental workshops, etc. on behalf of the project. Over 3,300 individuals were contacted and information materials on the project’s locations and collections sites were provided.



### Store and Community Signage

**Additional project support/interested parties:** As the project gained momentum and more people became aware of its existence, local and national groups sought information and in some cases offered to assist where possible. The following list represents various organizations that somehow contributed or promoted the grant activities.

- **50 PlusStLouis.com**
- **Abbott Laboratories**
- **Alexian Brothers (Hospitals) PACE Adult Care Day Health Center**
- **Brazos County, TX – initiative to create a countywide drug collection program**
- **City of Florissant, Missouri Cable Network**
- **City of St. Louis, Refuse Division**
- **Consumer Healthcare Products Association (CHPA)**
- **East Central District Health Department, Columbus, NE**
- **EMCO Waste Services**
- **Express-Scripts**
- **Fox Television, Channel 2, St. Louis**
- **Grace Hill, Health Camp**
- **GREAT, Family Safety Fair**
- **Human Development Corporation**
- **Living Lands and Waters**
- **Maternal Child and Family Health Coalition**
- **Metropolitan Sewer District of St. Louis**
- **Missouri American Water Company**
- **Missouri Black Expo**
- **Missouri Environmental Education Association (MEEA)**
- **Park Place at Winghaven, Health Fair**

- **Pattonville School District, Parents as Teachers**
- **PhRMA**
- **Ritenour School District Health Fair**
- **Schnuck Markets, Inc., Weekly Advertisement Section**
- **South Carolina Pharmacy Association**
- **St. Clair County Health Department**
- **St. Francis Xavier College Church, Mission Outreach**
- **St. Louis Area Agency on Aging**
- **St. Louis County Waste Management Program**
- **St. Louis Post-Dispatch Newspaper**
- **Saint Louis University, “Small Business Week”**
- **St. Rose Philippine Duchesne Catholic Church**
- **Union Avenue Christian Church, Community Health Fair**
- **University City United and Sierra Club of E. Missouri, Community Forum**
- **U.S. EPA, Region 7**
- **Wolters Kluwer Health (WK Health)**

It is important to note that the project received considerable support from many individuals and organizations beyond our original partners. There were a few that stood out, as follows:

- **Saint Louis University, Dr. Ray Tait:** Early on the grant was faced with the necessity of having the research methodology approved through an Institutional Review Board (IRB). None of the members of the partnership had this capability within their organization. Dr. Tait was contacted and volunteered to assist and sponsor the research through Saint Louis University. He worked with us on the presentation and “walked” it through to gain approval. Without his efforts and assistance we would not have been able to continue.
- **Wolters Kluwer Health:** One of the issues discussed during the approval process was the method by which sixth year COP students would be able to identify controlled substances at collection sites. At least two pharmacists or pharmacy technicians were available on site at each location. In addition, WK Health donated 300 copies of their compact disc software that helped identify medications. Each student was given a copy of the CD to load on their personal computers to help in the drug identification process (all students received personal laptops from COP as part of their school enrollment).
- **St. Clair County Health Department:** After the announcement of the grant award by EPA in April 2007, the St. Clair County Health Department called the RxMEDS project manager and asked about the program and how they could help. St. Clair County is in Illinois located near Scott Air Force Base. The Health Department and the community they serve are very environmentally active and eventually became the largest collection site in terms of number of participants and medications collected. Ms. Jennings of the Health Department served as a volunteer at every event held at the store in her county. She also conducted surveys, handed out materials, and personally placed news stories in the local newspaper to be printed the day before

each collection event was to be held. Ms. Jennings and the Department are models of how community agencies and individuals should have become involved.

**Quantifiable Outputs:**

<p><b>Output:</b></p> <ul style="list-style-type: none"> <li>• Create and disseminate an effective public relations program to promote the project.</li> <li>• Continue to recruit additional organizations to promote and expand the collection effort.</li> <li>• Utilize community resources in the creation, promotion, and operation of the project.</li> <li>• Collect regional data on unwanted drugs and their reason for disposal.</li> <li>• Interview and collect medications from 250-375 patrons per month.</li> <li>• Prepare 4-10 promotional materials to advertise project.</li> <li>• Conduct research (program assessment, analysis of drugs collected, patron demographics, disposal reasons, etc.)</li> </ul>	<p><b>Measurement/Methodology:</b></p> <ul style="list-style-type: none"> <li>• Number of patrons that participate in the collection program               <ul style="list-style-type: none"> <li>○ <b>892</b></li> </ul> </li> <li>• Number of new partners               <ul style="list-style-type: none"> <li>○ <b>39</b></li> </ul> </li> <li>• Number of programs and attendance at community awareness programs/workshop(s)               <ul style="list-style-type: none"> <li>○ <b>22 programs with 3,331 attendance</b></li> </ul> </li> <li>• Number of programs and attendance presented at schools               <ul style="list-style-type: none"> <li>○ <b>15 programs with 387 attendance</b></li> </ul> </li> <li>• Number of collection site surveys               <ul style="list-style-type: none"> <li>○ <b>Primary survey, 892</b></li> <li>○ <b>Secondary survey, 675</b></li> </ul> </li> <li>• Number of public relations items produced               <ul style="list-style-type: none"> <li>○ <b>4</b></li> </ul> </li> <li>• Extrapolation of information from surveys and data collected               <ul style="list-style-type: none"> <li>○ <b>296,650 doses of medications returned</b></li> <li>○ See Appendices</li> </ul> </li> </ul>
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**Sustainability:** The RxMEDS pilot was the first step in creating a realistic, effective community program for the education of the region’s citizens and the establishment of an ongoing, environmentally friendly procedure to dispose of unwanted medications.

For example as part of ARCHS’ U.S. EPA Collaborative Problem Solving grant-funded project “St. Louis Area Communities Against Toxics” (SLACAT), we partnered with neighborhood stakeholders, Veolia Environmental Services, and COP to provide a one-day take-back and disposal activity for non-controlled medications at SLACAT’s household hazardous waste (HHW) collection event on May 30, 2009. The event targeted residents of environmental justice neighborhoods in north St. Louis City, with a population of approximately 60,000 households in the target area. Veolia estimated they collected 5.6 tons of HHW, including 20 pounds of non-controlled medications, from the 125 vehicles/households participating in the event. The successful event will be repeated in spring 2010.

Additional conversations have taken place with the St. Louis County Waste Management Division about the possibility of collecting non-controlled household medications during their monthly waste collection events. The COP is interested in continuing the program on a reduced level and is considering working with the county at four events each year. The drawback to continuation of the program is creating collection sites, advertising the program, providing informed individuals who can collect acceptable medications, and the cost of waste disposal. Yet all these barriers could be overcome with this type of partnership, a partnership not even considered prior to the RxMEDS program.

There is currently a group in mid-Missouri that is interested in starting a regional collection program that would include controlled and non-controlled substances. RxMEDS staff have talked to them several times and told them of the laws, etc. that govern controlled substances. In

March 2009, they received a letter from regional DEA staff clarifying that they can not collect controlled substances without a law enforcement officer on site to collect them.

In July 2009, ARCHS and COP were interviewed for an in-depth article by the major regional newspaper about a successful medications collection program in Jefferson County. A community-based parent organization and law enforcement held a series of seven collection events at multiple locations. Their primary goal was to prevent teenage drug abuse by removing medications from homes. As a result of their success, permanent medication collection opportunities will be available at some law enforcement office sites in Jefferson County.

**Success Stories:** In 2008 Schnuck Markets, Inc., a major partner in the RxMEDS project who provided store locations to serve as monthly collection sites, was recognized as “Pharmacy Chain of the Year,” by the trade magazine *Drug Topics*. One of the major factors emphasized in this selection was Schnucks’ involvement in the RxMEDS project.

Dr. Nicole Gattas, who teaches at COP and during the RxMEDS project was a part-time pharmacist at Schnucks, received the 2009 American Pharmacists Association (APhA) “Award in Community and Ambulatory Practice”. APhA stated they recognized Dr. Gattas in part for her contribution to the RxMEDS project.



(Photo Courtesy of *Drug Topics*)

### **Overall Conclusions and Recommendations**

**Collection locations:** In determining the number of locations for a collection the first thing to consider is the amount of human resources you will have available to staff the sites. The RxMEDS project originally anticipated having sufficient collection site staff between the pharmacy

students and volunteers that would be recruited. Our site staff availability was limited by the students' school schedule, so not all anticipated students were available at all times. In addition, vacation schedules and academic breaks impacted the site staffing levels and assignment of students. The lack of someone whose full time job was the recruitment and assignment of community volunteers greatly hampered the quality and quantity of volunteers actually involved in the year-long project.

A second thing to consider is the distance between locations and the time involved to collect the medications efficiently. The waste hauler business responsible for the collection must re-route its trucks to collect on special days at the various locations, as well as arrive after a collection event has been completed. The original waste hauler had extreme difficulty in making the adjustments in pick up schedules and caused multiple duplicate collections during the initial stages of the project. This waste hauler business was dropped and another waste hauler had to be brought in midway through the project.

Collection locations should be convenient with ample parking and access. All of our sites were located in a major supermarket and collections occurred during set hours and advertised days only.

We also found that the collection sites located in low income areas of the region had the least participation from the community. Low income residents believed that the collections were a good idea, but were reluctant to dispose of unused medication just in case it might be needed in the future and be costly to purchase a new prescription or over-the-counter drug.

**Medications:** It was clear from the way drugs were collected that many participants turned in quantities reflecting the unused balance of a 30 day supply. It was almost universal that participants took doses until they felt better and then attempted to save the remainder of the prescription for future needs.

***Our main recommendation to pharmaceutical companies and insurance companies would be to reduce a standard prescription from 30 to 20 or 21 doses. This alone would remove millions of extra unused medications from the homes and eventually the environment.***

We anticipate pharmaceutical companies might view this as too costly an economic concession, because not selling as many doses per prescription would result in a loss of revenue. Also prescription insurance companies figure their handling costs, co-pays, and reimbursement rates on a 30-day supply. Even though these parties would have to make the adjustment, it would seem reasonable that paying for only a 20-day supply rather than a 30-day supply would save up to one-third the current cost of each prescription.

**90-day supplies:** Many of the participants turned in the balance of medications remaining from a 90-day supply. These medications generally fell into two categories: 1) medications that were discontinued due to side effects or 2) medications that were unused by patients after their death and families did not know safe drug disposal practices.

For example, one RxMEDS participant was an 80 year old white female who brought medications to a collection site in a low income neighborhood. She returned unused 90-day supplies of six different types of eye drops, explaining they were tried and discontinued due to side effects. If her doctor could have given her a sample or limited supply, then it would have significantly reduced the number of medications in her home and saved her considerable money.

RxMEDS participants who were relatives or friends of deceased family members were all very concerned about being responsible for the safe disposal of unused medications, many of which were prescribed to relieve end-of-life pain and suffering. Without being prohibitive, it may be that doctors providing palliative care for terminal cases, could recommend a 30-day supply with refills to reduce the unused medications in the home.

Yet another type of example occurred concerning the safe disposal of more than a 12-month supply of heart medicine from a mail-order company and automatically sent to the patient even though the doctor had changed the prescription. The family tried to stop the original order but the company continued to send the medications and the insurance company continued to pay for all the unused heart medicines.

Also we were approached by a few non-profits and businesses that wanted assistance with safe disposal of large quantities of medications. For example, we were contacted by a former pharmaceutical sales representative, a women's shelter, and several nursing homes. We were not able to resolve their concerns because the RxMEDS project focused on individuals or households only and did not accept medications from health centers, doctors' offices, or other organizations. However their dilemmas are real and need to be addressed.

Finally, we support recent initiatives from the federal government under the new White House administration that is creating mechanisms for collaboration between EPA, DEA, etc., to streamline policies and procedures for collecting controlled substances. We can already see that this new approach is trickling down and making a difference in our region and our state. There appears to be more cooperation from the various regulatory agency staff, rather than just an emphasis on compliance. This seems especially apparent when comparing our initial startup process in 2007 with nearby community-based medication collection efforts starting up in 2009.

With a few more common sense practices on the part of the prescribing doctors and more flexibility on the part of insurance companies, millions of dollars can be saved for the consumer and even more unused medications can be kept out of our homes and the environment.

## **Prudent Disposal of Unwanted Medications (RxMEDS)**

### **Primary Survey Results**

#### **Introduction:**

During 2008, Area Resources for Community and Human Services (ARCHS) implemented the U.S. EPA project known as Regional eXcess Medication Disposal (RxMEDS). ARCHS' project staff and partners conducted a bi-state medication collection program through a grocery store chain in Missouri and Illinois counties in or around St. Louis. A total of 220 collection days were conducted near the stores' pharmacy counters. The following information, charts, and tables reflect a summary of the information collected at the 20 store locations as a result of this year-long effort. The information was collected through a structured brief interview ("primary survey") conducted by pharmacy students as they collected medications from participants. A summary of the RxMEDS project's overall results is listed as follows:

- **Program cost \$137,849 (U.S. EPA grant award \$150,050):** RxMEDS project costs were under budget due to senior partners not requesting proposed funds and providing services as in-kind. Also we modified collection and disposal to reduce this cost.
- **Over 2,000 volunteer hours** were needed to operate the year-long program.
- **20 collection sites** were operated each month, January through October 2008. Only 10 collection sites were operated in November and December due to holidays.
- **\$289,000 in leveraged funds** were reported by the partnership.
- **39 other local, state, and federal organizations or agencies** assisted, provided information, or requested assistance during the project.
- **387 elementary students and 15 teachers** were presented an educational program on poison prevention via safe medication handling and disposal.
- **A secondary survey was conducted with 448 non-participants and 220 participants (7 non responses) for a total of 675 (see Appendix 2).**
- **Over 300 St. Louis College of Pharmacy students** participated in the program as collection agents.
- **3,331 older adults were educated** by senior partnership programs and community outreach efforts about safe handling and disposal of medications.
- **Media/publications reached an estimated 704,300 in the bi-state area.**

**Summary of RxMEDS Primary Survey Results:**

- **892 participants** returned one or more medications.
- **296,650 medications** were returned.
  - **244,708 over-the-counter (OTC) and non-controlled prescription individual capsules, tablets, and suppositories** were collected and incinerated.
  - **51,942 controlled substances** were recorded but not collected from the participants. This number is an *estimate* as RxMEDS project guidelines required collection sites to identify all controlled substances, keep the container closed, and visually estimate the amount of medication presented for return, and then give the container back to the participant.
- **10,095 “bottles” were recorded:** For this report, a “bottle” is defined as one prescription or one OTC medication that was recorded on the same line of the survey. A bottle may include multiple tablets. For instance, a prescription of Lipitor with 30 tablets would be counted as one bottle. Additionally, a bottle may be a tube of ointment or inhaler. It is possible that some bottles were recorded on the same survey line, making this statistic less accurate than the number of tablets returned. For instance, one student may have recorded “Lipitor #60” on one survey line, even if two bottles were brought in by the patient.

<b># of “Bottles”</b>	<b>Description of Type of “Bottle”</b>
473	Controlled prescription bottles attempted to return
6,399	Non-controlled prescription bottles returned
2,536	OTC medication bottles returned
123	Inhalers returned (prescription & OTC)
534	Creams, gels, & ointments returned (prescription & OTC)
30	Patches returned (prescription & OTC)
10,095	Total “bottles” returned

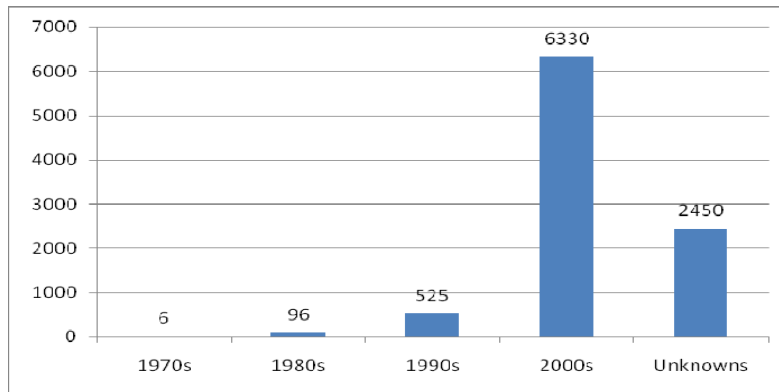
**Most frequent medication returned by category:**

- Controlled – Hydrocodone (prescription painkiller, e.g., Oxycontin)
- Non-controlled – Furosemide (prescription diuretic, e.g., Lasix)
- OTC – Aspirin, Acetaminophen, Ibuprofen (painkiller, anti-inflammatory)

**Age of Medications:**

In general, prescription medications are considered to expire a maximum of one year after they are dispensed. Over-the-counter medications generally expire two to three years after purchase. When medications were returned, the dispensing date was documented for prescriptions and the expiration date was documented for OTCs. The oldest medication expired in 1970.

**Frequency of Expiration/Dispense Dates of Bottles by Decade**



**Reasons for Returning Medications:**

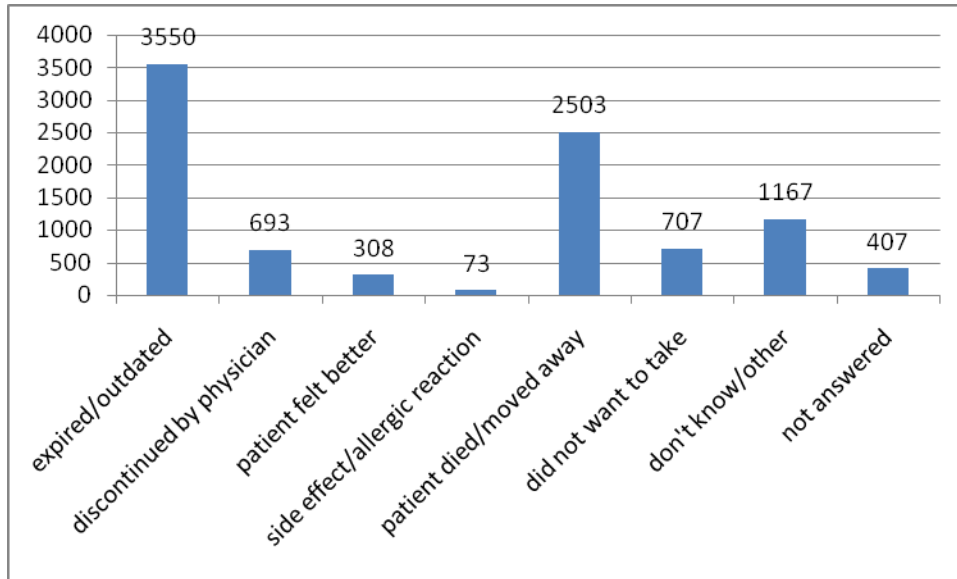
Participants were asked why they were returning each bottle of medication. Most commonly, the medications were expired. Many participants returned medications due to the patient having moved away or having died.

Students commented that many family members returned large quantities of medications after a death. Often their loved one had died from a medical condition and no instructions had been given regarding what to do with the medication.

In one instance, a neighbor brought back several boxes of medications. Most were prescription medications that had never been opened. The participant stated the pharmacy continually mailed medications that were no longer being prescribed and also continued to mail medications after the patient died.

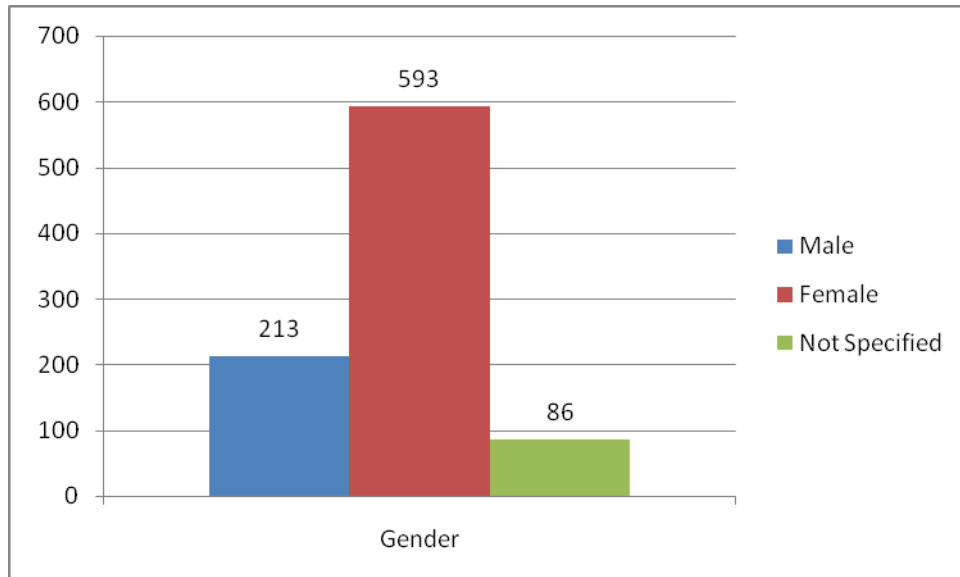
See the chart below for a summary of the reasons participants gave regarding why medications were returned.

**Participant Reasons for Return by Category**



**Gender of Participants:**

Gender	#	%
male	213	23.9
female	593	66.5
not specified	86	9.6



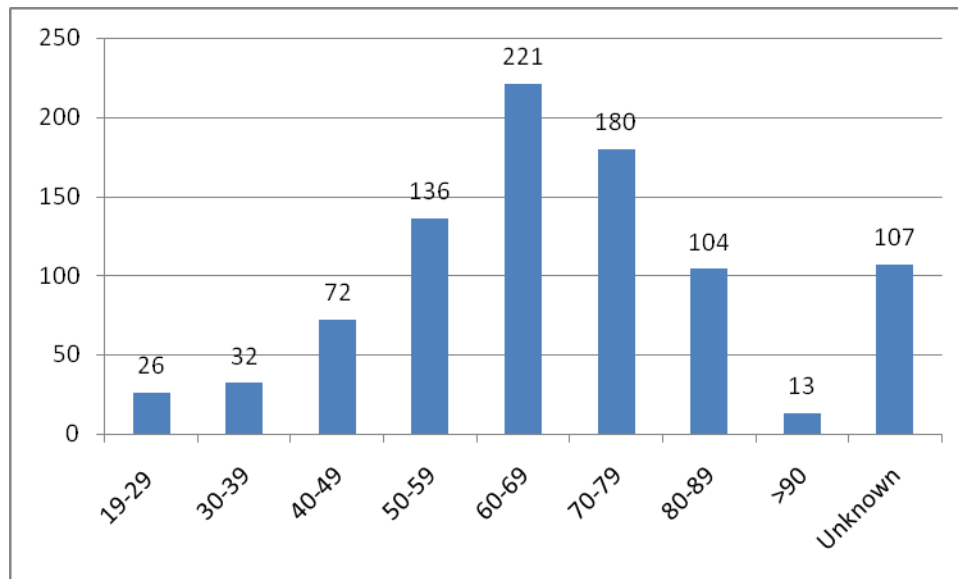
**Age of Participants:**

**Age by Decade and Divided by “Senior” Status**

Age by decade	#	%
19-29	26	2.9
30-39	32	3.6
40-49	72	8.1
50-59	136	15.3
60-69	221	24.8
70-79	180	20.2
80-89	104	11.7
≥90	13	1.5
Unknown	107	12.0

Age by senior status	#	%
<65	373	41.9
>65	411	46.1
Unknown	107	12.0

**Age by Decade**



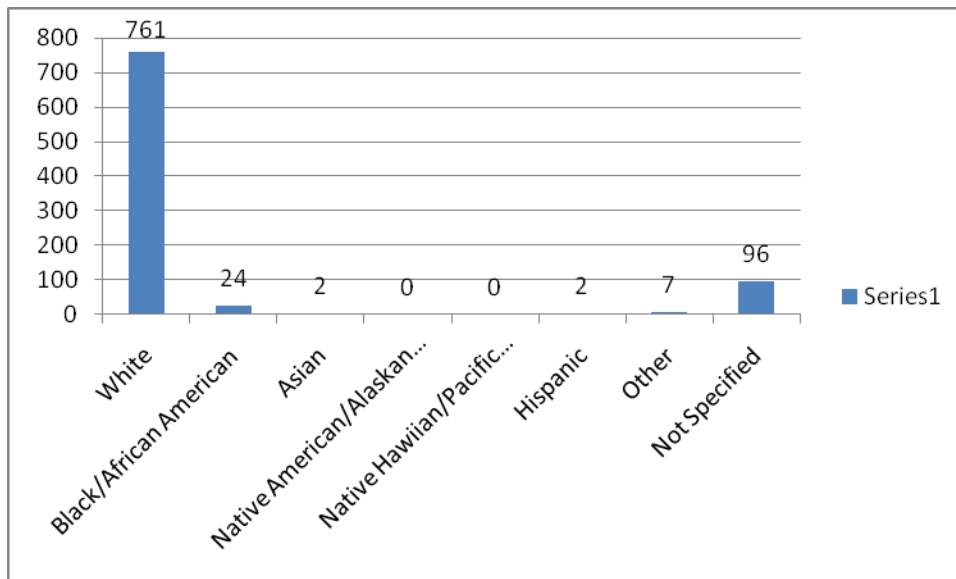
**Ethnicity of Participants:**

Overall, the majority of participants were white females age 50 and over.

Anecdotally, the store locations in racially diverse areas tended to be lower income. Pharmacy students collecting at those locations commonly reported talking with non-participants. Many responded that they needed to keep their medications in case they needed to take them later

or give them to other family members at a later time. Cost of the medications seemed to be a concern over safety of keeping medications in the home.

Ethnicity	#	%
White/Caucasian	761	85.3
Black/African American	24	2.7
Asian	2	0.02
Native American/Alaskan Native	0	0
Native Hawaiian/Pacific Islander	0	0
Hispanic/Latino	2	0.02
Other	7	0.07
Not Specified	96	10.7

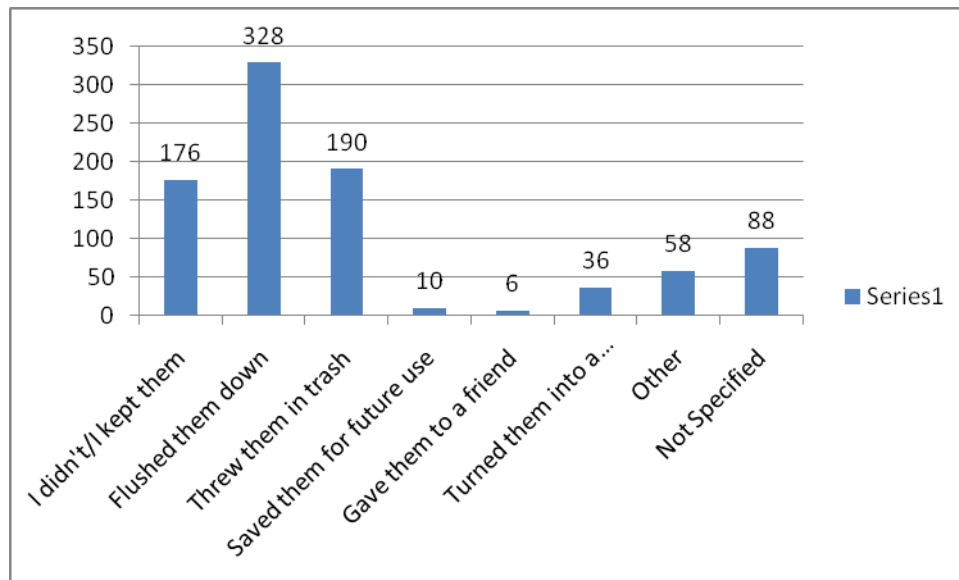


**Description of Previous Medication Disposal Methods by Participants:**

Previous studies report 50% of participants flushing medications down a toilet.\* Our findings show 36.8% previously flushed them down a toilet. We also see that approximately 20% of participants were keeping their medications in the home. These participants were provided with future instructions for disposal congruent with recent federal government recommendations.

\*Reference: Seehusen, D.A. and Edwards J. (2006) Patient practices and beliefs concerning disposal of medications. Journal of the American Board of Family Medicine, 19: 542–7.

Participants' Previous Disposal Methods	#	%
I didn't/I kept them	176	19.7
Flushed them down	328	36.8
Threw them in trash	190	21.3
Saved them for future use	10	1.12
Gave them to a friend	6	0.67
Turned them into a collection program	36	4.0
Other	58	6.5
Not Specified	88	9.8



**Zip Codes of Participants:**

As with the PhRMA secondary survey (see Appendix 2), the analysis of participant zip codes indicated that the majority of participants came from the same zip code as the collection point. However no reference or conclusions could be made other than the participants responded to the sites that were geographically convenient.

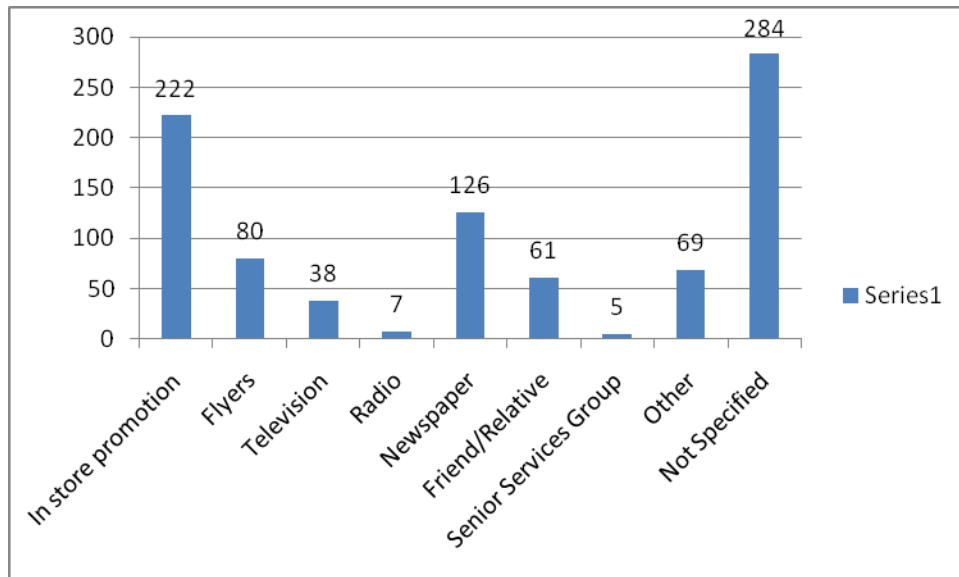
**How Participants Heard about the RxMEDS Project:**

Anecdotal, pharmacies that were actively promoting the program with their patients had a larger turnout. We successfully partnered with senior groups; however, when asked how participants heard about the program, few answered they heard through the senior group.

A major challenge to the program was the year-long continued effort to keep the public aware of the program. There were no funds for advertising so all efforts basically had to be in-kind. The program promotion was also difficult because the collections were only held once a month

at a location. Participants may have heard about the program but forgot about it or missed the collection day as a result of circumstances.

How Participants Heard	#	%
In store promotion	222	24.9
Flyers	80	9
Television	38	4.2
Radio	7	.78
Newspaper	126	14.1%
Friend/Relative	61	6.8%
Senior Services Group	5	.56%
Other	69	7.7%
Not Specified	284	31.8%



## **Prudent Disposal of Unwanted Medications (RxMEDS)**

### **Secondary Survey Results**

**Background:** In 2007 soon after the U.S. EPA awarded the grant for the Regional eXcess Medication Disposal Service (RxMEDS) project in the St. Louis metro region, the partners contacted representatives of Pharmaceutical Research and Manufacturers of America (PhRMA) to discuss the possibility of adding a second survey to function in parallel with the primary survey activities. Following the 2007 conference presentation in Maine, it was agreed that PhRMA would develop a one-page survey that would be administered at each collection site for both participants returning medications and non-participants. In appreciation for this survey, PhRMA provided a stipend that helped support RxMEDS project costs for purchasing collection site materials and supplies and for attending the 2008 national conference in Maine. Neither of these expenses were included in the grant budget.

**Level of Participation:** The one page survey was administered during the 220 collection days from January – December 2008 at each of the grocery store chain collection sites, setup near the pharmacy counters. The survey was conducted by volunteers or the collection site assigned staff and was administered at all 20 locations over the 12-month collection period. The survey was conducted only on the days the location was having a collection event. A total of 675 surveys were completed; some of the survey respondents were collection participants who were returning medications and other respondents were at the collection site but not returning medications. All survey respondents voluntarily answered the survey but not all respondents provided answers to all questions, such as age.

**Data Analyst Team:** The accompanying data was compiled by the St. Louis College of Pharmacy (COP) under the direction of Dr. Nicole Gattas. Assisting Dr. Gattas was Dr. Claude Gaebelein and student pharmacists Emily Svezia and Lynn Ramsey. A special thanks to them for their efforts.

**How to Read the Data:** The following tables show the frequency of responses. In column 1 are the different categories of the variable responses. In column 2 are the frequencies of each category. The “missing system” row indicates a missing value. The next column represents the percentage of each category to the total (675). The “valid percent” column expresses these values without counting the missing system values, and the final column represents the cumulative percentage, which is equal to the percentage of a variable plus the percentages of all variables that precede it.

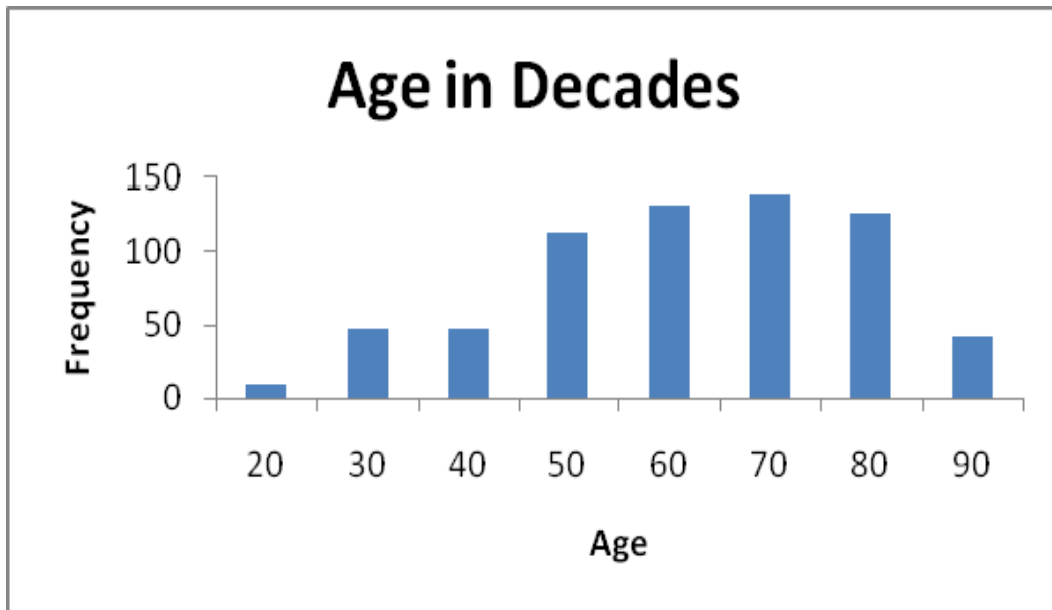
**Age and distribution of survey respondents**

The focus of the survey was designed to be on seniors and their ideas and perceptions about safe disposal of unwanted medications. 84% of the survey respondents were in the 50-90+ age range.

**Ages of the Respondents in Decades**

<i>Age</i>	<i>Frequency</i>
20	9
30	47
40	48
50	113
60	132
70	139
80	126
90	42
656 respondents	

(All respondents did not volunteer their age)



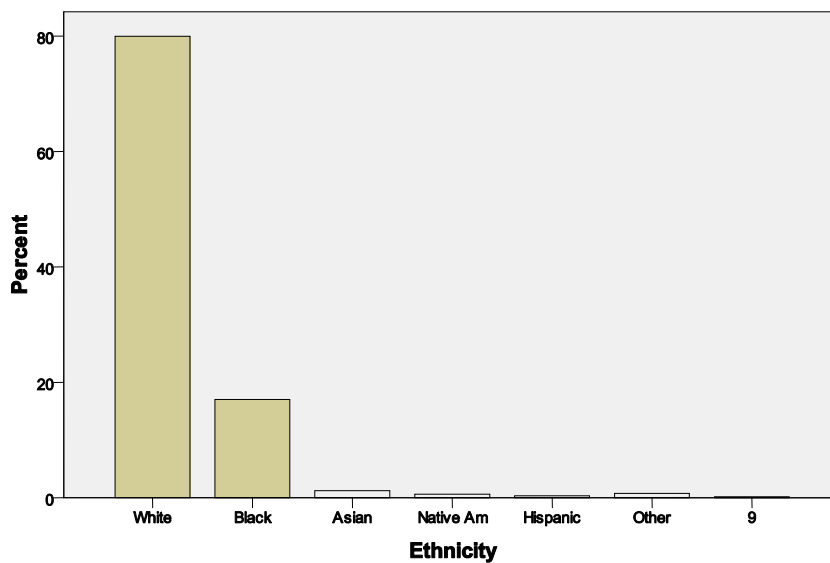
**Ethnicity**

Although collection sites were located in urban and rural areas, the level of response by ethnicity shows that 78% of the participants were White/Caucasian and 17% were Black/African American. This result parallels the results of the primary survey in which a vast majority of those participating in the return program were also white. More minority survey responders indicated that economic factors prevented them from returning unused medications, just in case they or a family member might need the medication in the future.

**Ethnicity**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	White	526	77.9	79.9	79.9
	Black	112	16.6	17.0	97.0
	Asian	8	1.2	1.2	98.2
	Native Am	4	.6	.6	98.8
	Hispanic	2	.3	.3	99.1
	Other	5	.7	.8	99.8
	9	1	.1	.2	100.0
	Total	658	97.5	100.0	
Missing	System	17	2.5		
Total		675	100.0		

**Ethnicity**



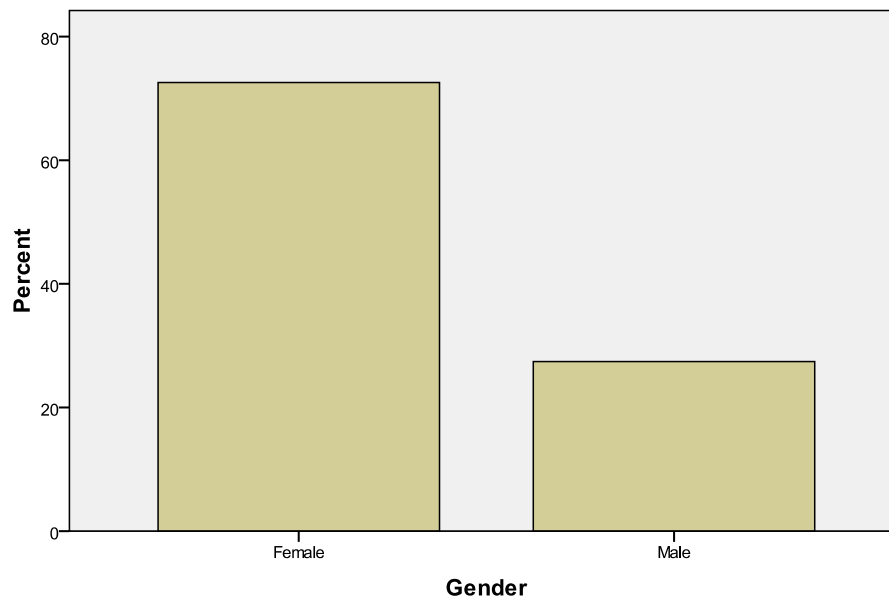
**Gender**

Because the collection sites were located at local grocery stores, it could be expected that the majority of the responders would be female. In fact, 70.5% of the secondary survey responders were female.

**Gender**

		Frequency	Percent	Valid Percent	Cumulative Percent
<b>Valid</b>	<b>Female</b>	<b>476</b>	<b>70.5</b>	<b>72.6</b>	<b>72.6</b>
	<b>Male</b>	<b>180</b>	<b>26.7</b>	<b>27.4</b>	<b>100.0</b>
	<b>Total</b>	<b>656</b>	<b>97.2</b>	<b>100.0</b>	
<b>Missing</b>	<b>System</b>	<b>19</b>	<b>2.8</b>		
<b>Total</b>		<b>675</b>	<b>100.0</b>		

**Gender**



**Survey Questions and Responses**

**1. Did you bring unused or unwanted medicines with you to return to the store today for disposal?**

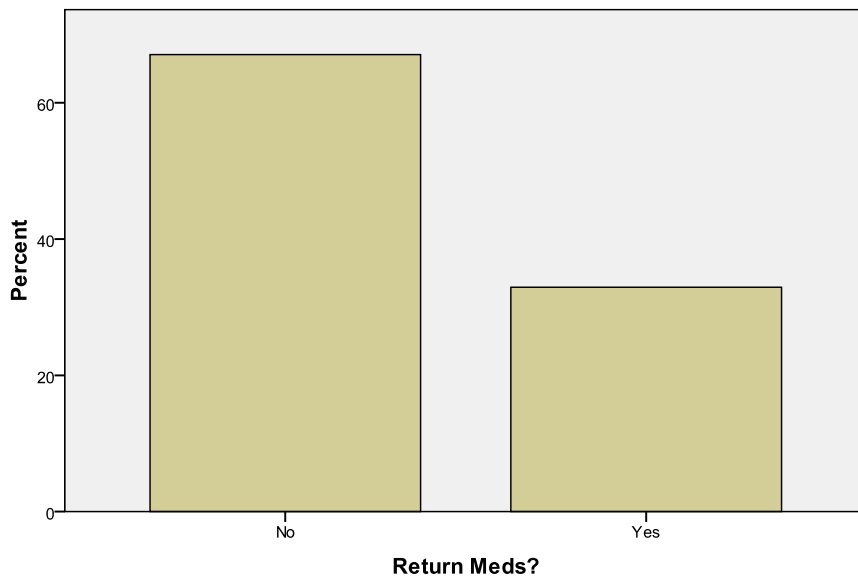
66% of the responders to this survey indicated that they were not at the store to participate in the monthly collection event.

**Did You Return Meds Today?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid*	No	448	66.4	67.1	67.1
	Yes	220	32.6	32.9	100.0
	Total	668	99.0	100.0	
Missing	System	7	1.0		
		675	100.0		

- The “valid percent” column ignores missing data

**Return Meds?**

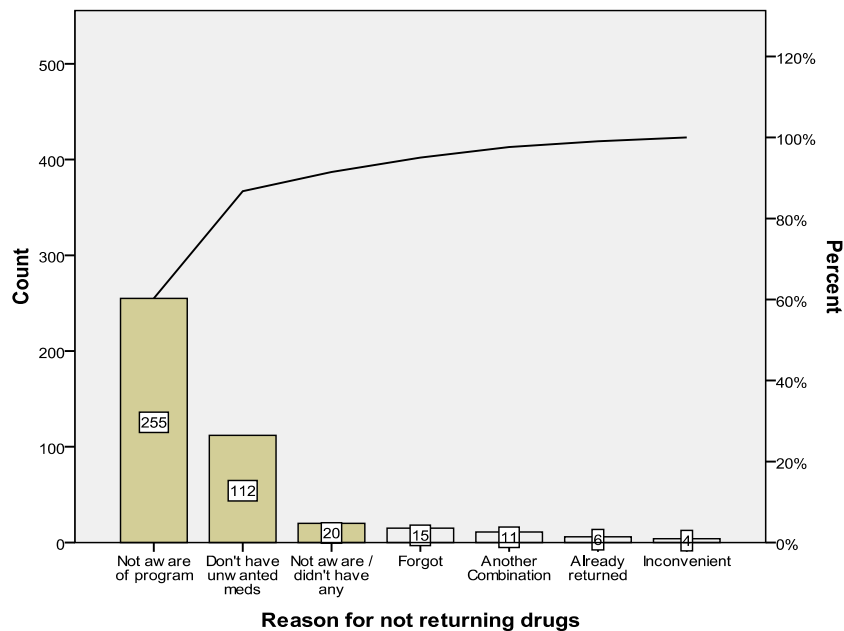


- a. If you answered no, please tell us the most likely reason why did you not return meds today.

We used only the two most common combinations, and gathered the rest as “Another Combination”. 60% of the survey responders were not aware of the program.

**Reason for Not Returning Meds**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Already returned	6	.9	1.4	1.4
	Not aware of program	255	37.8	60.3	61.7
	Forgot	15	2.2	3.5	65.2
	Inconvenient	4	.6	.9	66.2
	Don't have unwanted meds	112	16.6	26.5	92.7
	Not aware / didn't have any	20	3.0	4.7	97.4
	Another Combination	11	1.6	2.6	100.0
	Total	423	62.7	100.0	
Missing	System	252	37.3		
Total		675	100.0		



The chart above is a Pareto chart, which shows the frequency of responses on the left ordinate and the cumulative percentage on the right ordinate. It is used to indicate those components

that contribute most to an effect (like different sources of medication errors). The chart shows visually that the largest reason for not bringing in meds was a lack of information about the RxMEDS project. *This should be tempered by a realization, however, that almost 25% of those who did not bring in meds had none at home to return.* On the positive side—few found the program inconvenient!

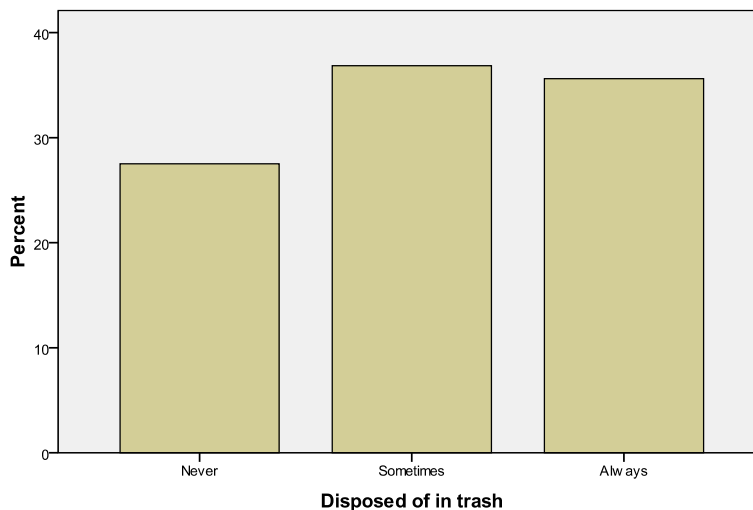
**2. What methods do you currently use to dispose of unused or unwanted medicine?**  
**a. Did you dispose of drugs in the trash?**

Of the respondents to this question, 72.5%, nearly three-fourths of those surveyed threw their unwanted medications in the trash.

**Disposed of in Trash**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	112	16.6	27.5	27.5
	Sometimes	150	22.2	36.9	64.4
	Always	145	21.5	35.6	100.0
	Total	407	60.3	100.0	
Missing	9	268	39.7		
Total		675	100.0		

**Disposed of in trash**



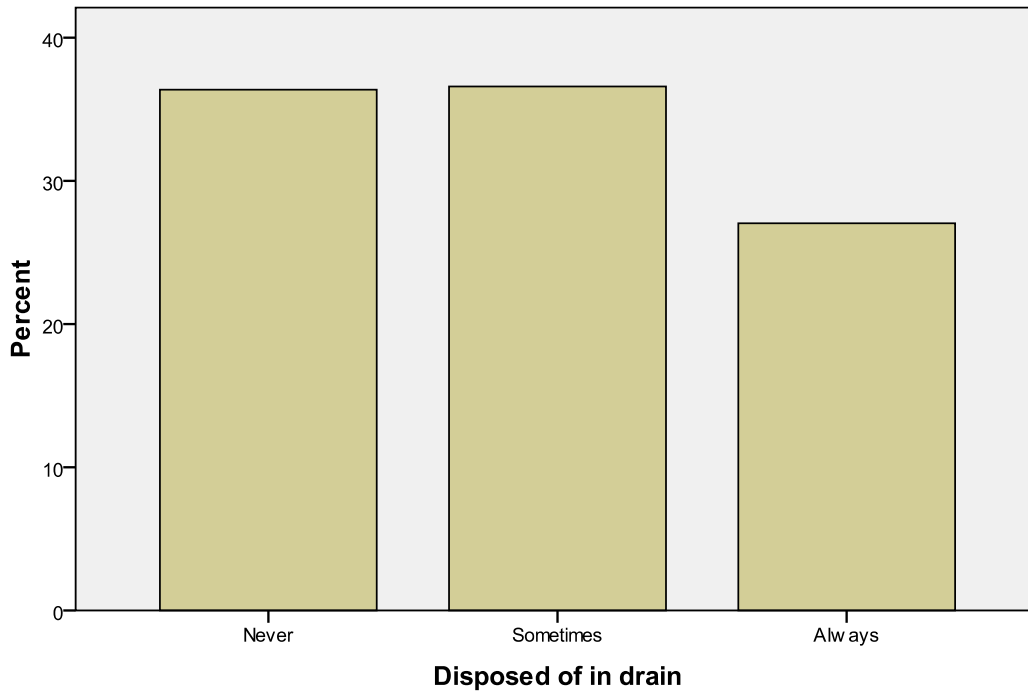
**b. Flush them in the toilet or down the drain? (Disposed of in the home sewage system?)**

Over a third, 36.4%, of the respondents indicated they never dispose of their medications through their waste water system. However, two-thirds of them do it on a regular basis.

**Disposed of in Toilet/Drain**

		Frequency	Percent	Valid Percent	Cumulative Percent
<b>Valid</b>	<b>Never</b>	<b>156</b>	<b>23.1</b>	<b>36.4</b>	<b>36.4</b>
	<b>Sometimes</b>	<b>157</b>	<b>23.3</b>	<b>36.6</b>	<b>73.0</b>
	<b>Always</b>	<b>116</b>	<b>17.2</b>	<b>27.0</b>	<b>100.0</b>
	<b>Total</b>	<b>429</b>	<b>63.6</b>	<b>100.0</b>	
<b>Missing</b>	<b>9</b>	<b>246</b>	<b>36.4</b>		
<b>Total</b>		<b>675</b>	<b>100.0</b>		

**Disposed of in drain**



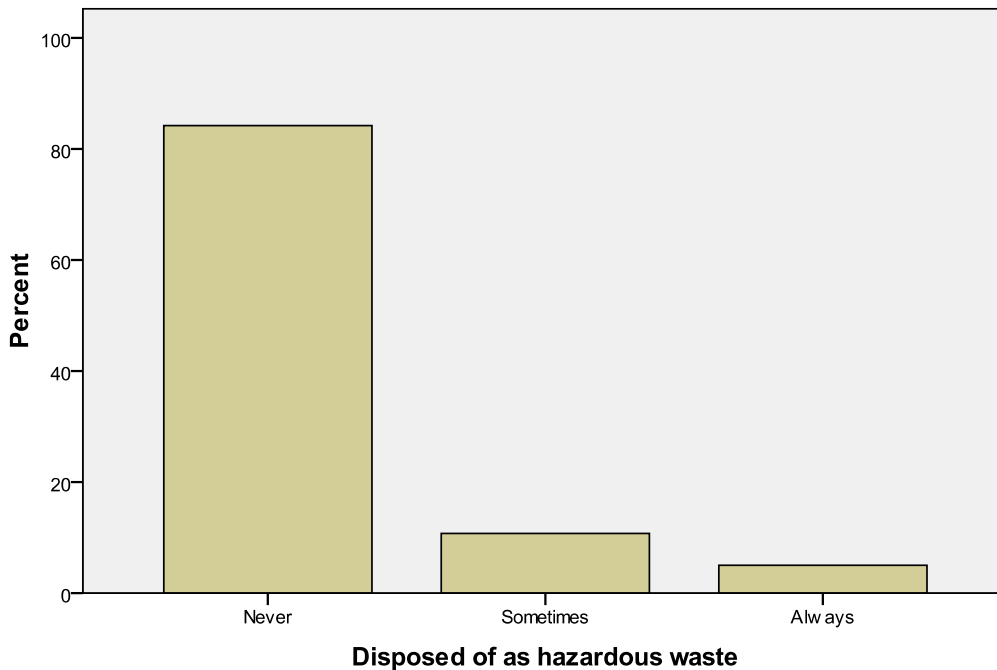
**c. Disposed of at a household hazardous waste collection program?**

Only 16% of the respondents indicated they use household hazardous waste (HHW) collection programs. This is not surprising as these programs are very infrequent in our area, sometimes charge a fee to dispose of HHW, and are not in convenient locations for seniors or others with limited transportation to participate easily.

**Disposed of at HHS Programs**

		Frequency	Percent	Valid Percent	Cumulative Percent
<b>Valid</b>	<b>Never</b>	<b>235</b>	<b>34.8</b>	<b>84.2</b>	<b>84.2</b>
	<b>Sometimes</b>	<b>30</b>	<b>4.4</b>	<b>10.8</b>	<b>95.0</b>
	<b>Always</b>	<b>14</b>	<b>2.1</b>	<b>5.0</b>	<b>100.0</b>
	<b>Total</b>	<b>279</b>	<b>41.3</b>	<b>100.0</b>	
<b>Missing</b>	<b>9</b>	<b>396</b>	<b>58.7</b>		
<b>Total</b>		<b>675</b>	<b>100.0</b>		

**Disposed of as hazardous waste**



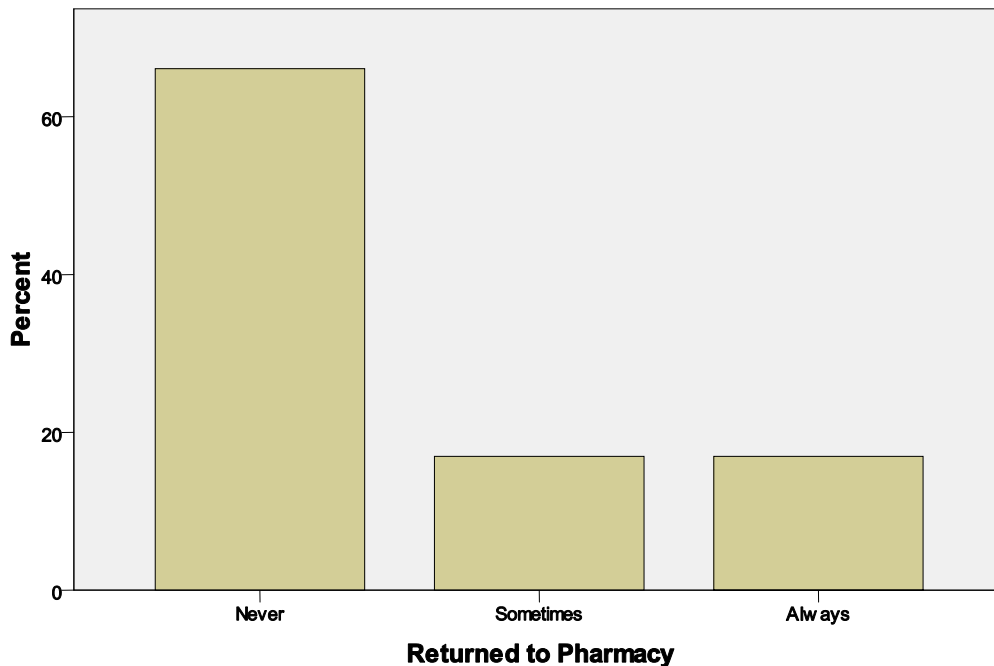
**d. Returned to pharmacy or collection event?**

The respondents indicated that 34% of the time they return medications to their pharmacist or a collection event. It is not clear if the respondents understood the question as it is illegal to return them to a pharmacy. As in the previous question, the same barriers of poorly located and fee-based collection events prevent many from disposing of hazardous waste and medications in a convenient and timely manner.

**Returned to Pharmacy or Collection Event**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	191	28.3	66.1	66.1
	Sometimes	49	7.3	17.0	83.0
	Always	49	7.3	17.0	100.0
	Total	289	42.8	100.0	
Missing	9	386	57.2		
Total		675	100.0		

**Returned to Pharmacy**



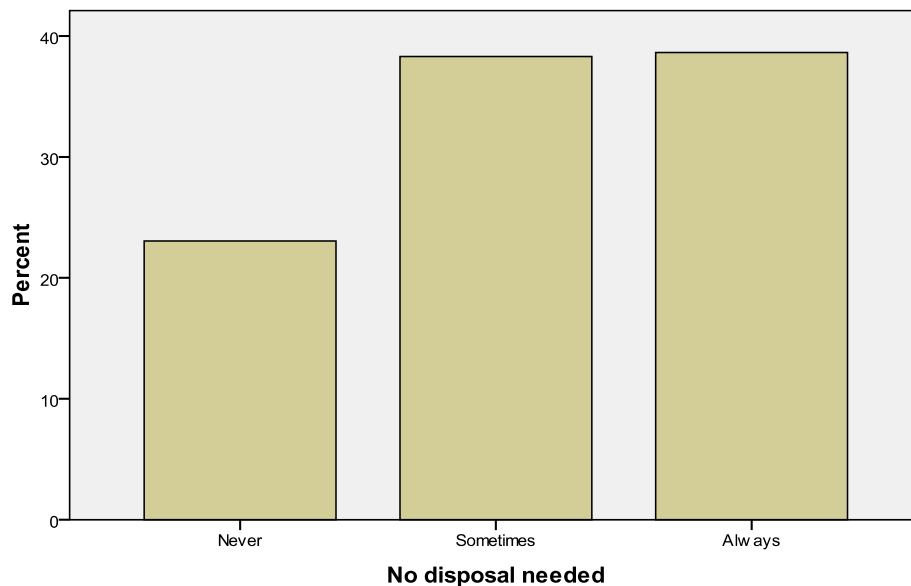
**h. No disposal needed, all the medicine was used?**

76.9% of the respondents indicated there is not a need to dispose of any medications. At the same time 61% of those surveyed indicated they do not use all doses that are prescribed for them and keep these unused doses on hand.

**No Disposal Needed**

		Frequency	Percent	Valid Percent	Cumulative Percent
<b>Valid</b>	<b>Never</b>	<b>71</b>	<b>10.5</b>	<b>23.1</b>	<b>23.1</b>
	<b>Sometimes</b>	<b>118</b>	<b>17.5</b>	<b>38.3</b>	<b>61.4</b>
	<b>Always</b>	<b>119</b>	<b>17.6</b>	<b>38.6</b>	<b>100.0</b>
	<b>Total</b>	<b>308</b>	<b>45.6</b>	<b>100.0</b>	
<b>Missing</b>	<b>9</b>	<b>1</b>	<b>.1</b>		
	<b>System</b>	<b>366</b>	<b>54.2</b>		
	<b>Total</b>	<b>367</b>	<b>54.4</b>		
<b>Total</b>		<b>675</b>	<b>100.0</b>		

**No disposal needed**



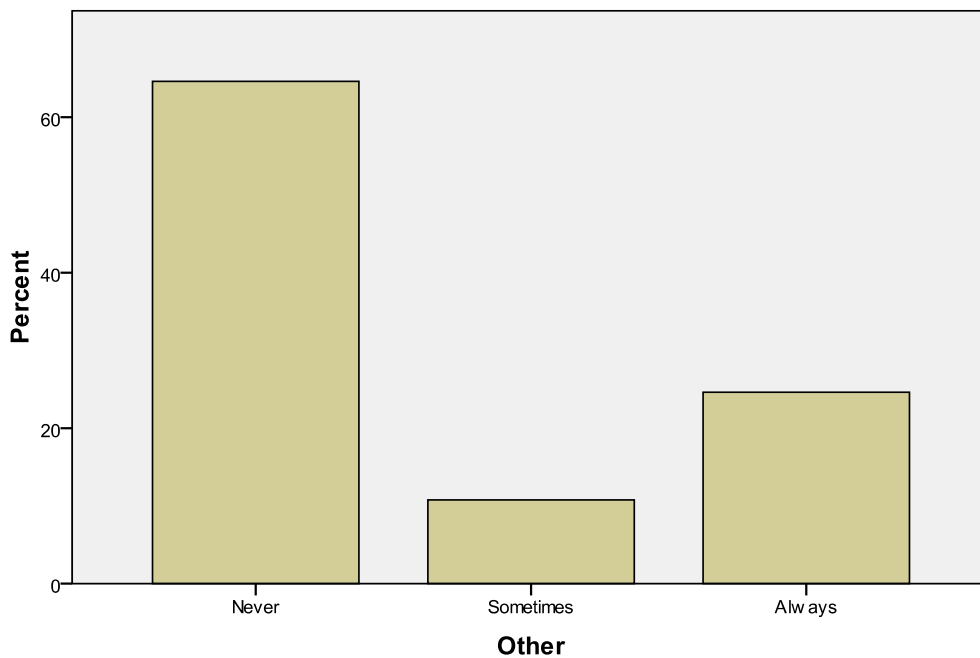
**i. Other disposal methods**

Although alternate methods of disposal are not described, almost two-thirds of the respondents indicated they never dispose of medications through means other than those addressed in the survey. Fewer than 10% of those surveyed responded to this question.

**Other Disposal Methods**

		Frequency	Percent	Valid Percent	Cumulative Percent
<b>Valid</b>	<b>Never</b>	<b>42</b>	<b>6.2</b>	<b>64.6</b>	<b>64.6</b>
	<b>Sometimes</b>	<b>7</b>	<b>1.0</b>	<b>10.8</b>	<b>75.4</b>
	<b>Always</b>	<b>16</b>	<b>2.4</b>	<b>24.6</b>	<b>100.0</b>
	<b>Total</b>	<b>65</b>	<b>9.6</b>	<b>100.0</b>	
<b>Missing</b>	<b>9</b>	<b>2</b>	<b>.3</b>		
	<b>System</b>	<b>608</b>	<b>90.1</b>		
	<b>Total</b>	<b>610</b>	<b>90.4</b>		
<b>Total</b>		<b>675</b>	<b>100.0</b>		

**Other**



**3. Which of the following will you consider when deciding to participate in future unwanted medicine disposal programs? *(Check all that apply)***

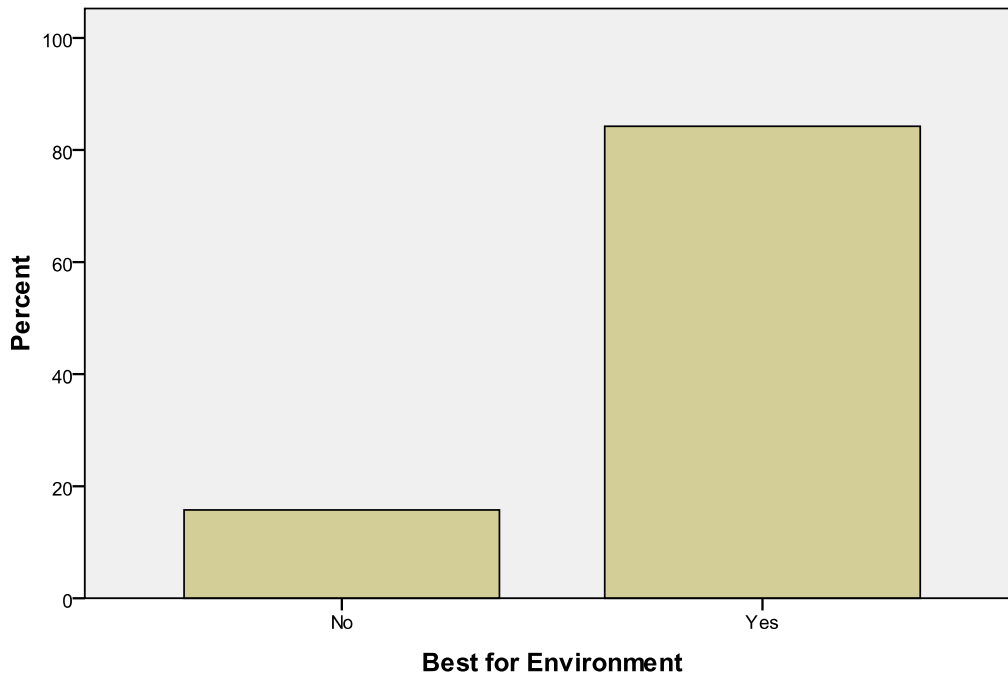
**a. Consider what is best for environment?**

Over 8 out of 10 participants acknowledged that they would participate in future disposal programs because they are aware of environmental issues.

**Best for Environment**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	105	15.6	15.8	15.8
	Yes	561	83.1	84.2	100.0
	Total	666	98.7	100.0	
Missing	System	9	1.3		
Total		675	100.0		

**Best for Environment**



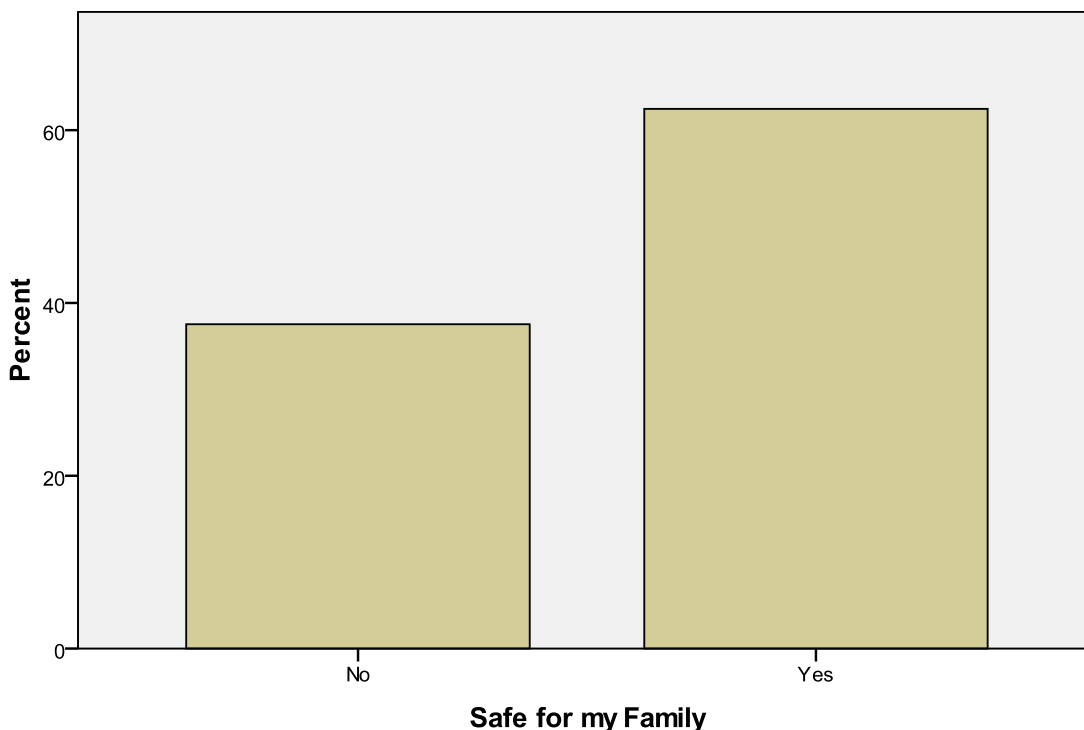
**b. Safe for my Family**

A second option was the consideration of home and family safety when properly disposing of unused medications. 62.4% of the responders think that this is an important issue and a reason to continue participation in future programs. The unusually large percentage of those saying “yes” may be indicative of information about youth drug abuse, “Pharming parties” and deaths associated with improper medication. Just six months after the survey, a community-based parent organization sponsored seven successful medication collection events at the boundary of the St. Louis metro region that was not conveniently served by the RxMEDS site locations.

**Safe for My Family**

		Frequency	Percent	Valid Percent	Cumulative Percent
<b>Valid</b>	<b>No</b>	<b>250</b>	<b>37.0</b>	<b>37.5</b>	<b>37.5</b>
	<b>Yes</b>	<b>416</b>	<b>61.6</b>	<b>62.5</b>	<b>100.0</b>
	<b>Total</b>	<b>666</b>	<b>98.7</b>	<b>100.0</b>	
<b>Missing</b>	<b>System</b>	<b>9</b>	<b>1.3</b>		
<b>Total</b>		<b>675</b>	<b>100.0</b>		

**Safe for my Family**



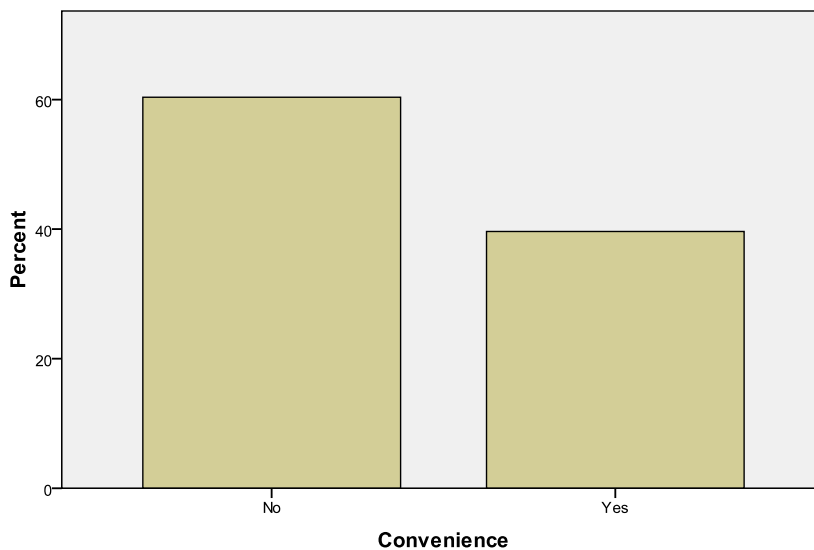
**c. Convenient**

Surprisingly, the sample indicated 60% of the respondents did not consider convenience as factor for future participation. Comments received at the collection sites would not have indicated this result. In many cases participants wanted the collection sites to be expanded both in location, time of collection, and frequency of collection so it would be more convenient for them to participate.

**Convenience**

		Frequency	Percent	Valid Percent	Cumulative Percent
<b>Valid</b>	<b>No</b>	<b>402</b>	<b>59.6</b>	<b>60.4</b>	<b>60.4</b>
	<b>Yes</b>	<b>264</b>	<b>39.1</b>	<b>39.6</b>	<b>100.0</b>
	<b>Total</b>	<b>666</b>	<b>98.7</b>	<b>100.0</b>	
<b>Missing</b>	<b>System</b>	<b>9</b>	<b>1.3</b>		
<b>Total</b>		<b>675</b>	<b>100.0</b>		

**Convenience**



**4. If both methods of disposal of unwanted medications were equally safe for the environment, which would you be more likely to use more often?**

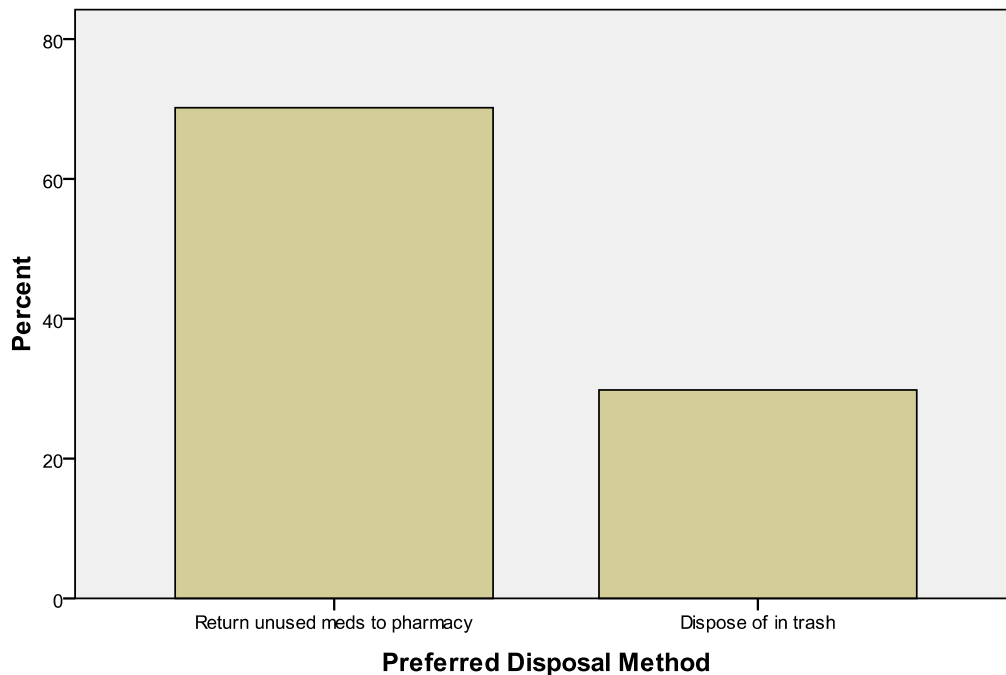
70% of the respondents would prefer, if legally possible, to be able to return unwanted or unused medications to their pharmacist. They believe that this is a reliable source for obtaining

the medications and that it therefore is a reliable source to dispose of the same medications. Point-of-purchase collection is gaining momentum for other household hazardous waste products, for example paint, batteries, tires, appliances and electronics, fluorescent bulbs, etc.

**Preferred Disposal Method**

		Frequency	Percent	Valid Percent	Cumulative Percent
<b>Valid</b>	<b>a. Return unused meds to pharmacy</b>	<b>452</b>	<b>67.0</b>	<b>70.2</b>	<b>70.2</b>
	<b>b. Dispose of in trash</b>	<b>192</b>	<b>28.4</b>	<b>29.8</b>	<b>100.0</b>
	<b>Total</b>	<b>644</b>	<b>95.4</b>	<b>100.0</b>	
<b>Missing</b>	<b>9</b>	<b>9</b>	<b>1.3</b>		
	<b>9.0</b>	<b>22</b>	<b>3.3</b>		
	<b>Total</b>	<b>31</b>	<b>4.6</b>		
<b>Total</b>		<b>675</b>	<b>100.0</b>		

**Preferred Disposal Method**



**Voluntary Unwanted Medicine Disposal Survey**

1. Did you bring unused or unwanted medicine with you to return to the store today for disposal?

Yes

No

If you answered no, please select the most likely reason:

Returned my unwanted medicine on a past visit

Did not know about the program

Forgot to bring my unwanted medicine with me

Not convenient enough for me to participate

I don't have any unwanted medicine

2. What methods do you currently use to dispose of unused or unwanted medicine?

Please select the option that most closely applies for each of the options listed below:	A L W A Y S	S O M E T I M E S	N E V E R
Put them in my household trash	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flush them in the toilet or pour them down the drain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use a household hazardous waste collection program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Return them to the pharmacy or a collection event	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No disposal needed, all the medicine was used/taken	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please describe):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Which of the following will you consider when deciding to participate in future unwanted medicine disposal programs? Please check all that apply.

Best for the environment

Safe for my family

Convenient to use

4. If both methods for disposal of unwanted medications were equally safe for the environment, which would you be more likely to use more often?

Bring your unused medicine back to the pharmacy for disposal, or

Dispose of your unused medicine in your household trash

**For data collection purposes, please complete the following information:**

**Zip Code:** \_\_\_\_\_ **Age:** \_\_\_\_\_ Please check if over 90 years of age

**Ethnicity:**  White  Black / African American  Asian  Native American or Alaskan Native

Native Hawaiian or Pacific Islander  Hispanic  Other \_\_\_\_\_

**Gender:**  Male or  Female

**Thank you for your participation.**

## **Prudent Disposal of Unwanted Medications (RxMEDS)**

### **Recyclable Materials Data**

Area Resources for Community and Human Services (ARCHS) implemented the U.S. EPA funded Regional eXcess Medication Disposal Service (RxMEDS) project in the St. Louis region from January-December 2008 primarily to collect unwanted medications for incineration. However, we designed RxMEDS so recycling the medicine's packaging container, such as a pill bottle, was an integral component. This design allowed for the collection and recycling of materials such as paper, foil, plastic, cardboard, glass, etc. that were collected along with any medications collected for disposal.

Each site was supplied with a tamper-proof container for the deposit of non-controlled medications that were turned in and with a 64-gallon container for the deposit of recyclable materials. At each collection site the staff determined which medications could be accepted (controlled substances could be entered into the data system but must be returned to the owner for disposal). All information on the medications and participants was recorded and then collection staff unpacked any medications in plastic bottles, glass, or other packaging. The medications were deposited into the tamper-proof container and recyclable materials were placed in the 64-gallon container. These containers were collected by the RxMEDS project waste hauler and processed for recycling. Containers were collected within 24 hours of the collection day.

The following table reflects the 20 collection sites and the amount of recyclable materials collected from each site according to our waste hauler. During the first three months of the project, the waste hauler provide only a total weight for all collection sites. There were numerous concerns about the reliability of this first waste hauler company. In July 2008 (six months into the project) we switched to another waste hauler company.

The weights indicated are in pounds and equal to the weight of the recyclable material only. Based on the information provided by the two waste hauler companies, RxMEDS collected over a ton of recyclable materials at the 20 locations during the 12-month project (2,248.4 lbs).

Since the recyclable containers were not tamper-proof, it is possible that other recyclable materials from the collection site pharmacy may have been tossed into the container prior to its eventual collection. There is no way to insure that these weights reflect only materials that were directly related to the medication collection project. However, it is considered a good estimate of what could be expected in a long-term collection project.

**RxMEDS Recyclable Materials ~ Weight in Pounds from 20 Collection Sites by Day and Month of 2008**

SITE	11 01	25 01	15 02	29 02	14 03	28 03	11 04	25 04	09 05	23 05	13 06	27 06	11 07	25 07	15 08	29 08	12 09	26 09	10 10	24 10	14 11	28 11	12 12
St Louis							15		7		6		9		8		0		0		5		4
St Louis							17		19		43		18		15		20		0		16		18
Lake St Louis							23		4		12		0		0		0		0		0		0
St. Peters							15		4		8		3		6		7		0		0		0
St Louis							20		9		0		4		7		5		5		5		0
St Louis							20		3		20		6		9		8		5		4		0
Ballwin							1.8		6		8		7		6		10		5		0		0
Florissant							13		1		2		10		7		5		5		6		3
Bridgeton							56		11		75		8		6		38		37		28		11
Granite City							0		19		20		0		0		8		0		3		0
Florissant								15		14		5		15		0		0		5			
St Peters								7.6		19		15		8		7		8		0			
St Louis								3.9		10		0		2		0		0		0			
Swansea								12		25		12		0		0				0			
Grover								4.9		11		5		2		0				0			
St Louis								12		12		6		6		7		8		85			
St Louis								7.4		43		18		21		8		10		12			
Godfrey								4		3		10		6		8		9		10			
St Louis								2.3		9		32		17		24		21		27			
Wentzville								8.9		8		0		0		0		0		0			

**Total** 107 84 168 202 179 0 181 77 83 154 194 103 65 77 64 54 101 56 57 139 67 0 36  
**2,248.4 lbs**