Prevalence of Unclaimed Prescriptions at Military Pharmacies

Dominick Esposito, PhD; Eric Schone, PhD; Thomas Williams, PhD; Su Liu, PhD; Karen Cybulski, MS; Rita Stapulonis, MA; Nancy Clusen, MS

ABSTRACT

BACKGROUND: Prescriptions that are ordered by physicians but not picked up by patients represent a potential quality improvement opportunity in health systems. Previous research has demonstrated that anywhere from as little as 0.28% to as much as 30.0% of prescriptions are unclaimed, and that 0.45% to 22.0% of patients fail to claim prescriptions. In the Military Health System (MHS), prescriptions filled at military pharmacies are dispensed with no copayment, providing an opportunity to examine the factors that contribute to unclaimed prescriptions other than out-of-pocket cost.

OBJECTIVES: To estimate the prevalence of unclaimed prescriptions in the MHS, investigate reasons for unclaimed prescriptions, and compare self-reported noncompliance, defined as the failure to pick up at least 1 prescription in a 12-month period, with evidence from an administrative database of prescription orders and dispensings.

METHODS: Research methods included pharmacy staff interviews at 6 military pharmacies, a telephone survey of beneficiaries who filled prescriptions at these pharmacies, descriptive analysis of survey data, and comparison of administrative pharmacy data with self-reported survey data. Beneficiary interviews, conducted from May through July 2004, covered background characteristics, medical conditions, and unclaimed prescriptions, relying on 12 months of recall regarding noncompliance. Interviews with pharmacy staff covered day-to-day operations, factors that alleviate or exacerbate noncompliance, and the burden that noncompliance places on pharmacies. Administrative data from the Pharmacy Data Transaction Service (pharmacy claims) and Composite Health Care System (CHCS: prescription orders and dispensings) databases were used to select a random sample for the beneficiary survey. Survey respondents’ CHCS data were matched to their responses to determine the degree of agreement between self-reports and administrative data.

RESULTS: Pharmacy interviews were completed with 30 staff members at 6 military pharmacies, and telephone interviews were completed with 1,214 beneficiaries (60.6% response rate). Beneficiary respondents filled an average of 7 prescriptions in the 5 months approximately surrounding the survey administration time frame (from March to July 2004). More than half (56.8%) of respondents were female, and nearly 60.6% were retired military or their dependents. Among all respondents at all study pharmacies, 8.0% reported failing to claim at least 1 prescription during the prior 12 months. Among survey respondents deemed compliant by CHCS data, 93.8% correctly identified themselves as compliant. However, among patients identified as noncompliant using CHCS data, only 16.0% self-identified as noncompliant. The administrative data were not concordant with self-report data: of 105 survey respondents identifying themselves as noncompliant in the prior year and matched to administrative data (CHCS), only 58.1% were noncompliant per administrative data, and of 1,065 self-identifying as compliant, only 61.1% were compliant per administrative data. The most common reasons cited by respondents for not picking up their prescriptions were: no perceived need for the prescription (18.3% of the noncompliant), forget to pick it up (17.3%), the prescription was not in stock (14.8%), long wait time (11.1%), the prescription was not yet available (10.5%), was out of town (9.9%), and was too busy to pick up the prescription (6.2%). Factors associated with unclaimed prescriptions were: younger age, active duty military status, lower educational levels, and the absence of certain chronic medical conditions (i.e., no claims for cardiovascular medications, no self-reported arthritis).

CONCLUSIONS: The present study’s survey findings of an 8.0% self-reported noncompliance rate fall in the midrange of noncompliance rates reported in previous literature: between 0.45% and 22.0% in nonmilitary populations. Although reported reasons for noncompliance were generally consistent with those identified in previously published studies, they were only partially consistent with previous military pharmacy literature, which also found that patients did not know they had a prescription waiting or had some of the prescribed medicine at home. Concordance between measures of noncompliance, comparing administrative data with patient self-report based on 12-month recall, was poor.

What is already known about this subject

- The prevalence of unclaimed prescriptions has been reported previously in the range of 0.45% to 22.0%, but much of these data were collected more than 15 years ago. More recent data from 2000-2001 for electronic prescribing showed an incidence of 2.4% for unclaimed prescriptions.

What this study adds

- The proportion of Military Health System (MHS) beneficiaries reporting an unclaimed prescription was estimated at 8.0%. This estimate falls in the midrange of previous estimates of drug noncompliance in the civilian population.
- Among survey respondents deemed compliant (no unclaimed prescriptions) through examination of an administrative database of prescription orders and dispensings, 93.8% reported that they had no unclaimed prescriptions in the last year.
- Among those deemed noncompliant based on the administrative database records, only 16.0% reported an unclaimed prescription, suggesting either that patients may be reluctant to report noncompliance or that a 12-month study period might be beyond survey respondents’ ability to recall unclaimed prescriptions.
- The most common self-reported reasons for failing to claim a prescription included perceiving no need for the prescription (18.5%), forgetting to pick up the prescription (17.3%), prescription not in stock (14.8%), and long wait times at the pharmacy (11.1%).
- Of 105 respondents identifying themselves as noncompliant in the prior year and matched to administrative data, only 58.1% were noncompliant per administrative data, and of 1,065 self-identifying as compliant, only 61.1% were compliant per administrative data.
A wide range of previous studies report that anywhere from as little as 0.28% to as much as 30.0% of prescriptions are unclaimed; that is, ordered by physicians but not picked up by patients.\textsuperscript{1-21} Moreover, research also shows that anywhere from 0.45% to 22% of patients fail to claim prescriptions.\textsuperscript{6-8,11,21-28} Some of these studies find that the count of unclaimed prescriptions might represent false noncompliance. For instance, while Kamaruzaman found a noncompliance incidence of 0.9% for all prescriptions, 69% of the unclaimed drugs could also be purchased without a prescription.\textsuperscript{20} In addition, Kirking et al. found that 73% of the unclaimed drugs actually were obtained elsewhere or the patients' physicians had changed or discontinued the regimen.\textsuperscript{19} Reasons for not picking up prescriptions include transfer of the prescription to another pharmacy, forgetting the prescription, leftover previous medication, no perceived need for the medication, high out-of-pocket costs, long wait times at pharmacies, change in the drug regimen by the physician, and miscommunication between the patient and physician.\textsuperscript{2,3,5,7,13-16,19,22,23,27-31} Both behavioral (e.g., having the patient begin using a pillbox or calendar) and educational (e.g., one-on-one meetings with a pharmacist who teaches the patient about the proper use of medications) interventions improve medication compliance, but there is little evidence that any one intervention improves compliance more than others.\textsuperscript{32} The most effective interventions are multifaceted,\textsuperscript{32} include a communication or counseling component,\textsuperscript{32-36} promote active participation in care on the part of patients,\textsuperscript{32} and reinforce compliant behavior with reminders by telephone or mail.\textsuperscript{19,37-40}

A prescription can be considered unclaimed if (1) a patient fails to fill a physician’s handwritten prescription order or (2) a patient or physician (on behalf of a patient) has submitted a request for the prescription and a pharmacist has filled it, but the patient has not picked it up within a time frame specified by pharmacy protocol.\textsuperscript{41} Accounting for unclaimed prescriptions is difficult in the privately insured population because most physicians prescribe medications with handwritten scripts. If patients fail to bring these records into pharmacies to fill them, accounting for unused drugs systematically is challenging. In the Military Health System (MHS), physicians at military treatment facilities transmit new or renewal prescriptions electronically to a military pharmacy through a provider order entry system. MHS maintains a record of all prescription orders in the Composite Health Care System (CHCS) database and all prescriptions dispensed in the Pharmacy Data Transaction Service (pharmacy claims) database. If a filled or unfilled prescription goes unclaimed after a specified grace period (which differs by pharmacy and ranges from 5 to 10 days), a pharmacy technician records the prescription as unclaimed by populating a data field in CHCS to indicate that this prescription was filled but unclaimed from the pharmacy. All prescriptions filled by military pharmacies are dispensed with no copayment for MHS beneficiaries under the TRICARE (Department of Defense health system) medical benefit.

Unclaimed prescriptions impose direct financial costs on pharmacies, may worsen patients’ long-term health, and may increase patient utilization of health care services.\textsuperscript{42,43} Financial costs of unclaimed prescriptions include the cost of filling the prescription, additional labor costs associated with restocking filled prescriptions, and, possibly, the costs of discarded medications. The incremental costs of filling or restocking a prescription are generally low (1 unpublished study, conducted in the mid-1990s, estimated a labor cost of $2.95 per prescription in the MHS\textsuperscript{44}), and during interviews with the present study pharmacy staff, they reported that the cost ranges from $3 to $5 per prescription. However, the large volume of prescriptions filled by military pharmacies means that the aggregate total cost to the MHS of unclaimed prescriptions could be large.

Much of the research on unclaimed prescriptions is limited by either small research samples or sole reliance on either administrative or survey data. In the present study, primary survey data on unclaimed prescriptions were collected for more than 1,200 beneficiaries, and more than 95% of survey respondents were matched to administrative pharmacy data. The addition of administrative data not only provides a possibly more accurate measure of noncompliance but also enables us to link the survey data with information about individual prescriptions. Moreover, because all survey respondents were able to fill prescriptions at no out-of-pocket cost, this study was able to examine factors that contribute to unclaimed prescriptions other than cost to the patient.

### Methods

Research methods included pharmacy staff interviews, a telephone survey of beneficiaries, descriptive analysis of survey data, and comparison of administrative pharmacy data with survey data. Two pharmacies from each branch of the military (Air Force, Army, and Navy) participated in the study and were selected based on size (number of beneficiaries served) and geographic location from a list submitted by the Department of Defense Pharmacy Board of Directors.

### Pharmacy Staff Interviews

Semi-structured interviews with pharmacy staff were conducted to examine day-to-day pharmacy operations, pharmacy staff members’ opinions about why beneficiaries did not pick up prescriptions, factors that might alleviate or exacerbate the level of unclaimed prescriptions, and the burden associated with unclaimed drugs. Four to 6 staff members were interviewed from each of the 6 study pharmacies (30 staff members total), including the chief pharmacist or department head, pharmacy managers, pharmacists, and technicians. Based on a brief review of noncompliance literature, 125 questions were developed, covering 7 topic areas ranging from “day-to-day operations” to “policies designed to increase patient compliance” (the complete protocol is available from the authors on request). Because there were many questions
and most interviews lasted only 30 minutes, question type was matched to staff member type to limit the number of questions asked to a manageable number. For example, managers were asked questions such as, “Do pharmacists or other personnel at this pharmacy consult with patients about the proper usage of their medication?” Pharmacists were asked questions such as, “How much time does it take a pharmacist to fill a prescription, on average?” To determine consensus opinion on specific topics, nearly every question in the protocol was posed to at least 2 staff members. In particular, questions on the magnitude of and reasons for noncompliance were asked during each interview. On average, each staff member was asked about 35 to 40 questions during an interview.

**Beneficiary Survey**

After interviews with pharmacy staff were completed, a beneficiary survey was developed based on findings from the literature review and the pharmacy staff interviews. The questionnaire was tested prior to full implementation on a sample of 9 military beneficiaries, who were not included in the final research sample; the maximum allowed under Institutional Review Board guidelines. To determine if respondents had ever had an unclaimed prescription in the last year, they were asked, “In the past 12 months, have you not picked up either a new prescription or a refill of a prescription at a military pharmacy for any reason?” The answers to this question served as the primary noncompliance measure for this study. As secondary measures, respondents were also asked a series of questions about compliance with their most recent new prescription (“Did you pick up this prescription?”) and their most recent refill (“Did you pick up your refill?”) at other points in the survey. Beneficiaries who responded that they did not pick their last new or refill prescription were included in the analysis of reasons for noncompliance. In addition, beneficiaries were asked to identify their usual pharmacy and provide demographic characteristics unavailable in administrative data, such as marital status, living arrangement, ethnicity, and education. The survey also collected data on recent health care utilization, the existence of common chronic illnesses, and features of the respondents’ usual pharmacy. (The complete questionnaire is available from the authors upon request.)

Pharmacy claims and CHCS data were used to create a survey sample frame. CHCS contains a record of prescriptions written for TRICARE beneficiaries that includes the prescription date, the compound prescribed, the pharmacy filling it, and if the prescription was picked up. At the Army and Air Force pharmacies, CHCS data were used to identify beneficiaries who did not pick up at least 1 prescription from November 2003 to January 2004 (Figure). At each of these 4 pharmacies (2 Army, 2 Air Force), 500 beneficiaries were randomly selected into the survey sample (250 beneficiaries with at least 1 unclaimed prescription and 250 without unclaimed prescriptions). At the 2 Navy pharmacies, pharmacy claims data were used to construct the survey sample frame because the pharmacies did not provide CHCS data (and, hence, the data for unclaimed prescriptions) at the time the sample frame was selected. A random sample of 500 beneficiaries who filled at least 1 prescription from November 2003 to January 2004 was selected from each of the 2 Navy pharmacies. The target number of completed interviews per pharmacy was 200, which was achieved after contacting 2,004 of the randomly selected 3,000 sample-frame members.

Survey sampling weights (the inverse probability of selection) were constructed for all sample members from all 6 pharmacies before the survey began. After fielding the survey, a weighted response rate was constructed for each sampling stratum (defined by pharmacy and compliance status). For each sampling stratum, the weighted response rate was calculated as the ratio of eligible respondents to all eligible respondents and nonrespondents. The final survey weight is the product of the sampling weight and the inverse of the response rate. To assess possible nonresponse bias, survey respondents and nonrespondents were compared on several key measures, including number of prescription fills, mean drug ingredient cost, and number of therapeutic classes, using pharmacy claims data for the 5-month time period approximately surrounding the survey administration time frame, March 2004 through July 2004.

**Analysis of Survey Data**

After the survey was fielded, CHCS data were obtained from the 6 pharmacies for June 1, 2003, through May 31, 2004 (the 12-month period approximately preceding the time when the survey was conducted). CHCS transaction records were linked to the survey sample results to (1) measure overall noncompliance (failure to pick up at least 1 prescription), (2) compare the administrative and survey-based measures of noncompliance, and (3) conduct descriptive analysis of the reasons for noncompliance. Statistical tests included t-tests for continuous variables and Pearson chi-square tests for categorical variables. All analyses were conducted using Software for the Statistical Analysis of Correlated Data (SUDAAN), release 7.5.6. (RTI International, Research Triangle Park, NC).

An indicator variable was created from CHCS to identify noncompliance at any time during the 12-month period. A sample member was deemed noncompliant (and the variable took the value 1) if that sample member had at least 1 unclaimed prescription in CHCS data, from June 2003 to May 2004. Otherwise the sample member was deemed compliant (and the variable took the value 0). This variable was compared with the survey item describing self-reported noncompliance in the last 12 months in 2 ways. First, self-reported noncompliance was compared with CHCS-based noncompliance for all respondents sampled from the Army and Air Force pharmacies. This was the principal comparison made because survey samples were randomly drawn from these pharmacies using CHCS data to stratify compliant and noncompliant beneficiaries. Second, the 2 noncompliance
measures were compared for all respondents sampled at all 6 study pharmacies. This secondary comparison tests the potential bias of sampling survey sample members differently across all study pharmacies. If this second comparison, which uses all 6 pharmacies, is similar to the first, which uses data from only 4 pharmacies, then one could conclude that using different methods to select survey sample members does not overly bias the primary study conclusions.

A number of additional variables were created from survey and administrative data to compare characteristics of compliant and noncompliant sample members. For instance, data were used to construct patient characteristics, pharmacy characteristics, prescription-related factors, and individual indicator variables for each study pharmacy. CHCS data also were linked to the survey data (for June 2003 through May 2004) to more precisely account for drug utilization. Whether the sample member had

**FIGURE** Survey Sample Design and Data Analysis

- Collected CHCS data (November 2003 to January 2004) for Army and Air Force pharmacies (4 in total), which includes an unclaimed prescription indicator for each prescription order. Sample members with 1 or more unclaimed prescriptions in the 3 months of data were deemed noncompliant.

- Randomly selected 500 beneficiaries from each of the 4 pharmacies (250 compliant and 250 noncompliant at each pharmacy). A total of 2,000 survey sample members were chosen using CHCS data.

- Each survey sample member was assigned a weight at the time of selection equal to the inverse probability of selection.

- Beneficiary survey conducted from May 2004 to July 2004 with attempts made to contact 2,004 beneficiaries and interviews completed with 1,214 (60.6% response rate). Sampling weights were adjusted for nonresponse by multiplying each weight by the weighted response rate from each sampling stratum, defined by pharmacy and compliance status.

- Conducted descriptive analyses on all survey data. Collected CHCS data from all study pharmacies (June 2003 to May 2004) for 1,170 of 1,214 survey responders (96.4%) and used the unclaimed prescription indicator from these data to determine whether each beneficiary had at least 1 unclaimed prescription from June 2003 to May 2004. Compared self-reports of unclaimed prescriptions from survey to CHCS data.

- Collected PDTS data for 2 Navy pharmacies for the period November 2003 to January 2004 as CHCS data were unavailable before survey sample selection for these pharmacies.

- Randomly selected 500 beneficiaries from each Navy pharmacy among beneficiaries with at least 1 prescription fill in the 3 months of available data. A total of 1,000 sample members were chosen using PDTS data.

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*CHCS: Composite Health Care System database of prescription orders. Data include compound prescribed, dispensing pharmacy, and whether prescription was picked up.

*PDTS: Pharmacy Data Transaction Service; pharmacy claims data.*
Prevalence of Unclaimed Prescriptions at Military Pharmacies

### Results

Between May and July 2004, telephone interviews with 1,214 TRICARE beneficiaries were completed, with a response rate of 60.6% (attempts were made to contact 2,004 patients in total to reach a target of 200 completed interviews per study pharmacy). From March to July 2004, respondents filled nearly 7 prescriptions, on average. More than half (56.8%) were female, fewer than 30% were aged younger than 40 years, and nearly 60% were retired military or their dependents. The most common prescriptions filled in the 12 months before the survey were for cardiovascular conditions (44.6% of the sample). The most common types of prescriptions that were unclaimed included psychiatric medications (3.0% of all fills), contraceptives (3.0%), analgesics (2.7%), antihistamines (2.2%), skin treatment medications (1.8%), antiseizure medications (1.6%), and antibiotics (1.5%).

### Prevalence of Unclaimed Prescriptions

Approximately 9% of survey respondents at the Army and Air Force pharmacies and 8% of respondents at all 6 study pharmacies reported not picking up at least 1 prescription in the last 12 months. These statistics, and all others from survey data, were calculated using nonresponse-adjusted sampling weights to be representative of all beneficiaries who filled prescriptions at the study pharmacies. In the year preceding the survey, only 1.66% of prescriptions ordered for survey respondents were unclaimed. However, among all beneficiaries who filled prescriptions at study pharmacies, 4.12% of ordered prescriptions were unclaimed. That discrepancy may suggest survey nonresponse bias if noncompliant individuals are less likely to respond to the survey. However, among beneficiaries at Army and Air Force pharmacies, the survey response rate (60.6%) was identical for beneficiaries deemed compliant and beneficiaries deemed non-compliant at the time of sampling. To confirm that survey results were not confounded by nonresponse bias, survey respondents were compared with nonrespondents on several characteristics observable from pharmacy claims data (Table 1). Differences in measured characteristics were not statistically significant.

Self-reported noncompliance was compared with unclaimed prescriptions recorded in administrative data to gauge the accuracy of the prevalence estimate (Table 2). At Army and Air Force pharmacies, prescription records were linked for 796 of 807 respondents, or 98.6%. The 2 noncompliance measures were positively but weakly correlated; beneficiaries’ reports and CHCS data were in agreement 56.2% ([392 + 55]/796) of the time. When CHCS data and self-reports did not agree, it was much more often the case (40.2% of 796 cases overall, or 91.7% of nonconcordant cases) that beneficiaries reported being compliant, but CHCS data indicated that they had at least 1 unclaimed prescription.

Comparison of compliance assessments using survey self-reports and administrative data suggest poor concordance; the proportion of beneficiaries who were noncompliant measured using CHCS data was larger than the proportion indicated by estimates from the survey alone. At the Army and Air Force pharmacies, 47.1% of survey respondents were deemed noncompliant based solely on CHCS data, while only 9.1% reported noncompliance. Among those deemed compliant by CHCS data, 93.8% also reported being compliant in the survey. However, among those with at least 1 unclaimed prescription in

### Table 1

<table>
<thead>
<tr>
<th>Key Characteristics of Beneficiary Survey Respondents and Nonrespondents (a)</th>
<th>Respondents (b)</th>
<th>Nonrespondents (b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unique number of providers</td>
<td>1.93</td>
<td>1.96</td>
</tr>
<tr>
<td>Number of fills</td>
<td>6.8</td>
<td>6.9</td>
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<tr>
<td>Mean drug ingredient cost</td>
<td>$486</td>
<td>$522</td>
</tr>
<tr>
<td>Number of unique therapeutic classes</td>
<td>3.94</td>
<td>3.96</td>
</tr>
<tr>
<td>Percentage of beneficiaries with a prescription for:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiovascular medications</td>
<td>18.3%</td>
<td>15.6%</td>
</tr>
<tr>
<td>Analgesics</td>
<td>21.5%</td>
<td>22.8%</td>
</tr>
<tr>
<td>Central nervous system agents</td>
<td>3.7%</td>
<td>4.3%</td>
</tr>
<tr>
<td>Sample size</td>
<td>1,214</td>
<td>1,467</td>
</tr>
</tbody>
</table>

(b) No differences between respondents and nonrespondents were statistically significant (t-test) at the 10% level.*
Prevalence of Unclaimed Prescriptions at Military Pharmacies

CHCS data (that is, deemed noncompliant), only 16.4% reported having an unclaimed prescription in the survey.

Results for all 6 study pharmacies were generally consistent with the findings for the Army and Air Force pharmacies, with some minor differences. At all 6 study pharmacies, 8.0% of survey respondents reported having an unclaimed prescription, slightly less than the 9.1% noncompliance rate estimated for the Army and Air Force pharmacies (Table 3). Recall that the primary difference in the Navy and non-Navy survey sample frames was that noncompliance based on CHCS data was unknown prior to selecting the Navy sample frame and became available only after completion of survey data collection. Thus, not having administrative data that indicate prior noncompliance to select a survey sample resulted in a slight underestimate of beneficiary noncompliance. Not surprisingly, the percentage of beneficiaries with at least 1 unclaimed prescription in CHCS data was smaller at all 6 pharmacies (40.6%) than at only the Army and Air Force pharmacies (46.5%).

As with the findings for the Army and Air Force pharmacies, among those deemed compliant by CHCS data, 93.8% reported being compliant in the survey. Among those with at least 1 unclaimed prescription in CHCS data (that is, deemed noncompliant), only 16.0% reported having an unclaimed prescription in the survey—slightly lower than the statistic reported in Table 2. Of 105 respondents identifying themselves as noncompliant in the prior year and matched to CHCS data, only 58.1% were noncompliant per CHCS, and of 1,065 self-identifying as compliant, only 61.1% were compliant per CHCS.

**Reasons for Unclaimed Prescriptions**

Among 172 beneficiaries who reported noncompliance in either the last 12 months (the primary noncompliance measure) or with their last new or refill prescription (the secondary noncompliance measures), excluding patients who were planning to pick up their last new or refill prescriptions, the primary reasons for not picking up prescriptions included both patient-specific

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**TABLE 2** Counts of Compliant and Noncompliant Sample Members Identified Using Self-Report Versus Administrative Claims Data: Army and Air Force Pharmacies

<table>
<thead>
<tr>
<th>Self-Report in Survey:</th>
<th>Identified by CHCS Administrative Data as:</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Compliant&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Noncompliant&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Unknown&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Total</td>
<td>Weighted Percentage</td>
<td></td>
</tr>
<tr>
<td>Compliant&lt;sup&gt;c&lt;/sup&gt;</td>
<td>392</td>
<td>320</td>
<td>10</td>
<td>722</td>
<td>90.9</td>
<td></td>
</tr>
<tr>
<td>Noncompliant&lt;sup&gt;c&lt;/sup&gt;</td>
<td>29</td>
<td>55</td>
<td>1</td>
<td>85</td>
<td>9.1</td>
<td></td>
</tr>
<tr>
<td>Percentage in agreement (weighted)&lt;sup&gt;d&lt;/sup&gt;</td>
<td>93.8</td>
<td>16.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>Source: CHCS data. Sample members were deemed noncompliant if CHCS records indicated that they had at least 1 unclaimed prescription from June 2003 to May 2004.  
<sup>b</sup>Administrative data were unavailable for 11 of 807 sample members at these 4 pharmacies.  
<sup>c</sup>Source: Beneficiary survey. Respondents who reported not picking up a prescription in the 12 months before the date of the survey were deemed noncompliant.  
<sup>d</sup>Percentage of CHCS data verified by self-reports; excludes unknown cases. Weighted to account for probability of selection and survey nonresponse.  
CHCS = Composite Health Care System.

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**TABLE 3** Counts of Compliant and Noncompliant Sample Members Identified Using Self-Report Versus Administrative Claims Data: Entire Sample

<table>
<thead>
<tr>
<th>Self-Report in Survey:</th>
<th>Identified by CHCS Administrative Data as:</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Compliant&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Noncompliant&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Unknown&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Total</td>
<td>Weighted Percentage</td>
<td></td>
</tr>
<tr>
<td>Compliant&lt;sup&gt;c&lt;/sup&gt;</td>
<td>651</td>
<td>414</td>
<td>42</td>
<td>1,107</td>
<td>92.0</td>
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<tr>
<td>Noncompliant&lt;sup&gt;c&lt;/sup&gt;</td>
<td>44</td>
<td>61</td>
<td>2</td>
<td>107</td>
<td>8.0</td>
<td></td>
</tr>
<tr>
<td>Percentage in agreement (weighted)&lt;sup&gt;d&lt;/sup&gt;</td>
<td>93.8</td>
<td>16.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>Source: CHCS data. Sample members were deemed noncompliant if CHCS records indicated that they had at least 1 unclaimed prescription from June 2003 to May 2004.  
<sup>b</sup>Administrative data were unavailable for 44 of 1,214 sample members at 6 pharmacies.  
<sup>c</sup>Source: Beneficiary survey. Respondents who reported not picking up a prescription in the 12 months before the date of the survey were deemed noncompliant.  
<sup>d</sup>Percentage of CHCS data verified by self-reports; excludes unknown cases. Weighted to account for probability of selection and survey non-response.  
CHCS = Composite Health Care System.
and pharmacy-related factors (Table 4). Patient-specific factors included perceiving no need for the prescription (18.5%), forgetting to pick up the prescription (17.3%), and being too busy to pick up the prescription (6.2%). Pharmacy staff reported that forgetfulness was a common reason for not picking up prescriptions among elderly TRICARE beneficiaries. Pharmacy-related reasons included that the prescription was not yet available (10.5%), the prescription was not in stock at the pharmacy (14.8%), and there were long wait times at the pharmacy (11.1%).

Patient characteristics associated with unclaimed prescriptions included active duty military status, younger age, lower educational levels, and absence of certain chronic medical conditions (i.e., no self-reported arthritis, no use of cardiovascular medications) (Table 5). Patients with unclaimed drugs were more likely to be active duty personnel or their dependents than retirees or their dependents. Among those who reported unclaimed prescriptions, 42.7% were active duty military, while only 20.0% of beneficiaries who reported no missed prescriptions were active duty (P < 0.001).

Among respondents without unclaimed prescriptions, 30.4% had more than a 4-year college degree; among respondents with unclaimed prescriptions, only 16.3% had more than a 4-year college degree (P = 0.037). The percentages of respondents with self-reported arthritis were 26.6% and 9.8%, respectively, for those with and without at least 1 unclaimed prescription (P < 0.001). For the same respective groups, the percentages with use of cardiovascular medications in the 12 months prior to the survey were 45.6% and 20.1% (P < 0.001).

**Pharmacy Features Associated With Unclaimed Prescriptions**

Unclaimed prescriptions were associated with beneficiaries’ ratings of pharmacies’ features, such as convenience of location, the amount of available parking, and the friendliness and courtesy of staff (Table 5). Patients who reported not missing a prescription in the past 12 months were more likely to rate these features as excellent compared with patients who had unclaimed prescriptions. Similarly, beneficiaries who reported missing a prescription in the last 12 months were significantly more likely to rate the time spent waiting to pick up a prescription and the friendliness of staff as fair or poor compared with patients who had no unclaimed prescriptions.

Two of the more important pharmacy-related factors associated with the patients’ decision not to pick up a prescription were the quality of directions on proper use of drugs and the time from prescription submittal to fill (average wait time). Survey respondents without unclaimed prescriptions were much more likely to rate the directions provided by pharmacists and pharmacy technicians as excellent compared with respondents who had unclaimed prescriptions (47.7% vs. 29.2%, P = 0.003). According to staff and beneficiary interviews, the pharmacy feature that had the strongest relation to wait times was the drug-dispensing system used. Military pharmacies in the interview sample used 3 different drug-dispensing methods: (1) the bank teller, (2) the assembly line, and (3) batch filling. In the bank-teller method, patients receive a priority number based on military status, the type of prescription, and whether their case is urgent; when a patient’s number is announced, an attendant fills prescriptions for that patient. In the assembly-line method, a pharmacy staff member notes the prescription to be filled for the patient, gives the patient a ticket, and sends the prescription to a separate filling station. In the batch-filling method, the pharmacy periodically prints all outstanding electronic prescription orders and fills them; patients pick up their prescriptions on a first-come, first-served basis.

Wait times can be particularly long at pharmacies where all prescriptions are filled and dispensed on a first-come, first-served basis. Pharmacy staff members report that wait times at these locations can reach up to 2.5 hours during some portions of the day. Results of the beneficiary survey suggest that the bank-teller system resulted in more favorable wait times and a lower rate of unclaimed prescriptions than did the batch-filling system. Beneficiaries who filled prescriptions from study pharmacies with a bank-teller system were more likely to rate the length of time spent waiting for a prescription as excellent or very good compared with patients whose pharmacy used the batch-filling method (42.5% vs. 28.5%, P < 0.001; Pearson chi-square test, not shown). But for this study population, the bank-teller system did not appear to result in a lower rate of unclaimed prescriptions. At the 1 study pharmacy that used batch filling, 12.0% of survey respondents reported an unclaimed prescription, while 7.5%, on average, reported an unclaimed prescription at study pharmacies that used the bank-teller system, but this difference was not statistically significant (P = 0.117).
### Table 5: Association Between Beneficiary and Prescription Characteristics and Self-Reported Unclaimed Prescriptions

<table>
<thead>
<tr>
<th>Beneficiary Characteristic</th>
<th>Patients Without Unclaimed Drugs</th>
<th>Patients With Unclaimed Drugs&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Difference</th>
<th>P Value&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample Size</strong></td>
<td>1,065</td>
<td>105</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Demographic Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (mean)</td>
<td>51.9</td>
<td>36.7</td>
<td>15.2</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Gender</td>
<td>Male: 49%</td>
<td>Female: 51%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beneficiary military status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active duty</td>
<td>20.0%</td>
<td>42.7%</td>
<td>22.7</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Active duty dependent</td>
<td>18.1%</td>
<td>34.1%</td>
<td>16.0</td>
<td></td>
</tr>
<tr>
<td>Retiree or dependent (aged &lt; 65 years)</td>
<td>34.6%</td>
<td>17.1%</td>
<td>-17.5</td>
<td></td>
</tr>
<tr>
<td>Retiree or dependent (aged ≥ 65 years)</td>
<td>27.2%</td>
<td>6.2%</td>
<td>-21.0</td>
<td></td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school graduate, GED, or less</td>
<td>21.6%</td>
<td>23.7%</td>
<td>2.1</td>
<td>0.037</td>
</tr>
<tr>
<td>Some college or 2-year degree</td>
<td>29.8%</td>
<td>44.7%</td>
<td>14.9</td>
<td></td>
</tr>
<tr>
<td>4-year college graduate</td>
<td>18.2%</td>
<td>15.3%</td>
<td>-2.9</td>
<td></td>
</tr>
<tr>
<td>More than 4-year college degree</td>
<td>30.4%</td>
<td>16.3%</td>
<td>-14.1</td>
<td></td>
</tr>
<tr>
<td>Living arrangement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On-base military housing</td>
<td>6.3%</td>
<td>15.4%</td>
<td>9.1</td>
<td>0.072</td>
</tr>
<tr>
<td>Off-base military housing</td>
<td>8.1%</td>
<td>10.9%</td>
<td>2.8</td>
<td></td>
</tr>
<tr>
<td>Apartment or home</td>
<td>82.6%</td>
<td>65.8%</td>
<td>-16.8</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>3.0%</td>
<td>7.9%</td>
<td>4.9</td>
<td></td>
</tr>
<tr>
<td><strong>Health Status and Prescription Drug Utilization</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chronic conditions&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>40.0%</td>
<td>28.5%</td>
<td>11.5</td>
<td>0.060</td>
</tr>
<tr>
<td>Heart disease</td>
<td>17.2%</td>
<td>11.0%</td>
<td>6.2</td>
<td>0.159</td>
</tr>
<tr>
<td>Diabetes</td>
<td>12.6%</td>
<td>7.0%</td>
<td>5.6</td>
<td>0.103</td>
</tr>
<tr>
<td>Asthma</td>
<td>8.1%</td>
<td>9.7%</td>
<td>-1.6</td>
<td>0.671</td>
</tr>
<tr>
<td>Arthritis</td>
<td>26.6%</td>
<td>9.8%</td>
<td>16.8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Had claims in the past 12 months&lt;sup&gt;d&lt;/sup&gt; for:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anti-asthmatics</td>
<td>24.4%</td>
<td>25.0%</td>
<td>-0.6</td>
<td>0.923</td>
</tr>
<tr>
<td>Cardiovascular medications</td>
<td>45.6%</td>
<td>20.1%</td>
<td>25.6</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Central nervous system agents</td>
<td>23.8%</td>
<td>26.5%</td>
<td>-2.7</td>
<td>0.643</td>
</tr>
<tr>
<td><strong>Beneficiary Characteristic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonsteroidal anti-inflammatory agents</td>
<td>6.1%</td>
<td>6.9%</td>
<td>-0.7</td>
<td>0.823</td>
</tr>
<tr>
<td>Prescription drugs treating AIDS, cancer, or tuberculosis</td>
<td>5.0%</td>
<td>3.0%</td>
<td>2.0</td>
<td>0.494</td>
</tr>
<tr>
<td>Drug utilization in the past 12 months&lt;sup&gt;d&lt;/sup&gt; number of:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Different therapeutic classes filled</td>
<td>3.9</td>
<td>4.2</td>
<td>-0.3</td>
<td>0.357</td>
</tr>
<tr>
<td>Fill dates</td>
<td>11.4</td>
<td>10.5</td>
<td>0.9</td>
<td>0.235</td>
</tr>
<tr>
<td>Fills per fill date</td>
<td>1.5</td>
<td>1.5</td>
<td>0.0</td>
<td>0.855</td>
</tr>
<tr>
<td>Total refills</td>
<td>7.4</td>
<td>4.8</td>
<td>2.6</td>
<td>0.044</td>
</tr>
<tr>
<td>Drugs prescribed by outside providers</td>
<td>3.4</td>
<td>1.0</td>
<td>2.4</td>
<td>0.026</td>
</tr>
</tbody>
</table>

<sup>a</sup>Patients who reported missing a prescription in the last 12 months.

<sup>b</sup>T-test for continuous variables; Pearson chi-square test for categorical variables.

<sup>c</sup>Chronic conditions as self-reported in beneficiary survey.

<sup>d</sup>Based on analysis of Composite Health Care System Database for 12-month period prior to the survey (June 2003 through May 2004). AIDS = Acquired Immunodeficiency Syndrome; GED = General Equivalency Diploma.
Another feature that influenced the patient’s assessment of pharmacy convenience was the availability of an automated telephone line to submit refills. This option was available to patients at all 6 study pharmacies. To submit a refill by telephone, patients enter their identification number, the prescription number, and a pharmacy identification code. A message on the telephone system informs patients when the prescription is expected to be ready (usually within 1-3 days) and how long the patient may wait to pick up the prescription before it is considered unclaimed. At the Army pharmacies in this study, the automated telephone system also automatically called patients who did not pick up their refills in 2 to 3 days. Among survey respondents who reported that their pharmacy did not offer a reminder, more patients with unclaimed prescriptions than patients without believed this would be a very useful feature (49.3% vs. 30.5%, P = 0.012). This finding suggests that patients who know they had missed prescriptions believed that a reminder would have prevented missed prescriptions. Reminder calls, along with other reminders (such as prescription calendars), have been shown to increase compliance with medications in other studies.53

Discussion
Like some previous research, the present study provides an estimate of the prevalence of unclaimed prescriptions in the MHS and further evidence of why patients do not pick up their prescriptions. While other studies of military pharmacy noncompliance have found the rate of unclaimed prescriptions to be between 1.6% and 4.7%, those studies estimated noncompliance at the pharmacy level using only administrative claims data.5,9,10,14 The present study, unlike others, provides estimates of the proportion of noncompliant military beneficiaries through use of a large beneficiary survey. Moreover, previous research examined noncompliance using as little as 1 month of data at only 1 pharmacy.5,10,14 While the present study used 12 months of data at 6 pharmacies. Even Kinnaird et al., who used a 7-month period of data, studied claims from only 1 pharmacy.5 The present study represents the first attempt to combine administrative and survey methods to examine pharmacy noncompliance at military pharmacies, though not the first to examine concordance between self-reported and administrative data.59

Some of these findings are consistent with those reported by Papke.49 In that study of 656 noncompliant patients at 1 military pharmacy, 27.4% did not know a prescription had been ordered, 18.3% had some of the prescribed medicine at home, 5.2% forgot the prescription, and 11.1% thought the wait at the pharmacy was too long. Among other reasons for unclaimed prescriptions was lack of perceived need for the drug (2.7%).

The top 2 reasons for noncompliance in Papke’s study were not primary reasons among those reported in the present study. In the present study, only 2 patients reported having medication at home, and no one reported not knowing that his or her prescriptions had been ordered. It is possible that beneficiaries in Papke’s sample were not as well informed as those in the present sample. Also, it is possible that patients who reported forgetting to pick up their prescriptions in the present study had medication on hand, but the survey did not explore this possibility. The next 3 most important reasons reported by Papke were 3 of the top 4 reasons found in the present sample: no perceived need for the prescription, forgetfulness, and long pharmacy wait times. Among the other reasons in the present sample, the 2 pharmacy-related factors (drug not in stock or not ready) might be related to the large volume of prescriptions processed; only 4.1% of patients in Papke’s study reported a similar reason (drug “not in bag with other prescriptions”). In the present study, beneficiaries also reported being out of town or too busy to pick up their drugs, which occurred much less frequently in the Papke study (4.9% of patients).

That the primary reasons for noncompliance differed between the 2 studies could have several explanations, including the difference in samples, number of pharmacies, or pharmacy technology. That no respondents in the present study reported not knowing about their drug might partially be due to telephone reminders (available at 2 of the pharmacies) that notify patients of prescriptions that are unclaimed, a policy change called for by Papke in his study report. In addition, at the time of Papke’s study, the CHCS provider order entry system had been implemented only 15 months before the study period. In contrast, at the 6 pharmacies in the present study, CHCS has been used for a much longer period. In its infancy, there could have been some miscommunication among medical staff and beneficiaries about the electronic order system. In fact, in Papke’s study, 3.0% of patients “expected a written prescription,” suggesting that there may have been some communication issues to work out at the pharmacy in that study.

The 3 most common drug classes in the present study for which prescriptions were unclaimed included psychiatric medications (3.0% of all fills), contraceptives (3.0%), and analgesics (2.7%). This is similar to previous research on unclaimed prescriptions in which the classes most frequently reported as having the highest percentage of unclaimed scripts included psychiatric medications (sometimes called central nervous system [CNS] drugs), analgesics, contraceptives, and antibiotics.1,3,7,8,10,15,20,26,27,41,47-49 Differences in research methods between the present study and previous research may explain why antibiotics, which comprised 1.6% of unclaimed fills, were not among the top 3 unclaimed prescription classes reported for this research population. By using 12 months of data on prescription drug orders and dispensings, the present study was not affected by seasonal drug utilization that is likely more common for antibiotics than other drug classes, while other studies that use fewer than 12 months of data (in some cases, 1 or 2 months) are potentially more affected by seasonal patterns of drug use.

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The present study also demonstrates the challenges associated with estimating the prevalence of unclaimed drugs using self-reported data. Some pharmacy-related reasons for unclaimed prescriptions, such as the prescription being unavailable or not ready, suggest that the same beneficiaries eventually may obtain prescriptions they have not yet claimed; thus our results may overstate the prevalence of noncompliance. Nonetheless, this snapshot of patient behavior indicates that patients do not consistently receive their medications in a timely manner, which may result in costs to the patient or pharmacy.

The discrepancy between administrative and self-reported data suggests either that the administrative data source is not an accurate way to identify unclaimed scripts, that beneficiaries failed to recall unclaimed drugs over a time frame of up to 1 year, or that patients refused to report noncompliant behavior. It may be that patients with unclaimed prescriptions at a study pharmacy obtained them elsewhere without notifying the pharmacy from which the drug was ordered. Pharmacy staff reported that this occurs with refills at military pharmacies that serve overlapping populations of patients (beneficiaries who fill prescriptions at more than one military pharmacy). Self-reports of unclaimed prescriptions, such as those in the survey, are more likely to capture patients who deliberately fail to pick up their drugs and are less likely to include beneficiaries who forget or did not realize a drug was waiting for them. Previous research on unclaimed prescriptions at military pharmacies lends support to this explanation, because slightly more than 25% of beneficiaries in that interview sample did not know that a prescription had been ordered for them.

Some pharmacy features, such as the drug-dispensing system and a refill reminder call, may have an important influence on the rate of unclaimed prescriptions. Staff at 2 study pharmacies observed a difference in the number of unclaimed prescriptions after moving from the batch-filling method to the bank-teller system, although data were available for only 1 pharmacy, and the analysis of that subsample lacked sufficient power to test the staff perception. The convenience of picking up prescriptions at a specific pharmacy may influence whether a patient picks up medications. Several features determine the patient’s perspective on a pharmacy’s convenience. These features include the ease of getting to the pharmacy, wait times once in the pharmacy, the ability to refill and conveniently retrieve prescriptions by telephone, and reminders from the pharmacy to pick up unclaimed drugs. In this study, only 2 of the 6 study pharmacies offered a reminder call to beneficiaries who did not pick up refills in a timely manner. Many survey respondents who reported an unclaimed script and did not have the reminder call available to them felt that a reminder call would have been very useful to them. For habitually noncompliant beneficiaries, a call from their primary physician or pharmacy staff might reduce unclaimed scripts. Previous research on this type of intervention suggests that it reduces prescription noncompliance.

Limitations

Foremost among limitations that may influence the interpretation of the present study’s results is that 19.3% of respondents to the beneficiary survey reported that their primary pharmacy was not 1 of the 6 military pharmacies from which the survey sample was drawn. While this problem does not affect the estimate of self-reported noncompliance, it might affect the concordance between self-reported and administrative database noncompliance. Because CHCS data were examined only for the study pharmacies and claims data came from a central source, beneficiaries who picked up scripts at nonstudy pharmacies (after not picking them up at study pharmacies) would appear noncompliant based on the CHCS data, even though an examination of claims data would have identified them as compliant. However, in a sensitivity analysis limited to survey respondents who reported that their usual pharmacy was one of the study pharmacies, concordance results were qualitatively similar to those reported here. In particular, among patients deemed compliant by CHCS data, 94.4% reported no unclaimed prescriptions (compared with 93.8% in Table 3). And, among those deemed noncompliant, 17.0% reported an unclaimed prescription (compared with 16.0% in Table 3).

Because the study is limited to 6 military pharmacies and to TRICARE beneficiaries, the results may not be relevant to civilian health plans or to other regions in the MHS. However, several features of the study help to overcome this limitation. First, military pharmacy operations throughout the United States are generally uniform, and according to the staff members who were interviewed, many other military pharmacies have had similar concerns with unclaimed prescriptions. So, the findings from this study may be generalizable across many other military pharmacies in the MHS. Second, TRICARE beneficiaries are representative of the U.S. population, with beneficiaries from many different ethnic groups and of varying ages. Their reasons for not picking up drugs and associated pharmacy features are similar to those found in previous literature. Future research on unclaimed prescriptions in the MHS should consider the claims history of a larger sample of TRICARE beneficiaries from a more representative cross-section of the military.

Also, future research should be based on administrative data measures, supplemented by follow-up interviews within a short period of time, to produce a more accurate rate of unclaimed prescriptions, as well as an estimate of the costs of these prescriptions. The recall period used for this study (12 months) was likely too long. Because patients may forget about unclaimed drugs, may not be comfortable talking about missed prescriptions, or may not always tell the truth about this behavior, this is a challenging topic to study. The different rates of self-reported noncompliance and unclaimed scripts in administrative data underline this point.
Prevalence of Unclaimed Prescriptions at Military Pharmacies

Conclusions

The proportion of MHS beneficiaries reporting an unclaimed prescription (8.0% in 2003-2004) is in the middle of the range of prior estimates for the civilian population, from 0.45% to 22.0%, but much of the prior research was conducted 15 to 20 years ago. Patients self-identifying as noncompliant or compliant differ significantly on several characteristics, including age, military status, and prevalence of some chronic medical conditions. Agreement between self-reports and administrative prescription data was mixed. Though patients who were deemed compliant, from a review of administrative data, were very likely to report being compliant (more than 90% agreement), those patients deemed noncompliant were much less likely to report having an unclaimed prescription in the last 12 months (about 16%).

Authors

DOMINICK ESPOSITO, PhD, is a Senior Researcher; ERIC SCHONE, PhD, is a Senior Researcher; SU LIU, PhD, is a Senior Researcher; KAREN CYBULSKI, MS, is a Senior Survey Researcher; RITA STAPULONIS, MA, is a Senior Survey Researcher; and NANCY CLUSEN, MS, is a Statistician, at Mathematica Policy Research, Inc., Princeton, New Jersey. THOMAS WILLIAMS, PhD, is Director of Program Evaluation for TRICARE Management Activity.

AUTHOR CORRESPONDENCE: Dominick Esposito, PhD, Senior Researcher, Mathematica Policy Research, Inc., P.O. Box 2393, Princeton, NJ 08543. Tel.: 609.275.2358; Fax: 609.799.0005; E-mail: desposito@mathematica-mpr.com

DISCLOSURES

The study concept and design was primarily the work of Esposito, Schone, and Williams, with assistance from the other authors. Data collection was primarily the work of Esposito, CyBulski, Stapulonis, and Clusen. Data interpretation was primarily the work of Esposito, Schone, and Liu. Esposito wrote the majority of the manuscript and the revision.

REFERENCES

Prevalence of Unclaimed Prescriptions at Military Pharmacies


42. Russie G. Researching the components of prescription pricing in a military pharmacy. [dissertation]. Austin, TX: University of Texas at Austin, 1996.


