U.S. Department of Health and Human Services
Assistant Secretary for Planning and Evaluation
Office of Disability, Aging and Long-Term Care Policy

MEDICATION USE BY MEDICARE BENEFICIARIES LIVING IN NURSING HOMES AND ASSISTED LIVING FACILITIES

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ABSTRACT

Objectives

This report compares the medication use of Medicare beneficiaries living in nursing homes and assisted living facilities. Descriptions of medication use include mean number of drug mentions per month of stay (scheduled and PRN drugs), and prevalence and duration of therapy by major drug classes. Characteristics of institutionalized beneficiaries include demographics, income, regional residence, Medicare supplemental coverage, any community residence or skilled-nursing stays, death, health status, activities of daily living scores, and major medical conditions.

Methods

Data are from the 1998 Medicare Current Beneficiary Survey (MCBS) facility and institutional drug files. The MCBS facility file captures a comprehensive picture of Medicare beneficiaries residing in institutions. The institutional drug use file contains chart abstracts of medications prescribed or administered to residents while institutionalized. The study sample comprised 1,182 institutionalized beneficiaries with medication records.

Results

In 1998, approximately 1.9 million Medicare beneficiaries lived in a nursing facility (NF) during the year and about 640,000 resided in assisted living and related facilities (ALF). Virtually all beneficiaries in facilities used some medications, and mean monthly use is eight prescriptions. Regularly scheduled medications comprised most drug regimens although drugs administered on an "as needed" basis were common (73% of NF residents vs. 63% of ALF residents). Beneficiaries whose institutional stay was paid for at least partially by Medicare have higher than average monthly prescription use (nine in NF, ten in ALF). Having Medicare supplemental coverage (especially private) is associated with mean monthly drug use in the assisted living facilities but not in nursing homes. The most prevalent drugs taken by residents in either setting were analgesics and antipyretics (82% NF vs. 71% ALF). Use of gastrointestinal drugs was higher for residents with nursing home stays than those with assisted living stays (79% vs. 65%). This difference stemmed mainly from the frequent use of cathartics and laxatives in nursing homes (64% vs. 47%). Anti-infective use was also higher in nursing homes than in assisted living facilities (64% vs. 51%), in particular, use of antibiotics (54% vs. 40%). Nearly 70% of the residents in both settings received central nervous system agents, usually used to treat depression, anxiety and psychoses. Between 38% and 41% of institutionalized beneficiaries received antidepressant therapies and about 23% took antipsychotics. Use of cardiovascular agents such as ace-inhibitors, cardiac stimulants,

and calcium channel blockers were also similar in both environments. More nursing home residents than assisted living residents took anticoagulants or thrombolytics (16% vs. 9%). With the exception of anti-infectives, most of the drugs listed here were taken for half to three quarters of the period during which the beneficiaries were in residence.

Conclusions

These national estimates of institutional drug use serve as the first benchmarks of prescribing patterns in nursing homes and assisted living facilities. Medicare beneficiaries in these setting typically receive many different kinds of medications each month, and at least a third have monthly drug regimens that include more than nine different medications. Future research should assess the appropriateness of these drug therapies. Associations detected between having Medicare supplemental coverage and monthly prescription use in assisted living facilities potentially raise questions about sufficient drug coverage that deserve further investigation.

INTRODUCTION

This report is the first to provide national estimates of medication utilization for Medicare beneficiaries living in nursing homes and assisted living and related facilities. We cover basic measures of drug use including mean number of drug mentions per month of institutional stay (scheduled and PRN drugs), and prevalence and duration of drug therapy by major drug classes. Characteristics of institutionalized beneficiaries include demographics, income, regional residence, Medicare supplemental coverage, any community residence or skilled-nursing facility stays, death, health status, activities of daily living scores, and major medical conditions. This paper also presents the first comparison of institutional medication use by residence in nursing facilities or assisted living and related facilities.

Previously, no nationally-representative estimates existed on the drug use of institutionalized Medicare beneficiaries because no data were available for that purpose. Most studies of prescribing patterns in institutional settings use small and geographically isolated samples, and thus the findings are not generalizable to the country at large. As a result, we have never known the most common or most persistent medications administered in long-term care facilities or assisted living facilities. Our knowledge of medication use in these settings has been pieced together through a collection of fragmented efforts. Our understanding of drugs administered in the nursing home environment comes from surveys of consultant pharmacists and a study using Minimum Data Set (MDS) records from the handful of states that systematically collect drug data. (Tobias 1997, Tobias 2001, Hume 1998) Overall drug use patterns in assisted living facilities are drawn from a single study using the database of one long-term care pharmacy provider. (Armstrong 2001) In all the above cases, these estimates came from data captured retrospectively and for only a short period of time (e.g., medication use in the last seven days or in the last one month). These studies cannot provide information on the duration of use and the reported prevalence rates may be underestimated. Only one analysis has attempted to compare medication use in the two institutional settings, although large differences in the data collection methods make the evaluation difficult to interpret. (Armstrong 2001)

Appreciating why institutional medication use is not simply a more intense version of community medication use requires an understanding of how drugs are dispensed and paid for in these environments. Private drug coverage is far less common in nursing homes and assisted living facilities, and the options for getting the medications filled there are often restricted. Nursing home residents are technically free to obtain their prescriptions at any pharmacy as long as it meets the facility's requirements for special packaging and extra services. In practice, few pharmacies meet these standards so nearly all residents use the long-term care pharmacy provider chosen by the facility. Assisted living facilities generally impose fewer rules on acceptable pharmacies so residents are freer to use outside pharmacies. Sole source pharmacy providers generally deliver the medications to the facility and handle the recordkeeping and billing for medications used. In most cases, the resident's facility negotiates the contract terms

with the long-term care pharmacy that are binding to its residents, but the facility has little direct involvement with managing drug costs.

The main payers for medicines used in nursing homes are public programs. Most beneficiaries enter long-term care facilities following a serious hospitalization. This transfer of acute care to the nursing home initiates a Medicare Part A benefit that includes temporary drug coverage. Medicare covers drug costs as part of a prospective per diem rate for beneficiaries admitted after a hospital stay lasting at least three days. This arrangement can last up to 100 days although most Medicare-covered stays are much shorter since only 60 consecutive days are allowable under this benefit. During this special period of Medicare coverage, beneficiaries pay nothing for their medicines for 20 days and then about $100 a day for all nursing home care including drugs. Nursing homes face potential risk for high drug costs during Medicare-covered days so some facilities negotiate daily medication rates with long-term care pharmacy providers. In turn, pharmacies limit their financial exposure by arranging risk-sharing bands around the per diem rate or fee-for-service exceptions for expensive medications. These contracts are generally proprietary and thus the details of these agreements are not well known.

Although Medicare Part A constitutes an important source of short-term drug coverage, Medicaid actually picks up the tab for most medications dispensed in nursing homes. The majority of residents enter with Medicaid eligibility or acquire it shortly after admittance since the costs of institutional care rapidly exhaust the personal resources of average beneficiaries. With rare exception, Medicaid programs pay for medications on a fee-for-service basis. Long-term care pharmacy providers transmit prescription claims directly to state Medicaid programs for reimbursement (exceptions include California and New York where medications costs are bundled with other institutional services.) For the other states, Medicaid reimburses long-term care pharmacies at the same medication prices as those given to retail pharmacies. There are, however, some state-to-state variations in what are allowable costs that are particularly relevant to institutional settings. Some Medicaid programs cover the costs of commonly prescribed over-the-counter drugs in nursing homes (e.g., vitamins). Some states also permit multiple dispensing fees for each prescription filled, while others impose a flat dispensing fee per resident per month.

The next largest payer is third-party prescription plans. In general, the drug coverage beneficiaries had while living in the community transfers with them into the nursing home. When nursing homes contract with a long-term care pharmacy provider, the selected pharmacy agrees to honor the third-party prescription coverage of all residents and to bill those plans directly. Many private drug plans do not, however, cover the costs of additional pharmacy services required by the facility (such as repacking the medications into blister packs and delivering them to the facility). Some long-term care pharmacy providers recoup these expenses by billing the resident for any uncovered services.

The last source of drug coverage in institutions is an assortment of public plans comprising mostly state pharmaceutical assistance programs. The benefits of these programs vary considerably and eligibility depends on a variety of income and assets tests. But, for the near-poor residents of three states (Pennsylvania, New Jersey and New York) these public plans offer substantial drug coverage to institutionalized patients. In general, these programs operate similarly to Medicaid, and medications are reimbursed on a fee-for-service basis.

For residents with no source of drug coverage, medications are paid for out-of-pocket. In these cases, the long-term care pharmacy provider bills the residents each month, and payments are made either by the resident or family members.

Drug coverage in assisted living and related facilities more closely resembles that found in the community although there are some peculiarities. Residents in this setting usually pay for their medications through private third-party plans or out-of-pocket. Public coverage is less common compared to nursing homes as most states do not allow Medicaid reimbursement for services rendered in assisted living facilities. Many assisted living facilities contract with long-term care pharmacy providers under similar contractual terms as nursing homes. Some assisted living facilities require that their residents fill all medications through the selected pharmacy provider, although most allow residents to use retail pharmacies, either directly or with the help of family members or friends. In cases of sole source long-term care pharmacies, residents of assisted living facilities pay higher medications prices than if purchasing them from retail pharmacies.

METHODS

This paper uses a merged dataset of the 1998 Medicare Beneficiary Survey (MCBS) Cost and Use facility file and the institutional drug administration (IDA) file. The facility file captures a comprehensive picture of Medicare beneficiaries residing in institutions. Institutional care is broadly defined and includes licensed nursing homes and other long-term care facilities such as retirement homes, domiciliary or personal care facilities, and assisted living facilities. Domains in the MCBS facility file include beneficiary demographics, income, regional residence, Medicare supplemental coverage, any community residence or skilled-nursing stays, health status, activities of daily living scores, major medical conditions and death. Type of institutional stay comes from the facility-reported descriptions. We defined assisted living and related facility stay for those described as: assisted living facility, domiciliary care home, personal care home, life care facility, continuing care retirement community, or retirement home.

The institutional drug use file contains monthly chart abstracts of medications prescribed to residents while institutionalized. Surveyors record all medicines listed on the resident's medication chart, including prescribed and over-the-counter medicines, and the number of administrations. This includes prescriptions given at regular intervals or those given as PRN or standing orders. In our analyses, we included only drugs

administered at least once during the month. We also excluded drug mentions that were classified as durable medical equipment, medical supplies/devices, and pharmaceutical adjuvants.

The study sample comprised 1,182 institutional beneficiaries with medication records. The MCBS facility sample consists of individuals who reside in long-term care settings at the time of their survey interview (MCBS sample persons are drawn from Medicare enrollment records without regard to their institutional status). The facility sample is representative of the Medicare population in long-term care facilities. Each sample person has information on all living situations during the year. We track residents as they moved from the community to the facility, from facility to facility, or from facility to death. Monthly drug use was mapped to these residence histories to create estimates of mean drug use per person month while in each facility type.

All estimates are weighted. Estimates failing reliability thresholds of cell size less than 20 sample persons are noted in the tables. (See the appendix for additional details on the study methods.)

STUDY FINDINGS

Socio-economic characteristics: Table 1 presents the characteristics of institutionalized Medicare beneficiaries by type of facility stay. In 1998, approximately 1.9 million Medicare beneficiaries lived in a nursing facility during the year and about 640,000 resided in assisted living facilities. Both populations show relatively similar socio-economic traits, although assisted living residents are slightly younger than nursing homes, more often white and have somewhat higher incomes. More notable differences are apparent with supplemental Medicare coverage. Far more beneficiaries in assisted living facilities than in nursing homes have some form of private health insurance during the year (50% vs. 36%). Nursing home residents rely more often on Medicaid coverage than assisted living residents (65% vs. 39%). Both populations show substantial movement between living in the community and facility: over one in three residents of assisted living facilities lived in the community at some time during the year compared to one in four nursing home residents. About 25% of the nursing home population died during the year compared to 15% of the assisted living population.

Health status: For every measure of health status evaluated, nursing home residents show greater frailty than assisted living residents: they have worse health status, higher prevalence of medical conditions and more physical impairments (see Table 2). This finding was expected, however the only slightly better health of the assisted living population was surprising. Almost 30% of assisted living residents have dementia/Alzheimer's disease or heart disease (compared to about 40% of nursing home residents.) Both populations share a similar prevalence of mental disorders (about 40%). Nearly 60% of assisted living residents have difficulties performing three or more activities of daily living (compared to 72% of nursing home residents) and

almost half of this population suffers from some urinary incontinence (compared to 61% of nursing home residents).

Average drug use: Average monthly drug use looks similar in the two institutionalized populations. Table 3 shows that virtually all beneficiaries in facilities used some medications, and mean monthly use is eight prescriptions. Regularly scheduled medications comprise most of the drug regimen although drugs administered on an "as needed" basis are common for residents of both nursing homes and assisted living facilities (73% vs. 63%).

Table 4 presents a more detailed picture of average monthly drug use in institutions. About 9% of nursing home residents and 14% of assisted living residents take simple medication regimens consisting of one or two different drug therapies in the course of a month. Most residents, though, take about three to eight different medicines every month (62% in nursing homes vs. 60% in assisted living facilities). Highly complex drug regimens of nine or more medicines in a month are taken by about 40% of nursing home residents and 34% of assisted living residents. The next two distributions of monthly medication use show that about half of all institutionalized beneficiaries take PRNs frequently enough to exceed an average of one or more per month.

The relationship between average drug use and having supplemental health insurance varies by setting. Mean monthly medication use appears stable among nursing home residents regardless of whether or not they have Medicaid, private insurance or other public coverage (See Table 5). That is not the case for assisted living residents: those without any health coverage besides Medicare use six prescriptions per month on average, while those with private health plans (either with or without Medicaid coverage) tend to use eight to nine prescriptions per month. Beneficiaries whose institutional stay was paid for at least partially by Medicare also have higher than average monthly prescription use, an association evident in both settings.

Use of therapeutic drug classes: Table 6 presents the types of medications most commonly used in nursing homes and assisted living facilities. The columns capture the prevalence of use and the duration of use. Overall, drug use is similar across settings although there are some notable exceptions. The most prevalent drugs taken by residents in either environment are analgesics and antipyretics. This indicates that pain management is the number one use of drugs in nursing homes or assisted living facilities. Nursing home residents tend to use more non-salicylate analgesics such as acetaminophen (61% vs. 47%) and narcotic analgesics (30% vs. 25%) than assisted living facility residents. Use of gastrointestinal drugs is also higher for residents with nursing home stays than those with assisted living stays (79% vs. 65%). This difference stems mainly from the frequent use of cathartics and laxatives in nursing homes (64% vs. 47%). Anti-infective use is also higher in nursing homes than in assisted living facilities (64% vs. 51%), in particular, antibiotics (54% vs. 40%). This reflects the high susceptibility of frail nursing home residents to infections. Nearly 70% of the residents in both settings received central nervous system agents, usually used to treat depression, anxiety and psychoses. Between 38% and 41% of the residents in either setting receive

antidepressant therapies and about 23% take antipsychotics. Use of cardiovascular agents such as ace-inhibitors, cardiac stimulants, and calcium channel blockers are also similar in both environments. More nursing home residents than assisted living residents do, however, take anticoagulants or thrombolytics (16% vs. 9%). With the exception of anti-infectives, most of the drugs listed here are taken for half to three quarters of the period the beneficiaries are in residence.

CONCLUSIONS

These estimates of institutional drug use serve as the first national-level benchmarks of prescribing patterns in nursing homes and assisted living facilities. Medicare beneficiaries in these setting typically receive many different kinds of medications each month, and at least a third have drug regimens exceed the Minimum Data Set Quality Indicator that nursing home residents receive no more than nine different medications. Future research should assess the appropriateness of these drug therapies. Associations detected between having Medicare supplemental coverage and monthly prescription use in assisted living facilities raise questions about drug coverage that deserve further investigation.

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TABLE 1. Institutional Medicare Beneficiaries by Type of Facility Stay and Resident Characteristics, 1998		
Beneficiary Characteristics	**Percent Beneficiaries**	
	Any Nursing Facility Stay	**Any Assisted Living or Related Facility Stay[a]**
Total	1,905,487	638,596
Age (years)		
Under 65	6.9	14.4
65-74	10.8	9.1*
75-84	32.3	30.8
85+	50.0	45.8
Gender		
Female	70.1	69.9
Male	29.9	30.1
Race		
White	86.3	93.8
Non-white	13.7	5.2
Income		
<$5,000	15.6	10.8
$5,000-$10,000	43.8	46.5
$10,001-$20,000	26.8	24.2
$20,001-$30,000	9.6	10.6
>$30,000	4.2	8.0
Urban/Rural Residence		
Urban	71.4	74.8
Rural	28.6	25.2
Census Region		
Midwest	33.7	29.5
South	32.0	32.4
Northeast	19.9	20.6
West	14.0	15.6
Source of Medicare Supplemental Coverage		
Private only[b]	19.5	39.3
Medicaid only[c]	48.1	28.6
Both Private and Medicaid	16.6	10.2
Other[d]	9.2	12.4
No Medicare Supplemental Coverage	6.6	9.5
Any Medicare Covered Nursing Home Stay		
Yes	25.6	22.7
No	74.4	77.3
Lived in Community Any Time During the Year		
Yes	25.7	34.7
No	74.3	65.3

TABLE 1 (*continued*)		
	Percent Beneficiaries	
	Any Nursing Facility Stay	**Any Assisted Living or Related Facility Stay**
Died During the Year		
Yes	25.8	15.3
No	74.2	84.7

SOURCE: Medicare Current Beneficiary Survey, Institutional Drug File, 1998

* Estimate not reliable as cell size <20.

a. Includes assisted living facility, domiciliary care home, personal care home, life care facility, continuing care retirement community, retirement home.

b. Includes employer sponsored plan, individual Medigap plan, Medicare HMO, private HMO.

c. Includes regular Medicaid and Qualified Medicare Beneficiary (QMB) and Specified Low-Income Medicare Beneficiary (SLMB) Plus programs.

d. Includes public plans (such as Veterans Affairs, Department of Defense, State Pharmaceutical Assistance Programs) and combinations, and evidence of some coverage but source not reported.

TABLE 2. Institutional Medicare Beneficiaries by Type of Facility Stay and Resident Health Status, 1998		
Beneficiary Characteristics	**Percent Beneficiaries**	
	Any Nursing Facility Stay	**Any Assisted Living or Related Facility Stay[a]**
Total	1,905,487	638,596
General Health Status		
Excellent to good	31.4	51.0
Fair	45.7	31.0
Poor	20.2	15.6
Reported Medical Conditions		
Dementia/Alzheimer's	42.5	28.9
Other mental disorders	40.4	37.7
Heart disease	41.6	31.4
Hypertension	37.7	39.1
Arthritis	30.0	17.1
Stroke	19.5	12.4
Diabetes	18.4	16.1
Chronic lung disease	12.3	9.1
Osteoporosis	10.7	12.8
Cancer	9.7	8.5
Hip fracture	6.0	3.8*
Activities of Daily Living (ADL) Limitation		
0	7.6	23.2
1-2	20.2	29.5
3-4	17.7	12.5
5-6	54.6	34.9
Evidence of Urinary Incontinence		
None	39.2	55.7
Any	60.8	44.3
Evidence of Memory Loss		
None	54.6	44.8
Any	45.4	55.2

SOURCE: Medicare Current Beneficiary Survey, Institutional Drug File, 1998

* Estimate not reliable as cell size <20.

a. Includes assisted living facility, domiciliary care home, personal care home, life care facility, continuing care retirement community, retirement home.

b. Includes depression, schizophrenia, psychosis and other mental disorders.

TABLE 3. Mean Number of Drug Mentions[a] per Month for Institutionalized Medicare Beneficiaries by Type of Facility Stay, 1998		
	Any Nursing Facility Stay	**Any Assisted Living or Related Facility Stay[b]**
Total	1,905,487	638,596
Mean total drug mentions per month	8.1	7.5
Percent beneficiaries under scheduled drugs	99.0%	98.2%
Mean scheduled drug mentions per month	7.3	6.9
Percent beneficiaries using PRN drugs	73.0%	62.6%
Mean PRN drug mentions per month	1.2	1.1

SOURCE: Medicare Current Beneficiary Survey, Institutional Drug File, 1998

a. Only those drugs that were administered at least once in the month were counted.
b. Includes assisted living facility, domiciliary care home, personal care home, life care facility, continuing care retirement community, retirement home.

TABLE 4. Frequency Distribution of Mean Number of Drug Mentions[a] per Month for Institutionalized Medicare Beneficiaries by Type of Facility Stay, 1998		
	Percent Beneficiaries	
	Any Nursing Facility Stay	**Any Assisted Living or Related Facility Stay[b]**
Mean Total Drug Mentions Per Month for Users		
1 - <3	7.2%	12.2%
3 - <6	23.2	29.2
6 - <9	30.4	24.7
9 or more	39.2	33.8
Mean Scheduled Drug Mentions Per Month for Users		
1 - <3	8.7%	13.5%
3 - <6	28.9	35.2
6 - <9	33.2	25.0
9 or more	28.8	26.4
Mean PRN Drug Mentions Per Month for Users		
<1	49.2%	53.1%
1 - <2	26.5	28.2
2 - <3	16.3	12.2
3 or more	8.0	6.5*

SOURCE: Medicare Current Beneficiary Survey, Institutional Drug File, 1998

* Estimate not reliable as cell size <20.

a. Only those drugs that were administered at least once in the month were counted.
b. Includes assisted living facility, domiciliary care home, personal care home, life care facility, continuing care retirement community, retirement home.

TABLE 5. Mean Number of Drug Mentions per Month for Institutionalized Medicare Beneficiaries by Type of Facility Stay and Health Insurance Coverage, 1998		
Health Insurance Coverage	**Any Nursing Facility Stay**	**Any Assisted Living or Related Facility Stay[a]**
Total	8.1	7.5
Source of Medicare Supplemental Coverage		
Private only[b]	8.0	7.8
Medicaid only[c]	8.1	6.8
Both Private and Medicaid	8.7	9.1
Other[d]	8.0	7.8
No Medicare Supplemental Coverage	7.8	6.2
Any Medicare Covered SNF Stay		
Yes	9.1	9.5
No	7.8	6.9

SOURCE: Medicare Current Beneficiary Survey, Institutional Drug File, 1998

* Estimate not reliable as cell size <20.

a. Includes assisted living facility, domiciliary care home, personal care home, life care facility, continuing care retirement community, retirement home.
b. Includes employer sponsored plan, individual Medigap plan, Medicare HMO, private HMO.
c. Includes regular Medicaid and Qualified Medicare Beneficiary (QMB) and Specified Low-Income Medicare Beneficiary (SLMB) Plus programs.
d. Includes public plans (such as Veterans Affairs, Department of Defense, State Pharmaceutical Assistance Programs) and combinations, and evidence of some coverage but source not reported.

TABLE 6. Prevalence and Duration of Drugs[a] Used by Medicare Beneficiaries in Nursing Facilities and Assisted Living and Related Facilities[b] by Descending Order of Prevalence of Drug Class in Nursing Facilities, 1998				
Drug Class[c]	Beneficiaries with Any Nursing Facility Stay		Beneficiaries with Any Assisted Living and Related Facility Stay	
	Percent of Residents with Any Use	For Users, Percent of Months of Residence in which the Drug is Used	Percent of Residents with Any Use	For Users, Percent of Months of Residence in which the Drug is Used
Analgesics and Antipyretics	81.5	74.7	71.3	78.9
Analgesics, Salicylates	30.4	86.0	29.3	89.7
Analgesics, Non-salicylates	60.8	53.5	47.1	60.3
Analygesics, NSAIDs	17.9	58.9	21.6	50.9
Analgesics, Narcotics	29.9	56.6	25.3	53.6
Gastrointestinal Drugs	78.6	84.4	65.1	82.2
Cathartics and Laxatives	63.5	76.9	46.7	73.1
Anti-Ulcer Agents	32.8	80.7	29.4	77.1
Antacids and Adsorbents	16.2	51.1	13.2	39.7
Antidiarrhea Agents	9.9	29.0	12.4	37.2
Intestinal Motility Stimulants	8.8	71.9	5.9*	70.5
Electrolytic, Caloric and Water Balance	73.8	88.0	63.0	87.9
Minerals and Vitamins	57.0	85.9	48.2	87.8
Electrolyte Balance	35.4	79.6	33.6	78.4
Nutritional Therapy	18.5	67.5	8.0	59.6
Central Nervous System (CNS) Agents	70.2	86.6	69.3	91.1
Antidepressants	38.3	82.1	41.2	83.1
Anxiolytics, Sedatives, and Hypnotics	29.1	69.6	28.9	69.3
Antipsychotics	23.2	77.7	23.9	82.3
Anticonvulsants	14.7	86.6	13.4	87.0
Antiparkinsonism Agents	11.6	68.8	9.5	83.3
Anti-Alzheimer	4.9	76.9	8.8	87.2
Anti-Infective Agents	63.5	38.6	50.8	40.5
Antibiotics	54.4	30.8	40.2	32.6
Antibacterials	14.8	26.4	12.1	31.2
Antifungal Agents	8.3	31.1	5.4*	51.8
Biologicals	4.7	19.6	4.4*	22.4
Antiparasitic Agents	3.4	40.1	3.0*	16.8
Antiviral Agents	3.1	16.8	1.6*	10.9
Antiseptics	2.7	73.6	3.0*	61.5
Cardiovascular Agents	56.1	91.8	56.8	91.8
Ace-Inhibitors	22.1	81.6	21.5	86.0
Cardiac Stimulants	19.8	94.6	19.7	91.0
Calcium Channel Blockers	19.0	85.2	18.7	84.7
Vasodilators	17.3	80.6	13.7	79.9
Beta-Blockers	9.0	86.8	11.5	83.1
Sympatholytic Drugs	4.4	92.1	5.6*	64.2
Angiotensin Receptor Blockers	2.6	90.8	2.1*	94.7
Cholesterol and Triglyceride Lowering Agents	2.6	76.0	5.4*	81.3
Ear/Eye/Nose/Rectum/ Topical/Vagina/Other	49.6	64.4	44.2	68.0
Dermatologic Preparations	29.7	46.0	22.8	40.3
Eye Preparations	23.6	71.6	23.9	74.4
Nose Preparations	3.6	44.9	5.7*	46.9
Ear Preparations	2.4	22.0	4.8*	11.5
Benign Prostatic Hypertrophy Agents	4.3	77.9	5.3*	97.6
Kidney/Urinary Tract Agents	46.3	83.3	45.2	83.4
Diuretics	43.3	83.5	40.0	86.8
Anti-incontinence/ Antispasmodic Agents	4.9	66.0	5.0*	50.8

TABLE 6 (continued)				
Drug Class[c]	Beneficiaries with Any Nursing Facility Stay		Beneficiaries with Any Assisted Living and Related Facility Stay	
	Percent of Residents with Any Use	For Users, Percent of Months of Residence in which the Drug is Used	Percent of Residents with Any Use	For Users, Percent of Months of Residence in which the Drug is Used
Hormones and Synthetic Substitutes	41.7	84.6	43.1	90.8
Insulin and Anti-Diabetic Agents	16.7	92.9	15.8	93.2
Thyroid and Antithyroid Agents	14.2	95.2	16.3	96.6
Adrenocortical Hormones	9.2	55.5	9.5	75.8
Parathyroid/Bone Resorption Drugs	5.7	73.3	7.1	86.0
Female Hormonal Agents	5.1	68.6	8.2	77.4
Respiratory Agents	40.9	46.6	33.4	49.5
Antitussives, Expectorants, Mucolytic Agents	27.1	29.1	22.3	31.1
Bronchodilators	19.0	62.9	12.7	72.4
Inhaled Steroids	6.0	63.4	5.0*	49.3
Anti-Allergy Agents	18.3	41.6	12.3	44.5
Antihistamines	17.2	43.1	12.0	45.1
Blood Formation and Coagulation Agents	17.3	76.5	10.0	85.9
Anticoagulants/ Thrombolytics	16.1	78.1	9.2	87.0
Anti-Cancer Agents	4.0	65.0	2.8*	76.3

SOURCE: Medicare Current Beneficiary Survey, Institutional Drug File, 1998.

* Estimate not reliable as cell size <20.

a. Only those drugs that were administered at least once in the month were counted.

b. Includes assisted living facility, domiciliary care home, personal care home, life care facility, continuing care retirement community, retirement home.

c. Drug classification is an adaptation of the HIC therapeutic drug classification system, First Databank 2001 edition. Data on drug sub-classes with prevalence of less than 2% in beneficiaries with any nursing facility stay are not shown, but are included in the estimates of overall prevalence and duration of each major drug class.

APPENDIX

Study Sample. The 1998 Medicare Current Beneficiary Survey (MCBS) Institutional Drug Administration (IDA) file contains information on 1553 Medicare beneficiaries. Of these, 1260 beneficiaries have survey IDs in the 1998 MCBS facility file and this group forms the sample for our analyses. Of the remaining 293 beneficiaries, 286 beneficiaries had survey responses from the 1997 MCBS facility files.

Type of Facilities. The MCBS survey used a broad definition of long term facility care in order to capture a complete picture of all types of institutions providing care received by the Medicare population. The survey includes licensed nursing homes and other long term care facilities such as retirement homes, domiciliary or personal care facilities, mental health or mental retardation facilities, continuing care facilities, assisted living facilities, and rehabilitation facilities. To be included in the survey, a facility must have three or more long term care beds, and answer affirmatively to at least one of the following three questions: does this facility (1) provide personal care services to residents; (2) provide continuous supervision of residents; (3) provide any long term care. It must be noted that while the MCBS sample is representative of the Medicare population that uses long-term care facilities, it was not designed to be representative of the universe of long term care providers. Due to the primary sampling of the person sample in the MCBS, larger facilities have a greater chance of being included than small facilities, because at any one time there are more persons in a larger facility than in a smaller facility.

Institutional Stay. We characterized the type of institutional stay according the facility descriptors collected in the survey. We defined assisted living or related facility (assisted living facility) stay as any stay in an assisted living facility, domiciliary care home, personal care home, life care facility, continuing care retirement community, or retirement home. Appendix table A1 presents a distribution of institutionalized beneficiaries by type of facility stay in 1998. We focused the analyses for this report on beneficiaries with any nursing home stay (N=910) or any assisted living facility stay (N=300) but excluded stays in mental health facilities, hospital and rehabilitation facilities, and other facilities because sample sizes in the 1998 MCBS are too small to adequately characterize these facility types.

Medications Administered. The MCBS IDA file describes medications prescribed or administered to residents while institutionalized. Surveyors are instructed to record all medicines listed on the resident's medication chart regardless of whether the medicine was actually taken. This includes prescriptions given at regular intervals or those given as PRN or standing orders. As a result, the IDA file contains the names of some medicines never taken during the month. Medications listed but never given can be identified through fields indicating the frequency of administrations. In our analyses only drugs administered at least once during the month are included. We also excluded drug mentions that were classified as durable medical equipment, medical supplies/devices, and pharmaceutical adjuvants.

Health Status. The MCBS survey gathers information on the health status and functioning of sample persons only once during the year (in the Fall interview round). The beneficiary's residence at that time determines whether the facility or community version of the health survey is given. In general, the facility health survey contains more detail than the community survey but they cover the same core of questions. To assess the health status of all residents, we identified a set of common questions in both surveys for this analysis. It should be noted that responses in the community health survey are self-reports while those from the facility interview are proxy responses from the medical chart and facility staff such as nurses. Seventy beneficiaries (7.7%) with a NH stay and 25 beneficiaries (8.3%) with an assisted living facility stay responded to the community health survey in 1998.

Therapeutic Drug Classes. The IDA file captures only raw drug mentions with no therapeutic drug classification. For this analysis, we used a computerized matching algorithm to map the raw drug mentions to standardized drug names with specific drug classes. Drug mentions receiving no matches or multiple matches were manually reviewed and mapped by two pharmacists. We relied upon the FirstDataBank drug dictionary, 2001 edition, as the source for the standard drug names and drug classes. Our tables report the HIC3 drug class from the FirstDatabank.

Residence Histories. The MCBS captures information on changes in the living situations of beneficiaries during the year. We used these situation codes to create detailed residence histories for each beneficiary. This information allowed us to track residents as they moved from the community to the facility, from facility to facility, or from facility to death. Monthly drug use was mapped to these residence histories to create estimates of mean drug use per person month while in each facility type. Partial months are counted the same as full months in these analyses.

TABLE A1. Distribution of Beneficiaries in the 1998 MCBS Facility Sample with Institutional Drug Administrations by Type of Facility Stay (unweighted counts)		
Type of Facility Stay		**N**
Any Nursing Home (NH) Stay		910
Only NH stay	874	
NH and assisted living facility	28	
NH and MH	5	
NH and hospital	1	
NH and rehab/other	1	
NH and MH and rehab/other	1	
Any Assisted Living or Related Facility (assisted living facility)[a] Stay		300
Only assisted living facility stay	267	
Assisted living facility and NH	28	
Assisted living facility and MH	5	
Any Mental Health Facility (MH)[b] Stay		55
Only MH stay	44	
MH and NH	5	
MH and assisted living facility	5	
MH and NH and rehab/other	1	
Any Hospital[c] (with Nursing Home Unit) Stay		30
Only hospital stay	29	
Hospital and NH	1	
Any Rehabilitation Facility or Other (Rehab/Other) Stay		6
Only rehab/other stay	4	
Rehab/other and NH	1	
Rehab/other and NH and MH	1	

a. Includes assisted living facility, domiciliary care home, personal care home, life care facility, continuing care retirement community, retirement home.
b. Includes mental health facility, institute for the mentally retarded/developmentally disabled, mental health center.
c. Includes Medicare-certified nursing home units based within acute care hospitals; private psychiatric hospitals; state or county hospitals for the mentally ill; Veterans Affairs hospitals and medical centers; state hospitals for the mentally retarded; chronic disease, rehabilitation, geriatric, and other long-term care hospitals; and other places that are commonly called hospitals.

TABLE A2. Characteristics of Facilities from which Residents Sampled		
Characteristics	**Nursing Facilities**	**Assisted Living and Related Facilities[a]**
Total (N)	727	267
Bed Size		
10 and less	3.2%	17.6%
11-25	2.1	13.9
26-50	4.5	10.9
51-100	26.3	21.0
101-150	30.7	17.2
More than 150	33.3	19.5
Mean Bed Size (SD)	143.7 (105.5)	90.3 (89.9)
Ownership		
For-profit	70.4%	58.4%
Non-profit	24.4	37.5
Government	4.8	4.1
Other	0.4	0.0
Census Region		
Northeast	19.9%	19.9%
Midwest	33.0	25.8
South	31.0	33.3
West	15.4	18.7
Supervision of Medications		
Yes	83.5%	88.8%
Unknown	16.5	11.2
24-Hour Nursing Care		
Yes	96.6%	37.5%
Unknown	3.4	62.5

a. Includes assisted living facility, domiciliary care home, personal care home, life care facility, continuing care retirement community, retirement home.

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Reports Available

Medication Use by Medicare Beneficiaries Living in Nursing Homes and Assisted Living Facilities

HTML	http://aspe.hhs.gov/daltcp/reports/2002/meduse.htm
PDF	http://aspe.hhs.gov/daltcp/reports/2002/meduse.pdf

Medication Use in Long-Term Care Facilities and Community Settings for Medicare Beneficiaries with Cardiovascular Disease

HTML	http://aspe.hhs.gov/daltcp/reports/2002/cdmeduse.htm
PDF	http://aspe.hhs.gov/daltcp/reports/2002/cdmeduse.pdf

The Graying of Medicare's Disabled Population: Implication for a Medicare Drug Benefit

Executive Summary	http://aspe.hhs.gov/daltcp/reports/2002/grayinges.htm
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