Chart book Number 5

Analysis of the Effect of Case Mix Adjustment on Medicaid Expenditure Data for 2002

(5th in a series of 6 quantitative reports)

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The overall Rebalancing Research is being conducted through a Task Order under a CMS Master Contract between CMS and the CNA Corporation, Arlington, VA, and subcontracts and consultant agreements between CNAC and the various researchers. Rosalie A. Kane is the principal investigator from the University of Minnesota and Elizabeth Williams is the CNAC project director. The special quantitative studies are under the direction of Robert L. Kane. The statements and opinions in the report are those of the writers and do not necessarily reflect the views of CMS or any of its staff, or the State liaisons to the project, or any other state staff or persons who spoke to us from participating states. We thank our CMS Project Officer, Kathryhn King and alsoWilliam D. Clark of CMS (ORDI), who made helpful comments on an earlier version of this report.

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Preface

In 2003, Congress directed the Centers for Medicare & Medicaid Services (CMS) to commission a study in up to 8 States to explore the various management techniques and programmatic features that States have put in place to rebalance their Medicaid long-term care (LTC) systems and their investments in long-term support services towards community care. The States of Arkansas, Florida, Minnesota, New Mexico, Pennsylvania, Texas, Vermont, and Washington are participating in this 3-year Rebalancing Study. For the study, CMS defined rebalancing as reaching "a more equitable balance between the proportion of total Medicaid long-term support expenditures used for institutional services (i.e., Nursing Facilities [NF] and Intermediate Care Facilities for the Mentally Retarded [ICFs-MR]) and those used for community-based supports under its State Plan and waiver options." CMS further clarified that a balanced LTC system "offers individuals a reasonable array of balanced options, particularly adequate choices of community and institutional options."

The products for the entire study include 3 iterations of State-specific case studies that qualitatively and quantitatively examine each State's management approaches to rebalance its long-term care systems; 6 cross-cutting topic papers on issues in rebalancing; and a series of 6 Chartbooks with special quantitative analyses. A list of all products with web links for completed documents is provided in the Appendix. Various products are posted on http://www.hcbs.org, on the CMS website at http://www.cms.hhs.gov/NewFreedomInitiative/035_Rebalancing.asp#TopOfPage, and on the study director's website at University of Minnesota at http://www.hsr.umn.edu/LTCResourceCenter. The special quantitative work was performed under the direction of Robert L. Kane. We thank Glenn Mitchell and Su Wang (in Florida), Mike Baldwin and Bob Myers (in Minnesota), Kathy Leitch, Bill Moss, Patricia Richards, and Terry Rupp (in Washington) and Bill Clark and Karyn Anderson (at CMS) for their cooperation and assistance but the responsibility for all material rests with the authors.

The special quantitative studies for this project used secondary data from State and Federal sources to explore enrollment, service utilization, and expenditures for state LTC program recipients. In general, they compared Medicaid expenditures for participants in HCBS and nursing homes, as well as Medicare expenditures for individuals dually eligible for Medicaid and Medicare. This quantitative paper, Chartbook Number 5, examines how much of the variation in Medicaid expenditures might be accounted for by case mix.

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Executive Summary

To address questions about how much of the observed variation in analyses of expenditures on LTC and acute care might be attributable to differences in case mix, we calculated case mix using slight modifications of the techniques already adopted for Medicare and Medicaid.

The Chronic Disability Payment System (CDPS) was developed specifically for Medicaid programs to make health-based capitation payments for TANF and disabled Medicaid beneficiaries. The CMS Hierarchical Condition Categories (HCC) model was developed to predict Medicare payments, and is currently used adjust payments to Medicare advantage plans.

Using the usual CDPS scores the case mix for MA only MR/DD waivers and ICF/MR residents is higher than that for duals. However, when the revised score is used the difference is reversed. (The revised score affects only the duals.) Among the AD waiver clients both the scoring systems show the duals as more impaired although the revisited score widens the gap. Among nursing home residents the usual scoring shows slightly more impairment among the MA only, whereas the revised score shows a large difference in favor of more impairment among the duals.

In general then patterns of relative relationships among the states seen with unadjusted analyses are maintained when case mix is applied. However, the size of the effects is often greatly influenced by case mix adjustment.

The general observation that dually eligible clients have a much higher case mix is not seen when all clients are eligible for LTC. In that case, the differences often depend on how the case mix is calculated. When the usual approaches are used there appears to be an

undercount of diagnoses. When this undercount is corrected the patterns change to suggest that the duals are more impaired. However, the undercount, by definition, applies only to the dually eligible participants.

In interpreting data about LTC expenditures and related medical costs, it is important to recognize the role case mix adjustment can play. It is more difficult to decide whether to consider case mix and if so, how.

Introduction

Previous analyses in this series have traced the expenditure patterns of LTC users under waiver and state plans. Questions were raised about how much of the observed variation might be attributable to differences in case mix. This analysis uses case mix adjustments based on adaptations of standardized adjustment systems in use for Medicaid and Medicare to address this issue.

It asks several questions:

1. Does the pattern of case mix vary across states and populations?
2. Is the case mix for dually eligible (i.e., Medicare and Medicaid) clients higher than that for Medicaid only clients?

Methods

This study adapts case mix models developed for the Medicare and Medicaid programs that use administrative data (e.g., age, living situation, diagnoses) to create case mix indexes. Because the two programs serve different clienteles and have different elements in their respective data bases, the two case mix calculation systems are different.

State Finder File Data

Our study sample includes all Medicaid LTC recipients in each of our 8 Rebalancing study states during 2001 and 2002. Because we used 2001 data to create case mix adjusters for 2002 expenditures, we excluded beneficiaries who were present in only 2001 or 2002. We asked states to provide a "finder file" including all individuals who were eligible for a HCBS waiver at least once each year and including all individuals who received an LTC service under the state plan during each year.

These files for the year 2002 were then matched against the CMS Medicaid MAX (sp) and Medicare claims data (discussed below) to permit analysis of medical and LTC service costs among HCBS waiver and other Medicaid LTC beneficiaries. Medical and LTC costs for HCBS waiver and other Medicaid LTC beneficiaries in 2002 were subsequently adjusted for beneficiary case mix using individual case mix scores from the previous year. Individual case mix scores for beneficiaries were estimated using a prospective model, which used individual demographic information and diagnoses available in the Medicaid and Medicare claims from the year 2001.

CMS Medicare and Medicaid Data

Cost data for medical and LTC services were obtained from Medicare and MAX claims files, both created by CMS. Using the CMS Health Insurance Claim (HIC) number for Medicare and the Eligible Identifier Number obtained from the MAX PS file, we extracted all claims pertaining to the persons identified and linked with the state provided finder files. Medicare claims were extracted from the MedPar (finalized inpatient claims), Outpatient, Carrier, and Home Health files. Medicaid claims were extracted from the MAX utilization files (MAX IP: inpatient, MAX LT: long-term care, MAX OT: other services, MAX RX: prescription drugs).

Our study population for this specific chart book includes individuals who are enrolled in a relevant Medicaid waiver or LTC state plan service in 2001 and 2002. They were either dual eligible recipients -- enrolled in both Medicaid and Medicare as a result of age or disability -- or non-dual eligible recipients, enrolled only in Medicaid. Among the dual-eligible recipients, only those who were identified in the state finder files, were linked to Medicaid MAX data and were eligible for Medicare were included in our

analyses. We excluded from our study population those individuals identified as having end stage renal disease, (ESRD). Although they represent a small portion of the population (less than 1% across the eight states), their high utilization of services could skew the results.

Creation of Person Months and Waiver/State Plan Analytic Groups

Person month was chosen as the unit of analysis. For each person, we identified the primary waiver program (if any) in which they were enrolled in each month, and set flags indicating the utilization of the various services of interest. In months where no waiver enrollment was indicated, but utilization of a state plan LTC service of interest was reported, we classified the person month as "state plan."

Specific waiver groups in each state were then regrouped (based on their eligible population) into the following two waiver categories of interest: Aging and (Physical) Disability and Mental Retardation/Developmental Disability (MR/DD). For instance, in Arkansas, enrollees in the Alternative Community Services Waiver were placed in the MR/DD category and those in the Elderly Choice waiver or the Alternatives for Adults with Physical Disability waiver were both included in the Aging and Disability category. Specific waiver groups that did not fall in the aforementioned waiver categories were excluded from the analysis. Our analysis summarized in this report focuses primarily on the larger HCBS waivers in each state serving the aging and disabled populations.

State plan groups of interest across the eight states were limited to individuals who used nursing facility, ICF, home heath, and personal care services. Other state plan service categories groups were excluded from the analysis.

The waiver and state plan analytic groups from each state that are included in our cross-state comparison are presented in Table 1. All eight states have waiver groups in the MR/DD and Aging & Disability categories. All eight states also have ICF/MR and nursing facility state plan analytic groups. Texas does not have home health; and Florida, Pennsylvania, and Vermont do not have personal care as a state plan group.

Our analysis is limited to Medicaid enrollees in fee-for-service (FFS) (including dual eligible). We excluded managed care person months from the analysis.

Table 1: Summary of Waiver and State Plan Analytic Groups in 2001 for Cross-state Comparison

State	Waiver Groups		State Plan Groups			
	Mental Retardation/Developmental Disability	**Aging & Disability**	**Nursing Facility**	**Intermediate Care Facility**	**Home Health**	**Personal Care**
Arkansas	Alternative Community Services Waiver	• Elderly Choice Waiver • Alternatives for Adults with Physical disability Waiver	Yes	Yes	Yes	Yes
Florida	Developmental Disability Waiver	Aging and Disabled Adults Waiver	Yes	Yes	Yes	-
New Mexico	Mental Retardation/Developmental Disability Waiver	Disabled Elderly Waiver	Yes	Yes	Yes	Yes
Minnesota	Mental Retardation/Related Conditions Waiver	• Elderly Waiver • Community Alternative for Disabled Individuals Waiver	Yes	Yes	Yes	Yes
Pennsylvania	Consolidated Mental Retardation/Developmental Disability Waiver	• PA Department of Aging Waiver • Attendant Care Waiver	Yes	Yes	Yes	-
Texas	• Home and Community-Based Services Waiver • Community Living Assistance and Support Services Waiver	Community-Based Alternatives Waiver	Yes	Yes	-	Yes
Vermont	Developmental Services Waiver	• Enhanced Residential Care Waiver • Adult Disability Waiver	Yes	Yes	Yes	-
Washington	Community Alternatives Program	Community Options Program Entry System	Yes	Yes	Yes	Yes

Calculation of beneficiary case-mix scores

To ensure that differences in medical and LTC costs per person month between analytic groups was not due to differences in severity of illness for beneficiaries within those groups, we adjusted costs by dividing the Medicaid or Medicare dollar amounts in each claim by their corresponding beneficiary's case-mix scores. Medicaid payments for Medicaid only and the Medicaid portion of duals were adjusted at the claim level using their corresponding beneficiary's Chronic Disability Payment System (CDPS) score, while Medicare payments were adjusted at the claim level using their corresponding beneficiary's CMS-Hierarchical Condition Categories (CMS-HCC) score. Institutional HCC score was used for adjusting Medicare payments for beneficiaries in Nursing Facilities and ICF/MRs covered under state plans, whereas the community HCC score was used for adjusting Medicare payments for beneficiaries in other state plan and waiver groups. Thus adjusted medical and LTC costs per person month in each analytic group were obtained.

CDPS Model:

The CDPS (available at http://cdps.ucsd.edu/license.html) was developed specifically for Medicaid programs to make health-based capitation payments for TANF and disabled Medicaid beneficiaries. Various states have currently implemented either prospective or concurrent CDPS models to adjust payments to managed Medicaid plans. This model has been discussed in detail by Kronick et al (2000)[1] . The model is built on diagnoses from Medicaid claims and beneficiary demographic information viz. age, gender, number of months of Medicaid eligibility in base year, and one of the following

[1] Kronick, Richard; Gilmer, Todd; Dreyfus, Tony; and Lee, Lora (2000). *Risk Adjustment - Improving Health-Based Payment for Medicaid Beneficiaries: CDPS.* Health Care Financing Review, 21(3), 29-63

four Medicaid eligibility categories (Disabled Adult, Disabled Child, AFDC Adult, and AFDC Child). The model groups diagnoses into 20 major categories of diagnosis, which correspond to body systems or types of diagnosis, and have various subcategories under them. CDPS predicts between 30 and 50 percent of the variance in healthcare costs in a population with disability.

We calculated prospective case-mix scores for Medicaid beneficiaries in 2002, based on their diagnoses and demographic information from 2001. Beneficiary diagnoses codes for the model were obtained from their 2001 Medicaid claims, while beneficiary demographic variables for the model, viz. age, gender, number of months of Medicaid eligibility in base year, and Medicaid eligibility category, were obtained from the 2001 MAX PS file. CDPS scores obtained for beneficiaries in 2001 were then linked to their 2002 Medicaid Claims to calculate adjusted Medicaid costs by dividing expenditures by adjustment scores.

HCC Model:

The CMS-HCC model (available on the CMS website[2]) was used to calculate beneficiary case-mix scores for adjusting Medicare payments. This model was developed to predict Medicare payments, and is currently used adjust payments to Medicare advantage plans. This model has received considerable attention in literature and has been discussed in detail by Pope et al (2004)[3]. The HCC model is built on diagnosis codes available in Medicare claims. The model classifies 15,000 ICD-9-CM diagnosis codes into distinct diagnostic groups (DxGroups) on the basis of clinical similarity and

[2] URL:http://www.cms.hhs.gov/MedicareAdvtgSpecRateStats/06_Risk_adjustment.asp

[3] Pope, G. C. Kautter, J. Ellis, R. P. Ash, A. S. Ayanian, J. Z. Iezzoni, L. I. Ingber, M. J. Levy, & J. M. Robst, J. (2004). *Risk Adjustment of Medicare Capitation Payments Using the CMS-HCC Model.* Health Care Financing Review, 25(4), 119-142.

resource use. The DxGroups are grouped into Condition Categories (CCs), which are then ordered into 70 Hierarchical Conditions Categories (HCC). Individuals can be assigned to multiple conditions across the HCCs, but only one condition within an HCC group. The HCC score is calculated based on the individual's HCCs derived from his diagnoses available in the previous year's claims, and demographic information, viz. age, sex, Medicaid eligibility and reason for Medicare eligibility. The HCC model can predict up to 40 percent of the potentially explainable variance in prospective health costs.

We used the CMS-HCC model to calculate the prospective HCC score for dual eligible beneficiaries in 2002. Beneficiary diagnoses codes for the model were obtained from their 2001 Medicare claims, while beneficiary demographic variables for the model, viz. age, sex, and reason for Medicare eligibility, were obtained from the 2001 MAX PS file. The HCC scores obtained for beneficiaries in 2001 were then linked to their 2002 Medicare Claims to calculate adjusted Medicare costs. Institutional HCC score was used for adjusting Medicare payments for dual beneficiaries in Nursing Facility and ICF state plans, while community HCC score was used for adjusting Medicare payments for dual beneficiaries in other state plan and waiver groups by dividing payments by adjustment scores.

For reasons that are not altogether clear the data that was used to develop the HCC and CDPS scores for the dually eligible clients did not use the same diagnoses. To correct this problem we developed revised scores that pooled the diagnoses from either the Medicare or Medicaid record to create a composite set of diagnoses as appropriate.

Results

Table 2 shows the pattern across states for the case mix scores. In most states the AD waiver case mix is lower than that for the nursing facilities. The MR/DD waiver case mix is consistently lower than that for ICF/MRs

Table 2: Mean Case Mix Scores
Mean CDPS Scores—MA only

	Waiver		State Plan			
	MRDD	**Aging/Disability**	**NF**	**ICF**	**Home Health**	**Pers Care**
AR	1.67	3.28	2.73	1.80	3.62	2.30
FL	0.55	1.68	2.87	1.64	3.06	-
MN	1.37	2.40	3.12	1.92	2.58	2.24
NM	1.39	1.46	2.43	1.46	4.62	2.52
PA	1.67	2.79	3.04	2.09	3.15	-
TX	1.60	3.11	3.16	1.76	-	2.19
VT	1.65	2.90	2.51	2.60	3.49	-
WA	1.01	2.37	3.21	1.40	4.00	2.09

Mean CDPS Scores--Duals

	MRDD	**Aging/Disability**	**NF**	**ICF**	**Home Health**	**Pers Care**
AR	1.55	3.41	2.70	1.67	2.90	2.55
FL	0.76	1.56	1.40	1.05	1.94	-
MN	1.56	2.29	1.81	1.99	2.51	2.96
NM	0.72	1.44	1.13	0.72	2.48	1.30
PA	1.30	2.21	1.58	1.44	3.09	-
TX	1.42	3.78	3.23	1.71	-	2.17
VT	1.28	2.57	2.15	2.50	2.04	-
WA	0.91	1.54	1.06	0.67	1.71	1.56

Mean HCC Scores--Duals

	MRDD	**Aging/Disability**	**NF**	**ICF**	**Home Health**	**Pers Care**
AR	0.68	2.11	1.88	1.22	2.04	1.72
FL	0.52	1.09	1.21	1.13	1.04	-
MN	0.76	1.80	1.71	1.29	1.57	1.83
NM	0.91	2.09	1.82	1.39	1.80	1.95
PA	1.05	2.54	2.06	1.65	1.67	-
TX	0.92	2.49	2.15	1.31	-	1.86
VT	0.74	2.30	1.72	1.83	2.08	-
WA	0.76	1.87	1.80	1.00	2.76	1.56

Table 3 shows the revised case mix scores after the diagnoses have been pooled

Table 3: Revised Case Mix Scores with Pooled Diagnoses

Revised Mean CPS Scores—MA only

	MRDD	Aging/Disability	NF	ICF	Home Health	Pers Care
AR	1.67	3.28	2.73	1.80	3.62	2.30
FL	0.55	1.68	2.87	1.64	3.06	-
MN	1.37	2.40	3.12	1.92	2.58	2.24
NM	1.39	1.46	2.43	1.46	4.62	2.52
PA	1.67	2.79	3.04	2.09	3.15	-
TX	1.60	3.11	3.16	1.76	-	2.19
VT	1.65	2.90	2.51	2.60	3.49	-
WA	1.01	2.37	3.21	1.40	4.00	2.09

Reviewed Mean CDPS Scores--Duals

	MRDD	Aging/Disability	NF	ICF	Home Health	Pers Care
AR	1.72	4.53	4.43	2.02	3.62	3.17
FL	1.66	3.81	4.45	2.34	4.16	-
MN	1.74	3.04	3.01	2.21	2.81	3.28
NM	1.79	3.60	4.16	2.02	3.84	3.25
PA	2.25	4.79	4.29	3.43	3.84	-
TX	1.95	5.18	5.27	2.23	-	3.72
VT	1.67	4.21	3.99	3.83	3.10	-
WA	1.54	3.60	3.82	0.67	4.35	3.19

Revised Mean HCC Scores—Duals

	MRDD	Aging/Disability	NF	ICF	Home Health	Pers Care
AR	0.75	2.35	1.93	1.23	2.19	1.86
FL	0.98	2.34	2.19	1.52	2.57	-
MN	0.81	1.94	1.74	1.32	1.64	2.18
NM	0.96	2.17	1.83	1.40	2.24	2.02
PA	1.08	2.64	2.10	1.66	2.21	-
TX	0.99	2.69	2.22	1.33	-	1.92
VT	0.76	2.44	1.75	1.83	2.17	-
WA	0.83	1.96	1.82	1.05	2.94	1.63

Table 4 shows the average case mix scores for beneficiaries in each analytic group calculated separately with the Medicaid and Medicare case mix adjustments systems. The upper portion of Table 4 addresses Medicaid only recipients. The lower portion addresses dually eligible recipients with the Medicaid and Medicare case mix adjustment systems, respectively. As can be seen, the majority of clients in nursing facilities and aging and disabled waivers were dually eligible, but the presence of some who were not allows a comparison of the case mix. The pattern differs when the usual case mix scores or the revised scores are used.

Using the usual CDPS scores the case mix for MA only MR/DD waivers and ICF/MR residents is higher than that for duals. However, when the revised score is used the difference is reversed. (The revised score affects only the duals.) Among the AD waiver clients both the scoring systems show the duals as more impaired although the revisited score widens the gap. Among nursing home residents the usual scoring shows slightly more impairment among the MA only, whereas the revised score shows a large difference in favor of more impairment among the duals.

These findings suggest that the widely held observation that duals are more impaired than MA only (or Medicare only) clients does not always apply when the comparisons are restricted to those who are eligible for LTC. In that case the differences depend on how the case mix is generated.

The higher case mix among duals in the broader population may be attributed in large measure to the fact that they are likely to be LTC users.

Table 4: Case Mix Weight Scores for Medicaid Only and Dually Eligible Recipients by Type of LTC Service Received

MA ONLY	MRDD	Aging/Disability	NF	ICF	HOME CARE	Pers. Care
Persons MA	**1,390**	**662**	**1,343**	**813**	**560**	**1,744**
Avg. CDPS SCORE	1.67	3.28	2.75	1.80	3.62	2.30
Avg. REVISED CDPS SCORE	1.67	3.29	2.77	1.80	3.62	2.30
Persons who were duals in 2001	**3**	**12**	**19**	**1**	**0**	**11**

DUALS	MRDD	Aging/Disability	NF	ICF	HOME CARE	Pers. Care
Persons DUAL	**977**	**6,222**	**12,488**	**828**	**252**	**5,224**
Avg. CDPS SCORE	1.55	3.41	2.70	1.67	2.90	2.55
Avg. REVISED CDPS SCORE	1.72	4.53	4.43	2.02	3.62	3.17
Avg. HCC SCORE	0.68	2.11	1.88	1.22	2.04	1.72
Avg. REVISED HCC SCORE	0.75	2.35	1.93	1.23	2.19	1.86
Persons who were non-duals in 2001	**0**	**0**	**0**	**0**	**0**	**0**

To get some idea about how case-mix adjustment might affect expenditures we compared the adjusted and unadjusted rates by dividing the former by the appropriate case mix scores at the individual claim level. Figure 1 shows the contrast for hospital expenditures with and without adjustment. In most cases the adjustment resulted in lower rates but the basic pattern across the states did not change. However, in some instances it did. became more dominant. The average case-mix score for beneficiaries in Florida's waiver groups is relatively greater than with the unadjusted rates.

Figure 1: Duals Adjusted and Unadjusted Inpatient Hospital Expenditures per Person Month

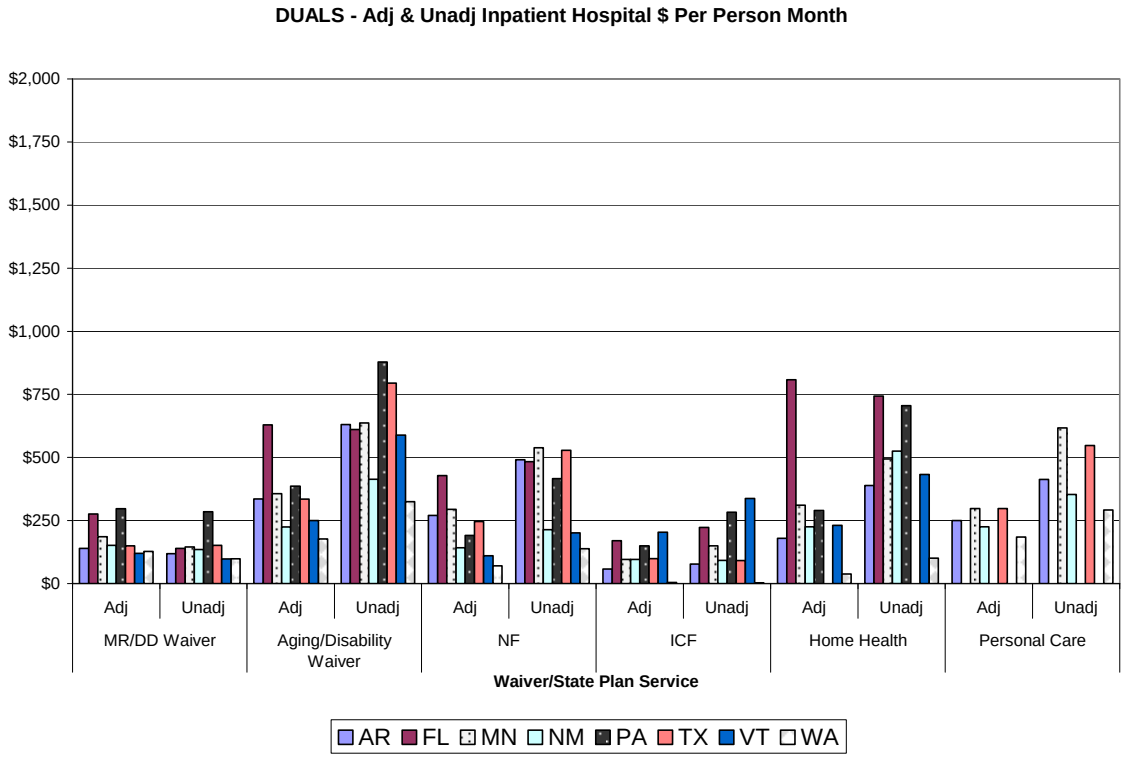
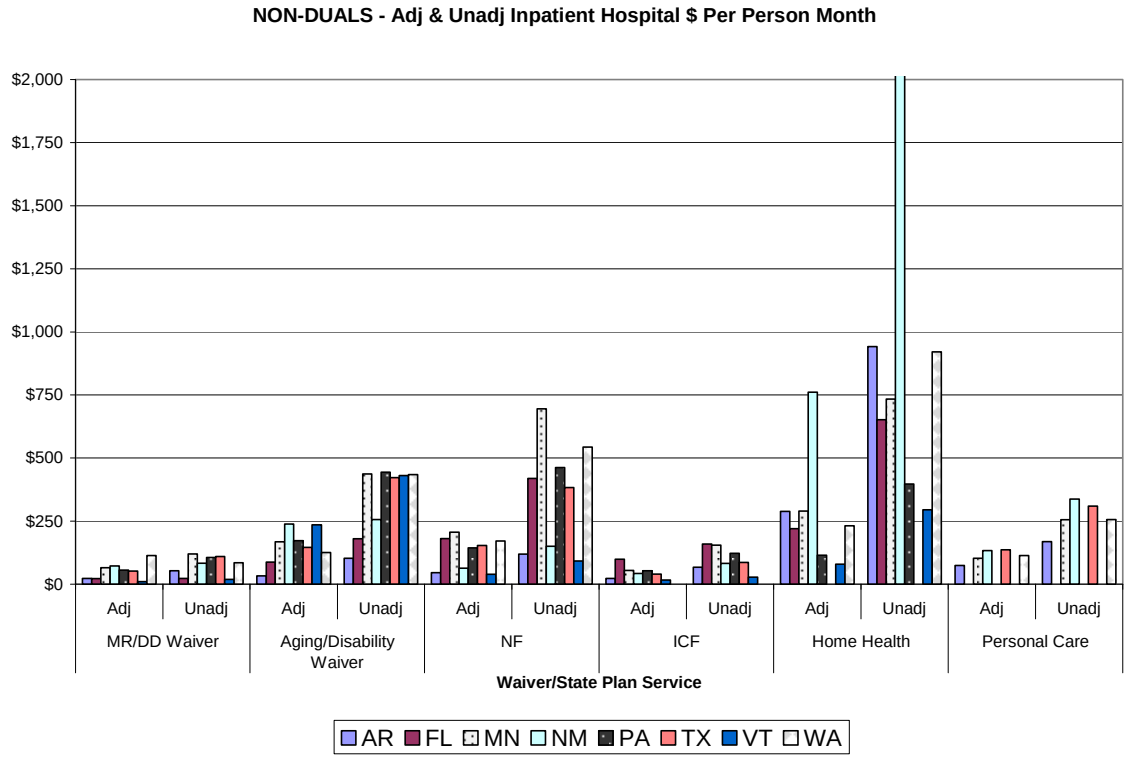


Figure 2 shows the same data for the Medicaid only recipients. In general the dampening effect of case mix adjustment does not change the relative expenditure patterns, but the Florida effect is no longer seen.

Figure 2: Medicaid Only Adjusted and Unadjusted Inpatient Hospital Expenditures per Person Month



Medicaid Only

Figures 3A and 3B show the effects of case mix adjustment on Medicaid only recipients of Aging and Disability waivers. As shown in Figure 3A, case adjustment reduces the ratio of medical to LTC expenditures slightly, but in two states (WA and VT) it increases it. The effect on the individual components is shown in Figure 3B. In general, case mix adjustment reduces medical expenditures, sometimes greatly. It also reduces LTC expenditures most of the time but in two states (FL and NM) it increases them.

Figure 3A: Adjusted and Unadjusted Ratios of Medical Care to Long-term Care among Medicaid Only Recipients of Aging and Disability Waivers

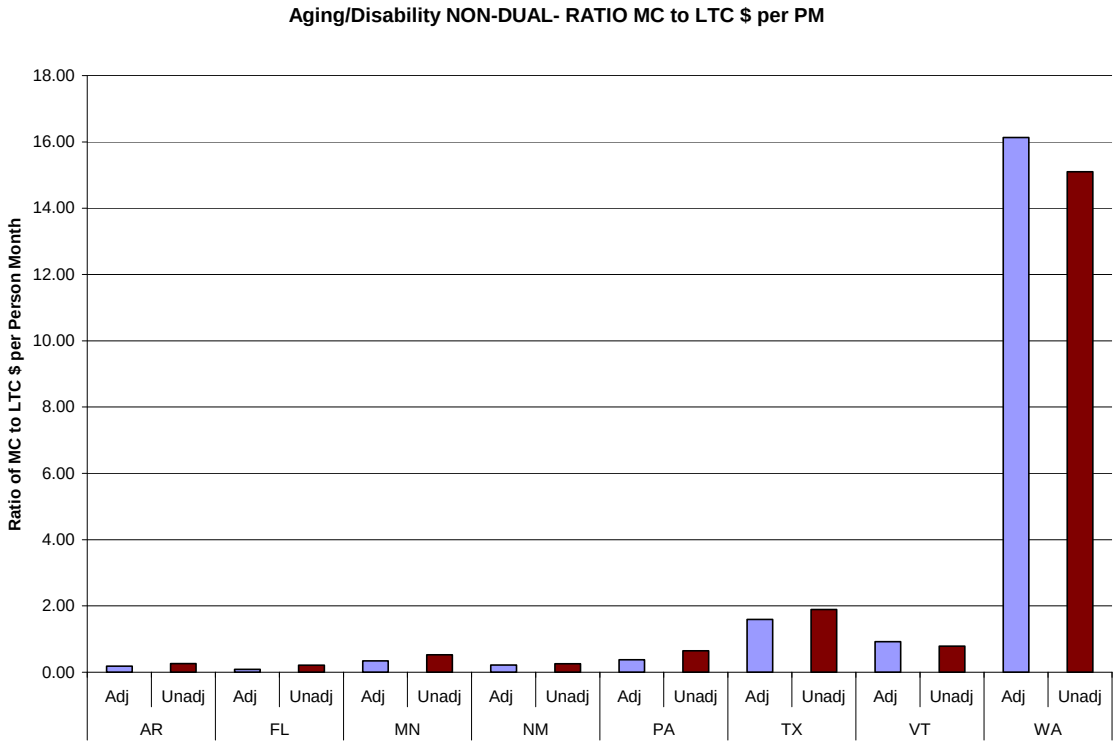
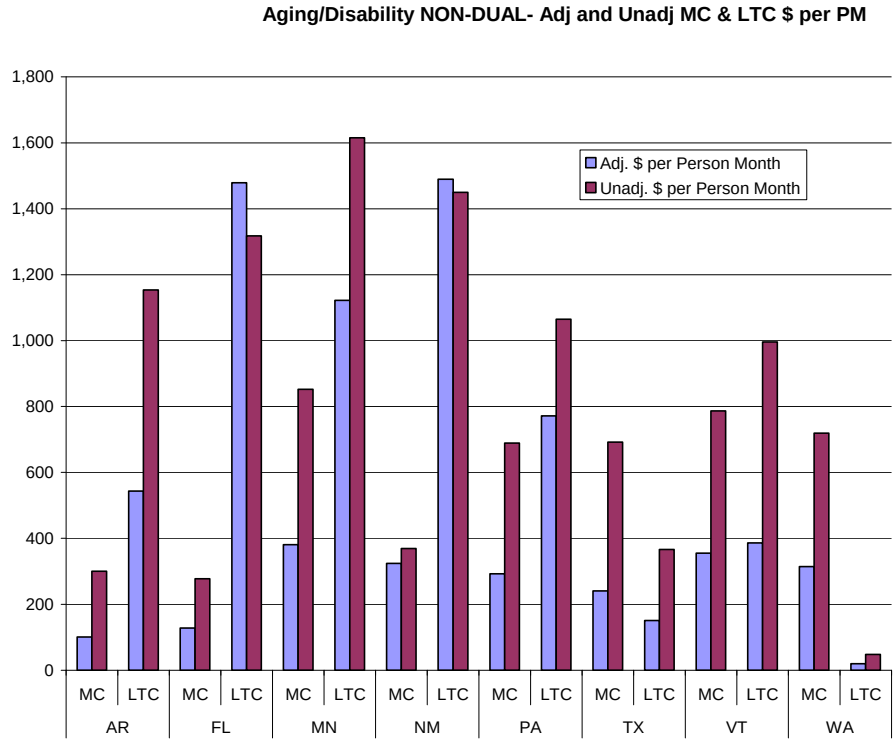


Figure 3B: Mean Adjusted and Unadjusted Medicaid Expenditures per Person Month for Medicaid Only Recipients of Aging and Disability Waivers



Figures 4A and 4B show the effects of case mix adjustment on Medicaid only home health recipients under the state plans. As seen in Figure 4A the ratios of medical to LTC expenditures are generally lower after adjustment except in PA where the ratio increases. As seen in Figure 4B, adjustment has a universally negative effect of both types of expenditures. The impact on medical expenditures in NM is especially remarkable.

Figure 4A: Adjusted and Unadjusted Ratios of Medical Care to Long-term Care among Medicaid Only Recipients of Home Health

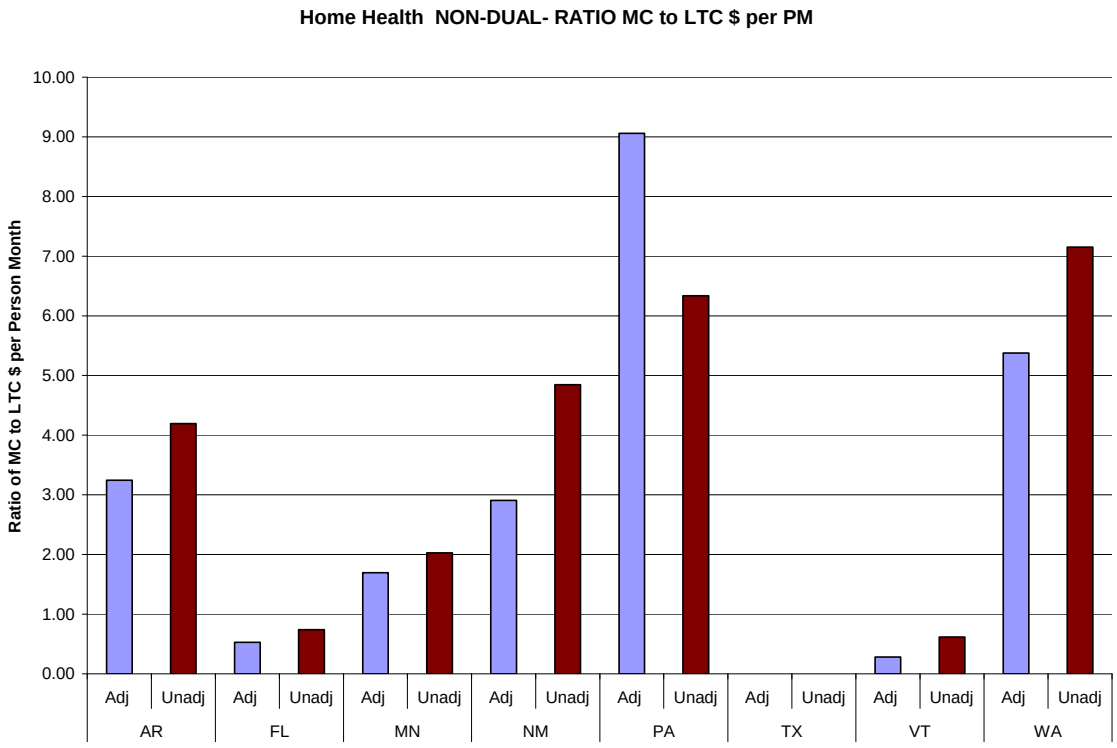
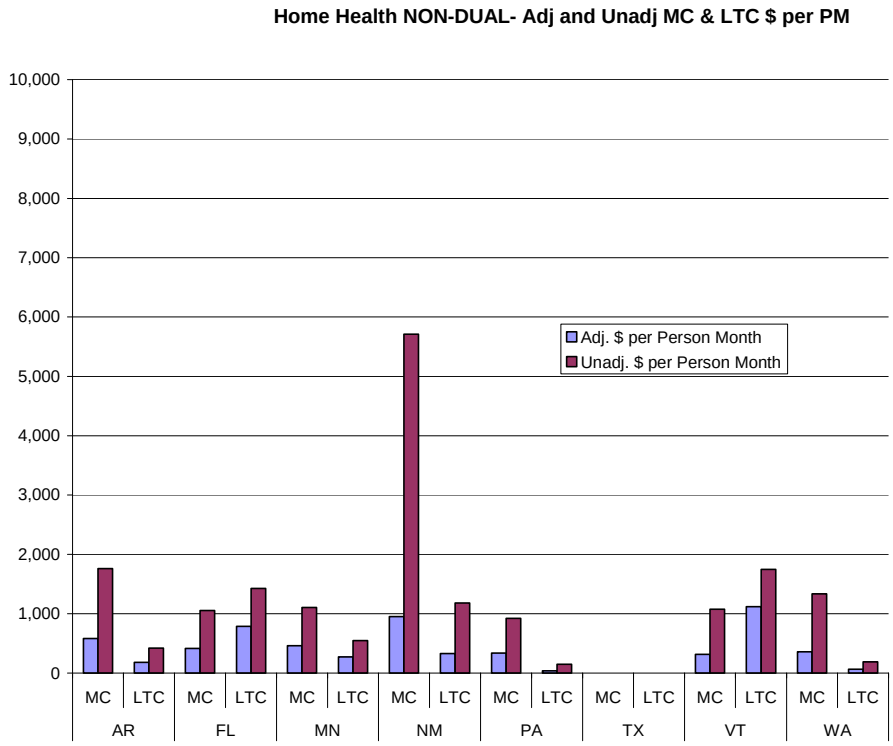


Figure 4B: Mean Adjusted and Unadjusted Medicaid Expenditures per Person Month for Medicaid Only Recipients of Home Health



As seen in Figure 5A Case mix adjustment has a consistently modest negative effect on the ratio of medical to LTC expenditures for Medicaid only nursing home residents. As Figure 5B shows, the effect is quite large on LTC expenditures but also proportionately substantial for medical expenditures as well.

Figure 5A: Adjusted and Unadjusted Ratios of Medical Care to Long-term Care among Medicaid Only Nursing Home Residents

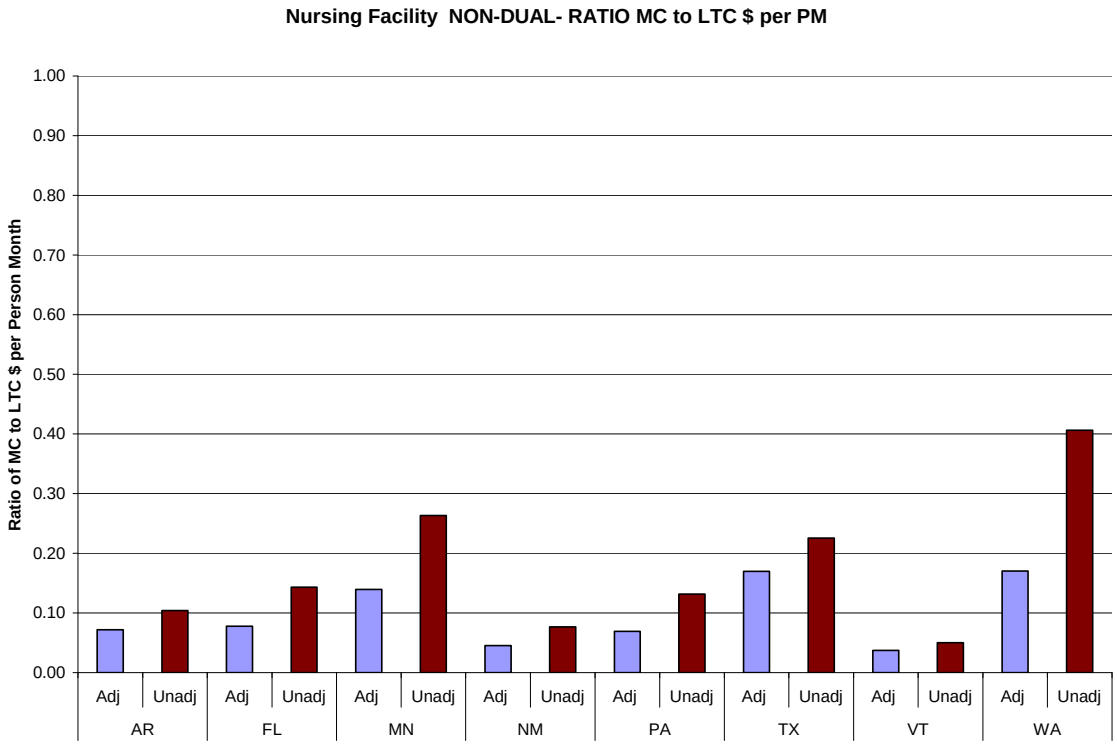
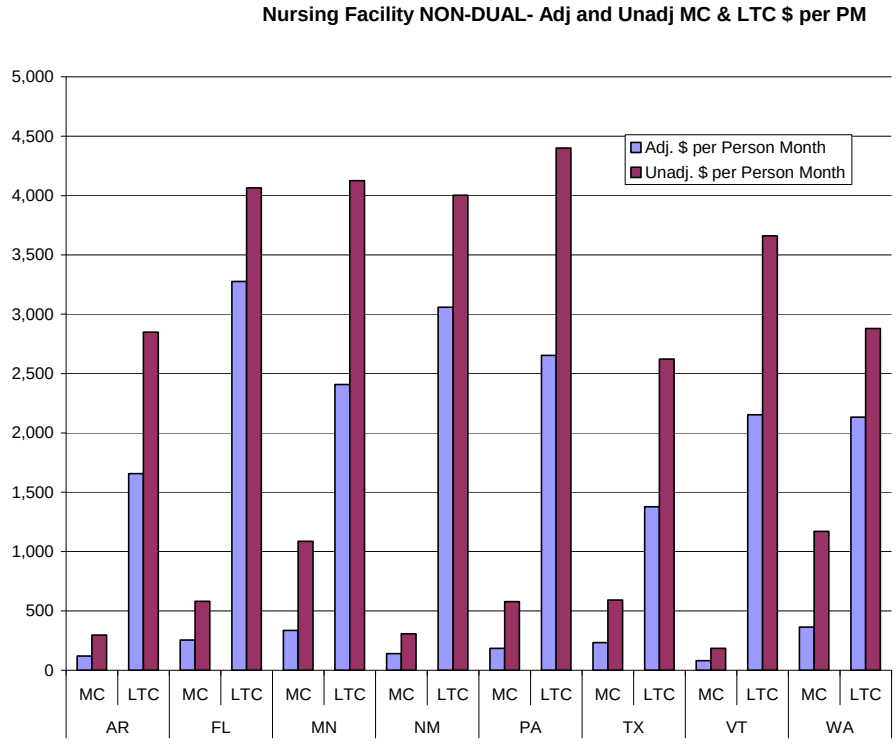


Figure 5B: Mean Adjusted and Unadjusted Medicaid Expenditures per Person Month for Medicaid Only Nursing Home Residents



Figures 6A and 7B show the effects of case mix adjustment on personal care state plan recipients. As seen in Figure 7A, the effects are generally modest but adjustment increases the ratio for those in WA and slightly for those in TX. As Figure 7B shows, the effect on each type of expenditure is universally negative.

Figure 6A: Personal Care Non_Dual Ratio MC to LTC $ per PM

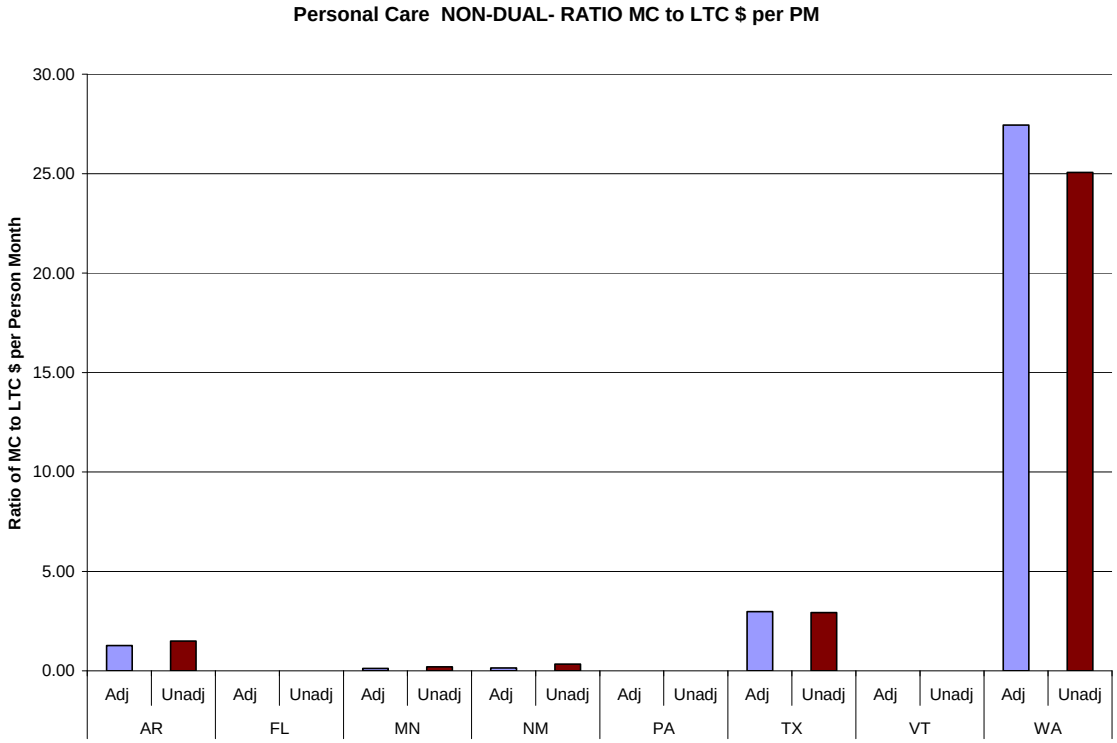
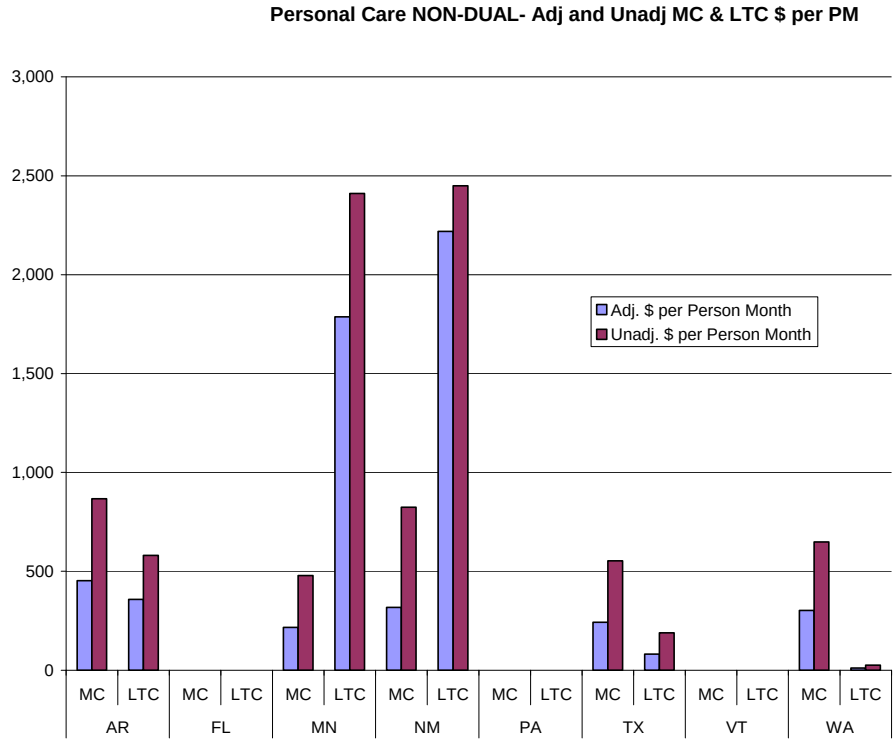


Figure 7B: Mean Adjusted and Unadjusted Medicaid Expenditures per Person Month for Medicaid Only Recipients of Personal Care



Figures 8A and 8B examine the effects of case mix adjustment on recipients of MR/DD waivers. As seen in Figure 8A the effects on the ratio of medical care to LTC costs are mixed. They go down in MN and PA, but rise in TX and WA and slightly in AR. Figure 8B reveals a complex pattern. Adjustment increases medical expenditures in FL, MN., NM and WA. It also increases LTC expenditures in FL, MN, and NM, and that increase is dramatically greater in FL and NM.

Figure 8A: Adjusted and Unadjusted Ratios of Medical Care to Long-term Care among Medicaid Only Recipients of MR/DD Waivers

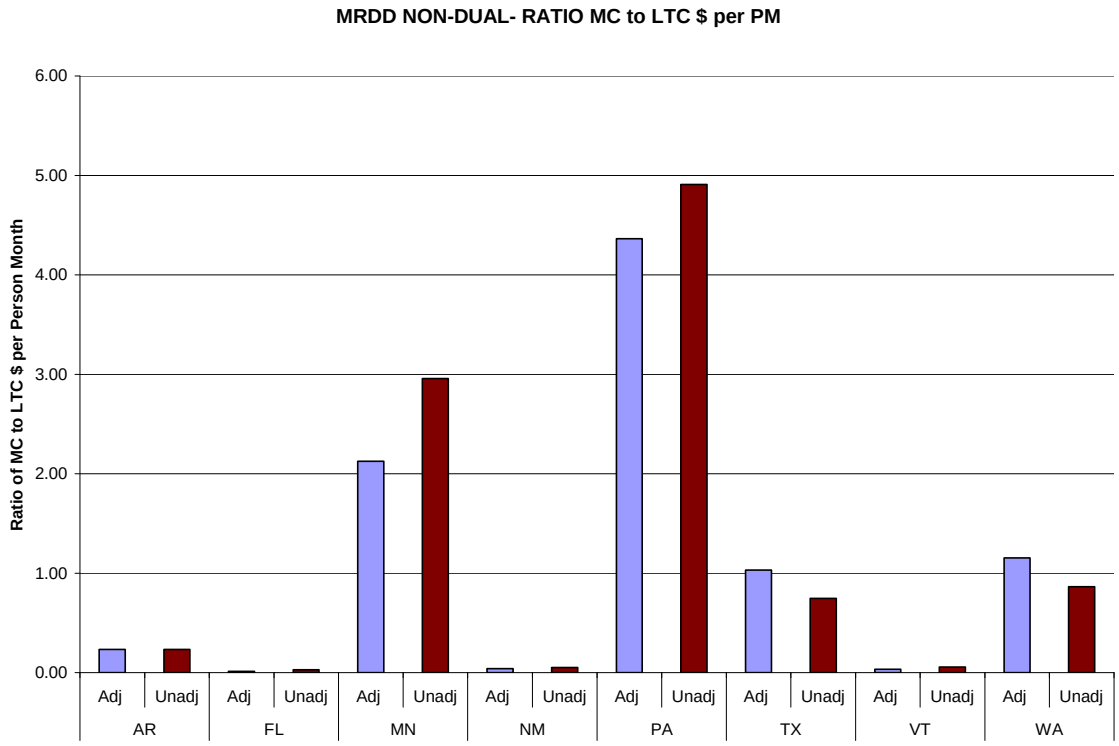
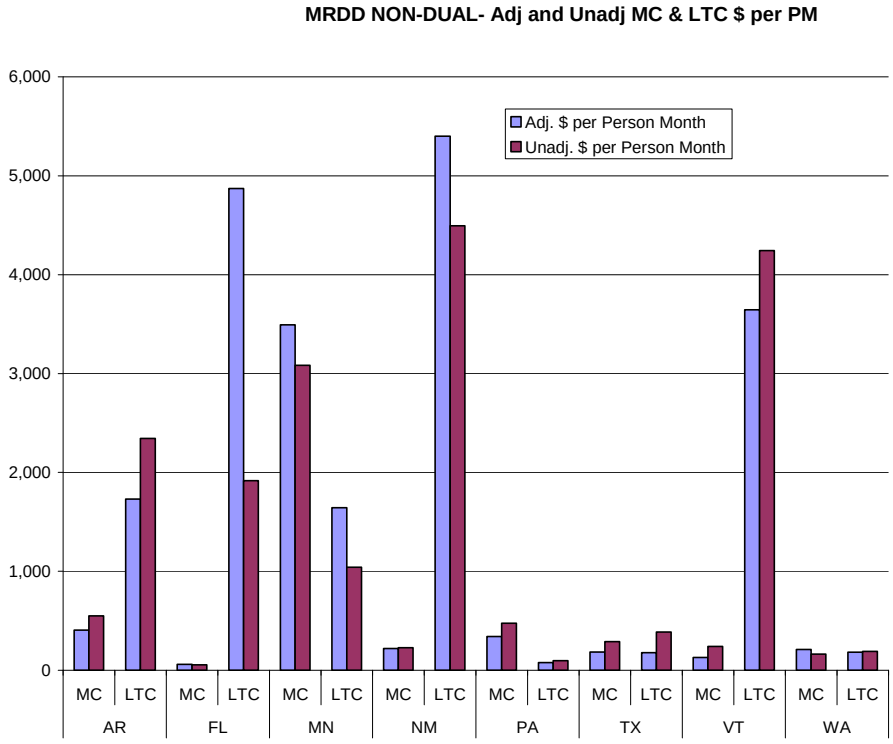


Figure 8B: Mean Adjusted and Unadjusted Medicaid Expenditures per Person Month for Medicaid Only Recipients of MR/DD Waivers



Figures 9A and B summarize the data shown above. A mean score was calculated weighted by the numbers of recipients in each state. As seen in Figure 9A, the weighted average adjusted score is lower for each program group. The higher ratio among home health recipients persists after adjustment. The next highest ratio is among MR/DD waiver recipients. The lowest ratio is among MR-ICF residents. Figure 9B contrasts the adjusted and unadjusted mean weighted expenditures for medical care and LTC across the programs. Adjustment lowers the expenditures except for MR/DD, which has the highest rate of medical expenditures. It and home health have higher medical expenditures than LTC. The highest LTC expenditures are for MR-ICF and nursing homes.

Figure 9A: Non-Duals: Ratio of Weighted Average of MC to LTC $ per Person Month

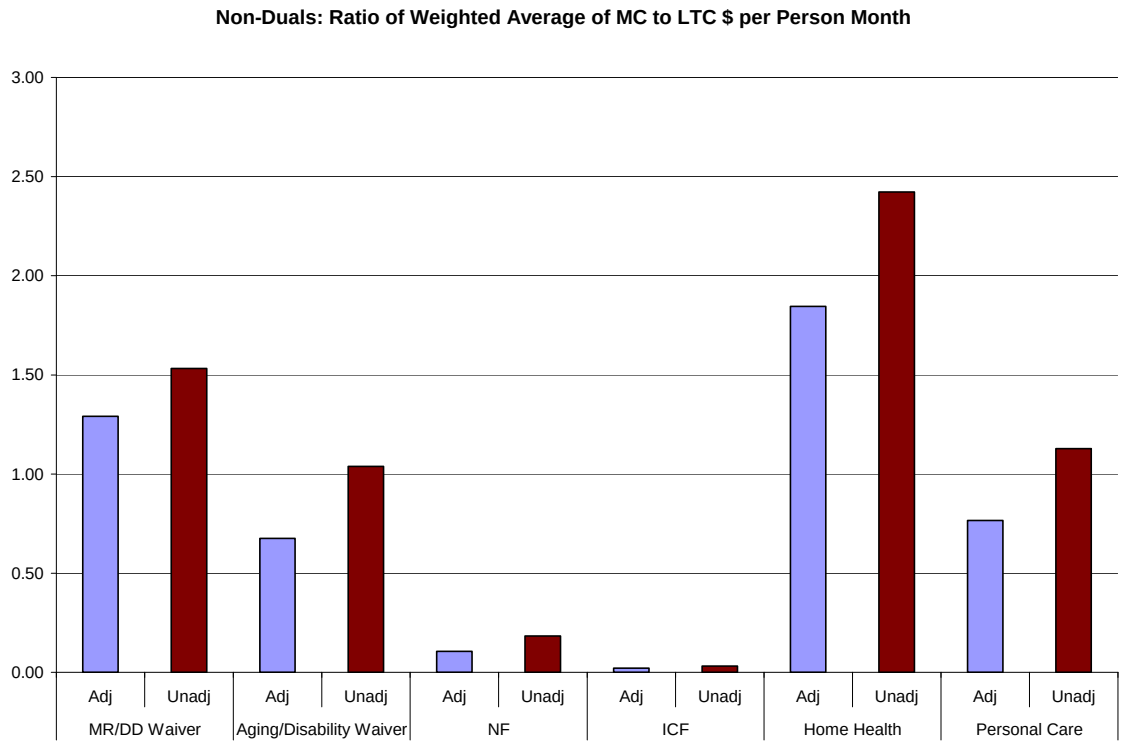
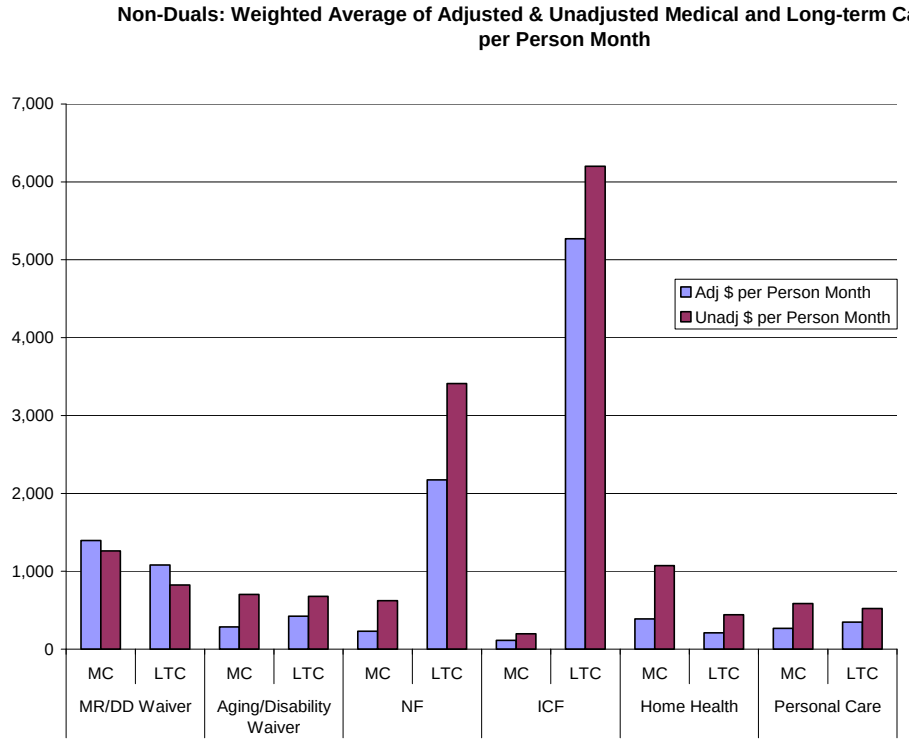


Figure 9B: Mean Adjusted and Unadjusted Medicaid Expenditures per Person Month for Medicaid Only Recipients across Programs



Dual Eligibles

The next series of figures shows the effects of case mix adjustment on the ratio of medical care to long-term care expenditures. Figure 10A shows the ratios with and without adjustment, and Figure 10B shows the component parts for aging and disability waiver recipients who are dually eligible. The ratios are based on combined Medicaid and Medicare expenditures. As seen in Figure 10A, in every care except AR adjustment yields a slightly lower ratio. As seen in Figure 10B, adjustment reduces both the medical care and long-term care components, especially the former, except in FL and NM (for LTC).

Figure 10A: Adjusted and Unadjusted Ratios of Medical Care to Long-term Care among Dual Eligibles Receiving Aging and Disability Waivers

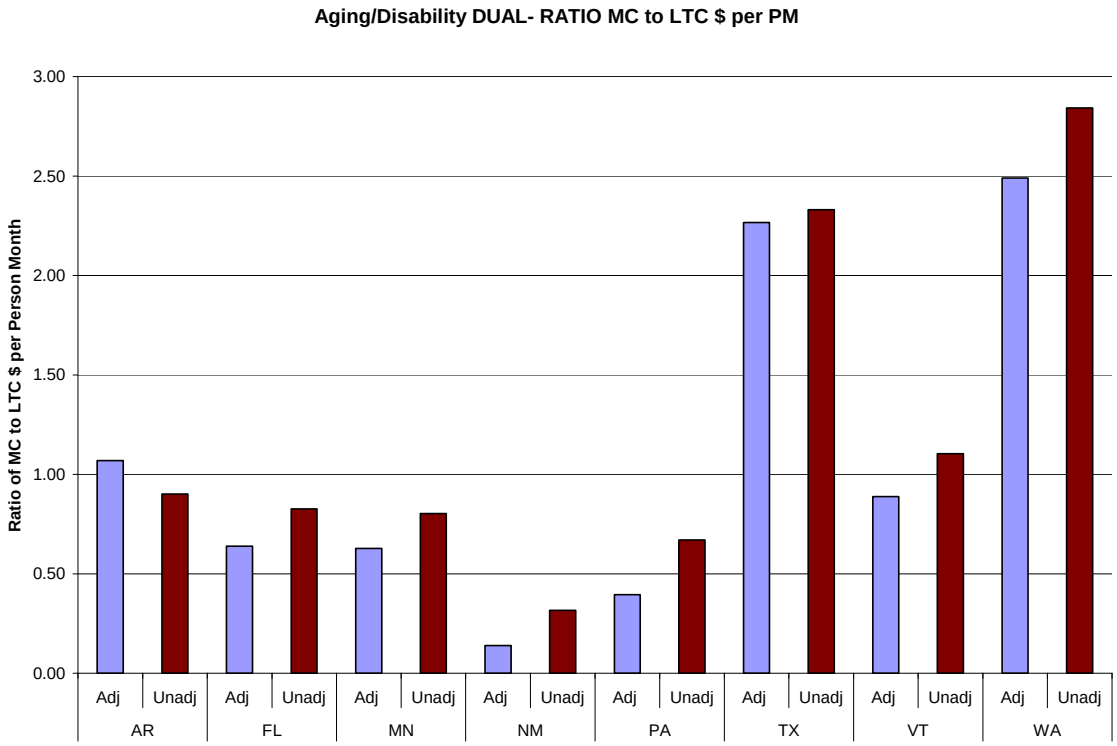


Figure 10B: Mean Adjusted and Unadjusted Medicaid and Medicare Expenditures per Person Month for Dually Eligible Recipients of Aging and Disability Waivers

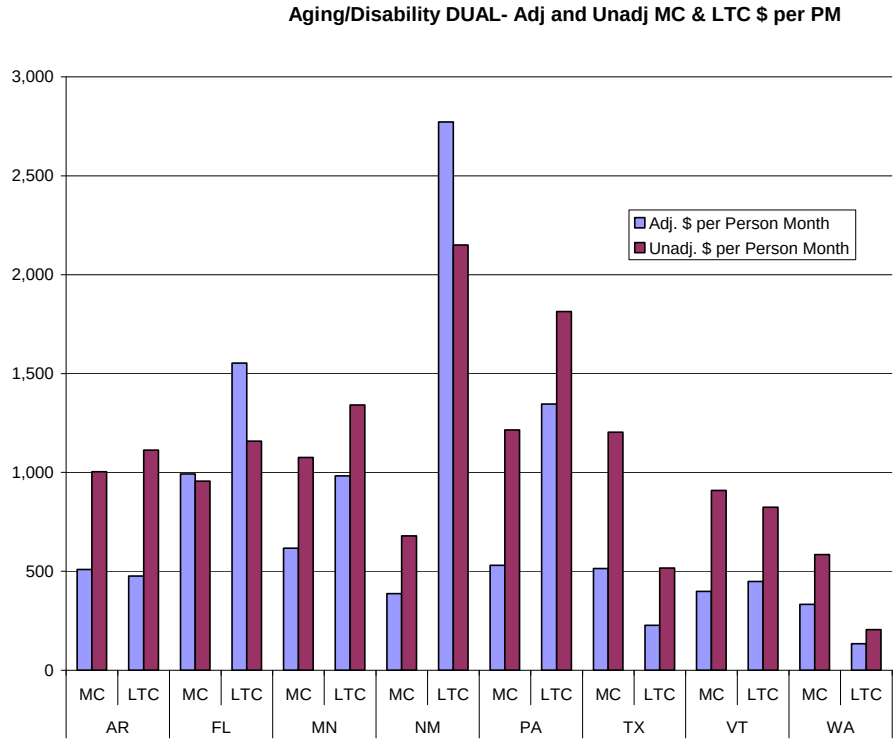


Figure 11A shows the effects of case mix adjustment on --- payments for dually eligible nursing home residents. There is a universal reduction in the ratios. As seen in Figure 11B, while the effect of adjustment is to reduce expenditures for medical care, in five states (FL, MN, NM, PA WA) it raised LTC expenditures, thus affecting the ratio in two ways.

Figure 11A: Adjusted and Unadjusted Ratios of Medical Care to Long-term Care among Dually Eligible Nursing Home Residents

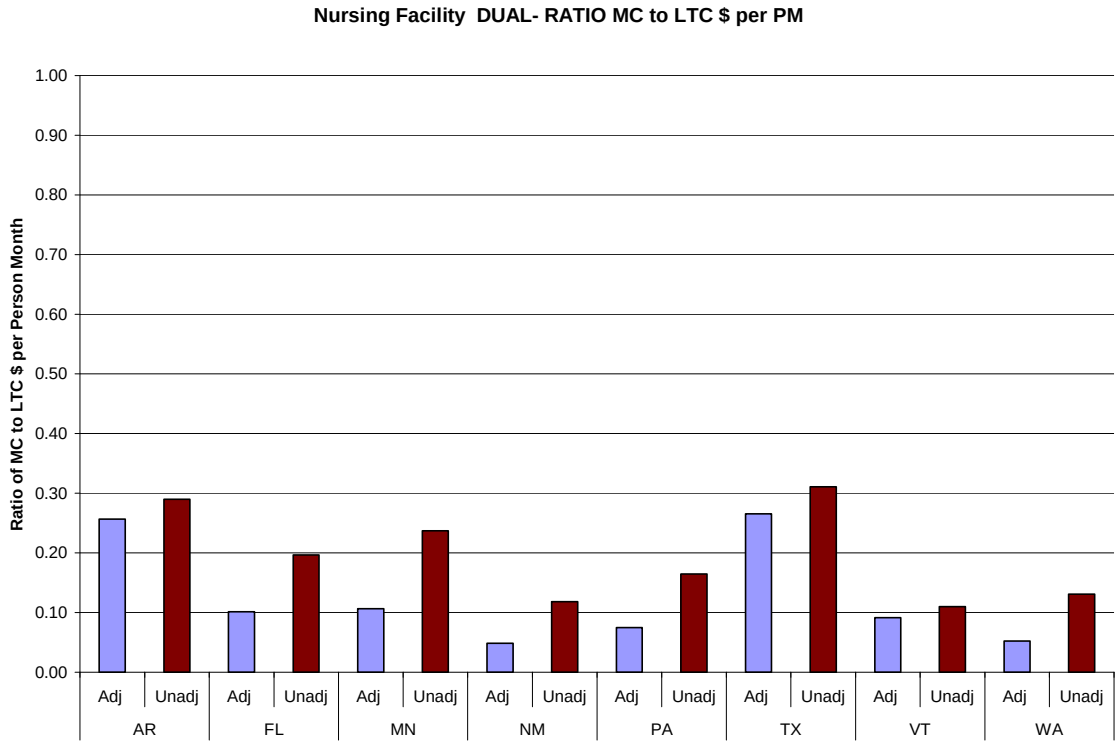
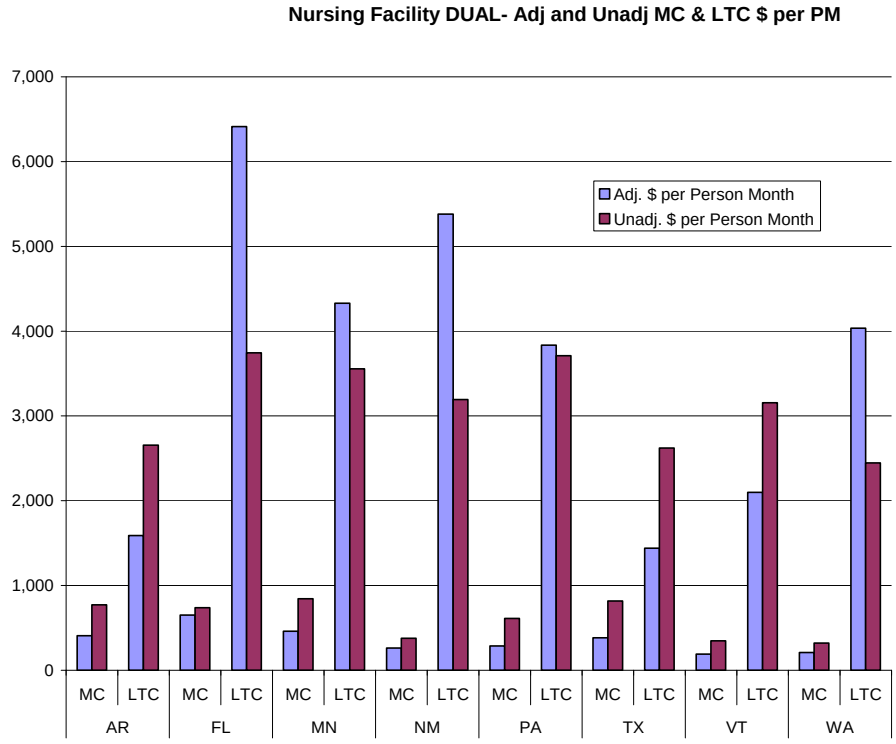


Figure 11B: Mean Adjusted and Unadjusted Medicaid and Medicare Expenditures per Person Month for Dually Eligible Nursing Home Residents



Figures 12A and B examine the effects of adjustment on expenditures for dually eligible recipients of home health under the state plan. As seen in Figure 12A, adjustment has an inconsistent effect on the ratio of medical care to LTC. In three states the ratios go up after adjustment (FL, MN, PA). As shown in Figure 12B, adjustment has a generally negative effect except in the case of medical care in FL.

Figure 12A: Adjusted and Unadjusted Ratios of Medical Care to Long-term Care among Dual Eligibles Receiving Home Health

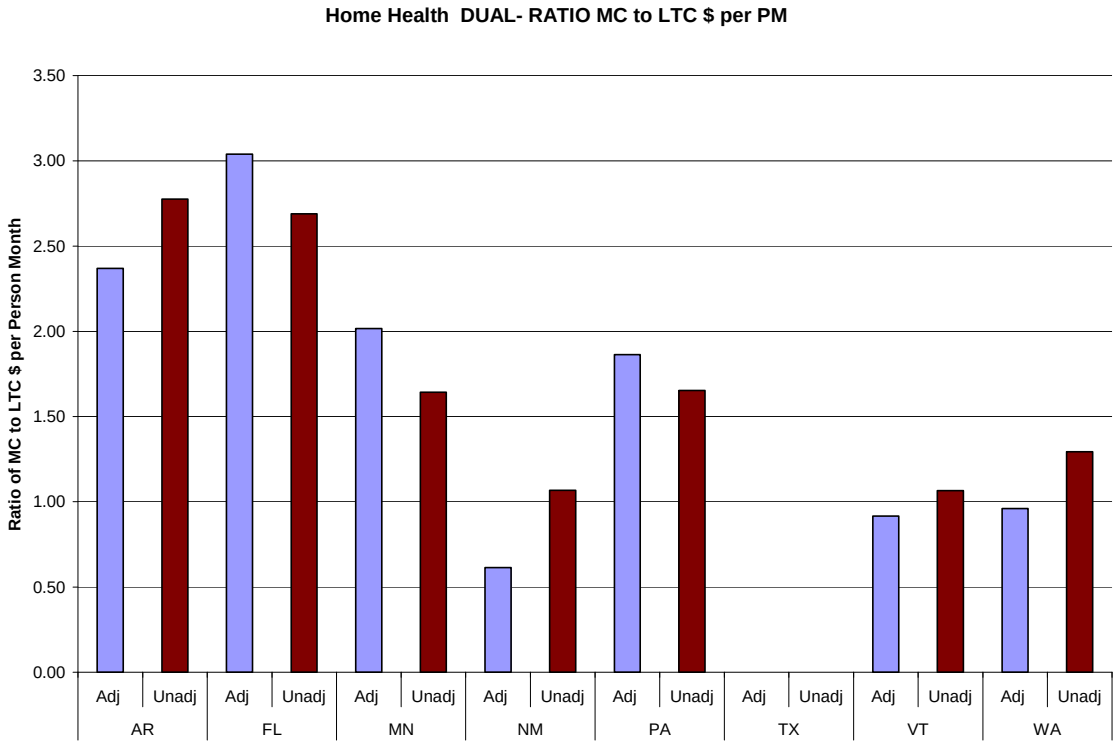
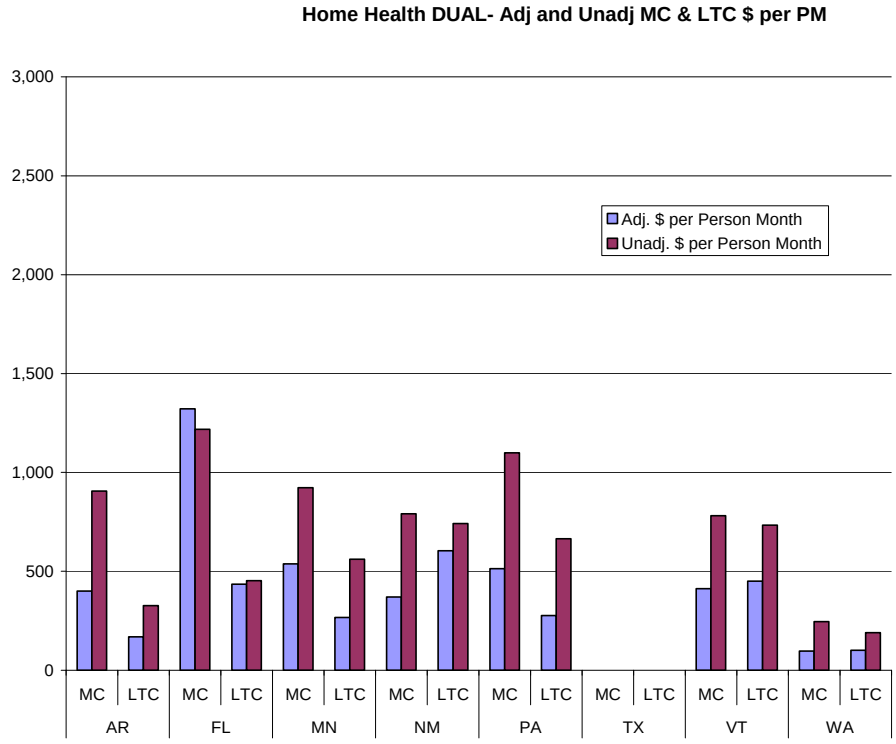


Figure 12B: Mean Adjusted and Unadjusted Medicaid and Medicare Expenditures per Person Month for Dually Eligible Recipients of Home Health



Figures 13A and 13B show the same things for dually eligible recipients of personal care under the state plan. As seen in Figure 13A, adjustment has little next effect, although it does play a role in the component scores as seen in Figure 13B. It substantially reduces both types of care in several states, but in NM it raises the expenditure rate for LTC

Figure 13A: Adjusted and Unadjusted Ratios of Medical Care to Long-term Care among Dual Eligibles Receiving Personal Care

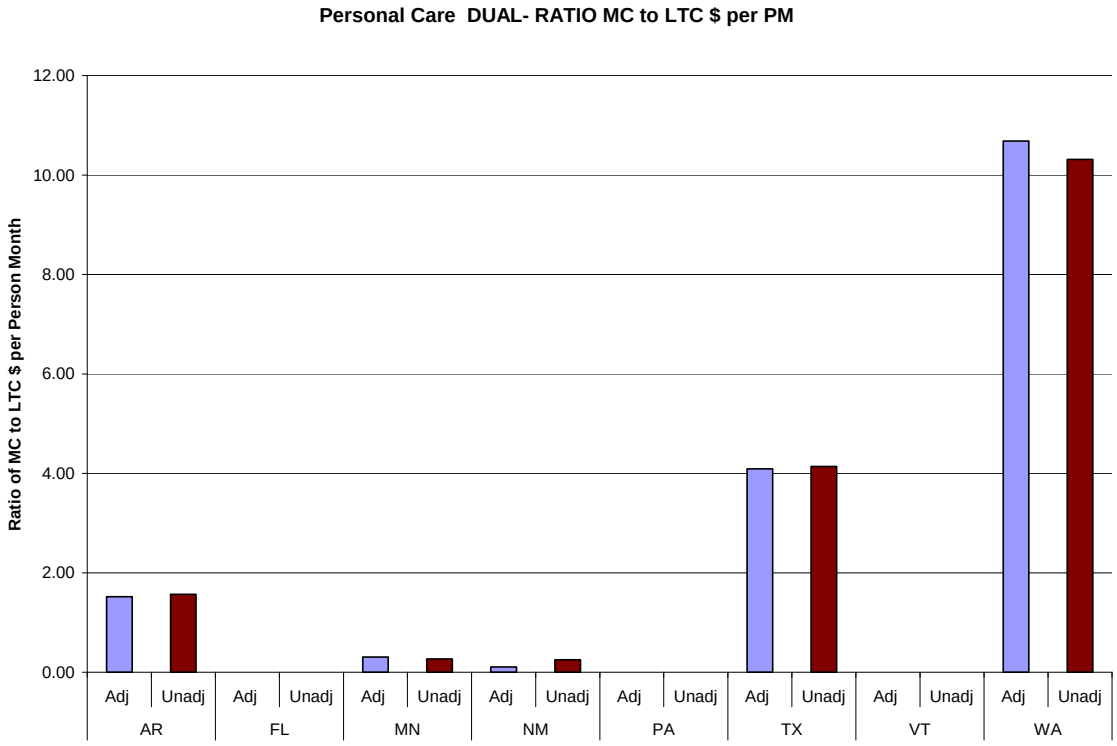
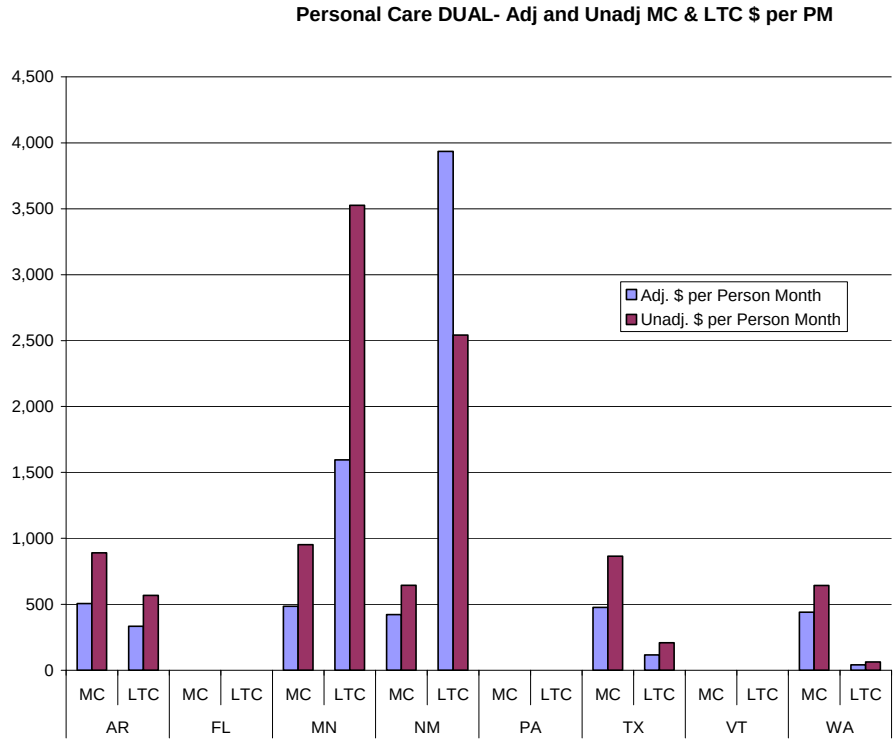


Figure 13B: Mean Adjusted and Unadjusted Medicaid and Medicare Expenditures per Person Month for Dually Eligible Recipients of Personal Care



Figures 14A and 14B address the effects of case mix adjustment on MR/DD waiver recipients. A seen in Figure 14A the effect of adjustment on the ratio of medical to LTC expenditures is more often positive than negative. the state with the highest ratio (MN) has a negative effect, but four state (AR, PA, TX, WA) show positive changes. As shown in Figure 14B, the adjustment increase LTC expenditures substantially in FL and NM.

Figure 14A: Adjusted and Unadjusted Ratios of Medical Care to Long-term Care among Dual Eligibles Receiving MR/DD Waivers

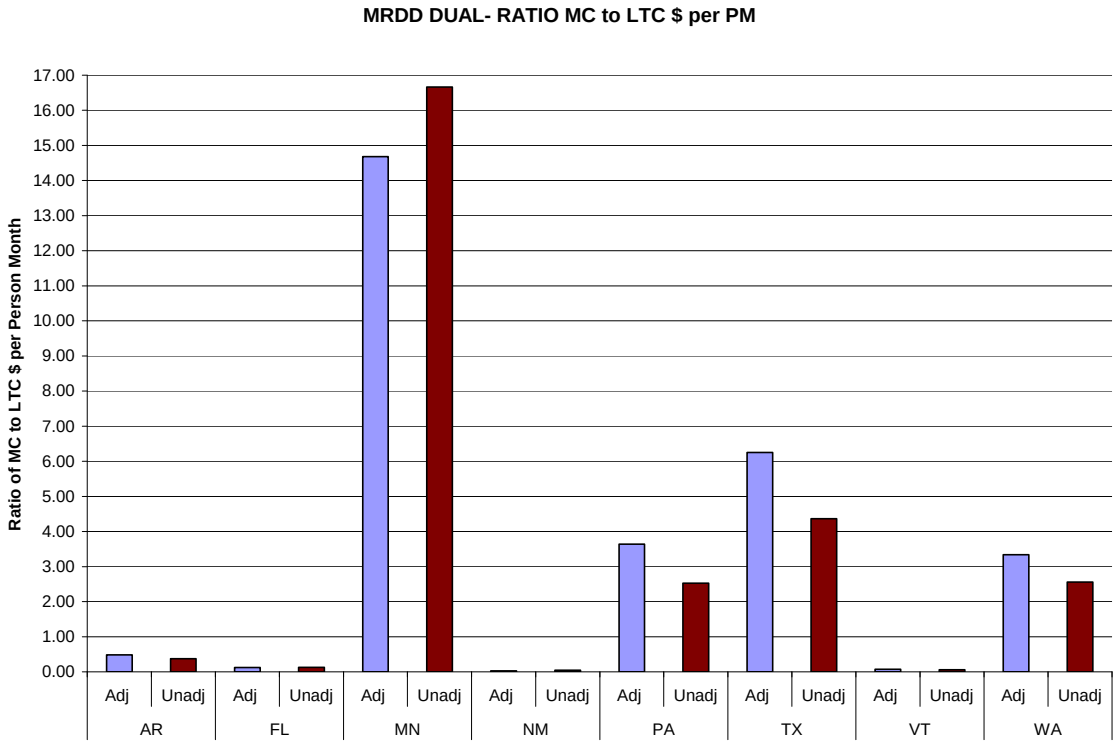
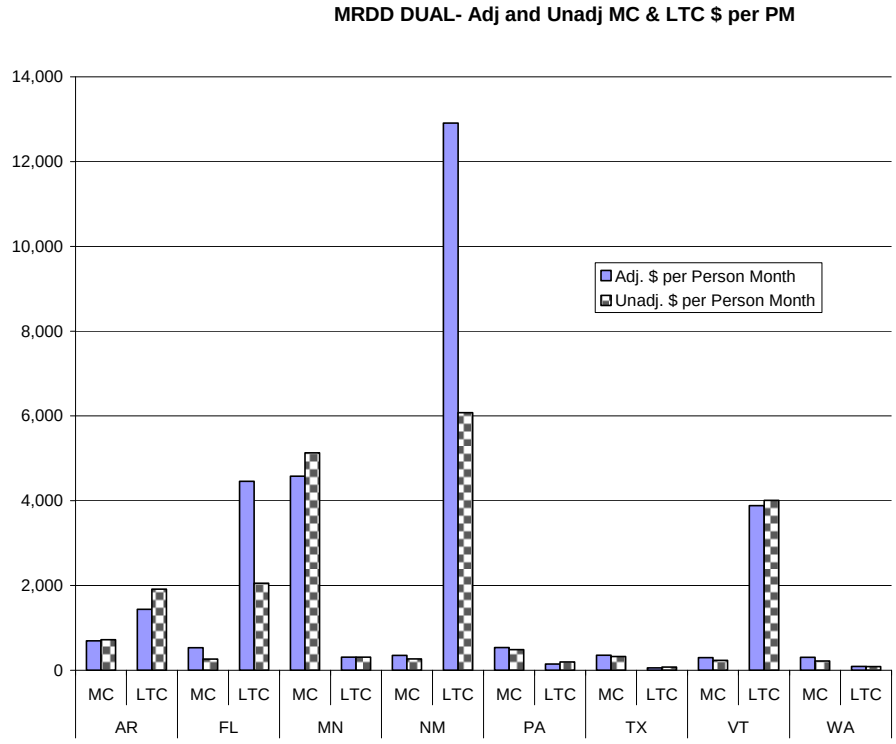


Figure 14B: Mean Adjusted and Unadjusted Medicaid and Medicare Expenditures per Person Month for Dually Eligible Recipients of MR/DD Waivers



Figures 15A and B summarize the data from the individual analyses of dually eligible recipients. Figure 15A contrasts the adjusted and unadjusted ratios of medical care to LTC for each recipient group. The pattern is similar to that seen with Medicaid only recipients except that adjustment raised the ratio for home health and the adjusted score for personal care is now higher than that for MR/DD waivers. Figure 15B contrasts the adjusted and unadjusted expenditure patterns for each recipient group. Here too the patterns are generally similar to Medicaid only except that adjustment increases only the LTC expenditures for MR/DD waiver recipients. The effect of adjustment on medical expenditures for home health is much less than with Medicaid only recipients.

Figure 15A: Weighted Average Adjusted and Unadjusted Ratios of Medical Care to Long-term Care among Dually Eligible Recipients across Programs

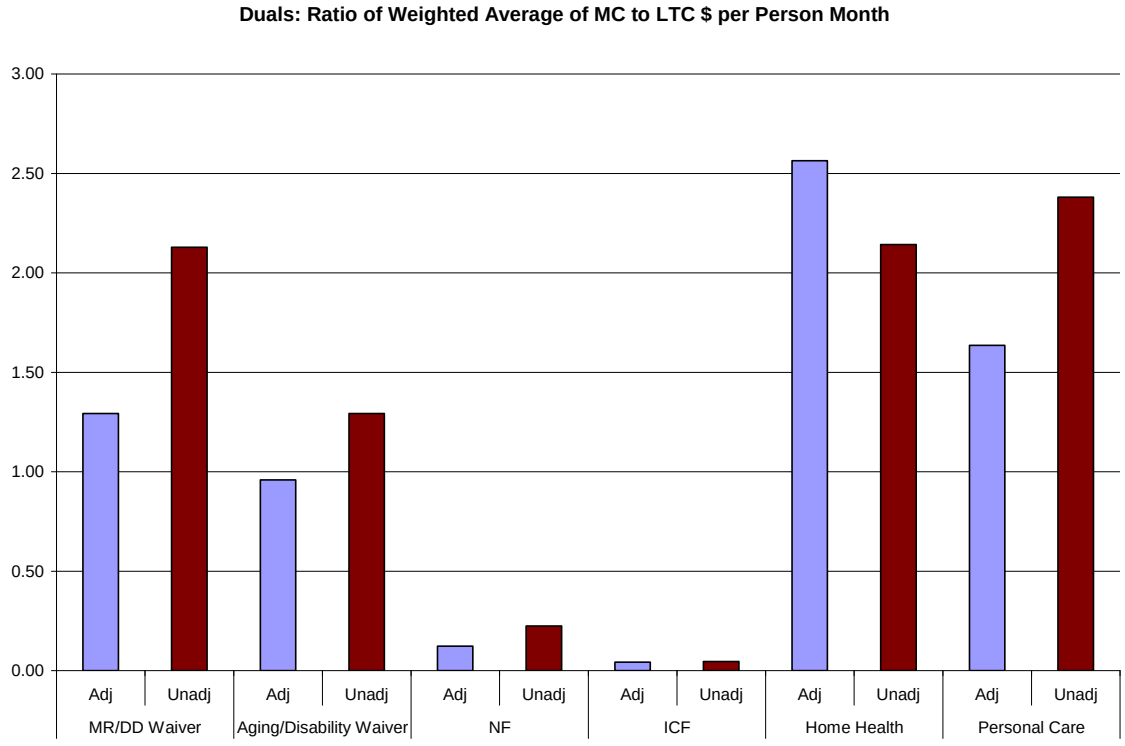
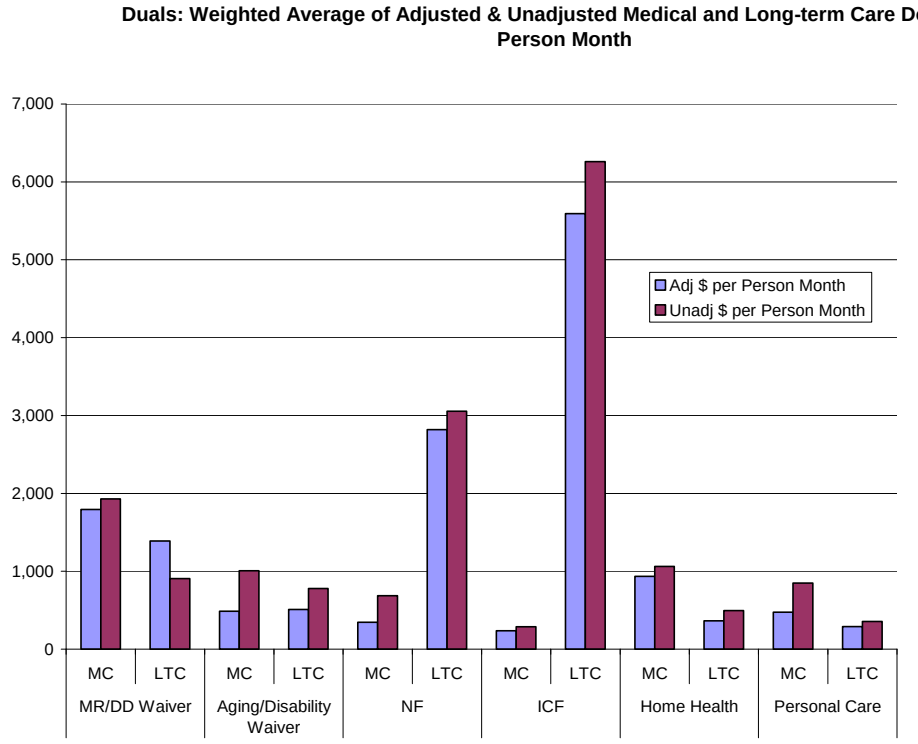


Figure 15B: Mean Adjusted and Unadjusted Medicaid Expenditures per Person Month for Medicaid Only Recipients across Programs



Conclusions

In general then patterns of relative relationships among the states seen with unadjusted analyses are maintained when case mix is applied. However, the size of the effects is often greatly influenced by case mix adjustment.

The general observation that dually eligible clients have a much higher case mix is not seen when all clients are eligible for LTC. In that case, the differences often depend on how the case mix is calculated. When the usual approaches are used there appears to be an undercount of diagnoses. When this undercount is corrected the patterns change to suggest that the duals are more impaired. However, the undercount, by definition, applies only to the dual eligibles.

In interpreting data about LTC expenditures and related medical costs, it is important to recognize the role case mix adjustment can play. It is more difficult to decide whether to consider case mix and if so, how.