

State-Mandated Health Insurance Benefits and Health Insurance Costs in Massachusetts

**Prepared for
Center for Health Information and Analysis
Commonwealth of Massachusetts**

**Prepared by
Compass Health Analytics, Inc.**

January, 2013



State-Mandated Health Insurance Benefits and Health Insurance Costs in Massachusetts

Table of Contents

Executive Summary.....	i
Introduction and Background.....	1
Statutory Basis and Scope.....	1
Approach to analyzing mandate efficacy.....	2
Approach to analyzing mandate costs.....	2
Applicable Population.....	3
Sample Population.....	4
Definition of Costs Measured.....	5
Results.....	7
Mandates with Potential Marginal Direct Cost: Results.....	7
Autism Spectrum Disorders.....	7
Chiropractic Services.....	11
Contraceptive Services.....	13
Diabetes-related Services and Supplies.....	15
Early Intervention Services.....	18
Home Health Care.....	20
Hormone Replacement Therapy (HRT).....	21
Human Leukocyte Antigen Testing (HLA).....	24
Hypodermic Syringes or Needles.....	25
Infertility Treatment.....	26
Low Protein Foods (LPF).....	28
Mental Health Care.....	29
Nonprescription Enteral Formulas.....	32
Prosthetic Devices.....	33
Speech and Audiology Services.....	35
Scalp Hair Protheses.....	36
New Provider-Centered Mandates.....	37
Certified Nurse Midwives.....	38

Certified Registered Nurse Anesthetists	40
Nurse Practitioners	42
Chiropractors.....	45
Dentists	46
Optometrists	47
Podiatrists.....	49
Aggregated Results of Mandates with Potential Marginal Direct Cost.....	50
Mandates Judged Likely to Have Zero Marginal Cost: Results.....	51
Bone Marrow Transplant for Breast Cancer.....	51
Cardiac Rehabilitation	52
Clinical Trials for Treatment of Cancer.....	54
Cytological Screening (Pap Smear).....	56
Hearing Screening for Newborns	57
Hospice Care	59
Lead Poisoning Screening	61
Mammography.....	62
Maternity Care	64
Preventive Care for Children up to Age 6 (including specific newborn testing)	67
Off-label Use of Prescription Drugs to Treat Cancer	68
Off-label Use of Prescription Drugs to Treat HIV/AIDS.....	71
Summary of Mandate Cost Estimates.....	72
Discussion and Conclusions	74
Appendices.....	77
Appendix A: Summary of Health Insurance Benefit Mandates.....	78
Service mandates.....	78
Provider-centered mandates	81
Appendix B: Mandates Present in 2007 and 2010: State-by-State Comparison.....	82
Appendix C: Methodology of Cost Estimation	86
Definition of Population and Costs Measured	86
Methodology and Data Sources	88
Project Organization and Study Design	88
Applicable Population.....	92
Sample Population.....	94

Methodology and Data for Mandates with Potential Marginal Direct Cost.....	95
Methodology and Data for Mandates Judged Likely to Have Zero Marginal Cost.....	100
Appendix D: Estimates of Population Subsets.....	101
Split of Commercial Fully-insured Population by Age	102
Split of Commercial Fully-insured Population by Gender	103
Appendix E: Population Applicability of Mandate Laws	104
Appendix F: Data Pull Matrix	106
Appendix G: Cost by Type of Service for Mandates with Potential Marginal Direct Cost.....	114
Table G-1: Chiropractic Services Mandate	114
Table G-2: Contraceptive Services	114
Table G-3: Diabetes-related services and supplies	115
Table G-4: Early Intervention Services	115
Table G-5: Home Health Services	116
Table G-6: Hormone replacement therapy.....	117
Table G-7: HLA Testing.....	117
Table G-8: Hypodermic Syringes and Needles.....	117
Table G-9: Infertility Treatment	118
Table G-10: Low Protein Food Products	118
Table G-11: Mental Health Services	119
Table G-12: Non-prescription enteral formulas.....	119
Table G-13: Prosthetic Devices	120
Table G-14: Scalp Hair Protheses	120
Table G-15: Speech, Hearing, and Language Disorders.....	120
Table G-16: Certified Nurse Midwives	121
Table G-17: Certified Registered Nurse Anesthetists	121
Table G-18: Nurse Practitioners	122
Table G-19: Chiropractor Provider Mandate.....	123
Table G-20: Dentists.....	124
Table G-21: Optometrists	125
Table G-22: Podiatrists	126
Endnotes	127

This report prepared by James Highland, PhD, MHSA, Amy Raslevich, MBA, MPP , Heather Clemens, FSA, MAAA, Andrea Clark, MS, and Lars Loren, JD, with assistance from Joshua Roberts and Brock Griffin. The project was supervised by Miriam Drapkin of the Massachusetts Division of Health Care Finance Policy, and has benefited greatly from the assistance of staff at The Center and staff at the participating health plans.

State-Mandated Health Insurance Benefits and Health Insurance Costs in Massachusetts

Executive Summary

M.G.L. Chapter 3 §38C requires that the Center for Health Information and Analysis (the Center) issue a comprehensive report at least once every 4 years on the cost and public health impact of all existing mandated benefits. The Center, recently established by Chapter 224 of the Acts of 2012, is the successor agency to the Division of Health Care Finance and Policy (the Division). Compass Health Analytics, Inc. (Compass) was engaged in 2011 to prepare this analysis, and the Division was responsible for data collection and contracting to support the development of the report. Compass therefore researched the medical efficacy and costs associated with mandated benefits in the Commonwealth on behalf of the Division, and delivered the report to the Center.

This is the second comprehensive review of health benefit mandates, though the first under the statute section cited above. The first comprehensive review was published in 2008 as required under Chapter 58 of the Laws of 2006.¹

The study provides a general review of the efficacy of the benefits described in the mandates, but estimates health care costs only for that part of the population in Massachusetts with health insurance subject to health benefit mandate laws, that is, with coverage in fully-insured commercial products regulated by the Massachusetts Division of Insurance, and for the public employees of the Group Insurance Commission.ⁱ Costs associated with mandated benefits are a subset of the total health care costs for this population. Excluded from the cost estimates in this study are costs associated with self-insured plans, which are not regulated by The Division of Insurance and not subject to the benefit mandate laws. The cost implications and clinical efficacy of 35 mandates are assessed in this report; the cost results are displayed in Table E1.

The first column in Table E1 displays total required direct costs, or RDCs, which measure the claim costs for services described in the mandate laws. RDCs, which are estimated to be \$1.24 billion after elimination of overlaps in cost between mandates, and \$1.4 billion with administrative costs, are not a measure of the impact of the mandates. RDCs include both costs for services that would be provided voluntarily in the absence of the mandates and marginal costs resulting from the imposition of the mandate laws. Mandates at the bottom of Table E1 labeled “Mandates Judged to Have Zero Marginal Cost” were deemed so by the largest Massachusetts health insurance carriers participating in the study, and thus have \$0 lower (and upper) bound marginal cost estimates. Many of the mandates in the “potential marginal cost” grouping in Table E1 were shown to have

ⁱ The majority of the Commission’s covered members are in self-insured plans; a subset of the mandates apply to the Commission’s members (both fully-insured and self-insured) in addition to the overall fully-insured population.

Table E1

Summary of Estimated Costs for Massachusetts Mandated Benefits as of 2009
Dollars in Millions (000,000s)

	Required Direct Cost Claims Estimate	Lower Bound Marginal Claims Estimate	Upper Bound Estimate with Admin Exp	Lower Bound Estimate with Admin Exp	Upper Bound Percent of Premium	Lower Bound Percent of Premium
Unduplicated Total All Mandates	\$ 1,236.22	\$ 52.27	\$ 888.29	\$ 58.69	7.23%	0.48%
Mandates with Potential Marginal Direct Cost						
Service Mandates						
Autism Spectrum Disorders (not in force until 1/1/2011)	\$ -	\$ -	\$ -	\$ -	0.00%	0.00%
Chiropractic Services	\$ 6.44	\$ -	\$ 7.23	\$ -	0.06%	0.00%
Contraceptive Services	\$ 32.94	\$ -	\$ 36.99	\$ -	0.32%	0.00%
Diabetes-related Services and Supplies	\$ 73.58	\$ -	\$ 82.61	\$ -	0.67%	0.00%
Early Intervention Services	\$ 26.33	\$ 2.93	\$ 29.57	\$ 3.29	0.26%	0.03%
Home Health Care	\$ 217.48	\$ 12.04	\$ 244.19	\$ 13.52	2.14%	0.12%
Hormone Replacement Therapy (HRT)	\$ 2.75	\$ -	\$ 3.09	\$ -	0.03%	0.00%
Human Leukocyte Antigen Testing	\$ 0.15	\$ 0.07	\$ 0.17	\$ 0.08	0.00%	0.00%
Hypodermic Syringes or Needles	\$ 0.09	\$ 0.03	\$ 0.10	\$ 0.03	0.00%	0.00%
Infertility Treatment	\$ 96.33	\$ 23.83	\$ 108.16	\$ 26.76	0.95%	0.23%
Low Protein Food Products for Inherited Amino Acid and Organic Acid Diseases (PKU)	\$ 1.45	\$ -	\$ 1.62	\$ -	0.01%	0.00%
Mental Health Care	\$ 284.39	\$ 46.26	\$ 319.33	\$ 51.94	2.60%	0.42%
Nonprescription Enteral Formulas	\$ 0.27	\$ 0.12	\$ 0.31	\$ 0.14	0.00%	0.00%
Prosthetic Devices	\$ 3.90	\$ 0.14	\$ 4.38	\$ 0.15	0.04%	0.00%
Scalp Hair Prostheses for Cancer Patients	\$ 0.57	\$ 0.03	\$ 0.64	\$ 0.03	0.01%	0.00%
Speech, Hearing and Language Disorders	\$ 1.43	\$ -	\$ 1.60	\$ -	0.01%	0.00%
Provider Mandates						
Certified Nurse Midwives	\$ 2.95	\$ -	\$ 3.31	\$ -	0.03%	0.00%
Certified Registered Nurse Anesthetists	\$ 14.06	\$ -	\$ 15.79	\$ -	0.14%	0.00%
Chiropractors	\$ 22.40	\$ 1.70	\$ 25.15	\$ 1.91	0.22%	0.02%
Dentists	\$ 13.49	\$ -	\$ 15.14	\$ -	0.13%	0.00%
Nurse Practitioners	\$ 14.37	\$ -	\$ 16.13	\$ -	0.14%	0.00%
Optometrists	\$ 17.09	\$ 3.27	\$ 19.18	\$ 3.67	0.17%	0.03%
Podiatrists	\$ 22.90	\$ -	\$ 25.72	\$ -	0.22%	0.00%
Mandates Judged to Have Zero Marginal Cost						
Bone Marrow Transplants for Treatment of Breast Cancer	\$ -	\$ -	\$ -	\$ -	0.00%	0.00%
Cardiac Rehabilitation	\$ 3.83	\$ -	\$ -	\$ -	0.00%	0.00%
Clinical Trials (to treat cancer)	\$ 2.61	\$ -	\$ -	\$ -	0.00%	0.00%
Cytologic Screening	\$ 24.61	\$ -	\$ -	\$ -	0.00%	0.00%
Hearing Screening for Newborns	\$ 2.55	\$ -	\$ -	\$ -	0.00%	0.00%
Hospice Care	\$ 14.06	\$ -	\$ -	\$ -	0.00%	0.00%
Lead Poisoning Screening	\$ 1.97	\$ -	\$ -	\$ -	0.00%	0.00%
Mammography	\$ 39.78	\$ -	\$ -	\$ -	0.00%	0.00%
Maternity Health Care (including minimum maternity stay)	\$ 254.85	\$ -	\$ -	\$ -	0.00%	0.00%
Preventive Care for Children Up to Age Six	\$ 100.83	\$ -	\$ -	\$ -	0.00%	0.00%
Off-Label Uses of Prescription Drugs to Treat Cancer	\$ -	\$ -	\$ -	\$ -	0.00%	0.00%
Off-Label Uses of Prescription Drugs to Treat HIV/AIDS	\$ -	\$ -	\$ -	\$ -	0.00%	0.00%

costs at higher levels in the self-insured population than in the fully-insured population, making it likely that these benefits (which have a zero lower-bound, e.g., diabetes related services and supplies) also have zero marginal direct costs. The other mandates in Table E1 have non-zero marginal costs relative to self-insured plans (e.g., infertility treatment).^{ii, iii}

The lower bound marginal claims estimate of \$52 million in the second column represents one measure of the marginal impact of the mandates on claims spending, calculated from per person spending differences on mandated benefits between the fully-insured population subject to the mandates and the self-insured population not subject to mandates. This \$52 million difference represents \$1.85 per member per month, or 0.48% of premium. Stated simply, the additional

ⁱⁱ As discussed in the body of the report, measurement for some zero marginal cost mandates was not feasible. These mandates are shown as having no cost in the required direct cost column Table E1.

ⁱⁱⁱ As discussed in the body of the report, the Autism Spectrum Disorders mandate was not in effect during the study period (2009). Rough cost estimates based on preliminary data obtained from carriers for 2011 are provided for information purposes in the Results section, but are not included in the 2009-based totals.

spending on mandated services in plans subject to the mandates compared to those plans not subject to the mandates represents approximately one half of one percent of premium.

In order to measure the full impact, insurer administrative costs should be added. In the next two columns of Table E1 the lower bound estimate of \$52 million becomes \$59 million with administration, and the \$1.24 billion RDC becomes an upper bound estimate of \$888 million after removing zero marginal cost mandates and adding administrative expense.

The initial range of the marginal direct cost impact of all 35 mandate laws studied, including administrative costs, is therefore between \$59 million and \$888 million. However, the true value is not likely to be near either end of this range. The upper bound estimate includes all RDCs except those for mandates judged by the carriers likely to have zero marginal costs, and so assumes that 100 percent of the RDC for mandates with potential marginal direct cost is marginal, and that carriers would eliminate the benefits completely in the absence of the mandate laws. This is very unlikely to be true or close to true, since over \$500 million of this amount is composed of two mandates, with one (mental health) required by Federal mandate, and the other (home health) likely to be provided as a cost-effective benefit, even if at somewhat lower levels.

The lower bound estimate subtracts from the RDCs of mandates judged to have potential marginal direct costs the dollars implied by the per person spending rate in the self-insured market, which is not subject to the mandate laws. This estimate assumes that 100 percent of the spending for the mandates in the self-insured market would occur in the absence of the mandate laws, and that none of the spending is influenced by the mandated spending levels in the fully-insured market. This, too, is very unlikely to be true or close to true, owing to the upward pressure mandates in the fully insured market place on benefits offered by self-insured plans.

This reasoning supports narrowing the range of the mandate law impact. Table E2 displays medical costs in the fully-insured population for each percent of premium in the \$52 million to \$888 million range. While the scope of this study does not allow a direct empirical basis for narrowing the range, the actual direct cost impact is likely to be somewhere in the middle part of the range. As self-insured employers must compete in the labor market with fully-insured employers whose health insurance policies must include the mandated benefits, self-insured benefits are likely to be significantly influenced by the presence of the mandate laws and the laws' effect on benefit structures at competing employers. Therefore it is likely that the 0.5 percent of premium in fully-insured cost levels over and above self-insured cost levels significantly understates the true impact. At the same time, Federally mandated benefits would remain even if state mandates were repealed, and it is unlikely that popular and/or cost-effective benefits like contraception and diabetes care would be completely removed from policies if the mandate laws were not in place, making 7.2 percent of premium (which assumes all costs of the twenty-three mandates in the primary data would disappear without the mandate laws) a certain overstatement of the impact. Based on the foregoing discussion, mid-range estimates in the one to four percent of premium (roughly \$125 million to \$500 million annually) range, while not directly empirically supported by this analysis, may be a logically inferable estimate of the marginal impact on health care costs directly associated with the covered benefits described in the mandate laws.

Table E2

Cost Implications of Impact Assumptions

Percent of Premium		PMPM		Dollars (millions)
0.5%	\$	1.94	\$	61.98
1.0%	\$	3.88	\$	123.97
2.0%	\$	7.77	\$	247.93
3.0%	\$	11.65	\$	371.90
4.0%	\$	15.53	\$	495.86
5.0%	\$	19.42	\$	619.83
6.0%	\$	23.30	\$	743.79
7.0%	\$	27.18	\$	867.76
8.0%	\$	31.07	\$	991.72

In addition to the direct cost impacts, there are indirect cost effects that we are not able to address in this study. Almost 90 percent of the total estimated direct cost stems from five of the mandates: mental health, home health, infertility, diabetes services and supplies, and contraception. Consideration of these five and their likely indirect cost effects would provide most of the required information on how the direct costs might be added to or reduced by indirect cost effects. It is possible that after consideration of indirect cost effects, the net impact of these five mandates is cost reducing, though we cannot estimate that impact in this study. Finally, there are individual and socially beneficial impacts aside from health care spending that these mandates may, and in many cases certainly do, provide. Benefit mandates are often enacted when such beneficial effects are perceived but something short of government provision of the benefit is the balance point of the political process.² The results section of the report discusses the efficacy and public health benefits of services described in the mandates in detail.

Looking forward, the implementation of the Federal Accountable Care Act's essential health benefits, and the decisions made in Massachusetts about the benchmark benefit package, will have a significant effect on estimates of mandate impacts for 2014 forward. The law requires that some services not currently mandated at the Federal level will be required in benefit packages, making the related state mandates redundant. On the other hand, the Commonwealth's decisions about the specific benchmark plan and its associated mandates will determine the degree to which cost sharing and premium subsidies for those with incomes between 133% and 400% of the Federal Poverty Level will be fully subsidized by the Federal government, and so will affect the Commonwealth's outlays for subsidies.

State-Mandated Health Insurance Benefits and Health Insurance Costs in Massachusetts

Introduction and Background

Statutory Basis and Scope

M.G.L. Chapter 3 §38C requires that the Center for Health Information and Analysis (the Center) issue a comprehensive report at least once every 4 years on the cost and public health impact of all existing mandated benefits. The Center, recently established by Chapter 224 of the Acts of 2012, is the successor agency to the Division of Health Care Finance and Policy (the Division). Compass Health Analytics, Inc. (Compass) was engaged in 2011 to prepare this analysis, and the Division was responsible for data collection and contracting to support the development of the report. Compass therefore researched the medical efficacy and costs associated with mandated benefits in the Commonwealth on behalf of the Division, and delivered the report to the Center.

This is the second comprehensive review of health benefit mandates, though the first under the statute section cited above. The first comprehensive review was published in 2008 as required under Chapter 58 of the Laws of 2006.³

For purposes of the section directing the Center to review health benefit mandates (MGL c. 3, §38C), the statute defines a mandated health benefit as “one that mandates health insurance coverage for specific health services, specific diseases or certain providers of health care services.” The mandates listed in Appendix A at the end of this report were identified by Division staff; this list provided the starting point for the study. This list includes all of the mandates studied in the first retrospective mandate review report published in 2008, and adds to that set of mandates three new mandates passed since the study period (the report was based on 2005 data).^{iv} Furthermore, the Center requested that “provider mandates” be added to the set of mandates reviewed, which added another seven mandates to the list, resulting in a total of 35. Most mandates in Massachusetts require insurers to cover specific services or to provide benefits to individuals with specific conditions, for those individuals the insurers cover. Another smaller set of mandates requires insurers to cover the services of specific types of providers. Most of these provider-centered mandates are similar in effect, essentially providing that payers must pay practitioners of the specified provider type when the service is covered and when the practitioner’s provider type is licensed to provide the covered service. Because all mandates addressed in this review apply to medical insurance policies, as opposed to policies that cover other sets of services, such as dental care, these provider-centered mandates do not address non-medical services. For example, while

^{iv} The Autism mandate did not become effective until 2011, after this report’s 2009 study period, and so cost estimates for autism are not included in the study’s cost totals. However an efficacy analysis and initial cost data are provided in the body of the report.

they require payers to pay dentists for a medical service that either a physician or dentist may perform under their licenses, they do not mandate coverage for services typically covered by dental plans. To provide national context for the list of mandates in Appendix A, Appendix B contains a state-by-state comparison of mandate laws, indicating which states require each specific benefit type.

Massachusetts statutes place various other requirements on insurers, including those addressing confidentiality, coverage practices (continuity of coverage, dependent coverage, coordination of benefits, etc.), and limitations on insurers' ability to deny coverage in general to individuals with specified conditions (blind persons, victims of domestic abuse, etc.). The statute charging the Center with this review does not include within the scope of the review these other types of requirements, and consequently this review does not address them.

As discussed in detail in Appendix C, data made available by the Center were from calendar year 2009, which sets the timeframe basis for the study. Results presented here include those mandates in force in 2009.

Approach to analyzing mandate efficacy

Compass's goal in reporting on the efficacy of the subject matter of the mandates is not to declare any given service or provider type efficacious or not, but rather to summarize how the service is currently regarded, by governmental or professional entities that recommend treatment or in general medical literature. If the efficacy of a service is controversial, we report, but do not attempt to resolve, the controversy. We include appropriate reference notes for readers who wish to learn more.

For some mandates, the depth we can reach in analyzing the mandate's impact is limited. In particular, for the analysis of the efficacy of the provider-centered mandates, we review whether the services are widely covered or whether standard-setting entities, such as Medicare, pay for them. But a complete assessment of current thought about the clinical effectiveness of an entire profession is beyond the scope of this review.

For mandates with potentially significant public health impact, meaning an effect on the health of individuals other than those covered by the mandated benefit, we provide descriptive information of the impact, but generally do not attempt to quantify it. This approach is consistent with the treatment of indirect costs in the economic analysis, and further consistent with the treatment of indirect costs in the 2008 review.

Approach to analyzing mandate costs

In this section we summarize the methodology used to measure the cost impact of the 35 benefit mandates studied. A more detailed description of the methodology can be found in Appendix C.

Applicable Population

This study estimates health care costs only for that part of the population in Massachusetts with health insurance subject to health benefit mandate laws, which can be summarized in two categories. Primarily, all of the mandates in the study apply to those with coverage in fully-insured commercial products regulated by the Massachusetts Division of Insurance. In addition, a subset of the mandates in this study also applies to coverage for public employees provided under the Group Insurance Commission (GIC). The great majority of the GIC coverage is provided on a self-insured basis, with the remainder included among the fully insured plans subject to all the mandates.

It is useful to delineate the populations to which mandates apply in more detail. Characteristics of the population common to all of the mandates are:

- Commercially insured
- Fully-insured contracts
- Non-Medicare
- Under age 65

Excluded from the population are all individuals covered under self-insured policies (except the GIC population for some mandates), as these policies are regulated under Federal ERISA legislation, not by the Massachusetts Division of Insurance, and thus are not subject to the mandate laws. The definition also excludes individuals with Medicare coverage and commercial “Medigap” policies, as these policies are tied to Federal Medicare benefits and cover patient cost-sharing within the Medicare benefit structure. MassHealth, the Massachusetts Medicaid program, is also not required to follow the mandate requirements.

U.S. Census Bureau data on Massachusetts Health Insurance Status showed that there were approximately 4.55 million persons covered by employer-sponsored plans in 2009. Data provided by The Center indicated that the approximate split between fully-insured and self-insured enrollment in the employer-sponsored population is 47.5 percent / 52.5 percent, which would imply a fully-insured employer-sponsored enrollment of approximately 2.164 million individuals. In addition, there were approximately 289,921 persons individually purchasing insurance in the non-group market (subject to the mandate laws), for a total of 2.454 million fully-insured members.

Some mandates apply to self-insured GIC contracts. For those mandates, an additional 183,446 members are added to the population for a total of 2.637 million individuals. Appendix D contains more details about these population calculations.

The populations to which the mandates are applicable are summarized in Table 1. The PMPM cost estimate from our sample data for each mandate was multiplied times the indicated population number to arrive at the total dollar cost estimate for each mandate.^v

^v As discussed below in the Results section, for aggregated cost estimates, overlap between mandates is removed when summing total dollars.

Table 1

Populations to Which Mandates Apply

Mandate	Applicable Population	Estimated Membership
Certified Nurse Midwives Chiropractors Dentists Optometrists	Indemnity and Blue Cross Blue Shield fully-insured members	1,174,281
Chiropractic Services	Blue Cross Blue Shield fully- insured members	839,150
Diabetes HLA testing Mental Health Non-prescription enteral formulas Scalp Hair Protheses Speech, hearing, and language disorders Bone marrow transplants for breast cancer Newborn hearing screening Hospice Care Maternity Health Care Autism spectrum disorders Prosthetic Devices	All fully-insured members and all GIC members (fully and self-insured)	2,637,117
All other mandates in study	All fully-insured members	2,453,671

The population member months denominator for percent of premium calculations in the study was the sum of member months for all of the license types, as we are estimating the per person costs of the benefits with respect to the overall average fully-insured health insurance premium. However, for the five mandates applying to less than the entire fully-insured population, claim estimates were included in the numerator only for the applicable sub-groups indicated in Table 1, as these are the only claims that are related to benefits required by the statutory language of the various mandates. The resulting impact estimates represent the impact on the average fully-insured premium, not on the premium for the sub-group(s) to which the mandate is applicable.^{vi}

Sample Population

In order to develop the dollar estimates in the study, PMPM estimates were developed from the data sources used in the study. PMPMs from representative samples were developed, and then multiplied times the applicable populations discussed in the preceding section. In general, the PMPM estimates developed from claim data drew upon the Center’s Health Care Quality and Cost Containment (HCQCC) 2009 claim database. The HCQCC data provided for the study contained claims and membership from five carriers. The average membership represented in this sample for calendar 2009 was 1.5 million. This compares to an estimated 2.45 million total average

^{vi} For those mandates applying to the GIC, the GIC population was included in both the numerator and the denominator for the percent of premium calculations.

membership for the fully-insured population in Massachusetts (both state residents and non-residents with a principal place of employment in Massachusetts),^{vii} or 60.2 percent of the applicable population. Cost estimates contained in this report assume that the PMPM costs obtained from the HCQCC sample data (which include only state residents) are representative of the overall fully-insured commercial under-65 population (which includes both residents and non-residents with a principal place of employment in Massachusetts). For the mandates developed with secondary data sources (discussed in the next section), the underlying utilization, prevalence, and other rates were drawn from Massachusetts data wherever possible. The samples drawn upon are discussed in detail in the methodology appendices.

Appendix C provides a more detailed discussion of the cost estimation methodology and Appendix D details the development of Massachusetts population segment estimates.

Definition of Costs Measured

Costs associated with mandated benefits are a relatively small subset of the total health care costs for the affected population; to begin to address by how much mandate laws impact total costs it will be helpful to define terminology for the purpose of this report. The general cost concepts defined below will aid in interpreting the results of the study. In practice these cost sub-categories are difficult to measure, and no precise measurement of these cost breakouts can be achieved within the scope of this project, although conceptual definition will aid in interpreting the results of the analysis. There are two general types of costs that may be associated with any mandate:

- **Required direct costs.** These are the costs of services that are explicitly described in a mandate law, used by covered members and paid for by the regulated insurance plans, whether or not some or all of the costs would have been incurred in the absence of the mandate through voluntary provision of the benefits. These costs are the primary focus of this study, and are the most easily measurable. Required direct costs (RDCs) are the sum of *base direct costs* and *marginal direct costs*.
 - *Base direct costs* (BDCs) are those costs that would be present even if the mandate law were not in force. Mandate laws may require benefits that would be provided, wholly or in part, voluntarily (by some or all of the market).
 - *Marginal direct costs* (MDCs) are those additional costs beyond the base direct costs that the imposition of the mandate impels.
- **Indirect costs.** Indirect costs are those costs that may be added as a result of the related delivered services associated with the mandate (e.g., costs of additional complicated births associated with fertility treatment) or those service costs avoided (these would be “negative costs” or cost offsets) as a result of the mandate (e.g., fewer emergency department visits for diabetics due to coverage for diabetes services and supplies).

^{vii} Based on data from the Census Bureau and the assumed 50.7 percent fully-insured percentage (including both employer-based and individually insured) based on data provided by the Center.

While we can measure RDCs reasonably, measuring their breakdown into base and marginal direct costs is far more difficult, and measuring indirect costs even more difficult. In order to measure the true cost impact of a mandate law on the regulated insurance product costs, one would need to include only marginal costs, which would consist of marginal direct costs and marginal indirect costs (those indirect costs associated with the marginal utilization produced by the mandate law). Since marginal indirect costs may be either positive or negative, the net impact of any one mandated benefit on total costs may be either increasing or decreasing, depending on:

- How much of the direct cost associated with the mandate is marginal (i.e., attributable to the imposition of the mandate)
- Whether indirect costs are positive or negative on net, and
- The size of those indirect costs relative to the direct costs.

Though not within the scope of this study, a well-conducted multi-variate statistical analysis using multi-state data would be better able to estimate marginal costs that include both direct and indirect components. Some multivariate econometric studies comparing benefit mandates and cost levels across states have shown that some specific mandated benefits decrease costs on net, while others increase costs on net.⁴

This study provides some information that may be useful in understanding the proportion of the required direct costs that are likely to be marginal for the mandates. The scope of this study does not attempt to measure precisely the amount of RDC that is marginal (which would require multi-state data), and the report does not include evaluation of indirect costs. As a result, it is not possible to ascertain from the information in this study the net impact on health care costs in the Commonwealth associated with the mandate laws, but previous research suggests that total RDCs will greatly overstate the net effect of the mandates, that offsetting indirect cost savings can be larger than direct cost effects (making the net effect of a mandate cost decreasing), and that the impact of mandate laws on insurance levels will not be directly inferable from the RDC estimates contained herein.⁵

This report does, however, present a comparison of the fully-insured population RDCs to the RDCs observed in the Massachusetts' self-insured sector (not subject to the mandate laws), the difference in which provides one estimate of the direct marginal differences (that is, net direct cost impact) introduced by the mandate legislation. Previous research has found that differences in benefit levels, including mandated benefits, are similar, if not richer, in the self-insured market.⁶ Mandate laws may have small effects if firms offer the benefits voluntarily. However, in that employers in Massachusetts that self-insure must compete in the labor market with fully-insured firms that must offer the mandated benefit package, the benefits in the self-insured firms are likely to be at least somewhat richer than they would be in the absence of the mandate laws. This competitive labor market effect would shrink the cost difference between fully-insured and self-insured plans and understate (or provide a lower bound for) the implied impact of benefit laws on health care costs provided by the difference between fully-insured and self-insured costs. In the cost estimates displayed in the Results section, the lower-bound estimates are calculated as the difference between the fully-insured and self-insured per person claim estimates.

An upper-bound claim cost estimate is also provided for each mandate, which includes the entire RDC, except those for mandates judged by the carriers likely to have zero marginal costs. This estimate assumes that 100 percent of the RDC for mandates with potential marginal direct cost is marginal, and that carriers would pay zero dollars in claims for the services described by the mandates in the absence of the mandate laws. For most mandates there is good reason to believe the actual marginal cost is far lower, though we do not have a direct method of estimating by how much. For example, the mental health mandate has significant overlap with the Federal mental health mandate, making the state law largely redundant and without effect.

To simplify the study's measurement task, mandates were reviewed by the major carriers in Massachusetts to ascertain whether, in their opinion, the RDCs of the mandates would be affected if the mandate were repealed. Those for which the law was judged not to affect cost were deemed "zero marginal direct cost" mandates, and a simpler estimation methodology drawing on secondary data was used. The remaining "mandates with potential marginal direct cost" were estimated using the HCQCC claims database. More details about how this distinction was made and about the overall methodology can be found in Appendix C. In the presentation of results below, the mandates are organized into these two categories.

Results

In this section we present results of both the efficacy and cost analyses for the mandates with potential marginal direct cost, the mandates with zero marginal direct cost, and the overall results combining the two.

Mandates with Potential Marginal Direct Cost: Results

The "data pull matrix," that is, the detailed specification for twenty-three primary-data mandates for which 2009 HCQCC claims were pulled is contained in Appendix D. Results for the individual mandates studied with primary data follow. The autism spectrum disorders mandate, which went into effect for contract renewal dates starting January 1, 2011, is not included in the 2009 timeframe of this study, and so is not included in the total impact estimates contained in the report. However, the mandate is of interest since it is now in effect, and so a brief discussion of its possible impact is also included below.

Autism Spectrum Disorders

Autism spectrum disorders (ASDs) are a group of neurological disorders resulting in developmental delays, including problems with behavior, communication, and socialization,⁷ and often are accompanied by abnormal cognitive functioning, sensory processing, learning, and attention.⁸ ASD is difficult to diagnose, as it is "a neurodevelopmental disability or phenomenological disorder, not a specific disease."⁹

Diagnosis and treatment of autism continues to evolve. The *Diagnostic and Statistical Manual of Mental Disorders (DSM)* is the standard behavioral health classification system used in the United States, and lists diagnostic criteria “for every psychiatric disorder recognized by the U.S. healthcare system.”¹⁰ The current version, DSM-IV-TR, was released in 1994 and updated in 2000; DSM-V is scheduled to be released in May 2013. The proposed new version makes significant changes to the diagnostic definition of autism, including expanding the diagnosis from a singular disorder to an entire diagnostic category including autism, Asperger’s disorder, childhood disintegrative disorder, and pervasive developmental disorder not otherwise specified.¹¹

According to the CDC, 1 of every 110 children in the U.S. has ASD. Prevalence is four to five times higher among boys than girls.¹² The prevalence of autism has been increasing rapidly, possibly due to better awareness, a change in diagnostic practices, and/or a true increase in cases. The median age of first diagnosis with ASD is between 4.5-5.5 years old, although the majority of these children exhibited a developmental delay before the age of three.¹³ However, the CDC has pointed out that due to its behavioral basis, as well as lack of consistent identification, genetic or biologic markers, ASD presents challenges to epidemiological investigation.¹⁴

ASD is often considered over a spectrum of severity, with symptoms varying widely among patients. In general, though, autistic children are less able to interpret non-verbal social and emotional cues, as they struggle to interpret behaviors such as body language and facial expressions; they also struggle with reciprocal social interaction. Younger patients sometimes have no interest in friendships and often fail to develop developmentally-appropriate peer relationships. Moreover, both expressive and receptive language development is often delayed. Taken together, autistic children are less able to understand social boundaries and the needs of others, often leading to inappropriate behavior, awkward interactions and lack of social connection.

While these behaviors and symptoms may change over time, adults with ASD continue to struggle throughout life with language, especially perspective, nuance, humor and implied meanings; self-sufficiency; and social skills. Adults with autism are much less likely to be fully self-supporting, and many develop psychiatric issues such as obsessive-compulsive disorder and affective disorders.¹⁵

ASDs require chronic management and cannot be cured. Outcomes and behaviors for individuals change over time, but most patients remain on the spectrum as adults. ASDs affect a person’s mental health, as well as his ability to achieve academically, live independently, obtain and retain employment, and establish and maintain positive social relationships.¹⁶

The primary treatment goals for ASD, according to the American Academy of Pediatrics, are to “minimize the core features and associated deficits, maximize functional independence and quality of life, and alleviate family distress.”¹⁷ Interventions, therefore, should be designed to promote development and learning; improve communication, social interaction and reciprocity; diminish repetitive and restricted behaviors; and educate and support families.¹⁸ Additionally, ASD patients may have an increased incidence of seizure and gastrointestinal disorders, as well as sleep disturbances, which must also be addressed through appropriate medical management.¹⁹

A wide variety of therapies are available for the treatment of ASDs, including: behavior and communication therapies; pharmacological therapies; dietary approaches; and complementary and alternative medicine (CAM) therapies.²⁰

Behavioral and communication interventions are the primary therapies for ASD and requiring insurance coverage for these therapies is the primary effect of the autism mandate. Broadly, they address communication, social, daily-living, play, and leisure skills, as well as academic achievement and maladaptive behaviors; interventions are structured to help the child to acquire the skills and knowledge necessary for independence and personal responsibility in a variety of environments.²¹

Behavioral and communication therapies for autism should provide structure, direction, and organization for the child, and encourage family participation.²² Models have most often been developed upon a “primary philosophical orientation,” frequently categorized as behavior analytic, developmental, or structured teaching.²³

The most widely used and researched type of behavioral therapy for ASD is applied behavior analysis (ABA).²⁴ Based on experimental psychology research and its resultant principles of learning, these interventions focus on patients learning positive behaviors and decreasing negative behaviors, while developing adaptive strategies to new situations.²⁵ ABA emphasizes evaluation and measurement of behaviors, leading researchers to most easily apply scientific methods when evaluating these interventions. In fact, “most studies of comprehensive treatment programs that meet minimal scientific standards involve treatment of preschoolers using behavioral approaches.”²⁶

The category of ABA encompasses a variety of methodologies including Pivotal Response Training (PRT), Early Intensive Behavioral Intervention (EIBI) and Verbal Behavior Intervention (VBI).²⁷ One popular method, Discrete Trial Training (DTT), teaches behaviors and responses step-by-step. Environments are highly structured and lessons are reduced to their simplest parts, using positive reinforcement for desired behaviors.²⁸ A similar intervention is TEACCH, or Treatment and Education of Autistic and Related Communication Handicapped Children program, also known as “structured teaching.” This intervention focuses on modifying the patient’s environment to accommodate the individual’s deficits, as well as on improving skills. Visual cues, schedules, routines and structured work and activity systems are part of this method.²⁹ Research has found that while these methods can teach certain skills, they cannot be generalized for “spontaneous use in natural environments.”³⁰

The Massachusetts autism mandate was enacted recently, in 2010, and the Center issued in March of that year a report including an extensive review of the efficacy of the mandated services, focusing on behavioral and communication therapies.³¹ That review cited several studies,³² most of which were in turn surveys of many other studies:

These works conclude with a diversity of opinion about how well the efficacy of treatment is established for therapies based on applied behavior analysis or other

behavioral approaches to therapy. A number of studies conclude that the efficacy of leading treatments for autism is well established.

The reliability of the evidence is questioned by two studies, with one concluding that efficacy is not established for early intensive treatment and a second concluding that the evidence moderately supports the efficacy of leading treatments. These differences of conclusion appear to stem in part from differences in what types of research were included for review. It is also possible that differences in the institutional and disciplinary backgrounds of the reviewers played some role.

The Center's review concluded:

Weighing the large review efforts of current research described above, we think it fair to say that the best-established treatments for autism have shown substantial evidence of efficacy. Skepticism about efficacy and a desire to focus treatment resources on the most effective therapies are useful guides to public discussion and should serve to encourage more efficacy research.³³

Other therapies that can be part of a complete treatment program for a child with an ASD include:³⁴

- Developmental, Individual Differences, Relationship-Based Approach (DIR; also called "Floortime"): Focus on the development of relationships and emotions, as well as sensory perceptions and reactions.
- Occupational Therapy (OT): Focus on teaching activities of daily living and personal interactions.
- Sensory Integration Therapy (SIT): Focus on sensory information and processing. Many children with ASD are especially bothered by certain sounds or smells or physical touch.
- Speech Therapy: Focus on receptive and interpretive communication skills. These can include verbal communication, as well as gestures and sign language, and/or picture boards. Speech-language pathologists work with patients, as well as parents, teachers, families and peers to "promote functional communication in natural settings throughout the day."³⁵

No drugs are currently approved specifically for the treatment of ASD.³⁶ However, medications are used to treat specific symptoms and "maladaptive behaviors such as aggression, self-injurious behavior, repetitive behaviors (e.g., perseveration, obsessions, compulsions, and stereotypic movements), sleep disturbance, mood lability, irritability, anxiety, hyperactivity, inattention, destructive behavior, or other disruptive behaviors."³⁷ Although dietary approaches and alternative medicine therapies are widely used, in general, research has not proven their effectiveness;³⁸ in fact, some therapies, such as intravenous chelation of heavy metals, have been shown to be dangerous.³⁹

The autism mandate requires coverage for treatment for autism spectrum disorders (ASDs) on a "non-discriminatory basis", meaning on the same terms as coverage for physical conditions. The

mandate includes in the treatment of ASDs: habilitative or rehabilitative care, pharmacy care, psychiatric care, psychological care, and therapeutic care. Psychiatric and psychological care are covered under the mental health mandate, and therapeutic care (e.g., speech pathology) is already covered by the carriers based on functional need regardless of diagnosis.⁴⁰ The primary net effect is to mandate coverage for medically necessary habilitative care, i.e., “professional, counseling, and guidance services and treatment programs, including applied behavior analysis supervised by a Board Certified Behavior Analyst.”

The Massachusetts autism mandate became effective for policy renewals beginning January 1, 2011, so no data from the 2009 HCQCC extract were available to study the cost impacts, and it is not applicable to the study period. However, an early indication of its cost impact is of interest. As part of the current study, Compass requested and received from one of the participating carriers a data pull specification which was distributed to all the participating carriers for review with a request that they extract claims for the procedure codes listed^{viii} and provide a summary of paid claim dollars and member months for renewals occurring in January 2011 (to get a full year of cost), or for calendar 2011 for carriers implementing the benefit for all policies in January 2011 regardless of renewal date. As of this writing, data were received from three carriers. The average annual PMPM from these limited data, which were restricted to members having the autism benefit for an entire year, was less than \$0.25 PMPM. Since these costs were not incurred until 2011, they are not included in the totals for this study. A review of the 2009 data found no presence of the ABA services, indicating that all costs for the mandate are marginal (i.e., a result of the mandate law).

Compass Health Analytics, Inc. previously performed a prospective study for the Center for Health Information and Analysis on a proposed mandate related to autism spectrum disorder services.⁴¹ The claims PMPM estimates from the study ranged from \$0.56 to \$1.40 PMPM for the first year. It appears these estimates, which were lower than the two other studies summarized in Appendix A of the cited Compass report, will prove to be overly conservative. The degree to which the costs will “ramp up” over time remains to be seen.

Chiropractic Services

Chiropractic is a form of alternative medicine that focuses on the relationship of the body’s structure, particularly the spine, to its function; the goal of chiropractic treatment is to enable the body to self-heal by realigning structure, often through spinal manipulation.⁴² A large number of studies regarding the effectiveness of chiropractic services have been conducted over the last few decades, with more intensive and rigorous research commencing since these services have become more routinely reimbursed by medical insurance,⁴³ and have been integrated into the clinical guidelines of certain medical specialties, including the American College of Physicians and the American Pain Society.⁴⁴

The research, however, is still unclear, despite the high satisfaction rates of patients receiving chiropractic treatments.⁴⁵ Most research points to mild to moderate short-term benefits of chiropractic services for acute low back pain,^{46,47} although these results were similar to those

^{viii} H0031, H0032, H2012, and H2019.

obtained through other treatments, such as physiotherapy, educational booklets, oral medications, acupuncture, or steroid injections.^{48,49,50} The results of a 2010 study into the effectiveness of manipulation/mobilization therapies found evidence of the following:⁵¹

Effective	Inconclusive	Not Effective
<ul style="list-style-type: none"> • Acute, subacute and chronic low back pain • Migraine and cervicogenic headache • Cervicogenic dizziness • Extremity joint conditions • Acute/subacute neck pain (thoracic manipulation/mobilization) 	<ul style="list-style-type: none"> • Neck pain (cervical manipulation/mobilization) • Mid-back pain • Sciatica • Tension-type headache • Coccydynia • Temporomandibular joint disorders • Fibromyalgia • Premenstrual syndrome • Pneumonia (Older adults) • Otitis media (children) • Enuresis (children) 	<ul style="list-style-type: none"> • Asthma (adults and children) • Dysmenorrhea • Stage 1 hypertension

As with many medical interventions, side-effects and risks also exist. The studies caution that chiropractic manipulation often leads to mild and transient side effects,⁵² including headaches, tiredness and soreness at the treatment site.⁵³ Other researchers point out more rare but serious side effects, such as cerebrovascular accidents⁵⁴ and ischemia,⁵⁵ other neurological complications,⁵⁶ and stroke.

The chiropractic services mandate covers expenses of chiropractic services. The mandate applies to medical service corporations (Blue Cross/Blue Shield of Massachusetts) only. Note that there are both chiropractic service and chiropractor (provider-based) mandates. The services in this chiropractic services mandate are provided by chiropractors and other providers, and chiropractors provide both chiropractic and other services.

The RDC of this mandate was calculated as the sum of all claims with procedure codes indicating chiropractic manipulative treatment.^{ix} Total estimated RDC claims PMPM was \$0.64, with a total PMPM of \$0.72 (or 0.06 percent of the Commonwealth total) after administrative loading. Self-insured costs for chiropractic services were found to be *higher* than fully-insured costs, resulting in a lower bound impact estimate of \$0. Table 2 below displays a summary of these results and related statistics.

^{ix} CPT codes 98940, 98941, 98942, & 98943.

Table 2
Chiropractic Services Mandate*
Contribution to Premium

Measures	Sample FI Amount	Sample SI Amount	FI Minus SI
Sample Users	56,711	39,003	
Sample Units	393,975	334,186	
Sample Average Members	839,150	736,874	
PMPM Claims	\$ 0.64	\$ 0.80	\$ (0.16)
PMPM With Admin	\$ 0.72	\$ 0.89	\$ (0.18)

	Upper Bound Impact	Lower Bound Impact*
Insured Population	839,150	839,150
Contribution to Total Annual Claims	\$ 6,440,470	\$ -
Contribution to Total Annual Premium	\$ 7,231,575	\$ -
Percent of Total Premium	0.06%	0.00%

*This mandate only applies to Blue Cross/Blue Shield of Massachusetts (medical services corporations).

**Net amounts do not remove overlap in mandated services between the chiropractor provider mandate and the chiropractic services mandate.

Contraceptive Services

It is estimated that in the United States, there are 62 million women ages 15-44; of these, 70% are sexually active but do not want to become pregnant.⁵⁷ Family planning is one of the major objectives of Healthy People 2020, the set of national health promotion and disease prevention goals outlined for the next decade by the U.S. Department of Health and Human Services. According to Healthy People, “[t]he availability of family planning services allows individuals to achieve desired birth spacing and family size and contributes to improved health outcomes for infants, children, and women.”⁵⁸

Adequate planning for an intended pregnancy allows women to receive appropriate preconception care, the importance of which is becoming increasingly evident. Care provided before pregnancy allows providers to reduce the risks of pregnancy to women, as well as some pre-term births and their associated birth defects.⁵⁹

The negative consequences of unintended pregnancies are numerous. They include: delays in initiating prenatal care; the use of tobacco and alcohol and the increased risk of physical violence during pregnancy; premature birth and low birth weight; reduced likelihood of breastfeeding; poor maternal mental health; and lower relationship quality between mother and child.^{60,61} Children born from an unintended pregnancy are more likely to suffer from poor physical and mental health in childhood; likewise they attain lower educational and behavioral outcomes.⁶²

Outcomes are worse for unintended pregnancies in teen mothers. An adolescent who experiences an unintended pregnancy is less likely to graduate from high school or attain a GED by age 30, and

will earn approximately \$3500 less per year on average compared with her peers who delay having children; teen fathers experience similarly lower educational achievement and income. Teen mothers, on average, receive twice as much federal aid for twice as long as non-parent teens. And children of teenagers have more behavioral problems and lower cognitive abilities than others, on average; in fact, sons of teen mothers are more likely to be incarcerated, while daughters are more likely to become pregnant as teens.⁶³

Contraceptive drugs and devices, with appropriate associated examination and consultation services, can play a significant role in family planning.

Nationally, over 39 million women ages 15-44 use contraception, or 89% of fertile sexually active women.⁶⁴ While almost 50% of women with an unintended pregnancy report using some form of contraception,⁶⁵ other research shows that 95% of unintended pregnancies are to women either not using contraception or using it inconsistently.⁶⁶ Most women (63%) who use contraception rely on non-permanent methods, while the remainder relies on male or female sterilization. Success rates depend on either permanency or consistency of use; permanent sterilization methods result in a failure rate of less than 1% with typical use, while other methods vary widely, from 1% failure rates for implants to 32% failure rates for sponges with typical use.

Method	Users (in 000s) ⁶⁷		First Year Contraceptive Failure Rate (%) ⁶⁸		Pregnancies/100 women ⁶⁹
	Percent	Number	Perfect Use	Typical Use	
Pill	28.0%	10,700	0.3	8.7	2-9
Female Sterilization	27.1%	10,400	0.5	0.7	<1
Male condom	16.1%	6,200	2.0	17.4	15-24
Vasectomy	9.9%	3,800	0.1	0.2	<1
IUD	5.5%	2,100	0.1-0.6	0.1-1.0	<1
Withdrawal	5.2%	2,000	4.0	18.4	15-24
3-month injectable	3.2%	1,200	0.3	6.7	2-9
Ring	2.4%	900			2-9
Fertility-awareness based methods	1.1%	400	1.0-9.0	25.3	≥25
Implant, one-month injectable or patch	1.1%	400	0.05-0.3	1.0-8.0	
Patch			0.3	8.0	2-9
Other	0.4%	200			
Female condom			5.0	27.0	15-24
Cervical cap			9.0-26.0	16.0-32.0	15-24
Sponge			9.0-20.0	16.0-32.0	15-24
Spermicide			18.0	29.0	≥25
LAM (Breastfeeding)		Not reported			2-9
Diaphragm		Not reported	6.0	16.0	15-24
No method			85.0	85.0	
	100.0%	38,214			

However, in terms of preventing unintended pregnancies, “[c]ompared with nonuse, even with a time horizon as short as 1 year, use of any method [of contraception]...results in financial savings and health gains.”⁷⁰

The contraceptive services mandate provides coverage for outpatient contraceptive services (consultations, exams, procedures, etc.) to the same extent as other outpatient services and for prescription contraceptive drugs and devices under the same terms and conditions as other prescription drugs and devices. The mandate provides exclusions for church-affiliated employers.

Required direct costs (RDCs) of this mandate were determined to consist of all claims for outpatient contraceptive procedures and consultations (IUD insertion, etc.), all claims for evaluation and management (identified by the evaluation and management, or E&M, CPT4 codes) with a contraception-related diagnosis, and all pharmacy claims for contraceptive drugs and devices for the target population described above in the Methodology section. Total estimated RDC claims PMPM for the calendar 2009 study period was \$1.12, with a total PMPM of \$1.26 (or 0.32 percent of the Commonwealth total) after administrative loading. Self-insured expense for these services was found to be slightly *higher* than RDC, resulting in a lower bound impact estimate of \$0. Table 3 below displays a summary of these results and related statistics.

Table 3
Contraceptive Services Mandate
Contribution to Premium

Measures	Sample FI Amount	Sample SI Amount	FI Minus SI
Sample Users	145,208	71,315	
Sample Units	22,823,019	10,215,505	
Sample Average Members	1,415,111	1,194,618	
PMPM Claims	\$ 1.12	\$ 1.12	\$ (0.00)
PMPM With Admin	\$ 1.26	\$ 1.26	\$ (0.00)

	Upper Bound Impact	Lower Bound Impact*
Insured Population	2,453,671	2,453,671
Contribution to Total Annual Claims	\$ 32,941,611	\$ -
Contribution to Total Annual Premium	\$ 36,987,939	\$ -
Percent of Total Premium	0.32%	0.00%

*Net amounts do not remove overlap in mandated services between the contraceptive services mandate and the certified nurse midwife and nurse practitioner mandate.

Diabetes-related Services and Supplies

Diabetes is one of the most serious and widespread illnesses in America today. The seventh leading cause of death in this country, diabetes affects 8.3% of, or 25.6 million, Americans, including 18.8 million diagnosed and an estimated 7.0 million undiagnosed patients.⁷¹ Over one million new

cases were diagnosed in 2010, and another 35% of adults in the U.S. and 50% of the over 65 population have pre-diabetes.⁷²

Diabetes mellitus is caused by the body's inability to produce or process insulin, the hormone used by the body to absorb and utilize glucose for energy.⁷³ The three most common types of diabetes are: type 1 diabetes, in which a body is unable to produce insulin; type 2 diabetes, which is a combination of a body's resistance to insulin and insufficient insulin production; and gestational diabetes, a pregnancy complication.⁷⁴

When the body's blood glucose levels rise above normal, metabolic problems occur resulting in serious complications and other illnesses. Diabetes reduces normal life expectancy by up to 15 years, and increases the risks of:⁷⁵

- Heart disease, stroke and hypertension: Diabetes increases the risk of heart disease two to four times.
- Kidney failure
- Non-traumatic lower limb amputation: Diabetes patients account for over 60% of nontraumatic lower limb amputations, or about 65,700 in 2006.
- Complications of pregnancy, including major birth defects, spontaneous abortion and excessively large babies: Gestational diabetes also increases a women's risk of type 2 diabetes later in life by 35-60%.
- Nervous system disease, including impaired sensation in hands or feet, slow digestion, carpal tunnel syndrome and erectile dysfunction
- Adult-onset blindness and eye problems
- Dental and periodontal (gum) disease
- Biochemical imbalances, including diabetic ketoacidosis and hyperosmolar coma
- Cognitive impairment
- Incontinence
- Cancer
- Bone fractures
- Depression: Diabetic patients are twice as likely to experience depression as others.
- Decreased activities of daily living and quality of life

Objectives to curb and control diabetes comprise a significant part of Healthy People 2020, the set of national health promotion and disease prevention goals outlined for the next decade by the U.S. Department of Health and Human Services. Key diabetes objectives include reductions to mortality (all-cause, diabetes-related, and cardiovascular disease-related) and lower extremity amputations in part through the following measures (list is not exhaustive):⁷⁶

- Glycemic control and daily self-blood glucose monitoring: Control of an individual's blood glucose level reduces the risk of microvascular complications, including kidney, eye and nerve diseases, as well as the risk of cardiovascular disease.⁷⁷
- Lipid control: Improved control of LDL cholesterol significantly reduces the risk of cardiovascular complications.⁷⁸
- Blood pressure control: Treating early diabetic kidney disease by lowering blood pressure can reduce decline in kidney function and proteinuria (a risk factor for developing kidney disease).⁷⁹
- Annual dental exams: Patients with diabetes are more susceptible to periodontal diseases; good oral hygiene is critical to reducing the effects.⁸⁰
- Annual foot exams: Comprehensive foot care can significantly reduce amputation rates.⁸¹
- Annual eye exams: The detection and treatment of diabetic eye disease significantly reduces the risk of severe vision loss.⁸²
- Diabetes education: "Self-management education or training is a key step in improving health outcomes and quality of life. It focuses on self-care behaviors, such as healthy eating, being active, and monitoring blood sugar. It is a collaborative process in which diabetes educators help people with or at risk for diabetes gain the knowledge and problem-solving and coping skills needed to successfully self-manage the disease and its related conditions."⁸³

The Massachusetts diabetes mandate addresses a wide range of services and supplies related to the treatment of diabetes, including: blood glucose monitoring gear, urine glucose strips, ketone strips, lancets, insulin, insulin syringes, prescribed diabetes medications that influence blood sugar levels, appropriate laboratory tests, insulin pumps, therapeutic shoes and inserts for people who have severe diabetic foot disease, supplies and equipment approved by the FDA, and diabetes outpatient self-management training and education, including medical nutrition therapy.

The diabetes-related services and supplies mandate requires coverage for items medically necessary for diabetics that fall within a category of benefits and services for which coverage is otherwise afforded and that have been prescribed by a healthcare professional. It includes blood glucose monitors, monitoring strips, lancets, insulin, syringes, lab tests, urine & lipid profiles, special shoes, etc.

The RDC of this mandate was calculated as the cost of all claims incurred by target-population members with at least two claims with a primary or secondary diagnosis of diabetes during the

calendar 2009 study period for diabetes-related services, devices, or drugs. Total estimated RDC claims PMPM was \$2.32, with a total PMPM of \$2.61 (or 0.67 percent of the Commonwealth total) after administrative loading. Self-insured costs for these services were found to be *higher* than fully-insured costs, resulting in a lower bound impact estimate of \$0. Table 4 below displays a summary of these results and related statistics.

Table 4

**Diabetes Service Mandate
Contribution to Premium**

Measures	Sample FI Amount	Sample SI Amount	FI Minus SI
Sample Users	55,842	47,902	
Sample Units	8,912,402	6,113,946	
Sample Average Members	1,415,111	1,194,618	
PMPM Claims	\$ 2.32	\$ 2.69	\$ (0.37)
PMPM With Admin	\$ 2.61	\$ 3.02	\$ (0.41)

	Upper Bound Impact	Lower Bound Impact*
Insured Population	2,637,117	2,637,117
Contribution to Total Annual Claims	\$ 73,575,335	\$ -
Contribution to Total Annual Premium	\$ 82,612,839	\$ -
Percent of Total Premium	0.67%	0.00%

*Net amounts do not remove overlap in mandated services between the diabetes mandate and the home health mandate.

Early Intervention Services

Neuroscience has proven that early in life, the human brain is most flexible; as we mature, the brain becomes more specialized and able to conduct complex functions, and less able to reorganize or respond to new challenges.⁸⁴ Brain architecture is mostly developed during the first three years of life, and the primary mode of this early learning is the interaction between a child, his caregivers, and his family as a unit.⁸⁵ For children born at-risk or diagnosed with a developmental delay or disability, these interactions can be compromised, thus impacting their lifelong growth and development.

Early intervention is a group of services and supports designed to decrease the stressors and improve the interactions and early learning of these children,⁸⁶ thereby encouraging healthy physical, social, emotional, and cognitive development.⁸⁷ These services can include speech, physical, and occupational therapy, as well as case management and community referral services, all designed to provide specialized instruction and support services to children and their families.⁸⁸

Early intervention services have been shown to prevent developmental delay, as measured by placement in special education as well as retention in grade when a child becomes school-aged.⁸⁹ Moreover, it is “deemed essential to prevent mental retardation and poor intellectual development

in children whose families do not provide adequate stimulation in the early years of life.”⁹⁰ Outcomes in health, language and communication, cognitive and social/emotional development, as well as academic achievement, have been shown to improve in children who receive high quality early intervention services.^{91,92}

The Early Intervention Services law mandates coverage for all "early intervention services" from birth until age three for children with or at risk for specified developmental delays including chromosomal abnormality, neurological condition, metabolic disorder, visual impairments, permanent hearing loss of any degree, and delayed cognitive, physical, communicative, social, or emotional development.

The RDC of this mandate was calculated as all claims for specifically identified early intervention procedure codes^x plus all claims for evaluation and management procedures performed by certified early intervention providers^{xi} for members under three years of age in the target population and period. Total estimated RDC claims PMPM was \$0.89, with a total PMPM of \$1.00 (or 0.26 percent of the Commonwealth total) after administrative loading. Self-insured expense for these services was found to be \$0.89 PMPM, resulting in a lower bound impact estimate of \$0.11, or 0.03 percent of Commonwealth premium. Table 5 below displays a summary of these results.

Table 5
Early Intervention Services Mandate
Contribution to Premium

Measures	Sample FI Amount	Sample SI Amount	FI Minus SI
Sample Users	6,988	4,706	
Sample Units	950,514	621,514	
Sample Average Members	1,217,493	989,239	
PMPM Claims	\$ 0.89	\$ 0.79	\$ 0.10
PMPM With Admin	\$ 1.00	\$ 0.89	\$ 0.11

	Upper Bound Impact	Lower Bound Impact*
Insured Population	2,453,671	2,453,671
Contribution to Total Annual Claims	\$ 26,331,558	\$ 2,931,386
Contribution to Total Annual Premium	\$ 29,565,951	\$ 3,291,457
Percent of Total Premium	0.26%	0.03%

*Net amounts do not remove overlap in mandated services between the early intervention services mandate and the home health mandate.

^x H2015, T1015, T1023, T1024, T1027, 96153

^{xi} The participating plans differed in the method used to identify EI providers in the claims system: Some plans use specific early intervention procedure code modifiers, others use an early intervention provider type code. Each plan used the criterion appropriate to its specific claims system to identify E&M EI claims. Compass extracted claims from the HCQCC extract based on the carrier-specific rules provided.

Home Health Care

Home health care is a term used to describe a broad range of health care and supportive services provided in the home that “cannot easily or effectively be provided solely by family and friends.” Services are most often used by those recovering from illness or injury, the disabled, or those with a chronic or terminal illness.⁹³

Provision of services in the home allows for more rapid discharge from inpatient settings, or for a delay in need for long-term nursing home or other institutional care.⁹⁴ Use of services continues to grow for a variety of reasons, including the aging of the population, medical advances that allow better disease management, technological advancements, changes to inpatient reimbursement, and patient choice.⁹⁵

Home health care is medically based, and may include:⁹⁶

- Occupational, physical and/or speech therapy and other rehabilitative services
- Skilled nursing
- Medical social services and counseling
- Behavioral and mental health counseling
- Medical case management
- Medication management
- Pain management
- Parenteral and enteral nutrition therapy (tube feeding)
- Infusion therapy
- Hospice and palliative care
- Telemedicine
- Vaccination
- Wound care
- Home medical equipment assistance
- Patient and caregiver education
- Home safety instruction and assistance
- Assistance with activities of daily living (ADLs, including bathing, dressing and eating)
- Home care support (including housekeeping and cooking)

Given the wide variety of available services, summarizing the clinical effectiveness of home health care is especially challenging. However, research has shown that the provision of well-defined, quality home health care services can provide significant clinical benefits. Some studies have found a reduction in mortality and admissions to hospitals and other long-term institutional care,^{97,98}

while others have documented a decrease in the rate of decline of functional status.⁹⁹ Terminally ill patients receiving home health care were more likely to be able to die at home according to their wishes.¹⁰⁰ Moreover, quality of life measures have been shown to be higher with the provision of home health services for terminally ill patients and their caregivers, and rates of satisfaction with care are higher for both patients and caregivers for both terminal and non-terminal illnesses.¹⁰¹

The RDC for this mandate was calculated as all claims for all procedures where the place of service indicated on the claim was the patient’s residence. Total estimated RDC claims PMPM was \$7.39, with a total PMPM of \$8.29 (or 2.14 percent of the Commonwealth total) after administrative loading. Self-insured expense for these services was found to be \$7.83 PMPM, resulting in a lower bound impact estimate of \$0.46, or 0.12 percent of Commonwealth premium. Table 6 below displays a summary of these results and related statistics.

Table 6
Home Health Services Mandate
Contribution to Premium

Measures	Sample FI Amount	Sample SI Amount	FI Minus SI
Sample Users	155,170	101,172	
Sample Units	11,845,520	7,281,168	
Sample Average Members	1,476,274	1,194,618	
PMPM Claims	\$ 7.39	\$ 6.98	\$ 0.41
PMPM With Admin	\$ 8.29	\$ 7.83	\$ 0.46

	Upper Bound Impact	Lower Bound Impact*
Insured Population	2,453,671	2,453,671
Contribution to Total Annual Claims	\$ 217,477,610	\$ 12,040,863
Contribution to Total Annual Premium	\$ 244,191,111	\$ 13,519,882
Percent of Total Premium	2.14%	0.12%

*Net amounts do not remove overlap in mandated services between the home health mandate and the diabetes, early intervention, low protein foods, mental health, nonprescription enteral formulas, podiatrist, scalp prosthesis and limb prosthesis mandates.

Hormone Replacement Therapy (HRT)

The use of hormone replacement therapy has undergone significant changes over the last two decades in the United States. Primarily approved and effective for the treatment of menopause-related vasomotor symptoms such as night sweats and hot flashes, as well as vulvar and vaginal atrophy,¹⁰² estrogen therapy (ET) with and without progestogen (combination therapy, or EPT) became routinely prescribed in this country for the treatment of other chronic diseases in women.

It was this change in prescribing practices for off-label uses that was studied by the National Heart, Lung & Blood Institute (NHLBI), part of the National Institutes of Health, in the landmark 1998 Women’s Health Initiative (WHI) clinical trials. WHI focused on the prevention of heart disease,

breast and colorectal cancer and osteoporosis in postmenopausal women through clinical trials studying hormone therapy, dietary patterns, and calcium/vitamin D supplements.¹⁰³

Research published from the WHI found that while hormone therapy reduced risks of colorectal cancer and fractures from osteoporosis, it potentially increased risks for coronary heart disease, breast cancer, venous thromboembolism, stroke, cholecystitis, dementia, and lower global cognitive function.¹⁰⁴ In response, the U.S. Preventive Services Task Force (USPSTF) issued its recommendations against the use of ET and EPT for the prevention of chronic conditions in postmenopausal women.¹⁰⁵ Likewise, the U.S. Food and Drug Administration (FDA) ordered all products for postmenopausal women containing estrogen to display a warning outlining the risks of prolonged use.¹⁰⁶ Studies shortly after these actions showed that practice patterns changed rapidly in response, and many women discontinued the use of the hormonal therapies.¹⁰⁷

At the same time, however, other studies which surveyed providers found widespread skepticism over the WHI results.¹⁰⁸ Critics claimed that the trials ended too early,¹⁰⁹ and that the study groups were not representative of the general population, making the findings difficult to generalize.

Medical societies responded with recommendations calling for doctors to assess the risks and benefits of hormone replacement therapy on a patient-by-patient basis. The American College of Obstetricians and Gynecologists (ACOG) states, “We continue to support the judicious, individualized use of estrogen and progestin for bone protection and believe that it is inappropriate to withhold this treatment option from those who need it and would benefit from it.”¹¹⁰ ACOG goes on to say that while hormone therapy should not be used for the prevention of diseases, it is appropriate for its approved treatment of vasomotor symptoms. The recommendation calls on women to discuss the benefits and risks of use with their doctor, and to use the smallest possible dose for the shortest possible time for treatment.¹¹¹

More recent research has found that the benefit-to-risk ratio is greatest for women closest to menopause and decreases with age. Further, results are positive for postmenopausal women at highest risk for osteoporosis or fracture.¹¹² These studies find that both the risks and benefits of hormone therapy are contingent on the specific type and combination of hormones, the route of administration, and the timing of therapy, both in terms of length of treatment and its initiation relative to menopause.¹¹³ In their most recent recommendation,^{xii} the North American Menopause Society (NAMS) states:

Use of HT should be consistent with treatment goals, benefits, and risks for the individual woman. The benefit-risk ratio for an individual woman continually changes with her age and her menopause-related symptoms (e.g., vasomotor symptoms, sleep disturbance, vaginal atrophy, dyspareunia, or diminished libido), any of which may have an adverse impact on quality of life (QOL). Risk factors are related to: a woman’s baseline disease risks, her age, age at menopause, cause of

^{xii} This NAMS position statement has been endorsed by: HealthyWomen (formerly the National Women’s Health Resource Center); Asociación Mexicana para el Estudio del Climaterio (AMEC); Society of Obstetricians and Gynaecologists of Canada (SOGC); The Endocrine Society; American Medical Women’s Association (AMWA); and National Association of Nurse Practitioners in Women’s Health (NPWH).

menopause, time since menopause, and prior use of any hormone including type, route of administration, dose, and medical conditions that emerged during treatment.

Other provider organizations continue to weigh the use of hormone therapy for the prevention of certain diseases, such as cardiovascular disease. In a statement representing a host of other organizations including the CDC, NHLBI, and ACOG,^{xiii} the American Heart Association recommends that a “conservative approach be taken in clinical practice unless further research is available to support use for CVD [cardiovascular disease] prevention.” They do not recommend hormone therapy for CVD prevention, and echo ACOG and NAMS in urging women and their providers to weigh the benefits and risks of this treatment.¹¹⁴

Table 7

**Hormone Replacement Therapy Mandate
Contribution to Premium**

Measures	Sample FI Amount	Sample SI Amount	FI Minus SI
Sample Users	11,992	5,704	
Sample Units	1,611,552	825,208	
Sample Average Members	1,415,111	1,194,618	
PMPM Claims	\$ 0.09	\$ 0.10	\$ (0.01)
PMPM With Admin	\$ 0.11	\$ 0.11	\$ (0.01)

	Upper Bound Impact	Lower Bound Impact*
Insured Population	2,453,671	2,453,671
Contribution to Total Annual Claims	\$ 2,754,721	\$ -
Contribution to Total Annual Premium	\$ 3,093,092	\$ -
Percent of Total Premium	0.03%	0.00%

*No areas of overlap were observed for the HRT mandate.

^{xiii} Representing the following participating organizations and major cosponsors: the American Heart Association; American College of Cardiology; American College of Nurse Practitioners; American College of Obstetricians and Gynecologists; American College of Physicians; American Medical Women’s Association; Association of Black Cardiologists; Centers for Disease Control and Prevention; National Heart, Lung and Blood Institute; Office of Research on Women’s Health; Society of Thoracic Surgeons; and World Heart Federation.

In addition, endorsed by: the American Academy of Physician Assistants; American Association for Clinical Chemistry; American Association of Cardiovascular and Pulmonary Rehabilitation; American Diabetes Association; American Geriatrics Society; American Society for Preventive Cardiology; American Society of Echocardiography; American Society of Nuclear Cardiology; Association of Women’s Health, Obstetric and Neonatal Nurses; Canadian Women’s Health Network; Jacobs Institute for Women’s Health; National Black Women’s Health Imperative; National Women’s Health Resource Center; The North American Menopause Society; Partnership for Gender-Specific Medicine at Columbia University; Preventive Cardiovascular Nurses Association; Sister to Sister: Everyone Has a Heart Foundation Inc.; Society for Women’s Health Research; Society of Geriatric Cardiology; The Mended Hearts Inc; WomenHeart the National Coalition for Women With Heart Disease; and Women’s Health Research Center.

The HRT mandate covers hormone replacement therapy (HRT) for all peri- and post-menopausal women covered under plans that provide coverage for outpatient therapy. RDC for this mandate was calculated as all claims for specific hormone replacement therapy procedures and pharmaceuticals as well as Evaluation and Management (E&M) procedures with a diagnosis (in any of the top five diagnosis columns) associated with menopause-related hormone regulation. Total estimated RDC claims PMPM was \$0.09, with a total PMPM of \$0.11 (or 0.03 percent of the Commonwealth total) after administrative loading. Self-insured costs for these services were found to be *higher* than fully-insured costs, resulting in a lower bound impact estimate of \$0. Table 7 above displays a summary of these results and related statistics.

Human Leukocyte Antigen Testing (HLA)

There are many diseases for which a bone marrow or cord blood transplant (BMT) is part of a standard treatment, and many others for which BMT has become a new option. These include leukemia and certain lymphoma, metabolic, blood, autoimmune, and genetic disorders.¹¹⁵ Transplants are intended to replace blood-forming cells, and can come from one of three sources: bone marrow, cord blood, or, most commonly, peripheral blood.^{116,117}

To match patients to suitable donors, human leukocyte antigen (HLA) typing is conducted. HLAs are proteins found in most cells that serve as immunologic markers; the best matches for BMTs are siblings who have identical markers.¹¹⁸ Sibling matches account for only 30% of BMTs, leaving 70% of patients in need of an unrelated donation; of these, only 20% receive a transplant from an unrelated or mismatched donor.^{119,120}

The better the HLA match between patient and donor, the better a patient's chances for survival.¹²¹ Mismatched HLA puts a patient at risk for acute and chronic graft-versus-host disease (GVHD), graft rejection, and treatment related mortality.¹²² However, according to the National Marrow Donor Program (NMDP), an imperfect match does not contraindicate transplantation; instead, "a less-than-optimal match is another risk factor to be considered in developing the patient's treatment plan."¹²³

While there are many HLA markers, only a small number are critical to transplant outcomes. The NMDP currently requires a minimum number of matches from a series of six HLA markers (two A, two B, and two DRB1) in order for a transplant to be made from its registry. Matches must be made on at least five markers for adult donors, and on at least four markers for cord blood.¹²⁴ Recent research also recommends matching on additional HLA-C markers, finding more successful outcomes are associated with this additional matching criteria.^{125,126} In fact, the NMDP recommends testing "at HLA-A, -B, -C and -DRB1," and states that the additional marker can help increase successful matching.¹²⁷ Testing for the HLA-C marker is not currently included in the Massachusetts mandate.

The HLA mandate requires "coverage for the cost of human leukocyte antigen testing or histocompatibility locus antigen testing that is necessary to establish bone marrow transplant donor suitability." Since the recent advent of DNA testing for compatibility, the traditional

serological test has largely been supplanted, although a small volume of serological tests are still performed.

Total estimated RDC claims PMPM was \$0.0049, with a total PMPM of \$0.0055 (or 0.00 percent of the Commonwealth total) after administrative loading. Self-insured expense for these services was found to be \$0.0029 PMPM, resulting in a lower bound impact estimate of \$0.0026, or 0.00 percent of Commonwealth premium. Table 8 below displays a summary of these results and related statistics.

Table 8
HLA Testing Mandate
Contribution to Premium

Measures	Sample FI Amount	Sample SI Amount	FI Minus SI
Sample Users	370	203	
Sample Units	888	431	
Sample Average Members	1,476,274	1,194,618	
PMPM Claims	\$ 0.0049	\$ 0.0026	\$ 0.0023
PMPM With Admin	\$ 0.0055	\$ 0.0029	\$ 0.0026

	Upper Bound Impact	Lower Bound Impact*
Insured Population	2,637,117	2,637,117
Contribution to Total Annual Claims	\$ 153,713	\$ 71,917
Contribution to Total Annual Premium	\$ 172,594	\$ 80,751
Percent of Total Premium	0.00%	0.00%

*No areas of overlap were observed for the HLA mandate.

Hypodermic Syringes or Needles

Many medications are self-administered by injection, requiring the use of sterile hypodermic needles or syringes. A wide range of illnesses are treated with patient-delivered injectable therapies, including multiple sclerosis,¹²⁸ infertility,¹²⁹ pernicious anemia,¹³⁰ iron deficiency,¹³¹ cancer,¹³² and HIV/AIDS.¹³³ Often these drugs must be injected, as the specific medication would be destroyed in the digestive process or is not tolerated orally.¹³⁴ Injectable drugs can also deliver a particular dosage of a drug over a long period of time, up to several months.¹³⁵

One disadvantage of injection, particularly self-injection, is the risk of infection; patients also may have a fear of needles, known as belonephobia, or may be unable or unwilling to self-administer the drug by injection.¹³⁶

The statutory sections requiring coverage for syringes and needles (e.g., M.G.L. c. 175 § 47Y) are part of a bill addressing a broad set of issues relating to preventing transmission of blood-borne diseases, including needle distribution programs for users of illegal drugs. However, the mandate language included in this review is limited to medically necessary use of needles covered by insurers. While theoretically that might encompass illegal drug injection, those scenarios are

outliers and addressing the issues surrounding them is beyond the scope of this review. The RDC of this mandate was calculated as the sum of all claims with syringe or needle procedure codes.^{xiv} Total estimated RDC claims PMPM was \$0.003, with a total PMPM of \$0.003 (or 0.0009 percent of the Commonwealth total) after administrative loading. Self-insured expense for these services was found to be \$0.002 PMPM, resulting in a lower bound impact estimate of \$0.001, or 0.0003 percent of Commonwealth premium. Table 9 below displays a summary of these results and related statistics.

Table 9
Syringe Mandate
Contribution to Premium

Measures	Sample FI Amount	Sample SI Amount	FI Minus SI
Sample Users	2,268	1,554	
Sample Units	24,960	15,705	
Sample Average Members	1,476,274	1,194,618	
PMPM Claims	\$ 0.003	\$ 0.002	\$ 0.001
PMPM With Admin	\$ 0.003	\$ 0.002	\$ 0.001

	Upper Bound Impact	Lower Bound Impact*
Insured Population	2,453,671	2,453,671
Contribution to Total Annual Claims	\$ 91,481	\$ 28,803
Contribution to Total Annual Premium	\$ 102,718	\$ 32,340
Percent of Total Premium	0.00%	0.00%

*No areas of overlap were observed for the syringe mandate.

Infertility Treatment

Infertility is clinically defined as the inability to become pregnant after one year of trying, for women who are of normal childbearing age; infertility also includes a history of multiple miscarriages.¹³⁷ It is estimated that 25% of couples experience infertility at some point, and about 20% consult their physicians regarding the condition; of these, approximately half require specialist care.¹³⁸ These numbers continue to rise as women attempt conception later in life.

Research shows that the causes of infertility are approximately evenly divided between conditions affecting the woman, conditions affecting the man, and unknown causes.¹³⁹ A large number of specific conditions are described within those categories. For women, the most common cause is problems with ovulation, but many other physical, genetic or environmental causes exist.¹⁴⁰ For men, the most common cause of infertility is problems with sperm (concentration, motility, and morphology), most often caused by physical or environmental factors.¹⁴¹

^{xiv} A4206, A4207, A4208, A4209, A4212, A4657, & K0552.

A large number of treatments are available for infertility, and choosing among them depends on a variety of factors, including the age and health of the parents; the causes, severity and duration of infertility; side effects; and treatment preferences.¹⁴² Generally, however, treatments can be categorized as expectant management (including lifestyle changes), surgery, controlled ovarian stimulation (COS), intrauterine insemination, and advanced assisted reproduction techniques (ART).¹⁴³ Most often, infertility is treated with medication and/or surgery to repair reproductive organs.¹⁴⁴

The effectiveness of infertility treatments is difficult to summarize. Many treatments have not been evaluated, and the definition of successful treatment is not standard.^{145,146} One study summarized, “there is little convincing evidence on which to base treatment strategies for the majority of infertile couples. More high-quality data on the relative superiority of each treatment option, and associated adverse events, are needed.”¹⁴⁷ Testing and treatment practices of infertility specialists vary widely and are evolving rapidly, while the age of couples seeking treatment continues to rise.¹⁴⁸

ART treatments, most frequently in-vitro fertilization (IVF) or intracytoplasmic sperm injection (ICSI),¹⁴⁹ now results in “reasonably high pregnancy rates,”¹⁵⁰ this success is prompting more patients to seek ART treatments sooner for their infertility.¹⁵¹ However, there are major risks associated with ART, most notably multi-fetal and especially higher-order (triplets or more) gestations. More than 30% of pregnancies resulting from ART are twins or higher-order multiple gestations;¹⁵² the complications of multiple gestations are well-documented. More than 50% of ART-related neonates are born from a multifetal gestation.¹⁵³ For singleton pregnancies, IVF is associated with a slight increased risk of birth defects, as well as preterm delivery, perinatal mortality, and infants small for their gestational age.¹⁵⁴ Maternal complication risk increases for preeclampsia, gestational diabetes, placenta previa, placental abruption, and cesarean delivery.¹⁵⁵ Beyond these, for women themselves, the major complication of ART for women is ovarian hyperstimulation syndrome (OHSS).¹⁵⁶

Many professional societies and organizations now recommend that the measurement of the effectiveness of infertility treatment, specifically ART, should be the birth of a single, healthy child.¹⁵⁷ They caution, however, that this goal may not be accepted for many reasons, including “insufficient awareness of the risks and costs associated with multiple pregnancy among the general public and policy makers,” limitations in certain aspects of the ART process itself, the cost of repeated treatment cycles, and competition between fertility specialists based on pregnancy or birth rates per cycle.¹⁵⁸

The infertility mandate requires coverage for infertility treatments for members covered under plans that include pregnancy-related benefits to the same extent benefits are provided for other pregnancy-related procedures. The RDC for this mandate was calculated from all claims for infertility-related procedure codes and pharmaceuticals, as well as E&M procedures for members with a diagnosis of infertility. The total estimated RDC claims PMPM was \$3.27, with a total PMPM of \$3.67 (or 0.95 percent of the Commonwealth total) after administrative loading. Self-insured expense for these services was found to be \$2.76 PMPM, resulting in a lower bound impact estimate

of \$0.91, or 0.23 percent of Commonwealth premium. Table 10 below displays a summary of these results and related statistics.

Table 10

**Infertility Services Mandate
Contribution to Premium**

Measures	Sample FI Amount	Sample SI Amount	FI Minus SI
Sample Users	16,864	12,226	
Sample Units	316,032	178,240	
Sample Average Members	1,415,111	1,194,618	
PMPM Claims	\$ 3.27	\$ 2.46	\$ 0.81
PMPM With Admin	\$ 3.67	\$ 2.76	\$ 0.91

	Upper Bound Impact	Lower Bound Impact*
Insured Population	2,453,671	2,453,671
Contribution to Total Annual Claims	\$ 96,327,690	\$ 23,832,267
Contribution to Total Annual Premium	\$ 108,159,942	\$ 26,759,664
Percent of Total Premium	0.95%	0.23%

*No areas of overlap were observed for the infertility mandate.

Low Protein Foods (LPF)

Phenylketonuria (PKU) is a metabolic disorder that results in a liver enzyme deficiency, leading to increased levels of the amino acid phenylalanine (Phe) in the blood and other tissues.¹⁵⁹ Untreated, PKU can lead to microencephaly, mental retardation, seizures, and other significant physical, mental, behavioral, and developmental disorders.^{160,161} Women with untreated PKU during pregnancy may bear children prematurely, or who suffer from microencephaly, physical or mental retardation, severe developmental delays, or birth defects.¹⁶²

Current treatment for PKU requires strict dietary control to lower the level of the Phe amino acid in the body; this includes the consumption of specialized low-protein foods and formulas. When PKU is treated early in life with a low-Phe diet, the outcomes have shown “remarkable success in preventing the devastating brain damage associated with untreated PKU.”¹⁶³ In fact, those able to achieve and maintain metabolic control “have normal health and development and can likely expect a normal life span.”¹⁶⁴ To reduce the risk of birth defects and other developmental abnormalities to their offspring, mothers at risk for PKU during pregnancy must achieve and maintain dietary control, preferably before conception.¹⁶⁵

In conducting its study of the effectiveness and cost savings of PKU screening and treatment, the NIH Consensus Statement concludes the following: “Most economic analyses of PKU screening are more than 10 years old. Methodological approaches vary widely among the studies. All published

studies, however, find that PKU screening and treatment represent a net direct cost savings to society...”¹⁶⁶

The LPF mandate covers low protein food products required to treat infants and children with specified metabolic disorders as well as fetuses of pregnant women with PKU. Costs of the mandate were estimated as all claims incurred in the study period for procedure codes indicating the purchase of low protein food products. Total estimated RDC claims PMPM was \$0.05, with a total PMPM of \$0.06 (or 0.01 percent of the Commonwealth total) after administrative loading. Self-insured expense for these services was found to be slightly *higher* than RDC, resulting in a lower bound impact estimate of \$0. Table 11 below displays a summary of these results and related statistics.

Table 11

**Low Protein Foods Mandate
Contribution to Premium**

Measures	Sample FI Amount	Sample SI Amount	FI Minus SI
Sample Users	230	199	
Sample Units	178,487	112,331	
Sample Average Members	1,476,274	1,194,618	
PMPM Claims	\$ 0.05	\$ 0.05	\$ (0.00)
PMPM With Admin	\$ 0.06	\$ 0.06	\$ (0.00)

	Upper Bound Impact	Lower Bound Impact*
Insured Population	2,453,671	2,453,671
Contribution to Total Annual Claims	\$ 1,445,415	\$ -
Contribution to Total Annual Premium	\$ 1,622,960	\$ -
Percent of Total Premium	0.01%	0.00%

*Net amounts do not remove overlap in mandated services between the low protein foods mandate and the home health mandate.

Mental Health Care

Mental illness is the leading cause of disability in America, with 25% of all years of life lost to disability and premature mortality attributed to it.¹⁶⁷ This includes suicide, the 11th leading cause of death in America, with over 30,000 cases each year.¹⁶⁸

According to Healthy People 2020, mental health is “a state of successful performance of mental function, resulting in productive activities, fulfilling relationships with other people, and the ability to adapt to change and to cope with challenges.”¹⁶⁹ Mental illness occurs when there is an abnormality in thinking (cognition) or perception, emotion or mood, or with behavioral integration, such as planning and social interactions.¹⁷⁰ Major categories of mental disorders include:¹⁷¹

- Anxiety disorders, including panic disorder, generalized anxiety disorder, agoraphobia without panic disorder, specific phobia, social phobia, posttraumatic stress disorder, obsessive-compulsive disorder, separation anxiety disorder
- Psychotic disorders, including schizophrenia, schizoaffective disorder, delusional disorder, paraphrenia
- Mood disorders, including major depressive disorder, dysthymia, bipolar disorder I or II
- Impulse control disorders, including oppositional defiant disorder, conduct disorder, attention-deficit/hyperactivity disorder, intermittent explosive disorder
- Substance use disorders, including alcohol and drug abuse and dependence
- Disorders of childhood, including separation anxiety disorder, oppositional defiant disorder, conduct disorder, and attention deficit/hyperactivity disorder

Some epidemiology surveys estimate that up to 30% of U.S. adults suffer from mental illness in any given year,¹⁷² with up to 13 million, or 5.8% suffering from “a seriously debilitating mental illness.”¹⁷³ In one national survey, 14% of the U.S. population was found to have moderate to serious cases of mental disorder. Anxiety disorders were the most common, although within that group the proportion of serious cases was lower than for other categories of mental illness. Mood disorders were the next most common, and had the highest proportion of serious cases. Impulse control disorders comprised more than one-third of cases, with more serious cases than anxiety or substance abuse disorders. This study also found a strong correlation between the severity of a case and co-morbidity, and noted that over 40% of cases of mental illness were co-morbid for more than one type of disorder.¹⁷⁴

In 2008, 13.4% of adults in the United States received treatment (inpatient, outpatient or prescription medication) for a mental health problem, up from 12.8% in 2004. This includes all adults who received care in inpatient or outpatient settings and/or used prescription medication for mental or emotional problems.¹⁷⁵ Of adults with a serious mental illness, only 58.7% received treatment, most commonly with outpatient services and/or prescription medication;¹⁷⁶ for children, this figure falls to 50.1%.¹⁷⁷ Research shows that overall fewer than 50% of people with a mental illness receive treatment, in part because a large proportion of these are mild or ‘self-limiting.’¹⁷⁸

Successful treatment of mental illness is critical to both mental and physical health, as studies continue to link physical and mental health issues. Simply put, those with mental illnesses are less able to exercise health-promoting behaviors, while individuals with chronic illnesses are more likely to suffer from mental health issues that may in turn impede treatment and recovery.

The seminal 1999 U.S. Surgeon General’s report on mental illness noted that “[t]he efficacy of mental health treatments is well documented, and...a range of treatments exists for most mental disorders.”¹⁷⁹ These treatments generally fall into the broad categories of psychosocial and pharmacological, and may incorporate multimodal therapy, or a combination of the two.

Psychosocial therapy encompasses a broad array of treatments, most generically categorized as:¹⁸⁰

- Psychodynamic therapy, or treatments to ‘make the unconscious conscious’ or to help develop an understanding of troubling actions as well as a course of correction.
- Behavioral therapy, which focuses on understanding and correcting current behavior. This category includes cognitive-behavior therapy which incorporates the understanding and replacement of certain ‘faulty cognitions’ with new thoughts that promote adaptive behavior.
- Humanistic therapy, which emphasizes the present and immediate feelings (as opposed to thoughts or behaviors), as well as the potential for future development and personal growth.

Pharmacological therapy for mental illness generally refers to drugs categorized as antipsychotics, antidepressants, antianxiety, stimulants, and antimanic.¹⁸¹

Research continues to evolve regarding the efficacy of specific treatments for specific mental illnesses and co-morbidities, reflected in recommendations such as those from the U.S. Preventive Services Task Force (USPSTF). For example, in a series of recommendations updated in 2009 specific to major depressive disorder (MDD), the USPSTF found evidence that treatment of adults with antidepressants, psychotherapy, or a combination decreases morbidity and improves clinical outcomes,¹⁸² and that treatment of adolescents with selective serotonin reuptake inhibitors (SSRIs), psychotherapy or a combination decreases the symptoms of MDD.¹⁸³

Table 12

**Mental Health Services Mandate
Contribution to Premium**

Measures	Sample FI Amount	Sample SI Amount	FI Minus SI
Sample Users	135,864	82,518	
Sample Units	1,687,764	1,056,558	
Sample Average Members	1,476,274	1,194,618	
PMPM Claims	\$ 8.99	\$ 7.53	\$ 1.46
PMPM With Admin	\$ 10.09	\$ 8.45	\$ 1.64

	Upper Bound Impact	Lower Bound Impact*
Insured Population	2,637,117	2,637,117
Contribution to Total Annual Claims	\$ 284,394,557	\$ 46,258,641
Contribution to Total Annual Premium	\$ 319,327,689	\$ 51,940,744
Percent of Total Premium	2.60%	0.42%

*Net amounts do not remove overlap in mandated services between the mental health mandate and home health and nurse practitioner mandates.

The Massachusetts mandate provides coverage for services to treat certain mental illnesses, including schizophrenia, bipolar disorder, obsessive-compulsive disorder, affective disorders, eating disorders, PTSD, and autism, and any biologically-based disorders recognized by the Commissioner of the Massachusetts Department of Mental Health. Claims covered pursuant to this mandate were identified as claims for mental health procedures and psychoactive pharmaceuticals incurred by members with a diagnosis for one of the specified disorders during the study period as well as E&M procedures for these members that listed a primary, secondary, or tertiary diagnosis for one of the listed disorders.

Total estimated RDC claims PMPM was \$8.99, with a total PMPM of \$10.09 (or 2.6 percent of the Commonwealth total) after administrative loading. Self-insured expense for these services was found to be \$8.45 PMPM, resulting in a lower bound impact estimate of \$1.64, or 0.42 percent of Commonwealth premium. Table 12 above displays a summary of these results and related statistics.

Nonprescription Enteral Formulas

Nonprescription enteral formulas are used in the treatment of a variety of diseases, including cancer, neurological, and gastrointestinal diseases, when a patient's diet does not meet his nutritional needs and results in continued weight loss and prolonged starvation.¹⁸⁴ And while home enteral nutrition (EN), or tube feeding, is a "life-sustaining therapy for patients who are unable to meet nutrient needs by oral intake," research indicates that indications for its use should be outcome specific.^{185,186} Some studies have found that "EN has been accepted and implemented despite the lack of convincing scientific support of efficacy," and encourage providers to determine the effectiveness of such therapy by specific disease-state and its corresponding research and evidence.¹⁸⁷

Nevertheless, malnutrition is a serious complication of many diseases, and enteral feeding, when appropriately prescribed and used, can minimize complications and be life-saving.¹⁸⁸ And while tube feeding helps a patient avoid prolonged starvation and its inevitable organ failure, it also serves to maintain the intestinal tract's integrity and local defense barrier, thereby preventing additional digestive deterioration and the spread of destructive bacteria.¹⁸⁹ According to the American Gastroenterological Association, "[t]ube feeding should be considered when the patient cannot or will not eat, the patient has a functional gut, and a method of access can be safely obtained."¹⁹⁰

The mandate requires "coverage for nonprescription enteral formulas for home use...which are medically necessary for the treatment of mal-absorption caused by Crohn's disease, ulcerative colitis, gastro-esophageal reflux, gastrointestinal motility, chronic intestinal pseudo-obstruction, and inherited diseases of amino acids and organic acids." Therefore, all claims with a procedure code indicating purchase of such formulas and a primary diagnosis of a covered disorder were summed to estimate RDC.

Total estimated RDC claims PMPM was \$0.009, with a total PMPM of \$0.01 (or 0.003 percent of the Commonwealth total) after administrative loading. Self-insured expense for these services was

found to be \$0.005 PMPM, resulting in a lower bound impact estimate of \$0.004, or 0.001 percent of Commonwealth premium. Table 13 below displays a summary of these results and related statistics.

Table 13
Nonprescription Enteral Formulas Mandate
Contribution to Premium

Measures	Sample FI Amount	Sample SI Amount	FI Minus SI
Sample Users	64	31	
Sample Units	45,384	34,070	
Sample Average Members	1,476,274	1,194,618	
PMPM Claims	\$ 0.009	\$ 0.005	\$ 0.004
PMPM With Admin	\$ 0.010	\$ 0.005	\$ 0.004

	Upper Bound Impact	Lower Bound Impact*
Insured Population	2,637,117	2,637,117
Contribution to Total Annual Claims	\$ 274,379	\$ 122,426
Contribution to Total Annual Premium	\$ 308,082	\$ 137,464
Percent of Total Premium	0.00%	0.00%

*Net amounts do not remove overlap in mandated services between the nonprescription enteral formula mandate and the home health mandate.

Prosthetic Devices

Prosthetics are used to assist with ambulation and participation in activities of daily living among those with an amputation or loss of limb.¹⁹¹ Amputations are performed for several reasons, including congenital anomalies, as complications from certain diseases such as peripheral vascular disease or cancer, or because of severe trauma to limbs.¹⁹² In 2005, it was estimated that over 1.5 million Americans, or 1 in 190, suffered with limb loss, not including those from cases of congenital anomaly (<1% of total incidence or 26 per 100,000 live births¹⁹³) or amputations performed in Veterans Administration or military hospitals, including cases deriving from combat,¹⁹⁴ which in total may account for another 10% of cases.¹⁹⁵ Of these, over half (54%) were due to dysvascular disease, most frequently diabetes, which accounted for 38% of overall reported cases.¹⁹⁶

To understand prevalence of individuals with limb loss and incidence rates of new amputations, it is critical to look at the age of patients. Over 64% of dysvascular disease-related amputations occur among adults 65 and older. As the population ages and the number of individuals diagnosed with diseases such as diabetes continue to rise, annual new cases of amputations are expected to double by 2050.¹⁹⁷ Within the same timeframe, the number of people living with a lost limb, and thus in need of prosthetics and related services, is estimated to triple. This is due to the age of the patients: although only 16% of hospital discharges related to amputation are due to trauma, trauma cases account for approximately 45% of people living with limb loss, two thirds of whom are adolescents and adults younger than 45.¹⁹⁸

2005 U.S. Estimates of Prevalence of Limb Loss by Type and Etiology (000s)			
Etiology	Total	Lower limb	Upper limb
All etiologies	1568	1027	541
Dysvascular disease: total	846	806	39
Dysvascular disease with comorbidity of diabetes	592	571	22
Trauma	704	207	498
Cancer	18	14	3

In general, amputations are categorized as upper limb (arm and hand), and lower limb (leg and foot).¹⁹⁹ Each type of amputation requires a different prosthetic, each with its own rate of effectiveness.

Overall, younger patients are more likely to suffer from upper limb loss, while older patients from lower limb loss. Lower limb prosthetics have higher rates of acceptance and daily use, while upper limb prosthetics have higher rates of abandonment.²⁰⁰ These findings may be attributable to overall intended functions for each prosthetic type. Lower limb prostheses are designed to accomplish gross motor tasks, including weight bearing, balance, ambulation, function, as well as provide more natural cosmetic appearance,²⁰¹ functions “well substituted for by the prosthesis.”²⁰² For upper limbs, prosthetics must perform fine motor tasks such as prehension and balance in addition to movement and natural cosmetic appearance.²⁰³ Moreover, in the case of thumb amputation, the prosthesis must provide opposition. Generally, fine motor functions are “not well served by a prosthetic device.”²⁰⁴ Acceptance rates and functionality improve while abandonment decreases with early prosthetic fittings, which also decreases risk of phantom pain syndromes.²⁰⁵

The clinical effectiveness of a prosthetic device is dependent upon many factors. According to one source, “[i]n general, the longer the residual limb and the more joints preserved, the more functional the prosthesis.”²⁰⁶ However, while function is critical to measuring effectiveness, psychosocial factors are also important to understanding quality of life and the ability level of patients, as well as their own self-image and sense of difference.^{207,208} As summarized by one study, prosthetic effectiveness “revolve around what people can practically achieve with a prosthetic limb, and the management of personal information and identity.”²⁰⁹ In fact, while most amputees with prosthetics used them extensively and expressed satisfaction with the device’s overall performance and quality, a large number were dissatisfied with their own interpersonal skills with the prosthetic, and almost 33% were dissatisfied with their comfort.²¹⁰ These psychosocial effects are influenced by such factors as time since amputation, social support, satisfaction with prosthesis, personality disposition, active coping attempts, the level of amputation, and the level of pain and phantom limb sensation.^{211,212}

Complications related to loss of limb include: psycho-social adjustment; skin disorders, including increased moisture, blisters, allergic reactions; pain and phantom limb sensations;²¹³ and heterotopic ossification, or an overgrowth of bone instead of scar tissue.²¹⁴ In the short-term, prosthetic patients are more likely to experience depression and anxiety, as well as social discomfort and body-image anxiety.²¹⁵ As patients age, additional complications include:

musculoskeletal impairments, including degenerative joint diseases, osteoarthritis and reduced bone mass density; increased risk for cardiovascular disease and pulmonary dysfunction.²¹⁶

The limb prostheses mandate requires coverage for prosthetic devices and repairs under the same terms and conditions that apply to other durable medical equipment covered under the policy and places restrictions on the use of annual or lifetime limits for prosthetic devices. The RDC of this mandate was calculated as the sum of all claims with procedure codes for limb prosthetic devices and repairs. Total estimated RDC claims PMPM was \$0.123, with a total PMPM of \$0.138 (or 0.04 percent of the Commonwealth total) after administrative loading. Self-insured expense for these services was nearly the same level as for fully-insured at \$0.134 PMPM, resulting in a lower bound impact estimate of \$0.005, or 0.00 percent of Commonwealth premium. Table 14 below displays a summary of these results and related statistics.

Table 14

**Limb Prosthesis Mandate
Contribution to Premium**

Measures	Sample FI Amount	Sample SI Amount	FI Minus SI
Sample Users	427	342	
Sample Units	5,394	4,695	
Sample Average Members	1,476,274	1,194,618	
PMPM Claims	\$ 0.123	\$ 0.119	\$ 0.004
PMPM With Admin	\$ 0.138	\$ 0.134	\$ 0.005

	Upper Bound Impact	Lower Bound Impact*
Insured Population	2,637,117	2,637,117
Contribution to Total Annual Claims	\$ 3,902,631	\$ 137,826
Contribution to Total Annual Premium	\$ 4,382,005	\$ 154,756
Percent of Total Premium	0.04%	0.00%

*Net amounts do not remove overlap in mandated services between the limb prosthesis mandate and the home health mandate.

Speech and Audiology Services

Speech and language disorders and delays are associated with a wide variety of conditions, ranging from chronic illnesses such as cerebral palsy and Parkinson’s and Huntington’s diseases to acute events such as brain injuries and strokes. The specific problems vary widely, as do treatment methods and modalities. For children, “[p]rimary speech and language delay/disorder is a common developmental difficulty which, if unresolved, can cause difficulties of both learning and socialisation lasting into adolescence and beyond.”²¹⁷ In general, “[s]peech and language therapy aims to maximize [the] ability to communicate through speech, gesture, and/or supplementary means, such as communication aids, and to enable [patients] to become independent communicators.”^{218,219}

Most studies reviewed suggest the effectiveness of treatment for speech, hearing, and language disorders in general; however, most of the conclusions are based on “clinical opinion’ rather than on controlled clinical trials.”²²⁰ Many investigators cited the need for additional research to be conducted using rigorous scientific methodology, and for the development of more consistent standards of treatment methods and interventions, as well as evidence-based practice guidelines for the variety of conditions requiring speech, hearing, and language therapies.^{221, 222, 223, 224, 225}

Table 15
Speech and Hearing Services Mandate
Contribution to Premium

Measures	Sample FI Amount	Sample SI Amount	FI Minus SI
Sample Users	666	495	
Sample Units	5,298	4,710	
Sample Average Members	1,476,274	1,194,618	
PMPM Claims	\$ 0.05	\$ 0.05	\$ (0.01)
PMPM With Admin	\$ 0.05	\$ 0.06	\$ (0.01)

	Upper Bound Impact	Lower Bound Impact*
Insured Population	2,637,117	2,637,117
Contribution to Total Annual Claims	\$ 1,425,270	\$ -
Contribution to Total Annual Premium	\$ 1,600,341	\$ -
Percent of Total Premium	0.01%	0.00%

*No areas of overlap were observed for the speech and hearing services mandate.

This mandate provides for "expenses incurred in the medically necessary diagnosis and treatment of speech, hearing and language disorders by individuals licensed as speech-language pathologists or audiologists." The RDC of this mandate was calculated as the sum of all claims for speech and audiology procedures performed by the indicated provider types where the primary diagnosis indicates a covered speech, hearing, or language disorder. Total estimated RDC claims PMPM was \$0.05, with a total PMPM of \$0.05 (or 0.01 percent of the Commonwealth total) after administrative loading. Self-insured costs for these services were found to be *higher* than fully-insured costs, resulting in a lower bound impact estimate of \$0. Table 15 above displays a summary of these results and related statistics.

Scalp Hair Protheses

Hair loss is a side effect of some cancer treatments, including chemotherapy and radiation to the head.²²⁶ These treatments result in ‘chemotherapy-induced alopecia’ (CIA) or damage to the hair follicles leading to the thinning or complete loss of hair. Alopecia is often cited as the “most severe side effect of chemotherapy,”²²⁷ negatively affecting the quality of life for many cancer patients, especially women and children.²²⁸ Studies have cited loss of self-confidence, depression,²²⁹ and humiliation as side effects.²³⁰ Likewise, CIA can negatively impact overall quality of life by affecting body image,²³¹ sexuality, self-esteem, and social functioning.²³² One study found that “[p]atients

who fear CIA may sometimes select regimens with less favorable outcomes or may refuse treatment.”²³³

Scalp hair prostheses offer some patients the possibility of mitigating the side effects of hair loss. The scalp prostheses mandate requires policies providing coverage for any other prosthesis to provide coverage for scalp hair prostheses worn for hair loss suffered as a result of the treatment of cancer or leukemia, in an amount not to exceed \$350 per year. The RDC of this mandate was calculated as the sum of all claims with procedure code A9282: “Wig, any type, each.” Total estimated RDC claims PMPM was \$0.018, with a total PMPM of \$0.02 (or 0.01 percent of the Commonwealth total) after administrative loading. Self-insured expense for these services was found to be \$0.019 PMPM, resulting in a lower bound impact estimate of \$0.001, or 0.0002 percent of Commonwealth premium. Table 16 below displays a summary of these results and related statistics.

Table 16

**Scalp Hair Prosthesis Mandate
Contribution to Premium**

Measures	Sample FI Amount	Sample SI Amount	FI Minus SI
Sample Users	952	710	
Sample Units	1,054	830	
Sample Average Members	1,476,274	1,194,618	
PMPM Claims	\$ 0.018	\$ 0.017	\$ 0.001
PMPM With Admin	\$ 0.020	\$ 0.019	\$ 0.001

	Upper Bound Impact	Lower Bound Impact*
Insured Population	2,637,117	2,637,117
Contribution to Total Annual Claims	\$ 566,063	\$ 26,632
Contribution to Total Annual Premium	\$ 635,595	\$ 29,903
Percent of Total Premium	0.01%	0.00%

*Net amounts do not remove overlap in mandated services between the scalp hair prosthesis mandate and the home health mandate.

New Provider-Centered Mandates

For the current study, the Center requested the inclusion of seven “provider mandates,” which mandate coverage for specific provider types rather than specific services. An *a priori* assumption that these non-physician providers are cost-effective would be supported by the very small to zero (in fact, negative) lower bound marginal cost estimates for these mandates. In many cases, the PMPMs are higher in the self-insured segment than in the fully insured segment. Based on these results, it would be reasonable to treat these mandates as “zero marginal cost” mandates, though they are treated here as potential-marginal cost mandates (i.e., their RDCs are included in the upper bound estimates).

Certified Nurse Midwives

Certified nurse-midwives (CNMs) are primary care providers of healthcare to women from adolescence through menopause.²³⁴ CNMs are legally authorized to practice and to prescribe in all fifty states.^{235,236} Services primarily focus on reproductive health and gynecological and obstetrical care, but also may be provided to male partners for treatment of sexually transmitted diseases, as well as normal neonates during their first month after birth.²³⁷ In 2010, CNMs and certified midwives attended over 317,000 births in the United States.²³⁸ CNMs have been licensed in Massachusetts since 1977, and were granted prescription writing authority in 1991.²³⁹ Over 10,000 births (13.4% of total) were attended by CNMs in Massachusetts in 2007. Today over 450 CNMs are licensed in Massachusetts and practice at almost 350 sites,²⁴⁰ while over 7300 CNMs practice nationwide.²⁴¹

As Advanced Practice Nurses, CNMs are also registered nurses (RNs) who have completed an undergraduate program in nursing as well as, at minimum, a masters-level graduate program in midwifery.²⁴² All 50 states license Certified Nurse Midwives, although some states include them under the umbrella of Advanced Nurse Practitioners.²⁴³ CNM licensure has historically varied widely by state, especially in the degree of oversight required by physicians. In 2008, the National Council of State Boards of Nursing (NCSBN) adopted the Consensus Model for Advanced Practice Registered Nurse (APRN) Regulation in an attempt to create consistent regulations and legislation across the United States. The group is attempting to standardize licensure to practice, APRN program accreditation, national certification requirements as well as educational requirements.²⁴⁴

As of January 2011, scope of practice has been summarized in the following summary:

Summary of State Legislation: Legal Authority to Practice for Certified Nurse Midwives as APRNs				
Scope of Practice				
Defined by State Board of:	<input checked="" type="checkbox"/> Nursing <input type="checkbox"/> Medicine	<input checked="" type="checkbox"/> Nursing <input type="checkbox"/> Medicine	<input checked="" type="checkbox"/> Nursing <input type="checkbox"/> Medicine	<input checked="" type="checkbox"/> Nursing <input checked="" type="checkbox"/> Medicine
Includes statutory or regulatory requirement for physician:	<input checked="" type="checkbox"/> None <input type="checkbox"/> Collaboration <input type="checkbox"/> Supervision	<input type="checkbox"/> None <input checked="" type="checkbox"/> Collaboration <input type="checkbox"/> Supervision	<input type="checkbox"/> None <input type="checkbox"/> Collaboration <input checked="" type="checkbox"/> Supervision	<input type="checkbox"/> None <input type="checkbox"/> Collaboration <input checked="" type="checkbox"/> Supervision
States	AK, AR, AZ, CO, DC, HI, IA, ID, IL, KY, ME, MI, MT, ND, NH, OK, OR, RI, UT, WA, WV, WY	AL, CA, DE, GA, IN, KS, LA, MA, MD, MN, MO, MS, NE, NV, NY, OH, PA, TX, VT, WI	FL, SC, TN	NC, SD, VA
	Illinois: No physician collaboration required for APRNs working in a hospital or ambulatory surgical center Maine: APRNs may practice independently after 24 months of practice.	Nebraska: State has Board of Advanced Practice Registered Nursing		
CT, NJ, NM, NY do not license CNMs as APRNs and thus cannot be summarized here.				

Generally, all states grant prescriptive authority to CRNMs, although again, the degree of independence varies widely, as summarized in the following summary:

Summary of State Legislation: Legal Prescriptive Authority for Certified Nurse Midwives as APRNs			
Type of substances	<input checked="" type="checkbox"/> Legend <input checked="" type="checkbox"/> Controlled	<input checked="" type="checkbox"/> Legend <input checked="" type="checkbox"/> Controlled	<input checked="" type="checkbox"/> Legend <input type="checkbox"/> Controlled
Degree of physician collaboration or delegation in statute or regulation	<input checked="" type="checkbox"/> Independent <input type="checkbox"/> Collaboration	<input type="checkbox"/> Independent <input checked="" type="checkbox"/> Collaboration	<input type="checkbox"/> Independent <input checked="" type="checkbox"/> Collaboration
	AK, AZ, CO, DC, IA, ID, MD, ME, MT, NH, OR, UT†, WA, WI, WY	AR, CA, DE, GA, HI, IL, IN, KS, KY, LA, MA, MI, MN, MO, MS, NC, ND, NE, NV, OH, OK, PA, RI, SC, SD, TN, TX, VA, VT, WV	AL, FL
	Utah: Schedule IV and/or V controlled substances only		

CT, NJ, NM, NY do not license CNMs as APRNs and thus cannot be summarized here.

To participate as a Medicare provider, CNMs “must be legally authorized and qualified to furnish the services in the State in which they are performed;”²⁴⁵ and they are eligible to deliver services without physician supervision.²⁴⁶ In 2011, payments for CNMs were raised to 100% of the physician fee schedule, from its previous level of 65%.²⁴⁷ CNMs are eligible to order and/or refer for Part B and DMEPOS Medicare beneficiaries.²⁴⁸ Twenty-seven states currently mandate private insurance coverage for certified nurse-midwives.²⁴⁹ As with licensure and scope of practice, reimbursement for other public and private programs varies widely by state.²⁵⁰

Table 17

**Certified Nurse Midwife Provider Mandate
Contribution to Premium**

Measures	Sample FI Amount	Sample SI Amount	FI Minus SI
Sample Users	8,288	5,151	
Sample Units	29,772	15,348	
Sample Average Members	839,150	736,874	
PMPM Claims	\$ 0.21	\$ 0.22	\$ (0.01)
PMPM With Admin	\$ 0.23	\$ 0.25	\$ (0.01)

	Upper Bound Impact	Lower Bound Impact*
Insured Population	1,174,281	1,174,281
Contribution to Total Annual Claims	\$ 2,946,044	\$ -
Contribution to Total Annual Premium	\$ 3,307,917	\$ -
Percent of Total Premium	0.03%	0.00%

*Net amounts do not remove overlap in mandated services between the certified nurse midwife mandate and the contraception mandate.

The certified nurse midwife mandate requires plans to pay for services rendered by certified nurse midwives when the same services are reimbursed when performed by any other practitioner and

are within the lawful scope of practice of midwives. The RDC of this mandate was calculated as the sum of all claims with a certified nurse midwife provider type indicator or a procedure code modifier indicating the service was performed by a nurse midwife.^{xv} The claims PMPM was \$0.21, with a total PMPM of \$0.23 (or 0.03 percent of the Commonwealth total) after administrative loading. Self-insured costs for these services were found to be *higher* than fully-insured costs, resulting in a lower bound impact estimate of \$0. Table 17 above displays a summary of these results and related statistics.

Certified Registered Nurse Anesthetists

Nurse anesthetists are Advanced Practice Registered Nurses (APRNs) who are licensed to provide anesthesia and related care, as well as pain management and emergency services, such as airway management.²⁵¹ There are more than 40,000 CRNAs practicing in the United States, providing over 32 million anesthetics annually;²⁵² over 1100 CRNAs are licensed in Massachusetts.²⁵³

As APRNs, CRNAs are required to complete a baccalaureate degree program in nursing or other appropriate field, as well as a graduate degree program in nurse anesthesia.²⁵⁴ The federal Centers for Medicare and Medicaid Services (CMS) currently requires that CNRAs be supervised by a physician, unless the state's own regulations do not require the CRNA to be supervised. States may opt-out of this requirement;²⁵⁵ since 2001, 16 states have formally opted-out. However, there is significant disagreement in the number of remaining states in which CRNAs may operate independently without need of the opt-out filing, with estimates ranging from 18 to 40 states; CRNA independence hinges on the definition of physician supervision and/or direction in state regulations.²⁵⁶

All 50 states license CRNAs, although some states include them under the umbrella of Advanced Nurse Practitioners.²⁵⁷ CRNA licensure has historically varied widely by state, especially in the degree of oversight required by physicians. In 2008, the National Council of State Boards of Nursing (NCSBN) adopted the Consensus Model for Advanced Practice Registered Nurse (APRN) Regulation in an attempt to create consistent regulations and legislation across the United States. The group is attempting to standardize licensure to practice, APRN program accreditation, national certification requirements as well as educational requirements.²⁵⁸ As of January 2011, scope of practice has been summarized in the following summary:

^{xv} HCPCS Modifier SB: Nurse midwife.

Summary of State Legislation: Legal Authority to Practice for CRNAs as APRNs				
Scope of Practice				
Defined by State Board of:	<input checked="" type="checkbox"/> Nursing <input type="checkbox"/> Medicine	<input checked="" type="checkbox"/> Nursing <input type="checkbox"/> Medicine	<input checked="" type="checkbox"/> Nursing <input type="checkbox"/> Medicine	<input checked="" type="checkbox"/> Nursing <input checked="" type="checkbox"/> Medicine
Includes statutory or regulatory requirement for physician:	<input checked="" type="checkbox"/> None <input type="checkbox"/> Collaboration <input type="checkbox"/> Supervision	<input type="checkbox"/> None <input checked="" type="checkbox"/> Collaboration <input type="checkbox"/> Supervision	<input type="checkbox"/> None <input type="checkbox"/> Collaboration <input checked="" type="checkbox"/> Supervision	<input type="checkbox"/> None <input type="checkbox"/> Collaboration <input checked="" type="checkbox"/> Supervision
States	AK, AR, AZ, CO, DC, HI, IA, ID, IL, KY, ME, MI, MT, ND, NH, NJ, NM, OK, OR, RI, UT, WA, WV, WY	AL, CA, CT, DE, GA, KS, LA, MA, MD, MN, MO, MS, NE, NV, OH, PA, TX, VT, WI	FL, SC, TN	NC, SD, VA
	Illinois: No physician collaboration required for APNs working in a hospital or ambulatory surgical center (ASTC) Maine: CRNAs may practice independently after 24 months of practice.	Nebraska: State has Board of Advanced Practice Registered Nursing		
IN, NY do not license CRNAs as APRNs and thus cannot be summarized here.				

Generally, all states grant prescriptive authority to CRNAs, although again, the degree of independence varies widely, as summarized in the following summary:

Summary of State Legislation: Legal Prescriptive Authority for CRNAs as APRNs			
Type of substances	<input checked="" type="checkbox"/> Legend <input checked="" type="checkbox"/> Controlled	<input checked="" type="checkbox"/> Legend <input checked="" type="checkbox"/> Controlled	<input checked="" type="checkbox"/> Legend <input type="checkbox"/> Controlled
Degree of physician collaboration or delegation in statute or regulation	<input checked="" type="checkbox"/> Independent <input type="checkbox"/> Collaboration	<input type="checkbox"/> Independent <input checked="" type="checkbox"/> Collaboration	<input type="checkbox"/> Independent <input checked="" type="checkbox"/> Collaboration
	AK, AZ, CO, DC, IA, ID, MD, ME, MT, NH, NM, OR, UT†, WA, WI, WY	AR, CA, CT, DE, GA, HI, IL, KS, KY, LA, MA, MI, MN, MO, MS, NC, ND, NE, NJ, NV, OH, OK, PA, RI, SC, SD, TN, TX, VA, VT, WV	AL, FL
	Utah: Schedule IV and/or V controlled substances only		
IN, NY do not license CRNAs as APRNs and thus cannot be summarized here.			

CRNAs have been eligible to receive direct Medicare reimbursement since 1986, and were the first nursing specialty authorized to do so.²⁵⁹ To participate as a Medicare provider, CRNAs “must be legally authorized and qualified to furnish the services in the State in which they are performed;”²⁶⁰ and they are eligible to deliver services without physician supervision if authorized by the state or through opt-out filings.²⁶¹ CRNAs may bill Medicare directly for their services, and are subject to their own fee schedule.²⁶² CRNAs are not eligible to order and/or refer for Part B and DMEPOS

Medicare beneficiary.²⁶³ Twenty states currently mandate private insurance coverage for CRNAs.²⁶⁴ As with licensure and scope of practice, reimbursement for other public and private programs varies widely by state.²⁶⁵

The certified registered nurse anesthetist mandate requires plans to pay for services rendered by certified registered nurse anesthetists when the same services are reimbursed when performed by any other practitioner and are within the lawful scope of practice of nurse anesthetists. The RDC of this mandate was calculated as the sum of all anesthesia claims^{xvi} with a procedure code modifier indicating the service was performed by a certified registered nurse anesthetist^{xvii} or a registered nurse anesthetist provider type indicator. Claims PMPM was \$0.48, with a total PMPM of \$0.54 (or 0.14 percent of the Commonwealth total) after administrative loading. Self-insured costs for these services were found to be *higher* than fully-insured costs, resulting in a lower bound impact estimate of \$0. Table 18 below displays a summary of these results and related statistics.

Table 18
Certified Registered Nurse Anesthetist Provider Mandate
Contribution to Premium

Measures	Sample FI Amount	Sample SI Amount	FI Minus SI
Sample Users	5,617	8,450	
Sample Units	5,928	9,741	
Sample Average Members	378,343	252,366	
PMPM Claims	\$ 0.48	\$ 1.21	\$ (0.73)
PMPM With Admin	\$ 0.54	\$ 1.36	\$ (0.82)

	Upper Bound Impact	Lower Bound Impact*
Insured Population	2,453,671	2,453,671
Contribution to Total Annual Claims	\$ 14,062,728	\$ -
Contribution to Total Annual Premium	\$ 15,790,100	\$ -
Percent of Total Premium	0.14%	0.00%

*No areas of overlap were observed for the CRNA mandate.

Nurse Practitioners

Nurse practitioners (NPs) are Advanced Practice Nurses (APNs) who are licensed as Registered Nurses as well as independent practitioners.²⁶⁶ NPs are legally authorized to practice and to prescribe in all fifty states.²⁶⁷ NPs practice as primary and/or specialty care providers in the full range of health care settings, emphasizing health promotion and disease prevention in addition to diagnosis, treatment and management of illness.²⁶⁸ The most common NP specialty areas include geriatrics, pediatrics, adult practice, family practice, women’s health, and acute care.²⁶⁹ There are

^{xvi} CPT Codes 00100-01999

^{xvii} HCPCS Modifier QX: CRNA service: with medical direction by a physician or QZ: CRNA service: without medical direction by a physician.

over 140,000 licensed NPs practicing in the United States in 2011, including over 6200 in Massachusetts;²⁷⁰ over 600 million visits are made annually to NPs.²⁷¹

As with all APNs, NPs must complete at least four years of undergraduate education and either a master’s, post master’s or doctoral level graduate-level program for NPs.²⁷² All 50 states license Nurse Practitioners, although some states include them under the umbrella of Advanced Nurse Practitioners.²⁷³ NP licensure has historically varied widely by state, especially in the degree of oversight required by physicians. In 2008, the National Council of State Boards of Nursing (NCSBN) adopted the Consensus Model for Advanced Practice Registered Nurse (APRN) Regulation in an attempt to create consistent regulations and legislation across the United States. The group is attempting to standardize licensure to practice, APRN program accreditation, national certification requirements as well as educational requirements.²⁷⁴ As of January 2011, scope of practice has been summarized as listed in the following summary:

Summary of State Legislation: Legal Authority to Practice for Nurse Practitioners as APRNs				
Scope of Practice				
Defined by State Board of:	<input checked="" type="checkbox"/> Nursing <input type="checkbox"/> Medicine	<input checked="" type="checkbox"/> Nursing <input type="checkbox"/> Medicine	<input checked="" type="checkbox"/> Nursing <input type="checkbox"/> Medicine	<input checked="" type="checkbox"/> Nursing <input checked="" type="checkbox"/> Medicine
Includes statutory or regulatory requirement for physician:	<input checked="" type="checkbox"/> None <input type="checkbox"/> Collaboration <input type="checkbox"/> Supervision	<input type="checkbox"/> None <input checked="" type="checkbox"/> Collaboration <input type="checkbox"/> Supervision	<input type="checkbox"/> None <input type="checkbox"/> Collaboration <input checked="" type="checkbox"/> Supervision	<input type="checkbox"/> None <input type="checkbox"/> Collaboration <input checked="" type="checkbox"/> Supervision
States	AK, AR, AZ, CO, DC, HI, IA, ID, IL, KY, ME, MI, MT, ND, NH, NJ, NM, OK, OR, RI, UT, WA, WV, WY	AL, CA, CT, DE, GA, IN, KS, LA, MA, MD, MN, MO, MS, NE, NV, NY, OH, PA, TX, VT, WI	FL, SC, TN	NC, SD, VA
	Illinois: No physician collaboration required for APNs working in a hospital or ambulatory surgical center (ASTC) Maine: NPs may practice independently after 24 months of practice.	Nebraska: State has Board of Advanced Practice Registered Nursing		

Generally, all states grant prescriptive authority to NPs, although again, the degree of independence varies widely, as summarized in the following table:

Summary of State Legislation: Legal Prescriptive Authority for Nurse Practitioners as APRNs			
Type of substances	<input checked="" type="checkbox"/> Legend <input checked="" type="checkbox"/> Controlled	<input checked="" type="checkbox"/> Legend <input checked="" type="checkbox"/> Controlled	<input checked="" type="checkbox"/> Legend <input type="checkbox"/> Controlled
Degree of physician collaboration or delegation in statute or regulation	<input checked="" type="checkbox"/> Independent <input type="checkbox"/> Collaboration	<input type="checkbox"/> Independent <input checked="" type="checkbox"/> Collaboration	<input type="checkbox"/> Independent <input checked="" type="checkbox"/> Collaboration
	AK, AZ, CO, DC, IA, ID, MD, ME, MT, NH, NM, OR, UT†, WA, WI, WY	AR, CA, CT, DE, GA, HI, IL, IN, KS, KY, LA, MA, MI, MN, MO, MS, NC, ND, NE, NJ, NV, NY, OH, OK, PA, RI, SC, SD, TN, TX, VA, VT, WV	AL, FL
	Utah: Schedule IV and/or V controlled substances only		
All states allow NPs to receive and/or dispense drug samples based on authorized scope of practice rules and regulations or statutes.			

Nurse practitioners are eligible for Medicare reimbursement “if the services are incident to a physician’s service or if there is specific authorization in the law,” except in rural health clinics, where NP services are specifically authorized to be delivered without direct physician supervision.²⁷⁵ Payment is generally made at 85% of the Medicare Physician Fee Schedule.²⁷⁶ NPs are eligible to order and/or refer for Part B and DMEPOS Medicare beneficiaries.²⁷⁷ Twenty-nine states currently mandate private insurance coverage for nurse practitioners.²⁷⁸ As with licensure and scope of practice, reimbursement for other public and private programs varies widely by state.²⁷⁹

Table 19

**Nurse Practitioner Provider Mandate
Contribution to Premium**

Measures	Sample FI Amount	Sample SI Amount	FI Minus SI
Sample Users	41,917	34,513	
Sample Units	83,132	68,963	
Sample Average Members	1,217,493	989,239	
PMPM Claims	\$ 0.49	\$ 0.52	\$ (0.03)
PMPM With Admin	\$ 0.55	\$ 0.59	\$ (0.04)

	Upper Bound Impact	Lower Bound Impact*
Insured Population	2,453,671	2,453,671
Contribution to Total Annual Claims	\$ 14,367,691	\$ -
Contribution to Total Annual Premium	\$ 16,132,523	\$ -
Percent of Total Premium	0.14%	0.00%

*Net amounts do not remove overlap in mandated services between the nurse practitioner mandate and the contraception and mental health mandates.

The nurse practitioner (NP) mandate requires plans to cover services of nurse practitioners (NPs) when the same services are reimbursed when performed by any other practitioner and are within the lawful scope of practice of nurse practitioners. C. 176R allows NPs to serve as Primary Care Physicians and prohibits NPs from being subject to reduced coverage limits. The RDC of this mandate was calculated as the sum of all claims with a nurse practitioner provider type indicator or a procedure code modifier indicating the service was performed by a nurse practitioner.^{xviii} Claims PMPM was \$0.49, with a total PMPM of \$0.55 (or 0.14 percent of the Commonwealth total) after administrative loading. Self-insured costs for these services were found to be *higher* than fully-insured costs, resulting in a lower bound impact estimate of \$0. Table 19 above displays a summary of these results and related statistics.

Chiropractors

Chiropractors, or doctors of chiropractic, diagnose and treat conditions primarily through manipulation and realignment of the musculoskeletal system and its related nerves.^{280,281} Chiropractic health care is based on the principle that the body has an innate ability to self-heal provided that its structure is properly aligned to promote intended function.²⁸² In theory, by aligning spinal joints, chiropractors improve the function of the body's nervous system and improve overall health. Chiropractors provide drug- and surgery-free therapy to allow the body to naturally recuperate from illness and injury.²⁸³

Chiropractors are required to complete two to four years of undergraduate education²⁸⁴ followed by four to five years at a chiropractic college.²⁸⁵ For licensure, graduates of chiropractic college must pass all or part of the examinations administered by the National Board of Chiropractic Examiners.²⁸⁶ Some states also administer their own additional examinations,²⁸⁷ and/or require the post-licensure NBCE Ethics & Boundaries (E&B) examination.²⁸⁸ All states except New Jersey require chiropractors to acquire continuing education to maintain and renew licensure.²⁸⁹

Licensed chiropractors are recognized by Medicare for payment as a physician only for manual spinal manipulation treatment of x-ray confirmed spinal subluxation.²⁹⁰ Chiropractors are eligible to order and/or refer for Part B and DMEPOS Medicare beneficiaries.²⁹¹ Further, forty-four states currently mandate private insurance coverage for chiropractors.²⁹²

The chiropractor provider mandate, c. 175 § 108D, requires a payer to pay for chiropractic services whether they are performed by a physician or chiropractor, and c. 176B § 7 statute prohibits an MSC from discriminating against chiropractors in providing chiropractic services. Note that there are both chiropractic service and chiropractor (provider-based) mandates. The chiropractors provide both chiropractic services and non-chiropractic services, and chiropractic services are provided by both chiropractors and other providers.

The RDC of this mandate was calculated as the sum of all claims with a chiropractor provider type indicator. The claims PMPM was \$1.59, with a total PMPM of \$1.78 (or 0.22 percent of the Commonwealth total) after administrative loading. Self-insured expense for these services was

^{xviii} HCPCS Modifier SA: Nurse practitioner rendering service in collaboration with a physician.

found to be \$1.65 PMPM, resulting in a lower bound impact estimate of \$0.14, or 0.02 percent of Commonwealth premium. Table 20 below displays a summary of these results and related statistics.

Table 20
Chiropractors Provider Mandate
Contribution to Premium

Measures	Sample FI	Sample SI	FI Minus SI
	Amount	Amount	
Sample Users	57,344	34,527	
Sample Units	712,980	523,740	
Sample Average Members	839,150	736,874	
PMPM Claims	\$ 1.59	\$ 1.47	\$ 0.12
PMPM With Admin	\$ 1.78	\$ 1.65	\$ 0.14

	Upper Bound Impact	Lower Bound Impact*
Insured Population	1,174,281	1,174,281
Contribution to Total Annual Claims	\$ 22,401,129	\$ 1,700,070
Contribution to Total Annual Premium	\$ 25,152,735	\$ 1,908,895
Percent of Total Premium	0.22%	0.02%

*Net amounts do not remove overlap in mandated services between the chiropractor provider mandate and the chiropractic services mandate.

Dentists

Dentists are doctors focused on the diagnosis, treatment and prevention of diseases of the mouth and maxillofacial area.²⁹³ To practice general dentistry, dentists must complete at least three years of undergraduate education, as well as four years of dental school.²⁹⁴ Two-year post-graduate residencies are sometimes required as well.²⁹⁵ Additional post-graduate training is necessary for specialization in orthodontia, periodontia, or maxillofacial surgery.²⁹⁶

To obtain a license, dentists must pass Parts I and II of the National Board Dental Examinations written tests which cover basic biomedical sciences, dental anatomy, case studies and ethics.^{297,298,299} All states except for New York require an additional clinical examination which focuses on performing dental procedures on patients.³⁰⁰ Clinical examinations in Massachusetts are administered by the North East Regional Board of Dental Examiners.³⁰¹

Licensure is available in nine specialties,³⁰² including dental public health, endodontics, oral and maxillofacial pathology, oral and maxillofacial surgery, orthodontics and dentofacial orthopedics, pediatric dentistry, periodontics, prosthodontics, and oral and maxillofacial radiology.³⁰³

Dentists are recognized as physicians by Medicare when providing medically necessary services, and “acting within the scope of his/her license when he/she performs such functions.”³⁰⁴ However, dental services – procedures “primarily provided for the care, treatment, removal, or replacement of teeth or structures supporting the teeth”³⁰⁵ – are generally excluded from Medicare coverage.

Dentists are eligible to order and/or refer for Part B and DMEPOS Medicare beneficiaries.³⁰⁶ Further, thirty-three states currently mandate private insurance coverage for dentists.³⁰⁷

This insurance mandate requires a dentist to be considered a physician for purposes of reimbursement for any services covered by the medical policy/contract which dentists are licensed to perform. The RDC of this mandate was calculated as the sum of all medical claims with a dentist or oral surgeon^{xix} provider type indicator. Claims PMPM was \$0.96, with a total PMPM of \$1.07 (or 0.13 percent of the Commonwealth total) after administrative loading. Self-insured costs for these services were found to be *higher* than fully-insured costs, resulting in a lower bound impact estimate of \$0. Table 21 below displays a summary of these results and related statistics.

Table 21

**Dentist Provider Mandate
Contribution to Premium**

Measures	Sample FI Amount	Sample SI Amount	FI Minus SI
Sample Users	11,315	10,305	
Sample Units	47,106	40,651	
Sample Average Members	839,150	736,874	
PMPM Claims	\$ 0.96	\$ 1.07	\$ (0.11)
PMPM With Admin	\$ 1.07	\$ 1.20	\$ (0.13)

	Upper Bound Impact	Lower Bound Impact*
Insured Population	1,174,281	1,174,281
Contribution to Total Annual Claims	\$ 13,485,712	\$ -
Contribution to Total Annual Premium	\$ 15,142,207	\$ -
Percent of Total Premium	0.13%	0.00%

*No areas of overlap were observed for the the dentist mandate.

Optometrists

Doctors of optometry are primary eye care providers, and are the largest eye care profession in the United States.³⁰⁸ Optometrists “examine, diagnose, treat and manage disorders that affect the eye or vision.”³⁰⁹

Educational requirements for optometrists include four years of undergraduate education and four years of graduate study concentrating on the eye, vision and associated systemic disease, such as diabetes and hypertension.³¹⁰ To practice, optometrists must obtain state licensures for optometry, therapeutic pharmaceutical agents, and diagnostic pharmaceutical agents; state certification in the treatment of glaucoma may also be required.³¹¹

^{xix} Maxillo-facial surgeon provider types were not included, as maxillo-facial surgeons hold dual licensure as dentists and medical doctors. Cases where the maxillo-facial and oral surgeon provider types could not be distinguished were also excluded.

To apply for licensure in optometry, optometrists must pass a national examination most often administered by the National Board of Examiners in Optometry (NBEQ).³¹² Some states require internships, while others also administer their own additional examinations, such as written, practical, pharmacology, and jurisprudence.³¹³ An additional NBEQ exam in the Treatment and Management of Ocular Disease (TMOQ) may be required for application for therapeutic pharmaceutical agent (TPA) and/or diagnostic pharmaceutical agent (DPA) licensure or certification.³¹⁴ Continuing education is required for license renewal in all fifty states.^{315,316} Massachusetts requires NBEQ Parts I, II and III, as well as the NBEQ TMOQ and a state jurisprudence exam. Licenses are renewed annually.³¹⁷

Medicare considers optometrists to be physicians “with respect to all services the optometrist is authorized to perform under State law or regulation.”³¹⁸ Optometrists are eligible to order and/or refer for Part B and DMEPOS Medicare beneficiaries.³¹⁹ Further, forty-one states currently mandate private insurance coverage for optometrists.³²⁰

The optometrist mandate requires coverage for services of optometrists when services are reimbursed when performed by medical or osteopathic physicians and are within the lawful scope of practice of optometrists. The RDC of this mandate was calculated as the sum of all claims with an optometrist provider type indicator. The claims PMPM was \$1.21, with a total PMPM of \$1.36 (or 0.17 percent of the Commonwealth total) after administrative loading. Self-insured expense for these services was found to be \$1.10 PMPM, resulting in a lower bound impact estimate of \$0.26, or 0.03 percent of Commonwealth premium. Table 22 below displays a summary of these results and related statistics.

Table 22
Optometrist Provider Mandate
Contribution to Premium

Measures	Sample FI Amount	Sample SI Amount	FI Minus SI
Sample Users	115,248	72,301	
Sample Units	149,162	98,456	
Sample Average Members	839,150	736,874	
PMPM Claims	\$ 1.21	\$ 0.98	\$ 0.23
PMPM With Admin	\$ 1.36	\$ 1.10	\$ 0.26

	Upper Bound Impact	Lower Bound Impact*
Insured Population	1,174,281	1,174,281
Contribution to Total Annual Claims	\$ 17,085,173	\$ 3,269,947
Contribution to Total Annual Premium	\$ 19,183,801	\$ 3,671,606
Percent of Total Premium	0.17%	0.03%

*No areas of overlap were observed for the optometrist mandate.

Podiatrists

A podiatrist is a doctor of podiatric medicine (DPM) who diagnoses and treats conditions affecting the foot, ankle, and related leg structures; there are an estimated 15,000 podiatrists in the United States.³²¹ Podiatrists are required to complete four years of undergraduate education, four years of graduate education at a podiatric medical college, and two to three years of residency training in a hospital.³²²

To obtain a license, podiatrists must pass oral and written examinations, which may be administered by the state itself. Other states accept examinations administered by the National Board of Podiatric Medical Examiners (NBPME).³²³ Most states also require podiatrists to obtain continuing education to renew licensure.³²⁴

Medicare considers podiatrists physicians “only with respect to those functions which he/she is legally authorized to perform in the State in which he/she performs them.”³²⁵ Podiatrists are eligible to order and/or refer for Part B and DMEPOS Medicare beneficiaries.³²⁶ Further, podiatrists may order and refer for Medicare Part A Home Health Agency (HHA) beneficiary services, the only provider type besides doctors of medicine and osteopathy permitted to do so.³²⁷ Thirty-three states currently mandate private insurance coverage for podiatrists.³²⁸

Table 23

**Podiatrist Provider Mandate
Contribution to Premium**

Measures	Sample FI Amount	Sample SI Amount	FI Minus SI
Sample Users	53,958	45,224	
Sample Units	198,401	176,918	
Sample Average Members	1,476,274	1,194,618	
PMPM Claims	\$ 0.78	\$ 0.92	\$ (0.14)
PMPM With Admin	\$ 0.87	\$ 1.03	\$ (0.16)

	Upper Bound Impact	Lower Bound Impact*
Insured Population	2,453,671	2,453,671
Contribution to Total Annual Claims	\$ 22,903,362	\$ -
Contribution to Total Annual Premium	\$ 25,716,659	\$ -
Percent of Total Premium	0.22%	0.00%

*Net amounts do not remove overlap in mandated services between the podiatrist mandate and the home health mandate.

The podiatrist mandate requires coverage for services of podiatrists when services are reimbursed when performed by medical or osteopathic physicians and are within the lawful scope of practice of podiatrists. The RDC of this mandate was calculated as the sum of all claims with a podiatrist provider type indicator. Claims PMPM was \$0.78, with a total PMPM of \$0.87 (or 0.22 percent of the Commonwealth total) after administrative loading. Self-insured costs for these services were found

to be *higher* than fully-insured costs, resulting in a lower bound impact estimate of \$0. Table 23 above displays a summary of these results and related statistics.

Aggregated Results of Mandates with Potential Marginal Direct Cost

The aggregated results of the required direct cost measurement for the twenty-three mandates drawing on primary data, with overlap (double-counting) between mandates removed, are summarized in Table 24. The overall RDC was calculated as the sum of all claims extracted for any of the primary data analysis mandates. Claims PMPM was \$26.27, with a total PMPM of \$29.49 (or 7.2 percent of the Commonwealth total) after administrative loading. Self-insured costs for these services were found to be \$27.64 PMPM, resulting in a lower bound impact estimate of \$1.85 PMPM, or 0.48 percent. That is, self-insured plans not subject to the mandates spent \$1.85 PMPM less on mandated benefits, or less than one half of one percent of premium. Table 24 below displays a summary of these results.

Table 24

**All Mandates with Potential Marginal Direct Cost
Contribution to Premium**

Measures	Sample FI Amount	Sample SI Amount	FI Minus SI
Sample Users	665,586	441,244	
Sample Units	48,251,336	26,401,334	
Sample Average Members	1,476,274	1,194,618	
PMPM Claims	\$ 26.27	\$ 24.62	\$ 1.65
PMPM With Admin	\$ 29.49	\$ 27.64	\$ 1.85

	Upper Bound Impact	Lower Bound Impact*
Insured Population	2,637,117	2,637,117
Contribution to Total Annual Claims	\$ 791,112,953	\$ 52,265,670
Contribution to Total Annual Premium	\$ 888,287,996	\$ 58,685,636
Percent of Total Premium	7.23%	0.48%

*Cross-mandate totals are *net* of all observed mandate overlaps.

Neither the RDC estimate in Table 24 (\$888 million) nor the lower bound marginal cost estimate of \$59 million provides an answer to the question of what additional direct costs are caused by the mandate laws, though the mandate impact should be somewhere in this rather wide range, and as discussed in more detail further below, is not likely to be near either of the two extremes produced by the required direct cost and lower bound marginal cost estimates.

In the next section, we address results for the mandates analyzed with secondary data sources.

Mandates Judged Likely to Have Zero Marginal Cost: Results

The RDC results for each of the mandates analyzed in the secondary cost analysis phase of the project are described below. As discussed above, carrier input supported the notion that these mandates are likely to have little or no marginal direct cost – that is, essentially all the costs of these services would be incurred even if the associated mandate laws were not in effect. The estimates presented below, then, are for RDCs only, as the marginal costs (and therefore lower bound marginal costs) are assumed to be zero.

In developing these estimates, a number of sub-population estimates of enrollment in fully-insured products were required; these are developed and discussed in Appendix D. The results of the sub-population calculations are summarized in Table 25 below.

Table 25

**Massachusetts Under-65
Commercial Fully-Insured
Population
Subset Estimates for 2009 (In 000s)**

Sub-Pop.	Total	Females
All Ages	2,454	1,241
Births	31	15
Under 5	154	75
Under 6	186	91
Age 40-64	1,005	518
Age 19-64	1,832	937

The estimates for each of the individual mandates discussed below refer to Appendix D as necessary.

Bone Marrow Transplant for Breast Cancer

Treatment for high-risk breast cancer has evolved significantly over time, with the development of new interventions as well as publication of additional research findings. At one time, high dose chemotherapy plus autologous bone marrow transplant (HDC-ABMT) was used as a last resort to treat advanced breast cancer, or breast cancer with a high probability of recurrence, as it reduced the probability of relapse.^{329,330}

However, since the mid-1990s, HDC-ABMT has been discredited as a treatment regimen due to the serious side effects of the highly toxic chemotherapy, and because the treatment did not offer an increased chance of survival when compared to standard-dose chemotherapy.³³¹ In fact, since 1996, the National Comprehensive Cancer Network has excluded HDC-ABMT from its clinical practice guidelines.^{332, 333} Evidence of efficacy remains unclear and highly dependent upon study design and patient cohort characteristics.

The controversy surrounding the research has continued, as many patients view HDC-ABMT as a viable treatment alternative while experts continue to press for clinical trials to prove its efficacy. In fact, as HDC-ABMT remains an independently mandated benefit, clinical trials have faltered due to the inability to enroll suitable patients, as nine out of ten patients have chosen to receive the therapy outside of the context of a clinical trial, thereby avoiding the possibility of random assignment to a control cohort.³³⁴

More recent data have shown the potential application of this treatment for more narrowly defined groups of patients³³⁵ and/or with an adjustment to the previously-used chemotherapy regimen.³³⁶ The data are not yet clear, and experts continue to press for additional rigorous clinical studies. As research continues, the American Cancer Society recommends HDC-ABMT only as part of an approved clinical trial,³³⁷ and the National Cancer Institute continues to support phase III clinical trials of HDC-ABMT for breast cancer.³³⁸

In light of these recommendations, the BMT mandate appears to be redundant to the separate mandate providing benefits for cancer clinical trials, which is also a zero marginal cost mandate (see the sub-section analyzing the cancer clinical trials mandate below).

Cardiac Rehabilitation

Approximately twenty-five percent of deaths in the United States are caused by cardiovascular disease,³³⁹ the leading cause of morbidity and mortality nationally. Coronary heart disease affects over 13.5 million Americans, most of whom could expect beneficial outcomes from cardiac rehabilitation, a supervised program of exercise, education, and lifestyle changes.³⁴⁰ These benefits include: improvement in exercise tolerance; improvement in symptoms; improvement in blood lipid levels; reduction in cigarette smoking; improvement in psychosocial well-being and reduction of stress; reduction in mortality.³⁴¹ In fact, research so strongly demonstrates the benefit of cardiac therapy that formalized performance measures for cardiac rehabilitation were published in 2007 and updated in 2010 by the American Association of Cardiovascular and Pulmonary Rehabilitation, the American College of Cardiology, and the American Heart Association. The same program is endorsed by the American College of Chest Physicians, American College of Sports Medicine, American Physical Therapy Association, Canadian Association of Cardiac Rehabilitation, European Association for Cardiovascular Prevention and Rehabilitation, Inter-American Heart Foundation, National Association of Clinical Nurse Specialists, Preventive Cardiovascular Nurses Association, and the Society of Thoracic Surgeons.³⁴² Despite this, however, utilization of cardiac rehabilitation programs remains low, “with less than 30 percent of eligible patients participating in a cardiac rehabilitation program after a cardiovascular disease event.”³⁴³

The cardiac rehabilitation mandate covers the expense of cardiac rehabilitation, i.e., multidisciplinary, medically necessary treatment of persons with documented cardiovascular disease.

For this analysis, the cost of the cardiac rehabilitation mandate reflected in insurance premiums is calculated by determining the approximate number of non-fatal heart attacks³⁴⁴ that occur annually in the under-65 privately insured population in Massachusetts, multiplying this figure by

the proportion of the population that will participate in cardiac rehabilitation, and again multiplying by the approximate cost of an episode of care.

An estimated 1.255 million heart attacks occur annually in the United States.³⁴⁵ The proportion of these events in Massachusetts, based on the state’s population as a percent of the national figure, is estimated at 214 percent, resulting in an estimate of 26,916 annual heart attacks in Massachusetts. The death rate per 100,000 from acute myocardial infarction in Massachusetts is 61.7, compared with 77.5 nationally.³⁴⁶ This converts to 4,068 fatal heart attack cases and approximately 22,848 non-fatal heart attacks annually in the state.

Based on University of Manitoba data³⁴⁷ and the age mix in Massachusetts, it is estimated that 35 percent of cardiac events will occur to those under age 65, bringing the number of events to 7,997. Of these, an estimated 78 percent, or 6,236, are privately insured, and 3,161 fully insured. According to the CDC, only 30.3 percent of individuals under age 65 will participate in cardiac rehabilitation,³⁴⁸ which results in an estimate of 957 annual cases of cardiac rehabilitation in the under-65 fully-insured population in Massachusetts.

A 1988 study of the costs of cardiac rehabilitation calculated an approximate total per case cost of \$1,485.³⁴⁹ Adjusting this figure for medical cost inflation between 1988 and 2009 provides a per case estimate of \$4,005, for a total dollar estimate of \$3.8 million. Based on 2.45 million individuals in the under-65 commercially fully insured population, this provides an estimate of \$0.13 PMPM for 2009 for cardiac rehabilitation services. With administrative loading, the estimate increases to \$0.15 PMPM, or 0.04 percent of total premium. These results are summarized in Table 26 below.

Table 26
Cardiac Rehabilitation Mandate
Contribution to Premium*

Measures	Sample FI		Sample SI Amount	FI Minus SI
	Amount			
Sample Users	N/A			
Sample Units	N/A			
Sample Average Members	N/A			
PMPM Claims	\$ 0.13		N/A	N/A
PMPM With Admin	\$ 0.15		N/A	N/A

	Required Direct Cost		Upper and Lower Bound Impact
Insured Population	2,453,671		2,453,671
Contribution to Total Annual Claims	\$ 3,831,615		\$ -
Contribution to Total Annual Premium	\$ 4,302,265		\$ -
Percent of Total Premium	0.04%		0.00%

*This mandate was judged by carriers contribute zero marginal cost to premiums.
Cost was estimated using literature review and public data sources.

Clinical Trials for Treatment of Cancer

According to the Coalition of Cancer Cooperative Groups, “[a] clinical trial is a carefully monitored medical research study in which people participate as volunteers to test new methods of prevention, screening, diagnosis, or treatment of a disease.”³⁵⁰ Clinical trials are categorized into four phases: Phase I trials, usually the first to involve humans, typically enroll 15-30 people, and seek to determine treatment safety, side effects, and optimal mode of administration. Phase II trials, usually enrolling 25-100 people, attempt to determine if and how the new treatment affects a certain cancer and may vary dosage levels between treatment groups while continuing to monitor side effects. Phase III trials typically enroll between 100 and several thousand participants, and compare the new treatment or use with the current standard, randomizing patients into test groups. Phase IV trials, if conducted, include several hundred to several thousand people, and assess long-term safety and effectiveness of a treatment that has already been approved by the FDA.^{351,352}

The National Cancer Institute cites several possible benefits of participation in clinical trials for cancer, including the high quality of care offered. Trial participants who are randomized into control groups receive the best known standard treatment, while those in the test groups receive the new treatment which is intended to improve upon the current standard. Many groups also point out that participation in trials empower patients to actively decide their cancer treatment, and provides an opportunity to “help others and improve cancer treatment.” Participation drawbacks may be that the new treatment is not as effective for an individual as the current standard, or may cause different or more severe side effects than the current standard treatment protocol.³⁵³

Yet while most major advances in battling cancer have come through clinical trials and most trial participants express high satisfaction rates with their involvement, only 3-5% of eligible cancer patients participate in approved trials.³⁵⁴ In fact, the American Cancer Society states that “[t]he biggest barrier to completing clinical trials is that not enough people take part in them.”³⁵⁵ Awareness of the studies is the biggest obstacle to more widespread participation,³⁵⁶ but of patients who were aware and decided not to participate in clinical trials, one study found that the biggest factor influencing their decision was fear of insurance reimbursement denial.³⁵⁷

The clinical trials for treatment of cancer mandate requires coverage for patient care services for patients enrolled in a qualified clinical trial to the same extent as the services would be covered if the patient was not receiving care in a qualified clinical trial. A qualified clinical trial must be cancer-related and must meet other criteria set forth in the law.

Detailed data do not exist to specifically identify costs associated with clinical trials for the treatment of cancer, but information is available to aid in its estimation. The number of people living with cancer in the US (prevalence count) in 2009 was approximately 12.55 million; of these about 3.65 million were ages 0-59.³⁵⁸ An additional 3.07 million cancer patients were aged 60-69.³⁵⁹ Given that the proportion of the US population ages 60-64 versus 60-69 was 57.5 percent,³⁶⁰ 1.76 million cancer patients ages 60-64 were living in the United States in 2009. This brings the national prevalence count for cancer in the under-65 population in 2009 to 5.42 million.

Massachusetts represents 2.14 percent of the total US population. Applying this percentage to the number of cancer cases estimates the number of Massachusetts under-65 cancer cases at 116,182. However, Massachusetts has a higher overall incidence rate for cancers versus the nation as a whole. While the national figure for 2004-08 was estimated at 465.0 cases per 100,000, the Massachusetts number was over 8 percent higher at 503.5. Applying a factor based on this higher rate to the preliminary number of cases raises the estimate of cancer cases in Massachusetts under age 65 to 125,802.

The latest estimate of the percentage of adults with cancer who participate in clinical trials is just 5 percent.³⁶¹ Allowing for a somewhat higher participation rate of 6 percent in Massachusetts, owing to its density of teaching hospitals, brings the estimate of clinical trial patients in Massachusetts to just over 7,500. Given that 78 percent of the under-65 population in Massachusetts is privately-insured and 50.7 percent of those are fully insured, the estimated number of cases of privately-insured under-65 individuals in Massachusetts participating in clinical trials in 2009 is 2,983.

Table 27

**Clinical Trials for Treatment of Cancer
Contribution to Premium***

Measures	Sample FI Amount	Sample SI Amount	FI Minus SI
Sample Users	N/A		
Sample Units	N/A		
Sample Average Members	N/A		
PMPM Claims	\$ 0.09	N/A	N/A
PMPM With Admin	\$ 0.10	N/A	N/A

	Required Direct Cost		Upper and Lower Bound Impact
Insured Population	2,453,671		2,453,671
Contribution to Total Annual Claims	\$ 2,614,795		\$ -
Contribution to Total Annual Premium	\$ 2,935,979		\$ -
Percent of Total Premium	0.03%		0.00%

*This mandate was judged by carriers contribute zero marginal cost to premiums.
Cost was estimated using literature review and public data sources.

A recent article estimated the total annual costs of cancer in the US for 2010 at \$124.6 billion based on a prevalence count of 13.8 million people;³⁶² this calculates to a cost per case for cancer care at \$9,045 annually. For the Massachusetts fully insured population under age 65, the cost of cancer care would then be about \$26.1 million in total, with adjustment of the cost level to a 2009 basis. The incremental cost of care in clinical trials for cancer is estimated at 10 percent,³⁶³ although a later article specifically examining NIH-sponsored clinical trials calculated this figure at 6.5 percent.³⁶⁴ Assuming the more conservative 10 percent estimate, the total cost of cancer clinical trials for the 2.45 million Massachusetts fully-insured under 65 population is \$2.6 million, or \$0.09

PMPM. With administrative loading, this figure rises to \$0.10, or 0.03 percent of the overall \$388 PMPM average 2009 premium. These results are summarized in Table 27 above.

Cytological Screening (Pap Smear)

According to the American Cancer Society, “[c]ervical cancer incidence and mortality rates have decreased 67% over the past three decades, with most of the reduction attributed to the Pap test, which detects cervical cancer and precancerous lesions.”³⁶⁵ Further, the survival rate for women diagnosed with precancerous lesions through the Pap test is nearly 100%, as cancer is prevented altogether.³⁶⁶

Given these statistics, there is widespread agreement on the benefits of cytological screening for women, although recommendations for the precise schedule for such testing are somewhat inconsistent. The American Cancer Society recommends screening approximately three years after a woman begins vaginal intercourse, but no later than 21 years of age. Screening should be performed annually for a conventional Pap test, or biennially for a liquid-based Pap screen. From age 30-70, women who have had three successive normal screens can move to testing every two to three years, while women 70 and older with three or more successive normal tests and no abnormal tests in the past 10 years, and women with total hysterectomies, can discontinue screening.³⁶⁷

The American Academy of Family Physicians, as well as the US Preventative Screening Task Force (USPSTF), “strongly recommends” a triennial cytology screen for women who have ever had sex, and who have a cervix.^{368,369} The USPSTF also recommends against screening women over age 65 with an adequate recent screening and no risk factors, as well as women who have had a total hysterectomy for benign disease.³⁷⁰ The American College of Obstetricians and Gynecologists recommends beginning Pap smear at age 21 regardless of sexual history, and following a biennial schedule until age 29. Women age 30 and over, with three consecutive negative screenings and no risk factors, can move to a triennial schedule. ACOG further recommends against screening before age 21, as “it may lead to unnecessary and harmful evaluation and treatment in women at very low risk of cancer.”³⁷¹ The American College of Preventive Medicine recommends beginning Pap smears as soon as a woman is sexually active, or by age 18 at the latest, to be performed triennially after two consecutive annual tests show normal results, until age 65.³⁷²

The cytological screen mandate requires coverage for cytologic screening (Pap smear) annually for women 18 years and older.

The approximate number of fully-insured women in Massachusetts ages 18-64 is 937,000 (see Appendix D). It is estimated that in 2008, the overall percentage of women in Massachusetts who received a Pap smear within the last three years was 87.6 percent.³⁷³ For the nation, this number was 82.8 percent for all women in the age group;³⁷⁴ this figure, adjusted for the privately insured population, was 84.2 percent,³⁷⁵ or 1.7 percent higher. Using this same adjustment factor for the Massachusetts population brings the number of privately insured women receiving a Pap smear within the last three years to 89.1 percent, or 835,000 women.

One study has estimated that of the 20 percent of women who have had an abnormal Pap smear, the rate of testing is approximately 79 percent annually, 11 percent biennially and 7 percent triennially.³⁷⁶ For the 80 percent of women who have never had an abnormal pap smear, these rates change to 55 percent annually, 17 percent biennially and 16 percent triennially.³⁷⁷ These figures calculate to an overall rate of Pap smears in a given year of 72.4 percent, or 604,755 Pap smears.

The estimated average paid amount of a cytology screening in 2006 was \$40.70 based on 2009 HCQCC data, producing a total dollar estimate of approximately \$24.6 million overall. Given 2.4 million privately fully-insured individuals under age 65 in Massachusetts, this equates to \$0.84 PMPM, \$0.94 PMPM (\$27.6 million in total) with 10.9 percent administrative loading included, or 0.24 percent of the overall premium. These results are summarized in Table 28 below.

Table 28
Cytologic Screening (Pap Smear)
Contribution to Premium*

Measures	Sample FI Amount	Sample SI Amount	FI Minus SI
Sample Users	N/A		
Sample Units	N/A		
Sample Average Members	N/A		
PMPM Claims	\$ 0.84	N/A	N/A
PMPM With Admin	\$ 0.94	N/A	N/A

	Required Direct Cost	Upper and Lower Bound Impact
Insured Population	2,453,671	2,453,671
Contribution to Total Annual Claims	\$ 24,613,540	\$ -
Contribution to Total Annual Premium	\$ 27,636,903	\$ -
Percent of Total Premium	0.24%	0.00%

*This mandate was judged by carriers contribute zero marginal cost to premiums.
Cost was estimated using literature review and public data sources.

Hearing Screening for Newborns

Permanent congenital hearing loss (PCHL) affects between one and three children per thousand born in the United States each year.³⁷⁸ Hearing loss, if left undetected, can negatively impact a child’s development in many ways, including “increased difficulties with verbal and nonverbal communication skills, increased behavioral problems, decreased psychosocial well-being, and lower educational attainment compared with children with normal hearing.”³⁷⁹

Age at diagnosis influences outcomes for children with PCHL: the earlier the detection, the better the outcome.^{380,381} As research continues to describe the rapid development of the brain before the age of three,³⁸² and positive outcomes are increasingly associated with early enrollment of hearing-impaired children into treatment programs,³⁸³ it becomes more critical to lower the age of

diagnosis of PCHL from the current median of 14-36 months to as early as possible in the life of an infant.³⁸⁴

Targeted screening programs directed at children at-risk for hearing loss detect only 50% of children with hearing impairments.³⁸⁵ Therefore, the USPSTF, the U.S. Centers for Disease Control and Prevention Early Hearing Detection and Intervention Program, the National Institutes of Health National Institute on Deafness and Other Communication Disorders, and the Joint Committee on Infant Hearing (American Academy of Audiology, American Academy of Otolaryngology, American Academy of Pediatrics, American Speech-Language-Hearing Association, Council of Education of the Deaf, Directors of Speech and Hearing Programs in State Health and Welfare Agencies) recommend universal screening for all newborns^{386,387,388} with most recommending screening before one month of age.

Universal newborn screening leads to earlier detection and treatment of PCHL.³⁸⁹ Screened infants were 19 times more likely to be referred as PCHL cases than were non-screened infants. Of children eventually confirmed with a hearing impairment, screened children were five times more likely to receive a diagnosis and eight times more likely to initiate management of the hearing loss before the age of 10 months than non-screened children.³⁹⁰ And a CDC Early Hearing Detection and Intervention survey of 46 U.S. states and territories show that in 2007, 97% of infants were screened for hearing impairments. In fact, the survey shows improvement in several measures for diagnosis and treatment of PHCL.³⁹¹

CDC EHDI Survey Data 1999-2007	2005	2007	Improvement
Infants received hearing screening before age 1 month	80.1%	85.4%	6.6%
Infants received recommended diagnostic follow-up before age 3 months	51.5%	66.4%	28.9%
Infants received early intervention enrolled before age 6 months	57.0%	60.8%	6.7%

The hearing screening for newborns mandate requires coverage for newborn hearing screening tests. The cost of the universal newborn hearing screening is based upon the number of newborns in the state who were tested in 2009, which was reported as 74,835, or over 99 percent of newborns.³⁹² We can apply the statewide average of 39.5 percent commercially fully-insured to determine the number of infants screened who were covered under a fully insured commercial plan. Based on the Center’s 2009 HCQCC claims data, the average cost of hearing screening tests was approximately \$86.35. This brings the total spent by insurers for the newborn screenings to \$2.6 million, or \$2.9 million with a 10.9 percent administrative load. The PMPM for the 2.6 million privately insured under-65 individuals including those enrolled in self-insured GIC programs in Massachusetts is then \$0.09, or 0.02 percent of the total premium. These results are summarized in Table 29 below.

Table 29
Hearing screening for newborns
Contribution to Premium*

Measures	Sample FI		Sample SI Amount	FI Minus SI
	Amount			
Sample Users	N/A			
Sample Units	N/A			
Sample Average Members	N/A			
PMPM Claims	\$ 0.08		N/A	N/A
PMPM With Admin	\$ 0.09		N/A	N/A

	Required Direct		Upper and Lower Bound	
	Cost		Impact	
Insured Population	2,637,117		2,637,117	
Contribution to Total Annual Claims	\$ 2,554,034		\$ -	
Contribution to Total Annual Premium	\$ 2,867,754		\$ -	
Percent of Total Premium	0.02%		0.00%	

*This mandate was judged by carriers contribute zero marginal cost to premiums.
 Cost was estimated using literature review and public data sources.

Hospice Care

Research into the medical effectiveness and efficacy of hospice care is difficult to conduct, given that hospice care is provided to dying patients who are no longer seeking curative treatments. Hospice care is, instead, “a program of palliative and supportive care services providing physical, psychological, social, and spiritual care for dying persons, their families, and other loved ones.”³⁹³ Services are provided in a variety of settings, including the home, nursing home, and hospital, and are tailored to the needs of each individual patient and their families. Outcomes of such treatment are variable and subjective, given that care is not intended to improve a disease-state, but are instead geared to address “physical, emotional, social and spiritual needs.”³⁹⁴ Quality of life measures are a difficult proxy to use, as data are often difficult to obtain from patients in the period immediately preceding death, and patient perception of quality of life often deteriorates until death.³⁹⁵ Despite these difficulties, however, some studies have shown hospice care to be associated with improved pain control, decreased hospitalizations, and decreased tube feedings for terminal patients,³⁹⁶ improved quality of death,³⁹⁷ and a reduction in mortality for the widowed spouse.³⁹⁸ Two oft-cited studies found that “for certain well-defined terminally ill populations, among the patients who died, patients who choose hospice care live longer on average than similar patients who do not choose hospice care,”³⁹⁹ although the authors point out that more research is needed before generalizing their findings.⁴⁰⁰

The mandate requires coverage for licensed hospice services to terminally ill patients with a life expectancy of six months or less. In 1999, 8,805 persons in Massachusetts utilized hospice services through the Medicare fee-for-service program, with \$41.4 million in associated costs.⁴⁰¹ In 2009, 22,406 persons received hospice services in Massachusetts through Medicare fee-for-service,⁴⁰²

representing a 154 percent increase in patients. Remarkably, the costs of these services totaled almost \$231 million, or an increase of over 457 percent.⁴⁰³

Assessing the level of hospice spending in Medicare should take into account managed care plan membership, which is not included in the previously cited fee-for-service figures. In 2009, 23 percent of members were enrolled in Medicare Advantage plans.⁴⁰⁴ Assuming that Medicare Advantage members utilize hospice services at the same rate as those in fee-for-service plans, the estimated spending on hospice expense for Medicare would rise to approximately \$300 million in total.

According to the Hospice Association of America, Medicare represents about 84.3 percent of spending for hospice services.⁴⁰⁵ Based on this proportion, overall spending on hospice expenses would be approximately \$356 million in 2009. The portion of this figure represented by private payers is approximately 7.8 percent, or \$27.7 million. However, this number includes all privately insured individuals, including employer self-insured, employer fully-insured and individual fully-insured members. This analysis includes only the 50.7 percent of the privately insured population who are fully-insured commercial members, or \$14.1 million of hospice spending, assuming similar per-case costs across all private payers. With 10.9 percent administrative loading, the total spending on hospice care for the under-65 fully-insured member population and self-insured GIC enrollees in Massachusetts in 2009 is estimated at approximately \$15.8 million, or \$0.50 PMPM, representing 0.13 percent of the overall premium. These results are summarized in Table 30 below.

Table 30

**Hospice Care
Contribution to Premium***

Measures	Sample FI		Sample SI Amount	FI Minus SI
	Amount			
Sample Users	N/A			
Sample Units	N/A			
Sample Average Members	N/A			
PMPM Claims	\$ 0.44		N/A	N/A
PMPM With Admin	\$ 0.50		N/A	N/A

	Required Direct Cost		Upper and Lower Bound Impact
Insured Population	2,637,117		2,637,117
Contribution to Total Annual Claims	\$ 14,057,780		\$ -
Contribution to Total Annual Premium	\$ 15,784,544		\$ -
Percent of Total Premium	0.13%		0.00%

*This mandate was judged by carriers contribute zero marginal cost to premiums. Cost was estimated using literature review and public data sources.

Lead Poisoning Screening

Elevated blood lead levels can harm many of the body's systems, including cardiovascular, renal, hepatic and especially neurological, thereby causing cognitive impairment. Very high levels of exposure may result in death or long-term neurologic disorders.⁴⁰⁶ Between 1976 and 1980, the median blood lead concentration in US children under age 5 was 15 mcg/dL. Between 1988 and 1991, the level fell to 3.6 mcg/dL, and dropped again to 1.9 mcg/dL by 1999.⁴⁰⁷ This decline is attributable to federal legislation removing lead from gasoline and reducing toxic emissions from smelters and other industrial sources, as well as eliminating lead from residential paint.⁴⁰⁸

While the exposure risk has decreased across the entire population, the prevalence of increased blood lead levels, as well as risk of exposure, varies significantly within population subgroups and is more frequent among low-income populations more likely to reside in buildings constructed before 1950. This has led to a shift in the debate from advocacy of the universal screening of all children for lead exposure to targeted screening for certain populations; this discussion is evident in the variety of recommendations and guidelines published by numerous public and professional medical organizations.

The CDC recommends universal screening for children in high risk communities (those where exposure rates of 10 mcg/dL for 1 and 2 year-olds are $\geq 12\%$, or $\geq 27\%$ of housing is built before 1950) and for all those receiving Medicaid, WIC (Supplemental Food Program for Women, Infants and Children), or other government assistance; and targeted screening based on individual risk assessment for all other children,⁴⁰⁹ a position echoed by the American College of Preventive Medicine.⁴¹⁰ The CDC recommends that state and local officials develop plans based on their own data and an inclusive planning process.⁴¹¹ The American Academy of Pediatrics supports state efforts to design targeted screening programs, with the goal to "find all children with excess exposure and interrupt that exposure."⁴¹² The American Academy of Family Physicians recommends a targeted screening program based on risk assessment.⁴¹³ However, the U.S. Preventive Services Task Force (USPSTF) concludes that evidence is insufficient to recommend routine screening for at-risk children, and recommends against routine screening for children not considered to be at-risk.⁴¹⁴

The difference in recommendations between the CDC and USPSTF may be confusing, but the guidelines are based on the different perspectives of the organizations. The CDC approached the issue from a community perspective and found that screening led to significant declines in childhood lead levels. The USPSTF, on the other hand, assessed whether a therapy exists to improve the neurodevelopmental condition for children who test positive, and found that no published data existed to recommend such therapy. It was on this basis, then, that the USPSTF "found insufficient evidence to support lead screening as a method of addressing individual patient deficits."⁴¹⁵

The policy recommendations of the Department of Public Health in the Commonwealth of Massachusetts call for universal screening for children at nine months, and ages one, two, and three. Children living in areas designated as high risk are also screened at age four. Other high-risk children, as identified by a health care provider, who live in a pre-1978 home that has not been

inspected for lead paint, or who have siblings identified with lead poisoning, should be screened every six months between six months and three years of age, and annually at ages four and five.⁴¹⁶

According to the CDC’s surveillance data, in 2009, 225,500 children under age 6 were screened for lead poisoning in Massachusetts;⁴¹⁷ the estimated proportion of children under age 6 in Massachusetts that are commercially fully-insured is 35.9 percent, for an estimate of approximately 81,000 children screened. Analysis of the Center’s HCQCC claim database found the average cost of lead screening, including blood draw and laboratory testing, averaged approximately \$24, for a total of just under \$2.0 million spent on lead screenings. This amounted to \$2.2 million after administrative loading, or \$0.07 PMPM, comprising 0.02 percent of the total premium. These results are summarized in Table 31 below.

Table 31

**Lead Poisoning Screening
Contribution to Premium***

Measures	Sample FI		Sample SI Amount	FI Minus SI
	Amount			
Sample Users	N/A			
Sample Units	N/A			
Sample Average Members	N/A			
PMPM Claims	\$ 0.07		N/A	N/A
PMPM With Admin	\$ 0.07		N/A	N/A

	Required Direct Cost		Upper and Lower Bound Impact
Insured Population	2,453,671		2,453,671
Contribution to Total Annual Claims	\$ 1,966,324		\$ -
Contribution to Total Annual Premium	\$ 2,207,854		\$ -
Percent of Total Premium	0.02%		0.00%

*This mandate was judged by carriers contribute zero marginal cost to premiums.
Cost was estimated using literature review and public data sources.

Mammography

According to the American Cancer Society, other than skin cancer, breast cancer is the most commonly diagnosed cancer for women in the United States, and second only to lung cancer in mortality rate.⁴¹⁸ Multiple studies have shown that mammography is an effective means to detect breast cancer in its early stages, when treatment is most effective⁴¹⁹ and “can often detect a lesion 2 years before the lesion is discovered by clinical breast examination.”⁴²⁰

While experts agree that mammography is effective in identifying breast cancer, there is some controversy around the recommended screening schedule, particularly regarding the risks and benefits of annual mammography for women between 40 and 50 years of age. The Massachusetts

mandate is in line with the 2003 American Cancer Society recommendation of annual mammography for women beginning at age 40,⁴²¹ which was again endorsed by the National Comprehensive Cancer Network in 2010.⁴²²

In 2009, the USPSTF changed its guidelines, recommending biennial screening for women between 50 and 75, stating evidence in support of screening for women over 75 is insufficient, and leaving the decision on routine mammography for women between 40 and 50 to the patient and her physician, citing evidence that the risks of screening prior to age 50 were more significant than the expected benefit for the general population.⁴²³ The American Academy of Family Physicians has publicly endorsed these statements.⁴²⁴

The American College of Physicians recommends annual screening for women 50 and over, but for women between 40 and 50 years of age, leaves the decision on routine mammography to the woman and her physician based upon risk factors.⁴²⁵ Finally, the American College of Obstetricians and Gynecologists recommends annual screening for women 50 and over, and screening every 1-2 years for women 40-50, again depending on risk factors.⁴²⁶

Table 32

**Mammography
Contribution to Premium***

Measures	Sample FI		Sample SI Amount	FI Minus SI
	Amount			
Sample Users	N/A			
Sample Units	N/A			
Sample Average Members	N/A			
PMPM Claims	\$ 1.35		N/A	N/A
PMPM With Admin	\$ 1.52		N/A	N/A

	Required Direct Cost		Upper and Lower Bound Impact
Insured Population	2,453,671		2,453,671
Contribution to Total Annual Claims	\$ 39,779,227		\$ -
Contribution to Total Annual Premium	\$ 44,665,442		\$ -
Percent of Total Premium	0.39%		0.00%

*This mandate was judged by carriers contribute zero marginal cost to premiums.
Cost was estimated using literature review and public data sources.

The mammography mandate requires coverage for one "baseline" mammogram between ages 35 and 40, and annual measurements thereafter. In 2009, the number of fully-insured women ages 40-64 in Massachusetts was approximately 518,000. According to the National Health Insurance Survey, 56.2 percent of women with health insurance received a mammogram within a year;⁴²⁷ according to the CDC, almost 85 percent of women receive a mammogram within a two year period.⁴²⁸ Using the annual number, approximately 291,000 mammograms were performed on the fully-insured female population of Massachusetts in 2009. In that year, estimated charges per mammogram ranged from \$80-\$153,⁴²⁹ with the average approximately \$137, or \$39.8 million in

total. This figure rises to \$44.7 million with 10.9 percent administrative loading, or \$1.52 PMPM, which is approximately 0.39 percent of the overall premium. These results are summarized in Table 32 above.

Maternity Care

Prenatal care has been a widespread practice in the United States since the early twentieth century, and has been proven effective at minimizing maternal mortality⁴³⁰ and helping to reduce fetal, neonatal, and perinatal mortality.⁴³¹ Further, studies have shown better control of preeclampsia (pregnancy-related high blood pressure),⁴³² gestational diabetes mellitus,⁴³³ and HIV⁴³⁴ through prenatal care. Some research also points to a reduction in pre-term delivery, term-low birthweight, and babies small for their gestational age for women receiving adequate prenatal care.⁴³⁵

Post-partum hospital stays for mother and baby have changed significantly over the last four decades, with vaginal delivery discharges dropping from 3.9 to 1.8 days and c-section deliveries from 7.8 to 3.5 days between 1970 to 1998.⁴³⁶ Beginning with a movement to ‘demedicalize childbirth,’ followed by continued pressure by insurers to reduce costs,⁴³⁷ postpartum lengths of stay continued to decrease until the mid-1990s. In 1992, the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists published joint guidelines for postpartum hospital stays, including a 48-hour stay for an uncomplicated vaginal birth, and a 96-hour stay for an uncomplicated c-section delivery, excluding the day of delivery;⁴³⁸ these guidelines were restated in their most recent publication in 2007.⁴³⁹ In 1995, Maryland became the first state to pass legislation intended to set minimum required lengths of stay following delivery for both mothers and their newborn babies; by 1997, 32 states had adopted similar laws, with the federal government enacting the federal Newborns’ and Mothers’ Health Protection Act of 1996, effective January 1, 1998.⁴⁴⁰

Post-partum hospital stays serve purposes aside from recovery from the birth event, in particular allowing time sufficient to determine the medical and psychosocial readiness of both mother and child.⁴⁴¹ According to a recent policy statement of the American Academy of Pediatrics, “The hospital stay of the mother and her healthy term newborn infant should be long enough to allow identification of early problems and to ensure that the family is able and prepared to care for the infant at home.”⁴⁴² Services performed include performance of newborn screenings and risk assessment through various tests and medical staff observation; administration of immunizations; maternal and family counseling and assessments, and perinatal education on issues such as breastfeeding, newborn sleep position, tobacco smoke exposure, car seat safety and fit, mental health including post-partum depression, and domestic violence; and follow-up care planning for both mother and baby.⁴⁴³

The intended and observed result of the legislative mandates targeting post-partum length of stay was to increase average length of stay and to compress variability in length of stay among population sub-groups.^{444,445} Further, evidence has shown that early discharge legislation has decreased risk for infant readmission,⁴⁴⁶ morbidity,⁴⁴⁷ and mortality.⁴⁴⁸ One study found a 36% reduction in infant mortality in its study population,⁴⁴⁹ while another states that “one infant life

could be saved for each 1400 normal newborns moved from early discharge (less than 30 h) to longer length of stay.”⁴⁵⁰ Other research suggests that mothers who stayed only one night after vaginal delivery reported more distress and fatigue, and more pediatric problems than mothers who stayed two nights, and utilized more outpatient services following discharge. Likewise, these mothers were less likely to initiate and/or continue breastfeeding.⁴⁵¹ Some research suggests, however, that improved mortality and morbidity rates are dependent on the content of post-partum services, which should be more uniformly defined and administered.^{452,453}

On average, the biggest increase in length of stay was for uncomplicated vaginal deliveries, as c-section and more complicated deliveries already resulted in longer stays.⁴⁵⁴ However, more recent research has shown that the impact on both length-of-stay and marginal charges is much more moderate than was reported in the years immediately following the passage of the legislation. The following table outlines two studies, one published in 2004 and the other in 1998, demonstrating more recent findings of smaller increases in length of stay (LOS) and costs due to the legislation. The authors of the later study point out that the dramatic decrease in impact may be the result of limitations in the earlier research, including a much smaller sample size and a much shorter timeframe studied, which may not reflect overall changes in provider practice patterns that may have occurred in absence of the legislative change.⁴⁵⁵

	2004 ⁴⁵⁶				1998 ⁴⁵⁷	
	Normal Newborn		Mother		Mother & Child	
	Vaginal delivery	C-Section delivery	Vaginal delivery	C-Section delivery	Vaginal delivery	C-Section delivery
LOS increase	11.3%	6.4%	9.5%	5.7%	37.5%	17.0%
Charges (%)	8.5%	5.0%	3.2%	1.5%	10.0%	6.3%
Charges (\$)	\$84	\$86	\$121	\$106	\$250	\$225

The 2004 study also conservatively values the cost per life saved as a result of the legislative change at \$1.79 million based solely on hospital charges that do not factor in other medical costs or health benefits, a figure the authors characterize as “[n]either highly cost-effective nor hugely cost-ineffective relative to estimates of the value of a life (often in the range of US\$1-10 million).”⁴⁵⁸

According to the American Academy of Pediatrics, following post-partum discharge, home visits are intended to verify the overall health, hydration and extent of jaundice of the infant; identify new problems; assess mother’s mental health as well as maternal-infant bond and attachment; conduct additional screens and provide immunizations; and to review and reinforce education objectives and health care planning and maintenance.⁴⁵⁹

Yet while these visits are not common practice in the United States,⁴⁶⁰ they are recommended by many health and public organizations, including the American Academy of Pediatrics,⁴⁶¹ the US Advisory Board on Child Abuse and Neglect,⁴⁶² and the US Centers for Disease Control and Prevention’s Task Force on Community Preventive Services.⁴⁶³

These visits have been found to be cost-effective based solely on the observed reduction in costs associated with readmission, and the need for other hospital-based services in the first 10 days of

life.⁴⁶⁴ However, beyond these savings, a variety of significant health benefits to both child and mother have resulted from these visits, including a decrease in missed well-infant visits;⁴⁶⁵ identification of psychosocial issues and post-partum depression, as well as improvement in the maternal-child bond;⁴⁶⁶ a reduction of incidence of child abuse and neglect;⁴⁶⁷ fewer emergency department visits and unintentional injuries, ingestions and poisonings;⁴⁶⁸ and a reduction in sudden infant death syndrome.⁴⁶⁹

The Massachusetts statute mandates coverage for "expense of prenatal care, childbirth and post partum care to the same extent as provided for medical conditions not related to pregnancy" with "minimum 48 hours of inpatient care following a vaginal delivery and a minimum of 96 hours of inpatient care following a caesarean section."

For the purposes of this analysis, the costs of maternity care include prenatal care in the nine months prior to delivery, delivery services, and services for the mother in the three months following delivery. The study upon which the estimates are based, published in 2007 from 2004 cost data, included only live births to women with continuous private insurance enrollment.⁴⁷⁰ In this study, the average health plan payment for maternity services for deliveries in the Northeastern U.S. was \$9,396. Converting this 2004 estimate to 2009 dollars brings the average cost of delivery in 2009 to \$11,350.

Table 33

**Maternity Health Care
Contribution to Premium***

Measures	Sample FI		
	Amount	Sample SI Amount	FI Minus SI
Sample Users	N/A		
Sample Units	N/A		
Sample Average Members	N/A		
PMPM Claims	\$ 8.05	N/A	N/A
PMPM With Admin	\$ 9.04	N/A	N/A

	Required Direct Cost	Upper and Lower Bound Impact
Insured Population	2,637,117	2,637,117
Contribution to Total Annual Claims	\$ 254,853,027	\$ -
Contribution to Total Annual Premium	\$ 286,157,475	\$ -
Percent of Total Premium	2.33%	0.00%

*This mandate was judged by carriers contribute zero marginal cost to premiums. Cost was estimated using literature review and public data sources.

According to the Massachusetts Department of Public Health, there were 74,966 births in Massachusetts in 2009, of which 59.1 percent were privately insured, for a total of 44,305 privately insured live births.⁴⁷¹ Approximately 50.7 percent of privately insured were fully insured in 2009, implying approximately 22,453 births. Multiplying by the average cost of maternity care provides an estimate of \$254.9 million in total estimated costs of maternity care for the privately fully

insured population including self-insured GIC enrollees in 2009. With 10.9 percent administrative loading, this total rises to \$286 million, or \$9.04 PMPM, representing 2.33 percent of the overall premium. These results are summarized in Table 33 above.

Preventive Care for Children up to Age 6 (including specific newborn testing)

Child health has recently been defined as “the extent to which individual children or groups of children are able or enabled to (1) develop and realize their potential; (2) satisfy their needs; and (3) develop the capacities to allow them to interact successfully with their biological, physical, and social environments.⁴⁷²” Given this broad definition, pediatric care in America has evolved over time, changing its focus from the prevention and treatment of illness and infection to a focus on prevention and the promotion of healthy physical, cognitive, social, and emotional development,⁴⁷³ as well as the family’s capacity and functioning.⁴⁷⁴

As care provision changed, criticism arose as to the inconsistency of the content and quality of well-child care, as well as a lack of research proving the effectiveness of each of its elements.^{475,476} Minority children,⁴⁷⁷ children receiving Medicaid,⁴⁷⁸ and children without special health care needs⁴⁷⁹ were shown to receive less adequate care than comparison groups. In response to such observations, researchers began to review the content and quality of well-child care provision as well as the methods by which it is studied; at present, much of pediatric medicine is considered to be “evidence-informed, rather than fully evidence-driven.”⁴⁸⁰

In part as a reaction to these reports, the American Academy of Pediatrics has released its third edition of *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents*,⁴⁸¹ as well as *Performing Preventive Services: A Bright Futures Handbook*.⁴⁸² The Bright Futures program began in 1990 to “to improve the quality of health services for children through health promotion and disease prevention;”⁴⁸³ and has developed a robust set of recommendations for the provision of well-child care, including a newly revised Periodicity Schedule that provides evidence of the effectiveness of each recommendation and intervention.⁴⁸⁴

The preventive care mandate requires coverage for preventive and primary care services for children up to age six, including physical exams, sensory screening, neuropsychiatric evaluation and developmental screening, hereditary and metabolic screening at birth, appropriate immunizations, blood tests, and urinalysis.

To calculate the effect of the preventive care mandate on commercial insurance costs in Massachusetts, Compass reviewed a 2005 study that examined components of preventive care for both “not-at-risk” and “at-risk” children. Multiplying each average preventive service cost by the estimated 42,000 children and summing the products results in an estimate of \$106 million, or \$2.95 PMPM. These costs do not include neuropsychiatric evaluations, as they were not included in the cited cost study. However, the costs do include newborn hearing screening, costs for which were estimated in the “Newborn Hearing Screening” section above. Lacking more specific data, Compass assumes that the costs for hearing screening and neuropsychiatric evaluations are approximately equal, and that any difference is within the range of estimation error for the preventive care mandate as a whole.

Based on this assumption, Compass trended the 2005 estimate forward to 2009, using U.S. Bureau of Labor Statistics medical consumer price index data (Medical CPI)⁴⁸⁵ data to obtain a 2009 estimated claims PMPM for preventive care for children under age 6 of \$3.42 PMPM (\$100.8 million), or \$3.85 PMPM (\$113.2 million) and 0.99 percent of total Commonwealth premium with 10.9 percent administrative loading. These results are summarized in Table 34 below.

Table 34
Preventive Care for Children up to Age Six
Contribution to Premium*

Measures	Sample FI		
	Amount	Sample SI Amount	FI Minus SI
Sample Users	N/A		
Sample Units	N/A		
Sample Average Members	N/A		
PMPM Claims	\$ 3.42	N/A	N/A
PMPM With Admin	\$ 3.85	N/A	N/A

	Required Direct Cost		Upper and Lower Bound Impact
	Insured Population	2,453,671	
Contribution to Total Annual Claims	\$ 100,833,679		\$ -
Contribution to Total Annual Premium	\$ 113,219,416		\$ -
Percent of Total Premium	0.99%		0.00%

*This mandate was judged by carriers contribute zero marginal cost to premiums. Cost was estimated using literature review and public data sources.

Off-label Use of Prescription Drugs to Treat Cancer

The off-label use of prescription drugs to treat cancer mandate requires the Commissioner of Insurance to establish a panel of experts to review off-label uses of prescription drugs for the treatment of cancer for medical appropriateness and to direct insurers to make payments consistent with those recommendations.

The Federal Food, Drug and Cosmetics Act of 1938 created the Food & Drug Administration (FDA) in part to control the activities of pharmaceutical manufacturers and their interstate commerce in the United States. The act specifically regulates manufacturer’s activities, but not physician prescribing practices.⁴⁸⁶

When the FDA approves a drug for market, it also approves its labeling. Labeling is specific to the approved indications for use, dosage, patient population, and method of administration. Physicians, however, are not limited to prescribing the drug according to its label, and may prescribe drugs for “off-label uses,” or those not specifically approved by the FDA. Off-label use is not the same as expanded access or special exemption, which are FDA processes allowing patients who are not eligible for clinical trials access to investigational treatments not yet FDA-approved.⁴⁸⁷

Because of the expense and time needed to obtain FDA-approved use of a drug, off-label prescribing has become “an integral part of contemporary medicine.”⁴⁸⁸ One study found that 57% of new drug uses come from field discovery, and not through clinical trials.⁴⁸⁹ Another, published in 2006, found that 21% of prescriptions written in the U.S. were for off-label use;⁴⁹⁰ the practice is so widespread that organizations like Consumer’s Reports now publish a guide to off-label prescription drugs.⁴⁹¹ A 2008 survey found that 80% of oncologists prescribe off-label treatments, and that 50% of chemotherapy treatments are off-label uses.⁴⁹²

Off-label use is common in cancer treatment for a variety of reasons. First, certain drugs approved for treatment of specific tumor types are effective against a broader array of tumors. Second, cancer is often treated with drug combinations, including one or more that are off-label. These combinations change frequently, as evidence gathers about their effectiveness. Third, cancer treatment continues to evolve quickly. Fourth, oncologists often treat terminal patients whose approved treatment options may be exhausted. And finally, oncologists may be more open to experimenting with off-label treatments for their patients.⁴⁹³

But this practice is not without significant risks and controversy. Critics rightfully stress the risks of drugs where rigorous scientific evidence does not exist for additional applications; such dangers may range from a drug’s ineffectiveness to its outright harm to a patient. Clinical study protocols and the FDA itself were created to protect patients from the harm of unknown outcomes and experimental practices. While the FDA cannot regulate physician prescribing activities, malpractice suits against practitioners and class action suits against manufacturers have increasingly admitted the court system into this area of medicine, bringing with them the threat of significant financial risks and, more recently, criminal penalties.⁴⁹⁴ And the provider community itself is divided; the same survey of oncologists that revealed widespread off-label prescribing found that “attitudes and practices...vary substantially.”⁴⁹⁵

Despite the risks, approved treatment options remain limited for certain patients, leaving doctors to continue to prescribe off-label uses for drugs. However, no widely systematic or transparent method currently exists to collect information on off-label use. One study found the use of off-label medication to be quite common in outpatient care, with most (73%) occurring “without scientific support.”⁴⁹⁶ Further, “[s]tudies suggest that many physicians rely on experience, anecdotal reports, and opinion leaders to guide their treatment decisions, often failing to demand solid evidence for their prescribing choices.”⁴⁹⁷ Since the decision to prescribe the off-label drug is a professional judgment, and the mandate is by nature broad, it is inevitable that some uses are efficacious while others are not.

Professional medical societies defend the rights of physicians to prescribe pharmaceuticals for off-label uses, although they differ in the strength of their advocacy statements. The American Medical Association (AMA) “confirms its strong support for the autonomous clinical decision-making authority of a physician and that a physician may lawfully use an FDA approved drug product or medical device for an unlabeled indication when such use is based upon sound scientific evidence and sound medical opinion,” and calls for full reimbursement of such prescriptions as “reasonable and necessary medical care.”⁴⁹⁸ The American College of Physicians (ACP) acknowledges that while

off-label prescriptions may bring benefit, they also carry risks and “should always be approached carefully.”⁴⁹⁹

While these societies leave treatment decisions to physicians, each encourages its members to study available information to determine whether off-label prescribing is in the best interest of the patient. The AMA points its members to published scientific literature, as well as three published drug compendia, including AMA's Drug Evaluations, United States Pharmacopeia-Drug Information Volume I, and American Hospital Formulary Service-Drug Information, to help in making off-label prescription decisions.⁵⁰⁰ Yet a study of these found that while oncologists rely on compendia for off-label indications and reimbursement information, even these “lack transparency, cite little current evidence, and lack systematic methods to review or update evidence.”⁵⁰¹ The ACP states that “[w]hen considering an innovative therapy that has no precedent, the physician should consult with peers, an institutional review board, or other expert group to assess the risks, potential adverse outcomes, potential consequences of foregoing a standard therapy, and whether the innovation is in the patient's best interest.”⁵⁰²

Reimbursement for off-label prescriptions is inconsistent and complex. Many states, like Massachusetts, mandate coverage for off-label prescriptions for certain types of drugs. Likewise, Medicare Part D only covers payment for drugs that have FDA approval, or for uses supported in their approved drug compendia, including DRUGDEX, United States Pharmacopeia-Drug Information Volume I and the AMA's Drug Evaluations.⁵⁰³ Further, Part D will pay for oral anticancer drugs with the same active ingredients and indications as chemotherapy drugs, even if they have not received FDA approval for that use.⁵⁰⁴

In response to advocates' calls for expanded access to drugs for additional uses, the FDA has done much in recent years to change its rulings and guidance to enable distribution of therapies which have been proven effective, especially in cases where formal approval has not been applied for and/or granted.

The 2007 FDA Amendments Act made changes that impacted off-label prescribing. First it expands the information collected and studied about drugs following their approval. The agency now has more authority to monitor the safety of drugs after approval, and has funding to set up a stronger post-marketing surveillance system as well as an active monitoring system to discover adverse events involving a drug. The agency is empowered to use large clinical databases to determine a drug's safety, including when used off-label, and may now order manufacturers to conduct post-approval studies to identify risks. Second, manufacturers must now register their studies, making the information on off-label use more robust and available to physicians and the public, and further preventing the industry from hiding negative results about their products. And third, the FDA has more power to act when a product appears harmful to patients, including the ability to change labeling to outline harms of certain off-label drug applications. An example is labeling changes to anti-depressants, long prescribed off-label to teenagers and children without FDA approval; studies proved that these drugs may increase suicidal thoughts and tendencies in younger populations, and the FDA recently added this warning to its labels for prescribers and patients. Furthermore, the FDA can limit the distribution of certain drugs only to physicians with specialized training.

More recently, in 2009, the FDA issued its non-binding guidance, so-called ‘Good Reprint Practices’, outlining means by which manufacturers may inform physicians of unapproved uses for approved drugs by distributing articles from independent medical and scientific resources.⁵⁰⁵

Despite these changes, off-label prescribing is still widespread in the practice of medicine. However, most patients are not aware that it happens at all. Physicians are not required to inform a patient that a prescribed treatment is not FDA approved; therefore, patients may not be aware of the treatment’s uncertainty and potential risks, nor of the potential additional cost of an off-label treatment that may not be reimbursable. In fact, one poll has shown that half of patients mistakenly think that doctors may only prescribe drugs for FDA approved uses, while another 25% are not sure if a drug must be approved in order to be prescribed; this means that only one-quarter of patients are aware that drugs may be prescribed for unapproved uses. In the same study, almost half think that doctors should not be able to prescribe off-label uses and 62% believe that off-label prescribing should only be permitted during an approved clinical trial.⁵⁰⁶ Some organizations, like the ACP, encourage informed consent by patients when a “recommended therapy is not standard treatment,”⁵⁰⁷ but again, this is not legally required.

An estimate of the costs of off-label drug use for cancer treatment would require a large, dedicated research effort, a comprehensive claims database (preferably from Massachusetts), and extensive clinical definition of potential off-label use, associated diagnoses, etc. Even with such an effort, ambiguities would likely remain in the results. Moreover, it was also the opinion of the participating health plans that these costs would be incurred by the plans even without the mandate laws in place (and therefore, the marginal cost of the mandate is zero) because it would be difficult to identify and monitor such prescribing practices. While there was general consensus among the plans about the treatment benefits of using off-label drugs, the cost-effectiveness of such treatments have not been studied comprehensively.

Off-label Use of Prescription Drugs to Treat HIV/AIDS

The general issues arising from the practice of prescribing off-label drugs are outlined in the preceding section on off-label uses of drugs for cancer treatment.

This mandate requires coverage for prescription drugs for off-label use in the treatment of HIV/AIDS if the drug is recognized for treatment of such in one of the standard reference compendia or in the medical literature.

Off-label prescribing became standard practice early in the history of the disease. This was especially true in medicine’s attempt to stop or limit the spread of opportunistic infections, as approved-use treatments were not available,⁵⁰⁸ and a large body of scientific evidence had not yet been developed to specifically treat the disease. Doctors learned in the field, finding new uses for old drugs with similar application or approved for a different population. These treatment attempts were sometimes the only hope of survival for a dying patient. Again, however, information on successful use of off-label drugs to treat HIV/AIDS was and continues to be scarce, and access to these treatments is often limited through actual supply or because of complex reimbursement issues.

In response to advocates' calls for expanded access to drugs for additional uses, the FDA has modified its rulings and guidance in recent years to enable distribution of therapies which have been proven effective, especially in cases where formal approval has not been applied for and/or granted.

As described above in the off-label treatments for cancer section, the 2007 and 2009 changes to FDA law and guidance made changes that impacted off-label prescribing, including uses for HIV/AIDS.

Some changes to the FDA processes have been made specifically because of the rapid spread of HIV/AIDS. In 1987, the agency created the 'AA Priority' category, giving priority to potential AIDS therapies in the review process.⁵⁰⁹ In 1992, the FDA published its Parallel Track policy [57 FR 13250], which "permits wider access to promising new drugs for AIDS/HIV related diseases..."⁵¹⁰ And in 2009, the FDA expanded its 1987 guideline regarding Treatment Investigational New Drug Applications, another attempt to ease administrative requirements for approval while expanding access to promising drugs for patients.⁵¹¹

For reasons similar to those presented above for off-label drug use in cancer treatment it is not feasible to measure costs of off-label prescription drug use for the treatment of HIV/AIDS in Massachusetts. It was the opinion of the participating health plans that these costs would be incurred by the plans even without the mandate laws in place because it would be difficult for the health plans to identify and monitor such prescribing practices, and therefore, the marginal cost of the mandate is estimated to be zero.

Summary of Mandate Cost Estimates

Table 35 below displays a summary of the cost estimates for all 35 mandates, including those estimated using secondary data sources. The first column displays total required direct costs, or RDCs,^{xx} which measure the claim costs for services described in the mandate laws, and so include both costs for services that would be provided voluntarily in the absence of the mandates and incremental costs resulting from the mandates, and are estimated to be \$1.24 billion after elimination of overlaps in cost between mandates, and \$1.4 billion with administrative costs. This estimate is not a measure of the impact of the mandates, as it includes the portion of the costs that would be provided voluntarily in the absence of the mandate laws.

The lower bound marginal claims estimate of \$52 million in the second column represents the marginal impact of the mandates on claims spending calculated from per person spending differences on mandated benefits between the fully-insured population subject to the mandates, and the self-insured population not subject to the mandates.^{xxi} This difference represents \$1.85

^{xx} Required Direct Costs, defined in the report introduction and Appendix C.

^{xxi} Note that the zero marginal cost mandates have been treated as having zero marginal cost, and that a number of the mandates with potential marginal cost were measured to have zero marginal cost relative to self-insured plan spending.

PMPM, or 0.48% of premium, meaning that the additional spending on mandated services in plans subject to the mandates compared to those plans not subject to the mandates represents approximately one half of one percent of premium.

In order to measure the full impact, insurer administrative costs should be added. In the next two columns of Table 35 the lower bound estimate of \$52 million becomes \$59 million with administration, and the upper bound estimate becomes \$888 million after removing zero marginal cost mandates and adding administrative expense.

The range of the marginal direct cost impact of all 35 mandate laws studied, including administrative costs, is therefore between \$59 million and \$888 million. The true value is not likely to be near either end of this range. The upper end of the range includes all RDCs except those for mandates judged by the carriers likely to have zero marginal costs, and includes an additional provision for carrier administrative costs. This upper bound estimate assumes that 100 percent of the RDC for mandates with potential marginal direct cost is marginal, and that carriers would pay zero dollars in claims for the services described by the mandates in the absence of the mandate laws.

The lower end of the range subtracts from the RDCs the dollars implied by the per person spending rate in the self-insured market, which is not subject to the mandate laws. This estimate assumes that 100 percent of the spending for the mandates with potential marginal direct cost in the self-insured market would occur in the absence of the mandate laws, and that none of the spending is influenced by the mandated spending levels in the fully-insured market.

The range of estimates is associated with between 0.48 percent of premium for the low-end estimate and 7.23 percent for the high-end estimate. The estimated range does not consider indirect costs, which, as noted above, previous research finds will increase costs for some mandates and offset costs for others.

The three most expensive mandates are mental health (impact range = \$52M to \$319M), infertility treatment (\$27M to \$118M), and home health care (\$14M to \$244M). All three are provided in the self-insured market at nearly the level they are provided in the fully-insured market, suggesting that these benefits are cost-effective, popular with employees, or both. Combined, these three represent a low-end estimate of 0.77 percent of premium and a high-end estimate of 5.69 percent of premium.

Table 35

Summary of Estimated Costs for Massachusetts Mandated Benefits as of 2009
Dollars in Millions (000,000s)

	Required Direct Cost Claims Estimate	Lower Bound Marginal Claims Estimate	Upper Bound Estimate with Admin Exp	Lower Bound Estimate with Admin Exp	Upper Bound Percent of Premium	Lower Bound Percent of Premium
Unduplicated Total All Mandates	\$ 1,236.22	\$ 52.27	\$ 888.29	\$ 58.69	7.23%	0.48%
Mandates with Potential Marginal Direct Cost						
Service Mandates						
Autism Spectrum Disorders (not in force until 1/1/2011)	\$ -	\$ -	\$ -	\$ -	0.00%	0.00%
Chiropractic Services	\$ 6.44	\$ -	\$ 7.23	\$ -	0.06%	0.00%
Contraceptive Services	\$ 32.94	\$ -	\$ 36.99	\$ -	0.32%	0.00%
Diabetes-related Services and Supplies	\$ 73.58	\$ -	\$ 82.61	\$ -	0.67%	0.00%
Early Intervention Services	\$ 26.33	\$ 2.93	\$ 29.57	\$ 3.29	0.26%	0.03%
Home Health Care	\$ 217.48	\$ 12.04	\$ 244.19	\$ 13.52	2.14%	0.12%
Hormone Replacement Therapy (HRT)	\$ 2.75	\$ -	\$ 3.09	\$ -	0.03%	0.00%
Human Leukocyte Antigen Testing	\$ 0.15	\$ 0.07	\$ 0.17	\$ 0.08	0.00%	0.00%
Hypodermic Syringes or Needles	\$ 0.09	\$ 0.03	\$ 0.10	\$ 0.03	0.00%	0.00%
Infertility Treatment	\$ 96.33	\$ 23.83	\$ 108.16	\$ 26.76	0.95%	0.23%
Low Protein Food Products for Inherited Amino Acid and Organic Acid Diseases (PKU)	\$ 1.45	\$ -	\$ 1.62	\$ -	0.01%	0.00%
Mental Health Care	\$ 284.39	\$ 46.26	\$ 319.33	\$ 51.94	2.60%	0.42%
Nonprescription Enteral Formulas	\$ 0.27	\$ 0.12	\$ 0.31	\$ 0.14	0.00%	0.00%
Prosthetic Devices	\$ 3.90	\$ 0.14	\$ 4.38	\$ 0.15	0.04%	0.00%
Scalp Hair Prostheses for Cancer Patients	\$ 0.57	\$ 0.03	\$ 0.64	\$ 0.03	0.01%	0.00%
Speech, Hearing and Language Disorders	\$ 1.43	\$ -	\$ 1.60	\$ -	0.01%	0.00%
Provider Mandates						
Certified Nurse Midwives	\$ 2.95	\$ -	\$ 3.31	\$ -	0.03%	0.00%
Certified Registered Nurse Anesthetists	\$ 14.06	\$ -	\$ 15.79	\$ -	0.14%	0.00%
Chiropractors	\$ 22.40	\$ 1.70	\$ 25.15	\$ 1.91	0.22%	0.02%
Dentists	\$ 13.49	\$ -	\$ 15.14	\$ -	0.13%	0.00%
Nurse Practitioners	\$ 14.37	\$ -	\$ 16.13	\$ -	0.14%	0.00%
Optometrists	\$ 17.09	\$ 3.27	\$ 19.18	\$ 3.67	0.17%	0.03%
Podiatrists	\$ 22.90	\$ -	\$ 25.72	\$ -	0.22%	0.00%
Mandates Judged to Have Zero Marginal Cost						
Bone Marrow Transplants for Treatment of Breast Cancer	\$ -	\$ -	\$ -	\$ -	0.00%	0.00%
Cardiac Rehabilitation	\$ 3.83	\$ -	\$ -	\$ -	0.00%	0.00%
Clinical Trials (to treat cancer)	\$ 2.61	\$ -	\$ -	\$ -	0.00%	0.00%
Cytologic Screening	\$ 24.61	\$ -	\$ -	\$ -	0.00%	0.00%
Hearing Screening for Newborns	\$ 2.55	\$ -	\$ -	\$ -	0.00%	0.00%
Hospice Care	\$ 14.06	\$ -	\$ -	\$ -	0.00%	0.00%
Lead Poisoning Screening	\$ 1.97	\$ -	\$ -	\$ -	0.00%	0.00%
Mammography	\$ 39.78	\$ -	\$ -	\$ -	0.00%	0.00%
Maternity Health Care (including minimum maternity stay)	\$ 254.85	\$ -	\$ -	\$ -	0.00%	0.00%
Preventive Care for Children Up to Age Six	\$ 100.83	\$ -	\$ -	\$ -	0.00%	0.00%
Off-Label Uses of Prescription Drugs to Treat Cancer	\$ -	\$ -	\$ -	\$ -	0.00%	0.00%
Off-Label Uses of Prescription Drugs to Treat HIV/AIDS	\$ -	\$ -	\$ -	\$ -	0.00%	0.00%

Discussion and Conclusions

The explicit empirical results of the study produce a wide range of potential impact of mandated benefits on health insurance direct costs in the fully-insured market. At one extreme, summing the cost of all the benefits described in the 35 mandates in total represented in 2009 approximately \$1.4 billion in required direct cost including administrative costs, or 11.3 percent of the average fully-insured commercial premium in the Commonwealth. Removing the cost of those benefits that carriers say they would provide even without the mandate laws, the total is \$888 million or 7.2 percent of premium. At the other extreme, the difference in spending per-person between fully-insured and self-insured employers implies a direct cost impact of only \$59 million, or 0.48 percent of premium. Table 36 displays this impact range in percent of premium, PMPM, and total implied

spending in the fully-insured market. Examining the assumptions required to use either of these numbers as an impact estimate makes it clear that the direct cost impact is neither as low as \$59 million nor as high as \$888 million.

The \$888 million estimate is far too high as a measure of direct costs. This estimate requires us to assume that all mandated benefits would be dropped completely by all insurers in Massachusetts if the laws were repealed. No fully-insured policies would include any of the mandated benefits, including mental health, home care, nurse practitioner services, or any of the other mandates. If instead, after mandates were hypothetically repealed, some of these benefits were offered and purchased voluntarily or as a result of Federal mandates, then the impact estimate of \$888 is too large by the amount of voluntarily offered or Federally required benefits, since not all that spending would have been compelled by the state mandate laws. Many of the larger-dollar benefits are offered, perhaps at lower levels, in states without mandate laws, either voluntarily or as a result of Federal mandates. Mental health alone, much of which is compelled by Federal mandate, constitutes approximately \$319 million of the \$888 million (see Table 36). Home health, a benefit not likely to be eliminated, accounts for another \$244 million of the total, and many other benefits such as nurse practitioners, CRNAs, contraceptives, and diabetes-related services would be unlikely to disappear from benefit packages. Without being able to analytically arrive at a difference, it would seem that \$888 million is hundreds of millions too high as an impact estimate.

The \$59 million estimate implied by the spending difference between fully-insured and self-insured plans requires us to assume that the presence of the mandate laws places no upward pressure on the benefits offered by self-insured firms. The need for self-insured firms to not disadvantage themselves in the labor market in the presence of the fully-insured firms with mandated benefit coverage seems certain to influence benefit levels. The magnitude of any such effect would increase the impact estimate above \$59 million, and would vary by mandate. Certain highly-visible and expensive benefits such as infertility treatment (\$108 million) would seem most subject to upward pressure of the labor market. On the other hand, for many of the mandates in Table 35, the per-person costs are actually higher in the self-insured market than in the fully-insured market (those with a zero lower-bound), suggesting no upward pressure induced by the fully-insured market.

Applying both these lines of reasoning to narrow the range displayed in Table 36, it seems likely that the direct cost impact of the mandates is somewhere between 1% and 4% of total premium.

In addition to the direct cost impacts, there are indirect cost effects that we are not able to address in this study. With almost 90 percent of the total estimated direct cost stemming from five of the mandates, consideration of these five and their likely indirect cost effects would provide most of the required information on how the direct costs might be added to or reduced by their indirect cost effects: mental health, home health, infertility, diabetes services and supplies, and contraception. It is possible that after consideration of indirect cost effects, the net impact of these five mandates is cost reducing, though we cannot estimate that impact in this study. Finally, there are individual and socially beneficial impacts aside from health care spending that these mandates may provide discussed in the efficacy summaries in the results section. Benefit mandates are often used when such beneficial effects are perceived but something short of government provision of the benefit is the balance point of the political process.⁵¹²

Table 36

Cost Implications of Impact Assumptions

Percent of Premium		PMPM		Dollars (millions)
0.5%	\$	1.94	\$	61.98
1.0%	\$	3.88	\$	123.97
2.0%	\$	7.77	\$	247.93
3.0%	\$	11.65	\$	371.90
4.0%	\$	15.53	\$	495.86
5.0%	\$	19.42	\$	619.83
6.0%	\$	23.30	\$	743.79
7.0%	\$	27.18	\$	867.76
8.0%	\$	31.07	\$	991.72

Looking forward, the implementation of the Federal Accountable Care Act’s essential health benefits, and the decisions made in Massachusetts about the benchmark benefit package, will have a significant effect on estimates of mandate impacts for 2014 forward. The law requires that some services not currently mandated at the Federal level will be required in benefit packages, making the related state mandates redundant. On the other hand, the Commonwealth’s decisions about the specific benchmark plan and its associated mandates will determine the degree to which cost sharing and premium subsidies for those with incomes between 133% and 400% of the Federal Poverty Level will be fully subsidized by the Federal government, and so will affect the Commonwealth’s outlays for subsidies.

Appendices

Appendix A: Summary of Health Insurance Benefit Mandates

Appendix B: Mandates Present in 2007 and 2010, State-by-State Mandate Comparison

Appendix C: Methodology of Cost Estimation

Appendix D: Estimation of Population Subsets

Appendix E: Population Applicability of Mandate Laws

Appendix F: Data Pull Matrix

Appendix G: Cost by Type of Service for Mandates with Potential Marginal Direct Cost

Appendix A: Summary of Health Insurance Benefit Mandates

Service mandates

Mandate	Statute	Summary	In 2008 Report
Autism	c. 175 § 47AA; c. 176A § 8DD; c. 176B § 4DD; c. 176G § 4V; c. 32A § 25	Mandates coverage for treatment for autism spectrum disorder, on a “non-discriminatory basis,” meaning on the same terms as coverage for physical conditions. The mandate includes in the treatment of ASDs: habilitative or rehabilitative care, pharmacy care, psychiatric care, psychological care, therapeutic care, some of which are covered by the mental health services mandate. The primary net effect is to mandate coverage for medically necessary habilitative care, i.e., “professional, counseling, and guidance services and treatment programs, including applied behavior analysis supervised by a Board Certified Behavior Analyst.”	No (enacted 2010)
Bone marrow transplants for treatment of breast cancer	c. 175 § 47R; c. 176A § 8O; c. 176B § 4O; c. 176G § 4F; c. 32A § 17D	Provides coverage for bone marrow transplants for breast cancer patients who've progressed to metastatic disease if they meet criteria provided by DPH.	Yes
Cardiac rehabilitation	c. 175 § 47D; c. 176A § 8G; c. 176B § 4F; c. 176G § 4	Covers the expense of cardiac rehabilitation, i.e., multidisciplinary, medically necessary treatment of persons with documented cardiovascular disease.	Yes
Chiropractic services	c. 176B § 4L	Covers expenses of chiropractic services. Applies to medical service corporations only.	Yes
Clinical trials (to treat cancer)	c. 175 § 110L; c. 176A § 8X; c. 176B § 4X; c. 176G § 4P	Mandates coverage for patient care services for patients enrolled in a qualified clinical trial to the same extent as the services would be covered if the patient was not receiving care in a qualified clinical trial. A qualified clinical trial must be cancer-related and must meet other criteria set forth in the law.	Yes
Contraceptive services	c. 175 § 47W; c. 176A § 8W; c. 176B § 4W; c. 176G § 4O	Requires coverage for outpatient contraceptive services and prescription contraceptive drugs and devices. Provides exclusions for church-affiliated employers.	Yes
Cytologic screening	c. 175 §§ 47G and 110(L); c. 176A § 8J; c. 176G § 4	Mandates coverage for cytologic screening (Pap smear) annually for women 18 years and older.	Yes
Diabetes-related services and supplies	c. 175 § 47N; c. 176A § 8P; c. 176B § 4S; c. 176G § 4H; c. 32A § 17G	Mandates coverage for items medically necessary for diabetics that fall within a category of benefits and services for which coverage is otherwise afforded and that have been prescribed by a healthcare professional: includes blood glucose monitors, monitoring strips, lancets, insulin, syringes, lab tests, urine & lipid profiles, special shoes, etc.	Yes

Mandate	Statute	Summary	In 2008 Report
Early Intervention services	c. 175 § 47C; c. 176A § 8B; c. 176B § 4C; c. 176G § 4	Mandates coverage for early intervention services from birth to age 3 for children with or at risk for specific developmental delays including chromosomal abnormality, neurological condition, metabolic disorder, visual impairments, permanent hearing loss, and delayed cognitive, physical, communicative, social, or emotional development.	Yes
Hearing screening for newborns	c. 175 § 47C (c. 111 § 67F); c. 176A § 8B; c. 176B § 4C (c. 111 § 67F); c. 176G § 4K (c. 111 § 67F) ; c. 32A § 17F	Mandates coverage for newborn hearing screening tests.	Yes
Home health care	c. 175 § 110(K); c. 176A § 8I; c. 176G § 4C	Mandates coverage for home care services: services provided by a home health agency in a patient's residence.	Yes
Hormone replacement therapy	c. 175 § 47W; c. 176A § 8W; c. 176B § 4W; c. 176G § 4O	Requires policies providing outpatient services to provide hormone replacement therapy for peri- and post-menopausal women.	Yes
Hospice care	c. 175 § 47S; c. 176A § 8R; c. 176B § 4Q; c. 176G § 4L; c. 32A § 17B	Mandates coverage for licensed hospice services to terminally ill patients with a life expectancy of six months or less.	Yes
Human leukocyte antigen testing	c. 175 § 47V; c. 176A § 8V; c. 176B § 4V; c. 176G § 4Q; c. 32A § 17H	Mandates coverage for the cost of human leukocyte antigen testing or histocompatibility locus antigen testing necessary to establish bone marrow transplant donor suitability.	Yes
Hypodermic syringes or needles	c. 175 § 47Y; c. 176A § 8CC; c. 176B § 4CC; c. 176G § 4U	Mandates coverage for medically necessary hypodermic syringes or needles.	No (enacted 7/2006)
Infertility treatment	c. 175 § 47H; c. 176A § 8K; c. 176B § 4J; c. 176G § 4	Requires policies including pregnancy-related benefits to provide, to the same extent benefits are provided for other pregnancy-related procedures, coverage for medically necessary expenses of diagnosis and treatment of infertility.	Yes
Lead poisoning screening	c. 175 § 47C; c. 176A § 8B; c. 176B § 4C; c. 176G § 4	Mandates coverage for screening for lead poisoning for all children under age six and others deemed at risk.	Yes
Low protein food products	c. 175 § 47I; c. 176A § 8L; c. 176B § 4K; c. 176G § 4D	Mandates coverage for low protein food products required to treat infants and children with specified metabolic disorders (for inherited amino acid and organic acid diseases) as well as fetuses of pregnant women with PKU.	Yes
Mammography	c. 175 §§ 47G and 110(L); c. 176A § 8J; c. 176G § 4	Mandates coverage for one "baseline" mammogram between ages 35 and 40, and annual measurements thereafter.	Yes

Mandate	Statute	Summary	In 2008 Report
Maternity health care (including minimum maternity stay)	c. 175 § 47F; c. 176A § 8H; c. 176B § 4H; c. 176G §§ 4, 4I; c. 32A § 17C	Benefits providing for "expense of prenatal care, childbirth and post partum care to the same extent as provided for medical conditions not related to pregnancy" with "minimum 48 hours of in-patient care following a vaginal delivery and a minimum of 96 hours of inpatient care following a caesarean section."	Yes
Mental health care	c. 175 § 47B; c. 176A § 8A; c. 176B § 4A; c. 176G § 4M; c. 32A § 22	Requires coverage for the diagnosis and treatment of specified biologically-based mental disorders including schizophrenia, bipolar disorder, obsessive-compulsive disorder, affective disorders, eating disorders, PTSD, and autism, and any biologically-based disorders recognized by the Commissioner of the Department of Mental Health.	Yes
Nonprescription enteral formulas	c. 175 § 47I; c. 176A § 8L; c. 176B § 4K; c. 176G § 4D; c. 32A § 17A	Mandates coverage for nonprescription enteral formulas for home use when medically necessary to treat malabsorption caused by Crohn's disease, ulcerative colitis, gastroesophageal reflux, gastrointestinal motility, chronic intestinal pseudo-obstruction, and inherited diseases of amino acids and organic acids, in an amount not to exceed \$2,500 annually.	Yes
Preventive care for children up to age six	c. 175 § 47C; c. 176A § 8B; c. 176B § 4C; c. 176G § 4	Mandates coverage for preventive and primary care services for children up to age six, including physical exams, sensory screening, neuropsychiatric evaluation and developmental screening, hereditary and metabolic screening at birth, appropriate immunizations, blood tests, and urinalysis.	Yes
Prosthetic Devices	c. 175 § 47Z; c. 176A § 8AA; c. 176B § 4AA; c. 176G § 4S; c. 32A § 17I	Requires coverage for prosthetic devices and repairs under the same terms and conditions that apply to other durable medical equipment covered under the policy; however the mandate places restrictions on the use of annual or lifetime limits for prosthetic devices.	No (enacted 9/2006)
Off-label uses of prescription drugs to treat cancer	c. 175 §§ 47K, 47L; c. 176A § 8N; c. 176B § 4N; c. 176G § 4E	Requires the Commissioner of Insurance to establish a panel of experts to review off-label uses of prescription drugs for the treatment of cancer for medical appropriateness and to direct insurers to make payments consistent with those recommendations.	Yes
Off-label uses of prescription drugs to treat HIV/AIDS	c. 175 §§ 47O, 47P; c. 176A § 8Q; c. 176B § 4P; c. 176G § 4G	Mandates coverage for prescription drugs for off-label use in the treatment of HIV/AIDS if the drug is recognized for treatment of such indication in one of the standard reference compendia or in the medical literature.	Yes
Scalp hair prostheses for cancer patients	c. 175 § 47T; c. 176A § 8T; c. 176B § 4R; c. 176G § 4J; c. 32A § 17E	Requires policies providing coverage for any other prosthesis to provide coverage for scalp hair prostheses worn for hair loss suffered as a result of the treatment of cancer or leukemia, in an amount not to exceed \$350 per year.	Yes
Speech, hearing and language disorders	c. 175 § 47X; c. 176A § 8Y; c. 176B § 4Y; c. 176G § 4N; c. 32A § 23	Mandates coverage for expenses incurred in the medically necessary diagnosis and treatment of speech, hearing and language disorders by individuals licensed as speech-language pathologists or audiologists.	Yes

Provider-centered mandates

Mandate	Statute *	Summary	In 2008 Report
Certified Nurse Midwives	c. 175 § 47E; c. 176B § 4G; also c. 176B § 7	Mandates benefits for services of midwives when services are reimbursed when performed by any other practitioner and are within the lawful scope of practice of midwives. (Not in HMO or HSC statutes.) Also, c. 176B § 7 provides no MSC shall "discriminate in any way against participating nurse midwives in the furnishing of midwifery service." This is redundant to § 4G.	No
Certified Registered Nurse Anesthetists	c. 175 § 47Q; c. 176A § 8S; c. 176B § 4T; c. 176G § 4	Mandates benefits for services of nurse anesthetists when services are reimbursed when performed by any other practitioner and are within the lawful scope of practice of nurse anesthetists.	No
Nurse Practitioners	c. 175 § 47Q; c. 176A § 8S; c. 176B § 4T; c. 176G § 4; also c. 176R	Statute sections affecting various forms of insurance, plus c. 176R, require all forms of insurance (and GIC under c. 176R) to cover services of nurse practitioners (NPs) when services are reimbursed when performed by any other practitioner and are within the lawful scope of practice of NPs. c. 176R allows NPs to serve as PCPs and prohibits NPs from being subject to smaller coverage limits.	No
Chiropractors	c. 175 § 108D; c. 176B § 7 see also "chiropractic services"	c. 175 § 108D requires a payer to pay for chiropractic services whether they are performed by a physician or chiropractor, and c. 176B § 7 statute prohibits an MSC from "discriminating" against chiropractors in providing chiropractic services. (Not in HSC or HMO statutes.) This mandate is technically different from the chiropractic services mandate, but analysis of this mandate will probably overlap with it.	No
Dentists	c. 175 § 108B	The insurance statute requires a dentist to be considered a physician for purposes of paying for any oral surgical care, services, or benefits covered by the policy/contract which dentists are licensed to perform. (The insurance statute might reach MSCs. Not in HSC or HMO statutes.)	No
Optometrists	c. 175 § 108(8)(D); c. 175 § 110(F)	Requires coverage for services of optometrists when services are reimbursed when performed by physicians or optometrists and are within the lawful scope of practice of optometrists. (Not in HSC, MSC, or HMO statutes.)	No
Podiatrists	c. 175 § 110(I); c. 176G § 1 (See "nondiscriminatory")	Requires coverage for services of podiatrists when services are reimbursed when performed by physicians or podiatrists and are within the lawful scope of practice of podiatrists. (Not in HSC or MSC statute.)	No

* Note that many provider-centered mandates, unlike the typical service-centered mandate, are not uniform across the standard forms of health care insurance (commercial insurance, medical and hospital service corporation, HMO).

Appendix B: Mandates Present in 2007 and 2010: State-by-State Comparison

Source: Council for Affordable Health Insurance⁵¹³

BENEFITS ¹	Total	Est.Cost	AK	AL	AR	AZ	CA	CO	CT	DC	DE	FL	GA	HI	IA	ID	IL	IN	KS	KY	LA	MA	MD	ME	MI	MN	MO	MS
AIDS/HIV Testing/Vaccine							A										A	A		A				A				
Alcoholism	45	1% to 3%	Y	Y	Y		Y	Y	Y	Y	A	Y	Y	Y			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Alzheimer's	2	<1%																		A			Y					
Ambulatory Surgery	12	1% to 3%			Y	Y						Y	Y	R						Y	Y			A		Y	Y	
Ambulance Services	8	<1%				A			Y			Y									Y			A	Y		Y	
Ambulatory Cancer Treatment																			A					A				
Anti-Psychotic Drugs	2	<1%																	A							Y		
Asthma Education & Self-Management							A													A								
Attention Deficit Disorder																				A								
Autism	7	<1%				A		A	A	A	R	A	Y		Y		A	Y	A	Y	A		Y					
Bilateral Cochlear Implant																					A							
Birth Centers/Midwives	6	<1%						Y			A	Y										Y		A	A		Y	
Blood Lead Poisoning	7	<1%					Y		A		Y												Y				Y	
Blood Products	2	<1%																					Y					
Bone Marrow Transplants	10	<1%										Y	Y							Y	A	Y				R	Y	
Bone Mass Measurement	15	<1%					Y					A	Y				Y		Y	Y	A		Y				Y	
Brain Injury																					A							
Breast Reduction																								A				
Breast Reconstruction	48	<1%	Y	Y	Y	Y	Y	A	Y	Y	Y	Y	Y	A	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Cancer Pain Medications	2	<1%							A												A			A				
Cervical Cancer/HPV Screening	28	<1%	Y				Y	A	Y	Y	Y		Y				Y		A		Y	Y	Y	Y		Y	Y	
Chemotherapy	4	<1%							A																	Y		
Circumcision																												
Chlamydia	3	<1%											Y										Y					
Cleft Palate	14	<1%					A	Y				Y				Y					Y	Y			Y			
Clinical Trials	21	<1%				Y	Y	A	Y		Y		Y							A		Y	Y	Y	Y	Y	Y	
Colorectal Cancer Screening	22	<1%	A	Y	Y		A	A	Y	Y	Y		Y				Y	Y		A	Y		Y	A		Y	Y	
Congenital Bleeding Disorders	2	<1%																										
Congenital Defect								A																				
Contraceptives	30	1% to 3%			Y	Y	Y	R	Y		Y		Y	Y	Y	R	Y			R		Y	Y	Y		Y	Y	
Dental Anesthesia	29	<1%			Y		Y	Y	Y			Y	Y		Y		Y	Y	Y	Y	Y	Y		Y	Y		Y	
Developmental Disability																												
Diabetes Self-Management	27	<1%	Y		Y	R	Y	Y	A	Y		Y	Y	Y	Y		Y	Y	Y	Y	Y	A	Y		A	Y	A	
Diabetic Supplies	47	<1%	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Drug Abuse Treatment	34	<1%	Y	R	Y		Y		Y	Y	Y	Y		Y						Y		Y	A	Y	Y	Y	Y	
Early Intervention Service								A			A										A							
Emergency Services	43	<1%	A		Y	Y	Y	A	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	A	R	Y	Y	Y	
Habilitative Svc for Congenital or Genetic Defect										A			A				A						A	A				
Hair Prostheses	7	<1%							Y		A											Y	Y			Y	Y	
Hearing Aid	9	<1%			A			A	Y		A		A								Y	Y		Y	A		Y	
Heart Transplant													A															
Home Health Care	19	<1%				Y	Y	Y	Y			Y									Y		Y	Y	Y			
Hospice Care	11	<1%			Y			Y						Y							Y		A	Y	Y	Y		

BENEFITS	Total	Est.Cost	AK	AL	AR	AZ	CA	CO	CT	DC	DE	FL	GA	HI	IA	ID	IL	IN	KS	KY	LA	MA	MD	ME	MI	MN	MO	MS			
HPV Vaccine								A				A			A	A						A									
Hormone Replacement Therapy									A													A									
In Vitro Fertilization	14	3% to 5%			Y		Y		Y				A	Y			Y				Y	Y	Y								
Kidney Disease	1	<1%																													
Long Term Care	4	1% to 3%								Y													Y								
Lyme Disease	3	<1%							Y																	Y	R				
Lymph Edema									A																						
Mammogram	50	<1%	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Mastectomy	23	<1%			Y	A	Y		Y			Y	Y				Y	A	Y	R	A	R		Y		Y	Y				
Mastectomy Stay	24	<1%			Y	A	Y		Y			Y	Y				Y		Y		A		Y	Y		Y					
Maternity	21	1% to 3%			Y		Y	Y	R				Y	R						Y		Y	Y	R		Y	Y				
Maternity Stay	50	<1%	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Mental Health General	40	1% to 3%		Y	Y	A	Y	Y	Y	Y		Y	Y	Y			Y		Y	Y	Y	Y	Y	Y	Y	A	Y	Y	Y		
Mental Health Parity	42	5% to 10%	A	Y	Y	Y	Y	Y	Y	A	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	R	Y	Y	A			
Minimum Hysterectomy Stay	1	<1%																													
Morbid Obesity Treatment	4	1% to 3%											Y				A	Y					Y								
Neurodevelopment Therapy	1	<1%																													
Newborn Hearing Screening	16	<1%	A								Y	Y						Y				Y	Y				Y				
Newborn Sickle-Cell Testing	3	<1%			A																										
Off-Label Drug Use	37	<1%		Y	Y	R	Y		Y		Y	R	Y				Y	Y	Y			Y	Y	Y	Y	Y	Y	Y	Y		
Oriental Medicine												A									A										
Orthotics/Prothetics	10	<1%			A		Y	Y	R			Y			A	A	A				A	A	Y	Y	R						
Ostomy Related Supplies	1	<1%							Y																						
Other Infertility Services	8	<1%					Y		A								Y					A				Y					
Ovarian Cancer Screening	3	<1%										A		Y			Y										Y				
PKU/Formula	33	<1%	Y		Y	Y	Y	Y	Y		A	Y		Y				Y			Y	Y	Y	Y	Y		Y	Y			
Port-wine Stain Elimination	2	<1%																										Y			
Prescription Drugs	2	5% to 10%																							R						
Prescription Inhalant																		A													
Prostate Screening	32	<1%	A	A	A		Y	Y	Y	Y	Y		Y				Y	Y	Y		Y	R	Y	Y		Y	Y				
Protein Screening												A										A									
Psychotropic Drugs																					A						A				
Reconstructive Surgery						A	A	A														A					A				
Rehabilitation Services	8	<1%	R						Y													Y	Y		Y						
Residential Crisis Service									A														A								
Second Surgical Opinion	9	1% to 3%					Y											Y			A		Y					Y			
Shingles (Herpes Zoster) Vaccine																	A														
Smoking Cessation								A	A														A								
Special Footwear							A																								
Telemedicine							A	A													A	A		A							
Testicular Cancer Minimum Stay	1	<1%										A												Y							
TMJ Disorders	19	<1%			Y							Y	Y				Y				Y		Y			Y	Y	Y			
Varicose Vein Removal																									A						
Vision Care Service													A																		
Well-Child Care	31	1% to 3%	A		Y		Y	Y	Y	Y	A	Y	Y	Y	Y				Y		Y	Y	Y			Y	Y	Y			
Wilm's Tumor	1	<1%																													

BENEFITS	Total	Est.Cost	MT	NC	ND	NE	NH	NJ	NM	NV	NY	OH	OK	OR	PA	RI	SC	SD	TN	TX	UT	VA	VT	WA	WI	WV	WY
AIDS/HIV Testing/Vaccine													A										A	A	A	A	
Alcoholism	45	1% to 3%	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Alzheimer's	2	<1%																		Y				A			
Ambulatory Surgery	12	1% to 3%				A					Y		Y										A		Y		
Ambulance Services	8	<1%								Y	Y		Y	A	A	A											
Ambulatory Cancer Treatment											A			A													
Anti-Psychotic Drugs	2	<1%						A		A				A		A					A		A	A	Y		
Asthma Education & Self-Management															A												
Attention Deficit Disorder															A												
Autism	7	<1%	A				A	Y	A	A	A			A	A	A	A			A	A						
Bilateral Cochlear Implant														A													
Birthing Centers/Midwives	6	<1%		Y			A		Y		A				Y	A								Y			
Blood Lead Poisoning	7	<1%						Y								Y									Y		
Blood Products	2	<1%									Y												A				
Bone Marrow Transplants	10	<1%					Y	Y												Y			R				
Bone Mass Measurement	15	<1%		Y		R			Y		Y		Y					Y		Y	Y						
Brain Injury														A								A					
Breast Reduction																											
Breast Reconstruction	48	<1%	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	A	Y	Y	Y	Y	Y	R	Y	Y	Y
Cancer Pain Medications	2	<1%				Y					A					A							R				
Cervical Cancer/HPV Screening	28	<1%		Y				Y	Y	Y	Y	Y	A	Y	Y	Y	Y			Y	Y		Y			Y	Y
Chemotherapy	4	<1%									Y			A	Y	A				Y				A			
Circumcision									A																		
Chlamydia	3	<1%														A				Y							
Cleft Palate	14	<1%		Y		Y									A		Y				Y	Y	A	Y	Y		
Clinical Trials	21	<1%		Y			Y		Y	Y	Y	A		A		Y			Y	A		Y	Y		A	Y	A
Colorectal Cancer Screening	22	<1%		Y	Y	A			A	A	Y			Y	A	A	Y			Y	Y		Y	A	A		Y
Congenital Bleeding Disorders	2	<1%							Y														Y	A			
Congenital Defect																											
Contraceptives	30	1% to 3%	A	Y			Y	Y	Y	Y	Y		Y	A		Y				Y		Y	Y	Y		Y	
Dental Anesthesia	29	<1%		Y	Y	Y	Y	Y	A	Y			Y						Y		Y	Y		Y	Y	Y	A
Developmental Disability							A																				
Diabetes Self-Management	27	<1%	A	Y		A		Y	A	Y	Y		Y	Y	A	A		Y		Y	Y	A	A	A	Y	Y	Y
Diabetic Supplies	47	<1%	Y	Y		Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Drug Abuse Treatment	34	<1%	Y	Y	Y			Y	Y	Y	Y			Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	
Early Intervention Service							A								A								A				
Emergency Services	43	<1%	R	Y	Y	A	Y	Y	Y	Y	Y	Y	Y	Y	Y	A	Y	Y	Y	Y	Y	Y	R	Y	Y	Y	Y
Habilitative Svc for Congenital or Genetic Defect																											
Hair Prostheses	7	<1%					Y		A				Y			A											
Hearing Aid	9	<1%			Y			A					Y	A		Y				Y						A	
Heart Transplant																											
Home Health Care	19	<1%	Y					Y	Y	Y	Y				A	Y				Y			Y	Y	Y		
Hospice Care	11	<1%								Y	Y												Y		Y		

BENEFITS	Total	Est.Cost	MT	NC	ND	NE	NH	NJ	NM	NV	NY	OH	OK	OR	PA	RI	SC	SD	TN	TX	UT	VA	VT	WA	WI	WV	WY	
HPV Vaccine					A				A	A				A						A			A					
Hormone Replacement Therapy										A	A																	
In Vitro Fertilization	14	3% to 5%	R					Y	Y		A					Y				Y						Y		
Kidney Disease	1	<1%														A									Y			
Long Term Care	4	1% to 3%												Y									A			Y		
Lyme Disease	3	<1%														Y												
Lymph Edema				A																			A					
Mammogram	50	<1%	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Mastectomy	23	<1%	Y	Y		A			Y		Y	R	Y	Y	Y	Y	Y					Y					A	
Mastectomy Stay	24	<1%	Y	Y				Y	Y		Y	R	Y	Y	Y	Y	Y			Y	Y	Y	Y			Y		
Maternity	21	1% to 3%	Y	A			Y	A	Y	Y	Y		Y	Y		A						Y	Y	Y			A	
Maternity Stay	50	<1%	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Mental Health General	40	1% to 3%	Y	A	Y	Y	Y			Y	Y	Y	Y	Y	Y	Y	Y	R	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Mental Health Parity	42	5% to 10%	Y	A	Y	Y	Y	Y	Y	Y	A	A	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	A	Y	Y		
Minimum Hysterectomy Stay	1	<1%																					Y					
Morbid Obesity Treatment	4	1% to 3%					A														A		Y					
Neurodevelopment Therapy	1	<1%																							Y			
Newborn Hearing Screening	16	<1%	Y	Y	Y	Y		Y	Y			A				R				A	Y		Y			Y		
Newborn Sickle-Cell Testing	3	<1%				Y								Y									A					
Off-Label Drug Use	37	<1%		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y	Y	Y	Y	Y	A	Y			
Oriental Medicine									A																			
Orthotics/Prothetics	10	<1%					Y				Y			Y	A	A				A		A	A					
Ostomy Related Supplies	1	<1%																										
Other Infertility Services	8	<1%	R					Y	Y		R					A										Y		
Ovarian Cancer Screening	3	<1%		A											A	A												
PKU/Formula	33	<1%	Y	R	Y		Y	Y	Y	Y	R		Y	Y	Y	A		Y	Y	Y	Y	Y	Y	Y	Y			
Port-wine Stain Elimination	2	<1%																								Y		
Prescription Drugs	2	5% to 10%													A	A								A	Y			
Prescription Inhalant																								A				
Prostate Screening	32	<1%		Y	Y			Y	Y	Y	A		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	A	A		Y	
Protein Screening									A						A													
Psychotropic Drugs											A											A				A		
Reconstructive Surgery							A																	A				
Rehabilitation Services	8	<1%									R	R									A						Y	
Residential Crisis Service							A																					
Second Surgical Opinion	9	1% to 3%						Y			Y					Y								Y		Y		
Shingles (Herpes Zoster) Vaccine																												
Smoking Cessation									A					A		A												
Special Footwear															A													
Telemedicine							A							A	A						A							
Testicular Cancer Minimum Stay	1	<1%																										
TMJ Disorders	19	<1%		Y	Y	Y			Y	Y											Y		Y	Y	Y	Y	Y	
Varicose Vein Removal																												
Vision Care Service																												
Well-Child Care	31	1% to 3%	Y	Y		Y		Y	Y		Y	Y	Y		Y	Y					Y	Y	Y		Y	A		
Wilm's Tumor	1	<1%						Y																				

Y Present in '07 and '10
 A Added since '07
 R Removed since '07
 Green New mandate added since '07

Appendix C: Methodology of Cost Estimation

Definition of Population and Costs Measured

This study estimates health care costs only for that portion of the Massachusetts population with health insurance subject to health benefit mandate laws, which is composed of two segments. First, all of the mandates in the study apply to those with coverage in fully-insured commercial products regulated by the Massachusetts Division of Insurance. Second, a subset of the mandates in this study also applies to coverage for public employees provided under the Group Insurance Commission (GIC). The great majority of the GIC coverage is provided on a self-insured basis, with the remainder included among the fully insured plans subject to all the mandates. The fully-insured segment of the commercial insurance market comprised approximately 50.7 percent of the 5 million member under-65 commercial market in 2009, with the other 49.3 percent provided by self-insured employers not subject to state benefit mandates (other than the approximately 183,000 under-65 members of self-insured GIC plans subject to a subset of the mandates). A more detailed discussion of the study population is contained in the methodology section below.

Costs associated with mandated benefits are a relatively small subset of the total health care costs for the affected population; to begin to address by how much mandate laws impact total costs it will be helpful to define terminology for the purpose of this report. The general cost concepts defined below will aid in interpreting the results of the study. In practice these cost sub-categories are difficult to measure, and no precise measurement of these cost breakouts can be achieved within the scope of this project, although conceptual definition will aid in interpreting the results of the analysis. There are two general types of costs that may be associated with any mandate:

- **Required direct costs.** These are the costs of services that are explicitly described in a mandate law, used by covered members and paid for by the regulated insurance plans, whether or not some or all of the costs would have been incurred in the absence of the mandate through voluntary provision of the benefits. These costs are the primary focus of this study, and are the most easily measurable. Required direct costs (RDCs) are the sum of *base direct costs* and *marginal direct costs*.
 - *Base direct costs* (BDCs) are those costs that would be present even if the mandate law were not in force. Mandate laws may require benefits that would be provided, wholly or in part, voluntarily (by some or all of the market).
 - *Marginal direct costs* (MDCs) are those additional costs beyond the base direct costs that the imposition of the mandate impels.
- **Indirect costs.** Indirect costs are those costs that may be added as a result of the related delivered services associated with the mandate (e.g., costs of additional complicated births associated with fertility treatment) or those service costs avoided (these would be “negative costs” or cost offsets) as a result of the mandate

(e.g., fewer emergency department visits for diabetics due to coverage for diabetes services and supplies).

While we can measure RDCs reasonably, measuring their breakdown into base and marginal direct costs is far more difficult, and measuring indirect costs even more difficult. As a hypothetical example of the distinction between base and marginal direct costs, if a mandate law requiring coverage of an annual EKG were passed, additional (marginal) direct costs for this service would likely result, but significant dollars are already being covered under existing policies (base direct costs) for this service. Measurement of the RDC for this mandate after passage of the law could be calculated as the number of persons receiving the test once or more per year, times the average cost per test. The resulting RDC would contain a mix of base and marginal RDC, since a large portion of the cost was already being incurred voluntarily (i.e., a large number of covered EKG tests would have been paid for by carriers anyway). Any indirect effects, such as increased interventional cardiology costs or avoided heart attack admissions, would be difficult to quantify directly.

In order to measure the true cost impact of a mandate law on the regulated insurance product costs, one would need to include only marginal costs, which would consist of marginal direct costs and marginal indirect costs (those indirect costs associated with the marginal utilization produced by the mandate law). Since marginal indirect costs may be either positive or negative, the net impact of any one mandated benefit on total costs may be either increasing or decreasing, depending on:

- How much of the direct cost associated with the mandate is marginal (i.e., attributable to the imposition of the mandate)
- Whether indirect costs are positive or negative on net, and
- The size of those indirect costs relative to the direct costs.

While not within the scope of this study, a well-conducted multi-variate statistical analysis using multi-state data would be better able to estimate marginal costs that include both direct and indirect components. Some multivariate econometric studies comparing benefit mandates and cost levels across states have shown that some specific mandated benefits decrease costs on net, while others increase costs on net.⁵¹⁴

This study provides some information that may be useful in understanding the proportion of the required direct costs that are likely to be marginal for the mandates. The scope of this study does not attempt to measure precisely the amount of RDC that is marginal (which would require multi-state data), and the report does not include evaluation of indirect costs. As a result, it is not possible to ascertain from the information in this study the net impact on health care costs in the Commonwealth associated with the mandate laws, but previous research suggests that total RDCs will greatly overstate the net effect of the mandates, that offsetting indirect cost savings can be larger than direct cost effects (making the net effect of a mandate cost decreasing), and that the impact of mandate laws on insurance levels will not be directly inferable from the RDC estimates contained herein.⁵¹⁵

This report does, however, present a comparison of the fully-insured population RDCs to the RDCs observed in the Massachusetts' self-insured sector (not subject to the mandate laws), the difference in which provides one estimate of the direct marginal differences (that is, net direct cost impact) introduced by the mandate legislation. Previous research has found that differences in benefit levels, including mandated benefits, are similar, if not richer, in the self-insured market.⁵¹⁶ Mandate laws may have small effects if firms offer the benefits voluntarily. However, in that employers in Massachusetts that self-insure must compete in the labor market with fully-insured firms that must offer the mandated benefit package, the benefits in the self-insured firms are likely to be at least somewhat richer than they would be in the absence of the mandate laws. This competitive labor market effect would shrink the cost difference between fully-insured and self-insured plans and understate (or provide a lower bound for) the implied impact of benefit laws on health care costs provided by the difference between fully-insured and self-insured costs.

The measurement of costs in this study was carried out in one of two ways for each of the mandated benefit laws currently in effect in Massachusetts summarized above in Appendix A.^{xxii} The exhibit displays 35 mandated benefit laws, and describes in summary fashion the requirements of the mandate. The next section describes in detail the two approaches used for measurement.

Methodology and Data Sources

Project Organization and Study Design

In the initial project discussions with the Center, it was decided that major health insurance carriers in Massachusetts would be approached to provide input about the specifications for measuring the cost of each mandate. Four carriers provided input on the mandates:^{xxiii}

- Blue Cross Blue Shield of Massachusetts
- Fallon Community Health Plan
- Harvard Pilgrim Health Care
- Tufts Health Plan

Government relations staff at each plan served as contact points, and in turn consulted their colleagues, including medical directors, other clinical experts, actuarial staff, and data management and analysis staff. In addition, the Massachusetts Association of Health Plans (MAHP) provided assistance with coordination and communication with its participating member plans.

An initial discussion with participating health plans and MAHP reviewed the process that had been used for the 2008 study (in which these same plans had participated) and described the new mandates to be added to the current study. In the original study, a collaborative process with the plans was used to develop the data to measure the costs of the mandates. At that time, the Center

^{xxii} As discussed above, this list includes mandated benefits and provider mandates. This study does not address population coverage mandates.

^{xxiii} Valuable assistance was also provided by ConnectiCare.

did not have data available for the analysis, so it was agreed that extraction of claim data from the carriers would be the best approach, but it was also clear that this would require significant effort on the part of the plans if all 26 mandates included in the 2008 analysis were to be studied this way. In order to reduce the burden on the plans to a reasonable level a prioritization process was conducted, during which mandates were categorized into one of two groups. The first group consisted of mandates that were considered by the plans to be most relevant for the study due to meeting the following criteria:

- The mandate required benefits that were judged likely to be reduced or eliminated if the mandate were to be repealed;
- The mandate covered benefits which were judged to be currently clinically relevant and being drawn on and paid for by the plans;
- The services related to the mandate could be readily identified and extracted from claim history files.

The mandates meeting these criteria were included in the portion of the study that relied on primary claim data analysis using claims extracted by the plans. The mandates failing to meet one or more of the criteria listed above were included in the secondary data analysis portion of the study. Cost estimates for these mandates were produced using secondary data sources (e.g., literature review) where possible. These mandates:

- Were judged to require benefits that the plans would substantially provide regardless of the mandate law, or
- Had become clinically obsolete, or
- Could not be feasibly measured as part of the study, nor monitored by the plans, regardless of the presence of a mandate.

Since the initial study was published, the Center has developed health care claim database resources. The Center provided to Compass the 2009 Health Care Quality and Cost Containment (HCQCC) dataset, which contained claims for approximately 60 percent of fully-insured commercial members in Massachusetts for that year. This claim dataset was used by Compass to estimate the per member costs for the first set of mandates in the study, relieving the carriers from performing mandate-specific claim extracts. For purposes of the current study, these mandates are called “potential marginal direct cost” mandates. Since the HCQCC data contain both fully-insured and self-insured claims, we were able to compare the per-person spending level in the fully-insured business (subject to the mandates) to the per-person costs in the self-insured business (not subject to the mandates) to generate estimates of the mandates’ impact. The second group of mandates, which for the current study were estimated with secondary sources supplemented by specific calculations (e.g., average unit cost) with HCQCC data, is termed the “zero marginal direct cost” group.

Before the analysis from Compass could be carried out, updating the specifications from the 2008 study was necessary, as well as creating specifications for the new mandates added to the study. Each carrier participating in the current study was asked to review the data specifications they had

developed in the 2008 study to update them for any changes in clinical practice, coding, or other relevant factors. The specifications for the three new service mandates (Autism Spectrum Disorders, Hypodermic Needles, and Prosthetics) were each developed by a volunteering carrier, and were circulated to the other carriers for review and comment. The specifications for the provider mandates were developed by Compass after consultation with relevant professional societies in Massachusetts, and these too were circulated to the carriers for review and comment. Finally, the judgments made by the carriers in the 2008 study about the mandates analyzed with secondary data sources were confirmed by the carriers. These “zero direct marginal cost” mandates and their associated analyses and data sources were reviewed and updated by Compass. Since the marginal costs are assumed to be zero, the estimated total RDCs were added to the RDC costs, but there were no additional costs included in the marginal cost estimates for these mandates (more precisely, zero was added to the marginal cost estimates).

The potential direct marginal cost mandates are shown in Table C - 1 below.

Table C - 1

Mandates with Potential Marginal Direct Cost
Service Mandates
Autism Spectrum Disorders
Chiropractic Services
Contraceptive Services
Diabetes-related Services and Supplies
Early Intervention Services
Home Health Care
Hormone Replacement Therapy (HRT)
Human Leukocyte Antigen Testing
Hypodermic Syringes or Needles
Infertility Treatment
Low Protein Food Products for Inherited Amino Acid and Organic Acid Diseases (PKU)
Mental Health Care
Nonprescription Enteral Formulas
Prosthetic Devices
Scalp Hair Protheses for Cancer Patients
Speech, Hearing and Language Disorders
Provider Mandates
Certified Nurse Midwives
Certified Registered Nurse Anesthetists
Chiropractors
Dentists
Nurse Practitioners
Optometrists
Podiatrists

In the terminology defined above, for these mandates it was assumed to be possible that both RDC and MDC were greater than zero, and thus they were the focus of more precise measurement using claims data.

The mandates judged likely to have little or no marginal direct costs are shown in Table C - 2 below. Treatment of breast cancer using bone marrow transplant was demonstrated to be clinically obsolete in the 2008 study by analysis of Commonwealth employee claims, and thus was assumed to no longer have marginal cost to the system. As discussed in more detail below, in this study it is included within the clinical trials mandate analysis. Two mandates were judged to be not measurable within the scope of the original study: Off-label uses of prescription drugs to treat HIV/AIDS and off-label uses of prescription drugs to treat cancer. Because the off-label uses of prescription drugs are not considered monitorable or manageable, elimination of these mandates would be likely to have little effect on utilization.

The remaining mandates in Table C-2 were judged to be benefits the plans would likely pay for even if the state mandate law was repealed, due to proven cost-effectiveness, demand from members, or redundancy with federal mandates. To summarize, for the reasons described, in all cases the marginal cost (i.e., cost caused by the presence of the mandate law) associated with the mandates in Table C-2 was assumed to be at or near zero for purposes of the original study, judgments that were confirmed by the carriers in their review for the current study.

The methodologies used in the analysis of both the primary and secondary data sources are discussed in detail further below.

Table C - 2

Mandates Judged to Have Zero Marginal Cost
Bone Marrow Transplants for Treatment of Breast Cancer
Cardiac Rehabilitation
Clinical Trials (to treat cancer)
Cytologic Screening
Hearing Screening for Newborns
Hospice Care
Lead Poisoning Screening
Mammography
Maternity Health Care (including minimum maternity stay)
Preventive Care for Children Up to Age Six
Off-Label Uses of Prescription Drugs to Treat Cancer
Off-Label Uses of Prescription Drugs to Treat HIV/AIDS

Applicable Population

Laws mandating insurance benefits in the Commonwealth of Massachusetts vary slightly in the populations to which they apply. Characteristics of the population common to all of the mandates are:

- Commercially insured
- Fully-insured contracts
- Non-Medicare
- Under age 65

Excluded from the population are all individuals covered under self-insured policies (except, as noted, the GIC population for some mandates), as these policies are regulated under Federal ERISA legislation, not by the Massachusetts Division of Insurance, and thus are not subject to the mandate laws. The definition also excludes individuals with Medicare coverage and commercial “Medigap” policies, as these policies are tied to Federal Medicare benefits and cover patient cost-sharing within the Medicare benefit structure. MassHealth, the Massachusetts Medicaid program, is also not required to follow the mandate requirements.

U.S. Census Bureau data on Massachusetts Health Insurance Status showed that there were approximately 4.55 million persons covered by employer-sponsored plans in 2009.^{xxiv} Data provided by the Center indicated that the approximate split between fully-insured and self-insured enrollment in the employer-sponsored population is 47.5 percent / 52.5 percent, which would imply a fully-insured employer-sponsored enrollment of approximately 2.164 million individuals. In addition, there were approximately 289,921 persons individually purchasing insurance in the non-group market (subject to the mandate laws), for a total of 2.454 million fully-insured members.

Some mandates apply to self-insured GIC contracts. For those mandates, an additional 183,446 members are added to the population for a total of 2.637 million individuals. Appendix B contains more details about these population calculations.

One dimension across which mandates vary in their covered population is geographic location. There are four possible general combinations of employer and employee location:

- Subscriber resides in Massachusetts and employer located in Massachusetts
- Subscriber resides in Massachusetts and employer located outside Massachusetts
- Subscriber resides outside Massachusetts but employer located in Massachusetts
- Subscriber resides outside Massachusetts and employer located outside Massachusetts (e.g., New Hampshire resident working for a national accounts employer operating in Massachusetts)

Based on data collected from carriers in the 2008 study, the last category is essentially immaterial and will be treated for purposes of this study as if a Massachusetts-based employer.

^{xxiv} See Appendix D for a more complete discussion and citations to sources.

The statutory language varies across the mandates and across the four license types contained in the insurance statutes as to which geographic categories the mandate is applicable. Most of the mandates apply to residents of Massachusetts and to those with a principal place of employment in Massachusetts, and so effectively apply to all members covered by fully-insured policies issued in Massachusetts. There are a few exceptions to this general case apparent in the statutory language, which is summarized for all the mandates in Appendix E. First, the statutory language from Chapter 175 (indemnity coverage) for a number of mandates only applies to state residents. However, it appears from the HCQCC data that only individual policies are issued under the indemnity license, and these in turn would only be issued to Massachusetts residents. As a result, the Chapter 175 language does not appear to exclude applicability to any of the fully-insured members. Second, four provider mandates (Certified Nurse Midwives, Chiropractors, Dentists, and Optometrists) do not have language in Chapter 176G (the HMO license for non-Blue Cross Blue Shield carriers). As a result, in our calculations we have not applied the cost estimates to this population for these four mandates. Third, the chiropractic services mandate applies only to medical service corporations (Chapter 176B), and as a result the cost estimates are applied only to the BCBS-MA membership.

Table C - 3

Populations to Which Mandates Apply		
Mandate	Applicable Population	Estimated Membership
Certified Nurse Midwives Chiropractors Dentists Optometrists	Indemnity and Blue Cross Blue Shield fully-insured members	1,174,281
Chiropractic Services	Blue Cross Blue Shield fully-insured members	839,150
Diabetes HLA testing Mental Health Non-prescription enteral formulas Scalp Hair Protheses Speech, hearing, and language disorders Bone marrow transplants for breast cancer Newborn hearing screening Hospice Care Maternity Health Care Autism spectrum disorders Prosthetic Devices	All fully-insured members and all GIC members (fully and self-insured)	2,637,117
All other mandates in study	All fully-insured members	2,453,671

The populations to which the mandates are applicable are summarized in Table C - 3. The PMPM cost estimate from our sample data for each mandate was multiplied times the indicated population number to arrive at the total dollar cost estimate for each mandate.^{xxv}

The population member months denominator for percent of premium calculations in the study was the sum of member months for all four of the geographic sub-groups and all of the license types, as we are estimating the per person costs of the benefits with respect to the overall average fully-insured health insurance premium. However, for the five mandates applying to less than the entire fully-insured population, claim estimates were included in the numerator only for the applicable sub-groups indicated in Table C-3, as these are the only claims that are related to benefits required by the statutory language of the various mandates.^{xxvi}

Sample Population

In order to develop the dollar estimates in the study, PMPM estimates were developed from the data sources used in the study. PMPMs from representative samples were developed, and then multiplied times the applicable populations discussed in the preceding section. In general, the PMPM estimates developed from claim data drew upon the Center's HCQCC claim database, which contains claims for state-residents (but not for non-residents with a principal place of employment in Massachusetts). The HCQCC data contained claims and membership from five carriers. The average membership represented in this sample for calendar 2009 was 1.5 million. This compares to an estimated 2.45 million total average membership for the fully-insured population in Massachusetts (both state residents and non-residents with a principal place of employment in Massachusetts),^{xxvii} or 60.2 percent of the applicable population. Cost estimates contained in this report assume that the PMPM costs obtained from the HCQCC sample data (which include only state residents) are representative of the overall fully-insured commercial under-65 population (which includes both residents and non-residents with a principal place of employment in Massachusetts). In general, the entire database sample population was used for calculations. Exclusions from the sample data were made where the analysis of applicable populations above indicated this would be appropriate. For example, since the chiropractic services mandate applies only to BCBS, and since BCBS is represented in the HCQCC data, only BCBS data were used to calculate the PMPM for this mandate.^{xxviii} Additional exclusions were made for identified data quality issues, as discussed in the next section.

^{xxv} As discussed below, for aggregated cost estimates, overlap between mandates is removed when summing total dollars.

^{xxvi} For those mandates applying to the GIC, the GIC population was included in both the numerator and the denominator for the percent of premium calculations.

^{xxvii} Based on data from the Census Bureau and the assumed 50.7 percent fully-insured percentage (including both employer-based and individually insured) based on data provided by the Center.

^{xxviii} In this case, since the applicable population membership and the sample population membership are the same, the dollars measured in the HCQCC data were used directly as the aggregate dollar impact of the mandate. In most cases, however, the sample is smaller than the population, and the resulting sample PMPM was multiplied times the larger population membership estimate to arrive at a population estimate for aggregate dollars.

With respect to the data extraction from the HCQCC, there was one additional relevant issue related to the study population. Four of the mandates include pharmaceuticals among their mandated services. However, identifying average costs for these must take into account that the carriers have some accounts that use a third-party pharmacy benefit manager (PBM), and that for some of these pharmacy claims were not included in the HCQCC. As a result, the membership for the pharmacy claim file is lower than the membership for the medical claims file. To address this issue, medical PMPMs were calculated for the medical data using the medical membership, and the pharmacy data PMPMs were calculated using the pharmacy membership. The PMPMs were then added together, and were multiplied times the population membership to get the estimated total dollar impact. This approach assumes that the pharmacy PMPM costs for the missing PBM data are the same, on average, as the pharmacy PMPM for the members for whom pharmacy data is contained in the database. Both the pharmacy and medical PMPMs were multiplied times the medical membership to get total dollars, which were then divided by medical membership to get PMPMs that included both. This prevented a distortion (downward bias) to the PMPM estimates that would have been caused by missing pharmacy claims. For estimates of the total dollar impact in the Commonwealth, the full population membership (all fully-insured members in the Commonwealth) is multiplied by the estimated PMPMs calculated without carved out pharmacy benefit accounts.^{xxix}

For the mandates developed with secondary data sources, the underlying utilization, prevalence, and other rates were drawn from Massachusetts data wherever possible. The samples drawn upon are discussed in detail in the following methodology sections.

Methodology and Data for Mandates with Potential Marginal Direct Cost

The mandates with potential marginal direct cost were analyzed using detailed clinical data specifications applied to detailed claim data. The Center provided a 2009 HCQCC data extract for five Massachusetts health plans⁵¹⁷ as the data source for required direct cost estimates of the mandated benefits shown in Table 1. As discussed more fully in the introduction, RDCs are those costs that stem from services described in the mandate law, and do not consider indirect costs (either cost-adding or cost-avoiding), nor do they consider that some or all of the benefit might be provided in the absence of the mandate law.

The availability of the HCQCC data allowed us to address two significant shortcomings in other state-level impact analyses that were reviewed prior to commencing the study.⁵¹⁸ First, the data used in the study are specifically from Massachusetts, rather than national data or data from other states. The data collected represent approximately 60.2 percent of the fully-insured population in Massachusetts.^{xxx} Second, the data allow measurement specifically of the fully-insured population,

^{xxix} Note that this assumes that the overall PMPM cost profiles (including pharmaceuticals) for the plans with and without carved-out pharmacy benefits are similar.

^{xxx} As discussed further below, the participating plans represent a greater proportion than 70 percent of covered lives, however, some accounts had to be excluded from the data sample.

and allow for a comparison to the self-insured (unregulated and not subject to mandate laws) population, rather than inappropriately mixing these populations together.

The approach taken to RDC measurement involved rigorous definition of costs associated with the mandate laws' required benefits, and careful measurement based on the definitions.

There were four general steps in the cost measurement:

1. Review and updating of specifications developed for the previous comprehensive mandate review study, and development of new specifications for more recently enacted mandates (hypodermic syringes, scalp prostheses, autism spectrum disorders) by the participating carriers
2. Quality control assessment of specifications and follow-up by Compass
3. Extracting and quality checking the data using programming language to implement the specifications
4. Summarization of totals and adjustments to arrive at meaningful aggregate values

The specification of the data requirements included the following steps:

- *Initial Completion or Revision of Data Specification Templates.* The mandates for which the HCQCC claim database was to be the data source were divided among the plans for review or development of data specifications. For those mandates analyzed in the 2008 report, each plan reviewed the specifications they had originally developed and provided suggested updates. Each of the three new service mandates was assigned to a carrier for development of a new draft specification, drawing on clinical experts and other appropriate staff within their organizations. Compass developed draft specifications for the seven provider-centered mandates and disseminated to the plans for review and comment.
- *Review and refinement of the specifications.* Compass reviewed each specification and conducted conference calls with each plan as necessary to clarify and refine their assigned specifications. This review helped promote consistency in the approach taken to the specification development. Compass then translated each of the specifications into "pseudo-code" programming outlines.
- *Quality checking the data.* The quality control assessment by Compass included the following steps. The data extracted for each mandate were summarized, grouped by the key fields for grouping, including service code, sex, year of birth, and place of service. Statistics, including penetration rate (i.e., users of service divided by average membership), utilization per 1,000 members, and per-member per-month (PMPM) costs, were calculated at this level by carrier and in total. Several checks were made against these summarized data. Comparisons were made of the

calculated statistics, including calculation of coefficient of variation as a standardized measure of deviation in the values obtained.^{xxxi}

The initial review of the data sets generated questions from Compass for each of the plans, which they addressed as requested. One small plan’s data were dropped in their entirety because PMPM values derived for almost all mandates were much lower than the average of the other four plans, suggesting a data problem. A second plan’s pharmacy data were unusable owing to a lack of accurate member matching between the medical and pharmacy data. Therefore, this plan’s data were excluded for the four mandates that included pharmacy expenses (contraception, infertility, HRT, and diabetes). Because the chiropractic services mandate is only applicable to medical services corporations (BCBS), data for all four of the other carriers were excluded in the analysis of this mandate.

Four additional provider mandates were only applicable to medical services corporations and indemnity (non-HMO) contracts for all other carriers. There were four additional cases in which a plan’s observations for a specific mandate had to be removed from the sample because of an inability to address an anomalous data value. All **four** cases were for provider-centered mandates. One plan’s data produced low, near-zero results for six of the seven provider mandates, while one provider mandate produced a problematic value for each of two different plans. Table C - 4 below summarizes the exclusions.

Table C - 4

Excluded Carrier Cells by Mandate

Mandate	BCBS	Harvard Pilgrim HealthCare	Tufts Health Plan	Health New England	Connecticare
Chiropractor Provider Mandate		X	X	X	X
Chiropractic Service Mandate		X	X	X	X
Certified Nurse Midwife Provider Mandate		X	X	X	X
Contraceptive Services Mandate				X	X
Certified Registered Nurse Anesthetist Provider Mandate	X		X		X
Dentist Provider Mandate		X	X		X
Diabetes Services Mandate				X	X
Early Intervention Services Mandate			X		X
HLA Testing Mandate					X
Home Health Services Mandate					X
Hormone Replacement Therapy Mandate				X	X
Infertility Services Mandate				X	X
Low Protein Foods Mandate					X
Mental Health Services Mandate					X
Nonprescription Enteral Formulas Mandate					X
Nurse Practitioner Provider Mandate			X		X
Optometrist Provider Mandate		X	X	X	X
Podiatrist Provider Mandate					X
Scalp Hair Prosthesis Mandate					X
Speech & Hearing Services Mandate					X
Limb Prosthesis Mandate					X
Syringe Mandate					X

^{xxxi} Coefficient of variation is the mean of a sample of data divided by the standard deviation of that sample. As such, it provides a standardized, unitless measure of variation across the sample, and allows meaningful comparisons of deviation across multiple samples with different means.

In all cases, both claims and membership were removed, and a sample PMPM calculated with the remaining data. These sample PMPMs were multiplied times the full applicable population count (see Table C-3) to produce the total population estimates.

After completion of the quality control process, a number of calculations were carried out to produce the results of the study. Prior to executing those calculations, a claim analysis was performed to eliminate overlap between mandates. Claims for which coverage is mandated by multiple mandates in the study (“mandate overlap”) must be identified and quantified to avoid double-counting in aggregate analyses. To quantify overlaps, all claims in the HCQCC sample were flagged for inclusion in each mandate. Areas of overlap were identified where the same claim was flagged for inclusion in multiple mandates. Total sample claims expense (in millions of dollars) for the observed areas of overlap are summarized in Table C - 5.

Table C - 5

Summary of Mandate Overlap (in Millions of Dollars)

Mandate	A	B	C	D	E	F	G	H	I	J	K	L	M	N
A	Chiropractor Provider Mandate	\$6.2												
B	Chiropractic Service Mandate													
C	Certified Nurse Midwife Provider Mandate			\$1.7										
D	Contraceptive Services Mandate											\$0.7		
E	Diabetes Services Mandate						\$7.3							
F	Early Intervention Services Mandate						\$9.4							
G	Home Health Services Mandate							\$2.0	\$0.9	\$3.3	\$1.5		\$0.1	\$0.2
H	Limb Prosthesis Mandate													
I	Low Protein Foods Mandate													
J	Mental Health Services Mandate											\$0.4		
K	Nonprescription Enteral Formulas Mandate													
L	Nurse Practitioner Provider Mandate													
M	Podiatrist Provider Mandate													
N	Scalp Hair Prosthesis Mandate													

Overlap amounts must be subtracted from the totals for the mandates when calculating: (i) costs across mandates, or (ii) the incremental cost attributable to the given mandate, i.e. the amount that mandated coverage costs to the Massachusetts healthcare system would be reduced if a given mandate, and only that mandate, were repealed. The mandate-level results *include* the overlap amounts; the overall aggregated result for all mandates with potential marginal direct cost remove the overlapping (double-counted) amounts, that is, each claim identified as a mandated service for any primary data analysis mandate is only summed once in these aggregated results.^{xxxii}

PMPMs for the included carrier observations were calculated for each mandate, and administrative loading (the additional costs over and above health care claims required to administer the health plan) was added. Based on the Center’s May 2011 report on Massachusetts health cost trends 2007-2009,⁵¹⁹ administrative loading (including profit) was assumed to be 10.9 percent. Therefore,

^{xxxii} Amounts larger than those shown in Table C-4 were removed from the aggregated study totals, as the sample amounts shown in the table were adjusted to the total population level at the same time that the sample PMPMs were adjusted to the population-level RDCs.

to arrive at estimates of fully loaded healthcare premium costs, claims costs were divided by one minus the 10.9 percent administrative load ($1 - 0.109$), or 0.891.^{xxxiii}

Total cost in the healthcare system associated with each mandated benefit was computed by multiplying the loaded PMPM estimate by the estimated number of persons subject to Commonwealth mandates from Table C-3.

These estimated premium amounts were calculated as an approximate percentage of healthcare premiums in Massachusetts by assuming that the average premium during the 2009 data period was \$388.33 PMPM.⁵²⁰

As discussed in the introduction, we are unable within the scope of this study to produce precise estimates of the marginal cost of the mandates to the system, the focus of the study being primarily on required direct cost, that is, the total cost to the system of benefits described in the statutory language of the various mandates. The only information available for the study which can shed some light on the question of marginal costs are the HCQCC self-insured data provided to Compass by the Center. Since the self-insured plans are subject to Federal ERISA law and are not regulated by The Division of Insurance, they are not required to comply with the mandates, and are free (subject to competitive labor market constraints) to reduce or remove these benefits from their health benefit packages. Since labor market issues may compel the self-insured employers to offer richer benefits than they would if other (fully-insured) employers were not compelled to offer the mandated benefits, any differences identified between the self-insured and fully-insured benefit costs are likely to be under-estimates of the true impact of the mandate. However, they may provide useful lower bound estimates of the marginal direct cost, or actual direct mandate cost impact to the system. As such, the differences between fully-insured and self-insured expenses (or zero dollars, where self-insured expenses exceed fully-insured cost) are presented in this report as lower bound estimates of the marginal direct cost. An upper bound estimate of the marginal cost is the full required direct cost, which is equivalent to saying that coverage for the entire benefit described in a mandate would be eliminated if the mandate was repealed. The upper bound estimate effectively assumes that all self-insured costs for mandated benefits (which are near the fully-insured levels in most cases) are a result of the competitive labor market effects of the mandates in the fully-insured segment.

^{xxxiii} This assumes that the carriers apply the same percentage gross up for these incremental claim expenses as for their baseline claim expenses. If a carrier elects to only apply incremental variable expenses, then the incremental premium may be 2-3 percent lower, based on an assumption that 2-3 percent of a carrier's administrative cost structure represents fixed overhead that is independent of claim volume. The actual percentages would vary by carrier.

Methodology and Data for Mandates Judged Likely to Have Zero Marginal Cost

The estimation process for the 12 mandates which drew upon secondary data sources had the following methodological features in common:

- Estimates were produced for the same under-65, commercial, fully-insured Massachusetts population analyzed for the 23 primary data analysis mandates discussed above.
- Literature and internet data sources, along with some calculations using HCQCC data, were drawn upon for the individual facts that were combined into calculations for the estimated cost of each mandate.
- For each mandate, adjustments were made to make the estimate applicable to the relevant population. For example, if a national commercial population estimate was available and deemed to be reasonably applicable to Massachusetts, the national per person rate was applied to the number of persons in the under-65 commercial fully-insured population in Massachusetts.
- Total cost, PMPM, and percent of premium estimates were calculated using the population numbers from Table C-3 and the same \$388.33 average premium number cited above.
- The enabling statutory language for each mandate was adhered to as closely as possible given the limitations of the approach described.

The form of each calculation was dependent to a significant extent on the data available. For example, in some cases cost per person per year data were available, but in others data on incidence of an illness and cost per episode of that illness were multiplied together to produce the estimate. In all cases, the costs estimated were total required direct costs. As discussed above under “Project Organization and Study Design,” marginal direct cost for each mandate in the secondary cost group is assumed to be zero.

Most of the estimates relying on secondary data drew on sources that were not specific to the fully-insured population in Massachusetts. As a result, data from broader populations (e.g., Massachusetts statewide) had to be adjusted to the sub-population using population estimates drawn from a number of sources, including Census Bureau data and a model of the Massachusetts insured population developed by Compass for its work for the Center. These estimates are developed and summarized in Appendix D.

Appendix D: Estimates of Population Subsets

Mandate costs were estimated for the Massachusetts under-65 fully-insured commercial insurance population, so it was important to develop an estimate of the size of this population. Actual Massachusetts population statistics from 2009 for the under-65 segment from the US Census Bureau were used as a starting point for the estimates. According to the Bureau,⁵²¹ there were 5.699 million Massachusetts residents under age 65 and 70.9 percent of these residents had employer-sponsored (fully insured and self-insured) coverage (5.699 million X 0.709 = 4.043 million residents). Calculations based on data from Table 1 of the report titled “Premium Levels and Trends in Private Health Plans: 2007 – 2009” published in May 2011 by the Massachusetts Center for Health Information and Analysis⁵²² indicate that 47.5 percent of employer sponsored coverage was fully insured in 2009. This percentage was applied to the number of under-65 residents to produce the estimate of 1.922 million Massachusetts residents with fully-insured employer sponsored insurance.

Since some mandates apply to non-residents having coverage with a Massachusetts employer, it was necessary to estimate the non-resident population. This estimate was developed by applying a factor calculated from Massachusetts income tax data. First, the total number of Massachusetts personal income tax returns in 2009 was divided by the number of Massachusetts residents filing personal tax returns. According to the IRS Master File there were 2.758 million personal tax returns filed in Massachusetts in 2009.⁵²³ The Massachusetts department of revenue indicates that there were 0.308 million returns filed for MA non-residents.⁵²⁴ The resulting factor of 1.13 ($2.758 / [2.758 - 0.308]$) was applied to the fully insured residents with employer coverage population to estimate the total fully insured population with employer sponsored coverage (resident and non-resident), resulting in an estimate of 2.164 million people (1.922 million times 1.13).

The US Census Bureau also indicates that in 2009, 5.1 percent of Massachusetts residents under age 65 were covered by individually purchased insurance. Applying this percentage to the total number of under-65 Massachusetts residents produces an estimate that 289,921 residents have individually purchased coverage. Therefore, the total estimated fully-insured under-65 population was about 2.454 million individuals (2.164 million plus .290 million).

The following is intended to illustrate how these population estimates were used as a starting point to develop age and sex estimates for fully insured MA residents in Table D - 1. Population estimates for various age and sex subsets were required for the cost calculations for certain mandates. Data from variety of sources were utilized to estimate the subsets. The results of the calculations are displayed below in Table D - 1.

Table D - 1

**Massachusetts Under-65 Commercial
Fully-Insured Population (000's)
Subset Estimates for 2009**

<u>Sub-Pop</u>	<u>Total</u>	<u>Females</u>
All Ages	2,454	1,241
Births	31	15
Under 5	154	75
Under 6	186	91
Age 40-64	1,005	518
Age 19-64	1,832	937

Split of Commercial Fully-insured Population by Age

The total commercial fully-insured non-elderly population was distributed by age by the following process. The Census Bureau indicates that 4,151,961 Massachusetts residents in 2009 were aged 19-64. Of that 4,151,961, the Census Bureau estimates 71.9 percent of Massachusetts residents aged 19-64 were covered by employer-sponsored health insurance. A factor of 1.13 was applied to the number of Massachusetts residents age 19-64 with employer sponsored coverage to include the non-resident population with coverage through a Massachusetts employer. Also, approximately 5.7 percent of individuals were covered by individually purchased health insurance. Assuming that 47.5 percent of those covered by employer-sponsored plans were covered by fully-insured commercial health insurance plans, the total commercial fully-insured non-elderly population is approximately 1,832,000 ($4,151,961 \times 0.719 \times 0.475 \times 1.13 + 4,151,961 \times .057$).

For specific mandates, a further split of the 19-64 population between 19-39 and 40-64 was required. This split was accomplished by referring to Census Bureau statistics which split the total Massachusetts population into five-year age groupings and assuming that the commercial fully-insured population was similarly distributed by age. We also assumed that the population was uniformly distributed by age within each five-year age grouping. These statistics indicated that 54.8 percent of the Massachusetts population age 19-64 was in the 40-64 range, so the enrollment in commercial fully-insured health plans is estimated as 1,005,000 ($=0.548 \times 1,832,000$).

For the age 0-18 population, the Census Bureau indicates that in 2009 68.3 percent of the Massachusetts residents in this age bracket population were covered by employer sponsored commercial health insurance and 3.4 percent were covered by individually purchased health insurance. If we assume that 47.5 percent of the individuals covered by employer sponsored plans are covered by fully-insured plans and apply a factor of 1.13 to include non-residents covered through a Massachusetts employer, then the estimate of children ages 0-18 who are covered by fully-insured commercial health plans can be derived by multiplying the total relevant population by 0.683 and 1.13 then by 0.475 and then adding the product of 0.034 and the total relevant population ($=0.683 \times 1.13 \times 0.475 \times \text{population} + 0.034 \times \text{population}$).

For the purposes of this report, the age groupings of interest in the 0-18 age range are newborns, children under 5 and children under 6. U.S. Census data indicate that the under 5 population (ages 0-4) in Massachusetts was 385,851 in 2009. Assuming a uniform distribution by age would mean that there were about 77,200 children at each age. Applying the factors indicated in the previous paragraph would result in about 27,700 children at each age that would be covered by commercial fully-insured health plans. Therefore, we anticipate about 77,200 newborns each year, of which 30,900 will be covered by commercial fully-insured health plans, and 386,000 (77,200 x 5) children under 5, of whom 154,000 are covered by commercial fully-insured plans. To estimate the under 6 population we assume the population within the 5 to 9 years age grouping is uniformly distributed by age. Dividing this total population of approximately 392,000 by 5 we estimate 78,000 are 5 years old. This amount is added to the under 5 population resulting in a total estimated population under 6 of 464,000, of whom 186,000 are covered by commercial fully-insured plans.

Split of Commercial Fully-insured Population by Gender

The Kaiser Family Foundation data indicate that 50.4 percent of the U.S. non-elderly (0-64) with employer-sponsored coverage were female. The Census Bureau web site indicates that the Massachusetts overall non-elderly population is similarly split between males and females, with 50.6 percent female in 2010.⁵²⁵ The Census Bureau web site also provides a male-female split by different age groupings, which show a pattern of an increasing female percentage at higher ages. We have assumed that the male-female mix for the insured population will vary by age in the same fashion as for the overall population. Based on these data, we assumed the following female percentages by age:

Newborns	48.9 percent
Ages 0- 5	48.9 percent
Ages 40-64	51.5 percent
Ages 19-64	51.2 percent
Ages 0-64	50.6 percent

These calculations result in the gender mix for the commercially insured resident age groupings summarized in Table D - 1.

Appendix E: Population Applicability of Mandate Laws

Mandate	Statute	Chapter 175	Chapters 176A, B	Chapter 176G	Geographic Summary for Analysis	GIC
Chiropractic services	c. 176B § 4L	NA	Residents and PPE	NA	R&PPE, BCBS only	
Contraceptive services	c. 175 § 47W; c. 176A § 8W; c. 176B § 4W; c. 176G § 4O	Policy	Residents and PPE	Residents and PPE	Residents and PPE	
Diabetes-related services and supplies	c. 175 § 47N; c. 176A § 8P; c. 176B § 4S; c. 176G § 4H; c. 32A § 17G	Policy	Residents and PPE	Policy	Residents and PPE	Y
Early intervention services	c. 175 § 47C; c. 176A § 8B; c. 176B § 4C; c. 176G § 4	Ambiguous, but probably residents	Policy	Ambiguous: Policy or Residents	Residents and PPE	
Home health care	c. 175 § 110(K); c. 176A § 8I; c. 176G § 4C	Policy	HSC: PPE only; MSC: NA	Policy	Residents and PPE	
Hormone replacement therapy	c. 175 § 47W; c. 176A § 8W; c. 176B § 4W; c. 176G § 4O	Policy	Residents and PPE	Residents and PPE	Residents and PPE	
Human leukocyte antigen testing	c. 175 § 47V; c. 176A § 8V; c. 176B § 4V; c. 176G § 4Q; c. 32A § 17H	Policy	Residents and PPE	Policy	Residents and PPE	Y
Infertility treatment	c. 175 § 47H; c. 176A § 8K; c. 176B § 4J; c. 176G § 4	Residents	Residents and PPE	Ambiguous: Policy or Residents	Residents and PPE	
Low protein food products	c. 175 § 47I; c. 176A § 8L; c. 176B § 4K; c. 176G § 4D	Policy	Residents and PPE	Policy	Residents and PPE	
Mental health care	c. 175 § 47B; c. 176A § 8A; c. 176B § 4A; c. 176G § 4M; c. 32A § 22	Residents and PPE	Residents and PPE	Residents and PPE	Residents and PPE	Y
Nonprescription enteral formulas	c. 175 § 47I; c. 176A § 8L; c. 176B § 4K; c. 176G § 4D; c. 32A § 17A	Policy	Residents and PPE	Policy	Residents and PPE	Y
Scalp hair prostheses for cancer patients	c. 175 § 47T; c. 176A § 8T; c. 176B § 4R; c. 176G § 4J; c. 32A § 17E	Policy	Residents and PPE	Policy	Residents and PPE	Y
Speech, hearing and language disorders	c. 175 § 47X; c. 176A § 8Y; c. 176B § 4X[sic]; c. 176G § 4N; c. 32A § 23	Residents and PPE	Residents and PPE	Residents and PPE	Residents and PPE	Y
Bone marrow transplants for treatment of breast cancer	c. 175 § 47R; c. 176A § 8O; c. 176B § 4O; c. 176G § 4F; c. 32A § 17D	Policy	Residents and PPE	Policy	Residents and PPE	Y
Cardiac rehabilitation	c. 175 § 47D; c. 176A § 8G; c. 176B § 4F; c. 176G § 4	Policy	Residents and PPE	Policy	Residents and PPE	
Clinical trials (to treat cancer)	c. 175 § 110L; c. 176A § 8X; c. 176B § 4X; c. 176G § 4P	Policy	Policy	Policy	Residents and PPE	
Cytologic screening	c. 175 §§ 47G and 110(L); c. 176A § 8J; c. 176G § 4	Residents (47G), ambiguous but probably residents (110(L))	HSC: Residents and PPE. MSC: NA	Ambiguous: Policy or Residents	Residents and PPE	
Hearing screening for newborns	c. 175 § 47C (c. 111 § 67F); c. 176A § 8B; c. 176B § 4C (c. 111 § 67F); c. 176G § 4K (c. 111 § 67F); c. 32A § 17F	Ambiguous, but probably residents	Policy	Policy	Residents and PPE	Y
Hospice care	c. 175 § 47S; c. 176A § 8R; c. 176B § 4Q; c. 176G § 4L; c. 32A § 17B	Policy	Residents and PPE	Policy	Residents and PPE	Y
Lead poisoning screening	c. 175 § 47C; c. 176A § 8B; c. 176B § 4C; c. 176G § 4	Residents	Policy	Ambiguous: Policy or Residents	Residents and PPE	

Mandate	Statute	Chapter 175	Chapters 176A, B	Chapter 176G	Geographic Summary for Analysis	GIC
Mammography	c. 175 §§ 47G and 110(L); c. 176A § 8J; c. 176G § 4	Residents (47G), ambiguous but probably residents (110(L))	HSC: Residents and PPE. MSC: NA	Ambiguous: Policy or Residents	Residents and PPE	
Maternity health care (including minimum maternity stay)	c. 175 § 47F; c. 176A § 8H; c. 176B § 4H; c. 176G §§ 4, 4I; c. 32A § 17C	Residents	Residents and PPE	Ambiguous: Policy or Residents	Residents and PPE	Y
Preventive care for children up to age six	c. 175 § 47C; c. 176A § 8B; c. 176B § 4C; c. 176G § 4	Residents	Policy	Ambiguous: Policy or Residents	Residents and PPE	
Off-label uses of prescription drugs to treat cancer	c. 175 §§ 47K, 47L; c. 176A § 8N; c. 176B § 4N; c. 176G § 4E	Policy	Residents and PPE	Policy	Residents and PPE	
Off-label uses of prescription drugs to treat HIV/AIDS	c. 175 §§ 47O, 47P; c. 176A § 8Q; c. 176B § 4P; c. 176G § 4G	Policy	Residents and PPE	Policy	Residents and PPE	
Autism	c. 175 § 47AA; c. 176A § 8DD; c. 176B § 4DD; c. 176G § 4V; c. 32A § 25	Residents and PPE	Residents and PPE	Residents and PPE	Residents and PPE	Y
Hypodermic syringes or needles	c. 175 § 47Y; c. 176A § 8CC; c. 176B § 4CC; c. 176G § 4U	Policy	Residents and PPE	Policy	Residents and PPE	
Prosthetic Devices	c. 175 § 47Z; c. 176A § 8AA; c. 176B § 4AA; c. 176G § 4S; c. 32A § 17I	Policy	Residents and PPE	Policy	Residents and PPE	Y
Certified Nurse Midwives	c. 175 § 47E; c. 176B § 4G; also c. 176B § 7	Policy	HSC: NA. MSC: Residents and PPE.	NA	Residents and PPE, but some licenses NA	
Certified Registered Nurse Anesthetists	c. 175 § 47Q; c. 176A § 8S; c. 176B § 4T; c. 176G § 4	Residents and PPE (or policy)	Residents and PPE	Policy	Residents and PPE	
Nurse Practitioners	c. 175 § 47Q; c. 176A § 8S; c. 176B § 4T; c. 176G § 4; also c. 176R	Residents and PPE (or policy)	Residents and PPE	Policy	Residents and PPE	
Chiropractors	c. 175 § 108D; c. 176B § 7 see also "chiropractic services"	Policy	HSC: NA. MSC: Policy	NA	Residents and PPE, but some licenses NA	
Dentists	c. 175 § 108B; c. 176B § 4	Policy	Policy	NA	Residents and PPE, but some licenses NA	
Optometrists	c. 175 § 108(8)(D); c. 175 § 110(F); c. 176B § 4	Policy	Policy	NA	Residents and PPE, but some licenses NA	
Podiatrists	c. 175 § 110(I); c. 176B § 4; c. 176G § 1 (See "nondiscriminatory")	Policy	Policy	Policy	Residents and PPE, but some licenses NA	

Appendix F: Data Pull Matrix

SERVICE MANDATES						
Field/Criterion Description	Diabetes		Mental Health		Home Health	
	1 Condition	2 Value	3 Condition	4 Value	5 Condition	6 Value
Plan Developed Indicators						
Medicare	Equal	No	Equal	No	Equal	No
Age	Equal	< 65	Equal	< 65	Equal	< 65
Fully Insured (FI)	Equal One	Yes/No	Equal One	Yes/No	Equal One	Yes/No
Geography	Member Principal Place of Emp. or Res. In MA 1, 2, 3		Member Principal Place of Emp. or Res. In MA 1, 2, 3		Member Principal Place of Emp. or Res. In MA 1, 2, 3	
Dates of Service	In	2009	In	2009	In	2009
Month of Service Start	Calculate	All	Calculate	All	Calculate	All
Month of Service End	Calculate	All	Calculate	All	Calculate	All
Sex		All		All		All
Year of birth	Calculate	All	Calculate	All	Calculate	All
Standard Claim Fields						
Provider Type						All
Place of Service					Equal	Home
ICD-9 Diagnosis Code 1 (primary)	In	250, 357.2, 362.0, 366.41, 648.0	In	MENT_1		
ICD-9 Diagnosis Code 2	In	250, 357.2, 362.0, 366.41, 648.0	In	MENT_1		
ICD-9 Diagnosis Code 3			In	MENT_1		
ICD-9 Diagnosis Code 4						
ICD-9 Diagnosis Code 5						
ICD9 Procedure Code (primary)		Null				
Revenue Code	Create As	Null	In	MENT_2		
HCPCS/CPT-4 Procedure Code	In	A4253, E0609, E2100, A4250, W4675, W4676, A4259, J1815-J1817, S8490, 83036, 82043-82044, 80061, 82645, 83715-83716, 83718-83719, 83721, 84023, 84478, E0779, E0780, E0781, E0791, E1520, S5560, S5561, S5570, S5571, A5500-A5513, G0108, G0109, E0607, A9275, 95250, 95251, A9277, A9278, A9276, 99401, 99402, 99403, 99404, 97802, 97803, 97804, G0108, G0109, G0270, G0108, A4233-NU, A4234-NU, A4235-NU, A4236-NU, A9274-NU, E2100-NU, E2101-NU, A4257-NU, E0620-NU, V2600-NU, A4258-NU, A4256-NU, A4772-NU, A4233-RR, A4234-RR, A4235-RR, A4236-RR, A9274-RR, E2100-RR, E2101-RR, A4257-RR, E0620-RR, V2600-RR, A4258-RR, A4256-RR, A4772-RR, A4206, A4207, A4208, A4209, A4210, A4211, A4212, A4213, A4215, A4230, A4231, A4232, A4250, A4252, A4253, A4255, A4256, A4258, A4259, A9275, A9276, A9277, A9278, A9279, E0607, E0779, E0780, E0781, E0784, E2100, E2101, S5560, S5561, S5565, S5566, S5570, S5571, S8490, G0108, G0109, A5500, A5501, A5503, A5504, A5505, A5506, A5507, A5508, A5510, A5512, A5513, L3000, L3001, L3002, L3003, L3010, L3020, L3030, L3031, L3040, L3050, L3060, L3070, L3080, L3090, S1030, S1031	In	MENT_3, MENT_4	All	
HCPCS/CPT-4 Procedure Code Modifier (Primary)	Create As	See above	Create As	Null	Create As	Null
NDC drug code	In	DIAB_1	Create As	Null	Create As	Null
Amount paid	Calculate	SUM	Calculate	SUM	Calculate	SUM
Units of Service	Calculate	SUM	Calculate	SUM	Calculate	SUM

SERVICE MANDATES						
Field/Criterion Description	Nonprescrip. Ent.		Speech/Hearing		Infertility (Primary)	
	7 Condition	8 Value	9 Condition	10 Value	11 Condition	12 Value
Plan Developed Indicators						
Medicare	Equal	No	Equal	No	Equal	No
Age	Equal	< 65	Equal	< 65	Equal	< 65
Fully Insured (FI)	Equal One	Yes/No	Equal One	Yes/No	Equal One	Yes/No
Geography	Member Principal Place of Emp. or Res. In MA 1, 2, 3		Member Principal Place of Emp. or Res. In MA 1, 2, 3		Member Principal Place of Emp. or Res. In MA 1, 2, 3	
Dates of Service	In	2009	In	2009	In	2009
Month of Service Start	Calculate	All	Calculate	All	Calculate	All
Month of Service End	Calculate	All	Calculate	All	Calculate	All
Sex		All		All		All
Year of birth	Calculate	All	Calculate	All	Calculate	All
Standard Claim Fields						
Provider Type						
Place of Service		All	DOES NOT Equal	School		
ICD-9 Diagnosis Code 1 (primary)	In	270.1-277.9, 555.x, 556.x, 530.1, 579.8, 530.11, 558.3, 530.13	In	SPEECH_1	In	628.0-628.9, 606.0-606.9, V26.0, V26.1, V26.2x, V26.5x, 646.30, 646.31, 646.33, 629.81
ICD-9 Diagnosis Code 2						
ICD-9 Diagnosis Code 3						
ICD-9 Diagnosis Code 4						
ICD-9 Diagnosis Code 5						
ICD9 Procedure Code (primary)			In	20.95, 20.96, 20.97, 20.98	Equal	69.92
Revenue Code						55870, 58321-58323, 58340, 58825, 58970-58976, 59866, S4011-S4040, 69710, 69711, 69714, 69715, 69717, 69718, 69930, 922601, 92602, 92603, 92604, 92640, 74740, 89250, 89252, 89253, 89254, 89255, 89256, 89257, 89258, 89259, 89260, 89261, 89264, 89268, 89272, 89280, 89281, 89321, 89335, 89342, 89343, 89346, 89352, 89353, 89356, S4042, 74740, 89250-89356, J3355, J0725, S0128, S0126, S0122, S4042, 99241-99245, 99211-99215, 99201-99205, 99384-99387, 99394-99397, 99401-99402, 49320, 49321, 49322, 58555, 58558, 83001, 83002, 83890-83912, 82670, 84144, 84146, 84443, 84702, 84703, 88261-88264, 88280-88289, 88271-88275, 88291
HCPCS/CPT-4 Procedure Code	In	B4150, B4151, B4153, B4154, B4155, B4152, B4156	In	V5095		
HCPCS/CPT-4 Procedure Code Modifier (Primary)	Create As	Null	Create As	Null	Create As	Null
NDC drug code	Create As	Null	Create As	Null	In	IVF_1
Amount paid	Calculate	SUM	Calculate	SUM	Calculate	SUM
Units of Service	Calculate	SUM	Calculate	SUM	Calculate	SUM

SERVICE MANDATES						
Field/Criterion Description	Contraceptive		Hormone Replace.		HLA Testing	
	13 Condition	14 Value	15 Condition	16 Value	17 Condition	18 Value
Plan Developed Indicators						
Medicare	Equal	No	Equal	No	Equal	No
Age	Equal	< 65	Equal	< 65	Equal	< 65
Fully Insured (FI)	Equal One	Yes/No	Equal One	Yes/No	Equal One	Yes/No
Geography	Member Principal Place of Emp. or Res. In MA 1, 2, 3		Member Principal Place of Emp. or Res. In MA 1, 2, 3		Member Principal Place of Emp. or Res. In MA 1, 2, 3	
Dates of Service	In	2009	In	2009	In	2009
Month of Service Start	Calculate	All	Calculate	All	Calculate	All
Month of Service End	Calculate	All	Calculate	All	Calculate	All
Sex	Equal	Female	Equal	Female		All
Year of birth	Calculate	All	Calculate	All	Calculate	All
Standard Claim Fields						
Provider Type						
Place of Service						
ICD-9 Diagnosis Code 1 (primary)	In	V25.01-V25.09, V25.1, V25.40- V25.49, V25.5-V25.9, V26.4, V45.51-V45.59, 996.32	In	627.0-627.9, 256.0, 256.2-256.39, 716.30-716.39, 733.01, V07.4,	In	V70.8, V59.3, V59.9
ICD-9 Diagnosis Code 2	In	V25.01-V25.09, V25.1, V25.40- V25.49, V25.5-V25.9, V26.4, V45.51-V45.59, 996.32	In	627.0-627.9, 256.0, 256.2-256.39, 716.30-716.39, 733.01, V07.4,		
ICD-9 Diagnosis Code 3	In	V25.01-V25.09, V25.1, V25.40- V25.49, V25.5-V25.9, V26.4, V45.51-V45.59, 996.32	In	627.0-627.9, 256.0, 256.2-256.39, 716.30-716.39, 733.01, V07.4,		
ICD-9 Diagnosis Code 4	In	V25.01-V25.09, V25.1, V25.40- V25.49, V25.5-V25.9, V26.4, V45.51-V45.59, 996.32	In	627.0-627.9, 256.0, 256.2-256.39, 716.30-716.39, 733.01, V07.4,		
ICD-9 Diagnosis Code 5	In	V25.01-V25.09, V25.1, V25.40- V25.49, V25.5-V25.9, V26.4, V45.51-V45.59, 996.32	In	627.0-627.9, 256.0, 256.2-256.39, 716.30-716.39, 733.01, V07.4,		
ICD9 Procedure Code (primary)	In	69.7, 96.17, 97.71, 97.73				
Revenue Code						
HCPCS/CPT-4 Procedure Code		11975, 11976, 11977, 57170, S4981, S4989, S4993, J1050, J1055, J1056, J7302, J7304, J7300, J7303, J7306, A4260, A4261, A4266, A4267, A4268, A4269, 99241-99245, 99211-99215, 99201-99205, 99384-99387, 99394-99397, 99401-99402, 99281-99285	In	11980, J1380, J1390, J1410, J1436, 99241-99245, 99211-99215, 99201-99205, 99205, 99384-99387, 99394-99397, 99401-99402, 83001, 83002	In	86812, 86813, 86816, 86817, 83890-83912
HCPCS/CPT-4 Procedure Code Modifier (Primary)	Create As	Null	Create As	Null	Create As	Null
NDC drug code	In	CONTRA_1	In	HRT_1	Create As	Null
Amount paid	Calculate	SUM	Calculate	SUM	Calculate	SUM
Units of Service	Calculate	SUM	Calculate	SUM	Calculate	SUM

SERVICE MANDATES						
Field/Criterion Description	Low Protein		Early Intervention		Chiropractic Svcs.	
	19 Condition	20 Value	21 Condition	22 Value	23 Condition	24 Value
Plan Developed Indicators						
Medicare	Equal	No	Equal	No	Equal	No
Age	Equal	< 65	Equal	< 3	Equal	< 3
Fully Insured (FI)	Equal One	Yes/No	Equal One	Yes/No	Equal One	Yes/No
Geography	Member Principal Place of Emp. or Res. In MA 1, 2, 3		Member Principal Place of Emp. or Res. In MA 1, 2, 3		Member Principal Place of Emp. or Res. In MA 1, 2, 3	
Dates of Service	In	2009	In	2009	In	2009
Month of Service Start	Calculate	All	Calculate	All	Calculate	All
Month of Service End	Calculate	All	Calculate	All	Calculate	All
Sex		All		All		All
Year of birth	Calculate	All	Calculate	All	Calculate	All
Standard Claim Fields						
Provider Type			Equal	Cert. EI Provider		
Place of Service		All		All		
ICD-9 Diagnosis Code 1 (primary)						
ICD-9 Diagnosis Code 2						
ICD-9 Diagnosis Code 3						
ICD-9 Diagnosis Code 4						
ICD-9 Diagnosis Code 5						
ICD9 Procedure Code (primary)			Equal	65.54		
Revenue Code						
HCPCS/CPT-4 Procedure Code	In	S9435, S9434, B4161, B4162	In	H2015, T1015, T1023, T1024, T1027, 96153, 99XXX	In	98940, 98941, 98942, 98943
HCPCS/CPT-4 Procedure Code Modifier (Primary)	Create As	Null	In	AH, AJ, GN, GO, GP, HN, TD, TE, TL		
NDC drug code	Create As	Null	Create As	Null	Create As	
Amount paid	Calculate	SUM	Calculate	SUM	Calculate	
Units of Service	Calculate	SUM	Calculate	SUM	Calculate	

SERVICE MANDATES						
Field/Criterion Description	Scalp Hair Pros.		Autism Services		Hypodermics	
	25 Condition	26 Value	27 Condition	28 Value	29 Condition	30 Value
Plan Developed Indicators						
Medicare	Equal	No	Equal	No	Equal	No
Age	Equal	< 3	Equal	< 3	Equal	< 3
Fully Insured (FI)	Equal One	Yes/No	Equal One	Yes/No	Equal One	Yes/No
Geography	Member Principal Place of Emp. or Res. In MA 1, 2, 3		Member Principal Place of Emp. or Res. In MA 1, 2, 3		Member Principal Place of Emp. or Res. In MA 1, 2, 3	
Dates of Service	In	2009	In	2009	In	2009
Month of Service Start	Calculate	All	Calculate	All	Calculate	All
Month of Service End	Calculate	All	Calculate	All	Calculate	All
Sex		All		All		All
Year of birth	Calculate	All	Calculate	All	Calculate	All
Standard Claim Fields						
Provider Type						
Place of Service						
ICD-9 Diagnosis Code 1 (primary)			In	299.00, 299.01, 299.10, 299.11, 299.80, 299.81, 299.90, 299.91		
ICD-9 Diagnosis Code 2			In	299.00, 299.01, 299.10, 299.11, 299.80, 299.81, 299.90, 299.91		
ICD-9 Diagnosis Code 3			In	299.00, 299.01, 299.10, 299.11, 299.80, 299.81, 299.90, 299.91		
ICD-9 Diagnosis Code 4			In	299.00, 299.01, 299.10, 299.11, 299.80, 299.81, 299.90, 299.91		
ICD-9 Diagnosis Code 5			In	299.00, 299.01, 299.10, 299.11, 299.80, 299.81, 299.90, 299.91		
ICD9 Procedure Code (primary)						
Revenue Code						
HCPCS/CPT-4 Procedure Code	In	A9282	In	H0031, H0032, H2012, H2019	In	A4206,A4207,A4208,A4209,A4212,A4657,K05
HCPCS/CPT-4 Procedure Code Modifier (Primary)	In		In		In	
NDC drug code	Create As		Create As		Create As	
Amount paid	Calculate		Calculate		Calculate	
Units of Service	Calculate		Calculate		Calculate	

SERVICE MANDATES			PROVIDER MANDATES	
Field/Criterion Description	Limb Prostheses		Cert. Nurse Midwives	
	31 Condition	32 Value	33 Condition	34 Value
Plan Developed Indicators				
Medicare	Equal	No	Equal	No
Age	Equal	< 3	Equal	< 3
Fully Insured (FI)	Equal One	Yes/No	Equal One	Yes/No
Geography	Member Principal Place of Emp. or Res. In MA 1, 2, 3		Member Principal Place of Emp. or Res. In MA 1, 2, 3	
Dates of Service	In	2009	In	2009
Month of Service Start	Calculate	All	Calculate	All
Month of Service End	Calculate	All	Calculate	All
Sex		All		All
Year of birth	Calculate	All	Calculate	All
Standard Claim Fields				
Provider Type			Equal	Certified Nurse Midwife
Place of Service				
ICD-9 Diagnosis Code 1 (primary)				
ICD-9 Diagnosis Code 2				
ICD-9 Diagnosis Code 3				
ICD-9 Diagnosis Code 4				
ICD-9 Diagnosis Code 5				
ICD9 Procedure Code (primary)				
Revenue Code				
HCPCS/CPT-4 Procedure Code	In	LIMB_PROS		
HCPCS/CPT-4 Procedure Code Modifier (Primary)	In		In	SB
NDC drug code	Create As		Create As	
Amount paid	Calculate		Calculate	
Units of Service	Calculate		Calculate	

PROVIDER MANDATES						
Field/Criterion Description	CRNA		Nurse Practitioners		Chiropractor (Provider)	
	35 Condition	36 Value	37 Condition	38 Value	39 Condition	40 Value
Plan Developed Indicators						
Medicare	Equal	No	Equal	No	Equal	No
Age	Equal	< 3	Equal	< 3	Equal	< 3
Fully Insured (FI)	Equal One	Yes/No	Equal One	Yes/No	Equal One	Yes/No
Geography	Member Principal Place of Emp. or Res. In MA	1, 2, 3	Member Principal Place of Emp. or Res. In MA	1, 2, 3	Member Principal Place of Emp. or Res. In MA	1, 2, 3
Dates of Service	In	2009	In	2009	In	2009
Month of Service Start	Calculate	All	Calculate	All	Calculate	All
Month of Service End	Calculate	All	Calculate	All	Calculate	All
Sex		All		All		All
Year of birth	Calculate	All	Calculate	All	Calculate	All
Standard Claim Fields						
Provider Type	Equal	CRNA	Equal	Nurse Practitioner	Equal	Chiropractor
Place of Service						
ICD-9 Diagnosis Code 1 (primary)						
ICD-9 Diagnosis Code 2						
ICD-9 Diagnosis Code 3						
ICD-9 Diagnosis Code 4						
ICD-9 Diagnosis Code 5						
ICD9 Procedure Code (primary)						
Revenue Code						
HCPCS/CPT-4 Procedure Code						
HCPCS/CPT-4 Procedure Code Modifier (Primary)	In	QX, QZ	In	SA	In	
NDC drug code	Create As		Create As		Create As	
Amount paid	Calculate		Calculate		Calculate	
Units of Service	Calculate		Calculate		Calculate	

PROVIDER MANDATES						
Field/Criterion Description	Dentist		Optometrist		Podiatrist	
	41 Condition	42 Value	43 Condition	44 Value	45 Condition	46 Value
Plan Developed Indicators						
Medicare	Equal	No	Equal	No	Equal	No
Age	Equal	< 3	Equal	< 3	Equal	< 3
Fully Insured (FI)	Equal One	Yes/No	Equal One	Yes/No	Equal One	Yes/No
Geography	Member Principal Place of Emp. or Res. In MA 1, 2, 3		Member Principal Place of Emp. or Res. In MA 1, 2, 3		Member Principal Place of Emp. or Res. In MA 1, 2, 3	
Dates of Service	In	2009	In	2009	In	2009
Month of Service Start	Calculate	All	Calculate	All	Calculate	All
Month of Service End	Calculate	All	Calculate	All	Calculate	All
Sex		All		All		All
Year of birth	Calculate	All	Calculate	All	Calculate	All
Standard Claim Fields						
Provider Type	Equal	Dentist/Oral Surgeon	Equal	Optometrist	Equal	Podiatrist
Place of Service						
ICD-9 Diagnosis Code 1 (primary)						
ICD-9 Diagnosis Code 2						
ICD-9 Diagnosis Code 3						
ICD-9 Diagnosis Code 4						
ICD-9 Diagnosis Code 5						
ICD9 Procedure Code (primary)						
Revenue Code						
HCPCS/CPT-4 Procedure Code						
HCPCS/CPT-4 Procedure Code Modifier (Primary)	In		In		In	
NDC drug code	Create As		Create As		Create As	
Amount paid	Calculate		Calculate		Calculate	
Units of Service	Calculate		Calculate		Calculate	

Appendix G: Cost by Type of Service for Mandates with Potential Marginal Direct Cost

This appendix presents required direct claims cost (RDC) by service category for the twenty-three mandates judged to have potential marginal direct cost that were analyzed using the 2009 HCQCC data extract.

Table G-1: Chiropractic Services Mandate

Chiropractic Services Mandate Summary of Services Used by Category			
Category	Raw Sample Claims	Adjusted to Fully Insured	
		Population	PMPM
Chiropractic Manipulative Treatment	\$6,440,470	\$6,440,470	\$0.640
All Services	\$6,440,470	\$6,440,470	\$ 0.64

Table G-2: Contraceptive Services

Contraceptive Services Mandate Summary of Services Used by Category			
Category	Raw Sample Claims	Adjusted to Fully Insured	
		Population	PMPM
Pharmacy Claims	\$11,762,495	\$20,395,072	\$0.693
Drugs Other Than Chemotherapy	\$3,358,336	\$5,823,042	\$0.198
Office/Other Outpatient Services	\$1,906,213	\$3,305,196	\$0.112
Preventive Medicine Services	\$1,629,566	\$2,825,516	\$0.096
Consultations	\$106,708	\$185,022	\$0.006
Surgery, Female Genital System	\$61,631	\$106,863	\$0.004
Temporary National Codes Est. by Private Payers	\$51,001	\$88,430	\$0.003
Uncategorized Services	\$45,012	\$78,046	\$0.003
Surgery, Integumentary System	\$39,951	\$69,271	\$0.002
Emergency Department Services	\$34,251	\$59,388	\$0.002
Pathology & Laboratory	\$2,268	\$3,933	\$0.000
Temporary Procedures & Professional Services	\$592	\$1,027	\$0.000
Medical & Surgical Supplies	\$353	\$611	\$0.000
Surgery, Maternity Care & Delivery	\$54	\$93	\$0.000
Radiology	\$48	\$83	\$0.000
Surgery, Cardiovascular System	\$9	\$16	\$0.000
All Services	\$18,998,487	\$32,941,611	\$ 1.12

Table G-3: Diabetes-related services and supplies

Diabetes Service Mandate Summary of Services Used by Category			
Category	Raw Sample Claims	Adjusted to Fully Insured Population	PMPM
Pharmacy Claims	\$25,928,706	\$48,319,201	\$1.527
Pathology & Laboratory	\$4,068,383	\$7,581,598	\$0.240
Durable Medical Equipment	\$3,120,966	\$5,816,047	\$0.184
Medical & Surgical Supplies	\$3,014,408	\$5,617,472	\$0.178
Temporary Procedures & Professional Services	\$1,286,763	\$2,397,935	\$0.076
Administrative, Miscellaneous & Investigational	\$1,177,165	\$2,193,695	\$0.069
Medical Nutrition Therapy	\$782,916	\$1,458,995	\$0.046
Office/Other Outpatient Services	\$35,558	\$66,264	\$0.002
Preventive Medicine Services	\$23,248	\$43,324	\$0.001
Endocrinology	\$12,171	\$22,681	\$0.001
Uncategorized Services	\$11,903	\$22,181	\$0.001
Drugs Other Than Chemotherapy	\$6,675	\$12,438	\$0.000
Temporary National Codes Est. by Private Payers	\$5,860	\$10,920	\$0.000
Orthotics	\$5,203	\$9,696	\$0.000
Psychiatry	\$1,076	\$2,006	\$0.000
Education & Training for Patient Self-Management	\$452	\$843	\$0.000
Special Services, Procedures, and Reports	\$22	\$41	\$0.000
All Services	\$39,481,474	\$73,575,335	\$ 2.32

Table G-4: Early Intervention Services

Early Intervention Services Mandate Summary of Services Used by Category			
Category	Raw Sample Claims	Adjusted to Fully Insured Population	PMPM
Behavioral Health and/or Substance Abuse Treatment Services	\$8,662,480	\$17,457,905	\$0.593
Temporary National Codes Est. by Medicaid	\$3,529,373	\$7,112,913	\$0.242
Health & Behavior Assessment/Intervention	\$873,666	\$1,760,740	\$0.060
All Services	\$13,065,520	\$26,331,558	\$ 0.89

Table G-5: Home Health Services

**Home Health Services Mandate
Summary of Services Used by Category**

Category	Raw Sample Claims	Adjusted to Fully Insured	
		Population	PMPM
Drugs Other Than Chemotherapy	\$35,241,172	\$58,573,319	\$1.989
Durable Medical Equipment	\$21,417,241	\$35,596,969	\$1.209
Uncategorized Service	\$16,030,899	\$26,644,487	\$0.905
Medical & Surgical Supplies	\$11,890,868	\$19,763,463	\$0.671
Temporary National Codes Est. by Private Payers	\$10,945,313	\$18,191,884	\$0.618
Behavioral Health and/or Substance Abuse Treatment Services	\$10,415,734	\$17,311,687	\$0.588
Orthotics	\$5,550,423	\$9,225,195	\$0.313
Temporary Procedures & Professional Services	\$4,391,601	\$7,299,151	\$0.248
Enteral and Parenteral Therapy	\$4,051,683	\$6,734,184	\$0.229
Prosthetics	\$2,396,225	\$3,982,695	\$0.135
Home Health Procedures/Services	\$1,696,628	\$2,819,916	\$0.096
Administrative, Miscellaneous & Investigational	\$1,596,010	\$2,652,682	\$0.090
Temporary National Codes Est. by Medicaid	\$1,240,141	\$2,061,203	\$0.070
Temporary Codes Assigned by CMS	\$949,990	\$1,578,950	\$0.054
Temporary Codes for Durable Medical Equipment Regional Carriers	\$753,699	\$1,252,702	\$0.043
Pulmonary	\$635,242	\$1,055,817	\$0.036
Psychiatry	\$329,635	\$547,877	\$0.019
Home Services	\$300,741	\$499,853	\$0.017
Special Otorhinolaryngologic Services	\$224,933	\$373,855	\$0.013
Vaccines, Toxoids	\$142,412	\$236,698	\$0.008
Vision Services	\$116,460	\$193,565	\$0.007
Physical Medicine & Rehabilitation	\$100,151	\$166,457	\$0.006
Chemotherapy Drugs	\$61,725	\$102,591	\$0.003
Domiciliary, Rest Home (assisted living facility) or Home Plan Oversight Services	\$52,784	\$87,731	\$0.003
Immune Globulins, Serum, or Recombinant Prods	\$46,111	\$76,640	\$0.003
Moderate (conscious) Sedation	\$45,409	\$75,473	\$0.003
Health & Behavior Assessment/Intervention	\$30,178	\$50,159	\$0.002
Dialysis	\$27,424	\$45,581	\$0.002
Surgery, Musculoskeletal System	\$24,539	\$40,785	\$0.001
Pathology & Laboratory	\$17,139	\$28,487	\$0.001
Cardiovascular	\$13,951	\$23,187	\$0.001
Care Plan Oversight Services	\$13,834	\$22,993	\$0.001
Special Services, Procedures, and Reports	\$12,616	\$20,968	\$0.001
Hearing Services	\$8,329	\$13,844	\$0.000
Laboratory Services	\$8,296	\$13,788	\$0.000
Transport Services Including Ambulance	\$7,323	\$12,171	\$0.000
Radiology	\$6,393	\$10,626	\$0.000
Surgery, Maternity Care & Delivery	\$6,205	\$10,313	\$0.000
Consultations	\$6,135	\$10,196	\$0.000
Surgery, Integumentary System	\$4,991	\$8,295	\$0.000
Prolonged Services	\$4,191	\$6,966	\$0.000
Neurology & Neuromuscular Procedures	\$3,614	\$6,007	\$0.000
Domiciliary, Rest Home (boarding home) or Custodial Care Services	\$3,124	\$5,193	\$0.000

Table G-6: Hormone replacement therapy

Hormone Replacement Therapy Mandate			
Summary of Services Used by Category			
Category	Raw Sample Claims	Adjusted to Fully Insured Population	PMPM
Pharmacy Claims	\$1,007,835	\$1,747,492	\$0.059
Office/Other Outpatient Services	\$370,377	\$642,200	\$0.022
Preventive Medicine Services	\$132,950	\$230,523	\$0.008
Consultations	\$41,008	\$71,104	\$0.002
Pathology & Laboratory	\$19,759	\$34,261	\$0.001
Surgery, Integumentary System	\$16,575	\$28,739	\$0.001
Drugs Other Than Chemotherapy	\$232	\$403	\$0.000
All Services	\$1,588,736	\$2,754,721	\$ 0.09

Table G-7: HLA Testing

HLA Testing Mandate			
Summary of Services Used by Category			
Category	Raw Sample Claims	Adjusted to Fully Insured Population	PMPM
Pathology & Laboratory	\$86,049	\$153,713	\$0.005
All Services	\$86,049	\$153,713	\$ 0.00

Table G-8: Hypodermic Syringes and Needles

Syringe Mandate			
Summary of Services Used by Category			
Category	Raw Sample Claims	Adjusted to Fully Insured Population	PMPM
Medical & Surgical Supplies	\$28,579	\$47,501	\$0.002
Temporary Codes for Durable Medical Equipment Regional Carriers	\$26,461	\$43,980	\$0.001
All Services	\$55,040	\$91,481	\$ 0.00

Table G-9: Infertility Treatment

Infertility Services Mandate			
Summary of Services Used by Category			
Category	Raw Sample Claims	Adjusted to Fully Insured Population	PMPM
Pharmacy Claims	\$23,711,241	\$41,113,087	\$1.396
Temporary National Codes Est. by Private Payers	\$22,903,814	\$39,713,084	\$1.349
Pathology & Laboratory	\$3,422,013	\$5,933,452	\$0.202
Surgery, Female Genital System	\$2,880,964	\$4,995,323	\$0.170
Office/Other Outpatient Services	\$1,357,520	\$2,353,814	\$0.080
Consultations	\$617,774	\$1,071,162	\$0.036
Radiology	\$586,646	\$1,017,189	\$0.035
Surgery, Digestive System	\$37,926	\$65,759	\$0.002
Surgery, Maternity Care & Delivery	\$29,465	\$51,089	\$0.002
Preventive Medicine Services	\$4,001	\$6,937	\$0.000
Drugs Other Than Chemotherapy	\$3,876	\$6,721	\$0.000
Uncategorized Services	\$42	\$73	\$0.000
All Services	\$55,555,280	\$96,327,690	\$ 3.27

Table G-10: Low Protein Food Products

Low Protein Foods Mandate			
Summary of Services Used by Category			
Category	Raw Sample Claims	Adjusted to Fully Insured Population	PMPM
Enteral and Parenteral Therapy	\$796,448	\$1,323,754	\$0.045
Temporary National Codes Est. by Private Payers	\$73,199	\$121,661	\$0.004
All Services	\$869,647	\$1,445,415	\$ 0.05

Table G-11: Mental Health Services

Mental Health Services Mandate Summary of Services Used by Category			
Category	Raw Sample Claims	Adjusted to Fully Insured Population	PMPM
Psychiatry	\$111,440,598	\$199,070,090	\$6.291
Inpatient Services	\$32,904,879	\$58,779,092	\$1.857
Central Nervous System Assessments/Tests (Neuro-Cognitive, Mental Status, Speech Testing)	\$5,008,119	\$8,946,172	\$0.283
Behavioral Health and/or Substance Abuse Treatment Services	\$4,903,298	\$8,758,926	\$0.277
Hospital Inpatient Services	\$2,702,302	\$4,827,213	\$0.153
Temporary National Codes Est. by Private Payers	\$1,597,601	\$2,853,849	\$0.090
Consultations	\$483,587	\$863,847	\$0.027
Home Services	\$83,725	\$149,560	\$0.005
Nursing Facility Services	\$51,973	\$92,841	\$0.003
Temporary Procedures & Professional Services	\$9,130	\$16,309	\$0.001
Surgery, Digestive System	\$8,299	\$14,825	\$0.000
Special Services, Procedures, and Reports	\$4,112	\$7,346	\$0.000
Health & Behavior Assessment/Intervention	\$3,663	\$6,543	\$0.000
Case Management Services	\$1,125	\$2,010	\$0.000
Non-Face-to-Face Physician Services	\$1,125	\$2,010	\$0.000
Hydration, Therapeutic, Prophylactic, Diagnostic Injections & Infusions, and Chemotherapy & Other Highly Complex Drug or Highly Complex			
Biologic Agent Administration	\$615	\$1,099	\$0.000
Emergency Department Services	\$461	\$823	\$0.000
Preventive Medicine Services	\$374	\$668	\$0.000
Other Medical Services	\$308	\$551	\$0.000
Office/Other Outpatient Services	\$193	\$345	\$0.000
Pathology & Laboratory	\$187	\$333	\$0.000
Surgery, Urinary System	\$41	\$73	\$0.000
Biofeedback	\$18	\$32	\$0.000
All Services	\$159,205,733	\$284,394,557	\$ 8.99

Table G-12: Non-prescription enteral formulas

Nonprescription Enteral Formulas Mandate Summary of Services Used by Category			
Category	Raw Sample Claims	Adjusted to Fully Insured Population	PMPM
Enteral and Parenteral Therapy	\$153,599	\$274,379	\$0.009
All Services	\$153,599	\$274,379	\$ 0.01

Table G-13: Prosthetic Devices

Limb Prosthesis Mandate			
Summary of Services Used by Category			
		Adjusted to Fully Insured	
Category	Raw Sample Claims	Population	PMPM
Prosthetics	\$2,184,716	\$3,902,631	\$0.123
All Services	\$2,184,716	\$3,902,631	\$ 0.12

Table G-14: Scalp Hair Protheses

Scalp Hair Prosthesis Mandate				
Summary of Services Used by Category				
			Adjusted to Fully Insured	
Procedure Code	Description	Raw Sample Claims	Population	PMPM
A9282	Wig, any type, each	\$316,886	\$566,063	\$0.018
All Services		\$316,886	\$566,063	\$ 0.02

Table G-15: Speech, Hearing, and Language Disorders

Speech and Hearing Services Mandate			
Summary of Services Used by Category			
		Adjusted to Fully Insured	
Category	Raw Sample Claims	Population	PMPM
Special Otorhinolaryngologic Services	\$538,336	\$961,648	\$0.030
Surgery, Auditory System	\$223,558	\$399,349	\$0.013
Prosthetics	\$35,981	\$64,273	\$0.002
All Services	\$797,874	\$1,425,270	\$ 0.05

Table G-16: Certified Nurse Midwives

Category	Certified Nurse Midwife Provider Mandate Summary of Services Used by Category		
	Raw Sample Claims	Adjusted to Fully Insured Population	PMPM
Surgery, Maternity Care & Delivery	\$1,284,772	\$1,797,873	\$ 0.128
Preventive Medicine Services	\$361,594	\$506,003	\$ 0.036
Office/Other Outpatient Services	\$189,028	\$264,521	\$ 0.019
Pathology & Laboratory	\$91,835	\$128,511	\$ 0.009
Drugs Other Than Chemotherapy	\$85,633	\$119,833	\$ 0.009
Surgery, Female Genital System	\$27,697	\$38,758	\$ 0.003
Vaccines, Toxoids	\$25,342	\$35,462	\$ 0.003
Hospital Inpatient Services	\$8,876	\$12,421	\$ 0.001
Surgery, Cardiovascular System	\$7,264	\$10,166	\$ 0.001
Temporary National Codes Est. by Private Payers	\$6,850	\$9,586	\$ 0.001
Temporary Codes Assigned by CMS	\$4,650	\$6,507	\$ 0.000
(blank)	\$3,519	\$4,924	\$ 0.000
Immunization Administration for Vaccines/Toxoids	\$3,139	\$4,392	\$ 0.000
Immune Globulins, Serum, or Recombinant Prods	\$2,964	\$4,148	\$ 0.000
Hospital Observation Services	\$2,257	\$3,158	\$ 0.000
Hydration, Therapeutic, Prophylactic, Diagnostic Injections & Infusions, and Chemotherapy & Other Highly Complex Drug or Highly Complex Biologic Agent Administration	\$1,906	\$2,667	\$ 0.000
Surgery, Integumentary System	\$796	\$1,113	\$ 0.000
Surgery, Digestive System	\$606	\$848	\$ 0.000
Consultations	\$500	\$699	\$ 0.000
Surgery, Urinary System	\$183	\$256	\$ 0.000
Radiology	\$109	\$153	\$ 0.000
Ophthalmology	\$105	\$147	\$ 0.000
Temporary Procedures & Professional Services	-\$4,362	-\$6,104	\$(0.000)
All Services	\$2,105,264	\$2,946,044	\$ 0.21

Table G-17: Certified Registered Nurse Anesthetists

Category	Certified Registered Nurse Anesthetist Provider Mandate Summary of Services Used by Category		
	Raw Sample Claims	Adjusted to Fully Insured Population	PMPM
Anesthesia	\$2,168,400	\$14,062,728	\$0.478
All Services	\$2,168,400	\$14,062,728	\$ 0.48

Table G-18: Nurse Practitioners

Nurse Practitioner Provider Mandate
Summary of Services Used by Category

Category	Raw Sample Claims	Adjusted to Fully Insured	
		Population	PMPM
Office/Other Outpatient Services	\$4,427,556	\$8,923,063	\$0.303
Preventive Medicine Services	\$1,168,041	\$2,354,008	\$0.080
Psychiatry	\$421,668	\$849,808	\$0.029
Consultations	\$277,702	\$559,667	\$0.019
Surgery, Integumentary System	\$239,885	\$483,452	\$0.016
Temporary National Codes Est. by Private Payers	\$131,835	\$265,693	\$0.009
Drugs Other Than Chemotherapy	\$65,746	\$132,501	\$0.005
Surgery, Urinary System	\$57,331	\$115,541	\$0.004
Emergency Department Services	\$43,082	\$86,825	\$0.003
Vaccines, Toxoids	\$32,058	\$64,608	\$0.002
Allergy & Clinical Immunology	\$27,349	\$55,117	\$0.002
Temporary Procedures & Professional Services	\$24,576	\$49,528	\$0.002
Surgery, Female Genital System	\$19,364	\$39,025	\$0.001
Cardiovascular	\$18,041	\$36,358	\$0.001
Pathology & Laboratory	\$14,678	\$29,581	\$0.001
Surgery, Cardiovascular System	\$14,187	\$28,591	\$0.001
Immunization Administration for Vaccines/Toxoids	\$13,858	\$27,929	\$0.001
Hydration, Therapeutic, Prophylactic, Diagnostic Injections & Infusions, and Chemotherapy & Other Highly Complex Drug or Highly Complex			
Biologic Agent Administration	\$13,275	\$26,754	\$0.001
Surgery, Musculoskeletal System	\$13,157	\$26,515	\$0.001
Pulmonary	\$10,707	\$21,578	\$0.001
Home Services	\$8,608	\$17,349	\$0.001
Hospital Inpatient Services	\$8,438	\$17,005	\$0.001
Gastroenterology	\$8,230	\$16,587	\$0.001
Radiology	\$8,058	\$16,240	\$0.001
Neurology & Neuromuscular Procedures	\$7,436	\$14,986	\$0.001
Hospital Observation Services	\$5,760	\$11,608	\$0.000
Photodynamic Therapy	\$5,205	\$10,490	\$0.000
Nursing Facility Services	\$4,958	\$9,993	\$0.000
Surgery, Auditory System	\$4,584	\$9,238	\$0.000
Chemotherapy Drugs	\$4,418	\$8,905	\$0.000
Central Nervous System Assessments/Tests (Neuro-Cognitive, Mental Status, Speech Testing)	\$3,572	\$7,199	\$0.000
Surgery, Digestive System	\$3,485	\$7,023	\$0.000
Temporary Codes Assigned by CMS	\$2,983	\$6,012	\$0.000
Anesthesia	\$2,386	\$4,808	\$0.000
Surgery, Maternity Care & Delivery	\$2,196	\$4,425	\$0.000
Inpatient Neonatal Intensive, and Pediatric/Neonatal Critical Care Services	\$1,805	\$3,637	\$0.000
Other Services & Procedures	\$1,461	\$2,945	\$0.000
Special Otorhinolaryngologic Services	\$1,397	\$2,815	\$0.000
Surgery, Eye & Ocular Adnexa	\$1,198	\$2,415	\$0.000
Surgery, Nervous System	\$1,070	\$2,156	\$0.000
Special Dermatological Procedures	\$1,059	\$2,135	\$0.000
Newborn Care Services	\$938	\$1,890	\$0.000

Table G-19: Chiropractor Provider Mandate

Chiropractors Provider Mandate			
Summary of Services Used by Category			
Category	Raw Sample Claims	Adjusted to Fully Insured Population	PMPM
Physical Medicine & Rehabilitation	\$7,574,347	\$10,599,319	\$0.752
Chiropractic Manipulative Treatment	\$6,306,731	\$8,825,454	\$0.626
Office/Other Outpatient Services	\$1,738,554	\$2,432,881	\$0.173
Radiology	\$383,087	\$536,081	\$0.038
Pathology & Laboratory	\$2,422	\$3,389	\$0.000
Medical Nutrition Therapy	\$1,840	\$2,575	\$0.000
Prolonged Services	\$530	\$742	\$0.000
Consultations	\$440	\$616	\$0.000
Orthotics	\$40	\$56	\$0.000
Surgery, Cardiovascular System	\$12	\$17	\$0.000
All Services	\$16,008,004	\$22,401,129	\$ 1.59

Table G-20: Dentists

**Dentist Provider Mandate
Summary of Services Used by Category**

Category	Raw Sample Claims	Adjusted to Fully Insured Population	PMPM
Dental Procedures	\$7,108,331	\$9,947,188	\$0.706
Surgery, Musculoskeletal System	\$549,887	\$769,496	\$0.055
Office/Other Outpatient Services	\$503,191	\$704,150	\$0.050
Surgery, Digestive System	\$483,171	\$676,135	\$0.048
Consultations	\$399,651	\$559,260	\$0.040
Temporary National Codes Est. by Private Payers	\$228,858	\$320,257	\$0.023
Radiology	\$166,174	\$232,539	\$0.017
Durable Medical Equipment	\$76,579	\$107,163	\$0.008
Surgery, Integumentary System	\$42,981	\$60,147	\$0.004
Surgery, Respiratory System	\$33,405	\$46,747	\$0.003
Surgery, Nervous System	\$19,911	\$27,863	\$0.002
Moderate (conscious) Sedation	\$9,855	\$13,791	\$0.001
Pathology & Laboratory	\$7,155	\$10,012	\$0.001
Hydration, Therapeutic, Prophylactic, Diagnostic Injections & Infusions, and Chemotherapy & Other Highly Complex Drug or Highly Complex Biologic Agent Administration	\$3,803	\$5,322	\$0.000
Drugs Other Than Chemotherapy	\$1,619	\$2,266	\$0.000
Hospital Inpatient Services	\$799	\$1,118	\$0.000
Emergency Department Services	\$566	\$792	\$0.000
Surgery, Urinary System	\$425	\$595	\$0.000
Surgery, Mediastinum & Diaphragm	\$280	\$392	\$0.000
Hospital Observation Services	\$133	\$186	\$0.000
Physical Medicine & Rehabilitation	\$97	\$136	\$0.000
Other Evaluation and Management Services	\$73	\$102	\$0.000
Surgery, Cardiovascular System	\$39	\$54	\$0.000
All Services	\$9,636,984	\$13,485,712	\$ 0.96

Table G-21: Optometrists

**Optometrist Provider Mandate
Summary of Services Used by Category**

Category	Raw Sample Claims	Adjusted to Fully Insured Population	PMPM
Ophthalmology	\$10,985,994	\$15,373,476	\$1.091
Office/Other Outpatient Services	\$899,196	\$1,258,308	\$0.089
Vision Services	\$166,137	\$232,487	\$0.016
Temporary National Codes Est. by Private Payers	\$65,840	\$92,135	\$0.007
Surgery, Eye & Ocular Adnexa	\$57,464	\$80,413	\$0.006
Consultations	\$22,646	\$31,690	\$0.002
Radiology	\$10,472	\$14,655	\$0.001
Physical Medicine & Rehabilitation	\$514	\$720	\$0.000
Special Services, Procedures, and Reports	\$281	\$394	\$0.000
Hospital Observation Services	\$199	\$278	\$0.000
Temporary Procedures & Professional Services	\$171	\$239	\$0.000
Nursing Facility Services	\$146	\$205	\$0.000
Prolonged Services	\$125	\$175	\$0.000
All Services	\$12,209,184	\$17,085,173	\$ 1.21

Table G-22: Podiatrists

**Podiatrist Provider Mandate
Summary of Services Used by Category**

Category	Raw Sample Claims	Adjusted to Fully Insured	
		Population	PMPM
Office/Other Outpatient Services	\$5,067,455	\$8,422,468	\$ 0.286
Surgery, Integumentary System	\$3,728,035	\$6,196,258	\$ 0.210
Surgery, Musculoskeletal System	\$2,371,819	\$3,942,130	\$ 0.134
Consultations	\$1,023,295	\$1,700,789	\$ 0.058
Orthotics	\$581,240	\$966,061	\$ 0.033
Radiology	\$571,283	\$949,513	\$ 0.032
Surgery, Nervous System	\$236,289	\$392,729	\$ 0.013
Medical & Surgical Supplies	\$87,231	\$144,984	\$ 0.005
Drugs Other Than Chemotherapy	\$31,743	\$52,760	\$ 0.002
Temporary Codes Assigned by CMS	\$21,700	\$36,067	\$ 0.001
Pathology & Laboratory	\$13,829	\$22,985	\$ 0.001
Neurology & Neuromuscular Procedures	\$12,615	\$20,967	\$ 0.001
Temporary Procedures & Professional Services	\$9,578	\$15,920	\$ 0.001
Hospital Inpatient Services	\$8,084	\$13,435	\$ 0.000
Nursing Facility Services	\$5,073	\$8,432	\$ 0.000
Home Services	\$3,885	\$6,457	\$ 0.000
Physical Medicine & Rehabilitation	\$3,738	\$6,212	\$ 0.000
Other Services & Procedures	\$3,509	\$5,833	\$ 0.000
Noninvasive Vascular Diagnostic Studies	\$3,455	\$5,743	\$ 0.000
Surgery, Cardiovascular System	\$1,620	\$2,693	\$ 0.000
Durable Medical Equipment	\$1,339	\$2,226	\$ 0.000
Hydration, Therapeutic, Prophylactic, Diagnostic Injections & Infusions, and Chemotherapy & Other Highly Complex Drug or Highly Complex			
Biologic Agent Administration	\$472	\$784	\$ 0.000
Surgery, Hemic and Lymphatic Systems	\$342	\$569	\$ 0.000
Chemotherapy Drugs	\$157	\$261	\$ 0.000
Care Plan Oversight Services	\$155	\$258	\$ 0.000
Special Services, Procedures, and Reports	\$153	\$255	\$ 0.000
Domiciliary, Rest Home (boarding home) or Custodial Care Services	\$133	\$220	\$ 0.000
Hospital Observation Services	\$82	\$136	\$ 0.000
Emergency Department Services	\$55	\$92	\$ 0.000
Uncategorized Services	-\$8,348	-\$13,876	\$(0.000)
All Services	\$13,780,017	\$22,903,362	\$ 0.78

Endnotes

-
- ¹ Massachusetts Center for Health Information and Analysis. State-mandated health insurance benefits and health insurance costs in Massachusetts, Prepared by Compass Health Analytics, Inc. Jul 2008. Accessed 11 June 2012: <http://www.mass.gov/eohhs/docs/dhcfp/r/pubs/mandates/comp-rev-mand-benefits-compass-report.pdf>.
- ² Summers, L.H. Some simple economics of mandated benefits. *American Economic Review* 1989 79(2), 177-83.
- ³ Massachusetts Center for Health Information and Analysis. State-mandated health insurance benefits and health insurance costs in Massachusetts, Prepared by Compass Health Analytics, Inc. Jul 2008. Accessed 11 June 2012: <http://www.mass.gov/eohhs/docs/dhcfp/r/pubs/mandates/comp-rev-mand-benefits-compass-report.pdf>.
- ⁴ See for example, Gabel, J, Jensen, G. The price of state mandated benefits. *Inquiry* 1989; 26:419-431.
- ⁵ Gruber, J. State-mandated benefits and employer-provided health insurance." *Journal of Public Economics*. 1994; 55:433-464.
- ⁶ Acs, G., Long, S.H., Marquis, S.M., and Short, P.F. Self-insured employer health plans: prevalence, profile, provisions, and premiums. *Health Affairs* 1996; 15 (2): 266-278.
- ⁷ American Academy of Pediatrics. Children's Health Topics: Autism. Accessed 7/7/2011: <http://www.aap.org/healthtopics/autism.cfm>
- ⁸ Autism and Developmental Disabilities Monitoring Network Surveillance Year 2002 Principal Investigators; Centers for Disease Control and Prevention. Prevalence of autism spectrum disorders--autism and developmental disabilities monitoring network, 14 sites, United States, 2002. *MMWR Surveill Summ*. 2007 Feb 9;56(1):12-28. Accessed 7/7/2011: <http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5601a2.htm>
- ⁹ Al-Qabandi M, Gorter JW, Rosenbaum P. Early autism detection: are we ready for routine screening? *Pediatrics*. 2011 Jul;128(1):e211-7. Accessed 7/7/2011: <http://pediatrics.aappublications.org/content/128/1/e211.full> (doi: 10.1542/peds.2010-1881)
- ¹⁰ American Psychiatric Association. About DSM-5. Accessed 7/7/2011: <http://www.dsm5.org/about/Pages/Default.aspx>
- ¹¹ American Psychiatric Association. DSM5 Development: A 09 Autism Spectrum Disorder Accessed 7/7/2011: <http://www.dsm5.org/ProposedRevisions/Pages/proposedrevision.aspx?rid=94>
- ¹² Autism and Developmental Disabilities Monitoring Network Surveillance Year 2006 Principal Investigators; Centers for Disease Control and Prevention (CDC). Prevalence of autism spectrum disorders - Autism and Developmental Disabilities Monitoring Network, United States, 2006. *MMWR Surveill Summ*. 2009 Dec 18;58(10):1-20. Accessed 7/7/2011: <http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5810a1.htm>
- ¹³ CDC 2002, *Op cit*.
- ¹⁴ *Ibid*.
- ¹⁵ Al-Qabandi, *Op cit*.
- ¹⁶ Myers SM, Johnson CP; American Academy of Pediatrics Council on Children with Disabilities. Management of children with autism spectrum disorders. *Pediatrics*. 2007 Nov;120(5):1162-82. Accessed 7/7/2011: <http://aappolicy.aappublications.org/cgi/content/full/pediatrics;120/5/1162> (doi:10.1542/peds.2007-2362)
- ¹⁷ *Ibid*.
- ¹⁸ *Ibid*.
- ¹⁹ *Ibid*.
- ²⁰ CDC 2006, *Op cit*.
- ²¹ Myers, *Op cit*.
- ²² Centers for Disease Control and Prevention (CDC). Autism Spectrum Disorders (ASDs). Last reviewed and updated 12/10/2010; Accessed 7/7/2011: <http://www.cdc.gov/ncbddd/autism/index.html>
- ²³ Myers, *Op cit*.
- ²⁴ CDC ASDs, *Op cit*.
- ²⁵ *Ibid*.
- ²⁶ Myers, *Op cit*.

-
- ²⁷ CDC ASDs, *Op cit.*
- ²⁸ Myers, *Op cit.*
- ²⁹ CDC ASDs, *Op cit.*
- ³⁰ Myers, *Op cit.*
- ³¹ Massachusetts Center for Health Information and Analysis. Review and Evaluation of Proposed Legislation Entitled: An Act Relative to Insurance Coverage for Autism, House Bill 3809, March 2010, Accessed 7/29/2011, http://www.mass.gov/Eeohhs2/docs/dhcfp/r/pubs/10/mb_autism.pdf
- ³² Studies cited in the 2010 autism mandate report of the Massachusetts Center for Health Information and Analysis:
- Beaulieu, "Interventions for Autism Spectrum Disorders; State of the Evidence," Report of the Children's Services Evidence-Based Practice Advisory Committee, Maine Department of Health and Human Services and Department of Education, 2009.
- Eldevik and colleagues, "Meta-Analysis of Early Intensive Behavioral Intervention for Children with Autism" (Journal of Clinical Child and Adolescent Psychology, 2009).
- Granpeesheh and colleagues, "Applied behavior analytic interventions for children with autism: a description and review of treatment research" (Annals of Clinical Psychiatry, 2009).
- Myers and Johnson, "Management of Children with Autism Spectrum Disorders" (Pediatrics Clinical Report, 2007).
- National Autism Center, "National Standards Project Findings and Conclusions; Addressing the Need for Evidence-Based Practice Guidelines for Autism Spectrum Disorders," 2009.
- Ospina and colleagues, "Behavioural and developmental interventions for autism spectrum disorder: a clinical systematic review" (Public Library of Science One, 2008).
- Rothenberg and colleagues, "Early Intensive Behavioral Intervention Based on Applied Behavior Analysis among Children with Autism Spectrum Disorders" (Assessment Program Technology Evaluation Center of Blue Cross Blue Shield Association, 2009).
- ³³ Massachusetts Center for Health Information and Analysis. Review and Evaluation of Proposed Legislation Entitled: An Act Relative to Insurance Coverage for Autism, House Bill 3809, March 2010, Accessed 7/29/2011, http://www.mass.gov/Eeohhs2/docs/dhcfp/r/pubs/10/mb_autism.pdf
- ³⁴ CDC ASDs, *Op cit.*
- ³⁵ Myers, *Op cit.*
- ³⁶ CDC ASDs, *Op cit.*
- ³⁷ Myers, *Op cit.*
- ³⁸ CDC ASDs, *Op cit.*
- ³⁹ Myers, *Op cit.*
- ⁴⁰ Input obtained from carriers, discussed in: Actuarial assessment of House Bill 3809: An act relative to insurance coverage for autism. Compass Health Analytics, Inc. 2010 March 1.
- ⁴¹ Compass assessment of HB 3809, *op. cit.*
- ⁴² National Center for Complementary and Alternative Medicine, National Institutes of Health. Chiropractic: An Introduction. NCCAM Publication No. D403. Accessed 6/17/2011; created November 2007; updated October 2010: <http://nccam.nih.gov/health/chiropractic/introduction.htm>.
- ⁴³ Meeker WC, Haldeman S. Chiropractic: a profession at the crossroads of mainstream and alternative medicine. *Ann Intern Med.* 2002 Feb 5;136(3):216-27. Accessed 6/17/2011: <http://www.ncbi.nlm.nih.gov/pubmed/11827498>
- ⁴⁴ Chou R, Qaseem A, Snow V, Casey D, Cross JT, Shekelle P, et al. Diagnosis and Treatment of Low Back Pain: A Joint Clinical Practice Guideline from the American College of Physicians and the American Pain Society. *Ann Intern Med.* 2007 Oct 2;147(7):478-91. Accessed 6/17/2011: <http://www.annals.org/content/147/7/478.full>
- ⁴⁵ Meeker, *Op cit.*
- ⁴⁶ Giles LGF, Müller R. Chronic spinal pain syndromes: a clinical pilot trial comparing acupuncture, a nonsteroidal anti-inflammatory drug, and spinal manipulation. *J Manipulative Physiol Ther.* 1999 Jul-Aug;22(6):376-81. Accessed 6/17/2011: <http://www.ncbi.nlm.nih.gov/pubmed/10478769>
- ⁴⁷ Chou R, Huffman LH. Nonpharmacologic Therapies for Acute and Chronic Low Back Pain: A Review of the Evidence for an American Pain Society/American College of Physicians Clinical Practice Guideline. *Ann Intern Med.* 2007 Oct 2;147(7):492-504. Accessed 6/17/2011: <http://www.annals.org/content/147/7/492.full>

-
- ⁴⁸ Shekelle PG, Adams AH, Chassin MR, Hurwitz EL, Brook RH. Spinal manipulation for low back pain. *Ann Intern Med.* 1992 Oct 1;117:590–8. Accessed 6/17/2011: <http://www.annals.org/content/117/7/590.short>
- ⁴⁹ Skargren EI, Oberg BE, Carlsson PG, Gade M. Cost and effectiveness analysis of chiropractic and physiotherapy treatment for low back and neck pain—six-month follow-up. *Spine.* 1997 Sep 15;22:2167–77. Accessed 6/17/2011: <http://www.ncbi.nlm.nih.gov/pubmed/9322328>
- ⁵⁰ Ernst E. Chiropractic Care: Attempting a Risk-Benefit Analysis. *Am J Public Health.* 2002 Oct;92(10): 1603–4. Accessed 6/17/2011: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447290/>
- ⁵¹ Bronfort G, Haas M, Evans R, Leininger B, Triano J. Effectiveness of manual therapies: the UK evidence report. *Chiropr Osteopat.* 2010 Feb 25;18:3. Accessed 6/17/2011: <http://www.ncbi.nlm.nih.gov/pubmed/20184717>
- ⁵² Ernst E. Prospective investigations into the safety of spinal manipulation. *J Pain Symptom Manage.* 2001 Mar;21:238–242. Accessed 6/17/2011: <http://www.ncbi.nlm.nih.gov/pubmed/11239743>
- ⁵³ National Center for Complementary and Alternative Medicine, *Op Cit.*
- ⁵⁴ Ernst 2002, *Op cit.*
- ⁵⁵ Haldeman S, Kohlbeck FJ, McGregor M. Unpredictability of cerebrovascular ischemia associated with cervical spine manipulation. *Spine.* 2002 Jan 1;27:49–55. Accessed 6/17/2011: <http://www.ncbi.nlm.nih.gov/pubmed/11805635>
- ⁵⁶ Stevinson C, Honan W, Cooke B, Ernst E. Neurological complications of cervical spine manipulation. *J R Soc Med.* 2001 Mar;94:107–110. Accessed 6/15/2011: <http://www.ncbi.nlm.nih.gov/pubmed/11285788>
- ⁵⁷ Guttmacher Institute. In Brief: Facts Sheet; Facts on Contraceptive Use in the United States, June 2010. Accessed 6/28/2011: http://www.guttmacher.org/pubs/fb_contr_use.html
- ⁵⁸ Healthy People 2020. 2020 Topics & Objectives: Family Planning. Washington DC. U.S. Department of Health & Human Services. November 2010. Accessed 6/28/2011: <http://healthypeople.gov/2020/topicsobjectives2020/overview.aspx?topicid=13>
- ⁵⁹ *Ibid.*
- ⁶⁰ Finer LB and Kost K, Unintended pregnancy rates at the state level, *Perspectives on Sexual and Reproductive Health*, 2011, 43(2):78–87. Accessed 6/28/2011: <http://onlinelibrary.wiley.com/doi/10.1363/4307811/full>.
- ⁶¹ Healthy People 2020, *Op cit.*
- ⁶² *Ibid.*
- ⁶³ *Ibid.*
- ⁶⁴ Burkman RT, Sonnenberg FA. Health Economics of Contraception. *Obstet Gynecol Clin North Am.* 2000 Dec;27(4):917-31. Accessed 6/28/2011: <http://www.sciencedirect.com/science/article/pii/S0889854505701777> (doi:10.1016/S0889-8545(05)70177-7).
- ⁶⁵ *Ibid.*
- ⁶⁶ Guttmacher Institute, State Facts, *Op cit.*
- ⁶⁷ Guttmacher Institute. In Brief: Facts Sheet; Facts on Contraceptive Use in the United States, June 2010. Accessed 6/28/2011: http://www.guttmacher.org/pubs/fb_contr_use.html
- ⁶⁸ *Ibid.*
- ⁶⁹ Planned Parenthood. Comparing effectiveness of birth control methods, Adapted from the World Health Organization, 2007. Accessed 6/28/2011: <http://www.plannedparenthood.org/health-topics/birth-control/birth-control-effectiveness-chart-22710.htm>
- ⁷⁰ Sonnenberg FA, Burkman RT, Hagerty CG, Speroff L, Speroff T. Costs and net health effects of contraceptive methods. *Contraception.* 2004 Jun;69(6):447-59. Accessed 6/28/2011: [http://www.contraceptionjournal.org/article/S0010-7824\(04\)00102-7/abstract](http://www.contraceptionjournal.org/article/S0010-7824(04)00102-7/abstract)
- ⁷¹ Centers for Disease Control and Prevention (CDC). National diabetes fact sheet: national estimates and general information on diabetes and prediabetes in the United States, 2011. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2011. Accessed 7/1/2011: http://www.cdc.gov/diabetes/pubs/pdf/ndfs_2011.pdf. In conjunction with: Agency for Healthcare Research and Quality, American Association of Diabetes Educators, American Diabetes Association, Centers for Medicare & Medicaid Services, U.S. Department of Veterans Affairs, U.S. Food and Drug Administration, Health Resources and Services Administration, Indian Health Service, Juvenile Diabetes Research Foundation International, National Diabetes Education Program, National Diabetes Information Clearinghouse, National Institute of Diabetes and
-

Digestive and Kidney Diseases of the National Institutes of Health, U.S. Department of Health and Human Services, Office of Minority Health

⁷² *Ibid.*

⁷³ Healthy People 2020: Topics & Objectives: Diabetes Overview. Accessed 7/1/2011:
<http://www.healthypeople.gov/2020/topicsobjectives2020/overview.aspx?topicid=8>

⁷⁴ *Ibid.*

⁷⁵ CDC, *Op cit.*

⁷⁶ Healthy People 2020, *Op cit.*

⁷⁷ Holman RR, Paul SK, Bethel MA, Matthews DR, Neil HA. 10-year follow-up of intensive glucose control in type 2 diabetes. *N Engl J Med.* 2008 Oct 9;359(15):1577-89. Accessed 7/1/2011:
<http://www.nejm.org/doi/full/10.1056/NEJMoa0806470#t=articleBackground>

⁷⁸ Rahilly-Tierney CR, Lawler EV, Scranton RE, Michael Gaziano J. Low-density lipoprotein reduction and magnitude of cardiovascular risk reduction. *Prev Cardiol.* 2009 Spring;12(2):80-7.
Accessed 7/1/2011: <http://onlinelibrary.wiley.com/doi/10.1111/j.1751-7141.2008.00018.x/full>

⁷⁹ Petty BG. The Place for ACE Inhibitors. *J Gen Intern Med.* 2004 June;19(6): 710–711. Accessed 7/1/2011:
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1492388/> (doi: 10.1111/j.1525-1497.2004.40402.x.)

⁸⁰ Katz PP, Wirthlin MR Jr, Szpunar SM, Selby JV, Sepe SJ, Showstack JA. Epidemiology and prevention of periodontal disease in individuals with diabetes. *Diabetes Care.* 1991 May;14(5):375-85. Accessed 7/2/2011:
<http://care.diabetesjournals.org/content/14/5/375.short> (doi: 10.2337/diacare.14.5.375).

⁸¹ Patout CA Jr, Birke JA, Horswell R, Williams D, Cerise FP. Effectiveness of a comprehensive diabetes lower-extremity amputation prevention program in a predominantly low-income African-American population. *Diabetes Care.* 2000 Sep;23(9):1339-42. Accessed 7/1/2011:
<http://care.diabetesjournals.org/content/23/9/1339.full.pdf+html> (doi:10.2337/diacare.23.9.1339)

⁸² Dodson PM. Diabetic retinopathy: treatment and prevention. *Diabetes Vasc Dis Res* 2007 Sep;4(suppl 3):S9–S11. Accessed 7/1/2011: http://www.dvdres.com/content/4/3_suppl/S9.full.pdf (doi:10.3132/dvdr.2007.051).

⁸³ CDC, *Op cit.*

⁸⁴ Center on the Developing Child at Harvard University (2008). In Brief: The science of early childhood development. Accessed 7/1/2011: http://developingchild.harvard.edu/download_file/-/view/64/

⁸⁵ Ramey CT, Ramey SL. Early intervention and early experience. *Am Psychol.* 1998 Feb;53(2):109-20. Accessed 7/1/2011: <http://jpkc.ecnu.edu.cn/fzlx/kewai/Early%20Intervention%20and%20Early%20Experience.pdf>

⁸⁶ Guralnick M. Effectiveness of early intervention for vulnerable children: a developmental perspective. *Am J Ment Retard.* 1998 Jan;102(4):319-45. Accessed 7/1/2011:
http://depts.washington.edu/chdd/guralnick/pdfs/effect_EI_AJMR_vol102_98.pdf

⁸⁷ NICHCY. Overview of Early Intervention. National Dissemination Center for Children with Disabilities. September 2010. Accessed 7/1/2011: <http://nichcy.org/babies/overview>

⁸⁸ Bailey DB, Hebbeler K, Spiker D, Scarborough A, Mallik S, Nelson L. Thirty-six-month outcomes for families of children who have disabilities and participated in early intervention. *Pediatrics.* 2005 Dec 1;116(6):1346-52. Accessed 7/1/2011: <http://pediatrics.aappublications.org/content/116/6/1346.full> (doi: 10.1542/peds.2004-1239).

⁸⁹ Anderson LM, Shinn C, Fullilove MT, Scrimshaw SC, Fielding JE, Normand J, et al. The effectiveness of early childhood development programs. A systematic review. *Am J Prev Med.* 2003 Apr;24(3)(suppl):32-46. Accessed 7/1/2011: [http://www.ajpmonline.org/article/S0749-3797\(02\)00655-4/abstract](http://www.ajpmonline.org/article/S0749-3797(02)00655-4/abstract).

⁹⁰ Ramey, *Op cit.*

⁹¹ NECTAC. The Importance of Early Intervention for Infants and Toddlers with Disabilities and Their Families. National Early Childhood Technical Assistance Center, Washington DC. April 2011. Accessed 7/1/2011:
http://www.nectac.org/~pdfs/pubs/eifactsheet_2pg.pdf

⁹² Ramey, *Op cit.*

⁹³ Visiting Nurses Associations of America, Home Health Care. Accessed 7/3/2011:
<http://vnaa.org/vnaa/g/?h=html/homehealthcareoverview.html>

⁹⁴ U.S. Department of Health and Human Services, Eldercare Locator, Home Health Care. Accessed 7/3/2011:
http://www.eldercare.gov/ELDERCARE.NET/Public/Resources/Factsheets/Home_Health_Care.aspx

⁹⁵ Montauk SL. Home health care. *Am Fam Physician.* 1998 Nov 1;58(7):1608-14. Accessed 7/3/2011:
<http://www.aafp.org/afp/981101ap/montauk.html>

-
- ⁹⁶ Visiting Nurses Associations of America, Home Health Care Services. Accessed 7/3/2011: <http://vnaa.org/vnaa/g/?h=html/homehealthcareservices.html>
- ⁹⁷ Elkan R, Kendrick D, Dewey M, Hewitt M, Robinson J, Blair M, et al. Effectiveness of home based support for older people: systematic review and meta-analysis. *BMJ*. 2001 Sep 29;323(7315):719-25. Accessed 7/3/2011: <http://www.bmj.com/content/323/7315/719.full>
- ⁹⁸ Hyde CJ, Robert IE, Sinclair AJ. The effects of supporting discharge from hospital to home in older people. *Age Ageing*. 2000 May;29(3):271-9. Accessed 7/3/2011: <http://ageing.oxfordjournals.org/content/29/3/271.full.pdf+html> (doi: 10.1093/ageing/29.3.271)
- ⁹⁹ Mann WC, Ottenbacher KJ, Fraas L, Tomita M, Granger CV. Effectiveness of assistive technology and environmental interventions in maintaining independence and reducing home care costs for the frail elderly. A randomized controlled trial. *Arch Fam Med*. 1999 May-Jun;8(3):210-7. Accessed 7/3/2011: http://www.orcotech.org/papers/home_monitoring/99_Mann_effectiveness_of_environmental_interventions.pdf
- ¹⁰⁰ Zimmer JG, Groth-Juncker A, McCusker J. A randomized controlled study of a home health care team. *Am J Public Health*. 1985 Feb;75(2):134-41. Accessed 7/3/2011: <http://ajph.aphapublications.org/cgi/reprint/75/2/134>
- ¹⁰¹ Hughes SL, Weaver FM, Giobbie-Hurder A, Manheim L, Henderson W, Kubal JD, et al. Effectiveness of team-managed home-based primary care: a randomized multicenter trial. *JAMA*. 2000 Dec 13;284(22):2877-85. Accessed 7/3/2011: <http://jama.ama-assn.org/content/284/22/2877.full> (doi: 10.1001/jama.284.22.2877).
- ¹⁰² POSITION STATEMENT: Estrogen and progestogen use in postmenopausal women: 2010 position statement of The North American Menopause Society. *Menopause*. 17(2):242-55. Accessed 6/29/2011: <http://www.menopause.org/PSht10.pdf> (doi:10.1097/gme.0b013e3181d0f6b9)
- ¹⁰³ NIH NHLBI. Women's Health Initiative Background and Overview. U.S. Department of Health and Human Services, National Institutes of Health, National Heart, Lung and Blood Institute. Washington DC. Accessed 6/30/2011: <http://www.nhlbi.nih.gov/whi/factsht.htm>
- ¹⁰⁴ U.S. Preventive Services Task Force. Postmenopausal hormone replacement therapy to prevent chronic conditions: recommendations and rationale. *Ann Intern Med*. 2002 Nov 19;137(10):1-48. Accessed 6/30/2011: <http://www.uspreventiveservicestaskforce.org/uspstf/uspspmho.htm>
- ¹⁰⁵ *Ibid.*
- ¹⁰⁶ American College of Obstetricians and Gynecologists. Women's Health: Hormone Therapy. December 2007. Accessed 6/29/2011: http://www.acog.org/publications/patient_education/bp066.cfm
- ¹⁰⁷ Hersh AL, Stefanick ML, Stafford RS. National Use of Postmenopausal Hormone Therapy: Annual Trends and Response to Recent Evidence. *JAMA*. 2004 Jan 7;291(1):47-53. Accessed 6/29/2011: (doi: 10.1001/jama.291.1.47).
- ¹⁰⁸ Power ML, Schulkin J, Rossouw JE. Evolving practice patterns and attitudes toward hormone therapy of obstetrician-gynecologists. *Menopause*. 2007 Jan-Feb;14(1):20-8. Accessed 6/29/2011: http://journals.lww.com/menopausejournal/Abstract/2007/14010/Evolving_practice_patterns_and_attitudes_to_ward.7.aspx (doi:10.1097/01.gme.0000229571.44505.cb).
- ¹⁰⁹ Power ML, Anderson BL, Schulkin, J. Attitudes of obstetrician-gynecologists toward the evidence from the Women's Health Initiative hormone therapy trials remain generally skeptical. *Menopause*. 2009 May-Jun;16(3):500-8. Accessed 6/29/2011: (doi: 10.1097/gme.0b013e31818fc36e).
- ¹¹⁰ Statement of The American College of Obstetricians and Gynecologists on Hormone Therapy for the Prevention and Treatment of Postmenopausal Osteoporosis for the FDA Endocrinologic and Metabolic Drugs Advisory Committee. Press Release: October 7, 2003. Accessed 6/29/2011: http://www.acog.org/from_home/publications/press_releases/nr10-07-03.cfm
- ¹¹¹ ACOG Issues State-of-the-Art Guide to Hormone Therapy. Press Release: September 30, 2004. Accessed 6/29/2011: http://www.acog.org/from_home/publications/press_releases/nr09-30-04-2.cfm ACOG Issues State-of-the-Art Guide to Hormone Therapy. Press Release: September 30, 2004. Accessed 6/29/2011: http://www.acog.org/from_home/publications/press_releases/nr09-30-04-2.cfm
- ¹¹² NAMS, *Op cit.*
- ¹¹³ *Ibid.*
- ¹¹⁴ Mosca L, Appel LJ, Benjamin EJ, Berra K, Chandra-Strobos N, Fabunmi RP, et al. Evidence-Based Guidelines for Cardiovascular Disease Prevention in Women. *Circulation*. 2004;109:672-93. Accessed 6/29/2011: <http://circ.ahajournals.org/cgi/content/full/109/5/672> (doi: 10.1161/01.CIR.0000114834.85476.81).
-

-
- ¹¹⁵ National Marrow Donor Program (NMDP). Learning More About Your Disease. Accessed 6/29/2011: http://www.marrow.org/PATIENT/Undrstnd_Disease_Treat/Lrn_about_Disease/index.html
- ¹¹⁶ National Marrow Donor Program. Learning about Bone Marrow or Cord Blood Transplants. Accessed 6/29/2011: http://www.marrow.org/PATIENT/Undrstnd_Disease_Treat/Undrstnd_Treat_Opt/Lrn_BMT_Cord/index.html
- ¹¹⁷ Karanes C, Nelson GO, Chitphakdithai P, Agura E, Ballen KK, Bolan CD, et al. Twenty Years of Unrelated Donor Hematopoietic Cell Transplantation for Adult Recipients Facilitated by the National Marrow Donor Program. *Biol Blood Marrow Transplant*. 2008 Sep;14(9):8-15. Accessed 6/29/2011: [http://www.bbmt.org/article/S1083-8791\(08\)00249-8/fulltext](http://www.bbmt.org/article/S1083-8791(08)00249-8/fulltext)
- ¹¹⁸ Flomenberg N, Baxter-Lowe LA, Confer D, Fernandez-Vina M, Filipovich A, Horowitz M, et al. Impact of HLA class I and class II high-resolution matching on outcomes of unrelated donor bone marrow transplantation: HLA-C mismatching is associated with a strong adverse effect on transplantation outcome. *Blood*. 2004 Oct 1;104(7):1923-30. Accessed 6/29/2011: <http://www.bloodjournal.org/cgi/content/full/104/7/1923> (doi:10.1182/blood-2004-03-0803).
- ¹¹⁹ National Marrow Donor Program. HLA Matching: Finding the Best Donor or Cord Blood Unit. Accessed 6/29/2011: http://www.marrow.org/PATIENT/Donor_Select_Tx_Process/The_Search_Process/HLA_Matching_Finding_the_Best/index.html
- ¹²⁰ Bray RA, Hurley CK, Kamani NR, et al. National Marrow Donor Program HLA matching guidelines for unrelated adult donor hematopoietic cell transplants. *Biol Blood Marrow Transplant*. 2008; 14(9, Suppl. 3):45-53. [http://www.bbmt.org/article/S1083-8791\(08\)00274-7/fulltext](http://www.bbmt.org/article/S1083-8791(08)00274-7/fulltext)
- ¹²¹ Tiercy JM, Bujan-Lose M, Chapuis B, Gratwohl A, Gmür J, Seger R, et al. Bone marrow transplantation with unrelated donors: what is the probability of identifying an HLA-A/B/Cw/DRB1/B3/B5/DQB1-matched donor? *Bone Marrow Transplant*. 2000 Aug;26(4):437-41. Accessed 6/29/2011: <http://www.nature.com/bmt/journal/v26/n4/full/1702529a.html>
- ¹²² Bray, *Op cit*.
- ¹²³ National Marrow Donor Program. HLA Matching for Hematopoietic Cell Transplantation. Accessed 6/29/2011: http://www.marrow.org/PHYSICIAN/URD_Search_and_Tx/HLA_Matching_for_HTC/index.html
- ¹²⁴ NMDP, HLA Matching, *Op cit*.
- ¹²⁵ Bray, *Op cit*.
- ¹²⁶ Flomenberg, *Op cit*.
- ¹²⁷ NMDP, HLA Matching for Hematopoietic Cell Transplantation, *Op cit*.
- ¹²⁸ Cox D, Stone J. Managing self-injection difficulties in patients with relapsing-remitting multiple sclerosis. *J Neurosci Nurs*. 2006 Jun;38(3):167-71. Accessed 7/8/2011: <http://www.medscape.com/viewarticle/548016>
- ¹²⁹ Greco E, Polonio-Balbi P, Ferrero S, Baroni E, Ubaldi F, Rienzi L, et al. Use of a fully automated injector for self-administration of follitropin alpha in an IVF/ICSI programme. *Reprod Biomed Online*. 2005 Oct;11(4):415-20. Accessed 7/8/2011: [http://www.rbmojournal.com/article/S1472-6483\(10\)61132-7/abstract](http://www.rbmojournal.com/article/S1472-6483(10)61132-7/abstract)
- ¹³⁰ Butler CC, Vidal-Alaball J, Cannings-John R, McCaddon A, Hood K, Papaioannou A, et al. Oral vitamin B12 versus intramuscular vitamin B12 for vitamin B12 deficiency: a systematic review of randomized controlled trials. *Fam Pract*. 2006 Jun;23(3):279-85. Accessed 7/8/2011: <http://fampra.oxfordjournals.org/content/23/3/279.short>
- ¹³¹ Information Center for Sickle Cell and Thalassemic Disorders. Iron deficiency: Parenteral iron replacement. Revised 5/15/2003; Accessed 7/8/2011: <http://sickle.bwh.harvard.edu/fe-def.html>
- ¹³² Dalmau J, Pimentel CL, Puig L, Peramiquel L, Roé E, Alomar A. Cutaneous necrosis after injection of polyethylene glycol-modified interferon alfa. *J Am Acad Dermatol*. 2005 Jul;53(1):62-6. Accessed 7/8/2011: [http://www.eblue.org/article/S0190-9622\(05\)00698-5/abstract](http://www.eblue.org/article/S0190-9622(05)00698-5/abstract)
- ¹³³ Cohen C, Hellinger J, Johnson M, Staszewski S, Wintfeld N, Patel K, Green J. Patient acceptance of self-injected enfuvirtide at 8 and 24 weeks. *HIV Clin Trials*. 2003 Sep-Oct;4(5):347-57. Accessed 7/8/2011: <http://thomasland.metapress.com/content/1w4ar6mn99q41gnm/>
- ¹³⁴ Silverstein SB, Rodgers GM. Parenteral iron therapy options. *Am J Hematol*. 2004 May;76(1):74-8. Accessed 7/8/2011: <http://www.ncbi.nlm.nih.gov/pubmed/15114602>
- ¹³⁵ Verma RK, Garg S. Current Status of Drug Delivery Technologies and Future Directions. *Pharmaceutical Technology On-Line*. 2001;25(2):1-14. Accessed 7/8/2011: <http://www.pharmanet.com.br/pdf/drugdelivery.pdf>
-

- ¹³⁶ Mohr DC, Boudewyn AC, Likosky W, Levine E, Goodkin DE. Injectable medication for the treatment of multiple sclerosis: the influence of self-efficacy expectations and injection anxiety on adherence and ability to self-inject. *Ann Behav Med*. 2001 Spring;23(2):125-32. Accessed 7/8/2011: <http://www.springerlink.com/content/977r33n54753031w/>
- ¹³⁷ National Institute of Child Health and Human Development (NICHD). Infertility/Fertility. Accessed 7/2/2011: http://www.nichd.nih.gov/health/topics/infertility_fertility.cfm
- ¹³⁸ Devroey P, Fauser BC, Diedrich K; Evian Annual Reproduction (EVAR) Workshop Group 2008. Approaches to improve the diagnosis and management of infertility. *Hum Reprod Update*. 2009 Jul-Aug;15(4):391-408. Accessed 7/2/2011: <http://humupd.oxfordjournals.org/content/15/4/391.full> (doi: 10.1093/humupd/dmp012)
- ¹³⁹ National Institutes of Health (NIH) Medline Plus: Infertility. Accessed 7/2/2011: <http://www.nlm.nih.gov/medlineplus/infertility.html>
- ¹⁴⁰ NICHD, *Op cit*.
- ¹⁴¹ *Ibid*.
- ¹⁴² Hrometz SL, Gates VA. Review of available infertility treatments. *Drugs Today (Barc)*. 2009 Apr;45(4):275-91. Accessed 7/2/2011: http://journals.prous.com/journals/servlet/xmlsl/pk_journals.xml_summaryn_pr?p_JournalId=4&p_RefId=1360985 (doi: 10.1358/dot.2009.45.4.1360985)
- ¹⁴³ *Ibid*.
- ¹⁴⁴ NICHD, *Op cit*.
- ¹⁴⁵ Hull MG. Infertility treatment: relative effectiveness of conventional and assisted conception methods. *Hum Reprod*. 1992 Jul;7(6):785-96. Accessed 7/2/2011: <http://humrep.oxfordjournals.org/content/7/6/785.short>
- ¹⁴⁶ Griesinger G, Dafopoulos K, Schultze-Mosgau A, Felberbaum R, Diedrich K. What is the most relevant standard of success in assisted reproduction? Is BESST (birth emphasizing a successful singleton at term) truly the best? *Hum Reprod*. 2004 Jun;19(6):1239-41. Accessed 7/3/2011: http://humrep.oxfordjournals.org/content/19/6/1239.abstract?ijkey=248cf7a906c4b82d2e0aeb1e9479b49874956378&keytype2=tf_ipsecsha
- ¹⁴⁷ Devroey, *Op cit*.
- ¹⁴⁸ Balasch J. Investigation of the infertile couple: investigation of the infertile couple in the era of assisted reproductive technology: a time for reappraisal. *Hum Reprod* 2000 Nov;15(11):2251-7. Accessed 7/3/2011: <http://humrep.oxfordjournals.org/content/15/11/2251.full> (doi: 10.1093/humrep/15.11.2251)
- ¹⁴⁹ Collins JA, Van Steirteghem A. Overall prognosis with current treatment of infertility. *Hum Reprod Update*. 2004 Jul-Aug;10(4):309-16. Accessed 7/3/2011: <http://humupd.oxfordjournals.org/content/10/4/309.full.pdf> (doi:10.1093/humupd/dmh029)
- ¹⁵⁰ Devroey, *Op cit*.
- ¹⁵¹ Van Voorhis BJ. Outcomes from assisted reproductive technology. *Obstet Gynecol*. 2006 Jan;107(1):183-200. Accessed 7/3/2011: http://journals.lww.com/greenjournal/Abstract/2006/01000/Outcomes_From_Assisted_Reproductive_Technology.31.aspx (doi: 10.1097/01.AOG.0000194207.06554.5b)
- ¹⁵² Reddy UM, Wapner RJ, Rebar RW, Tasca RJ. Infertility, assisted reproductive technology, and adverse pregnancy outcomes: executive summary of a National Institute of Child Health and Human Development workshop. *Obstet Gynecol*. 2007 Apr;109(4):967-77. Accessed 7/3/2011: http://journals.lww.com/greenjournal/Abstract/2007/04000/Infertility,_Assisted_Reproductive_Technology,_and.26.aspx
- ¹⁵³ *Ibid*.
- ¹⁵⁴ Van Voorhis, *Op cit*.
- ¹⁵⁵ Reddy, *Op cit*.
- ¹⁵⁶ Van Voorhis, *Op cit*.
- ¹⁵⁷ Devroey, *Op cit*.
- ¹⁵⁸ *Ibid*.
- ¹⁵⁹ Matalon KM, Acosta PB, Azen, C. Role of Nutrition in Pregnancy with Phenylketonuria and Birth Defects. *PEDIATRICS*. 2003 Dec 1; 112(Supplement 4):1534 -1536. Accessed 6/9/2011: http://pediatrics.aappublications.org/content/112/Supplement_4/1534.full

-
- ¹⁶⁰ NIH Consensus Statement. Phenylketonuria: Screening and Management. 2000 October 16-18; 17(3): 1-27. Accessed 6/9/2011: <http://consensus.nih.gov/2000/2000phenylketonuria113html.htm>
- ¹⁶¹ VanZutphen KH, Packman W, Sporri L, Needham MC, Morgan C, Weisiger K, Packman S, et al. Executive functioning in children and adolescents with phenylketonuria. *Clin Genet*. 2007; 72: 13–18. Accessed 6/9/2011: http://pkuworld.org/home/docs/literature/vanzutphen_2007_cg.pdf (doi: 10.1111/j.1399-0004.2007.00816.x).
- ¹⁶² Saal, HM, Braddock SR, Bull MB, Enns G, Gruen JR, Mendelsohn NJ, et al. POLICY STATEMENT: Maternal Phenylketonuria, Committee on Genetics. *PEDIATRICS*. 2008 Aug; 122(2):445-449 Accessed 6/9/2011: <http://aappolicy.aappublications.org/cgi/content/full/pediatrics;122/2/445> (doi:10.1542/peds.2008-1485).
- ¹⁶³ van Spronsen, FJ, Enns, GM. Future treatment strategies in phenylketonuria. *Mol Genet Metab*. 2010; 99(Supplement 1):S90-S95, Phenylketonuria, Psychology and the Brain. Accessed 6/9/11: <http://www.sciencedirect.com/science/article/pii/S1096719209002923> (doi: 10.1111/j.1399-0004.2007.00816.x).
- ¹⁶⁴ NIH Consensus Statement, *Op cit*.
- ¹⁶⁵ Saal, *Op cit*.
- ¹⁶⁶ NIH Consensus Statement, *Op cit*.
- ¹⁶⁷ Healthy People 2020, *Op cit*.
- ¹⁶⁸ *Ibid*.
- ¹⁶⁹ Healthy People 2020. Topics & Objectives: Mental Health & Mental Disorders. Accessed 7/4/2011: <http://www.healthypeople.gov/2020/topicsobjectives2020/overview.aspx?topicid=28>
- ¹⁷⁰ Satcher DS. Mental Health: A Report of the Surgeon General. Office of the Surgeon General, Center for Mental Health Services, National Institute of Mental Health (US). Rockville (MD): Substance Abuse and Mental Health Services Administration (US); 1999. Accessed 7/4/2011: <http://www.surgeongeneral.gov/library/mentalhealth/home.html>
- ¹⁷¹ Kessler RC, Chiu W, Demler O, Walters EE. Prevalence, severity, and comorbidity of twelve-month DSM-IV disorders in the National Comorbidity Survey Replication. *Arch Gen Psychiatry*. 2005 Jun;62(6):617-27. Accessed 7/4/2011: <http://archpsyc.ama-assn.org/cgi/reprint/62/6/617.pdf>
- ¹⁷² *Ibid*.
- ¹⁷³ Healthy People 2020, *Op cit*.
- ¹⁷⁴ Kessler, *Op cit*.
- ¹⁷⁵ National Institutes of Health, National Institute of Mental Health (NIMH). Use of Mental Health Services and Treatment Among Adults. Accessed 7/4/2011: http://www.nimh.nih.gov/statistics/3USE_MT_ADULT.shtml
- ¹⁷⁶ *Ibid*.
- ¹⁷⁷ National Institutes of Health, National Institute of Mental Health (NIMH). Use of Mental Health Services and Treatment Among Children. Accessed 7/4/2011: <http://www.nimh.nih.gov/statistics/1NHANES.shtml>
- ¹⁷⁸ Kessler, *Op cit*.
- ¹⁷⁹ Satcher DS. Executive summary: a report of the Surgeon General on mental health. *Public Health Rep*. 2000 Jan-Feb;115(1):89-101. Accessed 7/4/2011: <http://psycnet.apa.org/journals/pro/31/1/5/> (doi: 10.1037/0735-7028.31.1.5)
- ¹⁸⁰ Satcher DS. Mental Health: A Report of the Surgeon General, *Op cit*.
- ¹⁸¹ *Ibid*.
- ¹⁸² U.S. Preventive Services Task Force (USPSTF). Screening for depression in adults: U.S. preventive services task force recommendation statement. *Ann Intern Med*. 2009 Dec 1;151(11):784-92. Accessed 7/4/2011: <http://www.uspreventiveservicestaskforce.org/uspstf09/adultdepression/addeprss.htm>
- ¹⁸³ US Preventive Services Task Force. Screening and treatment for major depressive disorder in children and adolescents: US Preventive Services Task Force Recommendation Statement. *Pediatrics*. 2009 Apr;123(4):1223-8. Accessed 7/4/2011: <http://www.uspreventiveservicestaskforce.org/uspstf09/depression/chdeprss.htm>
- ¹⁸⁴ Lacy BE, Loew B. Diagnosis, Treatment and Nutritional Management of Chronic Intestinal Pseudo-Obstruction: Nutrition Issues in Gastroenterology, Series #77. *Pract Gastroenterol*. 2009 Aug; 33(8):9-24. Accessed 6/13/2011: <http://www.practicalgastro.com/pdf/August09/LacyArticleAug09.pdf>.
- ¹⁸⁵ Cawsey SI, Soo J, Gramlich LM. Home Enteral Nutrition: Outcomes Relative to Indication. *Nutr Clin Pract*. 2010 Jun 25;25(3):296-300. Accessed 6/13/2011: <http://ncp.sagepub.com/content/25/3/296.short> (doi: 10.1177/0884533610368702).
-

-
- ¹⁸⁶ Koretz RL, Avenell A, Lipman TO, Braunschweig CL, Milne AC. Does Enteral Nutrition Affect Clinical Outcome? A Systematic Review of the Randomized Trials. *Am J Gastroenterol*. 2007 Feb;102(2):412-29. Accessed 6/13/2011: <http://aura.abdn.ac.uk/bitstream/2164/149/1/Koretz%202007.pdf> (doi: doi:10.1111/j.1572-0241.2006.01024.x)
- ¹⁸⁷ Koretz RL. Enteral Nutrition: A Hard Look at Some Soft Evidence. *Nutr Clin Pract*. 2009 Jun-Jul; 24(3):316-324. Accessed 6/13/2011: <http://ncp.sagepub.com/content/24/3/316.short> (doi: 10.1177/0884533609335378).
- ¹⁸⁸ Stratton RJ, Elia M. Who benefits from nutritional support: what is the evidence? *Eur J Gastroenterol Hepatol*. 2007 May;19(5):353-8. Accessed 6/13/2011: http://journals.lww.com/eurojgh/Abstract/2007/05000/Who_benefits_from_nutritional_support_what_is_the.2.aspx (doi: 10.1097/MEG.0b013e32801055c0).
- ¹⁸⁹ American Gastroenterological Association Medical Position Statement: Guidelines for the Use of Enteral Nutrition. *Gastroenterology*. 1995 Apr;108(4):1280-1. Accessed 6/13/2011: download.journals.elsevierhealth.com/pdfs/journals/0016-5085/PII0016508595902309.pdf
- ¹⁹⁰ *Ibid.*
- ¹⁹¹ NLLIC and the Limb Loss Research and Statistics Program (LLR&SP). Limb Loss in the United States. Revised 2007; Accessed 7/5/2011: http://www.amputee-coalition.org/fact_sheets/limbloss_us.html
- ¹⁹² Milani J. Chapter 6: Prosthetics clinical issues in Traumatic Amputation and Prosthetics. Department of Veterans Affairs (VA), Veterans Health Initiative, Washington DC. May 2002. Accessed 7/5/2011: http://www.publichealth.va.gov/docs/vhi/traumatic_amputation.pdf
- ¹⁹³ Rate between 1988-96. National Limb Loss Information Center (NLLIC). Fact Sheet. Revised 2008; Accessed 7/5/2011: http://www.amputee-coalition.org/fact_sheets/amp_stats_cause.html
- ¹⁹⁴ Number of Operation Enduring Freedom/Operation Iraqi Freedom Amputees (as of 05/02/11): 1228. Source: VA Benefits and Health Care Utilization. Accessed 7/8/2011: <http://www.va.gov/vetdata/docs/Quickfacts/Spring2011.pdf>
- ¹⁹⁵ Ziegler-Graham K, MacKenzie EJ, Ephraim PL, Trivison TG, Brookmeyer R. Estimating the prevalence of limb loss in the United States: 2005 to 2050. *Arch Phys Med Rehabil*. 2008 Mar;89(3):422-9. Accessed 7/5/2011: [http://www.archives-pmr.org/article/S0003-9993\(07\)01748-0/fulltext](http://www.archives-pmr.org/article/S0003-9993(07)01748-0/fulltext)
- ¹⁹⁶ *Ibid.*
- ¹⁹⁷ *Ibid.*
- ¹⁹⁸ *Ibid.*
- ¹⁹⁹ Milani, *Op cit.*
- ²⁰⁰ Flood, Chapter 4, *Op cit.*
- ²⁰¹ Milani, *Op cit.*
- ²⁰² Flood, Chapter 4, *Op cit.*
- ²⁰³ Milani, *Op cit.*
- ²⁰⁴ Flood, Chapter 4, *Op cit.*
- ²⁰⁵ *Ibid.*
- ²⁰⁶ Flood KM, Saliman S. Chapter 4: Rehabilitation following amputation in Traumatic Amputation and Prosthetics. Department of Veterans Affairs (VA), Veterans Health Initiative, Washington DC. May 2002. Accessed 7/5/2011: http://www.publichealth.va.gov/docs/vhi/traumatic_amputation.pdf
- ²⁰⁷ Saradjian A, Thompson AR, Datta D. The experience of men using an upper limb prosthesis following amputation: positive coping and minimizing feeling different. *Disabil Rehabil*. 2008;30(11):871-83. Accessed 7/5/2011: <http://www.ncbi.nlm.nih.gov/pubmed/17852212>
- ²⁰⁸ Lundberg M, Hagberg K, Bullington J. My prosthesis as a part of me: a qualitative analysis of living with an osseointegrated prosthetic limb. *Prosthet Orthot Int*. 2011 Jun;35(2):207-14. Access 7/5/2011: <http://www.ncbi.nlm.nih.gov/pubmed/21697203>
- ²⁰⁹ Murray CD. Being like everybody else: the personal meanings of being a prosthesis user. *Disabil Rehabil*. 2009;31(7):573-81. Accessed 7/5/2011: <http://www.ncbi.nlm.nih.gov/pubmed/19034778>
- ²¹⁰ Pezzin LE, Dillingham TR, Mackenzie EJ, Ephraim P, Rossbach P. Use and satisfaction with prosthetic limb devices and related services. *Arch Phys Med Rehabil*. 2004 May;85(5):723-9. Accessed 7/5/2011: <http://www.ncbi.nlm.nih.gov/pubmed/15129395>
- ²¹¹ *Ibid.*
- ²¹² Milani, *Op cit.*
-

-
- ²¹³ Flood KM, Saliman S. Chapter 5: Long-term care of the Amputee in Traumatic Amputation and Prosthetics. Department of Veterans Affairs (VA), Veterans Health Initiative, Washington DC. May 2002. Accessed 7/5/2011: http://www.publichealth.va.gov/docs/vhi/traumatic_amputation.pdf
- ²¹⁴ War Related Illness and Injury Study Center (WRIISC). Deployment Health Conditions: Traumatic Amputations. Accessed 7/5/2011: <http://www.warrelatedillness.va.gov/education/healthconditions/traumatic-amputations.asp>
- ²¹⁵ Horgan O, MacLachlan M. Psychosocial adjustment to lower-limb amputation: a review. *Disabil Rehabil.* 2004 Jul 22-Aug 5;26(14-15):837-50. Accessed 7/5/2011: <http://www.ncbi.nlm.nih.gov/pubmed/15497913>
- ²¹⁶ Flood, Chapter 5, *Op cit.*
- ²¹⁷ Law J, Garrett Z, Nye C. Speech and language therapy interventions for children with primary speech and language delay or disorder. *Cochrane Database of Systematic Reviews.* 2003; 3(CD004110). Accessed 6/11/2011: <http://www2.cochrane.org/reviews/en/ab004110.html> (doi: 10.1002/14651858.CD004110).
- ²¹⁸ Pennington L, Goldbart J, Marshall J. Direct Speech and Language Therapy for Children with Cerebral Palsy: Findings from a Systematic Review. *Dev Med Child Neurol.* 2005; 47(1), 57-63. Accessed 6/11/2011: <http://journals.cambridge.org/action/displayFulltext?type=1&fid=274681&jid=DMC&volumeId=47&issueId=01&aid=274680> (doi: 10.1017/S0012162205000101).
- ²¹⁹ Speyer R. Effects of Voice Therapy: A Systematic Review. *J Voice.* 2008 Sep; 22(5):565-580. Accessed 6/11/2011: <http://www.ncbi.nlm.nih.gov/pubmed/17509828>.
- ²²⁰ Morris ME, Perry A, Bilney B, Curran A, Dodd K, Wittwer J, et al. Outcomes of Physical Therapy, Speech Pathology, and Occupational Therapy for People with Motor Neuron Disease: A Systematic Review. *Neurorehabil Neural Repair.* 2006 Sep; 20(3):424-434. Accessed 6/11/2011: (doi: 10.1177/1545968305285092).
- ²²¹ Law J, Garrett Z, Nye C. *Op cit.*
- ²²² Pennington L, Goldbart J, Marshall J. Speech and language therapy to improve the communication skills of children with cerebral palsy. *Cochrane Database of Systematic Reviews.* 2004; 2(CD003466). Accessed 6/11/2011: <http://www2.cochrane.org/reviews/en/ab003466.html> (doi: 10.1002/14651858.CD003466.pub2).
- ²²³ Bilney B, Morrie ME, Perry A. *Neurorehabil Neural Repair.* 2003 Mar; 17(1):12-24. Accessed 6/11/2011: <http://nrr.sagepub.com/content/17/1/12.abstract> (doi: 10.1177/0888439002250448).
- ²²⁴ Deane K, Whurr R, Playford ED, Ben-Shlomo Y, Clarke CE. Speech and language therapy versus placebo or no intervention for dysarthria in Parkinson's disease. *Cochrane Database of Systematic Reviews.* 2001; 2(CD002812). Accessed 6/11/2011: <http://www2.cochrane.org/reviews/en/ab002812.html> (doi: 10.1002/14651858.CD002812).
- ²²⁵ Kelly H, Brady MC, Enderby P. Speech and language therapy for aphasia following stroke. *Cochrane Database of Systematic Reviews.* 2010; 5(CD000425). Accessed 6/11/2011: <http://www2.cochrane.org/reviews/en/ab000425.html> (doi: 10.1002/14651858.CD000425.pub2).
- ²²⁶ American Cancer Society. *Caring for the Patient With Cancer at Home: A Guide for Patients and Families.* Last Medical Review: 03/24/2011; Last Revised: 03/24/2011; Accessed 6/27/2011: <http://www.cancer.org/Treatment/TreatmentsandSideEffects/PhysicalSideEffects/DealingwithSymptomsatHome/caring-for-the-patient-with-cancer-at-home-hair-loss>
- ²²⁷ K. Münstedt, N. Manthey, S. Sachsse, H. Vahrson. Changes in self-concept and body image during alopecia induced cancer chemotherapy. *Support Care Cancer.* 1997 Mar; 5(2):139-43. Accessed 6/27/2011: (doi: 10.1007/BF01262572).
- ²²⁸ Wang J., Lu Z., Au J. Protection Against Chemotherapy-Induced Alopecia. *Pharm Res.* 2006 Nov;23(11):2505-14. Accessed 6/27/2011: <http://www.springerlink.com/content/xm7364016087m2hm/> (doi:10.1007/s11095-006-9105-3).
- ²²⁹ Varni JW, Katz ER, Colegrove R, Dolgin M. Perceived physical appearance and adjustment of children with newly diagnosed cancer: A path analytic model. *J Behav Med.* 1995 Jun;18(3):261-78. Accessed 6/27/2011: <http://www.springerlink.com/content/x588296n6403w751/> (doi:10.1007/BF01857873).
- ²³⁰ Pickard-Holley S. The symptom experience of alopecia. *Semin Oncol Nurs.* 1995 Nov;11(4):235-8. Accessed 6/27/2011: <http://onlinelibrary.wiley.com/doi/10.1002/pon.1245/abstract>
- ²³¹ Nolte S, Donnelly J, Kelly S, Conley P, Cobb R. A randomized clinical trial of a videotape intervention for women with chemotherapy-induced alopecia: a gynecologic oncology group study. *Oncol Nurs Forum.* 2006 Nov 3;33(2):305-11. Accessed 6/27/2011: <http://www.ncbi.nlm.nih.gov/pubmed/16518446>.
-

-
- ²³² Lemieux J, Maunsell E, Provencher L. Chemotherapy-induced alopecia and effects on quality of life among women with breast cancer: a literature review. *Psycho-Oncology*. 2008 Apr;17(4): 317–28. Accessed 6/27/2011: <http://onlinelibrary.wiley.com/doi/10.1002/pon.1245/abstract> (doi: 10.1002/pon.1245)
- ²³³ Hesketh P., Batchelor D., Golant M., Lyman G.H., Rhodes N., Yardley D. Chemotherapy-induced alopecia: psychosocial impact and therapeutic approaches. *Support Care Cancer*. 2004 Aug;12(8):543-9. Accessed 6/27/2011: <http://www.springerlink.com/content/gc5y1qgj1h63j9h4/> (doi:10.1007/s00520-003-0562-5).
- ²³⁴ American College of Nurse Midwives (ACNM). Our Scope of Practice. Accessed 7/10/2011: <http://www.midwife.org/Our-Scope-of-Practice>
- ²³⁵ American College of Nurse Midwives. Our Credentials. Accessed 7/10/2011: <http://www.midwife.org/Our-Credentials>
- ²³⁶ U.S. Bureau of Labor Statistics. Occupational Outlook Handbook, 2010-11 Edition: Registered Nurses. Accessed 7/11/2011: <http://www.bls.gov/oco/ocos083.htm>
- ²³⁷ APRN Consensus Work Group & the National Council of State Boards of Nursing APRN Advisory Committee. Consensus Model for APRN Regulation: Licensure, Accreditation, Certification & Education. July 7, 2008. Accessed 7/10/2011: <http://www.aacn.nche.edu/Education/pdf/APRNReport.pdf>
- ²³⁸ American College of Nurse Midwives. 2010 Annual Report. Accessed 7/12/2011: <http://www.midwife.org/2010-Annual-Report>
- ²³⁹ Certified Nurse Midwives in Massachusetts. Updated 8/2008; Accessed 7/10/2011: <http://www.midwife.org/index.asp?bid=59&cat=11&button=Search&rec=194>
- ²⁴⁰ *Ibid.*
- ²⁴¹ Phillips SJ. 23rd Annual Legislative Update: As healthcare reforms, NPs continue to evolve. *Nurse Practitioner*. 2011 Jan; 36(1):30-52. doi: 10.1097/01.NPR.0000391176.02137.48
- ²⁴² American College of Nurse Midwives. Comparison of Certified Nurse-Midwives, Certified Midwives, and Certified Professional Midwives. Accessed 7/11/2011: <http://www.midwife.org/ACNM/files/ccLibraryFiles/Filename/000000001031/CNM%20CM%20CPM%20Comparison%20Chart%20March%202011.pdf>
- ²⁴³ Phillips, *Op cit.*
- ²⁴⁴ *Ibid.*
- ²⁴⁵ Center for Medicare and Medicaid Services. Medicare Information for Advanced Practice Nurses and Physician Assistants. September 2010. Accessed 7/12/2011: http://www.cms.gov/MLNProducts/downloads/Medicare_Information_for_APNs_and_PAs_Booklet_ICN901623.pdf
- ²⁴⁶ Center for Medicare and Medicaid Services. 90.3 - Practitioners Defined (Rev. 1, 09-11-02). Medicare General Information, Eligibility, and Entitlement: Chapter 5 - Definitions. Accessed 7/9/2011: <https://www.cms.gov/manuals/downloads/ge101c05.pdf>
- ²⁴⁷ Center for Medicare and Medicaid Services. 130.1 - Payment for Certified Nurse-Midwife Services. Medicare Claims Processing Manual: Chapter 12 - Physicians/Nonphysician Practitioners. Accessed 7/9/2011: <http://www.cms.gov/manuals/downloads/clm104c12.pdf>
- ²⁴⁸ Medicare Learning Network. Provider-Supplier Enrollment Fact Sheet Series: Medicare Enrollment Guidelines for Ordering/Referring Providers. Center for Medicare and Medicaid Services. Accessed 7/9/2011: http://www.cms.gov/MLNProducts/downloads/MedEnroll_OrderReferProv_FactSheet_ICN906223.pdf
- ²⁴⁹ Bunce VC, Wieske JP. Health Insurance Mandates in the States 2010. Council for Affordable Health Insurance, Washington DC. Accessed 7/8/2011: http://www.cahi.org/cahi_contents/resources/pdf/MandatesintheStates2010.pdf
- ²⁵⁰ Phillips, *Op cit.*
- ²⁵¹ U.S. Bureau of Labor Statistics. Occupational Outlook Handbook, 2010-11 Edition: Registered Nurses. Accessed 7/11/2011: <http://www.bls.gov/oco/ocos083.htm>
- ²⁵² American Association of Nurse Anesthetists (AANA). Certified Registered Nurse Anesthetists (CRNAs) at a Glance. Updated 4/5/2011; Accessed 7/9/2011: <http://www.aana.com/atagance.aspx>
- ²⁵³ Phillips SJ. 23rd Annual Legislative Update: As healthcare reforms, NPs continue to evolve. *Nurse Practitioner*. 2011 Jan; 36(1):30-52. doi: 10.1097/01.NPR.0000391176.02137.48
- ²⁵⁴ AANA, CRNAs at a glance, *Op cit.*
-

-
- ²⁵⁵ American Association of Nurse Anesthetists. Federal Supervision Rules: Opt-Out Information. Accessed 7/9/2011:
http://www.aana.com/Advocacy.aspx?ucNavMenu_TSMMenuTargetID=49&ucNavMenu_TSMMenuTargetType=4&ucNavMenu_TSMMenuID=6&id=1790
- ²⁵⁶ *Ibid.*
- ²⁵⁷ Phillips, *Op cit.*
- ²⁵⁸ *Ibid.*
- ²⁵⁹ AANA, CRNAs at a glance, *Op cit.*
- ²⁶⁰ Center for Medicare and Medicaid Services. Medicare Information for Advanced Practice Nurses and Physician Assistants. September 2010. Accessed 7/12/2011:
http://www.cms.gov/MLNProducts/downloads/Medicare_Information_for_APNs_and_PAs_Booklet_ICN901623.pdf
- ²⁶¹ Center for Medicare and Medicaid Services. 90.3 - Practitioners Defined (Rev. 1, 09-11-02). Medicare General Information, Eligibility, and Entitlement: Chapter 5 - Definitions. Accessed 7/9/2011:
<https://www.cms.gov/manuals/downloads/ge101c05.pdf>
- ²⁶² Center for Medicare and Medicaid Services. 140 - Certified Registered Nurse Anesthetist (CRNA) Services. Medicare Claims Processing Manual: Chapter 12 - Physicians/NoCRNA Physician Practitioners. Accessed 7/9/2011:
<http://www.cms.gov/manuals/downloads/clm104c12.pdf>
- ²⁶³ Medicare Learning Network. Provider-Supplier Enrollment Fact Sheet Series: Medicare Enrollment Guidelines for Ordering/Referring Providers. Center for Medicare and Medicaid Services. Accessed 7/9/2011:
http://www.cms.gov/MLCRNAproducts/downloads/MedEnroll_OrderReferProv_FactSheet_ICN906223.pdf
- ²⁶⁴ Bunce VC, Wieske JP. Health Insurance Mandates in the States 2010. Council for Affordable Health Insurance, Washington DC. Accessed 7/8/2011:
http://www.cahi.org/cahi_contents/resources/pdf/MandatesintheStates2010.pdf
- ²⁶⁵ Phillips, *Op cit.*
- ²⁶⁶ American Academy of Nurse Practitioners (AANP). Scope of practice for Nurse Practitioners. Updated 2010; Accessed 7/9/2011:
<http://www.aanp.org/NR/rdonlyres/FCA07860-3DA1-46F9-80E6-E93A0972FB0D/0/2010ScopeOfPractice.pdf>
- ²⁶⁷ U.S. Bureau of Labor Statistics. Occupational Outlook Handbook, 2010-11 Edition: Registered Nurses. Accessed 7/11/2011: <http://www.bls.gov/oco/ocos083.htm>
- ²⁶⁸ AANP Scope of practice, *Op cit.*
- ²⁶⁹ U.S. BLS, *Op cit.*
- ²⁷⁰ Phillips, *Op cit.*
- ²⁷¹ American Academy of Nurse Practitioners. Frequently asked questions. Accessed 7/9/2011:
<http://www.aanp.org/NR/rdonlyres/A1D9B4BD-AC5E-45BF-9EB0-DEFC1123204/4710/2011FAQswhatisanNPupdated.pdf>
- ²⁷² AANP Scope of practice, *Op cit.*
- ²⁷³ Phillips, *Op cit.*
- ²⁷⁴ *Ibid.*
- ²⁷⁵ Center for Medicare and Medicaid Services. 90.3 - Practitioners Defined (Rev. 1, 09-11-02). Medicare General Information, Eligibility, and Entitlement: Chapter 5 - Definitions. Accessed 7/9/2011:
<https://www.cms.gov/manuals/downloads/ge101c05.pdf>
- ²⁷⁶ Center for Medicare and Medicaid Services. 120.A. General Payment. Medicare Claims Processing Manual: Chapter 12 - Physicians/Nonphysician Practitioners. Accessed 7/9/2011:
<http://www.cms.gov/manuals/downloads/clm104c12.pdf>
- ²⁷⁷ Medicare Learning Network. Provider-Supplier Enrollment Fact Sheet Series: Medicare Enrollment Guidelines for Ordering/Referring Providers. Center for Medicare and Medicaid Services. Accessed 7/9/2011:
http://www.cms.gov/MLNProducts/downloads/MedEnroll_OrderReferProv_FactSheet_ICN906223.pdf
- ²⁷⁸ Bunce VC, Wieske JP. Health Insurance Mandates in the States 2010. Council for Affordable Health Insurance, Washington DC. Accessed 7/8/2011:
http://www.cahi.org/cahi_contents/resources/pdf/MandatesintheStates2010.pdf
- ²⁷⁹ Phillips, *Op cit.*
-

-
- ²⁸⁰ U.S. Bureau of Labor Statistics. Occupational Outlook Handbook, 2010-11 Edition: Chiropractors. Accessed 7/11/2011: <http://www.bls.gov/oco/ocos071.htm>
- ²⁸¹ American Chiropractic Association. Frequently Asked Questions. Accessed 7/10/2011: http://www.acatoday.org/level3_css.cfm?T1ID=13&T2ID=61&T3ID=152
- ²⁸² National Center for Complementary and Alternative Medicine, National Institutes of Health. Chiropractic: An Introduction. NCCAM Publication No. D403. Accessed 6/17/2011; created November 2007; updated October 2010: <http://nccam.nih.gov/health/chiropractic/introduction.htm>.
- ²⁸³ US BLS, *Op cit*.
- ²⁸⁴ *Ibid*.
- ²⁸⁵ American Chiropractic Association. History of Chiropractic Care. Accessed 7/10/2011: http://www.acatoday.org/level3_css.cfm?T1ID=13&T2ID=61&T3ID=149
- ²⁸⁶ US BLS, *Op cit*.
- ²⁸⁷ *Ibid*.
- ²⁸⁸ National Board of Chiropractic Examiners. Post-Licensure Examinations. Accessed 7/11/2011: <http://www.nbce.org/post/overview.html>
- ²⁸⁹ US BLS, *Op cit*.
- ²⁹⁰ Center for Medicare and Medicaid Services. 70.6 – Chiropractors (Rev. 1, 09-11-02). Medicare General Information, Eligibility, and Entitlement: Chapter 5 - Definitions. Accessed 7/9/2011: <https://www.cms.gov/manuals/downloads/ge101c05.pdf>
- ²⁹¹ Medicare Learning Network. Provider-Supplier Enrollment Fact Sheet Series: Medicare Enrollment Guidelines for Ordering/Referring Providers. Center for Medicare and Medicaid Services. Accessed 7/9/2011: http://www.cms.gov/MLNProducts/downloads/MedEnroll_OrderReferProv_FactSheet_ICN906223.pdf
- ²⁹² Bunce VC, Wieske JP. Health Insurance Mandates in the States 2010. Council for Affordable Health Insurance, Washington DC. Accessed 7/8/2011: http://www.cahi.org/cahi_contents/resources/pdf/MandatesintheStates2010.pdf
- ²⁹³ American Dental Association. Find a Dentist: Specialty Definitions. Accessed 7/10/2011: <http://www.ada.org/2555.aspx#definition>
- ²⁹⁴ *Ibid*.
- ²⁹⁵ U.S. Bureau of Labor Statistics. Occupational Outlook Handbook, 2010-11 Edition: Dentists. Accessed 7/11/2011: <http://www.bls.gov/oco/ocos072.htm>
- ²⁹⁶ ADA Find a Dentist, *Op cit*.
- ²⁹⁷ Joint Commission on National Dental Examinations. National Board Dental Examination Part I, 2011 Guide. Accessed 7/12/2011: http://www.ada.org/sections/educationAndCareers/pdfs/nbde01_examinee_guide.pdf
- ²⁹⁸ Joint Commission on National Dental Examinations. National Board Dental Examination Part II, 2011 Guide. Accessed 7/12/2011: http://www.ada.org/sections/educationAndCareers/pdfs/nbde02_examinee_guide.pdf
- ²⁹⁹ American Dental Association. State Dental Licensure for U.S. Dentists. Accessed 7/12/2011: <http://www.ada.org/492.aspx>
- ³⁰⁰ *Ibid*.
- ³⁰¹ North East Regional Board of Dental Examiners, Inc. NERB Participating States. Accessed 7/12/2011: http://www.nerb.org/c/states_accepting_c.html
- ³⁰² US BLS, *Op cit*.
- ³⁰³ ADA Find a Dentist, *Op cit*.
- ³⁰⁴ Center for Medicare and Medicaid Services. 70.2 – Dentists (Rev. 1, 09-11-02). Medicare General Information, Eligibility, and Entitlement: Chapter 5 - Definitions. Accessed 7/9/2011: <https://www.cms.gov/manuals/downloads/ge101c05.pdf>
- ³⁰⁵ *Ibid*.
- ³⁰⁶ Medicare Learning Network. Provider-Supplier Enrollment Fact Sheet Series: Medicare Enrollment Guidelines for Ordering/Referring Providers. Center for Medicare and Medicaid Services. Accessed 7/9/2011: http://www.cms.gov/MLNProducts/downloads/MedEnroll_OrderReferProv_FactSheet_ICN906223.pdf
- ³⁰⁷ Bunce VC, Wieske JP. Health Insurance Mandates in the States 2010. Council for Affordable Health Insurance, Washington DC. Accessed 7/8/2011: http://www.cahi.org/cahi_contents/resources/pdf/MandatesintheStates2010.pdf
-

-
- ³⁰⁸ American Optometric Association. Doctors of Optometry and Their Education. Accessed 7/10/2011: <http://www.aoa.org/x5879.xml>
- ³⁰⁹ *Ibid.*
- ³¹⁰ *Ibid.*
- ³¹¹ *Ibid.*
- ³¹² Eye Care Professions. Optometry Licenses for Optometrists. Accessed 7/11/2011: <http://www.eyecareprofessions.com/optometrist/optometry-license.html>
- ³¹³ *Ibid.*
- ³¹⁴ *Ibid.*
- ³¹⁵ *Ibid.*
- ³¹⁶ U.S. Bureau of Labor Statistics. Occupational Outlook Handbook, 2010-11 Edition: Optometrists. Accessed 7/11/2011: <http://www.bls.gov/oco/ocos073.htm>
- ³¹⁷ *Ibid.*
- ³¹⁸ Center for Medicare and Medicaid Services. 70.5 – Optometrists (Rev. 1, 09-11-02) B. Medicare General Information, Eligibility, and Entitlement: Chapter 5 - Definitions. Accessed 7/9/2011: <https://www.cms.gov/manuals/downloads/ge101c05.pdf>
- ³¹⁹ Medicare Learning Network. Provider-Supplier Enrollment Fact Sheet Series: Medicare Enrollment Guidelines for Ordering/Referring Providers. Center for Medicare and Medicaid Services. Accessed 7/9/2011: http://www.cms.gov/MLNProducts/downloads/MedEnroll_OrderReferProv_FactSheet_ICN906223.pdf
- ³²⁰ Bunce, *Op cit.*
- ³²¹ American Podiatric Medicine Association. About APMA. Accessed 7/10/2011: <http://www.apma.org/MainMenu/AboutPodiatry/APMAOverview.aspx>
- ³²² *Ibid.*
- ³²³ U.S. Bureau of Labor Statistics. Occupational Outlook Handbook, 2010-11 Edition: Podiatrists. Accessed 7/11/2011: <http://www.bls.gov/oco/ocos075.htm>
- ³²⁴ *Ibid.*
- ³²⁵ Center for Medicare and Medicaid Services. 70.3 - Doctors of Podiatric Medicine (Rev. 1, 09-11-02). Medicare General Information, Eligibility, and Entitlement: Chapter 5 - Definitions. Accessed 7/9/2011: <https://www.cms.gov/manuals/downloads/ge101c05.pdf>
- ³²⁶ Medicare Learning Network. Provider-Supplier Enrollment Fact Sheet Series: Medicare Enrollment Guidelines for Ordering/Referring Providers. Center for Medicare and Medicaid Services. Accessed 7/9/2011: http://www.cms.gov/MLNProducts/downloads/MedEnroll_OrderReferProv_FactSheet_ICN906223.pdf
- ³²⁷ *Ibid.*
- ³²⁸ Bunce, *Op cit.*
- ³²⁹ Tallman MS, Gray R, Robert NJ, LeMaistre CF, Osborne CK, Vaughan WP, et al. Conventional adjuvant chemotherapy with or without high-dose chemotherapy and autologous stem-cell transplantation in high-risk breast cancer. *N Engl J Med.* 2003 Jul 3;349(1):17-26. Accessed 6/13/2011: <http://www.ncbi.nlm.nih.gov/pubmed/12840088?dopt=Abstract>.
- ³³⁰ Rodenhuis S, Bontenbal M, Beex LV, Wagstaff J, Richel DJ, Nooij MA, et al. High-dose chemotherapy with hematopoietic stem-cell rescue for high-risk breast cancer. *N Engl J Med.* 2003 Jul 3;349(1):7-16. Accessed 6/13/2011: <http://www.ncbi.nlm.nih.gov/pubmed/12840087?dopt=Abstract>.
- ³³¹ American Cancer Society. High dose chemo with bone marrow or peripheral blood stem cell transplant. Atlanta: American Cancer Society. Last revision: 9/24/2010; last medical review: 9/24/2010; accessed 6/13/2011: <http://www.cancer.org/Cancer/BreastCancer/OverviewGuide/breast-cancer-overview-treating-high-dose-chemo-bone-marrow>
- ³³² National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: Breast Cancer, Version 2.2011. National Comprehensive Cancer Network, 2011 Mar 25. Accessed 6/13/2011: http://www.nccn.org/professionals/physician_gls/pdf/breast.pdf
- ³³³ Mello MM, Trennan TA. The Controversy over High-Dose Chemotherapy with Autologous Bone Marrow Transplant for Breast Cancer. *Health Aff.* 2001 Sep;20(5):101-17. Accessed 6/13/2011: <http://content.healthaffairs.org/content/20/5/101.long> (doi: 10.1377/hlthaff.20.5.101).
- ³³⁴ *Ibid.*

- ³³⁵ Intensive chemotherapy with autologous bone marrow transplantation in patients with locally advanced breast cancer: 12-years follow-up.
- ³³⁶ Stemmer SM, Hardan I, Raz H, Adamou AK, Inbar M, Gottfried M, et al. Adjuvant treatment of high-risk stage II breast cancer with doxorubicin followed by high-dose chemotherapy and autologous stem-cell transplantation: a single-institution experience with 132 consecutive patients. *Bone Marrow Transplant*. 2003 Apr;31(8):655–61. Accessed 6/13/2011: <http://www.nature.com/bmt/journal/v31/n8/full/1703856a.html> (doi:10.1038/sj.bmt.1703856).
- ³³⁷ American Cancer Society. *Op cit*.
- ³³⁸ Interim Results of Large Trials of High-Dose Chemotherapy with Bone Marrow or Stem Cell Transplants for Breast Cancer. National Cancer Institute, Bethesda MD. Press Release; 1999 Apr 15. Accessed 6/13/2011: <http://rex.nci.nih.gov/massmedia/pressreleases/interim1.html>
- ³³⁹ <http://www.cdc.gov/nchs/fastats/deaths.htm>
- ³⁴⁰ (US) Agency for Health Care Policy and Research. Cardiac Rehabilitation: Clinical Guideline Number 17. AHCPR Supported Guide and Guidelines 1992-2008. Oct 1995;AHCPR Publication No. 96-0672. Accessed 6/9/2011: <http://www.ncbi.nlm.nih.gov/books/NBK18026/>
- ³⁴¹ *Ibid*.
- ³⁴² American College of Cardiology Foundation. Performance Measures on Cardiac Rehabilitation for Referral to and Delivery of Cardiac Rehabilitation/Secondary Prevention Services. *JACC*. 2007;50:1400-1433. Accessed 6/9/2011: <http://content.onlinejacc.org/cgi/content/full/50/14/1400> (doi:10.1016/j.jacc.2007.04.033).
- ³⁴³ *Ibid*.
- ³⁴⁴ American Heart Association. What is cardiac rehabilitation. Accessed 1 June 2012: http://www.heart.org/HEARTORG/Conditions/More/CardiacRehab/What-is-Cardiac-Rehabilitation_UCM_307049_Article.jsp.
- ³⁴⁵ National Institutes of Health: National Heart, Lung & Blood. Morbidity & mortality: 2012 chart book on cardiovascular, blood & lung diseases. 2012 Feb 1. Accessed 31 May 2012: http://www.nhlbi.nih.gov/resources/docs/2012_ChartBook_508.pdf.
- ³⁴⁶ Massachusetts summary statistics: acute myocardial infarction death rate per 100,000, all race, all gender, 2007-2009. Accessed 1 June 2012: <http://apps.nccd.cdc.gov/DHDSPAtlas/reports.aspx?geographyType=county&state=MA&themeSubClassId=8&filterIds=4,3,2,7,9&filterOptions=1,1,1,1,1#report>.
- ³⁴⁷ University of Manitoba: http://www.umanitoba.ca/centres/mchp/reports/support_items_ntk_sex/Web_Graphs/Chapter3/WEBami_age_Aug2_05jb.xls
- ³⁴⁸ Centers for Disease Control and Prevention. Receipt of outpatient cardiac rehabilitation among heart attack survivors--United States, 2005. *MMWR Morb Mortal Wkly Rep* 2008; 57:89-94. Accessed 31 May 2012: <http://www.ncbi.nlm.nih.gov/pubmed/18235423?dopt=Abstract>.
- ³⁴⁹ Ades, PA, Pashkow, FJ, Nestor, J R. Cost-effectiveness of cardiac rehabilitation. *J Cardiopulm Rehabil* Jul Aug 1997; 17(4):222-231.
- ³⁵⁰ Coalition of Cancer Cooperative Groups. Most Cancer Patients Satisfied with Clinical Trial Experience, Yet, Few Aware of Opportunity: Study Shows Improved Physician-patient Communications Could Increase Enrollment in Cancer Clinical Trials. Press release: 6/5/2006, Philadelphia PA. Accessed 6/20/2011: <http://www.cancertrials.org/CTHpdf/CancerPatientsSatisfied5June06.pdf>
- ³⁵¹ National Cancer Institute. Take Part in Cancer Treatment Research Studies. Bethesda MD. Accessed 6/20/2011: <http://www.cancer.gov/clinicaltrials/education/Taking-Part-in-Cancer-Treatment-Research-Studies/page3>
- ³⁵² American Cancer Society. Clinical Trials: What You Need to Know: Why Do We Need Clinical Trials? Accessed 6/20/2011; Last Medical Review: 09/23/2010; Last Revised: 09/23/2010: <http://www.cancer.org/Treatment/TreatmentsandSideEffects/ClinicalTrials/WhatYouNeedtoKnowaboutClinicalTrials/clinical-trials-what-you-need-to-know-why-do-we-need-clin-trials>
- ³⁵³ National Cancer Institute, *Op cit*.
- ³⁵⁴ Bennett CL, Adams JR, Knox KS, Kelahan AM, Silver SM, Bailes JS. Clinical Trials: Are They A Good Buy? *J Clin Oncol*. 2001 Dec 1;19(23):4330-9. Accessed 6/20/2011: <http://jco.ascopubs.org/content/19/23/4330.full>

-
- ³⁵⁵ American Cancer Society, *Op cit.*
- ³⁵⁶ Coalition of Cancer Cooperative Groups, *Op cit.*
- ³⁵⁷ Bennett, *Op cit.*
- ³⁵⁸ National Institutes of Health National Cancer Institutes (NIH/NCI): Surveillance Epidemiology and End Results (SEER). Generate custom reports from the cancer statistics review 1975-2009. Table 1.22: U.S. Complete Prevalence Counts By Age at Prevalence, 1/1/2009. Accessed 9 June 2012: http://seer.cancer.gov/csr/1975_2009_pops09/results_single/sect_01_table.22_2pgs.pdf.
- ³⁵⁹ *Ibid.*
- ³⁶⁰ U.S. Census Bureau. Profile of general population and housing characteristics: 2010. Accessed 9 June 2012: http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_10_DP_DPDP1&prodType=table.
- ³⁶¹ American Cancer Society. Treatment and side effects: clinical trials, why do we need clinical trials? 23 Sep 2010. Accessed 9 June 2012: <http://www.cancer.org/Treatment/TreatmentsandSideEffects/ClinicalTrials/WhatYouNeedtoKnowaboutClinicalTrials/clinical-trials-what-you-need-to-know-why-do-we-need-clin-trials>.
- ³⁶² Mariotto AB, Yabroff KR, Shao Y, et al. Projections of the cost of cancer care in the United States: 2010-2020. *JNCI J Natl Cancer Inst* (2011) 103 (2): 117-128. doi: 10.1093/jnci/djq495 First published online: January 12, 2011. Accessed 9 June 2012: <http://jnci.oxfordjournals.org/content/103/2/117.full.pdf+html>.
- ³⁶³ Chirikos TN, Ruckdeschel JC, Krischer JP. Impact of clinical trials on the cost of cancer care. *Med Care*. 2001 Apr;39(4):373-83. Accessed 9 June 2012: <http://www.ncbi.nlm.nih.gov/pubmed/11329524>.
- ³⁶⁴ Goldman DP, Berry SH, McCabe MS, et al. Incremental treatment costs in national cancer institute-sponsored clinical trials. *JAMA*. 2003 Jun 11;289(22):2970-7. Accessed 9 June 2012: <http://www.ncbi.nlm.nih.gov/pubmed/12799405>.
- ³⁶⁵ American Cancer Society. Cancer Prevention and Early Detection Facts and Figures 2010. Atlanta: American Cancer Society, 2010, p. 36. Accessed 6/9/11: <http://www.cancer.org/acs/groups/content/@epidemiologysurveillance/documents/document/acspc-029459.pdf>
- ³⁶⁶ *Ibid.*
- ³⁶⁷ American Cancer Society. Cancer Facts and Figures 2010. Atlanta: American Cancer Society, 2010, p. 62. Accessed 6/9/11: <http://www.cancer.org/acs/groups/content/@epidemiologysurveillance/documents/document/acspc-026238.pdf>
- ³⁶⁸ American Academy of Family Physicians. A-E: Recommendations for Clinical Preventive Services: Cervical Cancer, Pap Smear. Accessed 6/9/11: <http://www.aafp.org/online/en/home/clinical/exam/a-e.html>
- ³⁶⁹ U.S. Preventive Services Task Force. Screening for Cervical Cancer. 2003 Jan. Accessed 6/9/2011: <http://www.uspreventiveservicestaskforce.org/uspstf/uspscerv.htm>
- ³⁷⁰ *Ibid.*
- ³⁷¹ American College of Obstetricians and Gynecologists. Cervical cytology screening. ACOG Practice Bulletin No. 109. *Obstet Gynecol*. 2009 Dec;114:1409-20. Accessed 6/9/11: http://journals.lww.com/greenjournal/documents/pb109_cervical_cytology_screening.pdf
- ³⁷² Hawkes AP, Kronenberger CB, MacKenzie TD, Mardis AL, Palen TE, Schuller WW, et al. Cervical Cancer Screening: American College of Preventive Medicine Practice Policy Statement. *Am J Prev Med*. 1996 Sep/Oct;12(5):342-44. Please note: "Although the research on which this statement was based is out of date, the position/recommendations contained in this policy were reaffirmed by the ACPM Board of Regents on 1/31/2005 until the evidence can be reevaluated." Accessed 6/9/11: <http://www.acpm.org/cervical.htm>
- ³⁷³ U.S. Centers for Disease Control and Prevention (CDC). Behavioral risk factor surveillance system survey data. 2008, 2010, Accessed 11 June 2012: http://apps.nccd.cdc.gov/brfss/display_c.asp?yr_c=2008&yr=2010&cat=WH&state=MA&bkey=20102535&qkey=4426&qtype=C&grp=0&SUBMIT2=Compare.
- ³⁷⁴ *Ibid.* Accessed 11 June 2012: http://apps.nccd.cdc.gov/brfss/display_c.asp?state_c=MA&state=US&cat=WH&yr=2008&qkey=4426&bkey=20080035&qtype=C&grp=0&SUBMIT3=Compare
- ³⁷⁵ CDC. National Center for Health Statistics. Health, United States, 2011: With Special Feature on Socioeconomic Status and Health. Table 91 (page 2 of 5). Use of Pap smears among women 18 years of age and over, by selected

characteristics: United States, selected years 1987–2010. Accessed 11 June 2012:

<http://www.cdc.gov/nchs/data/hus/hus11.pdf#091>.

³⁷⁶ Sirovich BE, Welch HG. The frequency of Pap smear screening in the United States. *J Gen Intern Med*. 2004 Mar;19(3):243-50. Accessed 11 June 2012: http://vaoutcomes.us/papers/Frequency_Pap_smear.pdf.

³⁷⁷ *Ibid*.

³⁷⁸ Centers for Disease Control and Prevention, MMWR Morbidity and Mortality Weekly Report, Identifying Infants with Hearing Loss — United States, 1999–2007, Weekly. March 5, 2010 / 59(08);220-223. Accessed 6/20/2011: http://www.cdc.gov/ncbddd/hearingloss/documents/EHDI_MMWR_2010.pdf

³⁷⁹ U.S. Preventive Services Task Force. Universal screening for hearing loss in newborns: U.S. Preventive Services Task Force Recommendation Statement. *PEDIATRICS*. 2008 Jul 1;122(1):143-148. Accessed 6/20/2011: <http://www.uspreventiveservicestaskforce.org/uspstf08/newbornhear/newbhears.htm> (doi: 10.1542/peds.2007-2210).

³⁸⁰ Kennedy CR, McCann DC, Campbell MJ, Law CM, Mullee M, Petrou S, et al. Language ability after early detection of permanent childhood hearing impairment. *N Engl J Med* 2006;354(20):2131-2141. Accessed 6/20/2011: <http://eprints.ucl.ac.uk/7666/1/7666.pdf>.

³⁸¹ Nelson HD, Bougatsos C, Nygren P. Universal Newborn Hearing Screening: Systematic Review to Update the 2001 U.S. Preventive Services Task Force Recommendation. *Pediatrics* 2008;122(1):e266-e276. Accessed 6/20/2011: <http://pediatrics.aappublications.org/content/122/1/e266.full> (doi: 10.1542/peds.2007-1422).

³⁸² Kupcha-Szrom J. A Window to the World: Early Language and Literacy Development. Zero to Three Policy Center, Washington DC. February 2011. Accessed 6/20/2011: <http://www.zerotothree.org/public-policy/policy-toolkit/early-literacywebmarch1-6.pdf>.

³⁸³ National Institute on Deafness and Other Communication Disorders, National Institutes of Health. Health Info, Inside NIDCD Newsletter, Winter 2000, Detecting Hearing Loss in Infants and Young Children. Accessed 6/20/2011, Last Updated 6/7/10: <http://www.nidcd.nih.gov/health/inside/wtr00/pg2.htm>.

³⁸⁴ Centers for Disease Control and Prevention. Infants tested for hearing loss: United States [published correction appears in *MMWR Morb Mortal Wkly Rep* 2003;52(49):1210]. *MMWR Morb Mortal Wkly Rep* 2003;52(41):981-984. Accessed 6/20/2011: http://www.cdc.gov/ncbddd/hearingloss/documents/EHDI_MMWR_2010.pdf.

³⁸⁵ USPSTF, *Op cit*.

³⁸⁶ USPSTF, *Op cit*.

³⁸⁷ Joint Committee on Infant Hearing. Year 2007 Position Statement: Principles and Guidelines for Early Hearing Detection and Intervention Programs. *PEDIATRICS*. 2007 Oct;120(4):898-921. Accessed 6/20/2011: <http://aappolicy.aappublications.org/cgi/content/full/pediatrics;120/4/898> (doi:10.1542/peds.2007-2333).

³⁸⁸ Early Identification of Hearing Impairment in Infants and Young Children. NIH Consensus Statement Online 1993 Mar 1-3;11(1):1-24. Accessed 6/20/2011: <http://consensus.nih.gov/1993/1993HearingInfantsChildren092html.htm>

³⁸⁹ Kennedy C, McCann D, Campbell MJ, Kimm L, Thornton R. Universal newborn screening for permanent childhood hearing impairment: an 8-year follow-up of a controlled trial. *Lancet* 2005;366(9486):660-662. Accessed 6/20/2011: [http://www.lancet.com/journals/lancet/article/PIIS0140-6736\(05\)67138-3/abstract](http://www.lancet.com/journals/lancet/article/PIIS0140-6736(05)67138-3/abstract).

³⁹⁰ USPSTF, *Op cit*.

³⁹¹ Centers for Disease Control and Prevention, MMWR Morbidity and Mortality Weekly Report, Identifying Infants with Hearing Loss — United States, 1999–2007, Weekly. March 5, 2010 / 59(08);220-223

³⁹² CDC. Total newborns screened in EHDI program, Massachusetts. 2009 Hearing Screening Summary, November 2011. Data Source: 2009 CDC EHDI Hearing Screening & Follow-up Survey (HSFS). Accessed 13 June 2012: www.cdc.gov/ncbddd/hearingloss/ehdi-data2009.html.

³⁹³ National Center for Health Statistics, Center for Disease Control and Prevention, Office of Information Services. Hospice Care - Data Highlights: Terms Related to Agencies. Accessed 6/14/11: http://www.cdc.gov/nchs/nhhcs/nhhcs_hospice_highlights.htm; Updated 2010 Jan 15; Reviewed 2009 Nov 17.

³⁹⁴ Bretscher M, Rummans T, Sloan J, Kaur J, Bartlett A, Borkenhagen L, et al. Quality of Life in Hospice Patients: A Pilot Study. *Psychosomatics*. 1999 Jul-Aug;40(4):309-13. Accessed 6/14/2011: <http://www.psy.psychiatryonline.org/cgi/content/abstract/40/4/309>

³⁹⁵ *Ibid*.

-
- ³⁹⁶ Zerzan J, Stearns S, Hanson L. Access to Palliative Care and Hospice in Nursing Homes. *JAMA*. 2000;284(19):2489-94. Accessed 6/14/2011: <http://jama.ama-assn.org/content/284/19/2489.short> (doi:10.1001/jama.284.19.2489).
- ³⁹⁷ Wallston KA, Burger C, Smith RA, Baugher RJ. Comparing the quality of death for hospice and non-hospice cancer patients. *Med Care*. 1988 Feb;26(2):177-82. Accessed 6/14/2011: <http://www.ncbi.nlm.nih.gov/pubmed/3339915>.
- ³⁹⁸ Christakis NA, Iwashyna TJ. The health impact of health care on families: A matched cohort study of hospice use by decedents and mortality outcomes in surviving, widowed spouses. *Soc Sci Med*. 2003 Aug;57(3):465-75. Accessed 6/14/2011: <http://www.ncbi.nlm.nih.gov/pubmed/12791489>.
- ³⁹⁹ Pyenson B, Connor S, Fitch K, Kinzbrunner B. Medicare Cost in Matched Hospice and Non-Hospice Cohorts. *J Pain Symptom Manage*. 2004 Sep;28:200-10. Accessed 6/14/2011: http://www.nhpco.org/files/public/jpsm_costarticle_0904.pdf (doi:10.1016/j.jpainsymman.2004.05.003).
- ⁴⁰⁰ Connor SR, Pyenson B, Fitch K, Spence C, Iwasaki K. Comparing Hospice and Nonhospice Patient Survival Among Patients Who Die Within a Three-Year Window. *J Pain Symptom Manage*. 2007 Mar;33(3):238-46. Accessed 6/14/2011: <http://www.hpccr.org/pilotFiles/resourceLibraryFiles/files/Comparing%20hospice%20and%20nonhospice%20survival-JPSM-Connor-2007.pdf> (doi:10.1016/j.jpainsymman.2006.10.010).
- ⁴⁰¹ Hospice Association of America. Hospice facts & statistics. Updated November 2002. TABLE 2: Number of Medicare-Certified Hospices and Program Payments, by State, 1999. Source: CMS, Office of Information Services: Data from the Medicare Decision Support System; data development by the Office of Research, Development, and Information (October 2002). Note: Medicare program payments represent fee-for-service only; that is, program payments exclude amounts paid for managed care services. Numbers may not add to totals because of rounding. Accessed 14 June 2012: <http://www.nahc.org/Consumer/hpcstats.html>.
- ⁴⁰² National Association for Home Care and Hospice. Medicare hospice utilization and payments. From the Health Care Information System (HCIS) Hospice Agency National State Summary for Calendar Year 2009. Accessed 14 June 2012: <http://www.nahc.org/Facts/HPCUtilPay2009.pdf>.
- ⁴⁰³ *Ibid.*
- ⁴⁰⁴ Gold M, Jacobson G, Damico A, et al. Medicare advantage 2012 data spotlight: enrollment market update. Henry J. Kaiser Family Foundation. Accessed 14 June 2012: <http://www.kff.org/medicare/upload/8323.pdf>.
- ⁴⁰⁵ Hospice Association of America. Hospice facts and statistics. November 2010. Table 3: Distribution of Hospice Primary Payment Source, 2007 & 2008. Accessed 14 June 2012: <http://www.nahc.org/facts/HospiceStats10.pdf>. Source: National Hospice and Palliative Care Organization. NHCPO facts and figures: hospice care In America. Oct 2009.
- ⁴⁰⁶ Rischitelli G, Nygren P, Bougatsos C, Freeman M, Helfand M, editors. Screening for Elevated Lead Levels in Childhood and Pregnancy: Update of a 1996 U.S. Preventive Services Task Force Review. Rockville (MD): Agency for Healthcare Research and Quality (US); 2006 Dec. Accessed 6/17/2011: <http://www.ncbi.nlm.nih.gov/books/NBK33447/>
- ⁴⁰⁷ Shannon MW, Best D, Binns HJ, Kim JJ, Mazur LJ, Weil, WB, et al. Policy Statement: Lead Exposure in Children: Prevention, Detection, and Management, Committee on Environmental Health. *PEDIATRICS*. 2005 Oct; 116(4):1036-46. Accessed 6/17/2011: <http://aappolicy.aappublications.org/cgi/content/full/pediatrics;116/4/1036> (doi:10.1542/peds.2005-1947).
- ⁴⁰⁸ Rischitelli, *Op cit.*
- ⁴⁰⁹ *Ibid.*
- ⁴¹⁰ Lane WG, Kemper AR. American College of Preventive Medicine Practice Policy Statement: Screening for Elevated Blood Lead Levels in Children. *Am J Prev Med* 2001;20(1):78-82. Accessed 6/17/2011: http://www.acpm.org/polstmt_blood.pdf.
- ⁴¹¹ Centers for Disease Control and Prevention. Screening Young Children for Lead Poisoning: Guidance for State and Local Health Officials. Atlanta, GA: USDHHS, 1997. Accessed 6/17/2011: http://www.cdc.gov/nceh/lead/publications/1997/pdf/p1_12.pdf
- ⁴¹² Shannon MW, Best D, Binns HJ, Kim JJ, Mazur LJ, Weil, WB, et al. Policy Statement: Lead Exposure in Children: Prevention, Detection, and Management, Committee on Environmental Health. *PEDIATRICS*. 2005 Oct;
-

116(4):1036-46. Accessed 6/17/2011:

<http://aappolicy.aappublications.org/cgi/content/full/pediatrics;116/4/1036> (doi:10.1542/peds.2005-1947).

⁴¹³ Ellis MR, Kane KY. Lightening the lead load in children. *Am Fam Physician*. 2000 Aug 1;62(3):545-54, 559-60. Accessed 6/17/2011: <http://www.aafp.org/afp/20000801/545.html>.

⁴¹⁴ U.S. Preventive Services Task Force (USPSTF). Screening for elevated blood lead levels in children and pregnant women: recommendation statement. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006 Dec. 12. Accessed 6/17/2011: <http://www.uspreventiveservicestaskforce.org/uspstf/uspstflead.htm>.

⁴¹⁵ Sege RD, DeVos E. Evidence-Based Health Care for Children: What Are We Missing? Issue Brief (Commonw Fund). 2010 Apr;85:1-14. Accessed 6/13/2011: http://www.commonwealthfund.org/~media/Files/Publications/Issue%20Brief/2010/Apr/1395_Sege_evidencebased_hlt_care_children_ib_v2.pdf.

⁴¹⁶ 105 CMR 460.050: Department of Public Health Mandatory Lead Poisoning Screening and Follow-up Schedule §§C,D. Accessed 6/17/2011: <http://www.mass.gov/Eeohhs2/docs/dph/regs/105cmr460.pdf>.

⁴¹⁷ CDC's National Surveillance Data (1997-2009). Number of children tested and confirmed EBLs by state, year, and BLL group, children < 72 months old. Accessed 15 June 2012: http://www.cdc.gov/nceh/lead/data/StateConfirmedByYear_1997_2009.htm.

⁴¹⁸ American Cancer Society. *Cancer Facts and Figures 2010*. Atlanta: American Cancer Society, 2010. P.9 Accessed 6/9/2011:

<http://www.cancer.org/acs/groups/content/@epidemiologysurveillance/documents/document/acspc-026238.pdf>

⁴¹⁹ Berry DA, Cronin KA, Plevritis SK, Fryback DG, Clarke L, Zelen M, et al. Effect of Screening and Adjuvant Therapy on Mortality from Breast Cancer. *N Engl J Med*. 2005; 353: 1784-1792. Accessed 6/9/2011:

<http://www.nejm.org/doi/full/10.1056/NEJMoa050518#t=articleDiscussion>

⁴²⁰ National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: Breast Cancer Screening and Diagnosis, Version 1.2011. National Comprehensive Cancer Network, 2010. P.MS-3 Accessed 6/9/2011: http://www.nccn.org/professionals/physician_gls/pdf/breast-screening.pdf

⁴²¹ Smith RA, Saslow D, Sawyer KA, Burke W, Costanza ME, Evans, WP, et al. American Cancer Society Guidelines for Breast Cancer Screening: Update 2003. *CA Cancer J Clin*. 2003; 53:141. Accessed 6/9/2011:

<http://caonline.amcancersoc.org/cgi/content/full/53/3/141> (doi: 10.3322/canjclin.53.3.141).

⁴²² NCCN, *Op cit.*, P. BSCR-1.

⁴²³ U.S. Preventive Services Task Force. *Screening for Breast Cancer*. July 2010. Accessed 6/9/2011:

<http://www.uspreventiveservicestaskforce.org/uspstf/uspstfbrca.htm>

⁴²⁴ American Academy of Family Physicians. A-E: Recommendations for Clinical Preventive Services: Breast Cancer, Mammography, Before Age 50; Breast Cancer, Mammography, Women 50 and 74; Breast Cancer, Mammography, Women 75 Years and Older. Accessed 6/9/11: <http://www.aafp.org/online/en/home/clinical/exam/a-e.html>

⁴²⁵ Qaseem A, Snow V, Sherif K, Aronson M, Weiss KB, Owen DK. Screening Mammography for Women 40 to 49 Years of Age: A Clinical Practice Guideline from the American College of Physicians. *Annals of Internal Medicine*. 2007 Apr 7; 146(7):511-515. Accessed 6/9/2011: <http://www.annals.org/content/146/7/511.full>

⁴²⁶ American Congress of Obstetricians and Gynecologists. Interpreting the U.S. Preventive Services Task Force Breast Cancer Screening Recommendations for the General Population. Press Release: November 16, 2009. Accessed 6/9/2011: http://www.acog.org/from_home/Misc/uspstfinterpretation.cfm

⁴²⁷ Smith RA, Cokkinides V, Brooks D, et al. Cancer screening in the United States, 2010: a review of current American Cancer Society guidelines and issues in cancer screening. *CA Cancer J Clin*. 2010 Mar-Apr;60(2):99-119. Table 4. Prevalence (percent) of Recent Cancer Screening Examinations Among US Adults by Race and Ethnicity, Health Insurance Coverage, and Educational Level, National Health Interview Survey 2008. Accessed 18 June 2012: <http://onlinelibrary.wiley.com/doi/10.3322/caac.20063/full>.

⁴²⁸ Centers for Disease Control and Prevention (CDC). Behavioral risk factor surveillance system survey data. prevalence and trends data: Massachusetts - 2008. Women's Health. Accessed 18 June 2012: <http://apps.nccd.cdc.gov/brfss/list.asp?cat=WH&yr=2008&qkey=4421&state=All>.

⁴²⁹ GE Healthcare. Medicare reimbursement for mammography services 2009. Accessed 18 June 2012: http://www.gehealthcare.com/us/en/community/reimbursement/docs/mammography_cust_advisory_22609edit.pdf.

-
- ⁴³⁰ Alexander GR, Kotelchuck M. Assessing the Role and Effectiveness of Prenatal Care: History, Challenges and Directions for Future Research. *Public Health Rep.* 2001 Jul-Aug; 116(4): 311-6. Accessed 6/10/2011: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1497343/pdf/12037259.pdf>.
- ⁴³¹ Ryan GM, Sweeney PJ, Solola AS. Prenatal care and pregnancy outcome. *Am J Obstet Gynecol.* 1980 Aug 15;137(8):876-81. Accessed 6/11/2011: <http://www.ncbi.nlm.nih.gov/pubmed/7405983>.
- ⁴³² Mackay AP, Berg CJ, Atrash HK. Pregnancy-Related Mortality from Preeclampsia and Eclampsia. *Obstet Gynecol.* 2001 Apr; 97(4):533-8. Accessed 6/11/2011: http://journals.lww.com/greenjournal/Abstract/2001/04000/Pregnancy_Related_Mortality_From_Preeclampsia_and.11.aspx.
- ⁴³³ Langer O, Yogev Y, Most O, Xenakis EMJ. Gestational diabetes: The consequences of not treating. *Am J Obstet Gynecol.* 2005 Apr; 192(4):989-97. Accessed 6/11/2011: [http://www.ajog.org/article/S0002-9378\(04\)01997-0/abstract](http://www.ajog.org/article/S0002-9378(04)01997-0/abstract)
- ⁴³⁴ Turner BJ, McKee LJ, Silverman NS, Hauck WW, Fanning TR, Markson LE. Prenatal Care and Birth Outcomes of a Cohort of HIV-Infected Women. *J Acquir Immune Defic Syndr.* 1996 Jul; 12(3): 259-67. Accessed 6/10/2011: http://journals.lww.com/jaids/Abstract/1996/07000/Prenatal_Care_and_Birth_Outcomes_of_a_Cohort_of.5.aspx
- ⁴³⁵ Krueger PM, Scholl TO. Adequacy of prenatal care and pregnancy outcome. *J Am Osteopath Assoc.* 2000 Aug; 100(8): 485-492. Accessed 6/10/2011: <http://www.jaoa.org/cgi/reprint/100/8/485>.
- ⁴³⁶ Liu LL, Clemens CJ, Shay DK, Davis RL, Novack AH. The Safety of Newborn Early Discharge: The Washington State Experience. *JAMA.* 1997;278(4):293-8. Accessed 6/12/2011: http://jama.ama-assn.org/content/278/4/293.abstract?ijkey=56890376e8c435ace0f30dceb4fcdcf20e0d5973&keytype2=tf_ipsecsha (doi: 10.1001/jama.1997.03550040049036).
- ⁴³⁷ Kay DJ, DeFor TA, Diane J. Madlon-Kay, MD, MS and Terese A. DeFor, MS. Maternal Postpartum Health Care Utilization and the Effect of Minnesota Early Discharge Legislation. *J Am Board Fam Pract.* 2005 (Jul-Aug); 18:307-11. Accessed 6/12/2011: <http://www.jabfm.org/cgi/reprint/18/4/307>.
- ⁴³⁸ Center for Disease Control and Prevention, Division of Reproductive Health, U.S. Department of Health and Human Services. 2002 PRAMS Surveillance Report: Multistate Exhibits Infant Follow-Up and Well-Baby Care Modified 8/23/06; reviewed 5/13/09; accessed 6/12/2011: <http://www.cdc.gov/PRAMS/2002PRAMSSurvReport/MultiStateExhibits/Multistates17.htm#ch17fn4>.
- ⁴³⁹ Intrapartum and Postpartum Care of the Mother, Chapter 5. Guidelines for Perinatal Care, 6th edition. American Academy of Pediatrics and American College of Obstetricians and Gynecologists. 2007 Oct: 139-75.
- ⁴⁴⁰ Liu. *Op cit*.
- ⁴⁴¹ Bernstein HH, Spino C, Finch S, Wasserman R, Slora E, Lalama C, et al. Decision-Making for Postpartum Discharge of 4300 Mothers and Their Healthy Infants: The Life Around Newborn Discharge Study. *PEDIATRICS.* 2007 Aug 1; 120(2): e391-400. Accessed 6/12/2011: <http://pediatrics.aappublications.org/content/120/2/e391.abstract> (doi: 10.1542/peds.2006-3389).
- ⁴⁴² Stark AR, Adamkin DH, Baley JE, Bhutani VK, Carlo WA, Kumar P, et al. Hospital Stay for Healthy Term Newborns; Policy Statement: Committee on Fetus and Newborn. *PEDIATRICS.* 2010 Feb; 125(2):405-9. Accessed 6/12/2011: <http://aappolicy.aappublications.org/cgi/content/full/pediatrics;125/2/405> (doi:10.1542/peds.2009-3119).
- ⁴⁴³ Mercier CE, Barry SE, Paul K, Delaney TV, Horbar JD, Wasserman RC, et al. Improving newborn preventive services at the birth hospitalization: a collaborative, hospital-based quality-improvement project. *Pediatrics.* 2007 Sep;120(3):481-8. Accessed 6/12/2011: <http://pediatrics.aappublications.org/content/120/3/481.full> (doi: 10.1542/peds.2007-0233).
- ⁴⁴⁴ Udom NU, Betley CL. Effects of maternity-stay legislation on 'drive-through deliveries'. *Health Affairs.* 1998 Sep-Oct; 17(5):208-15. Accessed 6/10/2011: <http://content.healthaffairs.org/content/17/5/208.full.pdf> (doi: 10.1377/hlthaff.17.5.208).
- ⁴⁴⁵ Datar A, Sood N. Impact of Postpartum Hospital-Stay Legislation on Newborn Length of Stay, Readmission, and Mortality in California. *PEDIATRICS.* 2006 Jul 1; 118(1):63-72. Accessed 6/10/2011: <http://pediatrics.aappublications.org/content/118/1/63.full.html> (doi: 10.1542/peds.2005-3044).
- ⁴⁴⁶ Liu. *Op cit*.
-

-
- ⁴⁴⁷ Hemler R, Shekhawat P, Hoffman RG, Chetty VK, Sasidharan P. Hospital Readmission and Morbidity Following Early Newborn Discharge. *Clin Pediatr*. 1998 Oct; 37(10): 609-15. Accessed 6/12/2011: <http://cpj.sagepub.com/content/37/10/609.abstract> (doi: 10.1177/000992289803701003).
- ⁴⁴⁸ Malkin JD, Keeler E, Broder MS, Garber S. Postpartum Length of Stay and Newborn Health: A Cost-Effectiveness Analysis. *PEDIATRICS*. 2003 Apr 1; 111(4): e316-22. Accessed 6/12/2011: <http://pediatrics.aappublications.org/content/111/4/e316.full>.
- ⁴⁴⁹ *Ibid.*
- ⁴⁵⁰ Liu Z, Dow WH, Norton EC. Effect of drive-through delivery laws on postpartum length of stay and hospital charges. *J Health Econ*. 2004; 23(1):129-155. (doi: 10.1016/j.jhealeco.2003.07.005)
- ⁴⁵¹ Lane DA, Kauls LS, Ickovics JR, Naftolin F, Feinstein AR. Early Postpartum Discharges Impact on Distress and Outpatient Problems. *Arch Fam Med*. 1999;8:237-42. Accessed 6/12/2011: <http://archfami.ama-assn.org/cgi/content/abstract/8/3/237>.
- ⁴⁵² Mandl KD, Brennan TA, Wise PH, Tronick EZ, Homer CJ. Effects of Moderate Reductions in Postpartum Length of Stay. *Arch Pediatr Adolesc Med*. 1997;151(9):915-921. Accessed 6/12/2011: <http://archpedi.ama-assn.org/cgi/content/abstract/151/9/915>.
- ⁴⁵³ Braveman P, Egerter S, Pearl M, Marchi K, Miller C. Early Discharge of Newborns and Mothers: A Critical Review of the Literature. *PEDIATRICS*. 1995 Oct 1; 96(4):716-26. Accessed 6/12/2011: <http://pediatrics.aappublications.org/content/96/4/716.abstract>.
- ⁴⁵⁴ Udom. *Op cit.*
- ⁴⁵⁵ Liu. *Op cit.*
- ⁴⁵⁶ *Ibid.*
- ⁴⁵⁷ Udom. *Op cit.*
- ⁴⁵⁸ Liu. *Op cit.*
- ⁴⁵⁹ Stark. *Op cit.*
- ⁴⁶⁰ Paul IM, Phillips TA, Widome MD, Hollebeak CS. Cost-Effectiveness of Postnatal Home Nursing Visits for Prevention of Hospital Care for Jaundice and Dehydration. *PEDIATRICS*. 2004 Oct 1; 114(4): 1015-22. Accessed 6/12/2011: (doi: 10.1542/peds.2003-0766-L).
- ⁴⁶¹ Schonberg SK, Anderson SJ, Council on Child and Adolescent Health, et al. The Role of Home-Visitation Programs in Improving Health Outcomes for Children and Families. *PEDIATRICS*. 1998 Mar 1; 101(3):486-9. Accessed 6/12/2011: <http://pediatrics.aappublications.org/content/101/3/486.full>.
- ⁴⁶² U.S. Advisory Board on Child Abuse and Neglect. A Nation's Shame: Fatal Child Abuse and Neglect in the United States. 1995 Apr. Washington DC. Accessed 6/12/2011: <http://www.ican-ncfr.org/documents/Nations-Shame.pdf>.
- ⁴⁶³ Hahn RA, Bilukha OO, Crosby A, Fullilove MT, Liberman A, Moscicki EK. First Reports Evaluating the Effectiveness of Strategies for Preventing Violence: Early Childhood Home Visitation. Findings from the Task Force on Community Preventive Services. *MMWR Recomm Rep*. 2003 Oct; 52(RR-14) :1-9. Accessed 6/12/2011: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5214a1.htm>.
- ⁴⁶⁴ Paul. *Op cit.*
- ⁴⁶⁵ Braveman P, Miller C, Egerter S, Bennett T, English P, Katz P, Showstack J. Health service use among low-risk newborns after early discharge with and without nurse home visiting. *J Am Board Fam Pract*. 1996 Jul-Aug;9(4):254-60. Accessed 6/12/2011: <http://www.ncbi.nlm.nih.gov/pubmed/8829074>.
- ⁴⁶⁶ Armstrong KL, Fraser JA, Dadds MR, Morris J. A randomized, controlled trial of nurse home visiting to vulnerable families with newborns. *J Paediatr Child Health*. 1999;35 :237- 244. Accessed 6/12/2011: <http://www.ncbi.nlm.nih.gov/pubmed/10404442>.
- ⁴⁶⁷ Olds DL, Henderson CR Jr., Chamberlin R, Tatelbaum R. Preventing child abuse and neglect: a randomized trial of nurse home visitation. *Pediatrics*. 1986 Jul;78(1):65-78. Accessed 6/12/2011: <http://pediatrics.aappublications.org/content/78/1/65.full.pdf+html>.
- ⁴⁶⁸ *Ibid.*
- ⁴⁶⁹ Iyasu S, Randall LL, Welty TK, Hsia J, Kinney HC, Mandell F, et al. Risk factors for sudden infant death syndrome among northern plains Indians. *JAMA*. 2002 Dec 4;288(21) :2717-23. Accessed 6/12/2011: <http://jama.ama-assn.org/content/288/21/2717.full.pdf+html> (doi: 10.1001/jama.288.21.2717).
-

-
- ⁴⁷⁰ Thomson Healthcare. The healthcare costs of having a baby. June 2007. Study for the March of Dimes. Accessed 28 June 2012:
http://www.marchofdimes.com/downloads/The_Healthcare_Costs_of_Having_a_Baby.pdf.
- ⁴⁷¹ Massachusetts Department of Public Health, Bureau of Health Information, Statistics, Research and Evaluation. Massachusetts births 2009. Aug 2011. Accessed 28 June 2012: <http://www.mass.gov/eohhs/docs/dph/research-epi/birth-report-2009.pdf>.
- ⁴⁷² National Research Council and Institute of Medicine. (2004). Children's Health, the Nation's Wealth: Assessing and Improving Child Health. Committee on Evaluation of Children's Health. Board on Children, Youth, and Families, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.
- ⁴⁷³ Sege RD, DeVos E. Evidence-Based Health Care for Children: What Are We Missing? Issue Brief (Commonw Fund). 2010 Apr;85:1-14. Accessed 6/13/2011:
http://www.commonwealthfund.org/~media/Files/Publications/Issue%20Brief/2010/Apr/1395_Sege_evidencebased_hlt_care_children_ib_v2.pdf.
- ⁴⁷⁴ Tanski S, Garfunkel LC, Duncan PM, Weitzman, M, eds 2010. Performing Preventive Services: A Bright Futures Handbook. Elk Grove Village, IL: American Academy of Pediatrics. Accessed 6/14/2011:
<http://brightfutures.aap.org/pdfs/Preventive%20Services%20PDFs/Forward%20and%20Introduction.pdf>.
- ⁴⁷⁵ Schor EL. Rethinking Well-Child Care. PEDIATRICS. 2004 Jul 1; 114(1):210-6. Accessed 6/14/2011: (doi: 10.1542/peds.114.1.210).
- ⁴⁷⁶ Moyer VA, Butler M. Gaps in the Evidence for Well-Child Care: A Challenge to Our Profession. PEDIATRICS. 2004 Dec 1;114(6):1511-21. Accessed 6/14/2011: <http://pediatrics.aappublications.org/content/114/6/1511.full> (doi: 10.1542/peds.2004-1076).
- ⁴⁷⁷ Hambidge SJ, Emsermann CB, Federico S, Steiner JF. Disparities in Pediatric Preventive Care in the United States, 1993-2002. Arch Pediatr Adolesc Med. 2007;161(1):30-36. Accessed 6/14/2011: <http://archpedi.ama-assn.org/cgi/content/full/161/1/30>.
- ⁴⁷⁸ Schor. *Op cit*.
- ⁴⁷⁹ Houtrow AJ, Kim SE, Chen AY, Newacheck PW. Preventive Health Care for Children With and Without Special Health Care Needs. PEDIATRICS. 2007 Apr 1;119(4):e821-8. Accessed 6/14/2011:
<http://pediatrics.aappublications.org/content/119/4/e821.full> (doi: 10.1542/peds.2006-1896).
- ⁴⁸⁰ Sege, *Op cit*.
- ⁴⁸¹ Hagan JF, Shaw JS, Duncan PM, eds. 2008. Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents, Third Edition. Elk Grove Village, IL: American Academy of Pediatrics. Accessed 6/14/2011:
http://brightfutures.aap.org/3rd_Edition_Guidelines_and_Pocket_Guide.html.
- ⁴⁸² Tanski, *Op cit*.
- ⁴⁸³ American Academy of Pediatrics. AAP Home: Bright Futures Home: About Us: History. Accessed 6/14/2011:
<http://brightfutures.aap.org/history.html>.
- ⁴⁸⁴ Hagan, *Op cit*. Chapter 13: Rationale and Evidence, pp 221-50. Accessed 6/14/2011:
http://brightfutures.aap.org/pdfs/Guidelines_PDF/13-Rationale_and_Evidence.pdf
- ⁴⁸⁵ US Department of Labor. Bureau of Labor Statistics. Accessed 12 June 2012:
<http://data.bls.gov/pdq/SurveyOutputServlet>.
- ⁴⁸⁶ U.S. Food & Drug Administration. FDA Basics. Page last updated 6/21/2011; Accessed 6/23/2011:
<http://www.fda.gov/AboutFDA/Transparency/Basics/default.htm>.
- ⁴⁸⁷ National Cancer Institute. Understanding the Approval Process for New Cancer Treatments; Q&A: Off-Label Drugs. Posted: 12/30/1999, Updated: 01/06/2004, Accessed 6/27/2011:
<http://www.cancer.gov/clinicaltrials/education/approval-process-for-cancer-drugs/page5>
- ⁴⁸⁸ Dresser R, Frader J. Off-label prescribing: a call for heightened professional and government oversight. J Law Med Ethics. 2009 Fall;37(3):476-86, 396. Accessed 6/23/2011:
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1763292
- ⁴⁸⁹ H. J. DeMonaco, A. Ali, E. von Hippel. The Major Role of Clinicians in the Discovery of Off-Label Therapies. Pharmacotherapy. 2006;26(3):323-32. Accessed 6/23/2011: <http://www.medscape.com/viewarticle/529167>
- ⁴⁹⁰ D.C. Radley, S.N. Finkelstein, R.S. Stafford. Off-Label Prescribing among Office-Based Physicians. [Arch Intern Med](#). 2006 May 8;166(9):1021-6. Accessed 6/23/2011: <http://archinte.ama-assn.org/cgi/content/abstract/166/9/1021>.
-

-
- ⁴⁹¹ Shopper's Guide to Prescription Drugs Number 6 - www.CRBestBuyDrugs.org: "Off-Label" Drug Use. Accessed 6/24/2011: <http://www.consumerreports.org/health/resources/pdf/best-buy-drugs/money-saving-guides/english/Off-Label-FINAL.pdf>
- ⁴⁹² Peppercorn J, Burstein H, Miller FG, Winer E, Joffe S. Self-reported practices and attitudes of US oncologists regarding off-protocol therapy. *J Clin Oncol*. 2008;26(36):5994–6000. Accessed 6/27/2011: <http://jco.ascopubs.org/content/26/36/5994.abstract> (doi: 10.1200/JCO.2008.18.1420).
- ⁴⁹³ American Cancer Society. Off Label Drug Use: What Is Off-Label Drug Use? Last Medical Review and Update: 3/14/2011; Accessed 6/27/2011: <http://www.cancer.org/Treatment/TreatmentsandSideEffects/TreatmentTypes/Chemotherapy/off-label-drug-use>
- ⁴⁹⁴ T. T. Perls, N. R. Reisman, and S. J. Olshansky. Provision or Distribution of Growth Hormone for 'Antiaging.' *JAMA*. 2005;294(17):2086-90. Accessed 6/24/2011: http://www.google.com/url?sa=t&source=web&cd=3&ved=0CCsQFjAC&url=http%3A%2F%2Fcentrostudi.gruppoabele.org%2Fdoping%2F%3Fq%3Dsystem%2Ffiles%2F5_Provision%2Bor%2BDistribution%2Bof%2BGrowth%2Bhormone%2Bfor%2BAntiaging.pdf&ei=3koETpvYDsWSOt7W4LwN&usq=AFQjCNFRnkfluuDSohuoTPIE4DCTwt_bHg&sig=2=sVUorWnKSBD983hDYldo2A (doi:10.1001/jama.294.16.2086).
- ⁴⁹⁵ Peppercorn, *Op cit*.
- ⁴⁹⁶ Radley, *Op cit*.
- ⁴⁹⁷ Dresser, *Op cit*.
- ⁴⁹⁸ American Medical Association House of Delegates. Health and Ethics Policies: Patient Access to Treatments Prescribed by Their Physicians, H-120.988. Accessed 6/24/2011: <https://ssl3.ama-assn.org/apps/ecommm/PolicyFinderForm.pl?site=www.ama-assn.org&uri=%2Fresources%2Fdoc%2FPolicyFinder%2Fpolicyfiles%2FHnE%2fH-120.988.HTM>.
- ⁴⁹⁹ Snyder L, Leffler C; Ethics and Human Rights Committee, American College of Physicians. Ethics manual: fifth edition. *Ann Intern Med*. 2005 Apr 5;142(7):560-82. Accessed 6/24/2011: http://www.acponline.org/running_practice/ethics/manual/ethicman5th.htm.
- ⁵⁰⁰ American Medical Association House of Delegates, *Op cit*.
- ⁵⁰¹ Abernethy AP, Raman G, Balk EM, Hammond JM, Orlando LA, Wheeler JL, et al. Systematic review: reliability of compendia methods for off-label oncology indications. *Ann Intern Med*. 2009 Mar 3;150(5):336-43. Accessed 6/27/2011: <http://www.annals.org/content/150/5/336.full>.
- ⁵⁰² Snyder, *Op cit*.
- ⁵⁰³ Medicare Prescription Drug Benefit Manual, V02.19.10: Chapter 6 Part D Drug and Formulary Requirements, Section 10.6. Accessed 6/24/2011: <http://www.cms.gov/PrescriptionDrugCovContra/Downloads/Chapter6.pdf>
- ⁵⁰⁴ *Ibid*.
- ⁵⁰⁵ U.S. Food & Drug Administration. Good Reprint Practices for the Distribution of Medical Journal Articles and Medical or Scientific Reference Publications on Unapproved New Uses of Approved Drugs and Approved or Cleared Medical Devices. January 2009. Page last updated 8/6/2009; Accessed 6/23/2011: <http://www.fda.gov/RegulatoryInformation/Guidances/ucm125126.htm>
- ⁵⁰⁶ Harris Interactive, "U.S. Adults Ambivalent about the Risks and Benefits of Off-label Prescription Drug Use," December 7, 2006. Accessed 6/23/2011: <http://www.harrisinteractive.com/news/printerfriend/index.asp?NewsID=1126>.
- ⁵⁰⁷ Snyder, *Op cit*.
- ⁵⁰⁸ Brosgart CL, Mitchell T, Charlebois E, Coleman R, Mehalko S, Young J, Abrams DI. Off-label drug use in human immunodeficiency virus disease. *J Acquir Immune Defic Syndr Hum Retrovirol*. 1996 May 1;12(1):56-62. Accessed 6/21/2011: <http://www.ncbi.nlm.nih.gov/pubmed/8624761>
- ⁵⁰⁹ U.S. Food & Drug Administration. HIV Specific Resources Expanded Access and Expedited Approval of New Therapies Related to HIV/AIDS. Page last updated 8/13/2009; Accessed 6/21/2011: <http://www.fda.gov/ForConsumers/ByAudience/ForPatientAdvocates/SpeedingAccessToImportantNewTherapies/ucm181838.htm>
- ⁵¹⁰ U.S. Food & Drug Administration. Treatment Use of Investigational Drugs - Information Sheet: PARALLEL TRACK. Page last updated 10/19/2010; Accessed 6/21/2011: <http://www.fda.gov/RegulatoryInformation/Guidances/ucm126495.htm>.
- ⁵¹¹ *Ibid*.

-
- ⁵¹² Summers, L.H. Some simple economics of mandated benefits. *American Economic Review* 1989 79(2), 177-83.
- ⁵¹³ Ibid
- ⁵¹⁴ See for example, Gabel, J, Jensen, G. The price of state mandated benefits. *Inquiry* 1989; 26:419-431.
- ⁵¹⁵ Gruber, J. State-mandated benefits and employer-provided health insurance." *Journal of Public Economics*. 1994; 55:433-464.
- ⁵¹⁶ Acs, G., Long, S.H., Marquis, S.M., and Short, P.F. Self-insured employer health plans: prevalence, profile, provisions, and premiums. *Health Affairs* 1996; 15 (2): 266-278.
- ⁵¹⁷ Blue Cross/Blue Shield of Massachusetts, Harvard Pilgrim Health Care, Tufts Health Plan, Connecticare, and Health New England.
- ⁵¹⁸ See for example, Kominski, GF, et. al. The California cost and coverage model: analyses of the financial impacts of benefit mandates for the California legislature. *Health Serv Re*, 2006 Jun 1;41(3) Part II.
- ⁵¹⁹ Massachusetts Center for Health Information and Analysis. Massachusetts health care cost trends, premium levels and trends in private health plans: 2007 – 2009. Table 18. 2011 May 1.
- ⁵²⁰ Average premium obtained from: Massachusetts Center for Health Information and Analysis. Massachusetts health care cost trends premiums and expenditures. Figure 1. 2012 May 1.
- ⁵²¹ 2009 US Census Bureau Actual.
- ⁵²² Total member months and distribution of enrollment in private comprehensive health insurance products, 2007-2009 (Oliver Wyman analysis of data from Massachusetts carriers for resident and non-resident insured lives).
- ⁵²³ IRS Individual Master File. *Statistics of Income*. Aug 2011.
- ⁵²⁴ MA Dept of Revenue. Statistical reports. Accessed 12 June 2012: <http://www.mass.gov/dor/tax-professionals/news-and-reports/statistical-reports/>.
- ⁵²⁵ US Census Bureau. American fact finder. Accessed 12 June 2012: <http://factfinder2.census.gov>. Gender statistics for 2009 were not available so 2010 statistics were used to develop female percentages.



Center for Health Information and Analysis

Center for Health Information and Analysis
Two Boylston Street
Boston, Massachusetts 02116

Phone: (617) 988-3100
Fax: (617) 727-7662

Website: www.mass.gov/chia

Publication Number: 13-10-CHIA-01
Authorized by Gary Lambert, State Purchasing Agent