



Commonwealth
of Massachusetts

Center for Health
Information and Analysis

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Mandated Benefit Review of House Bill 931:

An Act Relative to Mastectomies

September 2013

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Benefit Mandate Overview: An Act Relative to Mastectomies

History of the Bill

Massachusetts General Laws, chapter 3, section 38C requires the Center for Health Information and Analysis (CHIA) to review and evaluate the potential fiscal impact of each benefit mandate bill referred to the agency by a legislative committee.

The Joint Committee on Financial Services referred House Bill 2064, “An Act relative to mastectomies,” to the Division of Health Care Finance and Policy (DHCFP) on March 16, 2012 for review. When the new legislative session began on January 2, 2013, a similar bill – H.B. 931 – was filed, and the Committee requested that CHIA, successor agency to DHCFP, modify the scope of the review to reflect the revised bill.

What Does the Bill Propose?

H.B. 931 requires that health insurance plans defined in the bill provide “coverage for the cost of a mastectomy and coverage for a minimum of 48 hours in-patient care” following the procedure.

Mastectomy Types Covered by the Bill

The U.S. National Cancer Institute defines mastectomy as “surgery to remove a breast...performed either to treat or to prevent breast cancer,” and names four types: total mastectomy, modified radical mastectomy, radical mastectomy and lumpectomy. CHIA’s analysis interprets this proposed mandate’s provisions to apply only to procedures that remove the full breast (total, modified radical, and radical), and not lumpectomies, which are partial procedures most commonly performed on an outpatient basis.

Current Coverage

All six major Massachusetts insurers surveyed by CHIA for this review cover mastectomies; they also cover post-procedure inpatient hospital stays between 24 hours and seven days. Some do not pre-define the covered length of stay. Insurers may require pre-authorization in order to approve a certain length of stay; additionally, many require that an approved hospital stay meet their standard of “medical necessity,” “medical judgment,” or “best practices.”

Cost of Implementing the Bill

Adding this benefit to fully-insured health plans would result in a low-end estimate of zero impact and a high-end estimate of adding 2 cents to the typical member’s monthly health insurance premiums (0.004 percent) over the next five years.

Plans Affected by the Proposed Benefit Mandate

Individual and group accident and sickness insurance policies, corporate group insurance policies, and HMO policies issued pursuant to the Massachusetts General Laws, as well as the Group Insurance Commission (GIC) covering state employees and their dependents would be subject to this mandate.

The proposed benefit mandate would apply to members covered under the relevant plans, regardless of whether they reside within the Commonwealth or merely have their principal place of employment in the Commonwealth.

Plans Not Affected by the Proposed Benefit Mandate

Health insurance plans operated as self-insured entities (i.e., where the employer policyholder retains the risk for medical expenditures and uses the insurer to provide administrative functions) are subject to federal law and not to state-level benefit mandates.

State-mandated health benefits do not apply to Medicare and Medicare Advantage plans whose benefits are qualified by Medicare. Consequently this analysis excludes any members of commercial fully-insured plans over 64 years of age. These mandates also do not apply to federally-funded plans including TRICARE (covering military and dependents), Veterans Administration, the Federal Employees' Health Benefit program, and Medicaid/MassHealth.

Implications of the Federal Affordable Care Act

While this fiscal impact review focuses on premiums in accordance with H.B. 931, Affordable Care Act (ACA) changes have since gone into effect. In accordance with §1311(d)(3)(B) of the ACA and as codified in CFR §155.170, the Commonwealth is required to offset the costs of benefit mandates not included in the state's Essential Health Benefits (EHB) benchmark plan for individuals enrolled in Qualified Health Plans (QHPs) through the Health Connector, the state's ACA-compliant Exchange, or outside of the Exchange. Specifically, the costs of these mandated benefits will need to be supported through the state's operating budget or through other state resources. This would include the costs for any benefit mandates enacted on or after January 1, 2012.

As of September 2013, state-mandated benefits enacted on or after January 1, 2012 (and therefore not included in the state's EHB benchmark plan) include:

1. Cleft Palate and Cleft Lip
(M.G.L. c. 175 § 47BB; M.G.L. c. 176A § 8EE; M.G.L. c. 176B § 4EE; and M.G.L. c. 176G § 4W)
2. Hearing Aids for Children
(M.G.L. c. 175 § 47X(f); M.G.L. c. 176A § 8Y(f); M.G.L. c. 176B § 4EE; and M.G.L. c. 176G § 4N)
3. Oral Cancer Therapy
(M.G.L. c. 175 § 47DD; M.G.L. c. 176A § 8FF; M.G.L. c. 176B § 4FF; and M.G.L. c. 176G § 4X)

Medical Efficacy Assessment: An Act Relative to Mastectomies

Massachusetts House Bill 931 requires health insurance plans to cover the cost of a mastectomy and a minimum of 48 hours in-patient care following the procedure. M.G.L. c. 3 § 38C charges the Massachusetts Center for Health Information and Analysis (CHIA), formerly the Division of Health Care Finance and Policy, with reviewing the medical efficacy of mandating each benefit. Medical efficacy reports include the potential impact that the benefit(s) could have on the quality of patient care and health status of the population as well as research results addressing the medical efficacy of the treatment or service compared to alternative treatments.

Types of Mastectomies

The U.S. National Cancer Institute defines mastectomy as “surgery to remove a breast...performed either to treat or to prevent breast cancer,” and names four types: Total mastectomy, modified radical mastectomy, radical mastectomy and lumpectomy.¹ Of these, lumpectomies are considered partial procedures and the others are considered removal of the full breast (or breast plus adjoining lymph nodes and/or chest muscles).

Radical mastectomies are much less common today than in the early- to mid-20th century.² The number of mastectomies being performed has been trending down for some time, in favor of more breast tissue-conserving procedures. However, in the past decade, some studies have found this trend starting to reverse in some cases.³

Both men and women can get breast cancer, although women make up more than 99 percent of the cases.⁴ H.B. 931 applies equally to men and women.

CHIA’s analysis interprets this mandate’s provisions to apply only to procedures that remove the full breast (total, modified radical, and radical), and not lumpectomies, which are partial procedures that typically occur in an outpatient setting.

Prevalence of Mastectomy Procedures

The actuarial analysis performed by Compass Health Analytics for this report found an overall prevalence of 0.26 per 1,000 in Massachusetts for the mastectomy procedure, excluding lumpectomies, during calendar year 2011.⁵ That is, approximately one in every 3,800 people in the covered population had a mastectomy during the studied year.⁶

Mastectomy Patient Characteristics

A 2012 National Cancer Institute study of Medicare recipients found that between 1999 and 2002, women whose cancer was in a later stage, who were older, whose tumors were larger, or who had more comorbid conditions were more likely to seek total mastectomies than partial or alternative procedures.⁷ With respect to age, a 2010 study using California patient data suggested that between 2002 and 2007, mastectomy as a therapy for early-stage breast cancer increased at the highest rate among younger women.⁸ Geographic U.S. location has also been cited as having an influence on whether a woman has a mastectomy or another procedure (women in the Midwest and Southwestern United States appear more likely to undergo the procedure compared to alternatives).⁹

Prophylactic mastectomies (a preventive measure chosen by some women with a family history of breast cancer or other risk factors) have been on the rise in recent years.^{10,11} False positive results from breast magnetic resonance imaging, or MRIs,^{12,13} the availability of improved breast reconstruction techniques, more recently-available tests for BRCA1 or BRCA2 gene mutation (which indicate increased breast and ovarian cancer risk) and/or fear of the disease recurring or of the risks of radiation therapy have been cited as reasons that lead some women to take these steps.¹⁴

Some women might elect to have a mastectomy for a medical reason other than cancer or if undergoing a female-to-male (transgender) surgical transition.* A man might additionally wish to opt for the procedure if diagnosed with gynecomastia (swelling of the breast tissue in boys and men, caused by an imbalance of the hormones estrogen and testosterone). The language in H.B. 931 neither allows nor rules out required coverage of the procedure and post-procedure hospital stay for voluntary procedures.

Current Coverage: Post-operative Stays and Costs

Lifetime per-patient costs of breast cancer were found to range from \$20,000 to \$100,000 annually in a 2009 *Pharmacoeconomics* review of the literature, which cited a 2001 study that had found \$33,109 in lifetime costs associated with a mastectomy plus adjuvant chemotherapy used to treat breast cancer.¹⁵

A 2011 study found the mean costs of a prophylactic (preventive) mastectomy of the non-cancerous breast for women with breast cancer in the other breast to be comparable to the cost of routine cancer-prevention surveillance (e.g., mammography, magnetic resonance imaging) of the non-cancerous breast: \$36,594 for surgery over the course of a lifetime for women 45 years of age, compared to \$35,182 for surveillance. Preventive mastectomies were found to be “clearly cost-effective” in patients who tested positive for the BRCA gene, while cost-effectiveness was found to be “highly dependent on assumptions relating to quality of life” for patients who tested negative for the gene.¹⁶

The cost of a prophylactic mastectomy procedure alone, used as preventive treatment for patients with the BRCA1 or BRCA2 gene (predicting a likelihood of developing breast cancer), was cited by Anderson in the *Annals of Internal Medicine* (2006) as \$11,303.¹⁷

Current medical literature documenting the efficacy of mastectomy post-operative stays of a certain specified length was difficult to locate. Anecdotal evidence suggests that some women may benefit from inpatient stays in order to recover from surgery and anesthesia, and control and learn to manage pain associated with a mastectomy, while others prefer to be at home as soon as possible following the procedure.¹⁸ In a 2009 study published in *Nursing* journal, Weaver noted that “Women undergoing mastectomies will need more nursing care than [those] undergoing lumpectomy, as well as extra emotional support and extensive patient education about postoperative care.”¹⁹

* The text of H.B. 931 does not specify that coverage for inpatient stays for mastectomies be limited to cancer-related procedures. However, in conversations with the bill’s sponsor it was clear that the intent of the bill was to provide expanded access to breast cancer care. As a result, our analysis focuses only on the costs of breast cancer-related mastectomies and not mastectomies for other conditions.

Endnotes

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**Actuarial Assessment of House Bill 931:
An Act relative to mastectomies**

Prepared for
Commonwealth of Massachusetts
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April 2013

Prepared by
Compass Health Analytics, Inc.



Actuarial Assessment of House Bill 931: An Act relative to mastectomies

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Actuarial Assessment of House Bill 931: An Act relative to mastectomies

Executive Summary

Massachusetts House Bill 931 requires health insurance plans to cover the cost of a mastectomy and a minimum of 48 hours of inpatient care.¹ M.G.L. c. 3 § 38C charges the Massachusetts Center for Health Information and Analysis (CHIA, formerly the Division of Health Care Finance and Policy) with, among other duties, reviewing the potential impact of proposed mandated health care insurance benefits on premiums paid by employers and consumers. CHIA has engaged Compass Health Analytics, Inc. to provide an actuarial estimate of the effect that enactment of the bill would have on the cost of health care insurance in Massachusetts.

Background

H.B. 931 requires that health insurance plans provide “coverage for the cost of a mastectomy and coverage for a minimum of 48 hours of in-patient care.”

In general, a mastectomy is surgery to remove a breast, most often performed for the treatment or prevention of cancer.² The most common types of mastectomy surgeries include total mastectomy (removal of breast tissue and nipple); modified radical mastectomy (removal of the breast, most lymph nodes under the arm, and sometimes lining over the chest muscles); and radical mastectomy (removal of breast, lymph nodes and chest muscles). Mastectomies for gynecomastia are also performed for the removal of enlarged breasts in men.

All insurers surveyed for this study pay for the cost of mastectomy and related services, and none reported explicit limits on length-of-stay. Some require prior authorization for the procedure and/or conduct concurrent review during inpatient stays.

Broadly, the term mastectomy could encompass partial mastectomy surgery, in which a tumor and some normal surrounding tissue are removed; these surgeries include lumpectomy, quadrantectomy and segmental mastectomy, and are also known as breast-sparing or breast-conserving surgeries (BCS), as most of the breast remains.³ (For the sake of clarity, this analysis

¹ This bill was introduced into the 187th General Court (2011-2012) as House Bill 2064. The bill has been re-introduced to the 188th General Court as House Bill 931. This analysis will be guided by the intent as communicated to the Center by the sponsors in discussions about the bill and by the language of the re-submitted version.

² NIH, National Cancer Institute. Accessed 28 March 2013: <http://www.cancer.gov/dictionary?cdrid=304750>. Breast-sparing surgery is “[a]n operation to remove the breast cancer but not the breast itself. Types of breast-sparing surgery include lumpectomy (removal of the lump), quadrantectomy (removal of one quarter, or quadrant, of the breast), and segmental mastectomy (removal of the cancer as well as some of the breast tissue around the tumor and the lining over the chest muscles below the tumor).”

³ National Cancer Institute. Surgery Choices for Women with DCIS or Breast Cancer. Accessed 22 February 2013: <http://www.cancer.gov/cancertopics/treatment/breast/surgerychoices.pdf>.

will refer to all partial mastectomies as lumpectomies.) Based on the stated intent of the bill's sponsor, and on the opinion of at least one breast cancer specialist that convention in surgical nomenclature does not place lumpectomy within mastectomy, this analysis assumes the mandated minimum of 48 hours of inpatient care does not apply to lumpectomy procedures.

Analysis

Compass estimated the impact of H.B. 931 through the following steps:

- Estimate the populations covered by the mandate, projected for the coming five years
- Estimate the annual rate of mastectomy in the relevant insured population
- Estimate the proportion of cases currently performed on outpatient and inpatient bases
- Estimate the proportion of cases with and without immediate reconstruction
- For inpatient services, estimate the number of cases in which a one-day stay would increase to a two-day stay owing to the mandate
- For outpatient services, estimate the proportion of cases that would be performed on an inpatient basis owing to the mandate
- Estimate the cost difference between an average one-day inpatient stay and an average two-day inpatient stay, and between an average outpatient "stay" and an average two-day inpatient stay, recognizing low-, mid-, and high-level values
- Apply the marginal costs to the estimated utilization changes to calculate the proposed mandate's incremental effect on carrier medical expense
- Estimate the impact on premiums of insurers' retention (administrative costs and profit)
- Project the estimated cost over the next five years

Trends in breast cancer treatment and surgical approach present some degree of uncertainty to the projections in this analysis, as these will continue to change over the next five years and will affect the case mix for breast cancer patients.

Summary results

Table ES-1 summarizes the effect of H.B. 931 on premium costs for fully-insured plans, averaged over five years. The analysis finds that H.B. 931 may increase monthly premiums by \$0.001 to \$0.021 over the next five years.

The degree of precision achievable in this analysis is hampered by the inherent difficulty in estimating marginal costs of treatment while holding case complexity and acuity constant. But while the results have some variation as evidenced by the ratio between low- and high-level scenarios, even the high-level estimate represents a very small increase in overall premiums.

The relatively small magnitude of this estimated impact is driven by two key assumptions: First, this analysis assumes that lumpectomies are not included under the terms of this mandate. If these surgeries were included, the potential impact of the bill would rise, as lumpectomies comprise over 70% of all mastectomy surgeries in the Massachusetts claims analyzed for this study, and over 85% are conducted on an outpatient basis. Second, the number of impacted cases included in this analysis is driven primarily by the assumptions regarding the number of patients and physicians who would choose to increase their length of inpatient stay beyond one day, or to stay overnight following surgery, solely as a result of this mandate. These assumptions are based on conversations with providers and insurers, which revealed no existing explicit or experienced limit on inpatient length of stay following mastectomy, and their observations of current patient preferences.

The impact of H.B. 931 on premiums rises steadily throughout the 2014-2018 analysis period because of the underlying assumptions about continuing increases in the average marginal cost of the procedures. Finally, the impact of the bill on any one individual, employer-group or carrier may vary from the overall results depending on the current level of benefits each receives or provides, on how the benefits will change under the proposed mandate, and upon the disease and treatment profile of a specific population.

**Table ES-1:
Estimated Incremental Impact of H.B. 931 on Premium Costs**

| | 2014 | 2015 | 2016 | 2017 | 2018 | Average | 5-Yr Total |
|--------------------------------|---------|---------|---------|---------|---------|---------|------------|
| Members (000's) | 2,219 | 2,195 | 2,171 | 2,146 | 2,121 | 2,170 | |
| Medical Expense Low (\$000's) | \$27 | \$28 | \$29 | \$29 | \$30 | \$29 | \$143 |
| Medical Expense Mid (\$000's) | \$212 | \$218 | \$224 | \$230 | \$237 | \$224 | \$1,121 |
| Medical Expense High (\$000's) | \$468 | \$481 | \$495 | \$509 | \$523 | \$495 | \$2,476 |
| Premium Low (\$000's) | \$30 | \$31 | \$31 | \$32 | \$33 | \$31 | \$157 |
| Premium Mid (\$000's) | \$233 | \$240 | \$247 | \$254 | \$261 | \$247 | \$1,235 |
| Premium High (\$000's) | \$515 | \$530 | \$545 | \$561 | \$576 | \$546 | \$2,728 |
| PMPM Low | \$0.001 | \$0.001 | \$0.001 | \$0.001 | \$0.001 | \$0.001 | \$0.001 |
| PMPM Mid | \$0.009 | \$0.009 | \$0.009 | \$0.010 | \$0.010 | \$0.009 | \$0.009 |
| PMPM High | \$0.019 | \$0.020 | \$0.021 | \$0.022 | \$0.023 | \$0.021 | \$0.021 |
| Estimated Monthly Premium | \$487 | \$512 | \$537 | \$564 | \$592 | \$538 | \$538 |
| Premium % Rise Low | 0.000% | 0.000% | 0.000% | 0.000% | 0.000% | 0.000% | 0.000% |
| Premium % Rise Mid | 0.002% | 0.002% | 0.002% | 0.002% | 0.002% | 0.002% | 0.002% |
| Premium % Rise High | 0.004% | 0.004% | 0.004% | 0.004% | 0.004% | 0.004% | 0.004% |

Actuarial Assessment of House Bill 931: An Act relative to mastectomies

1. Introduction

Massachusetts House Bill 931 requires health insurance plans to cover the cost of a mastectomy and a minimum of 48 hours of inpatient care.⁴ M.G.L. c. 3 § 38C charges the Massachusetts Center for Health Information and Analysis (CHIA, formerly the Division of Health Care Finance and Policy) with, among other duties, reviewing the potential impact of proposed mandated health care insurance benefits on the premiums paid by employers and consumers. CHIA has engaged Compass Health Analytics, Inc. to provide an actuarial estimate of the effect that enactment of the bill would have on the cost of health care insurance in Massachusetts.

Assessing the impact of this bill entails analyzing the incremental effect of the bill on spending by insurance plans. This in turn requires comparing spending under the provisions of the proposed law to spending under current statutes and current benefit plans for the relevant services.

Section 2 of this analysis outlines the provisions of the bill. Section 3 summarizes the methodology used for the estimate. Section 4 discusses important considerations in translating the bill's language into estimates of its incremental impact on health care costs. Section 5 describes the calculation of the estimate.

2. Interpretation of H.B. 931

The following subsections describe the provisions of H.B. 931, as redrafted for the 188th General Court.

2.1. Plans affected by the proposed mandate

The bill amends the statutes that regulate insurers providing health insurance in Massachusetts. It has the following five sections, each addressing statutes dealing with a particular type of health insurance policy:

- Section 1: Insurance for persons in service of the Commonwealth (creating M.G.L. c. 32A, § 17L)
- Section 2: Accident and sickness insurance policies (creating M.G.L. c. 175, § 47EE)
- Section 3: Contracts with non-profit hospital service corporations (creating M.G.L. c. 176A, § 8FF)

⁴ This bill was introduced into the 187th General Court (2011-2012) as House Bill 2064. The bill has been re-introduced to the 188th General Court as House Bill 931. This analysis will be guided by the intent as communicated to the Center by the sponsors in discussions about the bill and by the language of the re-submitted version.

- Section 4: Certificates under medical service agreements (creating M.G.L. c. 176B, § 4GG)
- Section 5: Health maintenance contracts (creating M.G.L. c. 176G, § 4Y)

All sections mandate coverage for members covered under the relevant plans, regardless of whether they reside within the Commonwealth or merely have their principal place of employment in the Commonwealth.

Health insurance plans operated as self-insured entities (i.e., where the employer policyholder retains the risk for medical expenditures and uses the insurer to provide administrative functions) are subject to federal law, and not to state-level mandates. Section 1 of the bill directs the commissioners of the Commonwealth’s own largely self-insured employee plan (the Group Insurance Commission, or GIC) to provide coverage. While the bill reaches the GIC, CHIA has instructed Compass not to include it in this analysis.⁵

State health benefit mandates do not apply to Medicare, and the Medicare program qualifies Medicare Advantage plans and largely sets their benefits. Because Medicare is the major insurer of people over the age of 64, this analysis excludes older members of commercial fully-insured plans.

- Some might have Medicare supplement plans, but generally benefits in those plans mirror Medicare’s benefits (though “innovative” additional benefits might be offered in some cases) and the proposed mandate will likely not affect them. Such plans are typically excluded from mandate legislation.
- Some employees over age 64 have fully-insured plans through their employers, often with Medicare coverage also, which will be the primary payer for some but not others. The number of people in this employed group with primary commercial coverage is small enough compared to the size of the under-65 population that it will not materially affect the results of this analysis.
- Finally, some people over 64, generally certain resident aliens, might have commercial insurance without Medicare, but this analysis assumes this group is very small.

2.2. Covered services

H.B. 931 requires that the targeted health insurance plans provide “coverage for the cost of a mastectomy and coverage for a minimum of 48 hours of in-patient care.”

In general, a mastectomy is surgery to remove a breast, most often performed for the treatment or prevention of cancer.⁶ The most common types of mastectomy surgeries include total mastectomy

⁵ Note that the membership of any fully-insured plans sponsored by the GIC will be included in the membership estimate for the commercial, fully-insured plans that are the primary focus of this analysis.

⁶ NIH, National Cancer Institute. Accessed 28 March 2013:

<http://www.cancer.gov/dictionary?cdrid=304750>. Breast-sparing surgery is “[a]n operation to remove the breast cancer but not the breast itself. Types of breast-sparing surgery include lumpectomy (removal of the lump), quadrantectomy (removal of one quarter, or quadrant, of the breast), and segmental mastectomy

(removal of breast tissue and nipple); modified radical mastectomy (removal of the breast, most lymph nodes under the arm, and sometimes lining over the chest muscles); and radical mastectomy (removal of breast, lymph nodes and chest muscles). Mastectomies for gynecomastia are also performed for the removal of enlarged breasts in men. Appendix A includes the list of specific mastectomy-related billing codes used in this analysis.

All insurers surveyed for this study pay for the cost of mastectomy and related services, and none reported explicit limits on length-of-stay. Some require prior authorization for the procedure and/or conduct concurrent review during inpatient stays.

Broadly, the term mastectomy could encompass partial mastectomy surgery, in which a tumor and some normal surrounding tissue are removed; these surgeries include lumpectomy, quadrantectomy and segmental mastectomy, and are also known as breast-sparing or breast-conserving surgeries (BCS), as most of the breast remains.⁷ (For the sake of clarity, this analysis will refer to partial mastectomies as lumpectomies.) Based on the stated intent of the bill's sponsor⁸, and on the opinion of at least one breast cancer specialist that convention in surgical nomenclature does not place lumpectomy within mastectomy⁹, this analysis assumes the mandated minimum of 48 hours of inpatient care does not apply to lumpectomy procedures.

2.3. Existing laws affecting the cost of H.B. 931

Current Massachusetts statutes contain no mandates explicitly addressing coverage and length of stay for mastectomy patients. The only federal action identified that may impact the subject matter of this bill is H.R. 5937: Breast Cancer Patient Education Act of 2012, pending in Congress.¹⁰ This bill is intended “[t]o educate breast cancer patients anticipating surgery regarding, the availability and coverage of breast reconstruction, prostheses, and other options.”¹¹ While the Women’s Health and Cancer Rights Act of 1998 mandates health plans that cover breast cancer treatment to also pay

(removal of the cancer as well as some of the breast tissue around the tumor and the lining over the chest muscles below the tumor).”

⁷ National Cancer Institute. Surgery Choices for Women with DCIS or Breast Cancer. Accessed 22 February 2013: <http://www.cancer.gov/cancertopics/treatment/breast/surgerychoices.pdf>.

⁸ Interview with Massachusetts legislative and Center staff, 11 January 2013.

⁹ Interview with Esther Rhei, MD, surgical oncologist and breast cancer specialist, Brigham and Women’s Hospital, 18 January 2013.

¹⁰ Official Summary: 6/8/2012--Introduced. Breast Cancer Patient Education Act of 2012 - Amends the Public Health Service Act to direct the Secretary of Health and Human Services (HHS) to provide for the planning and implementation of an education campaign to inform breast cancer patients anticipating surgery regarding the availability and coverage of breast reconstruction, prostheses, and other options. Requires such campaign to include dissemination of the following information: (1) breast reconstruction is possible at the time of breast cancer surgery or in a delayed fashion; (2) prostheses or breast forms may be available; (3) federal law mandates that both public and private health plans include coverage of breast reconstruction and prostheses; (4) the patient has a right to choose the provider of reconstructive care, including the potential transfer of care to a surgeon that provides breast reconstructive care; and (5) the patient may opt to undergo breast reconstruction in a delayed fashion for personal reasons or after completion of all other breast cancer treatments. Accessed 22 February 2013: <http://www.opencongress.org/bill/112-h5937/show>.

¹¹ 112th Congress (United States), 2^d session: H.R. 5937. Accessed 22 February 2013: <http://www.gpo.gov/fdsys/pkg/BILLS-112hr5937ih/pdf/BILLS-112hr5937ih.pdf>.

for breast reconstruction, according to the authors of H.R. 5937, only 33% of women eligible for such surgery undergo the procedure, and “up to” 70% are not informed of their reconstructive options.¹² Moreover, the bill cites a study outlining that the two “dominant reasons” why women do not obtain breast reconstruction at the time of breast cancer surgery are because: 1) they were not informed of this option; and 2) they were not referred to a reconstructive surgeon.¹³ The bill, then, intends to create an education campaign about the availability of, and insurance coverage for, reconstruction following breast cancer surgery.

If this bill becomes law, the number of breast reconstructions following breast cancer surgery might rise. In the majority of cases, these surgeries result in an inpatient hospital stay of at least two days (79.7% in the 2011 Massachusetts claim data analyzed for this report). Therefore, as these types of cases might comprise a larger percentage of all mastectomy cases in Massachusetts, the overall average length of stay may rise for reasons other than the effect of H.B. 931, and thus reduce the marginal impact of the bill. However, as the fate of the federal bill has not yet been determined, this impact will not be part of this analysis.

Finally, in accordance with §1311(d)(3)(B) of the federal Affordable Care Act (ACA) and as codified in CFR §155.170, the Commonwealth is required to offset the costs of mandated benefits not included in the state’s Essential Health Benefits (EHB) benchmark plan for individuals enrolled in Qualified Health Plans (QHPs) through the Health Connector, the state’s ACA-compliant Exchange, or outside of the Exchange. These include the costs of any mandated benefits enacted on or after January 1, 2012. The costs of these mandated benefits will need to be supported through the state’s operating budget or through other state resources. However, because the potential impact of H.B. 931 on state resources does not directly affect commercial premiums, CHIA has not requested an estimate of the magnitude of that impact in this analysis.

3. Methodology

3.1. Steps in the analysis

Compass estimated the impact of H.B. 931 through the following steps:

- Estimate the populations covered by the mandate, projected for the coming five years
- Estimate the annual rate of mastectomy in the relevant insured population
- Estimate the proportion of cases currently performed on outpatient and inpatient bases
- Estimate the proportion of cases with and without immediate reconstruction
- For inpatient services, estimate the number of cases in which a one-day stay would increase to a two-day stay owing to the mandate

¹² *Ibid.* H.R. 5937 §2.

¹³ *Ibid.*

- For outpatient services, estimate the proportion of cases that would be performed on an inpatient basis owing to the mandate
- Estimate the cost difference between an average one-day inpatient stay and an average two-day inpatient stay, and between an average outpatient “stay” and an average two-day inpatient stay
- Apply the marginal costs to the estimated utilization changes to calculate the proposed mandate’s incremental effect on carrier medical expense
- Estimate the impact on premiums of insurers’ retention (administrative costs and profit)
- Project the estimated cost over the next five years

3.2. Data sources

The primary data sources used in the analysis were:

- Massachusetts insurer claim data from the Center for Health Information and Analysis 2011 All Payer Claims Database (APCD), for plans covering the overwhelming majority of the under-65 fully insured population subject to the mandate¹⁴
- Interviews with legislative and CHIA staff regarding legislative intent
- Interviews with clinical experts
- Interviews with surgical billing experts
- Academic literature, cited as appropriate
- A survey of major carriers soliciting information on their benefit structures

The step-by-step description of the estimation process that follows addresses limitations in some of these sources, and the uncertainties they contribute to the cost estimate.

4. Factors Affecting the Analysis

This section describes some of the important issues that arise when translating the provisions of H.B. 931 into an analysis of incremental cost.

4.1. Trends in surgical treatment for breast cancer

The mix of surgical procedures used to treat breast cancer is evolving. Beginning in the early 1990s, rates of mastectomy for treatment of breast cancer began to decline, as rates of lumpectomy (breast-conserving surgery, or BCS) began to rise. This shift has been attributed to improvements in surgical techniques and to a 1990 statement by the National Institutes of Health Consensus Panel

¹⁴ For more information, see <http://www.mass.gov/chia/researcher/health-care-delivery/hcf-data-resources/apcd/>.

asserting that the preferred primary surgical treatment for early-stage breast cancer is BCS.¹⁵ BCSs increased for patients with stage 1 breast cancer from 35% to 60%, and from 19% to 29% for stage 2 breast cancer over the period 1989 to 1995.¹⁶ Data for the period between 1997 and 2003 further show that rates of mastectomy continued to fall (in one study, from 45% to 31%).¹⁷ Moreover, recent studies show mortality rates for early-stage breast cancer patients opting for BCS with radiation as at least equivalent to those for patients undergoing mastectomy.¹⁸

However, other recent data indicate that certain mastectomy rates are actually rising, with patients increasingly choosing prophylactic bilateral mastectomy, or mastectomy for the *prevention* of breast cancer, in one or both otherwise healthy breast(s). One study found that contralateral prophylactic mastectomy (CPM) rates (where both breasts are removed, although only one has cancer) increased for surgically treated (lumpectomy and mastectomy) patients from 0.4% to 4.7% between 1998 and 2007¹⁹. Another study found, that for women having a mastectomy instead of a lumpectomy, the rate of CPM rose from 4.2% to 11% between 1998 and 2003.²⁰

Other authors have concluded that both of these trends are in effect. A large retrospective cohort analysis found that while overall mastectomy rates continue to fall, as unilateral mastectomy procedures are replaced with more breast-conserving surgeries, CPM rates are indeed rising.²¹

Quantifying these countervailing trends in the Massachusetts fully-insured population – and in particular, attempting to forecast the balance between them – is beyond the scope of this analysis. However, if these trends hold over time, the net impact of this mandate will fall. First, if more

¹⁵ Treatment of Early-Stage Breast Cancer. NIH Consensus Statement 1990 Jun 18-21;8(6)1-19. Accessed 8 February 2013: <http://consensus.nih.gov/1990/1990earlystagebreastcancer081html.htm>.

¹⁶ Lazovich D, Solomon CC, Thomas DB, et al. Breast conservation therapy in the United States following the 1990 National Institutes of Health Consensus Development Conference on the treatment of patients with early stage invasive breast carcinoma. *Cancer*. 1999 Aug 15;86(4):628-37. Accessed 8 February 2013: [http://onlinelibrary.wiley.com/doi/10.1002/\(SICI\)1097-0142\(19990815\)86:4%3C628::AID-CNCR11%3E3.0.CO;2-L/full](http://onlinelibrary.wiley.com/doi/10.1002/(SICI)1097-0142(19990815)86:4%3C628::AID-CNCR11%3E3.0.CO;2-L/full).

¹⁷ Katipamula R, Degnim AC, Hoskin T, et al. Trends in mastectomy rates at the Mayo Clinic Rochester: effect of surgical year and preoperative magnetic resonance imaging. *J Clin Oncol*. 2009 Sep 1;27(25):4082-8. doi: 10.1200/JCO.2008.19.4225. Epub 2009 Jul 27. Accessed 8 February 2013: <http://jco.ascopubs.org/content/27/25/4082.full.pdf>.

¹⁸ Brooks JM, Chrischilles EA, Landrum MB, Wright KB, Fang G, Winer EP, Keating N, et al. Survival implications associated with variation in mastectomy rates for early-staged breast cancer. *Int J Surg Oncol*. 2012;2012:127854. doi: 10.1155/2012/127854. Epub 2012 Aug 8. Accessed 8 February 2013: <http://www.hindawi.com/journals/ijso/2012/127854/>.

¹⁹ Yao K, Stewart AK, Winchester DJ, et al. Trends in contralateral prophylactic mastectomy for unilateral cancer: a report from the National Cancer Data Base, 1998-2007. *Ann Surg Oncol*. 2010 Oct;17(10):2554-62. doi: 10.1245/s10434-010-1091-3. Epub 2010 May 12. Accessed 11 February 2013: <http://link.springer.com/article/10.1245%2Fs10434-010-1091-3?LI=true>.

²⁰ Tuttle TM, Habermann EB, Grund EH, Morris TJ, Virnig BA. Increasing use of contralateral prophylactic mastectomy for breast cancer patients: a trend toward more aggressive surgical treatment. *J Clin Oncol*. 2007 Nov 20;25(33):5203-9. Epub 2007 Oct 22. Accessed 22 February 2013: <http://www.ncbi.nlm.nih.gov/pubmed/17954711>.

²¹ Habermann EB, Abbott A, Parsons HM, et al. Are mastectomy rates really increasing in the United States? *J Clin Oncol*. 2010 Jul 20;28(21):3437-41. doi: 10.1200/JCO.2009.27.6774. Epub 2010 Jun 14. Accessed 21 March 2013: <http://www.ncbi.nlm.nih.gov/pubmed/20548000>.

patients opt for lumpectomies – assumed not to be covered by H.B. 931 – the proportion of the population subject to this mandate will decline.

Second, if more mastectomy patients choose a prophylactic bilateral procedure, their length-of-stay (LOS) will most likely be at least two days regardless of a mandate. Site of service data in the APCD is instructive; analysis shows that the vast majority of patients undergoing bilateral mastectomy treated on an inpatient basis remain in the hospital for two days or more.

**Table 1:
Comparison of Unilateral and Bilateral Mastectomy Procedures**

| | Percent of mastectomies performed | Percent performed on inpatient basis | Percent of inpatient stays at least 2 days | Average inpatient length of stay |
|-------------------|-----------------------------------|--------------------------------------|--------------------------------------------|----------------------------------|
| All mastectomies* | 100% | 57.5% | 69.0% | 2.3 |
| Unilateral | 68.9% | 57.4% | 61.1% | 2.2 |
| Bilateral | 31.1% | 57.9% | 86.4% | 2.4 |

*Excludes lumpectomy/partial mastectomy procedures

Currently, bilateral mastectomies comprise 31.1% of mastectomies in the studied population. Although mastectomy procedures are equally likely to be performed on an inpatient basis regardless of whether they are unilateral or bilateral, if the proportion of bilateral procedures rises, the overall LOS for mastectomy patients will rise as more patients will remain in the hospital for at least two days due to post-operative requirements and not as a result of the mandate. See Table 1.

Currently, mastectomies followed by immediate reconstruction comprise 56.5% of mastectomies in the studied population. If this proportion rises, the overall LOS for mastectomy patients will rise as more patients will remain in the hospital for at least two days due to post-operative requirements and not as a result of the state mandate. See Table 2.

**Table 2:
Comparison of Mastectomy Procedures with and without Immediate Reconstruction**

| | Percent of mastectomies performed | Percent performed on inpatient basis | Percent of inpatient stays at least 2 days | Average inpatient length of stay |
|------------------------|-----------------------------------|--------------------------------------|--------------------------------------------|----------------------------------|
| All mastectomies* | 100% | 57.5% | 69.0% | 2.3 |
| Without reconstruction | 43.5% | 45.0% | 48.2% | 2.1 |
| With reconstruction | 56.5% | 67.2% | 79.7% | 2.3 |

*Excludes lumpectomy/partial mastectomy procedures

4.2. Shift in length of stay

A key driver of cost estimates for H.B. 931 is the degree to which the baseline service profile would shift under the mandate. In particular, the following effects are relevant:

- The shift in average length of stay. That is, for cases performed on an inpatient basis with a one-day stay, how many would shift to a two-day stay?
- The shift from outpatient to inpatient services. That is, to what degree would services provided on an outpatient basis shift to the inpatient setting?

The analysis assumes the mandate does not affect the overall rate of mastectomies, but rather only length of stay and place of service. However, research to support this analysis uncovered no representative data on the preferences of mastectomy patients or their physicians for lengthening or shortening their stays. Further, although it represents a single provider's perspective, one oncology surgeon specializing in breast cancer related in an interview that any request that she has made to an insurer regarding extending a patient's length of stay following a mastectomy has been approved.²² Moreover, in a survey of large insurers in Massachusetts, all asserted that inpatient stays following mastectomy are not explicitly limited as a matter of policy.

Aside from whether insurers explicitly, or de facto, somehow suppress length of stay, there is no evidence that under a mandate patients would choose to stay longer or would choose to convert an outpatient procedure into an inpatient one, and current conventional wisdom holds that patients often do better outside hospital settings.

Still, reasonable scenarios exist in which a patient or physician is motivated to lengthen or seek an inpatient stay, such as the need for a respite from a stressful home environment or the physician's determination that the patient would benefit from observation. Therefore, to be conservative, this analysis assumes a modest portion, specified in section 5 of this report, of inpatient stays of one day will lengthen to two, and some outpatient treatment will become inpatient.²³

4.3. Marginal cost estimates

Given the number of mastectomies and an estimate of how many will shift sites of service or lengths of stay as a result of the mandate, the remaining primary element in estimating the impact of the proposed mandate is the cost of an additional day and the difference in cost between an outpatient and an inpatient setting. Isolating these values is challenging.

Each surgical case is handled based on its complexity and the patient's health status, and a patient with a longer inpatient stay in the claims used for this analysis generally has clinical reasons for staying longer than a patient with an outpatient or shorter inpatient stay.²⁴ Simply measuring the cost difference between longer and shorter stays, and between inpatient and outpatient settings,

²² Interview with Esther Rhei, MD, 18 January 2013.

²³ For simplicity, the shift from outpatient to inpatient assumes that patients who choose to stay in the hospital as a result of the mandate will remain for two days. However, because some patients might choose to stay only one day, this assumption will slightly overstate costs.

²⁴ Interview with Esther Rhei, MD, 18 January 2013.

for mastectomy patients in general will overstate the impact of the mandate because of these differences in acuity. In fact, the patients most likely affected by the mandate, those who can have their surgeries in an outpatient setting or with a one-day stay, are the patients with the least complex cases, and for them the cost of an incremental day is likely to be lower than it is for the average mastectomy patient. Therefore, applying an overall average marginal cost, which is comprised in part by more complex cases, to this subset of mastectomy patients will overstate the impact of mandating a two-day stay.

Estimating marginal costs while holding these acuity factors absolutely constant is beyond the scope of this analysis. To address this issue to the extent practical, and arrive at a better estimate of marginal cost in the claim data analyzed for this report, mastectomy claims were separated into unilateral and bilateral procedures, as well as procedures followed and not followed by reconstructive surgery. The results imply that mastectomies followed by reconstruction are more complex than those without reconstruction, suggested by the larger number of procedures performed on an inpatient as opposed to an outpatient basis, on the proportion of inpatient stays of at least two days, and by the overall longer average length of stay. The same pattern of results is generally observed when comparing bilateral procedures to those involving one breast only.

This analysis uses this segmentation of mastectomy procedures in projecting the difference in the costs of outpatient and inpatient procedures, as well as the difference between a one-day and a two-day inpatient stay. While acuity issues remain, this allows for holding some of the complexity among cases constant. Basic descriptive statistics reflecting this decomposition appear in Table 3.

It is important to note that the site of service significantly affects the cost of service, even when the number of days in a treatment bed is held constant.²⁵ For example, the cost of an outpatient procedure performed in an ambulatory surgical center (ASC) is significantly lower than the same outpatient procedure performed in a hospital operating suite. Therefore, when estimating the difference in costs between an outpatient procedure and an inpatient procedure, the results include the effects of the surgical site shift, as well as costs associated with added days in an inpatient bed.

²⁵ For purposes of this analysis, “outpatient” refers to those cases for which the surgery is performed on the day that the patient is discharged, regardless of the site of the surgery; for these cases, the length of stay is zero. “Inpatient” refers to those cases in which the patient is discharged on some day following the initial admission to a facility, regardless of the site of surgery. In some cases, the mastectomy surgery is not performed on the initial date of admission. Likewise, the site of discharge may not be the same as the site of surgery, as in cases performed in an ASC with an immediate subsequent hospital admission and discharge.

**Table 3:
Comparison of Mastectomy Procedures:
Unilateral/Bilateral & without/with Reconstruction***

| | Percent procedures performed as inpatient | Proportion of inpatient procedures | Percent of inpatient stays at least 2 days | Average inpatient length of stay |
|-----------------------------------|-------------------------------------------|------------------------------------|--------------------------------------------|----------------------------------|
| All mastectomies** | 57.5% | 100% | 69.0% | 2.3 |
| Unilateral without reconstruction | 46.9% | 34.3% | 42.4% | 2.0 |
| Unilateral with reconstruction | 67.7% | 34.6% | 73.9% | 2.3 |
| Bilateral without reconstruction | 37.7% | 9.3% | 75.0% | 2.5 |
| Bilateral with reconstruction | 66.4% | 21.9% | 89.2% | 2.4 |

*Totals may not be additive due to rounding errors

**Excludes lumpectomy/partial mastectomy procedures

Finally, many of the claims for mastectomies are paid through a per-case, DRG/APC (diagnosis related group/ambulatory payment code), capitated, or global payment scheme. In these cases, no marginal payment for an additional inpatient day exists, and this mandate will have no immediate impact on insurer reimbursement. However, case-based payment structures are routinely re-evaluated to reflect actual practice and expense; therefore, this analysis assumes case-based payment structures will eventually reflect the marginal cost of this mandate.

5. Analysis

The following sections describe the series of calculations used to estimate the overall impact of the proposed legislation. The results provide a best estimate “mid-level” scenario; by varying assumptions in the model, low-level and high-level scenarios were produced as well, resulting in a range of estimations for the impact of the mandate.

5.1. Insured membership affected by the mandate

Table 4 shows the number of members in plans potentially affected by the mandate. As noted, this analysis excludes individuals with Medicare coverage and those over the age of 64. Further, no attempt has been made to adjust the projection for possible future effects of the federal Affordable Care Act on the number of people enrolling in fully-insured plans.

**Table 4:
Projected Commercial Fully-Insured under-65 Population**

| <u>Year</u> | <u>Projected Members</u> |
|-------------|--------------------------|
| 2014 | 2,219,000 |
| 2015 | 2,195,000 |
| 2016 | 2,171,000 |
| 2017 | 2,146,000 |
| 2018 | 2,121,000 |

The projected population values for each year were used in conjunction with projected utilization rates and unit costs to produce yearly cost estimates. As discussed in the following sections, the utilization rates and unit costs were developed from historical data.

5.2. Utilization rates

Historical utilization data were generated through CHIA's APCD. Data from fully-insured Massachusetts health plans were extracted for calendar year 2011. The baseline utilization rates for inpatient and outpatient mastectomies, unilateral and bilateral, with and without reconstructive surgery, were based on enrollment-weighted average utilization for the plans included in the APCD.

This analysis includes a variety of mastectomy procedures, including subcutaneous mastectomy, simple (complete) mastectomy, modified radical mastectomy, radical mastectomy, mastectomy for gynecomastia, as well as subcutaneous mammectomy. Appendix A lists the relevant CPT-4 and ICD-9-CM-Volume 3 procedure codes and their descriptions.

**Table 5:
Utilization/1000 of Mastectomy Procedures***

| | Total | Inpatient | Outpatient |
|-----------------------------------|-------|-----------|------------|
| All mastectomies** | 0.26 | 0.15 | 0.11 |
| Unilateral without reconstruction | 0.09 | 0.04 | 0.05 |
| Unilateral with reconstruction | 0.09 | 0.06 | 0.03 |
| Bilateral without reconstruction | 0.02 | 0.01 | 0.02 |
| Bilateral with reconstruction | 0.06 | 0.04 | 0.02 |

*Totals may not be additive due to rounding errors

**Excludes lumpectomy/partial mastectomy procedures

Overall, utilization per 1000²⁶ for mastectomies was 0.26; that is, approximately one in every 3,800 people in the covered population had a mastectomy in the studied year. Table 5 provides additional information on the studied procedures by type.

²⁶ Utilization per 1000 is equal to (units of service during a year/average enrollment during a year)*1000. It measures annual per person use.

5.3. Shift in length of stay

To estimate the marginal impact of the mandate, it is important to understand which cases already result in an inpatient length of stay of at least 48 hours; for these, the marginal impact of the mandate will be zero.

This analysis differentiates within three significant variables: 1) inpatient (IP) versus outpatient (OP); 2) one-day inpatient stays (IP 1-day) versus inpatient stays of two or more days (IP 2+days); and 3) type of surgery as defined by uni- or bi-lateral with or without immediate reconstruction.

**Table 6:
Proportion of Mastectomy Procedures by Length-of-stay***

| | OP | IP 1-day | IP 2+days |
|-----------------------------------|-------|----------|-----------|
| All mastectomies** | 42.5% | 17.8% | 39.7% |
| Unilateral without reconstruction | 53.1% | 27.0% | 19.9% |
| Unilateral with reconstruction | 32.3% | 17.7% | 50.0% |
| Bilateral without reconstruction | 62.3% | 9.4% | 28.3% |
| Bilateral with reconstruction | 33.6% | 7.2% | 59.2% |

*Totals may not be additive due to rounding errors

**Excludes lumpectomy/partial mastectomy procedures

As noted in section 4.2, a key driver of cost estimates for H.B. 931 is the degree to which the baseline service profile would shift under the mandate, with some one-day stays becoming two-day stays and some outpatient services becoming inpatient.

Table 7 summarizes the assumptions about the portion of cases that shift used in the low, middle and high impact estimates for this mandate; these assumptions are applied evenly across types of surgery (uni- or bi-lateral with/without reconstruction).

For example, the mid-range estimate of the percentage of cases that would shift from a one-day inpatient length-of-stay to a two-day inpatient length-of-stay is 25%. This means the analysis assumes that 25% of the estimated 17.8% of one-day inpatient mastectomy cases would shift to a two-day length of stay.²⁷

Similarly, the mid-range estimate of the percentage of cases that would shift from an outpatient to a two-day inpatient length of stay is 5%, meaning that 5% of the estimated 42.5% of outpatient mastectomy cases would shift to a two-day length of stay.²⁸ This value is lower than the inpatient one-day to two-day shift, as it is assumed that far fewer patients, if any in the case of the low estimate, would opt to stay overnight after their procedure if it could be performed on an outpatient basis.

²⁷ The model applied the assumptions in Table 7 to the proportion of cases unilateral and bilateral, with and without reconstruction, as summarized in Table 6. The “All mastectomies” weighted average is referenced here for the sake of simplicity.

²⁸ *Ibid.*

**Table 7:
Length-of-Stay and Site-of-Service Shift Assumptions**

| | Low | Middle | High |
|----------------------|-----|--------|------|
| IP 1-day to IP 2-day | 10% | 25% | 40% |
| OP to IP 2-day | 0% | 5% | 10% |

5.4. Marginal cost by type of procedure

As described in Section 4.3, the estimates of the marginal cost for each type of shift were developed by segmenting mastectomies by whether or not they were unilateral or bilateral, and whether or not they were followed by immediate reconstruction.

For example, to calculate the weighted average cost for shifting from a one-day to a two-day inpatient stay, the average cost of a one-day stay is subtracted from the average cost of a two-day stay for each of the four types of surgery (uni- or bi-lateral with/without reconstruction). This difference is then multiplied by the number of those surgeries projected to switch from one-day to two-days for the given year, driven by the assumptions outlined in section 5.3. After calculating the total costs by type of surgery, the sum of the four is then divided by the total number of cases shifting from one-day to two-days to derive the weighted average.

Table 8 displays the weighted averages derived from this calculation. The low estimate is based on reducing by 20% the marginal cost per case measured from claims, and the high estimate raises the measured marginal cost per case by 20%. When projecting the impact of the analysis for each of the next five years, these values were also inflated by four percent annually from the 2011 baseline displayed.²⁹ The marginal cost shift from outpatient to inpatient assumes that patients who will stay in the hospital as a result of the mandate will remain for two days; as some patients may choose to stay only one day, this assumption in isolation slightly overstates costs.

**Table 8:
2011 Baseline Medical Marginal Cost per Case**

| | Low | Middle | High |
|----------------------|---------|---------|----------|
| IP 1-day to IP 2-day | \$2,322 | \$2,903 | \$3,483 |
| OP to IP 2-day | \$0* | \$9,229 | \$11,075 |

*Low estimate assumes no cases would switch from outpatient to inpatient as a result of the mandate.

²⁹ This report must project the cost of the mandate for five years; the model assumes that these costs will rise at a rate approximating the average medical inflation rate over the past decade, which was 3.8% between 2003 and 2012. U.S. Department of Labor, Bureau of Labor Statistics. Measuring Price Change for Medical Care in the CPI. Accessed 6 March 2013: <http://www.bls.gov/cpi/cpifact4.htm>.

5.5. Net increase in carrier medical expense

To calculate the net impact of the mandate, expressed as medical expense per member per month (PMPM), this analysis:

- Multiplies the projected population by the baseline utilization/1000, yielding the projected number of mastectomy cases
- Multiplies the projected mastectomy cases by the assumed shift percentages, that is, the percentage of cases assumed to shift from outpatient to inpatient, or from a one-day stay to a two-day stay
- Multiplies the resulting number of “shifted cases” by the marginal cost estimate for that shift type

This calculation is repeated for each segment of the population undergoing mastectomy, as defined by combining the following variables:

- Unilateral/bilateral procedures
- With and without immediate reconstruction
- Outpatient/one-day inpatient base length-of-stay (before the mandate)

For example, the calculation for one “segment”, unilateral procedures without reconstruction in an outpatient setting, estimates the incremental cost resulting from these procedures shifting to an inpatient setting. The total costs of each of these segments are added together, and divided by the overall fully-insured population number to arrive at PMPM estimates. Finally, trending is applied to estimate costs over the coming five years.

The process is repeated for the low-, medium-, and high-level values from sections 5.3 and 5.4, which vary the percentage of cases shifting and the marginal cost per case.

| Case Shift Assumption % | Marginal Cost per Shifted Case | Total Cost by Scenario |
|--------------------------------|---------------------------------------|-------------------------------|
| Low | Low | Low Scenario |
| Medium | Medium | Mid Scenario |
| High | High | High Scenario |

Table 9 displays the baseline results for 2011.³⁰

³⁰ No medical inflation or population growth is reflected in this table; it therefore reflects the marginal PMPM medical expense attributable to shifting from current site and length-of-stay to a mandated two-day length-of-stay for the assumed proportion of cases that shift.

**Table 9:
Estimate of Increase in Carrier Medical Expense (PMPM)**

| | |
|---------------|---------|
| Low Scenario | \$0.001 |
| Mid Scenario | \$0.007 |
| High Scenario | \$0.016 |

5.6. Net increase in premium

Assuming an average retention rate of 10.2 percent, based on CHIA’s analysis of administrative costs and profit in Massachusetts,³¹ the medical expense is adjusted upward to approximate the impact on premiums, as displayed in Table 10. Rounding to the nearest cent would display the increase in the low scenario in this table as zero.

**Table 10:
Estimate of Increase in Premium (PMPM)**

| | |
|---------------|---------|
| Low Scenario | \$0.001 |
| Mid Scenario | \$0.008 |
| High Scenario | \$0.017 |

5.7. Five-year estimated impact

For each year in the five-year analysis period, Table 11 displays the projected net impact of the proposed mandate on medical expense and premiums using a projection of the Massachusetts fully-insured membership. The analysis finds that H.B. 931 may increase monthly premiums by \$0.001 to \$0.021 on average over the next five years.

The displayed results have some variation measured by the ratio between high- and low-level scenarios, but even the high-level estimate represents a very small increase in overall premiums. The relatively small magnitude of this estimated impact is driven by two key assumptions: First, this analysis assumes that lumpectomies are not included under the terms of this mandate. If these surgeries were included, the potential impact of the bill would rise, as lumpectomies comprise over 70% of all mastectomy surgeries in the Massachusetts claims analyzed for this study, and over 85% are conducted on an outpatient basis. Second, the number of impacted cases included in this analysis is driven primarily by the assumptions regarding the number of patients and physicians who would choose to increase their length of inpatient stay beyond one day, or to stay overnight following surgery, solely as a result of this mandate. These assumptions are based on conversations with providers and insurers, which revealed no existing explicit or experienced limit on inpatient length of stay following mastectomy, and their observations of current patient preferences.

³¹ Massachusetts Division of Health Care Finance and Policy. Massachusetts Health Care Cost Trends: Premiums and Expenditures, May 2012. Accessed 6 March 2013: <http://www.mass.gov/chia/docs/cost-trend-docs/cost-trends-docs-2012/premiums-and-expenditures.pdf>.

**Table 11:
Summary results**

| | 2014 | 2015 | 2016 | 2017 | 2018 | Average | 5-Yr Total |
|--------------------------------|---------|---------|---------|---------|---------|---------|------------|
| Members (000's) | 2,219 | 2,195 | 2,171 | 2,146 | 2,121 | 2,170 | |
| Medical Expense Low (\$000's) | \$27 | \$28 | \$29 | \$29 | \$30 | \$29 | \$143 |
| Medical Expense Mid (\$000's) | \$212 | \$218 | \$224 | \$230 | \$237 | \$224 | \$1,121 |
| Medical Expense High (\$000's) | \$468 | \$481 | \$495 | \$509 | \$523 | \$495 | \$2,476 |
| Premium Low (\$000's) | \$30 | \$31 | \$31 | \$32 | \$33 | \$31 | \$157 |
| Premium Mid (\$000's) | \$233 | \$240 | \$247 | \$254 | \$261 | \$247 | \$1,235 |
| Premium High (\$000's) | \$515 | \$530 | \$545 | \$561 | \$576 | \$546 | \$2,728 |
| PMPM Low | \$0.001 | \$0.001 | \$0.001 | \$0.001 | \$0.001 | \$0.001 | \$0.001 |
| PMPM Mid | \$0.009 | \$0.009 | \$0.009 | \$0.010 | \$0.010 | \$0.009 | \$0.009 |
| PMPM High | \$0.019 | \$0.020 | \$0.021 | \$0.022 | \$0.023 | \$0.021 | \$0.021 |
| Estimated Monthly Premium | \$487 | \$512 | \$537 | \$564 | \$592 | \$538 | \$538 |
| Premium % Rise Low | 0.000% | 0.000% | 0.000% | 0.000% | 0.000% | 0.000% | 0.000% |
| Premium % Rise Mid | 0.002% | 0.002% | 0.002% | 0.002% | 0.002% | 0.002% | 0.002% |
| Premium % Rise High | 0.004% | 0.004% | 0.004% | 0.004% | 0.004% | 0.004% | 0.004% |

The impact of H.B. 931 on premiums rises steadily throughout the 2014-2018 analysis period because of the underlying assumptions about continuing increases in the average marginal cost of the procedures. Finally, the impact of the bill on any one individual, employer-group or carrier may vary from the overall results depending on the current level of benefits each receives or provides, on how the benefits will change under the proposed mandate, and upon the disease and treatment profile of a specific population.

Appendix A: Billing Codes Included in the Analysis

| Mastectomy Procedures | | | |
|-----------------------|---------------------------------------------------------------------|----------|-------------------------------------------------------------------|
| ICD-9-CM- Volume 3 | Description | CPT-4 | Description |
| | | 19300 | Mastectomy for gynecomastia |
| 85.33 | Unilateral subcutaneous mammeectomy with synchronous implant | 19304 | Mastectomy, subcutaneous |
| 85.34 | Unilateral subcutaneous mammeectomy without synchronous implant | | |
| 85.35 | Bilateral subcutaneous mammeectomy with synchronous implant | 19304-50 | Mastectomy, subcutaneous (bilateral modifier) |
| 85.36 | Bilateral subcutaneous mammeectomy without synchronous implant | | |
| 85.41 | Simple mastectomy, unilateral | 19303 | Mastectomy, simple complete |
| 85.42 | Simple mastectomy, bilateral | 19303-50 | Mastectomy, simple complete (bilateral modifier) |
| 85.43 | Mastectomy, unilateral, modified radical | 19307 | Mastectomy, modified radical |
| 85.44 | Mastectomy, bilateral, modified radical | 19307-50 | Mastectomy, modified radical (bilateral modifier) |
| 85.45 | Mastectomy, unilateral, radical | 19305 | Mastectomy, radical |
| 85.46 | Mastectomy, bilateral, radical | 19305-50 | Mastectomy, radical(bilateral modifier) |
| 85.47 | Mastectomy, unilateral, extended radical (includes Urban procedure) | 19306 | Mastectomy, radical including Urban excision |
| 85.48 | Mastectomy, bilateral, extended radical (includes Urban procedure) | 19306-50 | Mastectomy, radical including Urban excision (bilateral modifier) |

| Reconstructive Surgeries (CPT-4 Codes) | | | |
|----------------------------------------|---------------------------------------------------------------------------------------------------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 19340 | Immediate insertion of breast prosthesis following mastopexy, mastectomy or in reconstruction | 19366 | Breast reconstruction with other technique |
| 19350 | Nipple/areola reconstruction | 19367 | Breast reconstruction with transverse rectus abdominis myocutaneous flap (TRAM), single pedicle, including closure of donor site |
| 19357 | Breast reconstruction, immediate or delayed, with tissue expander, including subsequent expansion | 19368 | Breast reconstruction with transverse rectus abdominis myocutaneous flap (TRAM), single pedicle, including closure of donor site; with microvascular anastomosis (supercharging) |
| 19361 | Breast reconstruction with latissimus dorsi flap, without prosthetic implant | 19369 | Breast reconstruction with transverse rectus abdominis myocutaneous flap (TRAM), double pedicle, including closure of donor site |
| 19364 | Breast reconstruction with free flap | | |