COMMONWEALTH OF MASSACHUSETTS
HEALTH POLICY COMMISSION

TECHNICAL APPENDIX A3
WASTEFUL SPENDING

ADDENDUM TO 2013 COST TRENDS REPORT

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Summary

This technical appendix lays out our approach for estimating the total wasteful spending in the Massachusetts health system and the dollars spent on specific examples of waste.

A. Estimate of total wasteful spending

In Chapter 3, we estimate the amount of wasteful spending in the Massachusetts health care system. To do so, we use Berwick and Hackbarth's framework from an April 2012 JAMA article titled "Eliminating Waste in US Health Care"[1]. The authors defined waste as the difference in spending between the current scenario and a counterfactual scenario in which one or more best known practices are broadly applied to achieve a lower level of spending while maintaining equal or improved levels of patient care. In this framework, the authors separated waste into six distinct categories: overtreatment, failures of care delivery, failures of care coordination, pricing failures, administrative complexity, and fraud and abuse. These categories are meant to be mutually exclusive, with no overlap.

To recreate a wasteful spending estimate in Massachusetts, we adapted this framework as follows:

- We removed the fraud and abuse category from our estimate.
- For the other five categories, we pursued one of two strategies:
    - Where possible, we developed an estimate aggregating Massachusetts-specific figures published by other researchers.
    - We scaled the authors' U.S. estimate to Massachusetts. Where data were available on Massachusetts' performance relative to U.S. performance, we used a ratio to adjust the authors' national estimates.
- We adjusted all values to 2012 dollars based on the rate of growth of Massachusetts health care spending between the time period of the estimate and 2012.

In the following sections, we lay out the calculation we conducted in each category.

1. Overtreatment

Definition: Refers to the delivery of unnecessary services or a treatment in a care setting that is more intensive than needed.

Examples: Hospitalizations for ambulatory care-sensitive conditions, low-acuity emergency department use, antibiotics used inappropriately for viral upper respiratory infections, low-value tests and treatments administered to reduce risk of lawsuits (often called "defensive medicine").

Method used: Scale U.S. estimate to Massachusetts and adjust based on relative performance.

Massachusetts estimate: $6.6 to $8.3 billion (9.6 to 12.1 percent of total health care spending)

Calculation: The authors' estimate was based in part on a Dartmouth analysis estimating spending uncorrelated to improved outcomes by classifying hospital referral regions (HRRs) in five quintiles based on intensity (using expenditures on care in the last 6 months of life as a measure of intensity of care).[2] Prior studies have established that overall health outcomes in each of these quintiles are equivalent, although quintiles that had higher intensity of end-of-life care

spent significantly more.[3] Such quintiles have been used to estimate spending due to overtreatment that does not represent value.

We recreated this approach to estimate the additional intensity for Massachusetts HRRs, estimating relative intensity by classifying HRRs into quintiles based on hospital days per cancer patient during the last month of life (2010 deaths). Average price-, age-, sex-, and race-adjusted Medicare spending per beneficiary was estimated for each quintile. Then, for each quintile we estimated a ratio of its spending level to the lowest-intensity quintile. This ratio represents an estimate of additional spending due to higher intensity-of-care. A weighted average of this ratio across all HRRs was calculated for the U.S. and for Massachusetts. We found that the Massachusetts average was approximately 3.5 percent more intense than the U.S. average. We then estimated the proportion of Massachusetts spending that is waste due to overtreatment at 103.5 percent of the authors' estimate for the U.S.

2. Failures of Care Delivery

Definition: Refers to care that can be considered appropriate but that is delivered poorly or not at all. These failures can come in two forms: care delivered in a more costly way than best practice suggests, and corrective care needed to fix adverse events resulting from improper treatment.

Examples: Readmissions attributable to adverse events, misuse of prescription drugs that can trigger avoidable adverse effects, hospital-acquired infections, ineffective preventive care, inefficiencies in physician offices, and other non-value-adding clinical activities.

Method used: Develop and aggregate estimates for three subcategories . For each subcategory, either use a published Massachusetts estimate or scale national estimate.

Massachusetts estimate: $2.3 to $2.4 billion (3.3 to 3.5 percent of total health care spending)

Calculation: Our approach was based on developing and then aggregating independent Massachusetts estimates for the three care delivery subcategories of waste: errors and injuries, ineffective preventive care, and ineffective clinical operations.

- *Errors and injuries:* Our estimate for wasteful spending attributed to errors and injuries was broken down in two components: misuse of drugs and treatments resulting in avoidable adverse effects of medical treatment, and health care-associated infections (HAIs). We used national rates to estimate wasteful spending due to the misuse of drugs and treatments, scaling the dollar estimate to Massachusetts based on the state's proportion of the U.S. population. Our analysis for HAIs is derived from the Massachusetts Department of Public Health's Infection Prevention & Control Program data related to central line-associated bloodstream infections (CLABSIs) and surgical site infections (SSIs), and a 2013 JAMA Internal Medicine article that generated U.S. estimates for per-case costs for the infections address above.[4]

- *Ineffective preventive care:* Our estimate for wasteful spending attributed to ineffective preventive care was developed through a study on the potential medical care cost savings achievable through direct reductions in the prevalence of certain chronic diseases, and enhanced community prevention programming. The study estimated the amount that Massachusetts could save from a five percent reduction in diabetes and hypertension, and effective community prevention efforts.[5]

- *Ineffective clinical operations*: Our estimate for wasteful spending attributed to ineffective clinical operations was broken down by savings from improving efficiency in physician offices, and from the elimination of non-value-added activities in hospitals. We used national rates for this component, scaling the dollar estimate to Massachusetts based on the state's proportion of the U.S. population.

3. Failures of Care Coordination

Definition: Refers to clinical situations in which the initial care delivery may be appropriate and of high quality, but subsequent communication failures and the lack of care integration across settings result in inappropriate and poorly delivered care.

Examples: Readmissions not attributable to adverse events and inefficiencies from uncoordinated benefits for dual-eligible (Medicare and Medicaid) patients.

Method used: Develop and aggregate estimates across two subcategories. For each subcategory, either use a published Massachusetts estimate or scale national estimate.

Massachusetts estimate: $0.9 to $1.4 billion (1.4 to 2.1 percent of total health care spending)

Calculation: Our approach was based on developing and then aggregating independent Massachusetts estimates for the two care coordination subcategories of waste: preventable hospital readmissions not attributable to an adverse event, and poor coordination for the state's dual-eligible population.

- *Preventable hospital readmissions* (not attributable to an adverse event): This subcategory is estimated at $790 million for Massachusetts. The basis for our estimate is derived from 2009 Division of Health Care Finance and Policy (now Center for Health Information and Analysis) analysis[6], and our figure adjusts for growth in Massachusetts health care spending in 2012.
- *Dual-eligible patients*: In a November 2008 report, the Lewin Group estimated that 4.5 percent savings were achievable for the dual-eligible population through increased use of capitated payment models.[7] We applied this estimate to Massachusetts spending on dual-eligibles in 2012.

4. Pricing Failures

Definition: Refers to excessive spending on health care services that could be eliminated without affecting patient care.

Examples: Excessive hospital prices and physician salaries, higher prices from hospital consolidation, the cost differential between brand and generic drugs, and the wide price variation for durable medical equipment and medical devices.

Method used: Scale U.S. estimate to Massachusetts and adjust based on relative performance.

Massachusetts estimate: $2.2 to $4.8 billion (3.2 to 7.0 percent of total health care spending)

Calculation: Our analysis of price levels in Massachusetts shows that they are higher than U.S. average levels (see Section 1.1). We conservatively estimated Massachusetts wasteful spending due to pricing failures as in line with the overall U.S. estimate. The authors estimated that US health care waste associated with pricing failures consumes 4.9 percent of total US health care spending, and we used this percentage in relation to total Massachusetts health care spending in order to estimate Massachusetts' waste figure for this category.

5. Administrative Complexity

Definition: Refers to indirect health care spending (that is, spending not directly associated with clinical care delivery) that could be eliminated without affecting the quality of care.

Examples: Excess billing and insurance-related (BIR) costs across payers and providers.

Method used: Scale U.S. estimate to Massachusetts and adjust based on relative performance.

Massachusetts estimate: $2.7 to $9.9 billion (4.0 to 14.4 percent of total health care spending)

Calculation: Massachusetts' multi-payer system of billing and insurance is similar to the national system. Thus, we estimated that the cost of Massachusetts' administrative complexity was comparable to the overall U.S. estimate. The authors estimated that US health care waste associated with administrative complexity consumes 9.2 percent of total US health care spending, and we applied this percentage to total Massachusetts health care spending.

B. Example opportunities identified for waste reduction

We present estimates of five examples of areas of wasteful spending in the report. These are:

1. Preventable hospital readmissions
2. Unnecessary emergency department visits
3. Health care-associated infections
4. Elective induction of labor before 39 weeks
5. Overuse of diagnostic imaging tests for acute low back pain

For each example, we present either a new analysis by the Commission or the most relevant previously reported analysis from another Massachusetts organization.

1 Preventable hospital readmissions

Estimate: $704 million in 2009

Source: 2012 Massachusetts Division of Health Care Finance and Policy (DHCFP)[6] analysis

Approach: Estimate provided by DHCFP analysis

2 Unnecessary emergency department visits

Estimate: $558 million in 2010

Source: 2012 Massachusetts DHCFP[8] analysis

Approach: Estimate provided by DHCFP analysis

3 Health care-associated infections

Estimate: $10 to 18 million in 2011

Source: Health Policy Commission analysis

Approach: Our estimate was developed using figures on reported incidence of central line-associated bloodstream infections (CLABSIs) and surgical site infections (SSIs) from the Massachusetts Department of Public Health's Infection Prevention & Control Program. Per-case cost ranges for CLABSIs and SSIs were obtained from a 2013 Journal of the American Medical Association Internal Medicine analysis.[4] The reported range represents the costs associated with the reported number of HAIs at the low end and high end of estimates of per-case costs.

4 Elective induction of labor before 39 weeks

Estimate: $3 to 8 million in 2012

Source: Health Policy Commission analysis

Approach: Our estimate was based on an expected reduction in neonatal intensive care unit (NICU) stays that would be achieved if the frequency of early elective inductions were lowered.

We used three assumptions based on results reported in a 2010 study in the American Journal of Obstetrics and Gynecology by Clark et al.: achievable rates of early elective inductions after interventions are applied (1.7 to 4.3 percent), a rate of additional NICU days per 1,000 early inductions, and a dollar savings per avoided NICU day. [9] We then estimated the reduction in NICU days that would occur and the savings that would be achieved if Massachusetts' current rate of early elective inductions of 5.9 percent could be reduced to 1.7 percent or 4.3 percent.

5 Overuse of diagnostic imaging tests for acute low back pain

Estimate: $1 to 2 million in 2011 (21 percent of patients with uncomplicated lower back pain received imaging studies against guidelines)

Source: Health Policy Commission analysis

Approach: We used Optum's Evidence Based Measures (EBMs), which were run on the All-Payer Claims Database to determine the number of patients in the Medicare and commercial populations with lower back pain who were administered imaging studies against guidelines.[10] EBMs help researchers assess provider and patient compliance with evidence-based best practices for clinical conditions and preventive treatment standards. Specifically, Optum defines three distinct measures that note whether a patient with uncomplicated low back pain did not have a spinal radiographic test, CT scan, or MRI. Estimated costs (low-high ranges) for each type of test were based on Choosing Wisely campaigns per-test estimates for this section.[11] Our estimate corresponds to total spending on imaging for acute low back pain identified as inappropriate under Optum's measure within the Medicare and commercial populations.

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