Short report

Estimating the costs of medicalization

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\section*{Abstract}

Medicalization is the process by which non-medical problems become defined and treated as medical problems, usually as illnesses or disorders. There has been growing concern with the possibility that medicalization is driving increased health care costs. In this paper we estimate the medical spending in the U.S. of identified medicalized conditions at approximately $77 billion in 2005, 3.9\% of total domestic expenditures on health care. This estimate is based on the direct costs associated with twelve medicalized conditions. Although due to data limitations this estimate does not include all medicalized conditions, it can inform future debates about health care spending and medicalization.

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\section*{Introduction}

The percent of the U.S. gross domestic product spent on health care has risen from 4.5\% in 1950 to 16\% in 2006 (Congressional Budget Office, 2008). Numerous explanations have been offered for this increase including the development and use of medical technology (Rettig, 1994), the aging population (Reinhardt, 2003), and particular reimbursement mechanisms (Bodenheimer, 2005). Critics have suggested medicalization as another potential explanation for increasing health care costs (Budetti, 2008; Hadler, 2008; Szasz, 2007), but to our knowledge no previous studies have systematically tried to estimate the costs of medicalization. In this paper we define medicalization, present a strategy for estimating the cost burden of medicalized conditions, and estimate 2005 US spending on medicalized conditions.

For more than three decades numerous scholars have described the process of medicalization and how an increasing number of conditions has come under medical jurisdiction (Conrad & Schneider, 1992; Zola, 1972). Medicalization is a process by which non-medical problems become defined and treated as medical problems, usually in terms of illnesses or disorders. Examples include menopause, alcoholism, attention deficit hyperactivity disorder (ADHD), post traumatic stress disorder (PTSD), anorexia, infertility, obesity, sleep disorders, erectile dysfunction (ED), among others (14). The growing interest in medicalization is seen in the number of symposiums about medicalization in places such as the British Medical Journal ("Special Issue on Medicalization," 2007), the President's Council of Bioethics (Kass, 2003), PLoS (Moynihan & Henry, 2006), and Lancet (Metzl & Herzig, 2007). In both the social science and medical literature, the major focus has been on documenting the rise in medicalization, debating conditions which constitute medicalization, and identifying the implications for patients, medicine, and society.

An underlying theme in this literature is the concern about "overmedicalization." While medicalization describes a social process, like globalization or secularization, it does not imply that a change is good or bad. Some observers have raised the concerns that medicalization is an over-expansion of medicine's professional jurisdiction and is a mechanism by which the pharmaceutical industry can increase markets, thus contributing to rising health care costs (Moynihan & Cassels, 2005). While these issues have been raised repeatedly, to our knowledge, no analysis of medicalization has attempted to estimate the fiscal impact on health care spending. Recognizing that there are many difficulties in such a task, not the least of which is defining what conditions are forms of medicalization, we believe such an estimate would be an important addition to the literature. While it is clear that in the last three decades there has been a significant growth in the number of medicalized conditions as well as number of patients treated for those conditions (Conrad, 2007), we seek to address what contribution this trend has had on the societal problem of spiraling health care costs.

\section*{Methods}

\textit{Identifying medicalized conditions}

A key issue in this study was to identify medicalized conditions. Selection of 'medicalized conditions' was based on two criteria: 1)
a published study identified the condition as an example of medicalization since 1950 (Ballard & Elston, 2005; Barsky & Boros, 1995; Conrad, 1992, 2007) and 2) the availability of reasonably valid and current data on US national medical expenditures for that condition. In the end, we included 12 conditions (see Table 1). Schizophrenia and bipolar illness (manic depressive disorder) were deemed a medical problem before 1950 (even as bipolar illness has become a more common diagnosis in recent years). We were unable to find reliable national estimates for medicalized conditions such as eating disorders, idiopathic short stature, chronic fatigue syndrome, and fibromyalgia (Conrad, 2007). Due to the limited availability of data, we only included costs of pharmaceutical drugs for erectile dysfunction and male pattern baldness, and for obesity we only estimated the costs of bariatric surgery and weight loss medication, excluding medical visits.

We recognize that medicalization is dimensional and on a continuum; there are degrees of medicalization from conditions that are thought to be minimally medicalized (e.g. sexual addiction or multiple chemical sensitivity disorder) to almost completely medicalized (e.g. childbirth or major depression). Once established, medicalized categories can be flexible, expanding or contracting. For example, post traumatic stress disorder (PTSD) emerged in the 1970s as an ailment among Viet Nam veterans (Young, 1995) but now PTSD includes survivors of all kinds of trauma (e.g., physical, sexual, environmental, etc.) and even witnesses to traumatic events. Medicalization has variable involvement from the medical profession. For example, alcoholism treatment involves relatively few physicians, while physicians play a central role in surgeries such as gastric bypass for obesity. Finally, medicalization is bidirectional. While the trend has been overwhelmingly toward increased medical categories and interventions in the past four decades, there are a few examples of demedicalization, such as the demedicalization of homosexuality since the 1973 APA decision (Bayer, 1985). Thus the selected conditions were, at the time of data collection, predominantly under medical jurisdiction being both defined and treated medically.

Estimating the cost of the twelve conditions

Cost-of-illness studies use a systematic method to identify and to calculate direct and indirect costs of treating and managing a particular condition or illness (Rice, 1994). In this study, our focus is specifically on how medicalized diagnostic categories increase national health care expenditures. Medical direct costs are defined as payments to hospitals, pharmacies, physicians, and other health care providers. These costs may be paid by the individual and their family, private and public insurance, or other payment sources. We therefore exclude non-medical direct and indirect costs such as transportation costs and decreased productivity or missed work.

This study uses multiple data sources that were ranked according to the empirical strength of each data source. Our use of multiple data sources is similar to how the federal government estimates national health expenditures yearly (Melkrotra, Dudley, & Luft, 2003). Our primary source was 2005 data from the Medical Expenditure Panel Survey (MEPS), released by the Agency for Healthcare Research and Quality AHRQ, 2008. MEPS is a nationally representative dataset of the non-institutionalized population in the United States (Cohen, 1997). The dataset has been widely used to estimate the medical expenditure related to different types of conditions or types of care (Chan, Zhan, & Homer, 2002; Sturm, 2002; Trogdon & Hyland, 2008). For each household in their panel, MEPS regularly collects detailed information for each person in the household on the following: demographic characteristics, health conditions, health status, use of medical services, charges and source of payments, access to care, satisfaction with care, health insurance coverage, income, and employment. MEPS then goes to each of the individual's identified providers and collects data on dates of visits/services, use of medical care services, charges and sources of payments and amounts, and diagnoses and procedure codes for medical visits/encounters (AHRQ, 2008).

Priority was given to these data for multiple reasons. First, the database allows for primary analyses of national expenditures for many of the identified medicalized conditions. The use of these data as our primary data set aimed to strengthen this study by reducing variation in the design and estimation techniques. Second, MEPS uses person level weights to generate a nationally representative sample and to correct for selection bias. Finally, numerous other studies have used the MEPS data to document the cost of health conditions ranging from pregnancy to pediatric behavioral health care (Guevara, Mandell, Rostain, Zhao, & Hadley, 2003; Machlin & Rohde, 2007). While data from MEPS were used when available, estimates were next selected from peer-reviewed publications, technical reports, annual sales reports from pharmaceutical companies, and lastly newspaper articles. The reliability of technical reports, annual sales reports, and newspapers are limited as these data points have not undergone scholarly review. We recognize that these data have limitations, but felt they were necessary for an initial estimation for the cost of medicalization that will require further refinement. Table 2 provides a list of the data sources used in this study, specifying the type of data source, type of health service utilization, medical conditions, and the payers of these services, when available.

This study implements three estimation techniques to ascertain the impact of medicalization on national health care spending. First, medicalized diagnostic conditions are used to identify relevant costs for medical care and treatment. This estimation technique is the strongest, by assuring that all medical expenditures are linked to the medicalized condition. As described in Table 2, this strategy is used for uncomplicated pregnancy, anxiety disorder, substance related disorder, behavioral disorders, and infertility.

<table>
<thead>
<tr>
<th>Medical condition</th>
<th>Defined by diagnosis of the following condition or use of the indicated health services or pharmaceutical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety disorders</td>
<td>Social phobia, anxiety states, dissociative, conversion and factitious disorders, obsessive compulsive disorder, neurosis, depersonalization disorder.</td>
</tr>
<tr>
<td>Behavioral disorders</td>
<td>Attention deficit disorder without and with mention of hyperactivity, conduct disorder, and oppositional defiant disorder.</td>
</tr>
<tr>
<td>Body image</td>
<td>Cosmetic procedures and surgeries (does not include bariatric surgery.)</td>
</tr>
<tr>
<td>Erectile dysfunction</td>
<td>Pharmacological use of Viagra, Cialis, Levitra.</td>
</tr>
<tr>
<td>Infertility</td>
<td>Includes primary and secondary female infertility and primary male infertility.</td>
</tr>
<tr>
<td>Male pattern baldness</td>
<td>Pharmacological use of Proppecia, Rogaine, and Minoxidil.</td>
</tr>
<tr>
<td>Menopause</td>
<td>Pharmacological use of Premarin family.</td>
</tr>
<tr>
<td>Normal pregnancy and/or delivery</td>
<td>In-patient deliveries, excludes all non in-patient deliveries and those with complications (e.g., hypertensions or diabetes complicating childbirth, early labor or prolonged delivery, and malpositioned, obstructed, or foreign deliveries). Caesarean sections are included in this analysis unless they had been coded as a complication of birth.</td>
</tr>
<tr>
<td>Normal sadness</td>
<td>Expansion of depression to include 'normal sadness' between 1990 and 2000.</td>
</tr>
<tr>
<td>Obesity</td>
<td>Bariatric surgery and weight loss medications.</td>
</tr>
<tr>
<td>Sleep disorders</td>
<td>Treatment for insomnia.</td>
</tr>
<tr>
<td>Substance related disorders</td>
<td>Treatment for alcohol, amphetamine, cannabis, cocaine, inhalant, nicotine, opioid, phenycyclidine, and sedative dependence.</td>
</tr>
</tbody>
</table>

Table 1 lists the 12 medicalized conditions included in this study. The table also specifies the way in which each condition is defined for the purposes of this study.
Table 2
Description of data sources and estimation techniques.

<table>
<thead>
<tr>
<th>Data source (citation)</th>
<th>Type of data source</th>
<th>Type of health service utilization</th>
<th>Medical conditions</th>
<th>Payer</th>
<th>Estimation techniques</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical expenditure panel survey</td>
<td>Primary data analysis &amp; peer-reviewed journal</td>
<td>In-patient visits, Out-patient office visits, Emergency department visits, Pharmaceutical drugs</td>
<td>Uncomplicated pregnancy, Anxiety disorder, Substance related disorder, Behavioral disorders, Female infertility, Male infertility</td>
<td>Private and public sector, Out-of-pocket expenditures</td>
<td>For primary analysis of MEPS data, conducted weighted analysis for each medicalized condition to reflect complex sampling design of the survey. Used Statistical Analysis Software (SAS), Version 9.1.3™.</td>
</tr>
<tr>
<td>Medical bulletin (Anonymous, 1998)</td>
<td>Technical report</td>
<td>Pharmaceutical use, including Propecia, Rogaine, Minoxidil</td>
<td>Male pattern baldness</td>
<td>Not available (pharmaceutical sales)</td>
<td>Acquired estimate from the Medical Bulletin, which acquired estimates from the annual sales reports of the respective distributors for Us sales of Propecia, Rogaine, and Minoxidil. All estimates were adjusted from 1998 US dollars to 2005 US dollars.</td>
</tr>
</tbody>
</table>

Table 2 identifies each data source, with specificity provided to the type of data source, the measures, the medicalized conditions, and the payer.

* In addition to the Medical Expenditure Panel Survey, the quotation for male infertility arrives from the National Ambulatory and Medical Care Survey, National Hospital and Ambulatory Medical Care Survey, and the Healthcare Cost and Utilization Project (Meacham et al., 2007).

* As stated in the text, we theorize this figure for normal sadness is likely as an overestimate, as not all increases between these two time periods can be attributable to the rise in medicalizing normal sadness. Although hypothesized as an overestimate, our attribution of the difference in expenditure from 2000 to 1990 to normal sadness does reflect an empirical understanding articulated in the work of Horwitz and Wakefield (2007).

* The figure for U.S. sales of Viagra was found in a 2006 New York Times citation (Berenson, 2007).

Second, certain treatments were strongly enough associated with a medicalized diagnostic condition that the treatments, themselves, are used to provide an estimate for the condition. This estimation technique is used for menopause, male pattern baldness, erectile dysfunction, and obesity. Third, calculations of the difference in expenditure over time are used to estimate the cost of medicalized categories that have undergone expansion. This estimation technique is implemented for estimating the medicalization of normal sadness. Horwitz and Wakefield identify the expansion of clinical depression to include normal sadness (Horwitz & Wakefield, 2007). Sadness is used as a generic label for normal mild to moderate depressive responses to various losses, such as bereavement, severe physical illness, romantic betrayal or rejection, economic misfortune, among others (Horwitz & Wakefield, 2007; Wakefield, Schmitz, First, & Horwitz, 2007). Therefore, we use the difference of inflation-adjusted costs between 2000 and 1990 to estimate the medical expenditure associated with normal sadness. To adjust for inflation in this paper, this study uses the 2005 Consumer Price Index, issued by the Bureau of Labor Statistics (Bureau of Labor Statistics, 2008).
Results

Our estimate of the total direct health care costs in 2005 attributable to the twelve mediclized conditions was $771.1 billion. This is 3.9% of the $1.97 trillion in total national health spending for the United States in 2005 (Catlin, Cowan, Heffler, & Washington, 2007).

The two types of conditions that together make up almost half of these expenditures are uncomplicated pregnancy and body image services. Together the size of this bill is substantial, generating a notable cost to the private and public sector, as well as consumers themselves (Table 3).

Discussion and implications

There have been concerns that mediclization has been a major driver of increased health care costs in the United States. We estimate that the mediclized conditions we could identify make up $771.1 billion in annual health care spending. This is a relatively minor portion of national health care expenditures (<4%) and therefore mediclization is unlikely to be a key driver of spiraling health care costs. Yet, $771.1 billion represents a substantial dollar sum. In comparison, $56.7 billion was spent on heart disease and $39.9 billion was spent on cancer in the United States for 2000 (Thorpe, Florence, & Joski, 2004). The almost four percent of health spending on mediclization is greater than the three percent estimated to be spent on public health in 2005 (Budetti, 2008).

Our estimate could be, on aggregate, an underestimate of the costs associated with mediclization. As discussed in the methodology, we have been conservative in our selection of mediclized conditions and excluded conditions such as schizophrenia, bipolar disorder, or fibromyalgia, and distinguished normal sadness from clinical depression. On the other hand it is possible that our estimate could be also seen as an overestimate because in some cases not all the costs related to a given condition are due to mediclization. For example, some might exclude the costs of treatment for insomnia that is secondary to other medical therapy. Additionally, the figure for normal sadness may be an overestimate, since not all increases between these two time periods are likely attributable to the rise in mediclizing normal sadness alone. Although other factors may also contribute to the difference in medical expenditures on depression between 1990 and 2000, our attribution of the difference in expenditure for increased mediclized treatment to normal sadness aligns with the analysis of Horwitz and Wakefield (2007).

More important than whether our estimate is low or high is with the policy implications of the cost estimate. As we noted above, mediclization in itself does not connote whether this is good or bad for health and society, only that problems have moved into medical jurisdiction. But by estimating a dollar sum the obvious question is raised as to whether this spending is “inappropriate.” Taking this fiscal concern a step further, it raises the question of whether policies should be in place to curb the growth or even decrease the amount of spending on mediclized conditions. While such policies could be introduced for particular conditions, we believe such policies are generally not applicable to mediclization overall. The individual and societal benefits would need to be carefully considered prior to any policy decision to curb or decrease spending on these conditions.

These policy implications draw attention to the importance of the economic, social, and political dimensions of health and health care in the United States. First, there is a notable distinction between spending by individuals and by employers, insurers, or government. There is likely less societal concern when individuals are paying out of pocket for cosmetic surgery or infertility treatment. Second, despite potential societal agreement that normal childbirth has become too mediclized, we suspect there is unlikely any societal desire for a wholesale move to the starkest alternative of childbirth at home with no medical attention. Third, some analysts have suggested that the pharmaceutical industry is the major driver of mediclization in an effort to expand the potential market for their drugs (Horwitz & Wakefield, 2007; Moynihan & Cossels, 2005). But individuals with these conditions may perceive benefit from and therefore desire mediclization because external sources of payment become available when a problem is defined as a medical ailment.

A next step would be to quantify further the economic and societal consequences of mediclization. For example, one could try and estimate the QALYs gained from treatment of erectile dysfunction or insomnia. In such a cost-benefit calculation, mediclized conditions might even be viewed as cost-effective. Future research might elaborate on these important questions to shed greater light on the intersections between the social, economic, and political consequences of mediclization.

There are numerous limitations to our analyses. First and foremost, there is controversy about what is and what is not a “medi- cialized” condition. We have attempted to partly resolve this controversy by using other published studies as a basis for choosing conditions. Nonetheless, we suspect there will be debate among readers on whether the twelve conditions were correctly chosen. Another limitation is that potential off-sets may exist between the use of health-related direct costs and other non-medical interventions. For example, the provision of mediclized services for ADHD may deter costs for school-based interventions. These cost savings to other stakeholders in child health are not accounted for in this study and remains an area for additional study. Finally, the quality of the data on direct costs was the best available but is not without biases due to varied data sources, estimation techniques.

Table 3

<table>
<thead>
<tr>
<th>Medical condition (citation)</th>
<th>Estimated direct medical cost 2005</th>
<th>Year of original data source (in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety Disorders (AHRQ, 2008)</td>
<td>10,878.3</td>
<td>2005</td>
</tr>
<tr>
<td>Behavioral Disorders (AHRQ, 2008)</td>
<td>4657.5</td>
<td>2005</td>
</tr>
<tr>
<td>Body Image (Cosmetic procedures and surgery) (American Society for Aesthetic Plastic Surgery, 2008)</td>
<td>12,376.0</td>
<td>2005</td>
</tr>
<tr>
<td>Erectile Dysfunction (Berenson, 2007; Eli Lilly and Company, 2006; Glaxo Smith Kline, 2005; Pfizer, 2005)</td>
<td>1112.1</td>
<td>2005; 2006</td>
</tr>
<tr>
<td>Infertility (AHRQ, 2008; Machlin &amp; Rohde, 2007)</td>
<td>1104.2</td>
<td>2005; 2000</td>
</tr>
<tr>
<td>Male Pattern Baldness (Anonymous, 1998)</td>
<td>1055.1</td>
<td>1999</td>
</tr>
<tr>
<td>Menopause (Wyeth, 2007)</td>
<td>914.3</td>
<td>2006</td>
</tr>
<tr>
<td>Normal Pregnancy and/or Delivery (AHRQ, 2008)</td>
<td>18,290.5</td>
<td>2005</td>
</tr>
<tr>
<td>Normal sadness (Greenberg et al., 2003)</td>
<td>6204.0</td>
<td>2000; 1990</td>
</tr>
<tr>
<td>Obesity (Bariatric surgery and weight loss medication) (American Society for Aesthetic Plastic Surgery, 2008; Enchonse et al., 2005)</td>
<td>1341.1</td>
<td>2005; 2002</td>
</tr>
<tr>
<td>Sleep Disorders (Walsh &amp; Engelhardt, 1999)</td>
<td>1,768.45</td>
<td>1995</td>
</tr>
<tr>
<td>Substance Related Disorders (AHRQ, 2008)</td>
<td>1468.7</td>
<td>2005</td>
</tr>
<tr>
<td>Total</td>
<td>77,086.30</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 provides the final estimation cost for all mediclized conditions in 2005 dollars, disaggregated by condition. All data originally collected in a year other than 2005 have been adjusted for inflation the 2005 Consumer Price Index, issued by the Bureau of Labor Statistics (Bureau of Labor Statistics, 2008).
and multiple years of data. Future research would benefit from constructing a stronger cost estimate, specifically direct costs for medicalized conditions from a single data source in the same fiscal year.

While we recognize the limitations of this work and the need for future work to refine our estimates, this initial analysis sheds new light on the fiscal impact of medicalization on health care. Although we find that these medicalized conditions constitute a small fraction of total health care spending, the expenditures of just over $77 billion dollars provides considerable reason for further attention to the medicalization process. We offer our cost estimate to advance the continuing debate and scholarship on the societal and economic impacts of medicalization.

Acknowledgements

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References