Examining the influence of insurance and moral hazard on the utilisation of practitioner-based complementary and alternative medicine

Josef Bohm

Abstract
Moral hazard (excess consumption of clinical services) is representative of consumer behaviour associated with the utilisation of services reimbursed from third-party payers. Within the USA, CAM is supported by numerous commercial and public insurance programmes. The objective of this article is to assess the utilisation of CAM when paid for by third-party payers. Data from the 2007 US National Health Interview Survey were examined to measure the relationship between insurance coverage and the utilisation of practitioner-based alternative medicine. Participant use of chiropractic, osteopathic manipulation and acupuncture was compared with health insurance coverage. The analysis applied standard epidemiological risk ratios to the data in order to calculate the effect of insurance coverage on CAM and moral hazard. The presence of health insurance was a strong facilitator of utilisation, with up to a 40% increase in utilisation when reimbursement mechanisms were introduced. The finding suggests that market-based strategies for dealing with moral hazard have little influence when applied to practitioner-based CAM, while insurance coverage plays a significant role in its delivery. Consequently, factors related to behavioural economics and agency modelling may undermine efficient utilisation and payment for CAM services.

Keywords
Acupuncture • complementary therapies – general • manipulative therapies • moral hazard

Background
Moral hazard is a by-product of market dynamics. The term ‘moral hazard’ refers to the additional consumption of health care that consumers undertake in response to their increased buying power resulting from insurance coverage. According to Ely, moral hazard arises when decision makers undertake risk because the consequence of the risk has been transferred to a third party. In market based healthcare systems, consumers purchase insurance to mitigate the economic risks associated with illness. In effect, the premium for insurance coverage is a market-based strategy for providing a protective straddle for the insured’s economic welfare. Premiums paid by the consumer provide a safeguard for the immediate costs associated with medical treatment and an assurance that economic resources will also be available for expensive extended care. These economic benefits are sound but their effectiveness are subject to compromise that arises from consumer psychology and economics associated with ‘agency’ modelling.

Behavioural economics recognises the consumer’s desire to be on the winning side of a transaction. Individuals making a financial outlay seek to obtain a return for their investment. Premiums paid represent...
an economic cost. As a basis for justifying that cost, patients with insurance are inclined to seek care. They may apply a lower threshold for consulting with a clinician or, once under treatment, they may seek to obtain more care than what they would have otherwise received had they been purchasing it directly. In effect, the consumer justifies this excess under a ‘use it or lose it’ principle that results in unnecessary and inefficient care. As a counterbalance, insurance has instituted a number of cost-sharing strategies, such as deductibles and co-payments. Also viewed as a market-based solution, cost sharing provides ‘braking power’ against conspicuous consumption by forcing insured consumers to become economic stakeholders in their care. Hoffman in her historical review of deductibles and co-payments affirms managed care’s commitment to cost sharing, but also acknowledges that its impact will vary depending on patient income and the nature of the medical services that are needed. Although originally intended to prevent trivial ‘sniffle claims’, the contemporary trend for consumers to choose and purchase ‘low deductible and co-payment plans’ may result in cost sharing becoming effective only in situations involving relatively expensive health care or with patients of limited economic means.

Agency theory is a central construct within the clinician–patient relationship. Patients receive health care via their agents – clinicians. Whereas patients may seek to obtain efficient care, motivations from agents may not be synchronised with patient priorities. As recently as 2009, the New York Times reported on the tensions inherent in the dual role of the physician as patient advocate and business person. ‘Today’s medical students are being inducted into a culture in which professionalism is seen increasingly in financial terms. The situation is further exacerbated by the information asymmetry inherent in the clinician–patient relationship. For a free market to function correctly, consumers must be informed with regard to their consumption options. Information flows from the clinician who chooses what information is made available and in what context. Shmanske defines this as a form of ‘information scarcity’ designed to undermine market dynamics. ‘Buyers and sellers cannot trade efficiently if one side of the transaction can be manipulated or charges excessively because of inferior information’. Clearly, the dynamics of the clinician–patient relationship favour the clinician with the patient at a disadvantage. As an outcome, the patient may have difficulty in understanding the complexities of their own health care.

Both of these factors are relevant to practitioner-based CAM where services can be directed either at the treatment of specific illness or applied as part of a holistic health-maintenance strategy. Its attraction may be due to a philosophy of naturalism that finds favour with many patients, perceived failures in conventional medical care, or a belief that CAM offers safer, less intrusive treatment. Although these three dynamics may differ in their information requirements, they all remain grounded in a physician-dominated agency model. In each case, it is left to the clinician to define the context of treatment; the patient assumes responsibility for paying for it. Within recent years, there has been a desire to develop evidence-based models for CAM. Where such evidence exists, consumers gain an information advantage by scrutinising a cause-and-effect relationship. However, such associations are rarely present when CAM is applied to patients’ general health and welfare. In place of evidence, there is a greater reliance on clinical metaphor and when cause and effect are poorly related, patients have difficulty interpreting their clinical experience. The effect is compounded due to the plethora of confusing proprietary information made available to CAM patients and the widely scattered nature of clinical literature and research information.

Insight into the cost of CAM care is provided by the US National Health Statistics Report, entitled Costs of Complementary and Alternative Medicine (CAM) and Frequency of Visits to CAM Practitioners: United States, 2007. The report indicates that the average American adult spent US$122 per person for visits to CAM providers with a typical out-of-pocket expense of US$29.00 per visit. This relatively low level of expense may act to facilitate CAM’s initial uptake by patients. It also invites moral hazard because small fees and co-payments provide only a modest safeguard against patients purchasing unnecessary care. The effect of modest cost sharing is only noticed over time as the cumulative financial impact of co-payments over an extended period of treatment moderate patient behaviour. By extension, moral hazard is usually reduced in the presence of serious illness. The need for treatment for such cases becomes obvious, but appropriate care often is intrusive and expensive. For patients who are deeply engaged in complex treatments there is little tolerance for unnecessary services even when paid by insurance.

This paper seeks to examine the influence of third-party reimbursement mechanisms on the use of practitioner-based alternative medicine. Health economists accept that in the presence of health insurance, the normal market dynamics between patients and clinical providers is changed. Generally, economists consider moral hazard to be inefficient as it results in unnecessary consumption of medical resources. In order to investigate this effect, information obtained from the 2007 National Health Interview Survey conducted by the National Center for Health Statistics, Centers for Disease Control and Preven-
tion, USA,\textsuperscript{10} will be used to examine the relationship between insurance coverage and the utilisation of chiropractic, osteopathic manipulation and acupuncture. Within the USA, these services are routinely covered by third-party payers including most commercial insurance and the Federal government’s health insurance for the elderly known as Medicare.

**Methods**

Data were obtained from the 2007 National Health Interview Survey (NHI) conducted by the National Center for Health Statistics, Centers for Disease Control and Prevention, USA.\textsuperscript{10} Anonymous survey respondents form a socio-demographic subset of the general population of the USA, providing self-reported data on their healthcare consumption, health status and insurance coverage. Specific information on treatments, duration of care and therapeutic outcomes are not reported but, the 2007 survey uniquely includes information on CAM usage. When utilising a national survey, it is important to understand that throughout the USA CAM disciplines vary in scope, insurance coverage and access. It would be inappropriate for the assessment of moral hazard to include CAM disciplines that function without insurance coverage or do not allow direct consumer access. Additionally, variation in the regulation of CAM results in some CAM being nationally recognised, others licensed in only a few states and some going unregulated nationally. To address these differences, inclusion criteria for CAM was limited to qualified disciplines with national recognition (Table 1).

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Reason for inclusion / exclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disciplines included:</td>
<td></td>
</tr>
<tr>
<td>chiropractic (DC) and osteopathic (DO) spinal manipulation</td>
<td>All criteria were present: insurance coverage available through commercial and government plans; licensed in all jurisdictions; and delivers services on a primary contact basis without prescription referral.</td>
</tr>
<tr>
<td>Acupuncture (ACAOM)</td>
<td>All criteria were present: insurance coverage generally available through commercial providers; licensed or registered in most jurisdictions; and delivers services without prescription referral.</td>
</tr>
<tr>
<td>Disciplines excluded:</td>
<td></td>
</tr>
<tr>
<td>Oriental medicine, massage therapy, naturopathy (ND) / homeopathy</td>
<td>Either unregulated or with only limited licensure. Insurance coverage is not generally available or providers do not operate in a primary contact capacity.</td>
</tr>
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</table>

ACAOM, Accreditation Commission for Acupuncture and Oriental Medicine, USA; DC, Doctor of Chiropractic; DO, Doctor of Osteopathic Medicine; ND, Doctor of Naturopathic Medicine.

Standardised epidemiological ratios were calculated to assess the effect of exposure (in this case insurance coverage) on event (CAM usage), including:

- Relative risk: the ‘risk’ of an event relative to exposure. It is the ratio of the risk in the exposed group to the risk in the unexposed group. A value above one indicates that there is a higher ‘risk’ of CAM usage in the insured group compared to the uninsured group.
- Odds ratio: compares the odds of CAM usage in the insured group to the odds of CAM usage in the uninsured group.
- Attributable risk percent: percent of the effect in the exposed group that is due to the exposure. This identifies what percentage of CAM usage would be reduced if insurance coverage was unavailable.

**Results**

Information concerning insurance coverage and their use of CAM was supplied by 22,636 respondents. Respondents identified whether they had ever consulted any of the aforementioned-included practitioners. For those that had, further inquiry was made to determine if the participant used such services within the previous 12 months and whether or not the services were used for the treatment of a specific condition. Of the 2054 respondents affirming practitioner-based CAM usage (included group only), 89.5% indicated they had used spinal manipulation and 16.5% had used acupuncture. The data affirmed that some respondents had used both therapies and that the total combined use of these therapies by the survey population was about 9% annually.

The survey did not provide separate utilisation rates for chiropractic and osteopathic spinal manipulation. The combined rate for spinal manipulation was merged with data for acupuncture and the amalgamated frequency counts are presented in Table 2.

For persons using spinal manipulation or acupuncture, the majority (84%) used them as interventions for the treatment of illness. A much smaller population (16%) used CAM in an unfocused manner. Although unstated in the survey, this smaller group may represent survey participants who employ these services as broad-based intervention strategies related to health maintenance and illness prevention.
The presence of two CAM utilisation groups represents a confounding effect that can be statistically controlled through separate analyses. Information from Table 2 was therefore separated into two \(2 \times 2\) contingency tables; one comparing columns A and C of Table 2, and one comparing columns B and C.

Standardised epidemiological ratios examining the effect of insurance coverage on CAM usage are presented in Table 3.

Insurance coverage assumed an important role for both utilisation categories. Overall, CAM usage increased with insurance coverage, and an individual with coverage was between 1.57 and 1.75 times more likely to use CAM. Interestingly, the probability of insurance coverage decreased when CAM usage was focused on the treatment of specific conditions. A possible explanation may be that under such circumstances CAM was ‘tested’. A reduction in symptoms may give patients a benchmark to evaluate the therapeutic effectiveness of CAM and, with every successful treatment, consumer confidence may build. In the case where CAM use is unfocused, evidence of its effectiveness is less robust and in these settings patients acting as consumers may require greater insurance safeguards in order to be willing to purchase such care.

As implied by the attributable risk percent, in the absence of insurance coverage, patient utilisation of practitioner-based CAM would decline by 40% (±3%). This change in utilisation is the epidemiological consequence of moral hazard in that it represents the fraction of patients who seek care due to insurance coverage. Generally, a risk ratio under ‘two’ represents a small effect but, when applied over a large sample size, a small effect becomes visible. Using US$122 as the average annual ‘out-of-pocket’ outlay for CAM services, a 40% change in utilisation for the 9% of the population using these services would result in cost reductions of US$1.2 billion. Add the additional amounts paid by insurance and the total financial outlay attributable to moral hazard becomes economically significant.

**Discussion**

Overall, for the 12 months prior to the NHI survey, 10% of insured survey participants consumed specific practitioner-based CAM services compared to 6% of uninsured persons. Clearly, insurance coverage facilitates practitioner-based CAM uptake but the analysis cannot determine whether changes would occur in either incidence or prevalence of treatment. An alternative prediction can also be considered – that similar levels of enhanced utilisation would occur with the introduction of third-party payments for CAM services. Odds ratios are the same whether calculated from a horizontal or vertical analysis. This makes the ratio a useful estimate of the risk ratio that would be obtained from a prospective study.11

More than half of practitioner-based CAM is independent of insurance coverage, which implies that there is a reasonable level of direct consumer interest and support. This has not been ignored by insurance carriers. Although coverage may vary in the USA, most commercial insurance carriers cover manipulative therapies as do the majority of government social insurance programmes. Acupuncture, although not covered by the federal government’s Medicare programme for the elderly, is covered under complementary care riders offered by commercial insurers. Insurance coverage is usually limited to medically necessary care for treatment of a covered illness. Table 4 identifies the most common conditions for using CAM, as reported by survey participants.

Focused CAM directed toward the treatment of specific conditions demonstrates greater levels of utilisation with a lower proportion of insurance coverage.
In market terms, this may represent greater levels of consumer confidence for CAM procedures under evidence-based settings. The opposite holds true when CAM services are provided for unstructured treatment. Given the level of consumer interest in CAM, there is a reasonable expectation that insurance coverage will continue but, safeguards against moral hazard need to be in place. Out-of-pocket expenses for CAM are relatively modest, implying that market-based measures such as co-payments may not provide acceptable levels of deterrence. Instead, administrative utilisation controls similar to those applied to conventional medical treatment and managed care may provide better alternatives.

Many CAM therapies are strongly aligned to social–psychological models related to health maintenance. Clinical services when directed at health maintenance are not covered by insurance, which may result in services that have an economic impact to the patient without moral hazard consequences. CAM that is not covered by insurance and treatments aimed at the maintenance of health fall under this category. This analysis suggests that up to 1.5% of the survey population may be using these services in such a manner and, although this represents a small percentage, when applied across the general population it culminates in a significant number of consumers who absorb these costs.

**Conclusion**

Caution needs to be applied in interpreting the findings from this investigation. Insurance is a risk-management strategy designed to increase consumer buying power for valued services that would otherwise be unaffordable. Only health care paid by insurance that would not have been undertaken by patients on a self-pay basis should be considered moral hazard. A dilemma is created by trying to subset this component. Determining what services are valued requires the elimination of traditional insurance reimbursement mechanisms so that the direct, unsupported pattern of consumption from patients acting as consumers can be observed. This option is unrealistic, given the mechanics of health-care provision and the cost of medical care. Gauging the level of moral hazard may therefore be somewhat interpretative, but CAM’s relatively low cost strongly suggests that the component of insurance utilisation attributable to increased buying power for the purchase of unaffordable services is relatively modest. Given that coverage appears to vary between CAM utilisation categories, arguments can be made that any insurance contribution toward unfocused health care represents moral hazard. Insurance contracts require that only medically necessary care for the treatment of diagnosed illness be reimbursed. Consequently, once a point of maximum medical improvement is reached, insurance is no longer obligated to pay for services. Insurance outlays made to participants using CAM unrelated to the treatment of a specific condition fall into this category.

The NHI survey does not quantify the level of financial outlay from insurance companies. While insurance coverage relates to usage, it is uncertain as to how usage correlates with financial outlay. The intent of co-payments is to reduce the incidence of trivial claims, yet their greatest impact is on extended care. Alternatively, administrative controls are seen as a mechanism to reduce abusive ‘fee for service’ arrangements, but this also limits access. As a result, insurers’ levels of payment vary greatly. At its extreme, in situations where insurance offers no CAM coverage, its traditional role in reimbursing conventional medical care may still provide an indirect economic benefit to the patient by facilitating discretionary spending for items such as CAM. Ultimately, information on the extent of financial outlay for CAM services from specific insurers would strengthen this analysis.

The manner in which CAM operates is biphasic; either supporting bio-ecologic models for prevention or, in other cases, providing direct treatment of specific illness. Each scenario is influenced differently by agency effects and the economic behaviour of patients. Third-party insurance contributes to each setting but, unexpectedly, its great influence appears amongst the small population of survey participants utilising unfocused CAM – a scenario in which coverage benefits should be absent. Given the small sample size for this group, the finding may only be an artefact. However, if true there is a suggestion that even in the absence of coverage, the presence of insurance gives an indirect economic benefit to CAM users. Alternatively, an agency model break down could also account for this finding. Patients may simply misinterpret their care believing that the purpose of treatment is aimed at maintaining their general health when in fact their clinician is coding for treatment of a specific illness. In either case, additional inquiry is warranted.

An important question remains as to how these findings compare to moral hazard experienced under

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**Table 4 Five most frequently identified conditions for using CAM**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Spinal manipulation (%)</th>
<th>Acupuncture (%)</th>
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<tbody>
<tr>
<td>Back pain</td>
<td>58</td>
<td>24</td>
</tr>
<tr>
<td>Neck pain</td>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td>Joint pain</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Arthritis</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Headache / migraine</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Data obtained from the 2007 National Health Interview Survey conducted, by the National Center for Health Statistics, Centers for Disease Control and Prevention, USA.
conventional medical care. The NHI survey describes general patterns of medical consumption and does not offer information on the utilisation of specific medical treatments. Therefore, this survey is not a suitable vehicle for making comparisons between traditional medical interventions and CAM. However, such an analysis would yield important information by directly comparing moral hazard under CAM to levels found in conventional medical settings. Given the ever rising cost of health care, and the need for efficient delivery of clinical services, this topic certainly warrants further research.

**Conflict of interest**

The author declares no conflicts of interest with respect to the authorship and/or publication of this article.

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**References**


