Agency for Healthcare Research and Quality

Evidence Report/Technology Assessment

Number 101

Economic Incentives for Preventive Care

Summary

Introduction

The Institute of Medicine's (IOM) recent Quality Chasm report suggests that the U.S. health care system requires major reengineering, including major realignment of incentives, if health care is to provide collaborative quality care and care management and effectively prevent and manage chronic disease.[1] Growing recognition of this need for realignment has led to "pay for quality" initiatives for providers and a parallel search for effective economic interventions for consumer health behavior change.[2] Similar "pay for prevention" initiatives are used to address the gap between the high cost of preventable disease and deaths[3] and the actual practices of health providers and consumers. These initiatives use explicit, or extrinsic, incentives such as bonuses and cash or other in-kind financial incentives for providers and consumers to engage in specific preventive care or health promotion practices. The question is whether such economic incentives are a useful approach.

In this report, we evaluate evidence from the literature on the impact of explicit economic incentives targeted at motivating providers and consumers to adopt preventive health behaviors. The review is designed to 1) help develop more effective preventive strategies (evidence-based practice), and 2) help inform key stakeholders about the role of such practices (evidence-based policymaking). In collaboration with AHRQ, the key research questions identified were:

Key Question 1

How have "preventive care" and "economic incentive" been defined in the literature?

Key Question 2

Do incentives work?

Key Question 3

Is there evidence of a dose/response curve?

Key Question 4

What is the evidence for cost-effectiveness of economic incentive interventions?

Definition of Prevention

In the current environment of growing chronic illness burden and improving identification of risk factors for major diseases such as heart disease, the boundaries between primary, secondary, and tertiary prevention begin to blur. For example, high cholesterol and hypertension, though risk factors, are identified as treatable conditions. However, the purpose of treating high cholesterol is prevention of full-blown heart disease. For the purposes of this report, we defined preventive care and health promotion as those situations in which consumers may consider themselves healthy or physically at risk but have not yet been labeled with a diagnosis. This includes individual-based health promotion and preventives services as defined in Healthy People 2000 and 2010[4, 5] but excludes mental health, substance abuse, and health protection concerns such as injury prevention, occupational health and safety, environmental health, and oral health. Tertiary care, including self-care and diagnosed chronic illnesses such as diabetes and heart disease, was also excluded. We included clinical and non-clinical settings, such as worksite and community-based health promotion settings.

Disease prevention and health promotion cover a wide spectrum of behaviors for both consumers and providers, from simple, one-time vaccinations to complex behavioral changes such as weight control. For the purposes of this review, we define a complex preventive concern as one that requires sustained effort over time on the part of the patient/consumer.

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Evidence-Based Practice

Definition of Economic Incentives

This review examines explicit incentives targeted at specific individuals, either providers or consumers. Incentives offered to providers could include direct payments or bonuses to the provider or his/her group. It was expected that economic incentives would vary considerably by the nature of the incentive, the components involved, size, frequency, duration, and the conditions that triggered payment of the incentive. More diffuse incentives offered as part of managed care (e.g., waiving co-payments) were excluded for both consumers and providers because of the difficulty in pinpointing their specific effect. Consumer incentives are fairly straightforward and include cash, gifts, lotteries, and other free or reduced price goods and services for the benefit of the specific consumer.

Methods

Literature Search and Data Abstraction

MEDLINE®, EconLit, Business Source Premier, and PsychInfo were the on-line reference databases used to conduct the literature review. PsychInfo, EconLit, and Business Source Premier were approached with a simple strategy of combining keyword searches for "incent$" and "health."

Reference lists of previous systematic reviews and identified articles were reviewed for other relevant studies. We also searched the Cochrane Collaboration database.

English-language articles published between 1966 and 2002 that addressed behaviors related to prevention as defined above were included in the review. We excluded studies that related to patient adherence to drug therapy or chronic illness management. We also excluded multiple component intervention studies in which the economic incentive was only one component and the study design precluded analyzing the independent effect of the incentive. In all, nine articles were included in the provider-incentive structured literature review, and 47 were included in the consumer review.

A data abstraction form was devised during the initial stages of the literature search. Formal meta-analysis of the incentive literature was not possible because of insufficient numbers of studies that examined the same incentive type, research outcome measures, and similar populations. The abstraction form was created with the purpose of facilitating the ability to capture emergent themes from the heterogeneous literature. Abstraction of the articles was performed by two independent reviewers. Disagreements were resolved by consensus of the group.

Results

All nine provider incentive studies addressed simple preventive concerns: Six articles examined immunizations,[6-11] two looked at cancer screening,[12, 13] one looked at prenatal care,14 one looked at well-child visits,[10] and one examined cholesterol screening.[6] (Numbers do not add to nine as two studies used more than one preventive care measure as an outcome.) Twenty-four of the 47 consumer articles were classified as simple prevention: seven on immunization,[15-21] two on cancer screening,[22, 23] two on prenatal care,[24, 25] three on attendance at educational sessions for STD/HIV prevention,[26-28] one on recruitment for a smoking cessation program,[29] and nine on preventive care followup: cholesterol[30] and tuberculosis screening,[31, 32] cancer screening,[33-36] and post-partum exams.[37, 38] Twenty-three articles addressed complex preventive care concerns: ten on smoking cessation,[39-48] two on exercise,[49, 50] seven on obesity and weight loss,[43, 51-56] and one each on breastfeeding,[57] nutrition,[58] cardiovascular disease prevention,[59] and cholesterol management.[60]

Key Question 1

In general, definitions for "prevention" and "economic incentive" are not specifically addressed in the literature. The term "economic incentives" is used to describe financial incentives. Such incentives include a wide variety of actions. For providers these included bonus payments payable on the basis of number of inputs used or based on the provider achieving a target outcome or target behavior. For consumers, the incentives took the form of cash payments, lotteries, coupons for free or reduced price goods and services, gifts, free or reduced price medical services, and the opportunity to avoid disincentives.

Key Question 2

Provider. All incentives were aimed at physicians; non-physician staff were not targeted. Reports were not clear on whether the financial incentives were paid to the physician or the practice. Incented physicians included family practitioners, general practitioners, internists, and pediatricians. All studies took place in nonacademic solo and group practices. However, "group" was often left undefined. Patient populations for five of the nine studies were vulnerable populations.

Seven studies used bonuses potentially payable to all physicians.[6-9, 11, 13, 14] The remaining two studies were paid in tournament style.[10, 12] Only a few studies provided data on the bonus payment average size and range. Of those reporting, potential payments ranged from $50 to a tournament bonus of $4,682. No study provided information on payment frequency or timing, nor on the investment costs the physician incurred establishing the clinical and office procedures necessary to support the production and behavioral changes. Therefore, we could not assess how these factors, plus the anticipated bonus program time period, impacted the physician's calculation of the incentive's potential overall financial benefit.

No study provided information on the physicians' expectations of receiving a bonus. Overall awareness of the bonus program was low in two studies that examined physician awareness.[10, 12]

Eight studies used performance bonuses that rewarded the physician for achieving a target outcome.[6-13] Two studies also

included a per-input bonus based on actual immunizations provided.[8, 9]

Study outcomes were primarily measured as the percent of charts in compliance with a target outcome. Charts were generally classified compliant if the preventive service was documented as having occurred regardless of whether the preventive service was provided by the physician or his/her office staff or provided elsewhere.

Findings for the studies were mixed; overall four found positive effects[6-9] and five found no effects.[10-14] Improvements in chart documentation procedures may account for the positive effects. Positive effects were found in three subgroup analyses for group practice settings.[10-12]

Not all studies reported effect sizes or provided adequate information to construct relative risk ratios. Attempts to contact lead authors to obtain such information met with limited success. Based on the information provided, the effect size is moderate at best. For example, in one study receiving economic incentives was associated with a 7.1 percent increase in immunization rates.[7]

Consumer. Patient populations tended to fall into two broad categories that correlated with the simple/complex classification. Vulnerable populations of low socioeconomic status, the first category, were the most frequently studied populations for simple preventive care such as immunizations and cancer screening and followup, constituting 16 of the 24 simple preventive studies but only four of the 23 complex studies. These populations included active drug users, teen mothers, low-income children with mothers in the Women, Infants and Children or Aid to Families with Dependent Children programs, and patients of public clinics and safety-net hospitals. These populations were also considered at high risk for the study's targeted health concern. By contrast, generally healthy, middle-class populations recruited from work sites or the general population were the most frequent recruitment bases for studies of complex health promotion lifestyle changes.

Very few reports outlined a clear link between the design of the economic incentive and the specific population intended to receive the incentive. Only three studies justified the design of the chosen economic incentive.[19, 28, 38] Only nine studies directly tested the uptake of an incentive.[15, 16, 24, 29, 33, 40, 45, 53, 58] Another ten studies used different intervention arms to test the desirability of the incentive.[18, 24, 26, 28, 31, 32, 38, 45, 55, 56]

The type and size of the 59 incentives offered in the 47 studies varied extensively: 10 lotteries, seven gifts, 11 cash incentives, 15 coupons for free or reduced price goods or non-medical services, six free or reduced price medical services, and ten incentives involving negative reinforcement or the opportunity to avoid punishment. Seventy-eight percent of incentives required a target behavior from the participant as a condition for incentive distribution. The remainder required the participant to attain a particular outcome. Several studies included additional intervention components, particularly social pressures, which potentially confound the impact of the incentive.

All of the simple preventive care studies used hard outcome measures. Complex preventive care studies used self-report in some instances. Whereas smoking cessation has available well established, valid, and reliable laboratory tests to confirm self-reported abstinence, directly observing many relevant lifestyle behavior changes related to health promotion, such as exercise and eating patterns, is difficult.

Facilitating incentives designed to make engaging in the new behavior easier, including structural barrier removal, and studies using disincentives showed significant effects. Incentives as rewards for participating and adhering to goals, whether for simple or complex prevention, are in general effective inducements for behavior change. Most studies matched a short-term incentive with a short-term behavioral change or outcome. While many of the studies in the outcome and negative reinforcement categories showed positive effects in the short run, of the four studies that checked for long-term results, all of the significantly improved measures had returned to their original levels.[42, 47, 48, 59]

Key Question 3

We could not address dose response for provider incentives given the limited number of studies. There is minimal evidence of a dose response within the consumer research. Cash incentives have the expected rank ordering. Coupons, more convenient and flexible, may be preferred to gifts. Both studies that pitted a coupon incentive against a gift incentive found the coupon more effective.[25, 38] In addition, while coupon incentives were effective, with 12 of 15 incentives showing positive results, only four of seven gift incentives had positive results, and two of the positive results were potentially confounded by additional lottery or competition intervention components. Indeed, some coupons were never redeemed.

Key Question 4

Provider. No study addressed cost-effectiveness. One study calculated an intervention cost of $3 per additional immunization.7

Consumer. Only seven of the 47 studies included cost-effectiveness calculations for the study itself. In five of the seven cases, a treatment arm that consisted of a similar intervention without the incentive itself was reported to be a more cost-effective approach. No study included an attempt to generalize cost-effectiveness over time for the estimated impact of the incentive on potential population morbidity or mortality.

Discussion

Findings

The basic findings of the review for the four key questions can be summarized as follows:

Key Question 1. Definitions for economic incentives are not emphasized in the literature, not only in terms of locating the incentive intervention within larger environmental contexts, but also with regard to the function of the incentive. That is, if the incentive fails to distinguish its goal as an external reinforcement of behaviors until such time as the individual's internal motivation is sufficient, as a reinforcement until habituation or until some learning task is accomplished, or simply as a means of directing a person's attention to a neglected area. As a whole, the studies lack a clear conceptual context to delineate what an incentive is, its intended purpose, and how it is hypothesized to impact the individual.

In general, research appears to be driven by policy considerations. Policy guidelines developed by national organizations, expert panels, and governmental bodies at the Federal and State levels provide the goals which in turn determine the operational definitions of preventive care. While advancing understanding for specific health conditions and constituencies, this motivation results in a fragmented research agenda, which inhibits transferring the gains across varied preventive domains.

Key Question 2. *Provider.* The literature is scarce. There is little evidence available to support the idea that explicit provider financial incentives, particularly of the modest and artificial nature that were evaluated in the studies, are effective. Further, it appears that bonuses do not work simply and easily. The core beliefs regarding the appropriateness and efficacy of financial incentives have only recently begun to be subjected to examination through either experimentation or well-designed quasi-experimental or observational studies.

While there was some evidence that incentive effects were larger for group practices than solo practices, there is not enough information to sort out the causes. The improvements could signal increased staff and office system resources available to group practices. As it is not clear whether the incentives were paid directly to the physician or to the group, the question remains open.

Consumer. We may guardedly say that economic incentives are effective in the short run for simple preventive care and well defined, distinct behavioral interventions. There is insufficient evidence to say that economic incentives are effective for long-term lifestyle changes required for health promotion.

Key Question 3. The reviewed literature cannot answer whether there is a dose response for provider incentives, although one may assume that a sizable enough incentive should produce the desired behavior, if at a high cost. There is a possible dose response for consumer incentives. Even more interesting for consumer incentives is the effectiveness of relatively modest incentives. The threshold dose appears low.

Key Question 4. None of the provider studies and few of the consumer studies undertook to make this calculation, thus it is difficult for us to assess the net predicted benefit of a given financial incentive.

Overall, the scientific quality of the current evidence is fair. While many studies were adequately designed to address the specific research question, the question itself was often uninformative.

Practical Implications

Concerns over the quality of care have prompted increasing attention to how to change providers' behaviors.[1] Educational strategies such as guidelines and protocols alone have not proven particularly successful.[1] Economic incentives seem a more direct approach, but this review raises several cautionary flags. The desired behaviors must be very specific and easy to track. Complex rules for success are less effective. The incentive must be of sufficient size to make it worthwhile for the provider to change practice behaviors. In general, offering a chance to win a large prize may be less attractive than the promise of a modest but substantial prize. Moreover, relying on incentives may prove dangerous because it may foster dependency on them. If the provider behaviors are not ingrained, they may disappear when the incentives end or when a new topic is selected to be incentivized.

Those planning to use incentives should be very clear about their goals. Is this intended as a temporary change in behavior or an inducement to make a permanent change? Practitioners feel under great stress and harried by many competing demands for their time. Incentives may buy a temporary priority from the provider, but sustained change in the operation of the practice will require an investment of energy to address the underlying mechanisms that can reinforce the desired behaviors. One might hope that a brief experience in delivering care in a new way, fostered by financial incentives, might lead to permanent changes in the modus operandi of the practice, but there is little empirical evidence to support this hope. Some incentives may be permanent, a direct reward to doing a defined task. Under those conditions, the necessary shifts in practice behavior may be incorporated, but it may be possible to catalyze this transition by studying the logistics of the practice. In many cases, the critical actions rely on simple changes to prompt actions and delegation of authority to support staff. In those cases, the resources earmarked for incentives may be put to more efficient use elsewhere.

The enthusiasm for consumer incentives may be driven by some of the same concerns. Pressures to improve preventive performance may motivate some health care organizations to induce their enrollees to become more active in their own care and health promotion activities. In some cases, it may be possible to simultaneously incent both consumers and providers towards synergistic ends. Consumers seem to be more susceptible to incentives, even modest ones. At least some patients may appreciate the attention that incentive programs represent. However, there is always a temptation to pick the low hanging fruit. The recalcitrant consumers may not be as easily swayed by incentives. The energy required to reach and persuade non-adherent patients may still be high.

Future Research

Overall

The limited success of modest and "artificial" incentives to induce long-term change supports the current push for multi-component interventions based on the full environmental or social ecological perspectives such as the McKinley model.[2] There is a need for further studies.[58]

Future researchers need to be clear about the causal chain of prevention or health promotion under investigation and the purpose of the incentive intervention being considered. Evidence of this clarity is demonstrated in careful definitions of the process of care for a given preventive concern; careful matching of the nature of the economic incentive in terms of type, size, duration, frequency, and the use of other components such as education, social support or competition; and the projected long-term effects of the intervention once the incentive is withdrawn.

The large literatures in the social and behavioral sciences on incentives should be brought to bear on the empirical questions of when, to whom, and how much. Without theoretical underpinning it is difficult to understand exactly why incentives did or didn't work.

How economic incentives compare to and complement other strategies to improve preventive care, particularly with regard to long-term effects, remains to be fully understood. Within multi-component research there may be joint effects between incentives and other components. Do explicit incentives improve or impede, or are they unnecessary when a larger ecological effort is made, especially for consumers?

Natural settings for incentive research are important. The potential cost-effectiveness of incentives would be compromised if any positive results of an incentive were so fragile that they survived only in controlled settings.

Mixed-method research projects would improve our understanding of the meaning and value of the incentives to the populations for which they are intended and the attitudes and beliefs those populations hold.

Personality research and other ways to understand individual differences may provide insights toward understanding and addressing the problem at which the incentive is aimed. Cultural differences should be more specifically examined.

Different types and sizes of economic incentives may trigger different modes of decision-making processes. We do not understand how a targeted individual determines when psychological or economic decision-making models are used.

Providers

Which metric to use for determining if preventive care is under-provided from an economic perspective remains unresolved. Possible perspectives are cost-effectiveness, effectiveness, consumer welfare, HMO welfare, or the opportunity cost of other types of care.

Consideration needs to be given to the organizations in which physicians work. Organizational dynamics affect the financial incentives and the rules under which physicians practice. Economic incentives do not exist in a vacuum.

Consideration also needs to be given to measurement issues. Incentives must be based on things that can be measured, which then create the potential for slackening of effort in other unmeasurable but potentially important domains of care. Paying provider incentives on health outcome measures becomes a default choice when we cannot measure the process. We are often unable to determine with confidence what a unit of preventive services is. Furthermore, success in prevention is generally a nonevent. It is much easier to count something that does occur than to estimate the number of events that might have occurred but did not.

Attention should also be paid to teasing out the differential effects of two major components of economic incentives for physicians: motivation and information content.

Future researchers should also keep in mind that scalability matters. For an incentive system to be widely put to use, it has to be large enough to make the task seem worthwhile. We know little about how large such incentives need to be.

Consumers

Researchers need to address the potential for the coercive effect of incentives on patient autonomy. No study has investigated this concern.

Competitions, or tournaments, as a work-site economic incentive program component, need more testing before widescale adoption.

Provider-Consumer Interaction

Future research should investigate possible synergistic effects of coordinated incentives simultaneously applied to both providers and consumers for a particular preventive concern. The patient-provider relationship itself is also important. There is extensive literature in this area to inform future research on the potential impact of incentives on the consumer's acceptance of the provider as a collaborator in health promotion activities. In turn, providers may become more enthusiastic about a preventive activity when they are aware that it is being offered at lower costs to their patients.

Conclusion

If we accept the value of preventive efforts, we must recognize the inadequacies of existing systems to encourage such practices. The literature reviewed here suggests that financial incentives have been used, in an uncoordinated fashion, at three levels in an attempt to increase prevention behaviors: 1) as motivators in the larger economic context of the health plan level, where savings associated with prevention are believed to be efficient, or where market interventions have instituted preventive care performance measures as quality indicators; 2) as provider incentives to induce discrete behavioral changes; and 3) as consumer incentives to remove

barriers, improve health education, and reward healthy behavior. System-level economic incentives can help to change the larger health care environment, in turn prompting the individual providers and consumers to adapt to a new environment. Financial incentives, if they are big enough, can influence discrete behavior at the individual level in the short run. The benefits of such incentives may be magnified if they are coordinated with each other and with system level incentives, although this potential synergy remains untested. Whereas provider incentives do work, they may not provide a sustained behavior change. There is always a danger that they will be displaced by a new set targeted at a new topic. So questions remain regarding whether investing in office system changes which support long-term changes in practice is a better choice than relying on incentives. More importantly, since various observers have noted that the business case for quality improvement is still weak, we must ask who is prepared to bear the cost of either strategy.

Availability of the Full Report

The full evidence report from which this summary was taken was prepared for the Agency for Healthcare Research and Quality (AHRQ) by the University of Minnesota Evidence-based Practice Center under Contract No. 290-02-0009. It is expected to be available in August 2004. At that time, printed copies may be obtained free of charge from the AHRQ Publications Clearinghouse by calling 800-358-9295. Requesters should ask for Evidence Report/Technology Assessment No. 101, *Economic Incentives for Preventive Care*. In addition, Internet users will be able to access the report and this summary online through AHRQ's Web site at www.ahrq.gov.

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