Behavioral Insights for Health Care Policy

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Abstract

Behavioral policy has become commonly associated with interventions targeting individual behavior (e.g., nudges). While there are opportunities for applying nudges to health and health care, the most promising applications of behavioral insights involve more far-reaching and systemic interventions. Here, we propose a series of policies inspired by behavioral research and insights that, we believe, offer the greatest potential for achievable gains.

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Perhaps the most daunting challenge facing contemporary policy-makers is the cost-effective provision of high-quality health care. The U.S. spends a far greater fraction of its national income on health care than wealthy peers, but suffers from the lowest life-expectancy at birth, the highest infant mortality, and comparatively high prevalence of obesity and chronic diseases such as diabetes.[1] Within the U.S., health outcomes, such as longevity, vary substantially by income, and, for those with low-incomes, vary sharply across geographic regions.[2] Although longevity has been increasing on average, there has been a virtually unprecedented recent decline in health for some groups.[3] Further underscoring the extent of such disparities are the estimated 32 million non-elderly individuals without health insurance, even after the introduction of the ACA exchanges.[4]

In this paper, we explore the ways in which behavioral insights and research findings could empower policy-makers to improve health outcomes, reduce health disparities, and contain health costs. We organize our discussion around a set of long-standing policy challenges of economic consequence that may hold particular promise for behaviorally informed policy reform. These challenges include encouraging healthier lifestyles, expanding enrollment in health insurance and improving the quality of plan choices, discouraging the use of inefficient health care, standardizing and simplifying clinical protocols, improving the provision of care at the end-of-life, and encouraging medical donations. Beyond discussing these different specific problem domains, we also address the pitfalls, but more importantly potential, of new informational technologies, such as electronic medical records and web-based diagnostic and decision aids.

Although behavioral insights have delivered profound successes in other domains through surprisingly straightforward innovations (e.g., the dramatic increase in employee savings due to the introduction of automatic enrollment), the potential for a simple behavioral cure-all in health policy is diminished by the uniquely disparate set of economic interests that populate the policy landscape.[5] Nevertheless, we draw on research across the behavioral sciences to identify several health policy interventions that we judge to be promising, pragmatic and, at a minimum, worthy of rigorous testing.

Disease and Lifestyle Management

Many of the health problems facing the U.S., as well as other nations, can be traced at least in part to poor behaviors. Unhealthy behavior such as smoking,[6,7,8] poor diet and sedentary lifestyles[9,10] account for as much as 40 percent of premature deaths in the United States, whereas deficiencies in health care delivery account for only 10 percent.[11,12]

Researchers have tested a number of behaviorally inspired interventions to deal with these problems. These include programs that use concepts from behavioral science to strengthen the impact of incentives to exercise,[13] quit smoking[14,15,16] and encourage dieting,[17,18,19,20] as well as the use of non-incentive based "nudges" such as strategically designed cafeterias,[21] trayless dining, and packages/plates shaped and sized to reduce eating[22] (reviewed in a recent meta-analysis[23]), as well as nutritional labeling.[24] While these efforts have yielded some beneficial

outcomes, such successes have generally been short-lived. For example, in one study participants in two incentive conditions lost more weight than those in a control group with no incentives by the end of the 4-month intervention. In a follow-up assessment three months later, however, there were no longer any differences between the intervention conditions and the control.[25]

One promising front in the effort to effect behavior change is the spread of health and wellness programs across large U.S. firms. These employee programs, encouraged by the ACA, typically feature a mix of disease management, health screening, and lifestyle improvement initiatives, and they draw heavily on behavioral insights, including the power of small economic incentives, social marketing, and rewards programs to encourage employee engagement.[26] While the details of program design, implementation, and take-up vary considerably across firms, the introduction of wellness programs appears to be correlated with increased exercise, healthy eating, smoking cessation, and weight reduction. We encourage more research aimed at estimating the long-term *causal* effects of specific components of wellness programs on a range of risk factors and, importantly, at understanding the optimal economic and behavioral design of these initiatives. Wellness programs offer some hope that traditional economic incentives, in combination with sophisticated behavioral marketing and design, can lead to sustained, and cost-effective, behavioral change.

The success of wellness programs, which integrate incentives and behavioral interventions, suggest that interventions aimed at deep-seated health-related behavior change may require comprehensive and multi-dimensional policy responses. As one example, consider that there is little evidence for the efficacy, in isolation, of warning labels and educational efforts on the reduction of cigarette use. When jointly administered with cigarette taxes, restrictions on advertising, and bans on public smoking, however, smoking declined substantially. Seat belt usage also became more widely adopted with such coordinated efforts.[27] Addressing other policy problems grounded in deep cultural and social norms (e.g., excess drinking, healthy eating, exercise), may require the sophisticated coordination of traditional economic policies, such as regulations and taxes, with behaviorally informed strategies designed to educate, persuade, and/or nudge. Rather than studying the effect of individual interventions, large-scale randomized controlled trials should also explore interactions between behavioral interventions.

Access to Health Insurance and the Quality of Plan Choice

The provision of health insurance (both medical and prescription drug coverage) offers perhaps the most direct example of how behaviorally informed policy reform could improve welfare and efficiency.

Insurance uptake: An initial challenge to the provision of insurance is that a significant share of individuals fail to enroll in subsidized health insurance coverage for which they are eligible. Estimates suggest that 33% of eligible adults fail to claim Medicaid benefits, while 54% of those eligible fail to purchase coverage from the ACA marketplaces which offer subsidized coverage for most enrollees.[28,29] While traditional economic models imply that the decision not to enroll reflects economic costs associated with program application, learning, or stigma that outweigh program benefits, recent research offers evidence that limited decision making competence may

be responsible for a substantial share of non-participation, particularly among the poor.[30] These behavioral limits, such as low program awareness, confusion with respect to eligibility, and an aversion to administrative complexity, may help explain why millions of individuals forego potentially valuable insurance coverage.

Behavioral research offers several strategies for improving insurance enrollment, including simplifying the enrollment process, effectively communicating program benefits and eligibility, and providing direct assistance as means of substantially increasing program participation.[31] Consistent with such evidence, the federal and many state ACA marketplaces have simplified plan enrollment, streamlined eligibility verification, and provided assistance through multiple channels. While these changes have undoubtedly contributed to shrinking the ranks of the uninsured, there remains considerable scope for further enhancements choice architecture (including the use of defaults).[32]

A more structural approach for increasing enrollment in Medicaid, CHIP, the ACA, and non-health benefit programs is to create a universal portal through which individuals could verify eligibility and enroll in federal (and possibly state) benefit programs. The existence of a single gateway, which could be the focus of intensive marketing, could dramatically increase application and enrollment across several benefit programs, particularly among the poor. Such a portal might resemble perhaps a far more functional version of the already existing benefits.gov.

Efficiency of plan choices: A second policy problem involving the administration of insurance is that those who do enroll often make what appear to be financially inefficient choices. Consumers are increasingly being directed towards exchanges that require comparisons across plans that differ not only in financial cost-sharing but along non-financial dimensions such as the availability of providers and the insurer's reputation for processing claims. In the face of such complexity, the evidence suggests that many consumers do not even grasp the fundamental building-blocks of insurance (e.g. copayments, deductibles).[33] Perhaps unsurprisingly, a number of studies have documented that in both employer- and government-sponsored exchanges, enrollees choose plans that either cost too much or provide too little insurance coverage for their circumstances.[34,35,36] Other studies have shown that consumers don't understand the metallic labels associated with plans in different tiers of the ACA, and make poor decisions as a result.[37, 38] The economic consequences of such choices are significant, borne disproportionately by those with low incomes, and are not remedied through improvements in plan choice over time.[31] We believe that many of these errors are avoidable.

Behavioral research offers a number of avenues for improving the quality of plan choices. Decision aids, informational disclosures, personalized "smart" defaults, and sophisticated choice interfaces have all been proposed as tools to help consumers to circumnavigate the complexities of insurance.[39] Perhaps a more promising approach, however, is to make the plans themselves simple enough so that even poorly informed consumers can understand them.[40] This could be achieved through regulations mandating a combination of simplification and standardization of policies, much the way we have seen with credit card statements in recent financial reform. [41]

Beyond pointing to the desirability of simplifying and standardizing health insurance options, behavioral science suggests the specific forms that such policies should take. For example, research shows that deductibles and coinsurance are the two aspects of health insurance that

consumers have the most trouble with, so simplified plans could simply eliminate these two features. There is, of course a concern that individuals insured by policies lacking deductibles will over-consume healthcare, leading to higher premiums, but the fact that at least one health insurance company has been selling such policies for years suggests that it is financially viable.[42]

Efficient Utilization of Medical Care

The fee-for-service system of reimbursement, which dominates in the U.S., favors overprovision.[43] It has been estimated that unnecessary tests and procedures account for nearly one in three dollars spent on medical care in recent years,[44] implying that in 2015 roughly 1 trillion dollars were wasted by overuse.

Currently, there is no consensus as to how to limit unnecessary and inappropriate medical care. Many ideas have been offered, but few seem well positioned to have a quick impact. Most pervasively, high-deductible health plans (HDHPs) have been shown to lower total spending, but are blunt instruments that are directed at consumers and do not necessarily target diagnoses and procedures most that are most prone to overuse by physicians.[45] More promisingly, although Accountable Care Organizations (ACOs) have experienced challenges in implementation,[46] and so far realized at best only modest saving, [47] they have yielded improvements in quality measures and patient satisfaction.[48,49,50]

Provider conflicts of interest: While correcting the misaligned incentives created by fee-for-service arrangements is a daunting challenge, there is considerable low-hanging fruit when it comes to eliminating or reducing conflicts of interest. Regulations currently in place to limit "detailing" by representatives of pharmaceutical and medical device companies, many of them introduced by the industries themselves (in response to a series of costly law suits), don't go nearly far enough in restricting such practices. Pharmaceutical firms continue to spend heavily on marketing, and the large majority of US physicians received some sort of financial benefit from industry (often food in the workplace).[51] Ample research supports the observations that even small gifts can distort decisions, in part because physicians are not aware of succumbing to conflicts of interest.[52] There is a virtual consensus of researchers working in this area that such gifts should be prohibited [53,54] (Indeed, Vermont bans industry from providing meals to physicians, as does the Veterans Affairs health system.) Recent evidence shows that restrictions on pharmaceutical marketing reduce off label prescribing.[55]

Transparency is another approach that can have a significant impact. Although there is no research showing that patients benefit directly from receiving information about physician conflicts (indeed, the opposite may be the case[56,57]), transparency policies often have unexpected benefits (e.g., enabling researchers and the press to do more comprehensive investigations), and there is research suggesting that individuals who are forced to disclose conflicts of interest will be less likely to accept gifts or compensation that they would be required to disclose.[58]

Second opinions: Second Opinion Programs (SOPs) offer a potentially quick, simple, and cost-effective way to reduce inappropriate and unnecessary medical care in the United States. Surgical SOPs were popular in the 1970s and early 1980s, but fell out of favor despite a number of very promising (if flawed) evaluations. [59,60,61] However, data and methods that were

unavailable then, but are available now, have the potential to vastly increase SOPs' efficacy and cost-effectiveness. These programs leave the medical decision in the hands of patients, relying in part on the idea that most people would prefer not to get surgery that is, at best, unlikely to benefit them. Moreover, SOPs can be implemented quickly and independently of other health care reforms.

Building on behavioral principles, a successful SOP program would target tests and procedures of evidence-based questionable value. Obvious candidates would be costly surgical procedures such as knee or back operations. An incentive program informed by ideas from behavioral science could encourage patients to obtain second-opinions. One possible approach would be to make second opinions the default for specific tests and procedures, with patients who fail to obtain a second opinion required to pay a significant copay that would otherwise be waived. Most (though not all) prior and existing programs have been entirely voluntary, resulting in low take-up rates. To minimize conflicts of interest and tacit collusion among physicians practicing together, where feasible, patients would be required to obtain second opinions from out-of-network physicians or a third-party practice that is dedicated to second opinions, but otherwise second opinions should come from physicians outside and independent of the original physician's practice group.

In the Netherlands, a program mandating double evaluations of mammograms (by two independent experts, with a procedure for adjudicating disagreements), has led to a false positive rate half that of the U.S. (with very few false negatives).[62] This program, which is minuscule compared to the scalable potential application of second opinions in the U.S., has resulted in huge savings from avoidance of unnecessary testing and treatment.

Evaluating merit of tests and treatments using cost-benefit analysis (CBA): Perhaps the most obvious (albeit not specifically behavioral) approach to excess utilization is for public and private insurance to not cover expensive tests and treatments of dubious value. In the United Kingdom, the National Institute for Health and Care Excellence (NICE) publishes guidelines that determine practices for, and coverage of, the National Health Service (NHS) in the use of healthcare technologies and in clinical practice for specific diseases and conditions. Such an agency is essential for making impartial, credible, decisions that trade off costs and quality. The Agency for Healthcare Research and Quality (AHRQ) played a similar role in the U.S. following its creation in 1989, but it encountered stiff opposition from pharmaceutical companies and physician groups when it proposed guidelines that would have limited funding for specific procedures and drugs. When it produced a guideline proposing that back pain surgery is often unnecessary and potentially harmful, a lobbying campaign by orthopedic surgeons led to the agency's effective defunding, as well as renaming. Although current politics seem to preclude the recreation of such an agency, were one to be established, principles of behavioral science could play an important role. Some existing procedures for measuring and making use of quality measures (e.g. QALYs) in CBA can produce recommendations that are widely viewed as misguided.[63] Behavioral science can contribute new and better methods for eliciting public, and expert, policy preferences as inputs into determining what tests and procedures should and should not be covered.

End of Life Care and Medical Donations

Enhancing End-of-Life Care: End-of-life care is perhaps the one domain of medical provision in which the immediate psychological, social, emotional, and physical well-being of the patient, and the patient's family, takes precedence over purely clinical concerns. By one composite measure, the "Quality of Death Index," the U.S. ranks 9th of 80 examined nations, which is not a particularly poor position, but the U.S. receives particularly low marks for the affordability of end-of-life care.[64] Behavioral insights could be applied towards enhancing patient-provider communication as well as more broadly improving societal awareness and understanding of end of life treatment options. For example, many patients may not wish painful and unpleasant life-extending measures and express such a preference in an advance directive. Defaults have been shown to be effective in these high-stakes decisions, even when they were transparently disclosed (alleviating ethical concerns); and those with stronger preferences about their end of life care tended to favor opting-out of painful measures at an even higher rate.[65,66] While defaults and communication with patients can be helpful, advance directives are only meaningful if physicians adhere to them, which today does not appear to be the case.

Absent, delayed, or inadequate communication is a documented source of patient anxiety, family distress, physician burnout, and excessive health care costs during the terminal stages of care.[67] One reason physicians may be reluctant to provide information to patients is uncertainty about the accuracy of their prognoses.[68] The prognoses that are delivered are systematically too optimistic, overestimating the length of survival by about 50%.[69] Overoptimistic prognoses discourage patients from opting for comfort options when possibilities for a cure have faded. Moreover, existing tools to support decision making at the end of life, such as living wills and advance directives, do not safeguard patients from unwanted treatments and are not frequently updated to reflect changes in goals of care over time.[70,71]

Behavioral research points to several interventions that could potentially improve communication and heighten public awareness. For example, EMRs could be outfitted with prompts to trigger advance care planning discussions more frequently among patients with serious illnesses, or patient narratives could be used to improve affective forecasts about preferences for end-of-life care. Behaviorally informed approaches could also be employed to produce healthcare policies that are more likely to result in desired health outcomes. For example, healthcare systems could utilize incentives to increase discussion about patient preferences and goals of care, as well as increase the number physicians trained in palliative care. Further, regulating bodies could urge the development of training in communication of prognostic information and emotion-focused conversations in medical school curricula.

Medical Donations. Medical donations, in the form of blood, plasma, bone marrow, tissues, and organs, can save lives,[72] improve health outcomes[73] and decrease medical costs.[74] Medical donation is a particularly ripe area for behavioral policy, since financial incentives for donation are often deemed repugnant and thus prohibited.[75,76] In the context of blood donation, social recognition for frequent blood donors encourages regular donors to give more often.[77] Gifts,[78] and the elimination of financial disincentives to donate,[79] also lead to more donation. In the context of organ donation, allocation rules that prioritize registered organ donors or next-of-kin of deceased donors have been shown to lead to more registrations and an increased rate of next-of-kin consent.[80,81,82,83,84] There has been less success with changing the way the organ donation question is asked at state departments of motor vehicles.[85] Future improvements in registration messaging might leverage social norms or highlight the social benefits of donation. Making the

decision whether or not to donate part of an advance directive could further guide relatives when it comes time to affirm the deceased's decision. An opt-out system in which individuals are presumed to be organ donors can increase the number of donors,[86] as can a system with active choice in which the options are framed to highlight the benefits of the desired option.[87] Changing the default, as Wales did in 2015, may thus be promising. However, implied consent could also increase families' propensity to overrule the deceased's wishes.

New Technologies to Improve Medical Care

Electronic medical records: Electronic medical records (EMRs) provide a unique opportunity to intervene in the choice architecture of medical care in a systematic and constructive fashion because doctors increasingly interact with EMRs while they are seeing patients. The potential of EMRs was illustrated in a recent study which attacked the problem of over-prescription of antibiotics using ideas from the behavioral sciences.[88] The study, in which physicians prescribing antibiotics via an EMR were randomized to different experimental conditions, found that merely suggesting alternative medication to doctors when the electronic records system flagged a prescription as questionable did not reduce inappropriate prescriptions, but that asking doctors to provide a short written justification for prescribing it reduced inappropriate prescriptions by 75% (from 23.2 to 5.2 percentage points). Another recent study[89] found that prescription of cost-saving generics can be increased by making such medications the defaults in EMRs. Regulation requiring systems to flag inappropriate prescriptions, tests and procedures, and asking doctors to provide a simple justification would likely not impose much of a burden or cost, but could substantially reduce the number of deaths (and the costs) associated with antibiotics resistance.

In addition to prompting for justifications, EMR systems could be used to reach out to patients to schedule follow-up appointments, or raise alerts if prescriptions are not filled on schedule (suggesting lack of compliance with the drug regimen). Such notifications could themselves be guided by behavioral science. For example, patients could receive a letter defaulting them into a particular appointment time, allowing them to opt-out or reschedule. This has been shown to increase vaccination rates compared to a letter asking them to make an appointment.[90] During interactions between physicians and patients, checklists have been shown to reduce adverse outcomes and mortality.[91] Integrating checklists with electronic medical records may further provide physicians with timely information and reduce errors.[92]

EMRs are, however, an enormous source of physician dissatisfaction,[93] and interventions of this type should be used very selectively. As with other behaviorally inspired interventions, those that work well in isolation might be less effective or even have perverse effects (e.g., in the case of EMRs, leading physicians to ignore all alerts) when combined.[94]

Beyond their potential to target physician behaviors, EMRs also have the potential to provide data that could be analyzed using big data methods to obtain new insights on diseases and treatments. Yet, such applications are currently stymied both by the proliferation of different systems that don't "talk" to one-another, as well as barriers to data access caused by privacy regulations. EMRs also offer patients direct access to information such as test results that in theory can aid self-management of chronic disease and preparation for clinic visits. Unfortunately, current patient portals to EMRs fail to provide the context needed to allow patients to use such data effectively.[95]

Physician adoption and use of information technology is crucial to the efficient provision of health care services, but there is still very limited empirical research with large-scale micro-data highlighting the effectiveness of information technology (IT) adoption and use and examining how effectiveness of usage varies across different physicians, patient, diseases, and organizational structures. Some research has shown that IT improves outcomes for certain patients with complex health problems (but not simpler cases),[96] and other work shows that adoption of IT is correlated with improved process-based care (e.g. management of diabetics), and also reduces over-testing.[97] One key issue is whether IT is productive (e.g., helping physicians perform their jobs more effectively)[98] or non-productive (e.g., helping them to "game the system" to take advantage of existing financial incentives).

Web-based decision aids: Patients are often unaware that their own preferences and values should determine which tests and procedures are performed. Patients have a general reluctance to raise questions or challenge clinicians who they view as authority figures[99] and are reluctant to deviate from the care plan (i.e. they prefer to maintain the "status quo"). Because of this, patients are not adequately informed or engaged in the decision making process, which can result in unwanted treatment or overtreatment.[100,101,102] Moreover, for both patients and doctors there exist stubborn cognitive and affective biases that can negatively impact processing of information and decision making.[103,104,105] Clinicians also contribute to this problem because they are not trained to engage in shared decision making, risk communication, or emotion-focused conversations, do not view shared decision making as "the norm," or do not perceive that there is time for shared decision making within the constraints of today's clinical encounter. [106,107]

Patient decision aids are a promising tool, with demonstrated benefits including increasing patient knowledge, accuracy of risk perceptions, concordance between patient preferences and treatment decisions, and patient engagement.[108] State laws that mandate or incentivize (e.g., through protected liability) shared decision making and the use of certified high quality decision aids (CA, CT, MA, ME, MN, OR, VT) should be employed. Other strategies include telehealth or e-health options as additional safe spaces for patients to engage and ask questions, the development of clinical information systems capable of tracking patients through the decision making process and automatically triggering appropriately timed decision aids, the identification of institutional leaders who model quality shared decision making as "the norm" to providers, the required effective training in patient engagement and shared decision making during medical education and residency, and supporting effort engaged in shared decision making as billable and reimbursable clinical time.[109,110]

Checklists to Prevent Errors and Increase Adherence to Evidence-Based Guidelines: Medicine deals with complex and demanding situations. Physicians make mistakes and forget steps. Checklists are low cost interventions that are used in many settings (e.g. aviation), and can serve both as a memory aid and a way of monitoring quality.[111] Checklists for surgical procedures have been shown to reduce complications and mortality,[112,113,114] though a recent randomized trial of ICUs showed some improvement in several measured outcomes (e.g., avoidance of heavy sedation), but no immediate impact on mortality. [115] They are recommended by both the CDC (e.g. for Infection Prevention) and the WHO (e.g., the Safe Surgery Checklist). However, simply requiring use of the checklist may not be effective, either because staff do not comply with checklist use or it is not adapted to a local setting.[116] Checklists may also have declining

marginal value if already in use or good practices become routinized, which means incentivizing their use may only be required for a short period of time.

Surgical checklists can be adopted by healthcare providers themselves (e.g. they are used by Veterans Affairs hospitals). Randomized controlled trials of checklists could be conducted for adherence to various types of evidence-based medicine. Evaluation of strategies to encourage compliance with checklist use would also be valuable. Policy could encourage adoption of checklists. For example, payers could choose to not reimburse providers for complications that would have been avoided by the use of checklists, similar to CMS' policy towards "Never Events", or savings from the introduction of checklists could be shared with providers.

Conclusions

In this report, we highlighted several of the most promising applications of behavioral science to health policy and health care. These proposals target a range of health stakeholders from consumers and practitioners to the broader insurance system and emphasize solutions that strike a compromise between near-term feasibility and long-term potential to improve health outcomes and/or reduce health spending.

Overall, while there is some scope for improving the quality of patient and provider decisions through low-touch interventions such as disclosures and decision-tools, we believe that the most promising behaviorally informed health reform will take the form of structural changes inspired by a deep understanding of psychological mechanisms. Such ambitious interventions may require significant "buy-in" among political leaders, communities and health care professionals, but can have substantial effects on population health.

We conclude by commenting on the state of evidence-based policy research in health relative to other settings. Wherever possible, we have relied on evidence from administrative data or field studies to forecast how policy interventions might affect the real-life behavior and welfare of doctors, consumers and patients. However, because of the practical difficulty of conducting randomized field studies on topics involving health, and privacy protections around the use of health data, such studies are rare. Returning to the analogy with consumer finance, our understanding of how individuals might respond to behaviorally informed policy has benefited greatly from the proliferation of randomized studies on a range of financial decisions. The recently created Consumer Financial Protection Bureau (CFPB) has, for example, worked with an issuer of a prepaid debit card to improve savings among those who may not have access to traditional bank accounts.[117] Importantly, CFPB has the authority to grant regulatory exceptions to firms to facilitate research on consumer protection. Such public-private research collaborations present a highly promising recent development that can bring in substantial resources and expertise at no cost to the agency. We suspect that a similar institution in the area of health could greatly extend the breadth and depth of health-policy research by clarifying often obscure rules governing the ability of firms and public agencies to conduct field studies and by granting regulatory exceptions when warranted. SBST could then offer such waivers to partner with insurance firms, providers, and pharmaceutical companies and develop randomized controlled trials to explore the effects of policy changes. For example, an insurer might be

permitted to “recommend” insurance plans to customers based on their personal health data, or a drug manufacturer could offer incentives and patient outreach promoting drug adherence.

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