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The Potential of an Online and Mobile Health Scorecard for Preventing Chronic Disease

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The Potential of an Online and Mobile Health Scorecard for Preventing Chronic Disease

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This article proposes a digital or electronic health scorecard to help prevent chronic disease. Today, chronic diseases—such as diabetes, cardiovascular diseases, and cancer—are among the most prevalent, costly, and preventable of all health problems. Yet, no credible, broadly distributed tool exists for monitoring and promoting health of large populations. The Take Care scorecard, we propose, will be a parsimonious way to both convey to people what measures they need to take to maintain their health and prevent or control chronic disease. The scorecard will aggregate several health and lifestyle indicators, such as blood pressure, body mass index, smoking and exercising, and allow the person to score him- or herself, coming up with a single number that assesses where he or she stands in terms of health. The terms used in the scorecard are easily comprehended by laypeople and are intended for usage that is not necessarily mediated by a physician, although it can be easily applied in the clinical setting. The measures included in the scorecard were selected on the basis of converging medical evidence attesting to their significance in curbing chronic disease. While the scorecard can also be used in a pen-and-paper manner, the increasing global popularity and accessibility of online and mobile content makes such a scorecard a potentially powerful and cost-effective means of increasing health.

Chronic Disease and an Online Health Scorecard

Recognizing the growing burden of chronic and noncommunicable diseases (NCDs), the United Nations will be holding a high-level meeting in September 2011 to "address the prevention and control of [NCDs] worldwide, with a particular focus on developmental and other challenges and social and economic impacts,

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particularly for developing countries'' (United Nations, 2011). One of the many goals for this meeting is to ''develop appropriate action plans to promote health literacy and awareness as important factors in ensuring significant health outcomes, in particular for prevention and control of NCDs'' (United Nations, 2011). This article proposes a digital or electronic health scorecard to help prevent chronic disease through improving awareness and health literacy.

Today, NCDs and chronic diseases—such as diabetes, cardiovascular diseases, and cancer—are among the most prevalent, costly, and preventable of all health problems. Between 1997 and 2003, the incidence of diagnosed diabetes in U.S. adults increased 41%, from 4.7 to 6.9 per 1,000 (American Medical Association, 2008). Heart disease, the leading cause of death, was responsible for 631,636 deaths in 2006; and cancer, as the second leading cause, for 559,888 (Centers for Disease Control and Prevention, 2006). Half of those who die from chronic diseases are in their productive years, making the social costs and economic consequences in terms of lost productivity significant. In 2007, the direct and indirect costs of diabetes were $174 billion; the estimated annual effect of heart disease is more than $200 billion, with the effect of hypertension being almost as high (U.S. Department of Health and Human Services, 2010). Last, the nature of chronic disease today presents a challenge not only for researchers and physicians, but also for patients, as chronic diseases are increasingly being self-managed: the number of drugs (prescription and nonprescription) purchased doubled in 1995–1996 and 2004–2005, and despite the growth in chronic disease there have been fewer hospital stays since 2000 (Briss et al., 2004).

This evidence points to the need for a tool to help prevent and manage chronic disease. We propose that a digital (online or mobile) health scorecard can help achieve these goals at a low cost, and for broad populations, including those with low health literacy. A health scorecard is a user-friendly, efficient tool providing evidence and key factors to help an individual understand basic indicators that can help optimize one's health, in terms of medical testing and lifestyle behaviors. A scorecard aggregates medical information, allowing for a quick assessment of where one stands medically, as well as for follow-up, particularly through improved communication with one's physician, and for comparisons over time.

An online or mobile scorecard could display a person's ratings on several basic health measures associated with preventable disease. These include body mass index, blood sugar, blood pressure, and cholesterol levels, and behavioral factors such as smoking and exercise. (Medical support for these is brought below, as well as in Table 1.) The scorecard will provide information on each health measure, allowing users to keep track of their health and monitor risk factors. The most prominent feature of the proposed health scorecard is its ability to capture one's overall health (or preventable disease risk) with a single, easily comprehensible number (including a benchmark against which this number can be assessed), and with clear affective implications. The scorecard would focus on the major determinants of health, prioritizing ease of comprehension over medical jargon and the inclusion of exhaustive criteria. Other significant benefits of the scorecard are engaging patients in health-related decision making and legitimizing patients taking charge of their health, as mental representations of health become clear and coherent.

Despite the considerable potential benefits of an online health scorecard, none exists today that is broadly accepted, applied, and disseminated. We propose that

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Table 1. Recommendations for preventing chronic disease

	NIH	AHA	Mayo	ACC	HMS	Jiao et al. (2009), Mozaffarian et al. (2009)	Patterson et al. (2007), Cleary et al. (2006)
Maintain blood pressure within normal range	X	X Goal is 120/80 mmHg	X Goal is 120/80 mmHg	X	X <120/80 mmHg		X
Keep proper weight	X	X	X Keep	BMI < 25	X	X Keep BMI < 25	X
Exercise more	X	X ≥150 min/ week	X ≥150 min/ week		X ≥150 min/week	X	
Quit smoking	X	X	X	X	X	X	X
Eat a healthy diet		X	X	X Lower intake of saturated fats	X	X	
Reduce blood cholesterol		X <200 mg/ dl		X Reduce LDL Increase HDL	X <200 mg/dl		X Control LDL
Manage diabetes		X			X Keep fasting blood	sugar < 100 mg/ dl	
X							

(*Continued*)

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Table 1. Continued

	NIH	AHA	Mayo	ACC	HMS	Jiao et al. (2009), Mozaffarian et al. (2009)	Patterson et al. (2007), Cleary et al. (2006)
Reduce stress		X					
Limit alcohol to moderate amounts		X	X			X	
Learn about major risk factors that can't be changed		X		X Find out about health of relatives			
Get regular health screenings			X				

Note. NIH = National Institutes of Health (2009); AHA = American Heart Association (2009); Mayo = Mayo Clinic (2009); ACC = American College of Cardiology (2010a, 2010b); HMS = Harvard Medical School (2010). LDL = low-density lipoprotein; HDL = high-density lipoprotein; BMI = body mass index.

Figure 1. The proposed health scorecard: "Take Care—7 Steps for Better Health."

an online scorecard could respond to the changing nature of chronic disease management and provide an effective way to reach a broad audience.

Americans routinely seek health information outside of the clinical encounter, particularly online. A report by the Pew Research Center's Internet & American Life Project revealed that in 2009, a staggering 61% of American adults looked online for health information; 8 in 10 Internet users have looked for health information online, with more than 90% seeking material related to illnesses (Pew Research Center's Internet & American Life Project, 2009). The most common topics are the leading causes of death (heart disease and cancer). The information people find may influence their medical decision making and help them manage their own care, but it may not be enough to motivate action or prevention.

In addition, given the uptake of mobile phones, smart phones, and the proliferation of apps, the idea for mHealth and devices that can access and update scorecards and risk factors (even potentially offering passive input such as movement/exercise), also makes this a ripe area for exploration and application of the scorecard concept. There are close to 5 billion cell phone subscriptions around the world, and 85% of the world's population is now covered by a commercial wireless signal (World Health Organization, 2011). The widespread nature of mobile communication shows the incredible potential in harnessing the technology to reach people all over the world and provide health information. The scorecard could be adapted to be downloaded to a mobile phone, with the individual's responses texted back to collect data on the health status of people everywhere.

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Table 2. Benefits of the health scorecard for individuals and society

Benefits for individuals	Benefits to society
1. A health scorecard, especially when it generates a single number, provides an easy means for people to keep track of their health. 2. A health scorecard will provide a rating that will be easily comprehended and will also have clear affective meanings. Compare a score with, for example, a low-density lipoprotein cholesterol level of 170, which is not immediately interpretable as good or bad. 3. A health scorecard that provides a comprehensive list of medical indicators and behaviors comprising ''health'' helps patients create a mental model of what health means, and how various diseases and lifestyle choices are connected. 4. Having the scorecard reflect the degree to which one subjects him- or herself to preventable diseases will highlight the potential health losses associated with various health conditions, and people will be more motivated to initiate a change. 5. Linking the health scorecard rating to fluctuations in health measures, particularly ones that are actionable, provides an incentive to improve those, so as to see the improvement in the health scorecard rating.	1. A health scorecard, especially when it results in one number, allows anyone interested in monitoring and promoting health, and healthy behavior, whether insurers, governments, agencies, pharmaceutical companies, or global health organization officials to keep track of health indicators at every level. This will allow for detecting areas of either excellence or need. 2. An agreed-upon and broadly disseminated health scorecard will allow each city, county, region and state to know its ''health'' ranking, relative and absolute. This provides a benchmark and incentive for improvement. 3. An agreed-upon and broadly disseminated health scorecard will translate to a unified national concept of health that can be accepted and hopefully pursued.

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Online decision aids do encourage action. Most are designed for specific conditions, such as heart disease (e.g., Heart-to-Heart [www.med-decisions.com/H2HV2] and The Cardiac Risk Calculator [www.cardiacriskcalculator.org/questions/intro]) and prostate cancer (e.g., Prosdex [www.prosdex.com/index_content.htm]). These are premised on the idea that patients go to the web for guidance when the need to choose among courses of action arises around a medical issue, or even to develop a clear view of the options. There are many online cardiovascular disease prevention checklists, ranging from the Mayo Clinic's ''5 medication-free strategies to help prevent heart disease'' (Mayo Clinic) to the Centers for Disease Control and Prevention's 95-page toolkit directed toward workplaces ensuring employee cardiac health, titled ''Successful Business Strategies to Prevent Heart

Disease and Stroke'' (Centers for Disease Control and Prevention, 2005). In 2003, the European Society of Cardiology launched the ''Guidelines for Chronic Disease Prevention,'' which included information and an easy-to-use color-coded chart in which users can identify their age, gender, smoking status, and blood pressure and cholesterol levels to determine their risk of contracting cardiovascular disease in the next 10 years. This scorecard was praised for being evidence based from clinical trials, up-to-date, and adaptable to different countries, as it included different scorecards for countries at high risk and low risk for cardiovascular disease. However, it was criticized for inaccuracies in diagnosing risk between age groups, for asymptomatic cases, and for familial history (DeBacker et al., 2003).

The suggested scorecard follows a similar yet more comprehensive premise. We assume that people wish to know where they stand in terms of their health, even when they are not diagnosed with a specific condition, and may go to the web for this. The scorecard would not be disease specific, nor is it intended for people who are ill. Therefore, it differs from the condition-specific decision aids, such as Prosdex, which users often engage with for as much as 20 min (Joseph-Williams et al., 2010). Rather, the scorecard would be designed to give a quick reply to the question, ''How am I doing in terms of health?'' and provide the user with implicit action items.

Like online decision tools, a web-based scorecard has a number of advantages: access to information that is free, public, and does not require registration or commitment (Schwitzer, 2002). Users can access information at their own pace and revisit it as often as they wish. For the scorecard, the second advantage would be particularly important, given that evaluating risk and well-being are ideally not one-time activities, but rather ongoing, habitual practices. Compared with such a digital tool, repeated usage of a paper scorecard would be more challenging.

Support for Scorecards

The idea of an online health scorecard responds to calls from various stakeholders in public health for improvements in preventing and responding to serious illness. In broad terms, the need for standardization and coordination of surveillance and evaluation systems in health care has been recognized by the Institute of Medicine Committee on Preventing the Global Epidemic of Cardiovascular Disease: Meeting the Challenges in Developing Countries and the United Nations' Joint Programme on HIV/AIDS Monitoring and Evaluation Reference Group (Fuster & Kelly, 2010; UNAIDS, 2009). Furthermore, the World Health Professional Alliance—an Alliance of medical, nursing, pharmacists, dental and allied health professions—also has endorsed the concept and is examining implementation in 2011.

The scorecard also speaks to research on how best to present health information to the public. Scorecards embody an emerging principle in medical practice and interventional epidemiology—the concept of knowledge translation (Davis, 2003). Translational medicine strives to optimize patient care, but also preventive measures, thereby going beyond the provision of health care services, such as medication, info lifestyle practices. A scorecard would facilitate patients' knowledge of the tests they need and physicians' alertness to poor or declining control of chronic disease. Furthermore, the scorecard will provide a unifying framework for discussing health, as, hopefully, patients and physicians will strive together to improve the indicators that appear on the scorecard.

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Policymakers and public communicators need to cultivate the skill of conveying health information so that the patient, reader, consumer, or citizen understands it, without compromising the evidence base (Apfel et al., 2010). Bailey and colleagues (2009) suggested producing information materials in simplified language, with improved formats (Bailey, Wolf, Jacobson, Parker, & Ratzan, 2009). On the basis of their work, Apfel and colleagues (2010) listed several health literacy enhancement interventions, the first being provision of simplified and more attractive written materials (Apfel et al., 2010). Recommended formats involve more white space, friendlier layout, short sentences, simple words, and large fonts. They also recommend passages that are action and goal-oriented, and provide a clear explanation of the purpose of the written material. Passages should clearly define what actions should be taken by the reader and why these actions are necessary. We suggest that widespread adoption of a health scorecard will prioritize, increase, and improve the way health information is conveyed to patients. The design of the scorecard incorporates Apfel and colleagues' (2010) recommendations in multiple ways. The individual's health information is concise and expresses health items in simple language. The clearly displayed information provides goal-oriented steps to health improvement. The calculated score creates a way for the individual to rank themselves and then interpret the ranking in a way that motivates them to make a change. These steps will increase health literacy by informing individuals of their health.

While most existing scorecards have not been empirically tested, evidence indicates that supplying providers with clear guidelines promotes patients' health. For example, Veterans Affairs Medical Centers with higher levels of provider adherence to diabetes guidelines had distinguishing organizational characteristics, including more frequent feedback on diabetes quality of care, and greater acceptance of guideline applicability (Ward et al., 2004). In Veterans Affairs Medical Centers with better patient outcome measures for diabetes, there was more effective communication between physicians and nurses, and educational programs and Grand Rounds presentations were used to implement the diabetes guidelines.

Evidence for the effectiveness of simplified materials for the public also comes from nutritional labels, which allow for comparison across products, as well as with suggested daily consumption. The Nutrition Facts panel mandated by the Nutrition Labeling and Education Act of 1990 had a modest but beneficial effect on the dietary intakes of Americans (Variyam, 2008): Those who reported using the Nutritional Facts panel had significantly higher fiber and iron intakes compared with those who rarely or never used the panel.

Considerations in Creating an Online Health Scorecard

On the basis of these findings, we suggest the creation of a Take Care online or mobile scorecard designed according to several guiding criteria. The scorecard would adhere to recommendations for health information to be presented simply and attractively, as outlined earlier (Bailey et al., 2009; Miron-Shatz et al., in press). The audience for a health scorecard is an important consideration; the Take Care scorecard could be aimed at all adults who wish to remain healthy or to improve their health. By targeting the entire population, early prevention of chronic disease can be achieved, as well as prevention of complications in diagnosed and undiagnosed patients. Furthermore, such framing of the scorecard would remove any

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stigma from its use, and make it suitable for all. In this respect the Take Care scorecard differs from scorecards for diabetic patients, for example, which may not be perceived by the general population as relevant despite being an effective means of prevention.

Converging evidence for these measures appears in diabetes research, suggesting that glucose control (individualized for Type 2 diabetic patients), smoking cessation, aspirin use, blood pressure and low-density lipoprotein control are an effective multifactorial therapy for reducing diabetes complications (Cleary et al., 2006; Paterson et al., 2007). In addition, two recent large studies published in the *Archives of Internal Medicine* identified five lifestyle factors as contributors to pancreatic cancer and diabetes (Jiao et al., 2009; Mozaffarian et al., 2009). These five factors alone accounted for a 58% reduction in risk of developing pancreatic cancer, and attributability for diabetes incidence in 90% of new cases. These five variables include smoking, alcohol use, diet, body mass index, and physical activity. Once again, we see that various lifestyle interventions contribute to reduction of disease, and that recommended steps for reducing, for example, cardiovascular illness, also aid in the reduction or prevention of other dire medical conditions.

A simple behavior change incorporated in the scorecard that can prevent chronic disease is limited intake of alcohol. Dose-response relationships have been found between alcohol use and chronic diseases such as cancers, including mouth, pharynx, colon, liver, breast cancers, diabetes, depression, hypertension, ischemic heart disease, and cirrhosis of the liver (Rehm et al., 2010). However, light to moderate consumption may have health benefits. Studies have shown that regular light to moderate consumption of alcohol may have beneficial effects on ischemic heart disease; however, mixing regular light to moderate consumption with occasional heavy consumption of alcohol negates the protective effects (Roerecke & Rehm, 2010). In addition, this protective effect on ischemic heart disease was not seen in all populations, such as Chinese men (Schooling et al., 2008).

The Take Care scorecard we are proposing would include indicators that are associated with chronic disease, and that can easily be measured and understood by large audiences:

- Fasting blood sugar (diabetes)
- Body mass index (obesity)
- Cholesterol (cardiovascular disease)
- Blood pressure (hypertension)
- Smoking/tobacco use (cancer and cardiovascular disease)
- Alcohol use (hypertension, cancer, and cardiovascular disease)

The overall score resulting from this calculation will range from 0 to 7, with one point for each indicator in the healthy range. This differs from the method of the D5 scorecard, for example, used in Minnesota to promote "living well with diabetes" (secondary prevention), which applies a dichotomous criterion where patients "pass" if they reach desirable levels on all five health indicators, and "fail" otherwise (Schooling et al., 2008). Nolan and Berwick (2006) demonstrated the effectiveness of the all-or-none approach in getting health care professionals to perform all necessary steps when treating patients with, for example, congestive heart failure or pneumonia. Because of the risk that an all-or-none approach may be demotivating to patients, the Take Care scorecard would be designed to provide patients with a composite number (i.e., part of a continuum, rather than healthy vs. unhealthy)

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evaluating their health, alongside an interpretation of this number, what it means, what number they should aspire for, and how they may get there.

Studies have shown that a majority of patients prefer numerical information to care only (Hallowell, Statham, Murton, Green, & Richards, 1997; Wallsten, Budescu, Zwick, & Kemp, 1993). This approach also addresses the problem of lack of standardization in verbal expressions of risk (Kong, Barnett, Mosteller, & Youtz, 1986).

While the Take Care scorecard supplies users with a single, comprehensive health score, it also mobilizes affect and emotion to increase its effectiveness. The importance of affect in information processing and decision making has been widely documented (Bechara, Damasio, Tranel, & Damasio, 1997; Loewenstein, Weber, Hsee, & Welch, 2001; Slovic, Finucane, Peters, & MacGregor, 2004; Zajonc, 1980). People often base their judgment on emotional cues, if these are present (Slovic, Finucane, Peters, & MacGregor, 2002). In light of these findings, it seems that language that involves patients emotionally can increase usage and the perceived benefit of a scorecard.

The Take Care scorecard could link with other risk calculators for specific conditions to enhance dialogue with health professionals and carers to enhance emotional encouragement. For example, the Mayo Clinic website tells people with low risk for heart disease, "Your blood pressure and cholesterol levels are within the healthy range. Your age and sex still have an effect on your heart disease risk score, but your controllable risk factors are well in check. Keep up the good work!" (Mayo Clinic, 2009). Less directly, the D5 (Minnesota Community Measurement, www.thed5.org) communicates emotional support by offering "5 Goals for Living Well With Diabetes": There is a difference between the emotional effect of "controlling" diabetes and "living well" with it. In the Take Care scorecard, the emotional benefit can be accomplished by a means as simple as including a subtitle such as "7 Steps for Better Health." Taking care of oneself implies being careful and responsible, and the term is often used colloquially, especially in friendly parting. In addition, *take* is a verb, implying that action is required.

Positive Side Effects of Scorecards

The Take Care Scorecard not only helps people improve their health, but does so in a way that carries additional benefits as well, some of which might be sustained even if the scorecard is no longer used. Perhaps the scorecard's most important side benefit lies in creating a mental model of health. Even patients diagnosed with a chronic disease do not necessarily have a holistic, coherent model of what affects their health: For example, about 60% of hypertensive patients do not know that exercise lowers blood pressure (Williams, Baker, Parker, & Nurss, 1998). Similarly, 2 out of 3 persons with diabetes do not consider cardiovascular disease a significant risk factor for diabetes (U.S. Department of Health and Human Services, 2002). Thus, patients might think of chronic disease as a medical condition, to be detected, treated, and monitored by a health care professional, solely through medication. Okoro and colleagues (2004) recommended that preventive programs and public awareness messages be directed toward these risk factors to avoid diabetes complications and care costs.

A scorecard that includes lifestyle factors, such as smoking cessation and exercise, alongside medical indicators such as blood pressure and cholesterol, will help

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create a unifying model through which people can appreciate that maintaining their health is a comprehensive task that takes place at home and in the doctor's office or clinic.

Patient participation is crucial in chronic disease prevention. Yet patients are often reluctant to take part in decision-making processes, perhaps because they feel ill-equipped to deal with medical information. For instance, in a study on prostate cancer patients, about half (69 of 148) had a low preference for participation in medical decisions (Van Tol-Geerdink et al., 2006). However, after having been informed about treatment options with a decision aid, 75% of these patients with generally low participation preferences wanted to be involved in choosing their radiation dosage. This result suggests that when medical information is presented in a clear and understandable way, patients feel equipped, even eager to participate. Last, similar to scorecards used with professionals (Nolan & Berwick, 2006), the Take Care scorecard could serve as a check list, ensuring that health professionals assess relevant medical indicators and make sure their patients take the necessary steps for maintaining their health (or at least encouraging them to do so).

Online or mobile scorecards have the potential to be incredibly useful in preventing chronic disease through increasing health literacy, mobilizing individual action for their own health, and teaching users how to live healthy lives and make healthy choices. The digital aspect will also improve surveillance measures, because individuals will be able to report their scores to doctors or governments to monitor progress or areas and individuals in need of help. There are some blind spots within scorecards (as mentioned earlier with the European Society of Cardiology's cardiovascular health scorecard), such as oversimplifying and overcategorizing health information. Individuals that are between age groups, asymptomatic, or that have familial history of chronic diseases may be misdiagnosed by a comprehensive scorecard (De Backer et al., 2003).

Although the scorecard may seem to oversimplify health materials and leave out important ethnic and genetic risk factors and behaviors such as a fiber-rich diet, Ratzan (2011) suggests that usability trumps comprehensiveness and that

> [I]t is the demands and complexity of health information and task . . . that stop many from being able to do what they need to do for health. Interventions to simplify and improve the demands and complexity are the top priority for action, and we must work to systematically make health more understandable and services more navigable for patients.

Whereas some patients, perhaps most, would find the information provided by scorecards sufficient, others may wish to know more and to understand the evidence underlying their score. This can be accomplished by presenting the scorecard information in a stratified manner, which is easily accessible online. The Cochrane Collaboration, providing information about the effects of health care, now applies such a layered structure (Higgins & Green, n.d.). Online scorecards can offer even more, including evidence for the ratings, and potentially even including the relevant medical papers and reviews, for patients who want those. An online version may also provide visual presentations, animation, and any other information that is deemed interesting and beneficial in promoting health.

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Where and How Will the Scorecard Be Used?

In an ideal scenario, the answer is "Wherever there is chronic disease, or wherever chronic disease needs to be prevented." The practicality of the scorecard will likely be different. We expect it to be used in several ways, none of which is mutually exclusive. Note that even in low-income countries some of the more sophisticated and expensive forms of usage can be applied, but other, more affordable forms will also be available.

1. As a phone app: This free app will be available for download, and hopefully used by broad populations. While smart phones are becoming increasingly prevalent, the app will also be available for regular phones. Through a simple text messaging software, an individual would be able to punch in his or her health indicators and receive a health score, along with a simple explanation of what it means.
2. As a Facebook feature: This means of dissemination potentially carries an additional benefit. Through Facebook, anyone using the scorecard will have the option to share his or her results and progress with friends and family, and benefit from their support.
3. As a pen-and-paper tool: While the focus of this article is a digital scorecard, the tool itself was created with low-income countries in mind. Thus, it can easily be replicated and disseminated in pen-and-paper format. Even in the poorest countries, and even in areas where physicians are scarce, and where measurement of blood pressure, for example, is not available, we believe that the scorecard would be beneficial. If an individual learned that his or her alcohol consumption was excessive and that this was affecting overall health and risk of developing chronic disease, he or she might reduce alcohol consumption. Information on smoking and exercise might have the same effect. Further, the awareness that constant measurement and control of blood pressure and blood sugar level is important might drive health-service related change in countries where these are unavailable.

This list was written with an emphasis on a user-initiated usage of the scorecard. Other more institutional uses are also highly feasible. The scorecard may be adopted by health maintenance organizations, which will make it available to their members. This carries a broader public health benefit, as the health maintenance organization will be alerted to areas where chronic-disease related measures are above the desirable threshold, and to develop interventions and perhaps offer incentives for improvement in those areas. Another potential for broad application lies in local initiatives, similar to the one launched in Oklahoma City, Oklahoma, for weight loss, where pounds lost appear on the website, with the goal of losing 1 million pounds ("This City Is Going On a Diet," n.d.). The analogy would be for a city to record how many of its habitants have improved their health scores in general, or particular indicators, over time. An even more global usage would be for countries to adopt the scorecard, and, in poor or developing countries, for local or global health agencies to encourage usage of the scorecard as well as improvement of scores and indicators.

Evaluation of the Scorecard

Beyond the proof of concept, and the empirical evidence pointing that information, especially when coupled with motivational input, is an effective means of persuasion

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(Cialdini, 2001), an empirical evaluation is required in order to demonstrate the effectiveness of the scorecard, as well as its potential pitfalls. We propose to evaluate the scorecard in several ways:

1. A between subjects design, across areas and health maintenance organizations: During preliminary dissemination, there might be a possibility to limit the use of the scorecards, so that a simulated between-subjects design is created. After the scorecard has been used for at least 6 months in one geographic area (e.g., city, county), we will compare health indicators such that are included in the scorecard between this area and another, which bears demographic similarity, but where the scorecard was not used. An equivalent comparison can be carried out between two health maintenance organizations, should they treat similar populations, if the scorecard was to be used only in one of them.
2. A before-and-after design: Within an assigned area or health maintenance organization, and following at least 6 months of using the scorecard, we will compare the indicators that are included in the scorecard, as measured after usage, with those that were measured prior to the scorecard.

Benchmark: The evaluation will allow us to see whether there are shifts in major health indicator after using the scorecard. This will be tested for statistical significance. Further, we will be able to detect whether some indicators are more resistant to change than others, and to target those by special interventions. In addition, when available, we will use matrixes applied by health maintenance organizations, whereby they divide their insured population to five tiers, Tier 4 being those who are severely ill, and Tier 5 being those who are also housebound and need home care. We will check whether the proportions of patient in each tier have changed over time with usage of the scorecard. In an ideal scenario, the scorecard will allow people who are in lower, healthier tiers to remain in them longer than before, and prevent them from reaching the higher, sicker tiers.

Conclusion

Recent trends in health point to the need to take action to reduce (a) the colossal burden of chronic disease and (b) the toll it takes on the health system, the economy, and society. An online or mobile health scorecard is a simple, efficient tool that can create a common vocabulary of what it means to be healthy and what is required to get there—medically and in terms of lifestyle choices and behavior. It can also emphasize patients' responsibility for attaining better health and being aware of their medical conditions, as well as of the implication of their choices.

Preventing chronic disease through an efficient online health scorecard, may be less difficult to accomplish than it appears at first. Perhaps the decree of the Institute of Medicine—to realistically consider how to balance the need for comprehensive data collection with the practicalities of timeliness and resources—needs to be a cornerstone in the creation of an agreed-upon scorecard that will allow for moving global health forward (Fuster & Kelly, 2010). The United Nations High Level Meeting in September 2011 and outcome document provides an opportunity to draft, develop, and diffuse a scorecard for chronic disease that can serve as the compass to address NCD prevention and galvanize motivation to address risk factors and practice behaviors that enhance global health and well-being.

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