Cumulative Adverse Financial Circumstances: Associations with Patient Health Status and Behaviors

Joanna Bisgaier and Karin V. Rhodes

This article examines associations between cumulative adverse financial circumstances and patient health in a sample of 1,506 urban emergency department (ED) patients. Study participants completed a previously validated Social Health Survey between May and October 2009. Five categories of economic deprivation were studied: food insecurity, housing concerns, employment concerns, cost-related medication nonadherence, and cost barriers to accessing physician care. Logistic regression that adjusted for the effects of demographics (age, gender, race, education) tested the association between the cumulative number of adverse financial circumstances (range: 0 to 5) and patients’ health status (self-rated health, stress level, depressed mood) and health behaviors (smoking and substance abuse). Approximately 48 percent of respondents reported one or more financial concern, and 31 percent reported two or more financial concerns. A significant graded relationship was found between the number of adverse financial circumstances and patients’ poor/fair self-rated health, depressed mood, high stress, smoking, and illicit drug use. Findings suggest that in today’s acute health safety net, patients’ concerns related to financial insecurity are very relevant to patient health. This underscores the imperative for hospital-based social workers to design models of routine social health risk screening and system interventions that address patient financial well-being in the ED.

KEY WORDS: emergency department patients; financial well-being; health behaviors; social determinants of health; social health risk screening

There are approximately 39.4 visits per 100 people to U.S. hospital emergency departments (EDs) annually (Niska, Bhuiya, & Xu, 2010). Across health service disciplines, there is a sizeable, long-standing body of evidence establishing the role of the ED as a health system safety net for vulnerable populations, emphasizing the need for social work response to patients’ psychosocial and economic needs in this medical setting (Bergman, 1976; Gordon, 1999, 2009; Gordon, Chudnofsky, & Hayward, 2001; Healy, 1981; Walls, Rhodes, & Kennedy, 2002). In general, the current responsibilities of social workers in U.S. EDs include addressing physician-identified social service needs, counseling and crisis intervention, discharge planning, and referral to relevant services (Auerbach & Mason, 2010; Holliman, Dziegielewski, & Datta, 2001). Typically, these direct, individualized interactions are brief, single-session contacts (Kitchen & Brook, 2005). Although the need for patient-level social work functions in EDs is well-researched, the value of system-level social health screening and response in EDs has yet to be established (Auerbach & Mason, 2010; Gibbons & Plath, 2005; Gordon, 2001; Keehn, Roglitiz, & Bowden, 1994; McCoy, Kipp, & Ahern, 1992; Ponte & Berg, 1992). The result is that routine screening and referral for patient economic deprivation (for example, food insecurity, housing instability, unemployment or income security, lack of adequate health coverage for medications and physician care) are scarce practices in contemporary medical settings (Fleegler, Lieu, Wise, & Muret-Wagstaff, 2007).

The relationship between socioeconomic well-being and biomedical and behavioral health is well-documented (Adler et al., 1994; Bosma, Schrijvers, & Mackenbach, 1999; Head & Faul, 2008; Krieger, Williams, & Moss, 1997; Lynch, Kaplan, Cohen, Tuomilehto, & Salonen, 1996; Oakes & Rossi, 2003; Schrijvers, Stronks, van de Mheen, & Mackenbach, 1999). In the United States, a patient’s socioeconomic status (SES) is a multilayered construct that includes individual-, household-, and neighborhood-level consideration of social class, race and ethnicity,
gender, education level, and income and access to financial resources (Krieger et al., 1997). Although no single SES factor explains the connection between SES and health, one component that is malleable is an individual’s experience of financial constraints (Fleegler et al., 2007). Similarly, among the many other non-SES factors associated with disease and disability that lie outside the reach of public policy, individual financial constraints can be immediately addressed through broad health policies, physician treatment strategies (that is, prescriptions for less costly medications), and targeted social work referrals to existing public programs (Kaplan & Lynch, 2001; Piette, Heisler, & Wagner, 2004; Poleshuck & Green, 2008; Schrijvers et al., 1999).

Currently, the U.S. health system is entering a critical juncture in its development. The present fiscal crisis has resulted in 46 of 50 U.S. states facing budget shortfalls for fiscal year 2011, and the number of unemployed Americans has reached 14.9 million, with 8.9 million Americans who want to work full-time but are underemployed working part-time (McNichols & Johnson, 2010; U.S. Bureau of Labor Statistics, 2010). In the current political climate, the economic recession was accompanied by considerable federal support to state health agencies, unprecedented funding to health services researchers, and comprehensive legislative reforms to the health system. Federal stimulus money granted through the American Recovery and Reinvestment Act of 2009 (P.L. 111-5) includes $750 million in contracts to build fully integrated electronic medical record (EMR) infrastructures in health systems nationwide; $225 million in funding for health information technology (IT) job training programs; and, beginning in October 2011, $14 to $27 billion in bonuses to physicians and hospitals if they demonstrate “meaningful use” of their EMR systems (Ferris, 2010; Sack, 2009; U.S. Department of Health and Human Services, Office of the Secretary, 2009). In addition, the Patient Protection and Affordable Care Act (ACA) (P.L. 111-148) was signed into law on March 23, 2010. Among the many reforms emphasized in this landmark health care overhaul legislation are training and research support for improving patient-centered communication and care coordination and payment incentives for centralized care delivery through voluntary accountable care organizations that focus on coordination and quality of care (Levinson, Lesser, & Epstein, 2010; Shortell, Casalino, & Fisher, 2010).

The present system transition toward a full-scale health informatics infrastructure (in which the definition of “meaningful use” will be developed over the next several years) marks a unique opportunity to incorporate social work screening and response as an essential feature of routine standard of care in acute health care safety-net settings. In this context, understanding the current burden of ED patients’ adverse financial circumstances and their association with patient health status and health behaviors can inform whether there is a pressing need for fully integrated, system-level social work screening and intervention.

OBJECTIVES

Accordingly, the present investigation was designed to examine the prevalence of patient-disclosed food insecurity, housing instability, employment concerns, and lack of adequate health coverage for medications and physician care. In addition, we sought to determine whether cumulative adverse financial circumstances are relevant to ED patient health status and behaviors.

METHOD

Participants

This is a secondary analysis of a prospective, cross-sectional study of a convenience sample of non-emergent adult patients presenting to the ED at an urban, tertiary care teaching hospital between May and October 2009. This ED had a volume of approximately 61,962 patient visits in 2009. Patients who presented to the ED with any nonemergent complaint that did not require an urgent intervention were 18 years or older and were willing and able to complete a survey voluntarily self-administered an anonymous 40-item paper–pencil Social Health Survey (SHS) that was previously validated through cognitive interviewing with several hundred nonemergent, urban ED patients from diverse backgrounds to ensure content and construct validity (Rhodes et al., 2001). Clerks in the ED were instructed to distribute surveys 24 hours a day, 7 days a week to all patients who were able to read English (fifth-grade reading level) were eligible to participate. The patients returned the survey to the provider or nurse caring for them in the ED.
surveys were placed in a collection box and patients’ responses were entered into a database for further analysis. The study protocol was reviewed and approved by the institutional review board (IRB), which considered this anonymous patient data exempt from IRB oversight.

**Measures**

**Demographics/Control Variables.** Age (18 to 25, 26 to 35, 36 to 45, 46 to 65, and over 65), gender (male versus female), race (white, black, Hispanic, Asian, multiracial, other), and education level (less than high school, high school, some college, completed college or more) were collected using the SHS. The surveys were self-administered, and some answers were left blank. On these control variables, multiple imputation methods were used to account for this missingness in logistic regression analyses.

**Exposure to Economic Deprivation.** Five dichotomous (disclosed versus not disclosed) variables of adverse financial circumstances were studied as patient exposure to economic deprivation: food insecurity, housing instability, employment concerns, cost-related medication nonadherence (CRMN), and cost barriers to accessing physician care. Participants were asked, “Do you have concerns about any of the following?” followed by a list of 19 check-box options that included the following: not enough food, housing, employment, and can’t afford medication. In addition, participants were asked the following three questions:

1. Do you sometimes eat less than you would like because of money concerns?
2. Have you ever not seen a doctor when you needed to because of money concerns?
3. Have you ever not taken medications you needed because of money concerns?

To meet criteria for experiencing food insecurity, participants had to disclose either having concerns about not enough food or sometimes eating less because of money concerns. Participants who reported having concerns about housing or employment were considered positive for exposure to housing instability and employment concerns. Participants who reported either having a concern about not being able to afford medication or ever not taking medications due to money concerns were considered positive for exposure to CRMN. If participants reported ever not seeing a doctor due to money concerns, this was considered a positive disclosure of experiencing cost barriers to physician care. Responses of not sure to the three specific questions of food insecurity, cost barriers to physician care, and CRMN were considered positive disclosures. Missing information on any of these items was considered a nondisclosure. After assessment of whether participants had screened positive for each individual category, the cumulative number of adverse financial circumstances was calculated (range: 0 to 5).

**Patient Health Status/Health Behaviors.** An item that questioned how participants would rate their own overall health (with response options of poor, fair, good, very good, or excellent) was used to measure overall patient health status. Prior research has established that this question of self-rated health is a strong predictor of mortality (DeSalvo, Bloser, Reynolds, He, & Muntner, 2006). Consistent with prior literature, self-rated health responses were dichotomized into categories of poor/fair versus good/very good/excellent (Felitti et al., 1998). As depression is the leading contributor to the global burden of disease, an item gauging level of depressed mood was measured (World Health Organization, 2010). Any answer of yes or not sure to this question, “In the last 12 months have you felt sad or depressed more than two weeks in a row?” was considered a positive disclosure of depressed mood. Although the effects of psychological stress on health have not been fully explicated, there is evidence that high stress has an effect on physiological processes that leads to many common diseases (Ismail, Winkley, & Rabe-Hesketh, 2004; Pickering, 2001; Segerstrom & Miller, 2004; Yuen, Thompson, Flugel, Bell, & Sander, 2007). An item questioned participants about how much stress they were under, with response options of none, just a little, normal amount, too much, or extreme. Responses were dichotomized into none/just a little/normal amount versus too much/extreme. Three behavioral risk factors that are known contributors to the leading causes of morbidity and mortality in the United States served as outcome variables: smoking tobacco, excessive alcohol consumption, and illicit drug use (Mokdad, Marks, Stroup, & Gerberding, 2004). For smoking tobacco and using illicit drugs, participants were asked, “Have you smoked ANY cigarettes in the last 12 months?” and “Have you used ANY street drugs in the last four weeks?” Responses of yes or not sure were considered...
positive disclosures of tobacco or illicit drug use. To measure unsafe alcohol consumption, participants were asked the number of days per week that they have an alcoholic drink and the number of drinks they have on a typical drinking day. National Institute on Alcohol Abuse and Alcoholism (NIAAA) gender-specific criteria for at-risk drinking (that is, exceeding seven drinks per week for women, 14 drinks per week for men) were used to create a dichotomous variable of whether the participant screened positive for unsafe alcohol consumption (NIAAA, 2010). In addition, heavy episodic drinking behavior (four or more drinks in one sitting) was measured with a question asking participants how many times in the last year they have had four or more drinks in one day (NIAAA, 2010). For all dependent variables, multiple imputation methods were used to account for any missing data in logistic regression analyses.

**Statistical Analyses**

All data entry and statistical analyses were performed using SPSS version 17.0 (SPSS Inc., Chicago). Data were analyzed descriptively to characterize the demographic characteristics (age, gender, race, and education level) of the overall sample and the subgroups of participants with cumulative adverse financial circumstances. Logistic regression analysis was used to adjust for the potential confounding effects of demographic variables on the relationship between patients’ number of adverse financial circumstances and health problems. A “dose-response” relationship of adverse financial circumstances to self-rated health and behavioral health risks was tested by entering the number of adverse financial circumstances as a single ordinal variable (0, 1, 2, 3, 4, and 5) into a separate logistic regression model for health status and behavioral risk factor dependent variable. To account for missing data on control and dependent variables, multiple imputation methods were used to produce correct standard errors and consistent estimates of regression coefficients (Allison, 2010). Adjusted odds ratios and 95 percent confidence intervals were calculated.

**RESULTS**

**Demographics**

The demographic characteristics of the total sample and for subgroups of cumulative exposures to adverse financial circumstances are described in Table 1. The 1,506 patients who completed the SHS were predominantly female (65 percent), and the mean age of the total sample was 37 years (range: 18 to 90). Compared with the demographic characteristics of this urban ED’s general patient population (N = 61,962) for that year (January to December 2009), the group of nonemergent patients who participated in this study was distinct in that it was less elderly (over 65 years of age) (5 percent versus 11 percent), less black (39 percent versus 55 percent), less white (16 percent versus 29 percent), and more female (65 percent versus 45 percent). In this sample, 384 (25.5 percent) patients disclosed CRMN, 352 (23.4 percent) disclosed experiencing barriers to physician care, 346 (23.0 percent) disclosed food insecurity, 290 (19.3 percent) disclosed employment concerns, and 272 (18.1 percent) disclosed housing instability. Slightly more than half of respondents (51.9 percent, n = 781) were unexposed to adverse financial circumstances; 257 (17.1 percent) had one exposure, 182 (12.1 percent) had two exposures, 157 (10.4 percent) had three exposures, 93 (6.2 percent) had four exposures, and 36 (2.4 percent) had five exposures. Taken together, 725 (48 percent) of the 1,506 respondents reported one or more exposures to adverse financial circumstances, and 468 (31 percent) reported two or more exposures to adverse financial circumstances.

**Relationship between Exposures to Economic Deprivation and Health**

Logistic regression models (which included age, gender, race, and educational attainment as covariates) found that as patients’ number of exposures to adverse financial circumstances increased, their risk (adjusted odds ratio) increased for poor/fair self-rated health, depressed mood, high stress, smoking, and illicit drug use (see Table 2). For these outcome variables, there was a significant dose-response relationship between the number of adverse financial circumstances and health risks. When participants with five categories of exposure were compared with those with none, the adjusted odds ratios ranged from 24.7 for high stress to 3.4 for poor/fair self-rated health (see Table 2). An exception to this pattern was that the risk (adjusted odds ratio) of unsafe alcohol consumption and heavy episodic drinking did not demonstrate the same graded relationship and did not significantly increase as the number of exposures to adverse financial circumstance increased.
Almost half of our sample of urban ED patients reported at least one exposure to economic deprivation, and almost a third reported two or more exposures to economic deprivation. The two most common adverse financial circumstances among these ED patients were an inability to afford needed medications due to cost and an inability to see a doctor when needed due to cost. We found a striking dose response between the number of exposures to economic deprivation and multiple markers of risk for the leading causes of disease and death in adults. Compared with patients unexposed to economic deprivation, patients who had experienced five categories of adverse financial circumstances had a threefold increase in poor/fair self-rated health, a 17-fold increase in depressed mood, a 24-fold increase in high stress, a sixfold increase in smoking, and a fivefold increase in illicit drug use. These findings suggest that the impact of economic deprivation on patient health status is strong and cumulative.

Contrary to prior findings linking financial stress to increased alcohol use (Dawson, Grant, & Ruan, 2005; San Jose, van Oers, van de Mheen, Garretsen, & Mackenbach, 2000), patients with cumulative adverse financial circumstances were not more or less likely to report unsafe alcohol consumption. It is possible that unmeasured factors—such as family alcohol abuse, childhood exposure to abuse and household dysfunction, marital status, and depressive symptoms—are more strongly associated with unhealthy drinking behavior (Felitti et al., 1998; Merrick et al., 2008). These possible explanations for the absence of a relationship between patient-
<table>
<thead>
<tr>
<th>Health Problems and Health Risk Behaviors</th>
<th>Number of Categories</th>
<th>Prevalence (%)(^a)</th>
<th>Adjusted Odds Ratios(^b)</th>
<th>95% Confidence Interval</th>
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<td>Referent</td>
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<td>16.4</td>
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<td>1.2–2.5</td>
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<td>15.3</td>
<td>2.5(^*)</td>
<td>1.7–3.7</td>
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<td>9.5</td>
<td>3.1(^*)</td>
<td>1.9–4.9</td>
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<td>5</td>
<td>3.5</td>
<td>3.4(^*)</td>
<td>1.7–7.1</td>
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<td>Depression</td>
<td>0</td>
<td>23.5</td>
<td>1.0(^*)</td>
<td>Referent</td>
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<td>(in last two weeks, most of the time)</td>
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<td>19.3</td>
<td>5.8(^*)</td>
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<td>7.1(^*)</td>
<td>4.4–11.7</td>
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<td>6.5</td>
<td>17.9(^*)</td>
<td>8.1–39.3</td>
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<td>0</td>
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<td>1.0</td>
<td>Referent</td>
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<td>(under &quot;too much&quot; or extreme stress)</td>
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<td>20.8</td>
<td>2.8(^*)</td>
<td>2.0–3.9</td>
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<td>15.4</td>
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<td>11.2</td>
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<td>5</td>
<td>6.4</td>
<td>24.7(^*)</td>
<td>9.3–65.2</td>
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<tr>
<td>Tobacco use</td>
<td>0</td>
<td>39.2</td>
<td>1.0</td>
<td>Referent</td>
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<td>(in last 12 months)</td>
<td>1</td>
<td>19.5</td>
<td>1.6(^*)</td>
<td>1.2–2.2</td>
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<td>9.7</td>
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<td>5</td>
<td>4.7</td>
<td>5.9(^*)</td>
<td>2.7–12.5</td>
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<td>40.6</td>
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<td>(exceeds gender-specific NIAAA safe</td>
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<td>28.1</td>
<td>2.1(^*)</td>
<td>1.1–4.1</td>
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<td>alcohol consumption criteria)(^c)</td>
<td>2</td>
<td>6.3</td>
<td>0.6</td>
<td>0.2–1.8</td>
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<td>10.9</td>
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<td>0.5–3.1</td>
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<td>4</td>
<td>12.5</td>
<td>2.4(^*)</td>
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<td>1.6</td>
<td>0.8</td>
<td>0.1–6.2</td>
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<tr>
<td>Heavy episodic drinking(^d)</td>
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<td>46.1</td>
<td>1.0</td>
<td>Referent</td>
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<tr>
<td>(in past 12 months)</td>
<td>1</td>
<td>21.3</td>
<td>1.7(^*)</td>
<td>1.1–2.6</td>
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<td>5</td>
<td>2.2</td>
<td>0.9</td>
<td>0.3–2.3</td>
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<td>Illicit drug use</td>
<td>0</td>
<td>33.3</td>
<td>1.0</td>
<td>Referent</td>
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<td>(in last four weeks)</td>
<td>1</td>
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<td>1.8(^*)</td>
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Note: NIAAA = National Institute on Alcohol Abuse and Alcoholism.

*Prevalence percentages based on nonmissing data.

\(^b\)Odds ratios, \(p\) values, and confidence intervals derived using multiple imputation for missing data.

\(^c\)More than seven drinks per week for women and more than 14 drinks per week for men.

\(^d\)Four drinks or more on a single occasion.

\(^*\)\(p < .05\).
reported financial problems and hazardous alcohol use behavior warrant further study.

These results must be interpreted with consideration of several important limitations. First, our study setting was an urban adult teaching hospital ED, and, therefore, the results might not be generalizable to children or other settings. Notably, only 2.7 percent of our sample’s respondents reported having an education level below high school, which is lower than the 8.0 percent dropout rate for 16- to 24-year-olds in the general U.S. population (U.S. Department of Education, National Center for Education Statistics, 2010). Even within our setting, our convenience sample of ED patients differs from the base population of ED patients, which makes it difficult to generalize results from the SHS to the setting’s general patient population. Second, convenience sampling is vulnerable to selection bias if patients who did not choose to complete the survey or patients who were not eligible to complete the survey (for example, those who were visually impaired, illiterate, or nonproficient English readers) were more, or less, likely to be positive for adverse financial circumstances or markers of health risks. Third, some people with poor health status and negative health behaviors may be more, or less, likely to report adverse financial circumstances, which limits inferences of causality. Similarly, there may be important mediators or moderators of the relationship between adverse financial circumstances and health status that were unmeasured in our study. Nonetheless, there is reason to believe that our estimates are conservative and the relationship between these variables may actually be stronger due to patients’ reluctance to disclose sensitive financial concerns and stigmatized adverse health behaviors. Moreover, the large number of patients willing to self-disclose these risks represents “low-hanging fruit” deserving of social work intervention.

**IMPLICATIONS FOR RESEARCH AND POLICY**

The enactment of health care reform marks an opportunity to remold U.S. health care service delivery processes (Sebelius, 2010) and to expand the paradigm of health services to more directly account for social determinants of health. As the implementation stages of the ACA commence, policymakers are charged with the tasks of developing national quality improvement strategies and establishing guidelines for the use of health IT (White House, President Barack Obama, 2010). In this process, it will be possible to organize and advocate for a restructuring of the extent to which social work practices and services are integrated into the U.S. health infrastructure. Critical priorities for these restructuring efforts include upgrading the qualifications and definitions of social workers in health systems, expanding the hours of social work coverage and the clinical (patient-level) component of social work practice in medical settings, and promoting the inclusion of social work departments in the overall health system organization (NASW, 2009). In addition to these important policy goals, the current study signals the need for extensive broad-based, system-level integration of social work services. Our findings reinforce the call for routine patient self-assessment of economic constraints in all medical settings (Fleegler et al., 2007) and specifically underscore the need for these practices in the ED setting.

It is reasonable to urge social work professionals to weigh in on the implementation of health care reform. A longitudinal survey of social work administrators in hospital settings found a reported increase in the “social work influence” in hospital strategic decision making and system reorganization (Mizrahi & Berger, 2005). Empirical evidence can better equip social work leaders in their communication with hospital decision makers and those drafting regulations to accompany legislative reforms (Alexander, Hearld, Jiang, & Fraser, 2007). Therefore, further research using rigorous methodologies are needed to examine the effect of hospital-based system interventions on reducing ED patient economic deprivation and the resulting effect on clinical care quality. Given the current allocation of federal resources toward the conversion toward EMRs, interventions that leverage ITs for social health screening are of particular research interest. Outcome measures of societal costs and costs to providers and health systems are also necessary to secure funding for patient care that includes consideration of patient financial distress. HSW

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Original manuscript received September 28, 2010
Accepted November 12, 2010