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Proactive Screening for Health Needs in United Way's 2-1-1 Information and Referral Service

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ABSTRACT. Cancer disproportionately affects the underserved. United Way 2-1-1 is an information and referral system that links underserved populations to community services. This study explores the feasibility of integrating proactive screening and referral to health services into 2-1-1. A cancer risk assessment was administered to callers ($n = 297$), measuring their need for 6 cancer control services. A subset of respondents was randomized to receive generic or tailored referrals to needed services. Nearly all participants (85%) needed at least one of the services. Those who received tailored referrals were more likely to make appointments. Future research will explore approaches to address and eliminate health disparities through 2-1-1.

KEYWORDS. Social services, cancer, screening, prevention, health disparities, poverty, minorities, African American, tailoring

INTRODUCTION

In the United States, cancer disproportionately affects those who are poor, uninsured, and/or African American. Compared to other groups, African Americans are more likely to live in poverty, lack health insurance, be diagnosed with cancer at a later stage of disease, receive substandard cancer care once diagnosed, have lower 5-year survival rates, and higher cancer death rates (American Cancer Society, 2007; Jemal et al., 2007). Similarly, residents of low-income neighborhoods have higher rates of overall cancer incidence (Mackillop, Zhang-Salomons, Boyd, & Groome, 2000), late-stage incidence (MacKinnon et al., 2007), and mortality (Singh, Miller, & Hankey, 2002), and lower rates of 5-year survival (Boyd, Zhang-Salomons, Groome, & Mackillop, 1999; Mackillop et al., 2000) and cancer screening (Adams, Thorpe, Becker, Joski, & Flome, 2004; Breen, Wagener, Brown, Davis, & Ballard-Barbash, 2001; Schootman, Jeffe, Baker, & Walker, 2006; Schootman, Jeffe,

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Reschke, & Aft, 2003) than residents of higher income neighborhoods.

United Way 2-1-1 is a nationally designated 3-digit telephone exchange—like 9-1-1 for emergencies or 4-1-1 for directory assistance—that links low-income callers to health and social services in their community. Most 2-1-1 systems are operated locally and funded through partnerships between a local United Way and other agencies, foundations and/or government sources in a community or state. There are currently more than 240 active 2-1-1 call centers in 46 states, Washington, DC, and Puerto Rico, covering over 80% of the U.S. population (2-1-1 US, 2010). Thus the opportunity for dissemination and social impact by integrating health screening and referral into these systems is great.

This study is the first to explore the feasibility and potential impact of providing proactive cancer risk assessment and referral to prevention and screening services in a United Way 2-1-1 population. In preparation for the study, 17 active 2-1-1 systems with publicly available data on caller characteristics or call volume were found (2-1-1 Brevard, 2006; 2-1-1 Idaho, 2006; 2-1-1 Maine, 2007a, 2007b; 2-1-1 United Way of Connecticut, 2006; Firstlink, Inc., 2007; Indiana 2-1-1 Partnership, 2007; Mile High United Way, 2006; New Jersey 2-1-1 Partnership, 2007; Saxton, Naumer, & Fisher, 2007; United Way for Southeastern Michigan, 2006; United Way of Greater Houston, 2006; United Way of Metro Atlanta, 2006; United Ways of Northeast Florida 2-1-1, 2007; United Ways of Vermont, 2007; Virginia 2-1-1, 2007; Williams, 2007). These data show that 73–90% of 2-1-1 callers are women (Mile High United Way, 2006; New Jersey 2-1-1 Partnership, 2007; Saxton et al., 2007; United Ways of Northeast Florida 2-1-1, 2007), 54–59% are unemployed (Mile High United Way, 2006; United Way of Metro Atlanta, 2006), 45–64% have annual household incomes $<$ \$15,000 (2-1-1 Idaho, 2006; Mile High United Way, 2006) and where race or ethnicity is reported, callers are disproportionately Black or Hispanic relative to the local population (Saxton et al., 2007; United Way for Southeastern Michigan, 2006; United Way of Greater Houston, 2006).

A large majority of 2-1-1 callers are seeking help meeting basic human needs: housing, shelter, electricity, heat, and food. In our review of publicly available 2-1-1 data, these reasons for calling were in the top 10 of every 2-1-1 system and accounted for 35–87% of total calls received ($M = 61\%$). Although 2-1-1 can provide referrals to many health-related services (O'Shea et al., 2004), very few callers seek this information (2-1-1 Brevard, 2006; 2-1-1 Idaho, 2006; Mile High United Way, 2006; New Jersey 2-1-1 Partnership, 2007; United Way for Southeastern Michigan, 2006; United Way of Metro Atlanta, 2006; United Ways of Northeast Florida 2-1-1, 2007; United Ways of Vermont, 2007) and those who do are rarely seeking preventive services.

Call volume to 2-1-1 is extremely high. In 2006, 2-1-1 systems received 80–100 calls per day in smaller states like Maine and Vermont (2-1-1 Maine, 2007a; United Ways of Vermont, 2007); 175–250 calls per day in cities like Denver, Detroit, Jacksonville, and St. Louis (Mile High United Way, 2007; United Way for Southeastern Michigan, 2006; United Ways of Northeast Florida 2-1-1, 2007); 350–650 calls per day in states like Idaho, Indiana, Ohio, and Virginia (Firstlink, Inc., 2007; Indiana 2-1-1 Partnership, 2007; Virginia 2-1-1, 2007; Williams, 2007), and 900–1,000 calls per day in the largest and longest-standing 2-1-1 systems in Atlanta, Houston, and Connecticut (2-1-1 United Way of Connecticut, 2006; United Way of Greater Houston, 2006; United Way of Metro Atlanta, 2006). These 13 systems alone accounted for over 2.1 million calls received in 2006. Nationally, calls to 2-1-1 systems increased 44% in 2008 over 2007 (Stone, 2009), and by another 22–54% during the 2008–2009 economic recession (2-1-1 Alameda County, 2009; 2-1-1 Orange County, 2009; County of Santa Cruz, 2009; Rehkopf Smith, 2009; United Way of Massachusetts Bay and Merrimack Valley, 2009). Federal legislation, the "Calling for 2-1-1 Act" (S.211/H.R.211), would establish a national 2-1-1 system and authorize \$700 million through DHHS to help states with starting or enhancing a 2-1-1 system.

United Way 2-1-1 Missouri, where this feasibility pilot was conducted, launched its service in July 2007. In the first five months of operation (July 1 to November 30), 34,097 calls were received, or 225 calls per day. In the next

12 months, 135,352 calls were received (370 per day). Most callers have sought financial assistance (e.g., for utilities or rent), material resources (e.g., clothing, furniture, appliances), housing information (e.g., shelters, home repair), and food (e.g., pantries). Only 1.4% sought health-related services.

From November 1 to December 7, 2007, the study team tracked characteristics of 2-1-1 callers. Gender was obtained from 5,726 callers, and 85% were women. Age was obtained from 3,337 callers and was evenly distributed across 4+ decades (ages 18–29, 27%; ages 30–39, 24%; ages 40–49, 23%; ages 50+, 26%). United Way 2-1-1 Missouri does not routinely assess callers' race or income, so the study team estimated these by zip code (which is collected from all callers). A majority of callers (57%) were from zip codes where the median household income was less than 200% of poverty, and 42% were from zip codes with a majority African American population.

Because 2-1-1 is an information and referral service, any proactive health screening conducted through 2-1-1 must lead to a local referral where callers can go for help if a risk or need is identified. In the case of cancer control, many evidence-based interventions exist and are available through state and local programs. For example, screening mammograms reduce breast cancer mortality by about 20% (Humphrey, Helfand, Chan, & Woolf, 2002; Woolf, 2001), regular Pap smears reduce both incidence of and mortality from cervical cancer, and the HPV vaccine is highly effective in preventing growth of precancerous cells and lesions in the cervix (Garland et al., 2007), especially among girls and young women not yet exposed to vaccine-type HPV. Colonoscopies reduce the risk of death from colorectal cancer and can reduce disease incidence through removal of precancerous polyps (Pignone, Rich, Teutsch, Berg, & Lohr, 2002). Quitting smoking greatly reduces the risk of lung and other cancers (U.S. Department of Health and Human Services, 1989), and effects of secondhand smoke exposure—which causes premature death and disease in children and nonsmoking adults (U.S. Department of Health and Human Services, 2006)—can be reduced through smoke-free policies in the home and workplace. In Missouri, programs are available that provide all six of these cancer control services for free to low-income and uninsured populations.

United Way 2-1-1 Missouri receives hundreds of thousands of calls annually from callers who are primarily low-income, disproportionately female and minorities, and are seeking assistance with basic human needs. These same groups are at higher risk for developing and dying from cancer. Missouri provides cancer control services for free to low-income populations, and these services are underused by target populations. To better understand the need, feasibility, and impact of integrating proactive screening for health needs and referral to health services into United Way 2-1-1, this pilot study explored a) the need for cancer control services in 2-1-1 callers; b) the acceptability of delivering cancer risk screening and referrals through 2-1-1; and c) whether mailed referrals tailored to an individual's needs lead to greater use of cancer control referrals than non-tailored referrals.

METHODS

Participants

Survey participants were 297 men and women who called United Way 2-1-1 Missouri between December 18, 2007 and February 7, 2008. To participate, callers had to be 18 or older and calling on their own behalf (i.e., not calling for a client or another person). After receiving standard 2-1-1 service, eligible callers were asked if they would be willing to answer a few questions to help 2-1-1 better understand the health needs of its callers. Of those asked ($n = 680$), 58% agreed to complete the risk assessment. No incentive was offered. Callers were either transferred directly to an interviewer or arrangements were made for an interviewer to call the participant at a more convenient time. One in five callers who agreed to answer the questions ($n = 88$; 22%) ended the call during this transfer process and were never connected with an interviewer. Interviewers read a brief recruitment statement, then administered the cancer risk assessment and provided verbal referrals to

any cancer control services that were indicated by the participant's responses. This process took 5 minutes ($M = 4{:}54$).

To recruit a subset of these callers for the follow-up study, all callers who completed the cancer risk assessment during a 10-day period from January 14, 2008 to January 28, 2008 and received at least one referral to a cancer control service ($n = 57$) were invited to participate in a follow-up study to evaluate effects of receiving printed referrals, in addition to verbal telephone referrals. They were offered a $10 incentive (a gift card to a local grocer), and 91% accepted ($n = 52$). This enrollment process took 3 minutes ($M = 2{:}52$). At two-week follow-up, 81% of these callers (42 of 52) were reached. Of those who were not, 4 could not be reached in multiple attempts, 3 were not residents at the number called, 2 were non-working or disconnected numbers, and 1 participant had left the area. Incentives were mailed to participants' homes. Participants were assigned a unique ID, and names, addresses, and phone numbers were kept separately from the study data. All identifying information was discarded after follow-up was completed and the final incentive was sent. Institutional Review Board approval was obtained for this study.

Cancer Risk Assessment

Participants were asked 4–12 questions, depending on their age, gender, screening history, and whether they had children who were girls aged 9–17 years (for HPV screening). These questions assessed having a Pap test (ever, last 12 months; for women ages ≥18 only) mammogram (ever, last 12 months; for women ages 40+ only) or colonoscopy (ever, last 10 years; for men and women ages 50+ only); receiving the HPV vaccination (all three doses; for women 18–26 and parents of girls 9–17), and smoking cigarettes, having a smoker in the home and having a smoke-free home policy (all callers). This assessment also measured callers' health insurance status.

Questions about Pap testing, mammography, colonoscopy, and smoke-free home policies were used or adapted from the 2006 Behavioral Risk Factor Surveillance System (BRFSS; Centers for Disease Control and Prevention, 2007). All of these measures were rated as having high or moderate reliability and validity in a 2001 review of BRFSS measurement studies (Nelson, Holtzman, Bolen, Stanwyck, & Mack, 2001). All have been evaluated in diverse populations in Missouri by members of our study team. Responses to BRFSS breast and cervical cancer screening items have been validated against medical records and found to be accurate (Caplan et al., 2003; Stein, Lederman, & Shea, 1996), with good test-retest reliability in diverse populations (Brownson et al., 1999) and among women in Missouri (Brownson, Jackson-Thompson, Wilkerson, & Kiani, 1994). Test-retest reliability is good for the endoscopy items used, and acceptable for timing of most recent endoscopic exam (Bradbury, Brooks, Brawarsky, & Mucci, 2005). HPV vaccination items for BRFSS were under development at the time of this feasibility pilot. Therefore, the study team created items using information from the *HPV Vaccine Questions and Answers Fact Sheet from the Centers for Disease Control* (Centers for Disease Control and Prevention, 2006a), and modeled after BRFSS measures of hepatitis B vaccination—also a series of three shots. All cancer screening items include a brief preamble describing the procedure in plain language. Questions about current smoking were taken from an effective online smoking cessation intervention (Wang & Etter, 2004), and the item assessing passive cigarette exposure was adapted from the Centers for Disease Control's Youth Tobacco Survey (Centers for Disease Control and Prevention, 2006b).

Cancer Control Referrals

As callers completed the cancer risk assessment, a computer program identified any needs they had for cancer control services and locations where those services could be obtained near each caller's zip code. Referrals to these services were provided verbally by phone, as in standard 2-1-1 practice. Callers were referred to Missouri's Breast and Cervical Cancer Control Program, Missouri's Comprehensive Colorectal Cancer Screening Demonstration Program, the Missouri HPV Education Coalition

or Planned Parenthood, The Missouri Tobacco Quitline, and the U.S. Environmental Protection Agency's Smoke-free Homes and Cars Program.

Randomized Experiment

Callers who agreed to participate in the randomized experiment were assigned by a random number generator to receive either a generic or tailored referral, sent by mail to their home address. Participants in both groups were contacted to complete a follow-up survey two weeks after they were mailed the printed referral.

Intervention

All printed referrals were written at a 3rd–4th grade reading level ($M = 3.3$ across 48 different versions) using the Flesch-Kincaid formula (Kincaid, Fishburne, Rogers, & Chissom, 1975). They were mailed to participants' homes within 2 working days of calling 2-1-1 and completing the cancer risk assessment along with a consent form and introductory letter.

Generic Print Referral

This mailing consisted of a list of all cancer control referrals ($n = 6$) that could be received in the study. Each referral had a check box adjacent to it, and a tic mark was placed in the box when that referral was indicated for that caller.

Tailored Print Referral

Tailored materials included two components. The first was a short personal story in which the age, gender, family status, and cancer control needs of the story's main character were matched to those of the caller. In each story, the main character describes struggling to meet basic needs (as is often the case with 2-1-1 callers) but still finding a way to obtain a needed cancer control service. The second component provided a clear and simple summary of all information the caller would need to act on the specific cancer control referral they received. This information was tailored not only to referral type (i.e., HPV vaccine, colonoscopy), but also to location—identifying a specific service provider closest to the caller's zip code. It provided contact information, hours of operation, eligibility requirements, and a description of what will happen when they call.

Follow-up Survey

All participants in the follow-up study were contacted by telephone two weeks after calling 2-1-1 to complete a 5-minute follow-up survey. Participants were asked if they remembered receiving a referral by phone (yes/no), by mail (yes/no), and whether they had contacted the referral (yes/no) and made an appointment to use the recommended service (yes/no). Participants who remembered receiving the printed referral were also asked how much of it they read (all/most/some/none of the information), how easy or difficult it was to understand (very easy, somewhat easy, somewhat difficult, very difficult), and how much they liked or disliked it (liked it a lot, liked it somewhat, disliked it somewhat, disliked it a lot). Finally, participants were asked to indicate whether 2-1-1 should be asking questions about health (yes/no), if any of the health questions they were asked were too private (yes/no), whether they were uncomfortable answering any of the questions (yes/no) or receiving information in the mail (yes/no), and if the health questions made 2-1-1 more or less appealing (much more appealing, somewhat more appealing, somewhat less appealing, much less appealing).

Statistical Analyses

Simple descriptive statistics are used to characterize study participants and the prevalence of cancer-related behaviors. In the follow-up intervention study, comparisons between the generic and tailored referral groups are made using chi-square statistics. Seven participants (2.3%) with missing data for age, gender, and cancer risk assessment responses were excluded. All analyses were conducted using SPSS 16.0 Statistical Software Package for Macintosh (SPSS, 2007).

RESULTS

Participants

The 2-1-1 callers who participated in the study ($n = 297$) were mostly women and roughly

TABLE 1. United Way 2-1-1 Caller Characteristics, Missouri Callers ($n = 7{,}008$) versus Study Sample ($n = 297$)

Characteristic	MO callers[a]	Study sample[b]
Gender ($n = 7{,}008$)		
Women	85%	85%
Age ($n = 5{,}752$)		
Ages 18–26	18%	16%
Ages 27–39	36%	27%*
Ages 40–49	23%	21%
Ages 50+	23%	36%**
Neighborhood characteristics ($n = 6{,}048$)		
Zip <200% poverty	57%	40%**
Zip >50% Black	42%	59%**

[a]Missouri, November 1, 2007–December 7, 2007.
[b]Missouri, December 1, 2007–February 7, 2008.
*$p < .01$. **$p < .001$.

evenly distributed across age categories. Table 1 compares study participants to all 2-1-1 callers, based on a census of callers completed during the 5-week period immediately preceding recruitment for the study.

Use of Cancer Control Services

Nearly all participants (85%) needed one or more of the six cancer control services offered in the study, and over half (53%) needed two or more services. Table 2 compares use of cancer screening, vaccination and cancer risk behaviors among 2-1-1 callers in the study to BRFSS data on the same outcomes for Missouri and the U.S. Among women callers to 2-1-1, 56% reported having a Pap smear within the last 12 months, 48% of those ages 40 and older reported having a mammogram within the last 12 months, and 20% of those ages 18–26 reported receiving the HPV vaccination. Among participants with daughters or granddaughters ages 9–17 ($n = 68$), 27% reported that these girls had received the HPV vaccine. Among all callers, 33% were current smokers and 45% of households had a smoker living in their home. In households with children under age 18 ($n = 157$), the proportion with a smoker living in the home was slightly higher (49%). About half of all participants (52%) had a smoke-free home policy, but only 23% of households with smokers living in the home had such a policy. Of participants ages 50 and older, half (50%) had ever had a colonoscopy. One in four participants (26%) had no health insurance.

Effects of Mailed Referrals

Participants in the follow-up study ($n = 52$) were randomized to receive by mail either a generic referral ($n = 23$) or a tailored referral ($n = 29$). Among those reached at follow-up ($n = 42$; 81%), data from 3 participants (2 intervention, 1 control) were lost in a computer malfunction. Of those for whom follow-up data

TABLE 2. Cancer Risk Factors and Prevention Needs in United Way 2-1-1 Missouri Callers versus Missouri, U.S.

Risk factor or preventive measure	Respondents (n)	2-1-1	MO[a]	U.S.[a]
No health insurance	all ($n = 297$)	26%	12%**	12%**
Current cigarette smoker	all ($n = 297$)	33%	23%**	19%**
Cigarette smoker lives in home—1	all ($n = 297$)	45%	n/a	n/a
Cigarette smoker lives in home—2	have kids aged < 18 in home ($n = 157$)	49%	n/a	31%[b]**
Has smoke-free home policy—1	all ($n = 297$)	52%	64%**	73%**
Has smoke-free home policy—2	have smoker in home ($n = 133$)	23%	n/a	n/a
Ever had a colonoscopy	men and women, aged 50+ ($n = 107$)	50%	55%	58%
Received HPV vaccination (self)	women, aged 18–26 ($n = 41$)	20%	n/a	n/a
Received HPV vaccination (daughter)	have daughters aged 9–17 ($n = 68$)	27%	n/a	n/a
Up-to-date on use of mammography[c]	women, aged 40+ ($n = 146$)	48%	69%**	74%**
Up-to-date on Pap smear[d]	women, aged 18+ ($n = 255$)	56%	77%**	82%**

Note. n/a = not available.
[a]2006 BRFSS for Missouri and United States samples, except; [b]2004[69]; [c]within last year for 2-1-1, 1–2 years for Missouri and U.S.; [d]within last year for 2-1-1 sample, last 3 years for Missouri and U.S.
**$p < .001$ for differences between 2-1-1 and Missouri samples, and 2-1-1 and U.S. samples.

TABLE 3. Reactions to Pilot Intervention

Outcome	Tailored ($n = 19$)	Generic ($n = 19$)	χ^2	p value
Recall getting referral	95%	89%	.42	.517
Recall getting mailing	60%	47%	1.39	.238
Read all of mailing	50%	33%	.58	.445
Liked mailing a lot	67%	56%	.27	.604
Very easy to understand	75%	56%	.88	.350
Called referral agency	30%	21%	.41	.520
Made an appointment	20%	5%	3.73	.053

were available ($n = 39$), most remembered receiving the verbal referral, but reactions to the mailed referrals were consistently more positive among those in the tailored group (Table 3). These participants were more likely to remember receiving the mailing (60% vs. 47%), report reading all of it (50% vs. 33%), liking it a lot (67% vs. 47%), and finding it very easy to understand (75% vs. 56%). Ten participants (6 tailored, 4 generic) reported calling one of the referrals they received, and 5 of these (4 tailored, 1 generic) reported making an appointment with the referral agency.

Acceptability of Cancer Screening and Referral Through 2-1-1

When participants in the follow-up study were asked if 2-1-1 should be asking callers about their health, 56% said yes, 37% said no, and 7% were unsure. But all reported that receiving health information and referrals from 2-1-1 made the service somewhat (59%) or much more (41%) appealing. Only 2 participants (<5%) felt the health questions were too personal or private, and most (81%) reported being comfortable receiving health information in the mail from 2-1-1.

DISCUSSION

Findings from this pilot study indicate that integrating proactive cancer control referrals into United Way 2-1-1 is both feasible and greatly needed. Nearly all 2-1-1 callers had an immediate need for at least one of the six cancer control services addressed in the study, all of which are evidence-based, and most of which are available for free to low-income Americans in communities across the United States. Most callers were willing to answer questions about their cancer risks, very few felt these questions were too personal or private, and all reported that receiving health referrals from 2-1-1 made the service more attractive.

The study also demonstrated that it is possible to supplement 2-1-1's verbal referrals with printed referrals mailed to callers' homes, and that this approach is promising for helping callers act on the information they receive. Callers who received printed referrals—especially those that received referrals tailored to their personal situation—read, understood and liked them, and were comfortable getting this information in the mail from 2-1-1. One in four callers that received the printed referrals reported contacting at least one of the cancer control referrals they received, and half of those reported making an appointment to use the recommended service. It's not clear whether this rate of acting on referrals exceeds what would be found from 2-1-1's verbal referrals alone, although previous research conducted in cancer information and referral systems suggests that mailed interventions can enhance effects of verbal referrals (Heimendinger et al., 2005; Marcus et al., 2001; Marcus, Heimendinger et al., 1998; Marcus et al., 2005; Marcus, Morra et al., 1998; Strecher et al., 2005).

Even a relatively low rate of response to cancer control referrals among 2-1-1 callers could have important benefits for population health and reducing health disparities. The math is simple: 2-1-1 reaches tens of millions of disadvantaged Americans every year, and findings from this study indicate that 2-1-1 callers have a much greater cancer risk profile than the average American. If findings from this feasibility pilot are at all representative of other 2-1-1 systems and if proactive screening could be integrated in 2-1-1 systems nationally, the potential benefit of even a modest rate of response would be significant.

This sample appears to be quite similar to the universe of callers to this particular 2-1-1

system in Missouri; however results may not be generalizable to all 2-1-1 systems or to all disadvantaged Americans. It is possible that callers who declined to answer the cancer risk questions (42% of those offered participation) had far fewer cancer risks than those who agreed to answer these questions. This is unlikely as refusers typically have similar risk profiles to those who immediately participate in a study (Voigt, Koepsell, & Daling, 2003), but it cannot be ruled out. While comparisons among 2-1-1 callers and general populations in Missouri and the United States (as made in Table 2) point out the heightened need for cancer control services among 2-1-1 callers, interpretations of the data on breast and cervical cancer screening must be made with caution. In the 2-1-1 sample, both having a mammogram and Pap smear were assessed by asking if callers had these tests "in the last 12 months." The BRFSS items administered to the Missouri and U.S. samples consider women up-to-date on mammograms if they've had one in the last two years, and up-to-date on Pap smears if they've had one in the last three years (Centers for Disease Control and Prevention, 2007). Thus adherence rates for these two screening tests in the 2-1-1 sample are almost certainly lower than they would be using the BRFSS measures. All other measures were identical, except for HPV vaccination, which had not yet been added to BRFSS when the 2-1-1 survey was administered.

These limitations should be considered in the context of several important and unique strengths of the study and the 2-1-1 system. First, because 2-1-1 is so new, there have been few published studies evaluating its services and none assessing effects of adding proactive health referrals to standard 2-1-1 service. Second, few systems can match 2-1-1 in providing access to very large numbers of highly disadvantaged Americans. Even more importantly, 2-1-1 callers are actively seeking help and initiating contact with the system. Thus, many of the costs and challenges traditionally involved in finding and reaching out to disadvantaged populations are greatly diminished because 2-1-1 has built a system of services that attracts members of these populations.

CONCLUSION

We believe that cancer control partnerships with 2-1-1 systems hold great promise for helping eliminate health disparities. We are actively involved in research that builds upon these pilot findings to evaluate and maximize the effects of 2-1-1 referrals to local cancer control services. The prevalence of need for cancer screening and feasibility of proactive cancer control screening and referral is being investigated in several 2-1-1 systems nationwide. In addition, the feasibility pilot described in this article led to a 5-year pilot study currently being conducted in collaboration with United Way 2-1-1 Missouri. In the study, the authors are estimating the prevalence of need for cancer screening and prevention in a population of 2-1-1 callers; determining whether cancer communication interventions delivered through 2-1-1 can increase use of breast, cervical, and colon cancer screening, HPV vaccination, smoking cessation and adoption of smoke free home policies; determining how intensive an intervention is needed to bring about these changes; and determining whether the effectiveness of these interventions is enhanced when callers' basic needs have been addressed. A similar large-scale collaboration has been funded with 2-1-1 in Texas, and several more academic 2-1-1 collaboration grants are under review, including a 5-year study to integrate smoking cessation into 2-1-1 systems.

A national 2-1-1 Research Consortium has been established, with members representing the United Way, 2-1-1 U.S., individual 2-1-1 systems nationally, health care systems, the National Cancer Institute, the Centers for Disease Control and Prevention, and university-based researchers. The Consortium was established to facilitate the development of collaborative relationships between 2-1-1 systems and researchers in public health and social services, and to set a 2-1-1 research agenda. The research conducted by members of the Consortium is diverse, and includes cost-benefit analyses of 2-1-1 systems, media strategies to increase use of 2-1-1, investigation of unmet health needs during natural disasters, and additional research on cancer risks in 2-1-1 callers. Additional collaborative research

with 2-1-1 is needed in areas of aging and disability, disaster, other health initiatives, and in the use of 2-1-1 as surveillance tool for emergent community needs. We encourage readers to explore similar collaborations with their local 2-1-1 systems, and accelerate our understanding of how this system might help achieve national health objectives.

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