

# Impact of a Social Marketing Media Campaign on Public Awareness of Hypertension

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**Background:** Barriers to high blood pressure (BP) awareness and control are exacerbated by poor knowledge of the consequences and uncertainty regarding how to and who should direct care. We developed a social marketing hypertension awareness program to determine baseline awareness, knowledge, and treatment behavior, and then studied the impact of a targeted, media intervention among randomly surveyed adults at risk in a representative urban community compared to a control community immediately and 6 months after the intervention.

**Methods:** The program consisted of three random-digit telephone surveys conducted in two mid-sized Ontario cities to determine high BP awareness, knowledge, and treatment behavior. Using baseline knowledge and attitudes toward high BP in both communities, a social marketing awareness strategy and mass media intervention campaign incorporating television, radio, print, direct to patient, and interactive techniques was developed and implemented in the test city only. Both test and control cities were resurveyed immediately after and at 6 months post-media intervention to detect change and decay.

**Results:** A sample of 6873 men and women more than 35 years old who were aware of their high BP demonstrated a high prevalence of high BP in the general population (~34% in both communities). At baseline this population had poor knowledge of their own BP numbers and poor understanding of the diseases related to high BP. Although few considered high BP a health concern, they had good understanding of lifestyle interventions for high BP prevention and control. The number of the respondents who claimed to have high BP increased immediately after intervention in the test city (38%;  $P < .02$ ), whereas the

number of respondents who were treated and uncontrolled decreased ( $P < .05$ ) compared to control. There was a significant increase in patients' knowledge of consequences and in their perception that they were most responsible for high BP control in the test city ( $P < .005$ ) compared to control. At 6 months, no further changes were observed in those claiming to have high BP in either city, whereas decay to baseline in those treated but not controlled and those claiming responsibility for their BP control was observed in the test city. No changes were observed in the control city except for an increase from baseline to 6 months in the percentage claiming to be treated but uncontrolled. We were unable to determine whether the increase in number treated but uncontrolled was due to a higher treatment rate, similar treatment rate but more patients being uncontrolled, or a combination of these scenarios.

**Conclusions:** High BP is very prevalent in adults and knowledge of lifestyle options for management is encouraging. In the short-term, although our media awareness program increased the number of respondents claiming to have high BP and patient self-efficacy for BP control, this was not maintained. We did not change knowledge of consequences or importantly, the health importance of BP control among those at risk. Hence, in addition to a mass media campaign, attention should be focused on dissemination of awareness knowledge information through medical professionals at the point of care. Am J Hypertens 2005;18:270–275 © 2005 American Journal of Hypertension, Ltd.

**Key Words:** Hypertension, social marketing, awareness, mass media.

**I**t is astonishing that improvements in hypertension control rates have been elusive<sup>1</sup> at a time when novel recommendations processes,<sup>2,3</sup> compelling new research results,<sup>4–6</sup> and efficacy of new treatment

regimens<sup>7,8</sup> have demonstrated that control is achievable and that this can lower rates of congestive heart failure, stroke, and death.<sup>9</sup> Whereas many hypertensive patients are either unaware of their diagnosis or untreated, only a

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minority of those prescribed treatment achieve recommended target levels.<sup>1,10-12</sup>

Between 1986 and 1992, the Canadian Heart Health Surveys examined cardiovascular disease risk factors in each of Canada's 10 provinces.<sup>13</sup> Hypertension awareness, treatment, and control status were examined and 22% of subjects (26% men, 18% women) were found to be hypertensive (systolic blood pressure [BP] >140 mm Hg or diastolic BP >90 mm Hg). Of this hypertensive group, only 16% were treated and controlled, 23% were treated but not controlled, and 19% were not treated. Most concerning was that 42% were unaware they had hypertension. Kirkland et al<sup>13</sup> confirmed that the awareness of other risk factors for cardiovascular disease is generally low in the Canadian population 55 to 74 years of age and particularly among older men. Because treatment of many chronic diseases have a strong behavioral components (ie, diet, smoking, and physical activity), much emphasis in public health has been directed recently on changing individual behavior by community programs, many promoted by large health promotion organizations—primarily targeting increased awareness and knowledge of risk. However, when knowledge has been increased, this has not necessarily led to improved behavior to achieve control among those at risk.<sup>14</sup> Continuing and widening the knowledge needs among those at risk requires audience-specific delivery in multiple formats over time.<sup>15</sup> Specifically, social marketing research principles have recently shown effectiveness in raising awareness of cardiovascular disease risk factors,<sup>16</sup> because the messages and delivery are geared to the target market. The genesis of the Canadian Coalition for High Blood Pressure Prevention and Control (CCHBPPC) hypertension awareness strategy was based on these findings and conducted as a parallel activity to support dissemination and implementation of hypertension diagnosis and treatment recommendations in Canada.<sup>3</sup> The CCHBPPC is a public interest/education coalition comprised of health care professional organizations, volunteer organizations, corporations, and governmental organizations who aim to stimulate and promote coordinated efforts to prevent and control high BP in Canada.

The goals of our study were to:

1. Assess the current baseline prevalence and level of awareness of hypertension in a representative sampling of the population defined by two demographically similar Ontario communities.
2. Implement, using the results established by the baseline survey and information gathered through focus group presentations, a mass media intervention campaign designed to improve the level of knowledge regarding hypertension based on established social marketing principles.<sup>16,17</sup>
3. Assess the immediate impact of the hypertension awareness intervention campaign by conducting a

second survey (test and control cities) immediately after the media campaign.

4. Assess the sustained impact of the hypertension awareness intervention campaign by conducting a third survey (test and control cities) 6 months after the media campaign.
5. Develop an intervention to improve awareness, knowledge of consequences, and treatment, and improve empowerment for treatment of high BP among the population at risk.

## Methods

The general population of two mid-sized (>200,000) Ontario cities (London and Kingston) with equivalent academic institutions, teaching hospitals, socioeconomic base, access to health resources and services, and access to media sources without contamination from the other site were sampled. The telephone interview survey was developed based on the 2000 National Hypertension Survey conducted by the Seniors Research Group for the National Council on Aging ([www.fromatoa.org](http://www.fromatoa.org)). Ethics approval was received from an independent ethics review board. The initial interview quantified baseline demographics, personal history of hypertension, knowledge of hypertension treatment and consequences, and attitude toward hypertension control. Interviews were performed by an arm's length contracted telephone marketing company with experience in health surveys using random digit dialing. The sample was limited to men and women more than 35 years old, obtained by targeted telephone time periods using industry standards for representation of age and gender.<sup>16</sup> Using baseline data and parallel input from focus groups including family physicians, patients with hypertension, and the general public, a social marketing awareness strategy and mass media campaign incorporating television, radio, direct to patient, print, and web-based ([www.know-yournumbers.ca](http://www.know-yournumbers.ca)) interactive techniques was developed and implemented during October 2001 in the test city (London) only. The timing of the multimedia intervention considered confounding affects of National media programs, local pharmacy campaigns, and competition from major advertising intensive times. The key messages presented were "Know Your Blood Pressure Numbers" and "Go to see your Doctor" with insight provided into the disease states linked to high BP. No intervention was developed for the physicians or other health care workers or agencies. Both test and control cities were resurveyed immediately after (T1) and at 6 months after (T2) media intervention to detect change. Funds allocated to the various media delivery modes were determined by the target audience and industry standard for the market using an independent, contracted media relations firm.

Statistical analyses were performed using SAS version 8 (SAS Institute, Cary, NC), 1999.

**Table 1.** Frequency of respondents with high blood pressure, those treated and uncontrolled and those who believe they are most responsible for managing their blood pressure in test and control communities

	Baseline	Immediately Post Campaign	6 Months Post Campaign
HBP			
Yes: Test City	33.7%	38.9%*†	41.5%*
Yes: Control City	33.8%	32.1%	35.9%
Treated and uncontrolled			
Yes: Test City	66.2%	61.3%	68.3%
Yes: Control City	64.3%	63.8%	75.5%
Most responsible			
Yes: Test City	66.8%	74.8%	70.7%
Yes: Control City	65.1%	69.5%	64.5%

HBP = high blood pressure; Most responsible = those who believe they are most responsible for managing their blood pressure.

\* Change from baseline within group,  $P < .05$ . † Difference between groups,  $P < .05$ .

### Study Population and Sample Size Justification

Using prevalence figures from Joffres et al,<sup>1</sup> it was assumed in the test and control communities that approximately 22% (33,000) of the more than 35-year-old population would have high BP and of these, 42% (13,860) were thought to be unaware of their condition. Therefore, about 9% (13,860/150,000) of test respondents would be “unaware hypertensives.” Of the total hypertensive population, 23% (7590) were estimated to be aware but untreated. Thus, only about 5% (7590/150,000) of test respondents would be “aware but untreated and uncontrolled hypertensives.” Therefore, sample size requirements were based on precision of the baseline prevalence estimates and demonstration of a clinically and statistically significant net difference in key awareness end points between the control and test communities. Calculations using EpiInfo (Centers for Disease Control, 2000) indicated that if the true prevalence were 5%, a sample of 1159 would yield an estimate with a precision of  $\pm 25\%$  (ie, 3.75% to 6.25%) 19 times in 20. This is predicated on a study design that includes samples to be collected at three time points (baseline, immediately after, and 6 months post-media intervention) in two centers, resulting in a conservative total study sample size of 6954.

To demonstrate improvements in awareness end points, the methods of difference in proportion of standard error was used.<sup>18</sup> It was assumed that at baseline the two cities had a combined prevalence of 14% (9% unaware and 5% aware and untreated). If the intervention is associated with an increase of 33% or greater, the sample size required to detect an improvement at the 95% level of statistical significance is approximately 1025 per site. The same sample size could detect an improvement of between a third and one-half in the 9% of the population who are unaware of their hypertension (ie, 12 to 13.5%). Samples of this size would detect only large increases (greater than 50%) in the 5% of the population who is aware but untreated.

### Results

The two samples (6873 men and women more than 35 years) were drawn from similar populations of adult urban Ontarians with respect to age, sex, education, income, and access to health care resources. A total of 16,730 telephone numbers were generated for use, and 14,566 calls were placed. Of these calls, 4231 (29%) were either placed to a business, or they were nonworking numbers, or were not answered. Of the remaining 10,335 calls, 2132 were answered but the respondent declined to participate in the survey. An additional 680 calls were not completed because of language barriers, 650 were incomplete or were excluded because they were outside the predefined age and gender quotas. At baseline, 33.7% of test respondents and 33.8% of control respondents had been told they had high BP, which was significantly altered throughout the study period in the test city (Test; T1 38.9% [ $P < .05$ ] and T2 41.5% [ $P < .02$ ] v Control; T1 32.1% and T2 35.9%) (Table 1). Only 37.3% of test respondents and 39.2% of control respondents remembered their own BP numbers at baseline and neither group changed at either postintervention survey period. Remarkably, the percentage of test site respondents who were treated for their hypertension but uncontrolled was 66.2% at baseline, 61.2% at T1 ( $P < .05$ ), and 68.3% at T2 versus the control site with 64.3% at baseline, 63.8% at T1, and 75.5% ( $P < .05$ ) at T2 (Table 1). Whether changes in treatment but uncontrolled BP were due to a change in treatment rate, a change in those with uncontrolled BP, or a combination, was not determined in this study. Knowledge of a normal BP was not favorably impacted by the media intervention with only 69.9% knowing normal BP values at baseline and no difference between test (T1 67.5% and T2 67.7%) and control (T1 61.8% and T2 68.4%). There was no difference between male and female respondents. The baseline proportion who believed they were most responsible for managing their own BP was similar in both test (66.8%) and control (65.1%) cities. Immediately after the media campaign, this proportion was 74.8% (T1;  $P < .05$ ) in the test community and only 69.5% in the control community (Table 1). At 6 months the respon-

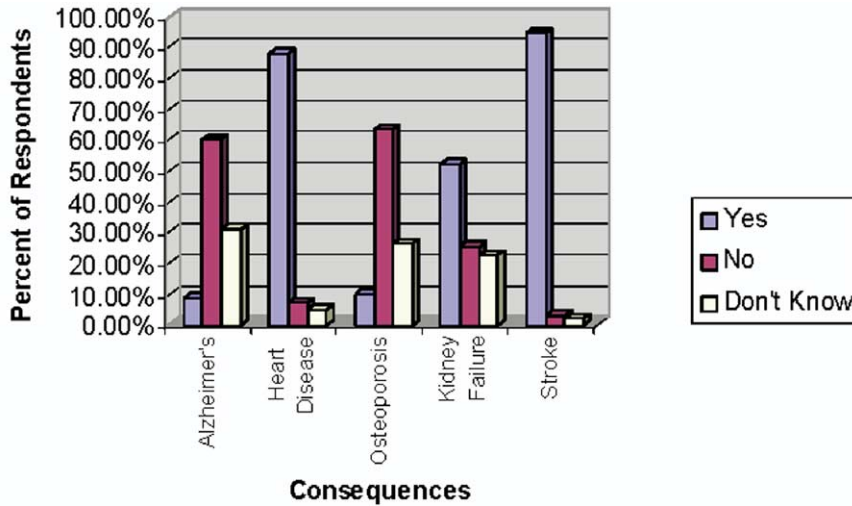


FIG. 1 Knowledge of consequences: combined survey responses.

dents believing that they were most responsible for high BP control approached baseline values in the test city (70.7%;  $P < .05$ ) suggesting decay, whereas in the control city the numbers decreased to 64.5%. At baseline, 32.5% of the test community believed that high BP was a “very or somewhat” serious personal health concern in the previous 12 months. However, even after a multimedia campaign and despite increased claimed responsibility for BP control, the proportion of test city respondents concerned about high BP decreased (T1 = 23.2%,  $P < .03$ ; T2 = 25.6%,  $P < .05$ ). In the control city, response did not change with respect to concern about BP. Impact of the media campaign on knowledge of consequences and knowledge of treatment was measured by assessment of combined test city and control city responses. Those who were aware that they had high BP, had a good understanding of the impact of high BP on stroke (94.7%), and were aware that small changes in BP can effectively reduce risk of heart disease (86.6%) as shown in Fig. 1.

However, awareness of other related diseases was poor and not affected by the media intervention. In particular, there was little understanding of the link between hypertension and cognitive decline and kidney disease. Although the media intervention was not focused on treatment for high BP, there was good understanding in those with high BP that hypertension is effectively reduced by weight loss (81.7%), reduced alcohol consumption (63.4%), reduced salt intake (70.2%), regular exercise (86.0%), and reduced emotional stress (84.3%) (Fig. 2).

The impact of the type of media for delivery of the media message was measured in the test and control cities immediately after the campaign. There was a significant difference in the frequency of response to television, radio, billboard, and busboard advertisements. Television was most frequently observed with 58.9% of the test respondents versus 48.4% of control respondents ( $P < .01$ ), noting advertisements about high BP. Radio showed a

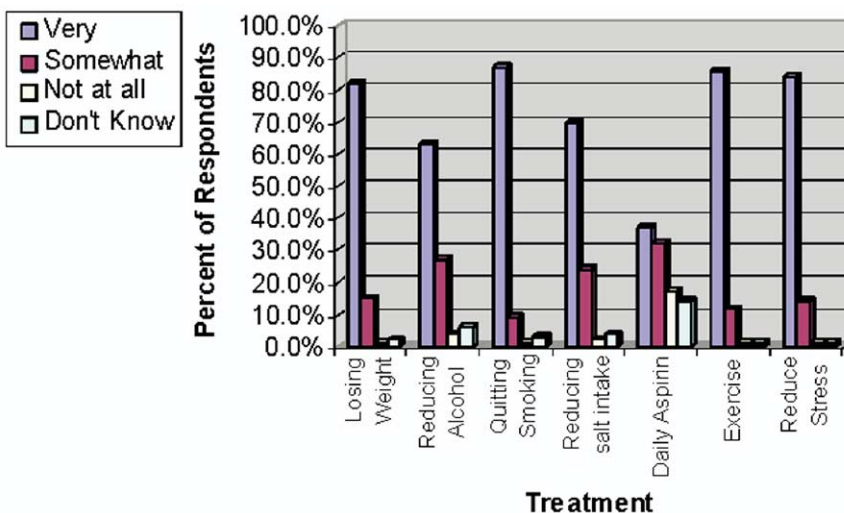


FIG. 2 Knowledge of treatment: combined survey responses.

difference with 28.6% (test) versus 19.5% (control) ( $P < .01$ ), billboard with 25.9% (test) versus 16.0% (control) ( $P < .03$ ), and busboard messages recognized by 14.6% (test) versus 10.8% (control) ( $P < .05$ ).

To determine whether the media campaign had impact on physician visits for hypertension during the study, we reviewed ICD-9 codes among all family physicians for the baseline, T1, and T2 periods in both communities. There was a trend to higher number of visits at T1 (32% and 34% ICD-9 for hypertension at baseline versus 38% and 33% at T1 for test and control cities, respectively) in the test city; however, no significant difference was observed between cities for T1 or T2 compared to baseline.

## Discussion

Increasing rates of high BP parallel a growing older, sedentary, and overweight Canadian population. The lifetime risk of hypertension is more than 90%.<sup>19</sup> Hence, the period of opportunity for prevention and initiation of treatment is being compressed. Furthermore, despite established recommendations for prevention and treatment, most Canadians either are unaware they have high BP or do not receive treatment to established BP targets. In response to these alarming demographic trends and treatment shortcomings, Health Canada in collaboration with the Canadian Coalition for Prevention and Treatment of High Blood Pressure produced a National High Blood Pressure Strategy.<sup>20</sup> This strategy proposed a multifaceted, comprehensive approach to reduce uncontrolled hypertension by 10% by 2005 through advocacy of healthy public policy, community action, and supportive environments for education—in particular, to raise public awareness of hypertension.

We observed a prevalence of known hypertension of 33% at baseline that increased to 41% after intervention in two representative Canadian communities. This self-reported prevalence is much higher than previous estimates and suggests the burden of high BP may be even greater than previously thought. Our key media messages were to “know your numbers” and “go see your doctor.” Despite good knowledge of lifestyle maneuvers to control HBP, and their belief that they (patients) were most responsible for their BP control, few knew their own BP, knew what an optimal BP target was, or believed high BP was a serious health concern. The month-long media campaign improved patient self-efficacy for their BP control and decreased the number treated and not controlled, but did not alter their knowledge of their own or optimal BP targets nor were the intervention changes sustained to 6 months.

These results confirm that a high prevalence of hypertension remains in the general population (perhaps greater than previous estimates) and this population has poor knowledge and retention of their own or optimal BP numbers, a poor understanding of the diseases related to hypertension, and high BP is not viewed as a serious

health concern. Many health issues and messages may be present for any given patient at a particular point in time. These issues and messages are likely processed differently and hence, we may see an apparent disconnect between individuals knowing BP is a risk for stroke, and at the same time, they do not view it as a serious personal health concern at that time. We speculate that media intervention must be reinforced by continued support of the message at the level of health care professionals, particularly family physicians who regularly see patients with and at risk for hypertension. Previous study of the impact of media as well as interpersonal health consultation in smoking cessation in North Karelia showed that the impact of both coordinated strategies was more effective than either one alone.<sup>21</sup> This evidence and the small number of increased visits for hypertension in the test city immediately after the intervention supports targeting of the family physician as a catalyst to future community-based health promotion strategies for BP using media marketing to raise awareness.

Certainly some methods of media were more effective than others in the current study. Furthermore, it has been shown that the scale and duration of expenditure, content, and targeting of advertisement messages impact success of media interventions.<sup>22</sup> Although unlimited funds are unlikely, combining media with other forms of interventions as suggested could improve impact, dissemination, and sustainability. Finally, we observed a high prevalence, with poor knowledge and behavior regarding hypertension at baseline and improved knowledge after media intervention in an urban Ontario community. It is unknown whether all levels of society were sampled and whether our messages failed to target particular segments of the population. Furthermore, it is unknown whether responses were subject to responder bias or the volunteer effect. We did use focus group feedback to direct our messages to specific groups (ie, the elderly); however, given the disparity in cardiovascular risk by socioeconomic status, future interventions aimed at raising awareness should continue to ensure a widened approach to ensure generalizability.<sup>15</sup>

Although comprehensive, the media message was delivered at a time when unintended media activities including the events of September 11th, 2001, occurred. The awareness campaign message was potentially diluted due to these unforeseen catastrophic events as the mass media message did not receive the emphasis from the media providers that it would have under usual circumstances.

In conclusion, the prevalence of hypertension in the general population may be greater than previous estimates. Furthermore, it is difficult to raise and maintain a high level of awareness of hypertension. Social marketing awareness campaigns, in conjunction with a shift in clinical practice, are poised to impact health promotion and assist patients to assess lifestyle risk factors and improve health outcomes.<sup>23</sup> However, current clinical practice regarding management of hypertension needs to be modified

to improve knowledge, awareness, and impact on lifestyle choices that impact hypertension. Alarming, patients accept primary responsibility for high BP prevention and control; yet they do not view high BP as a serious health problem. Future strategies must include providers armed with proper educational tools and supports to change hypertension behavior among those at risk.

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