CARDIOVASCULAR DISEASE PREVENTION IN LOW RESOURCE SETTINGS: LESSONS FROM THE HEARTFILE EXPERIENCE IN PAKISTAN

Sania Nishtar, MRCP, PhD

This paper outlines activities of the Heartfile Program in Pakistan (http://heartfile.org). The program focuses on cardiovascular disease prevention and health promotion, and includes several initiatives that encompass building policy, reorienting health services, and developing grass-roots community interventions that utilize the print and electronic media by incorporating social marketing approaches.

Initiated by the nonprofit private sector, the program now links with major public sector primary healthcare programs, and is currently spearheading formulation of the National Action Plan on Noncommunicable Disease Prevention and Control in Pakistan. In addition, the program is being refined, validated, and packaged as a replicable model for other developing countries and in low resource settings, which utilizes utilizing appropriate principles of franchising with inbuilt components sensitive to cultural and social adaptations.

A review of the planning process, implementation strategy, and fund-raising experience is presented. Strategies unique to low resource settings, such as the development of cost- and time-efficient strategic alliances and partnerships, have also been highlighted. In addition, specific caveats are identified as being helpful to private sector development of chronic disease prevention programs in resource-constrained settings, and a road map to a sustainable public-private sector partnership is provided. (*Ethn Dis.* 2003;13[suppl2]:S2-135–S2-144)

From Heartfile, Pakistan.

Address correspondence to Sania Nishtar, MRCP, PhD; 1-Park Road, Chak Shazad; Islamabad, Pakistan; 0092-51-2243580; 0092-51-2240773 (fax); sania@heartfile.org; http://heartfile.org

BACKGROUND

Heartfile was created in Pakistan for use among a population of 140 million, against the backdrop of the high prevalence rates of cardiovascular disease (CVD), which affects more than 30% of the adult population, therefore warranting aggressive preventive strategies.[1] The need to address these issues is made more urgent by the serious health and economic challenges posed by Pakistan's average per capita income of US $500, and its total health expenditure of 0.8% of the GNP. The delineation of the epidemiological transition highlighting the changing global trends of disease, which brought the burden of noncommunicable diseases (NCD) to the forefront as a major health challenge for developing countries, has lent additional gravity to the situation.[2–5]

Further, the recently published World Health Report 2002 *Reducing Risks, Promoting Healthy Life*[6] provides powerful reasons for greater investment in CVD prevention and management. The report concludes that 6 of the top 10 health risks in developing countries are directly relating to CVD, and highlights the magnitude of benefit that possible reductions in risk could achieve in various cost-effective ways. In this context, successful experiences from community-based interventions in the setting of developed countries,[7–10] and in countries with economies in transition,[11] provide useful insights into the dynamics of addressing these diseases at a population level, translating into a decline in incidence of cardiovascular diseases. Similar trends can be expected for the developing world.

Reaching this goal will necessitate a reorganization of priorities in developing countries to incorporate policy changes shifting the focus from communicable diseases and reproductive health to also include the prevention and control of NCDs. This shift will require defining public health models that focus on the population approach to NCDs, and are suited to low resource situations.

Heartfile, a private sector, donor-funded organization based in Pakistan, used this approach in a developing country and developed several relevant models for targeting different segments of the population, as well as healthcare providers throughout the nation. The organization optimized its meager resources through partnerships that enabled it to draw support from the media, distribution channels, and social development organizations, and provided the opportunity to include its interventions in National Primary Healthcare programs. The organization was subsequently successful, not only in initiating a policy change that led to the inclusion of CVD on the country's health agenda, but also in spearheading the formulation of the National Action Plan and Policy for its government, thus allowing advancement toward the goal of reducing morbidity and mortality due to cardiovascular diseases in Pakistan. The program can also be viewed in its broader context and its practical relevance to other developing countries in the process of designing heart health programs, thereby broadening its goals to encompass the overarching objective of developing a model for use in other developing countries and low resource settings.

Founded by the author in 1998 with an initial grant from the Canadian Development International Agency to support the publication of public awareness leaflets, Heartfile has since expanded to

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include 4 dimensions: community interventions, reorientation of health services, research, and advocacy. An overview of the individual projects follows.

Community interventions needed to cater to the information needs of different segments within the native Pakistani population, as categorized by literacy rates, place of residence, and economic status. Based on these considerations, a three tier model was designed. The first tier constituted the Print Media campaigns targeted to the urban and rural literate populations; the newspaper campaigns are the highlight in this category, drawing support from the largest publication house in the country. Subsequently, second tier programs evolved that drew on a partnership with state-owned electronic media, and expanded the scope of community interventions to areas in which the print media has limited penetration. In addition, other novel projects were launched at the grass-roots level as part of the third tier projects, in partnership with social development organizations, that incorporated social marketing approaches to expand the scope of the program in the underprivileged and remote rural areas.

As part of this program, health professionals were initially sensitized to the concept by the circulation of a regular newsletter, frequent updates on activities, and through the distribution of posters. Later, specific programs in allocated districts focused on encouraging the participation of all categories of healthcare providers through dedicated training and provision of signage. In addition, publication of the South Asian Association for Regional Cooperation (SAARC) prevention guidelines[12,13] represented the initial step in developing customized guidelines for the prevention and control of cardiovascular diseases in Pakistan. In conjunction with these activities, a research wing was also set up at Heartfile to fill gaps in knowledge that were relevant to addressing CVD prevention in Pakistan. An overview of the individual projects follows.

COMMUNITY INTERVENTIONS

Tier 1: Print Media Campaigns

Newspaper Campaign (http://heartfile.org/news.htm)

An overview of Heartfile's newspaper campaigns is presented in Table 1. The "NEWS-Heartfile public awareness campaign" was the opening intervention for the Heartfile project in Pakistan, with the target group being the English literate elite, a minority of the urban population. The campaign's intent was to change behaviors within this segment of the population, which usually proves to be trend setting for other social groups. Tier 1 (print media campaigns) includes similar interventions that are currently ongoing though a newspaper in the local language and a US magazine targeted to adolescents. This campaign has been launched through space donated by the newspaper group "JANG" (http://jang-group.com), which has the largest circulation in the country.

Along with articles, colored illustrations of the Heartfile mascot and the logo lettering are posted on a weekly basis in each of the 2 daily newspapers and the weekly magazine (Figure 1). One article in each category appears each week, with a total weekly appearance of 3 articles. As part of the NEWS campaign, articles appear on the inside front page of the newspaper; in JANG, the articles appear on the health page of the Sunday newspaper, and are printed on half the back page of the US magazine every Friday. In the former 2 newspapers, the word count ranges from 300–800 words; whereas articles in the US magazine for adolescents are in the form of large graphics with the message contained in a caption of 100–150 words (Figure 2). Boxes are inserted in the articles promoting questions via email, while a checklist repeatedly advocates healthier lifestyles. The style of the articles varies from being a topic-oriented discussion on a specific aspect of a risk factor to an informative piece responding to a particular question; in addition, stories and checklists are also published.

Assessment of the intermediate measures of community impact of the English newspaper campaign has recently been conducted through a telephone survey.[14] Results indicate that an estimated 0.66 million individuals read these articles regularly, while 0.79 million read them occasionally. For the sample interviewed, the articles significantly supplemented the knowledge of 86.7%, 77.3%, and 85.3% with respect to diet, exercise, and smoking, respectively, and were the sole source of information for 5.3%, 9.3%, and 4%, again with respect to diet, exercise, and smoking, respectively. With respect to the practical impact of these articles, 40.4% of those interviewed had made some dietary changes, 38.7% had made some changes in their exercise patterns, and 7.6% had reduced their tobacco consumption.

Even after taking the limitations of a telephone survey into account, results indicate that the program has had a significant impact on the knowledge, perceptions, and practices of the English newspaper reading elite in Pakistan. The key element of this campaign, however, is the donated newspaper space, which helped not only to significantly optimize

Overview of the newspaper campaigns*

Campaign WEEKLY	News Paper	Copies per Day	Outreach to Individuals	Profile of the Population	Duration of the Campaign	Number of Articles Appeared
NEWS† Heartfile public awareness campaign	NEWS daily	450,000	2.7 million (nation wide)	English literate urban	February 1999 and ongoing	182
JANG† Heartfile public awareness campaign	JANG daily	1 million	6–7 million (nation wide)	Urdu literate urban and rural	January 2000	82
US‡ Heartfile public awareness campaign	US	450,000	2.7 million (nation wide)	Urdu literate urban and rural	February 2001	91

* As of January 2003.
† Daily newspaper.
‡ Weekly adolescent's magazine accompanying THE NEWS.

resources, but also, more importantly, ensured nationwide dissemination of the information. Survey responses also revealed that the use of an identifiable logo and mascot were critical to the effective penetration of these messages.

Public Information Leaflets (http://heartfile.org/pamphlet.htm)

A set of 6 public information leaflets have been developed in English and Urdu (a local Pakistani language) and entitled: "High Blood Pressure: Why and How"; "Smoking and Your Heart"; "Food and Your Heart"; "Prevent a Heart Attack"; "Symptoms of Heart Disease" and "Cholesterol and Your Heart." A local consumer distribution network distributes these to pharmacy stores in 16 cities nationwide where they are sold on a cost recovery basis. The pamphlets have also been used by a hospital in Manchester, England for its Urdu-speaking population.


Too late to wonder why

Of course I was not worried! Who would be after 10 years of high blood pressure? This was my immediate reaction when my doctor had warned me of the possibility of a complication nearly one month before my stroke. I brushed all the concerns that had raised aside and walked out of the clinic as unconcerned about my blood pressure as I was when I had entered it. In fact I went for the blood pressure check on my last visit to the doctor on the insistence of my wife who was constantly worried about me.

This was my state of mind a month prior to my stroke. It is obviously different now. I recall each and every direction of my doctor with regret!

I have had blood pressure for over 10 years now. I never suffered any symptoms. High blood pressure was incidentally discovered when I visited the doctor for fever many years ago and was subsequently confirmed on many other occasions. As it gave me no symptoms I forgot all about it. Even the medicines that the doctor was so insistent about on every visit and never minded my lifestyle. Who wanted to listen to the doctor about cutting cigarettes and eating healthy when I had no trouble at all; if blood pressure was silent, it was meant to remain silent: this is how I looked at it. With a great pang of regret I now remember that my doctor always told me so otherwise; I also remember his warnings about the condition that I have now. The doctor was clear that I would have a complication since I was taking my disease so casually. And there it was! Of all the complications of untreated and uncontrolled high blood pressure I suffered the worst. A Stroke, just a month ago.

I am living someone else's life now. At the age of 61, I refuse to believe that life is over for me. I have to be helped with everything. And this is now that I have recovered! Not to talk of the time when I was totally bed bound. I have to be helped with walking, sitting, eating, and toileting, anything imaginable. I can't even cry without noticing that half my face does not move. I don't want to know it is me when I see my reflection in the mirror. Forming words is not one great torture as you hear yourself mumble the babble that you intend to say not does it express any thing meaningful. No it can't be me. I keep telling myself! But it is.

My CT scan (a special x ray of the brain) took 2 days after the stroke shows a ruptured vessel in the brain. Even in my half comatose state I knew what the cause was as the doctors muttered comments on my bedside. High blood pressure in arteries is just like the pressure of water in a pipe. If it is not relived, the pipe bursts. Why then was I so ignorant? In any case it is too late to wonder.

The News-Heartfile Public Awareness drive against heart disease
A DFID funded project
Heartfile Website: http://heartfile.org

Fig. 1. Caption ???

Posters (http://heartfile.org/posters.htm)

Posters have been developed for different target audiences. An example of this involved an illustrated poster encouraging individuals to have their blood pressure checked and displayed in facilities throughout the country. This intervention was found to be effective in prompting 36.6% of those viewing the posters in waiting rooms of clinics to have their blood pressure checked for the first time.[15] Using pharmaceutical field staff to distribute the posters greatly reduced the cost of distribution. As a follow up to this activity, another intervention is being designed to give individuals a more comprehensive overview of high blood pressure. This approach employs posters and take-away leaflets as tools of intervention. Posters are also being used to pilot the school system's anti-passive smoking campaign in the capital city of the country. Other posters are discussed as part of the specific interventions.

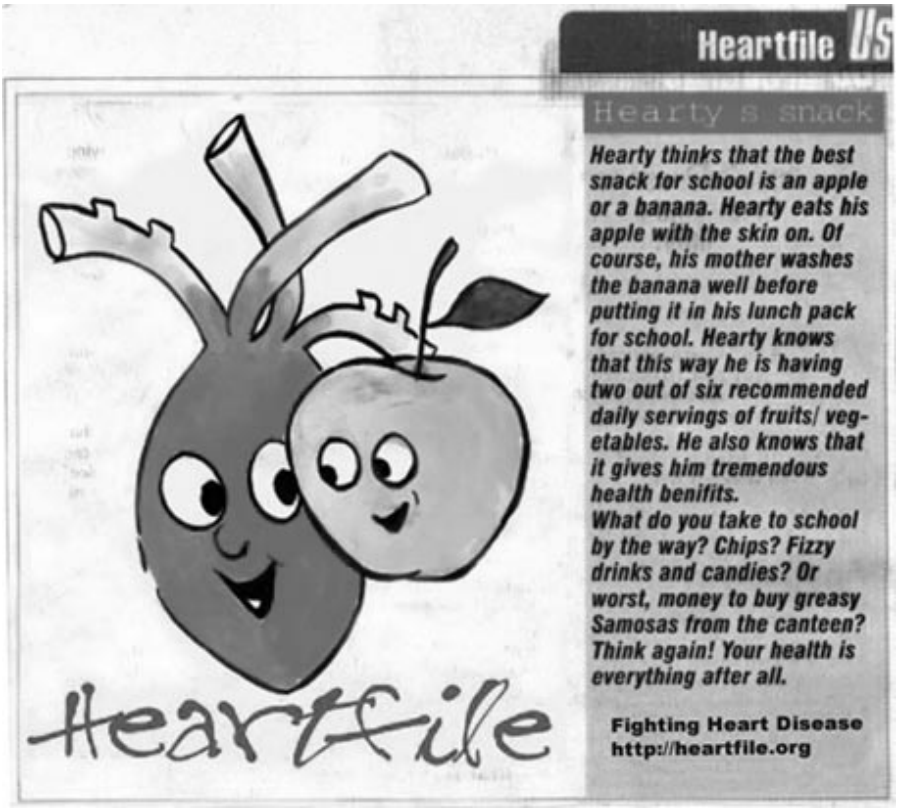

Fig. 2. Caption ???

Tier 2: Electronic Media Campaigns

Radio

A one year campaign concluded in October 2002 featured a daily 60-second spot on network radio, as part of the only hour-long program that is broadcast throughout the country, reaching 90% of the population with access to radio. Eight spots were broadcast in rotation. Placement in the nationwide air time was negotiated at subsidized rates. Currently, this campaign, along with the television campaign described below, is being undergoing evaluation.

Television

As part of piloting the electronic media intervention, Heartfile, in partnerships with the ministry of health, ran 30 television spots (on national television during prime time, which reaches 80% of the population. One of these spots focused on creating awareness about high blood pressure and promoted opportunistic screening while the another emphasized the principles of cardiovascular disease prevention. The spots ended with the Heartfile and Ministry of Health logos appearing together, the first time the ministry has shared its logo with a private sector nongovernmental organization. Currently, this campaign is undergoing impact evaluation, the results of which will be the basis of a joint strategy to air future spots over an extended period of time.

Internet Campaign

Heartfile has posted the largest bilingual Web site dealing with preventive cardiovascular care with English and Urdu versions; the Urdu version is the only site of substantial size that uses Urdu to post public awareness material relevant to preventive cardiovascular care in Pakistan. In addition, the site provides an overview of the organizations activities and the text of the public information material.

Tier 3 Campaigns

The 3rd tier campaigns are designed on a grass roots level to reach a population with little penetration by print media and to supplement the electronic media (televison and radio) campaigns. Two models are currently being implemented in separate districts. The first model focuses on communities, including the health professional component, and is being conducted in partnership with social development organizations. The other model focuses on the training of health professionals, who then become responsible for engaging the community.

Model 1: Heartfile Lodhran CVD Prevention Project (http://heartfile.org/lodhran.htm)

The project in Lodhran has been initiated in one of the poorest areas of Pakistan targeting a predominantly rural population of one million, in partnership with the National Rural Support Program (NRSP). The NRSP is a nationwide network of rural, grass-roots community organizations (CO) to enable rural communities to plan, implement, and manage development activities and programs for the purpose of ensuring productive employment, alleviating poverty, and improving in the quality of life. In the District of South Punjab, NRSP has 534 organizations with an average of 30 members per CO representing their villages. The project was initially designed with 3 components: community-wide health education, village activist training, and training of health professionals.

The first 2 components are linked with the NRSP program. Community-wide health education is packaged with the CO sessions of NRSP and involves dedicated cardiovascular health education sessions for community groups utilizing customized training materials, in-

cluding overheads, posters, and pamphlets. The village activist training component is linked to the NRSP community management and skills training; sessions are scheduled on a quarterly basis for village activists selected from the COs. In these sessions, the activists are subjected to further training to enable them to act as effective catalysts for their communities; approximately 50 activists receive training modules every 3 months. The health professional component has been launched in partnership with the district health department and will use training to encourage all categories of healthcare providers to participate in health promotion interventions, and will link the health professional component with the community and activist components. The health professional component also focuses on increasing the rates of screening for high blood pressure by including health professionals into the Facility-Based High Blood Pressure Screening Program and by organizing screening camps throughout the district. Intervention tools include workshops, district based high blood pressure screening camps and distribution of educational and support materials.

The need to restructure the implementation strategy was identified bu intermediate impact evaluations, highlighing the program's need to include health professionals at the grass-roots level, children, and other local activists. In this context, Lady Health Workers (LHWs), of the National Program for Family Planning of the Ministry of Health, were identified as a useful resource. LHWs are the work force of more than 100,000 locally hired young women with at least an 8th grade education and who participate in the Lady Health Worker Program (LHWP) of the government of Pakistan. The LHWP is key to the government's effort to raise the health status of women and children in Pakistan's poor rural areas. Therefore, the inclusion of LHWs represented the desired reorientation of health services, which obviated the need to develop an independent vertical program in the short-to-medium term. In addition, LHWs were thought to be ideal catalysts for promoting healthy behaviors in their communities, as they exercised local influence in the domain of health. The launching of the "LHW Heart Health Program" in the district of Lodhran was therefore treated as the pilot phase of this program at the national level, and was conducted in collaboration with the district health department under a formal agreement with the federal ministry of health, which included a provision for future expansion on a national level.

As part of the pilot phase, process evaluation and validation of the training curriculum and the intervention tools were conducted. A training package was developed that focused on including cardiovascular disease prevention as part of the LHW work-plan. Training was organized following the cascade approach, which included a "train the LHW trainers" component for 38 trainers in the district, followed by training for 700 LHWs in Lodhran.

The restructuring plan also incorporated a school health component composed of interactive lecture sessions, extensively piloted visual intervention tools including posters, pamphlets, and take-home materials. The project has built-in assessment components for evaluation. Support from the local department of education ensured the active and consistent participation of state-owned schools, which provide the majority of primary and secondary level schooling in the district. In addition, restructuring introduced several other categories of village activists and locally influential individuals, such as counselors and the clergy, to the program.

Results from the midterm evaluation of the Lodhran project have guided the incorporation of changes in the implementation strategy; refining this experience will help in developing a replicable model.

Model 2: The Jhelum and Chakwal Project

This project is an example of the second approach in the tier 3 community interventions, and focuses on utilizing health professionals to advance the cardiovascular prevention agenda. The health professional component of this project, which forms the main bulk of the intervention, is described in detail under the health professional component. The community intervention component is linked to the health professional component and focuses on introducing communities to the program through opportunistic screenings of high blood pressure. The communications campaign directs the public to look for the Heartfile logo to get a blood pressure check and accurate information on lifestyle changes that promote cardiovascular disease prevention and control. Heartfile print and electronic media campaigns also target this community, using the logo and the mascot to reinforce the message, a critical part of the social marketing approach. The community component is further reinforced by the school health component of the project, which draws support from a close collaboration with the district health department and uses packaged formats and tools utilized for the Lodhran project. The processes and tools of the school health project are being validated and pilot tested in these districts; results could form the basis of expansion of the school health plan at a national level.

"Eat Healthy" Promotional Campaigns

In addition to the core projects, which target significant segments of the population, other projects have been launched for selected target groups; the objective of these campaigns is to change behaviors, which may set trends, thus having a "trickle-down" effect. The "Eat Healthy" campaign is an example of this approach and was launched in 2 settings. A heart-friendly menu was en-

dorsed by a Marriott Hotel restaurant, one of the few 5-star hotels in the country. In addition, low cholesterol items were promoted in a leading chain pastry shop.

Other Support Projects

A women's awareness campaign has been packaged with the ongoing community health promotion projects by incorporating women's cardiovascular health issues in print and electronic media campaigns. A similar strategy is being used for the anti-tobacco awareness campaign. Other support projects feature events to mark special occasions, such as World Heart Day, helping to enhance media coverage of the issue, and thereby acting as effective advocacy tools.

REORIENTATION OF HEALTH SERVICES

Jhelum and Chakwal Project (http://heartfile.org/jc.htm)

The focus of this project is on training both physician and non-physician health service provider who provide the bulk of health care at the grass-roots level, but do not benefit from the academic opportunities that focus on larger towns. Health providers are sensitized and trained in opportunistic blood pressure screening with the help of customized training curricula developed for different categories of healthcare providers. The curricula are participatory in nature and suitable for adult learning, focusing on quality of care to clients, good communication techniques, and rational use of drugs in the context of CVD prevention. Short, one-day courses are provided to health service providers on relevant issues and practical steps that providers can take. Following training, each provider receives a signboard with the Heartfile logo. The public are then directed by the communications campaign to look for this logo to get blood pressure checks and accurate information on lifestyle changes to promote cardiovascular disease prevention and control. The health professional education component is supplemented by the community interventions through the print and the electronic media.

KSM Collaboration

Heartfiles collaboration with the family planning organization, Key Social Marketing (KSM), has resulted in the development of a training module on prevention and management of hypertension. KSM works with a network of about 4,000 private doctors and paramedics throughout Pakistan who are expected to take refresher training over the next 2 years; this training will include the new module on hypertension. While the normal focus of KSM's training activities is the provision of high-quality family planning services, the relevance of blood pressure screening for clients intending to use hormonal methods make this module a useful addition to the curricula. The collaboration between KSM and Heartfile is intended to utilize private sector providers to promote wider health goals.

SAARC Region Prevention Guidelines

In 2002, Heartfile published *Guidelines and Recommendations for Coronary Heart Disease Prevention in the SAARC*[a] *Region* in collaboration with the SAARC Cardiac Society which is a representative scientific body of South Asian countries. These guidelines are partly dedicated to policy recommendations and also summarize practical and relevant public health and clinical recommendations addressing primary and secondary prevention of coronary heart disease. The guidelines represent the first time culturally appropriate and practical, relevant guidelines have been developed through a broad-based consensus among various stakeholders in 7 South Asian countries. These guidelines were officially released by the World Heart Federation at the Second SAARC Biennial Congress of the SAARC Cardiac Society in Delhi in February 2002. Publication of the SAARC was reported in international journals, and received extensive media attention in SAARC countries; an abbreviated version was published as an article in a peer-reviewed journal.[13]

Newsletter

The quarterly *Heartfile Newsletter* is posted to more than 3000 physicians throughout the country, with a focus on those without access to academic opportunities. In addition to activity highlights of the quarter, the newsletter carries a regular feature, named "Billboard," which is a pull-out section intended for use as an easy reference in clinical situations and containing customized guidelines and management algorithms for common diseases. In addition, a section on ProCOR[b] posts selected items of interest that have been recently posted on the ProCOR web site, while another site collates clippings from the bulletin of the World Heart Federation, *HeartBeat* in an attempt to raise awareness of the need to address the prevention paradigm of diseases on a global scale.

RESEARCH

Implementation research is an important component of the Heartfile program. Though several of the initial projects lacked a true experimental design, such as control groups or baseline assessments, many of the projects initiated subsequently have sound evaluation and

[a] South Asian Association for Regional Cooperation is made up of participants from Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. The main goal of SAARC is to accelerate economic and social development in member states through joint action in certain agreed areas of cooperation.

[b] ProCOR is a global electronic conference on heart health (http://www.procor.org).

assessment components. First-generation Heartfile projects (eg, newspaper campaign) were evaluated through post-intervention, self-reported changes in practice and perceptions. Later, second-generation projects (eg, the Lodhran project), established baselines and control communities for comparison, but evaluated knowledge and attitudes about risk factors exclusively and, as part of the post-intervention analysis, will examine changes in these. Third-generation projects, (eg, the Jhelum and Chakwal project) are establishing prevalence of risk factors, in addition to determining baseline levels for knowledge and practices; this will enable evaluation of outcomes as part of the post-intervention assessment.

Heartfile is also working to define the risk factor profile of the Pakistani population, in order to set precise goals for preventive initiatives. Ideally, this should have been undertaken in a well-designed, multi-center prospective cohort design; however, logistic issues precluded that, so a case-control study was conducted. Prospective cases of CAD, documented by coronary angiography were recruited in a hospital-based setting, with controls being those from the study population with normal coronary angiograms, matched for age and sex. The key advantage to this approach lies in using the "gold standard" for the diagnosis of CAD, thereby avoiding problems of misdiagnosis associated with the use of less specific diagnostic modalities such as ECG. The study was completed in February 2002, and is currently in press.

Heartfile's role as principal investigator from Pakistan in WHO studies such as the PREMISE Study and Validation of the CVD Risk Assessment and Management Package expands the contributions of research beyond risk factor definition and community-based implementation to include studies examining the treatment gap in secondary prevention of CVD and validation of programs that are developed to address these issues. These studies will help to uncover current gaps in knowledge and practices in Pakistan, which can then be specific targets for interventions to expand secondary prevention practices.

ADVOCACY

Noncommunicable diseases, including cardiovascular diseases, were not featured prominently as part of the healthcare agenda in Pakistan at the time of Heartfile's inception; therefore one component of the Heartfile program focused on advocacy. This was greatly enhanced by media visibility, a natural consequence of Heartfile's information dissemination strategy. Several achievements indicate significant progress in this direction, initially evidenced by the initiation of the collaborative television campaign and representation of Heartfile in national committees on related issues. Three years of Heartfile's advocacy efforts culminated in signing of a Memorandum of Understanding (MOU) between Heartfile and the ministry of health in January 2003; the MOU enables Heartfile to take a lead role in formulating the National Action Plan on NCD Prevention and Control for Pakistan through a consultative process. In addition, the MOU binds the ministry of health to incorporate the National Action Plan as part of its new health policy.

REPLICATION OF THE HEARTFILE PROGRAM

In the wake of the present urgency to address CVD through a prevention approach, it is also necessary to develop effective implementation methodologies that are suited to low resource situations, cater to cultural and social requirements in under-privileged communities and are adaptable for resource-constrained healthcare practices. In this context, useful lessons can be learned from the Heartfile experience in Pakistan. Work is currently underway to refine and package this experience in order to replicate it in other similar settings utilizing appropriate principles of franchising. The package will incorporate sound evaluation components and will have built-in mechanisms to cater to local situations. This first Heartfile initiative will incorporate approaches to advance cardiovascular health in the developing world. Several international health organizations have already expressed interest in facilitating the transfer of this methodology to other developing countries. In addition, formal agreements have been reached with institutions in Sri Lanka, Bangladesh, Iran, Nepal, and Tunisia.

DISCUSSION

The Heartfile Program has not been fully evaluated for impact; however its individual components are in varying phases of evaluation and reporting. Intermediate measures of community impact, and the proven economic feasibility of one of the projects, have yielded positive and encouraging results.[14]

In ideal situations, public health interventions begin after initial situational assessments and baseline surveys. Such programs have long-term implementation strategies, which are executed by dedicated resource personnel with specific adequate funding allocations over a period of time. In addition, these programs are often tested in an experimental design, with control communities for tangible comparisons and are also usually under-taken with public sector institutional support, linked with a long-term strategic plan. Heartfile on the other hand, has evolved as an initiative in the private sector with no initial long-term funding allocation. Its various components and programs evolved and developed in the context of locally relevant circumstances as need was identified and as strategic alliances became available that would maximize the mea-

ger resources drawn from international donor support and personal funding. Therefore, several weaknesses may be identified in this program, compared with programs developed in ideal situations. Along with these weaknesses, however, the program has several inherent strengths and the experience gained from the program is relevant to other developing countries reflecting both the problems encountered in such settings, as well as the opportunities that exist to counter these.

From its inception to the time it affected policy change, Heartfile has spanned a period of 4 years, a tight timeline that would have made achieving the desired results difficult in even the best of circumstances. Factors that have contributed to the program's success relate to human factors, and the development of strategic partnerships at the local, regional, and international levels, which, together, have helped optimize time and resources.

At a national level, effective links with the media, social sector development organizations, social marketing agencies, consumer distribution networks, the public sector and the commercial sector have helped in achieving program objectives. At the local district level, public sector partnerships with the departments of health and education have resulted in effective penetration at the grass-roots level. At the regional level, Heartfile's partnership with the SAARC Cardiac Society in publishing the *SAARC Guidelines on the Prevention of Coronary Heart Disease* established a regional initiative, which provided the impetus for relevant activities at a national level. Another example of successful regional collaboration is highlighted by the initiation of the Heartfile program's replication in other South Asian countries, an initiative currently in the planning stage. On the other hand, strong ties to global international organizations such as the World Health Organization (WHO) and the World Heart Federation (WHF) have helped to integrate and strengthen relevant programs, and to disseminate these to other low resource settings. Links with international research institutes have been the backbone of ongoing epidemiological research. In addition, Heartfiles' eminent international advisory board brings a broad-based international perspective to this program.

Several local examples of this program merit further elaboration in an attempt to highlight their relevance for similar private-sector based initiatives to take place in the future. The print media campaigns using newspapers, demonstrate the potential to develop a health education campaign with minimal resources, producing low-cost, effective messages in a public health setting, as opposed to commercial advertising. These messages can be carried by a premier media product, not only as a public service, but also as a valuable addition to the quality of the media's product. In resource-constrained settings, newspapers can be identified as a readily available tool for health education messages, and an important component of CVD prevention strategies. In addition to providing health information, such messages can provide practical skills and social support for change, and can promote policy change. In addition, these messages can help shape the public discussion agenda, and increased media coverage of an issue has been demonstrated to increase the public perceptions of the issue's importance.[16,17] However, it is necessary to make a distinction between health education relayed by newspapers and through advertising with important cost implications. The success of social marketing approaches in health education warrants the use of visual aids such as a logo and mascot. These intervention tools, while identified as being essential to social marketing strategies, had not previously been identified as being effective for CVD prevention campaigns in the developing world. These an other social marketing approaches should be addressed by the commercial domain in the context of health education. During such dialogue, it is necessary specify the prolonged duration of the campaign, as such campaigns need to be of a sustained duration to have an impact.[18,19] The success of this intervention has been based largely on the visibility of the message, and its cost effectiveness due to donated newspaper space. As this strategy has proven to be largely useful in Pakistan, it seems prudent to recommend exploration of the feasibility of the replicating this module in other low resource settings.

Heartfile's nationwide dissemination of pamphlets to pharmacy counters could be achieved by considering the pamphlets a "product" on the distribution list of a consumer distribution agency, with an extensive national network. The agency distributed pamphlets free of cost, and included an incentive for the retailer. Since commercial item distribution channels exist in most countries, the feasibility of this approach can be explored in other situations.

As part of Heartfile's tier 3 community interventions, the Lodhran project outlines a novel partnership, initiated at a district level with a social development organization, and eventually expanded to encompass links to both the private and public sectors, providing a guide for affecting policy change. Links with social development organizations helped to optimize administrative costs, and allowed the CVD prevention agenda to penetrate a community in partnership with a well-respected social sector development network. Several components of this project are being refined and evaluated in order to make them replicable both within and outside the country. This model outlines an opportunity and provides useful approaches within this paradigm for other low resource settings, which are certain to have initiatives in place at the grass-roots level aimed at social development and improvement of the quality of life.

The Lodhran experience represented one approach to engaging in heart health activities at a district level whereas the approach adopted as part of the Jhelum and Chakwal project exemplifies another. This latter approach used health professionals, rather than the community, as an entry point. The project design focused heavily on the principles of social marketing, involving training of health professionals, provision of signage, and engaging the already sensitized community in the project through the opportunistic screening of blood pressure. Social marketing approaches are known to being effective as part of health promotion in the developing countries[20] and have been utilized in Pakistan in the domain of reproductive health.[21] While incorporating such approaches, however, extreme caution must be exercised; over-enthusiasm in promoting a range of products not only casts doubt in the minds of officials and donors but also narrows the range at the cost of excluding other non-controversial elements that resonate with the principles of health education.[22] Therefore the Heartfile approach to social marketing did not involve product promotion in any way. The concept of social marketing has not been previously utilized on a mass scale in projects related to CVD prevention. Heartfile represents the first such use of the approach. Utilizing opportunistic blood pressure screenings as the focal point in the program presents additional advantages, since high blood pressure screening and control is ideally suited to be the initial component of an integrated cardiovascular disease prevention and control program particularly for a poor country. High blood pressure screening is perceived as a 'clinical' need and is a vehicle for dietary, tobacco, diabetes, and obesity control; the program is also unlikely to encounter the powerful resistance of organized vested interests, such as the tobacco industry.[23] This project has been undertaken with donor funding and has involved health professionals from the private and public sectors. The project format represents a replicable methodology, which is suited to similar situations, and can be initiated locally with seed funds; subsequent incorporation of the training module with formal health sector capacity building training ensures long-term sustainability.

Other links have enabled Heartfile to reach out to health service providers in an attempt to engage them in the project. Collaborative initiatives under a formal agreement with a multi-national pharmaceutical company have helped to circulate the quarterly newsletter, supported publication of the SAARC guideline[13] and helped in disseminating posters developed for health facilities. Indeed opportunities to develop such alliances exist in most situations; however extreme caution must be exercised in doing so. The organizations name, intellectual property, and reputation must be safeguarded at all costs. The principles of transparency, avoidance of conflict of interest and compliance with laws and regulations must also guide relationships. In addition, the contributing organization must be of high repute.

This program has also highlighted several opportunities that exist for private sector organizations with similar goals and objectives to link with government programs. Examples include the electronic media collaborative initiative, the LHW Heart Health Project in the district of Lodhran, with provision for national expansion, and links with the department of education. The most significant collaboration with the public sector however relates to the formal agreement (MOU) with the ministry of health, which empowers Heartfile to take a lead in the development of the National Action Plan on CVD Prevention and Control, expanding the CVD issue to encompass an NCD approach. The signing of this MOU represents a major breakthrough, not only in terms of prioritizing NCDs on the health agenda of the government, but also because it represents the first public-private partnership in health initiated at the policy development level, and will encompass common program implementation elements.

Several difficulties were also encountered throughout the course of this program. Initial attempts at placing CVD on the national health agenda were unsuccessful and despite the delineation of several opportunities to incorporate heart health into primary health care, the governent was resistant to making a policy change. However, subsequent efforts were fruitful in prompting the ministry of health to stage joint television spots with Heartfile. In addition, collaboration with the LHWP involved training the work force of more than 100,000 LHWs, thereby expanding the scope of the Heartfile program. The process and tools of this intervention are of particular relevance to other low resource settings utilizing grass-roots networks of primary healthcare providers with limited education and training.

Initial failed attempts at engaging the government in this approach can be attributed to bureaucratic, cultural, and policy constraints; a similar resistance can be expected in similar settings. In this context, the role of international health organizations such as WHO should be fully appreciated. Such organizations play a major role in shaping health agendas of developing countries. Therefore, it is imperative for private-sector-based initiatives to foster an active collaboration with the country's operational arm of WHO so that advocacy targeted at local policy makers will also have active support of WHO.

The Heartfile program also encountered several funding constraints. Healthcare needs of developing countries are traditionally thought to be synonymous with reproductive health issues and communicable disease control; NCDs do not resonate with these priorities. Therefore, significant effort was required to highlight the importance of the rising CVD burden. To this end,

. . . it is imperative for private-sector-based initiatives to foster an active collaboration with the country's operational arm of WHO so that advocacy targeted at local policy makers will also have active support of WHO.

Heartfile successfully drew attention to the economic impact of these diseases, both at the macroeconomic level and as it related to households. The argument was also made stronger by highlighting the inability of health systems to face the challenge of the rising burden, thereby strengthening the case for investing in CVD prevention and control. Data from the World Bank, WHO, and Murray and Lopez were of significance importance in highlighting the issue, while local cost-based data from the recent *SAARC Coronary Heart Disease Prevention Guidelines,*[24] which emphasized the inability of individuals to access care, further enhanced the relevance of investment in CVD prevention and controls programs. Therefore, Heartfile was successful in generating funding from international donor sources, including: the UK's Department of International Development (DFID), the Canadian International Development Agency (CIDA), and the European Union funded Trust for Voluntary Organizations in Pakistan (TVO).

These organizations provided funding support for the Heartfile program at a critical point during the course of the cardiovascular disease epidemic in developing countries. This enabled Heartfile to plan and implement projects addressing CVD issues in the native Pakistani setting and had implications for a much broader context in the domain of development. Heartfile represents a private sector experience, which has now expanded to assist national development through improved health. The degree to which this provides a model for other developing countries remains to be determined.

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