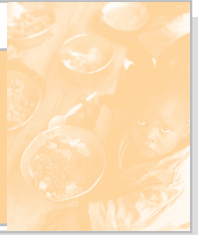


# Community intervention for the emerging epidemic of non-communicable diseases



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**Background.** Community health workers (CHWs) are lay people trained to assist with health care in their communities. This study took place at two sites in Khayelitsha, a township in the Cape Peninsula, from 2000 to 2002.

**Objectives.** To describe the process of developing an intervention programme for primary prevention of non-communicable diseases (NCDs) in general and cardiovascular disease in particular, targeting CHWs.

**Method.** Forty-four CHWs were assigned to either an intervention or a control group. The intervention group, living in Site C, received training on lifestyle modification with emphasis on healthy eating and physical activity, while the control group, living in Site B, did not receive any training until a year later. The process was undertaken in four stages. Stage 1 involved assessment of the CHWs' risk factors by obtaining anthropometric measurements. CHWs were interviewed and focus group discussions were held on the socio-cultural factors associated with body weight and body image, and barriers to physical activity. Stage 2 involved developing and implementing a training programme for primary prevention of NCDs among CHWs. Stage 3, conducted at Site C, involved a situational assessment of available resources in the community for promoting healthy lifestyles. The fourth and final stage involved the implementation of community interventions by the CHWs.

**Results.** A large percentage of CHWs were overweight and obese, and therefore at risk for NCDs. They had misconceptions about causes and treatment of these diseases, and also lacked knowledge on nutrition and the risk of high fat intake. Easy access to cheap unhealthy food, rather than fresh fruit and vegetables, limited their ability to make healthy food choices. The findings from stage 1 led to a community participatory intervention.

**Conclusions.** Developing community-targeted interventions for NCDs can be achieved by involving CHWs at the initial stage and utilising a multifaceted approach. Education of community members and CHWs does not guarantee behaviour modification. Unless the environment encourages healthy living, NCDs will continue to be a burden in the poor populations of South Africa.

Non-communicable diseases (NCDs) are a major cause of global morbidity and mortality. The World Health Organization (WHO)<sup>1</sup> has estimated that by 2020, one-third of the global burden of disease will be attributable to NCDs. Obesity is one of the most common risk factors for these conditions. Hypertension, type 2 diabetes and cardiovascular disease are NCDs with similar risk factors, and these diseases are more common among those classified as being overweight.

Preventing NCDs is generally not given high priority in poor populations, despite their disproportionate effect on these people. For example, in 2002 the WHO<sup>2</sup> reported that worldwide 60% of all deaths and 47% of the global burden of disease were attributable to NCDs.

However, 66% of the deaths occurred in developing countries, where those who were affected were younger and therefore died at an earlier age. Furthermore, of the 10 leading risk factors for the disease burden in developing and developed countries, 6 were related to nutrition and physical activity.

## WHO global strategy for prevention and control of NCDs

In recognition of the existing knowledge on risk factors for NCDs, but bearing in mind that malnutrition, including undernutrition and nutritional deficiencies,

is still a major cause of death in many developing countries, the WHO<sup>3</sup> developed a global strategy for diet, physical activity and health to be implemented within the integrated prevention and control of NCDs. The strategy aims at promoting healthy lifestyles (food choices and an increase in physical activity) in a healthier environment, where nutritious foods, especially fruit and vegetables, are available locally at reasonable prices. The strategy also seeks to promote simpler labelling of benefits and potential harmful effects of foods so that people can make informed food choices. The WHO strategy can only work if there is a broader, multisectoral approach involving all stakeholders interested in public health matters. The challenges of implementing the strategy in a given community depend on answers to the following questions: (i) does the environment in which most poor people live promote a healthy lifestyle?; (ii) do health workers encourage health-related alternatives?; and (iii) are prices of nutritious food reasonable for poor people?

We took up the challenge of implementing the WHO global strategy for prevention and control of NCDs in a poor population of Cape Town. This article describes the stages of developing an intervention model utilising a group of community health workers (CHWs) who were educated to adopt healthy lifestyles, and to serve as change agents for planning and implementing community-based programmes for primary prevention of NCDs in their communities. The goal was to develop a NCD model that could be used to benefit an urban township community.

## Evidence of successful strategies in prevention and control of NCDs

The problems of nutrition, smoking and heavy alcohol use have been addressed successfully in a few countries. For example, Finland and Norway changed the high-fat and high-density diets consumed by their populations and in so doing reduced serum cholesterol levels and the number of deaths caused by coronary heart diseases.<sup>4</sup> In Singapore, a comprehensive programme that involved use of mass media, pricing policies, widespread education in the community, workplace and schools, as well as legislative and fiscal measures, reduced mean cholesterol levels, hypertension, smoking, and heavy alcohol use.<sup>5</sup>

These programmes have required community-wide preventive action by institutions, rather than efforts to master risk factors singly. This highlights the institutional problem in the poorest countries as they attempt to deal with the epidemic of NCDs, particularly obesity.

## Community intervention model

CHWs are lay people, with minimum basic education. In this study they were selected by the communities where they lived, and were employed by Zanempilo, a non-governmental organisation (NGO) that rewarded them with a stipend. They spent their time making 'home visits' to households in their area, administering directly observed short-course therapy for tuberculosis (TB DOTS), and were also involved in community events to promote health and prevent disease.

In 2000, Zanempilo added a health-promotion component to the activities of the CHWs, at the request of the community. The component focused on reducing cardiovascular disease risk factors. CHWs were targeted to serve as change agents because of their instrumental role in the community. Community-based programmes in many countries have found that with appropriate training, experienced CHWs can be effective motivators.<sup>6</sup>

## Framework for interventions

The health-promotion approach was employed in developing the community-based intervention. The intervention was based on the framework provided by the Ottawa Charter.<sup>7</sup> The development of personal skills among health workers was expected to strengthen community action in demanding an environment that promotes healthy choices. This should translate into reorientation of health services and public policy. The stages of interventions are outlined in Fig. 1.

## Methodology

A 'triple A' approach of assessment, analysis and action was utilised.<sup>8</sup> The assessment was undertaken in two parts.

Stage 1 included assessment before the training of CHWs. Assessment comprised two phases. During phase 1 the focus was on obtaining anthropometric measurements and understanding the socio-cultural factors associated with body weight and body image and the barriers to physical activity among CHWs. During the second phase, information was gathered on eating patterns and barriers to healthy eating. Knowledge, beliefs and attitudes were explored with regard to NCD risk factors.

Stage 2 involved developing and implementing a training programme for primary prevention of NCDs among CHWs in Site C.

Stage 3 involved doing a situational assessment of Site C to identify available resources for promoting healthy lifestyles.

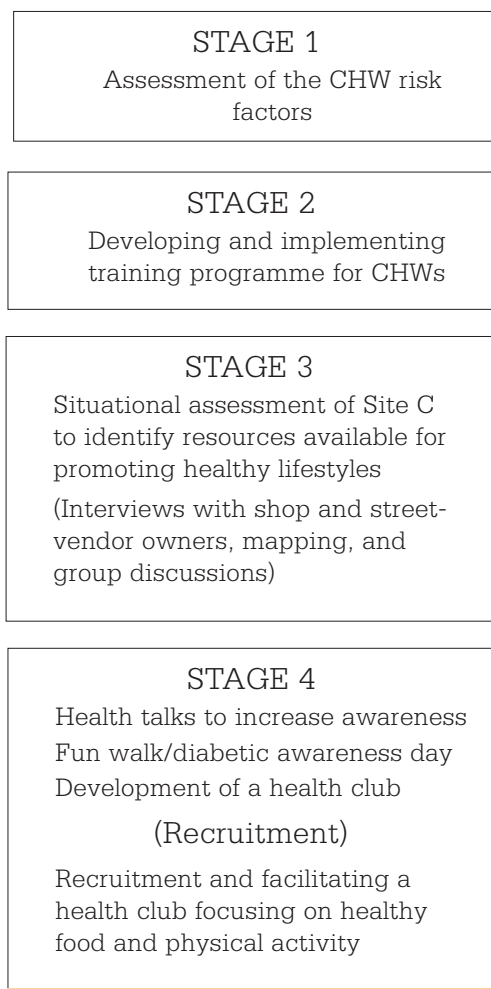


Fig. 1. Community health worker interventions (implementation stages).

Stage 4 involved implementing community interventions.

## Setting

Khayelitsha, a large black township located in Cape Town, has a population estimated at between 350 000 and 900 000.<sup>9</sup> The average household size is 5.6 people/residents and more than 40% are unemployed. Many have moved to Khayelitsha seeking employment, although opportunities are scarce.<sup>9</sup>

## Subjects

Subjects included 44 CHWs employed by Zanempilo to provide health care services in underresourced areas in and around Khayelitsha (Sites B and C). Eighty per cent of the CHWs lived in informal shacks and 20% in formal housing. Their ages ranged between 28 and 60 years (mean  $43.2 \pm 7.2$  years). The average educational level was standard 8 (10 years of schooling).

## Sampling framework

**Stage 1.** All CHWs from Sites B and C had their measurements taken, and were interviewed about their eating patterns, risk factors and control of NCDs.

**Stage 2.** CHWs were divided and assigned to an intervention group (Site C) and a control group (Site B, with the aim of implementing interventions at a later stage).

**Stage 3.** Each CHW area comprises 100 - 150 households. For situational assessment, each CHW living in Site C purposely selected 1 local shop and 2 street-vendor stands for interviewing. Twenty local shop owners and 40 street-vendor owners were interviewed. For the mapping exercise, 10 meetings were facilitated.

**Stage 4.** In Site C, 7 of the 44 CHWs implemented the intervention programme.

## Human subjects/ethical considerations

Ethical approval was obtained from the University of the Western Cape's Ethics Committee. Informed consent was obtained from all participants.

## CHW engagement process

The initial process involved making contact and establishing a relationship with the CHWs. After ensuring that the relationship had been established, training was initiated on anthropometric measurements (weight, height, and arm, waist and hip circumferences) and blood pressure measurement. The aim was to equip the CHWs with skills to measure each other, and utilise these skills in community surveys. This process was facilitated by the project leader (TP), who is familiar with the Xhosa culture and language. The CHWs could therefore relate freely, raise their concerns, and ask questions.

## Data collection

### Assessment of CHW risk factors

The anthropometric measurements were taken by trained research assistants using a standard protocol.<sup>10</sup> Information on eating patterns was collected through use of structured interviews. For instructional purposes, the CHWs were provided with chicken and maize (mealie-meal) and were asked to demonstrate their cooking methods for these foods. Once they completed this task, they all commented on each other's cooking techniques, and food flavour. Photographs of food preparation and portion sizes were taken.

Focus group discussions explored perceptions about the causes, advantages and disadvantages of being overweight, reasons for consumption of fat and methods of food preparation, and barriers to physical activity. The discussions were facilitated in isiXhosa, tape recorded and continued until saturation, and then transcribed and translated into English. Data for stage 1 were collected between September 2000 and August 2001.

## Situational assessment

The CHWs interviewed 2 food vendors in their respective areas, and obtained information on food sold, business practices and perceptions of what constitutes healthy food. In addition, they obtained a list of foods sold, and pricing in local shops. Photographs of food sold by vendors and of the surroundings were also taken.

A pair of CHWs who lived in the area facilitated the mapping exercise. This exercise identified main streets, churches, and schools as boundaries. Participants also identified places that sold fruit and vegetables, fatty meat, cigarettes, and alcohol, and the location of recreation parks. When the mapping exercise was completed, questions relating to risk factors for NCDs were discussed as follows: (i) do you think overweight is a problem in your community? If so explain; (ii) who suffers from high blood pressure and diabetes in your area?; (iii) what factors do you think are responsible for these conditions?; (iv) is alcohol a problem in your area?; (v) which people are the most affected by alcohol, and why?; and (vi) what do you understand about eating healthy foods and how do you feel about this concept?

The situational assessment was undertaken from August to October 2002.

## Data analysis

### Anthropometric measurements

Data were analysed using the Statistical Package for Social Sciences (SPSS 9.0 for Windows). Body mass index (BMI) was calculated as weight in kg/height in m<sup>2</sup>. Cut-off points were established for obesity at BMI 30 - 40, and extreme obesity at BMI > 40 in accordance with the WHO's classification.<sup>11</sup> For waist circumference, cut-off points for obesity-associated complications were  $\geq 80$  cm (increased risk) and 88 cm (substantially increased risk).<sup>11</sup> Descriptive statistics (means and percentage) were used to analyse the interviews.

Content analysis was used for focus groups and these were organised according to emerging themes.

Photographs were grouped into categories and themes were generated. A discussion with the CHWs followed to ensure reliability and validity of data.

Triangulation, i.e. use of different data collection methods, ensured reliability and validity of data collected. In addition, information collected through mapping exercises was grouped into categories to generate themes, and feedback and discussion of the results with the CHWs ensured reliability of the results.

## Findings

The intervention was based on the findings from stage 1, which revealed that a large percentage (95%) of CHWs were overweight (BMI 25 - 29) and obese (BMI > 30), and therefore at risk for developing NCDs.<sup>12</sup> CHWs also had misconceptions about causes and treatment of hypertension and diabetes.<sup>13</sup> Eating patterns revealed consumption of cheap fatty fried foods. Reasons for consuming fried food were for taste, satisfaction, and for what it does to the body: 'If you are plump, you look happy and people think that you can afford to feed yourself'.<sup>14</sup>

The CHWs also lacked knowledge on nutrition and the risk of high fat intake, which was indicated by the statement that, 'People who boil food are not civilised. Fried food is attractive, tasty - like "chicken lick'n". Chicken skin is very tasty because it contains fat. It makes you satisfied. We can't throw the skin away. We even buy skin and fat from local shops.'<sup>15</sup>

Observation of cooking methods revealed unhealthy practices such as cooking chicken with the skin on in 300 ml cooking oil. The portions served were extremely large, almost triple the suggested serving size.<sup>12</sup>

Stage 3 assessments revealed that a large percentage of vendors sold fatty meat and sausages, few sold fresh fruit and vegetables, and there was easy access to alcohol. Participants were concerned about the presence of shebeens close to the schools as this was thought to encourage drinking among the youth. Prices of healthy food were higher than those of unhealthy foods. Discussions during community situational assessment meetings revealed that socio-economic issues were also contributing to unhealthy food choices, as indicated in the following comments: 'I have been poor for most of my childhood, now I have a husband who works and can afford to feed me, why should I punish myself?'; 'You want me to starve myself, the next thing, a car accident, and I am dead. Let me eat what I like and be happy'; and 'I have been deprived since I was a child. This is the time to enjoy myself by eating what I like. I like my food.'

Photographs of local shops confirmed the information presented by CHWs, namely that the environment in the township promoted unhealthy food choices. Crime, lack of safety, cultural beliefs, and lack of green areas and recreation facilities in the township interfered with participation in physical activities.<sup>16</sup>

### Planning community interventions (action)

#### Setting the agenda to discuss the extent of the problem of NCDs and the importance of primary prevention of risk factors

On completion of the assessment of risk factors, feedback on the results of anthropometric

measurements using WHO cut-off points were used to explain the risk associated with different BMI levels.<sup>11</sup> In addition, the consequences of a high-fat diet, the benefits of reducing fat intake and increasing fruit and vegetable intake were explained. At the end of the presentations, CHWs were given time to think about their results. Small-group discussions were held to discuss the way forward. At the end of their discussion, one of the CHWs said: 'We have been discussing our results. I am going to speak for the group. We do not know what to eat to be healthy. We have realised that we have been poisoning ourselves with unhealthy food. We need to be educated, we do not want to die and leave our young children behind. We need help.' This statement has led to a participatory community intervention for primary prevention of NCDs.

### Development of a training programme for CHWs

The aim of the training programme was to empower CHWs with knowledge and skills to make healthy food choices, and to increase their level of physical activity. By the end of their training they were expected to influence their community to adopt healthy lifestyles by being positive role models. In addition they were expected to use key messages to increase awareness and promote healthy lifestyles, and be able to implement the intervention in their communities.

### Advocacy meeting for stakeholders

An advocacy meeting was held to motivate stakeholders to support the CHWs in their effort to increase community awareness risk factors and preventive NCD strategies. Stakeholders, including community members, doctors, professional nurses, shop owners, school teachers, and health promotion and environmental officers, were invited. The Deputy Director of Chronic Diseases for the Western Cape spoke briefly about the burdens associated with NCDs, and the need for preventive action.

The training co-ordinator for CHWs presented the training agenda and highlighted the activities. These included arranging community walks, educational meetings to create community awareness of NCDs, and working in partnership with the community to plan and implement appropriate interventions.

### The training programme

The CHWs' training was participatory. Lectures were given once a week for a period of 3 hours. Learning was reinforced with the use of visual aids, including examination of visceral animal organs. Case studies, specifically developed for this population group, were used to reinforce learning and encourage critical thinking. For each topic, the role in causation of cardiovascular diseases and NCDs was explained, preventive measures were highlighted, and a key

message was provided to inform the community. The training was facilitated in English and in isiXhosa, a local language spoken in the Western Cape. The training of Site C's CHWs took place from October 2001 to October 2002. Lectures for this training were used to develop a training manual, which was piloted and finalised during February - June 2005 using Site B's group of CHWs.

### Setting of goals to modify behaviour

During the training session CHWs were asked to identify modifiable risk practices and barriers to achieving such goals, and how to overcome these barriers. The aim of this exercise was to help them realise that behaviour modification is a stepwise process that incorporates targeted goals.

It was determined that CHW efforts were hindered by family, community members, and environmental factors. Some of their comments were noted: 'Even if we want to cut down on the fat and salt that we eat, children do not listen. When they cook they add salt and fry the food'; 'When we attend community parties, we are served large portions of the best meat, cakes etc. - community members know us'; and 'When we do home visits we become hungry and are tempted by the food already fried in the environment, including fried tripe, sausages and "vetkoek" [equivalent to donuts].'

### Community interventions by CHWs

The CHWs met with residents to develop a community map. The goal was to involve the community residents in identifying available resources for promoting healthy living in their environment. The information collected during mapping exercises was used to plan interventions by CHWs in the community.

Some of the activities for increasing community awareness of the prevention of NCDs by CHWs included: discussions on healthy eating, group walks, developing and staging drama/acting to disseminate messages about prevention and control of NCDs, and formation of a health club.

During January 2005, the 7 CHWs who continued working with the project took part in planning and development of a health club, *Masiphakame Ngempilo yethu* (Let's stand up for our health). They all received training on the types of exercises they could teach community members, which included stretching before and after going for walks. Each CHW recruited 5 members in the surrounding area to join the club. Baseline information was collected for people who joined the club, including weight, height, waist and blood pressure measurements. A food frequency

questionnaire was used to collect data on eating patterns. Monthly cooking demonstrations were given, with everyone tasting the food and sharing recipes. Club members met weekly, and their numbers are increasing.

## Problems experienced during the process of developing interventions

The training lasted longer than originally planned because of CHWs' prior obligations and time constraints. The intended 3-month training continued for over a year. Some sessions were delayed because of conflicting community meetings.

By the end of 2003, Zanempilo funding ended, which meant retrenchment of the CHWs. All but 7 CHWs took employment elsewhere, which slowed down our progress in this work.

## Discussion

The study revealed that obesity and risk factors for NCDs are significant among CHWs. These participants are at substantial risk of developing NCDs related to their obesity, poor nutrition, lack of physical activity, and cultural perceptions. Our findings on women being overweight were similar to those of Mvo *et al.*,<sup>17</sup> who reported that overweight black urban women were perceived to be affluent and happy. These findings paralleled those reported in national and international surveys, which found fewer women perceiving themselves as overweight/obese than indicated by their BMIs. The participants preferred to be overweight because of the stigma associated with thinness.<sup>12,16</sup>

This study demonstrated the importance of involving CHWs in the initial process of developing a targeted community intervention. By utilising a multi-step process and data collection, an active participatory approach was conceived. The approach identified cultural and environmental beliefs and attitudes of the CHWs that influenced their behaviour, and that of their community.

The strength of this study lay in the fact that the project leader and research staff shared the same language and cultural background as the CHWs. Before the data collection process, an established relationship of trust was developed through informal discussions, social gatherings and dedicated time commitment with the CHWs. This study did not measure the effect of the intervention on the CHWs, but describes the developmental process of establishing a community-based intervention.

The study limitations included small sample size and a focused intervention targeting CHWs in an urban township which meant that findings could not be generalised to the larger South African community.

The participatory process transformed the CHWs, motivating them to take action to improve their lifestyles. This has led to several encouraging moves. One initiative, for example, involved organising a walk to create awareness among community members of the need to be physically active to prevent NCDs. A logo, 'Walk for Life and Prevent Chronic Diseases', was designed.

Several activities have begun in the community. These include health clubs set up by CHWs focusing on diet and physical activity. Educational talks are planned, with mobilisation of community leaders to join the initiative for reduction of NCD risk factors. Overall, we expect and hope for increased community demand for nutritious food and a healthful environment, which will promote a disease-free lifestyle.

## Conclusions

Implementation of the WHO global strategy for prevention and control of NCDs is difficult in poor communities. Education does not guarantee behaviour modification of community members and CHWs. Unless the environment encourages healthy living, NCDs will continue to be a burden among the poor population of South Africa. However, not enough time has elapsed to see changes in the community, but there are promising signs, such as requests from prominent community members for help with developing walking clubs, and for education on nutritious diets. With this plan in hand, and trained and enthusiastic CHWs, it is time to reach for the goal of the project. We can begin to educate the community members of Khayelitsha for healthful change, making this a model to be replicated in other provinces in South Africa, thereby assisting policy makers to direct resources to NCD-focused interventions.

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