



Review of WDF supported school health programs

Primary prevention for the coming generation

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March 2012

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WORLD **DIABETES** FOUNDATION

Acknowledgements

This review was made possible by the kind cooperation of the project partners of the World Diabetes Foundation. The valuable experiences of the partners form the basis on which the analysis and recommendations are made.

We would like to thank WDF Managing Director, Dr Anil Kapur, for his interest, commitment and support to this review. His continuous important and constructive feedback on designing the questionnaire and reviewing and editing the report has been crucial to the completion of this review.

Furthermore, we would like to thank WDF Senior Programme Coordinator, Mr Ulrik Uldall Nielsen, for his interest and valuable inputs throughout the review process.

Mette Skar was supported through an unrestricted financial grant from WDF for this work.

Abstract

The aim of this review is to collect valuable experiences from project partners implementing school health programmes around the world. The review includes 17 programmes implemented by 15 project partners. The review is based on structured survey questionnaire filled by all project partners, interviews with selected partners, field visits and focus group interviews with some beneficiaries, review of project data and applying qualitative analysis on the information collected. Primary data collection is complemented by a literature review of secondary data. Through the analysis, experiences and lessons learned from the projects were analysed against the secondary data in the literature review.

The review discusses various approaches to organising health promotion programmes in school settings and highlights factors one needs to be aware of. A list of recommendations at the end of the review serves as a guidance tool for organisations planning to implement primary prevention programme in school settings.

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List of Abbreviations

MoE – Ministry of Education

MoH – Ministry of Health

NCDs- Non-Communicable Diseases

NGO – Non-Governmental Organisations

PAHO – Pan American Health Organisation

PPA – Project Partnership Agreement

WDF – World Diabetes Foundation

WHO – World Health Organisation

Introduction

There are an estimated 366 million people living with diabetes worldwide, of which 80% live in low and middle income countries [1]. This huge disease burden places tremendous economic and capacity constraint on the already stretched health care systems, communities as well as on families and individuals. In developing countries the onset of diabetes is increasingly occurring in younger productive age groups and therefore has negative impact on the economy due to loss of productivity and trained manpower [2]. The lifelong provision of diabetes care services is resource demanding and health care systems largely geared to treat communicable diseases are unable to provide care and preventive services to achieve the desirable outcomes of diabetes management. Hence, patients face the risk of serious debilitating and costly diabetes related complications, such as blindness, renal failure, heart disease or amputations [3, 4]. When the disease affects the breadwinner it has immense consequences for the family as well [5]. This public health crisis in the making calls for immediate action.

There are convincing reasons why primary prevention should be the main approach in developing countries [3]. Although genetic inheritance plays a role in the development of diabetes, most risk factors are modifiable [6]. Several studies have shown that lifestyle change can prevent or delay the onset of type 2 diabetes - the most common form of diabetes [7-9]. It has also been shown that these interventions are not only feasible and cost effective particularly in the developing world setting but that the effects of even short-term interventions are long lasting [9-11]. Thus by targeting the population before the onset of diabetes, costs of treatment of both the disease and its complications together with human suffering can be considerably reduced [3]. However bringing about lifestyle changes and behaviour modification are hard to achieve and sustain when initiated in adult life; therefore primary prevention and health promotion efforts need to begin early in childhood. Health and risk behaviour are strongly related to habits. Habits are formed in childhood and often last for a lifetime. Targeting children before they develop unhealthy habits creates a window of opportunity to change the future prospects.

Several population based primary prevention programmes supported by the World Diabetes Foundation (WDF) have targeted children through school health programmes using various approaches.

The aim of this report is to analyse the WDF projects targeting health promotion in schools, to collate the learning and understand what works and what does not, the factors influencing success, as well as the opportunities and barriers faced. This review will be useful for assessing, guiding and designing future school health programmes. The report elaborates approaches and activities with emphasis on both challenges and successes. The report highlights applicable and well-functioning approaches in school settings. It is thus not be the objective of the review to evaluate the selected projects and make a summative judgement of their perceived success rate.

1. Method

This report is a desk study combined with limited fieldwork and is based on a thorough review of primary prevention and health promotion projects in schools funded by WDF. The objective of the review is internal and external learning as opposed to external accountability - and the chosen approach is hence formative as opposed to summative.

1.1 Data Collection

1.1.1 Identification of Projects

To identify eligible projects all applications from WDF-supported projects in the period from 2002-2011 were screened for the keywords 'school', 'child*' 'adoles*', 'student', and 'primary prev*'. Project applications and Technical Assessments containing one or more of these keywords were further examined for their relevance. Applications from projects where the keyword was mentioned in relation to previous projects, background information or in references were excluded. Additionally, if 'school' was mentioned as site for a general public awareness campaign or in 'diabetes school' or 'medical school' the inclusion criteria were not considered fulfilled. If 'child' was mentioned in relation to diabetes care for 'mother and child', in relation to prevention of gestational diabetes or in prevention programmes for children with type 1 diabetes mellitus the project was not eligible for inclusion. Furthermore, projects that only conducted one talk on health promotion and primary prevention in schools were excluded. The inclusion criteria thus included projects, which had conducted more than one health promotion activity in schools for children, teachers and if possible other activities for the surrounding community. Projects in both the planning and implementation phases and completed projects were included. For inclusion in the review a prerequisite was that the Project Partnership Agreement (PPA) had to be signed. The identified projects were then scrutinised to determine if it was either a full-fledged primary prevention project in school settings or a project where primary prevention in the school setting was a substantial component among others (henceforth referred to as projects with school component). The list of identified projects was sent to the WDF project coordinators to ensure that all relevant projects were included and that the categorisation was correct. The final list of projects meeting the inclusion criteria was prepared for the review. Please see Table 1 for a comprehensive listing of the projects selected.

1.1.2 Questionnaires

A web-based questionnaire was developed and distributed via email to the main project responsible or to the person responsible for the daily implementation of activities. The partners were informed that the focus of the questionnaire was to collect lessons learned as opposed to an assessment of their respective project. Furthermore the respondents were made aware that their response would not be anonymous due to the limited number of respondents and the recognisable features of the projects would make it possible to identify them.

The questionnaire consisted of three parts. The first part explored the structural environment in which the projects operate. This part contained questions on stakeholders, currently existing health policies and the school health environment prior to intervention. The second

part of the questionnaire gathered basic information on the selected approach, target groups and the specific activities conducted in each project. The last part of the questionnaire explored barriers, successes and lessons learned. The questionnaire was developed based on existing knowledge of primary prevention in schools and review of project documents.

The questionnaire served as a guiding tool for the exploratory interviews that were conducted subsequently. To ensure a high response rate, the respondents who had not filled the questionnaire by the deadline, were encouraged to respond as soon as possible. Consequently, questionnaires were received from 15 of the 16 project partners (response rate of 94%).

1.1.3 Interviews

A semi-structured interview guide was developed for the full-fledged primary prevention projects. This approach allows the interviewer to pursue interesting topics and themes as the interview evolves [12]. Additionally, questions were open-ended to facilitate and encourage exploratory information from the interviewees [13]. The interviews served the purpose of exploring individual experiences and perceptions of school health programmes [12]. All interviews were customised for each specific project after reviewing the responses to the questionnaires. The purpose of conducting such interviews was to retrieve information that was difficult to obtain with a questionnaire.

The interviews were conducted in-person or via telephone and informed consent and permission to record all interviews were ensured. Interviews were successfully conducted with all 8 full-fledged school health projects and additionally with one project with a school health component, which was visited as part of the field visit of selected Indian projects.

1.1.4 Field visit and Focus Groups interviews with beneficiaries

To promote a better understanding of school health projects explanatory data was collected through a field trip to India, visiting three different school projects in three different parts of the country. The purpose of the field visit was to gain an understanding of the way in which selected projects and activities are implemented and carried out in the field. Hence, the field visit was not intended to assess the effectiveness and success of the programmes, but rather to get insight on the different challenges and lessons learned in the field. The purpose of the field visit was to add the perspectives of the beneficiaries of the programmes in this case both teachers and students to the review process. Therefore focus group interviews were conducted with both teachers and students at all three projects. Semi-structured interview guides were developed for the focus groups. The focus groups contained 2-6 students or teachers, and were conducted in 2-3 schools in the three visited projects. This approach permitted beneficiaries to express their direct experiences with the projects. The three visited projects serve as a case study in this report, as the projects share the same structural and social context. As these projects were examined in depth the analysis will consequently have a higher number of quotes and references to the Indian context.

1.2 Strategy for data analysis

After receiving responses on the questionnaires, descriptive analysis was performed. For analytic and scientific purposes the conducted interviews were transcribed in full length; this enabled coding of the interviews and document the internal validity of the following analysis. The coding of both interviews and questionnaires were done according to themes and categories discovered throughout the period of the review. The themes and categories were revised to ensure that they were exhaustive. Hereafter the themes and categories were organised according to key concepts such as health education sessions, nutrition, physical activity, political environment, barriers, lessons learned etc. With regards to the risk factors this review concerns the modifiable risk factors.

1.3 Strategy for literature review

In addition to data collected from the WDF supported projects a literature review was conducted to gather the current existing evidence from peer reviewed school health programmes. The literature search was performed using the search engines Google scholar and Pubmed. As inclusion criterion the papers should be published in the same period as the on-going WDF supported programmes. Thus the included articles were published in the period from 2001 to 2011. In Google Scholar the following search words were used; primary prevention, diabetes, school programme, (+ developing countries). To specify the search *Mesh* terms were used to search Pubmed. Mesh terms is the U.S National Library of Medicine's controlled vocabulary used for indexing papers. Mesh terms provide a consistent way to retrieve information, when different terminology for the same concepts may be used. The following Mesh terms were used; Primary prevention AND School Health Services AND Diabetes Mellitus. Additionally, the subsequent search words were used; prevention AND diabetes AND school programs AND children. To find further relevant publications, the references from already retrieved papers were looked up.

2. Literature review

The literature search revealed a large number of peer reviewed school health programmes conducted worldwide. The programmes vary largely with respect to scope and have different focal points of their interventions. The predominant number of programmes has been implemented in developed countries, especially in USA, Canada and Europe [14-19]. As the programmes are tailored to be context specific, the successful components of these programmes, cannot necessarily be generalised to low and middle-income settings.

Fortunately publications from few programmes implemented in low and middle-income settings were available. Five of these programmes will be introduced in the following section, comprising programmes from Zambia, Chile, China, South Africa and India. Thereafter follows a broader examination of lessons learned from school health programmes in general, as this is relevant for the discussion of the programmes undertaken by this present report.

Sherman et al. 2007 implemented a school health programme in Zambia, targeting the age group of 7 to 13 years old, with a health and nutrition education programme [20]. The aim of the programme was to integrate health and nutrition topics to the existing school curriculum and further to train school staff on these topics. The study proved to be effective in raising awareness, knowledge and behavioural change, even in the absence of health and nutrition services in the schools. Key components of the programme included the active involvement of school management, teachers, students and parents in the development of both materials and curriculum [20].

Kain et al., 2004 implemented a school health programme in Chile [21]. The 6-month intervention comprised nutrition education for students and parents, healthier kiosks near schools, an addition of 90 minutes of weekly physical activity and focus on active recess. To assess the impact of the interventions, the programme was designed as a randomised controlled trial, where the impact was measured as changes in adiposity and physical fitness. The programme targeted grade 4 to 8 with the educational programme. A nutritionist and a trained physical education teacher were responsible for the classes. The additional 90 minutes of weekly physical activity were mainly orientated towards specific types of sports. Furthermore the programme held meetings with parents to ensure a supportive environment at home. As a structural approach the programme targeted kiosk vendors and advocated for more healthy food choices sold at the schools. The 6-month intervention significantly improved the physical fitness of both girls and boys. With respect to adiposity reduction the decrease was only significant for boys. The degree of involvement differed in the schools and Kain et al., 2004 found that smaller schools were more successful in implementing the programme.

Jiang et al., 2007 conducted a three-year school programme in China, with the aim to reduce obesity in urban schools [22]. The primary component of the programme was nutrition education of parents and students. Additionally, the programme aimed at increasing the amount of physical activity in already obese children, by encouraging 20 minutes of running after classes. The three year intervention significantly reduced the prevalence of obesity in the intervention schools [22].

Draper et al., 2010 conducted a nutrition and physical activity intervention for primary schools in low-income settings in South Africa [23], which is included as a part of the present review. The intervention promoted healthy eating habits and physical activity among students, parent and teachers. Additionally, the intervention had focus on creating healthy environments within the schools and communities to facilitate healthy lifestyle choices. Draper et al., 2010 found that it could be difficult to engage the teachers in school based interventions and being aware of this barrier is important. Furthermore, a toolkit was developed during the intervention in order to build capacities for change in the schools [23]. Based on the intervention Abrahams et al., 2011 investigated dietary behaviour among the students [24]. The study showed large differences between students who brought their own lunch box to school compared to students who did not bring a lunch box. Apparently, the former group of students showed greater dietary diversity, had meals regularly and had a higher standard of living [24].

Misra et al., 2011 conducted a large school and community-based intervention study, which is also included as part of this review. The intervention was designed as an intensive programme spanning over 24 weeks. The intervention targeted 11th graders, with a weekly health education session. In relation to this session, group discussion and quizzes were arranged to increase student participation. Furthermore, promotion of weekly physical activity for at least 30 minutes and targeting school canteens were key components of the intervention. On the basis of this intervention several studies have been published [25].

Singhal et al., 2010, 2011 investigated the effect of the school based nutrition education and lifestyle intervention on behaviour modification, anthropometry, metabolic risk profile, and insulin resistance in India [26, 27]. They found that after 6 months of intervention, students' level of knowledge on healthy behaviour was significantly improved and behavioural change such as not consuming sweetened aerated drinks and unhealthy food was detected in the intervention group [27, 28]. Furthermore the waist circumference of the intervention group significantly decreased compared to a control group. Additionally, a significant reduction of several parameters related to insulin resistance showed improvements in the intervention group [26].

The current literature published on school based health promotion shows promising results with regards to the improvements in several risk factors for NCDs for school children in four different developing countries. These results support the argument of initiating preventive measures in childhood. Studies have shown that most metabolic abnormalities associated with insulin resistance manifest during childhood and adolescence [29, 30]. Furthermore, it has been shown that childhood obesity is a marker for obesity in adult life [31]. By targeting school children when obesogenic behaviour is less developed the children are more susceptible to intervention and change. Additionally, by initiating preventive strategies in young people they are targeted while the pathological processes are still reversible [32]. The two main focus areas of health promotion activities in schools are nutrition education and promotion of physical activity [16, 18, 33]. A common feature of many programmes is that they have moved from being knowledge orientated to be behavioural orientated as knowledge does not necessarily manifest itself as behavioural change [34]. With this feature as a starting point school health programmes have to seek linking traditional classroom learning with practical action in order to increase the chance of a successful intervention [20, 35, 36]. Ensuring parental support and inclusion has also been effective in several studies [34, 37]. Furthermore, by employing a multi-component intervention with both behavioural components, structural and environmental approaches studies have shown that health promotion in schools can be very effective [34].

3. Results

The initial review of the WDF project portfolio identified 62 projects, which came out positive on one or more of the keywords. Of these, 11 were excluded as they were projects with a general awareness component and furthermore four were excluded as they had only one talk on health promotion in schools. Six of the projects did not meet the inclusion criteria as

'school' was mentioned as a setting of an activity or in 'diabetes school'. Three projects were excluded because 'school' was mentioned in relation to previous experience of the authors.

Additionally, four projects were excluded, as they were focussing on type 1 diabetes and tuberculosis and diabetes. Further examination, excluded ten more as they had either been terminated prematurely, had not signed the PPA or the activity was not directly linked up to school institutions. Finally, the review resulted in 18 primary prevention and health promotion projects in school settings. Of these, nine were full-fledged school projects and nine were projects where primary prevention was a main component of a larger diabetes project, which also included other elements such as establishing clinics, foot care, eye care or raising awareness for the general public.

The 18 projects selected were implemented and managed by 16 project partners, as two partners implemented two projects each. Of the 16 project partners invited to participate in the review, 15 responded to the questionnaire (response rate 93.7%). As responding to the questionnaire was a prerequisite to participating in the interview, the project partner who did not answer the questionnaire was not contacted further to participate in the interview. Out of 9 projects eligible for an interview, all 9 partners participated (response rate 100%). See Table 1 for the extensive list of included projects.

Three on-going projects in India were selected for a field visit. Two of the projects were full-fledged school based primary prevention projects and the last had primary prevention as a larger component besides implementing a comprehensive diabetes care project. During the field visit to India six focus groups with teachers and six focus groups with students were conducted.

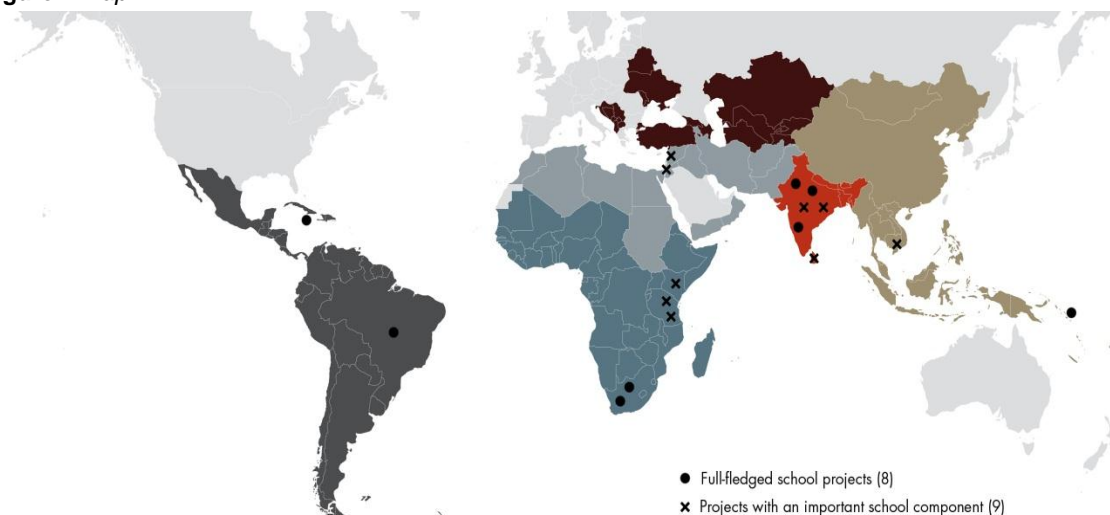
Table 1 Overview of projects included in the review

Region	Country	Project Title (Project number)	Objective	Implementing Partner	Grant from WDF	Grant used for Primary Prevention	Project Period
Africa	Kenya (National Programme)	Mainstreaming Comprehensive Diabetes Care in Kenya (<i>WDF09-436</i>)	Strengthening the health care system to address diabetes by building capacity for the health facilities and increasing community participation. Raise awareness in schools, through health clubs.	Kenyan Ministry of Public Health and Sanitation	USD 1,652,854	USD 130,488	Aug. 2009 - March 2015
	South Africa	A school-based Intervention Program to Reduce Diabetes Risk Factors in Disadvantaged Communities of South Africa (<i>WDF06-174</i>)	Develop, implement and assess a school-based intervention programme aimed at promoting healthy lifestyle and preventing diabetes.	Human Science Research Council, University of Cape Town	USD 248,385	USD 248,385	July 2006 - Oct. 2012
	South Africa	Smart Living: Teenage Diabetes Awareness through Sports and Healthy Nutrition (<i>WDF 10-502</i>)	Promote healthy living in school children through information on healthy diet and physical activity.	Daveyton Environmental Youth Council (DEYC)	USD 87,156	USD 87,156	May 2010 - April 2011
	Tanzania	Increasing Access to Diabetes Care in Private Health Sector in Tanzania (<i>WDF06-212</i>)	Improve access to diabetes care and prevention through the private health sector. Awareness raising through health education in schools and community.	The Association of Private Hospitals in Tanzania	USD 374,333	USD 93,583	June 2007 - June 2009
	Tanzania	Integrated Approach in Prevention and Increasing Access to Diabetes Care in Tanzania (<i>WDF09-450</i>)	Improve diabetes prevention and care by integrating school, community and health facility approaches to prevention, detection, treatment, and rehabilitative care. Train teachers to do anthropometric measurements of school children to screen for risk factors in school children	The Association of Private Hospitals in Tanzania	USD 250,000	USD 50,000	Sept. 2009 - July 2011
Northern Africa and Middle East	Occupied Palestinian territories	Incorporating diabetes prevention and nutrition counselling into medical treatment of diabetes patients (<i>WDF02-010</i>)	Promote access to prevention and quality care for diabetes patients and high risk groups on the West Bank. School training programmes with health education focusing on obesity, healthy lifestyle and prevention of chronic diseases.	DanChurchAid	USD 206,855	USD 206,855	Jan. 2003 – Dec. 2005
	Occupied Palestinian Territories	Nationwide Diabetes Care and Prevention in the Palestinian Areas (phase 2) (<i>WDF 06-170</i>)	Expand and promote a holistic approach to diabetes care and prevention. Conducting "Healthy Living" Campaign, including Wellness days for school children.	DanChurchAid & Augusta Victoria Hospital	USD 443,105	USD 147,701	June 2006 - Jan. 2010
South-East Asia	India, Delhi, Uttarakhand, Uttar Pradesh, Rajasthan, and Maharashtra	Medical education for children/adolescents for Realistic prevention of obesity and diabetes and for healthy ageing (MARG). (<i>WDF05-120</i>)	Create awareness about diabetes, obesity, lipid disorders and heart disease in children and adolescents through a school-based intervention programme.	Diabetes Foundation India	USD 252,597	USD 252,597	Jan. 2006 – Jan. 2009
	India, Andhra Pradesh	The Prakasam District Diabetes Prevention Program - Targeting the future through Child-to-Family communication for lifestyle changes and health promotion (<i>WDF 05-137</i>)	Develop and pilot a sustainable district level model to control diabetes through lifestyle changes and health promotion in school setting, that can be scaled up to a state level model.	L.V Prasad Eye Institute	USD 129,290	USD 129,290	April 2006 - March 2010

Region	Country	Project Title (Project number)	Objective	Implementing Partner	Grant from WDF	Grant used for Primary Prevention	Project Period
South-East Asia	India, Kerala	Primary prevention of Diabetes and other Lifestyle Diseases through Targeted Approach (<i>WDF 07-236</i>)	Raise awareness at secondary school level on how to prevent diabetes. Conducting health education and yoga classes at schools	Medical Trust Hospital and Diabetes Care Centre	USD 500,000	USD 500,000	Aug. 2008 - Aug. 2013
	India, Karnataka	Project CODE: Comprehensive Diabetes and Eye Care (<i>WDF09-456</i>)	Provide comprehensive diabetes care. Primary prevention component with school intervention focusing on healthy diet and exercise.	Vittala International Institute of Ophthalmology	USD 388,988	USD 58,348.3	Sept. 2009 - June 2013
	India, Ahmedabad	Diabetes Prevention Program in the state of Gujarat (<i>WDF09-477</i>)	Implement a diabetes prevention project. Organise awareness and screening camps at schools to empower teachers, children and parents to spread knowledge in their social network	All India Institute of Diabetes and Research	USD 302,854	USD 302,854	Nov. 2010 - Feb. 2014
	Sri Lanka	National Initiative to Reinforce and Organize General Diabetes Care in Sri Lanka (<i>WDF09-411</i>)	Improve quality and delivery of preventive and care services for diabetes in Sri Lanka. Health promotion approach to empower communities (students, workers, poor) to develop healthy behaviours and thereby prevent the onset of diabetes.	Diabetes Prevention Task Force	USD 625,000	USD 104,166	July 2009 - June 2012
Western Pacific	Cambodia	A Provincial Diabetes Peer Educator Network (<i>WDF09-463</i>)	Create a provincial diabetes and hypertension peer educator network. Awareness raising in schools, by educating teachers on healthy nutrition and physical activity	MoPoTsyo Patient Information Centre	USD 300,000	USD 100,000	Nov. 2009 - Feb. 2012
	Marshall Islands	Diabetes Prevention Education for Children (<i>WDF10-524</i>)	Educate school children and their parents to improve general health and address diabetes prevention	Diabetes Wellness Center	USD 250,000	USD 250,000	March 2011 - June 2014
Latin America & Caribbean	Brazil, São Paulo	ADJ Diabetic Bus: Decreasing the Diabetic Impact in Children by Nutritional Education at Schools (<i>WDF 08-402</i>)	Prevent obesity among young people through promotion of nutritional education.	Associação Diabetes Juvenil	USD 298,690	USD 298,690	Oct. 2009 - Oct. 2011
	Caribbean, St. Kitts & Nevis, St. Vincent, Trinidad & Tobago and Grenada	Preventing Diabetes and other Chronic Diseases through a school-based Behavioural Intervention in Four Caribbean Countries (<i>WDF 05-139</i>)	Promote healthy lifestyle among children in secondary school through a school-based intervention in four Caribbean countries. Prevent children and parents from becoming obese and get diabetes.	Caribbean Food and Nutrition Institute	USD 275,000	USD 275,000	May 2007 - Sept. 2011

Geographically the projects are spread globally covering Africa, South-East Asia, Western Pacific, Northern Africa & Middle East and Latin America & Caribbean regions. See Figure 1 below. Furthermore, the included projects cover urban (11 projects), semi-urban (9 projects) and rural areas (8 projects), which ensure a broad perspective on the different contexts in which school health projects are implemented.

Figure 1 Map



Of the included projects, 20% were in the beginning of the implementation phase, 13.3% were in the middle of the implementation phase, 26.7% were almost at the end of the implementation phase, and 40% of the projects were completed. Hence, the review captures experiences from all the different phases of a school health project.

Fifty per cent of the projects listed prevention of non-communicable diseases (NCDs) as the main focus area of their project, 35.7% listed primary prevention of diabetes as their main focus area and 14.3% listed general health promotion as their main focus area. Thus, many of the projects focus broadly on prevention of NCD's or general health promotion instead of having a more narrow focus on diabetes prevention only.

Approximately half of the projects operated in public government run schools and the other half operated in both government and private schools. None of the projects targeted private schools exclusively. Since the majority of the projects are implemented in the government run schools, the projects target children from the middle and lower socioeconomic strata. This is in line with WDF's code of conduct, which emphasises giving support to alleviate human suffering related to diabetes and its complications among those least able to withstand the burden of the disease [38].

In the period January 2003 to March 2015 the WDF supported projects under review in this report will target an estimated 2,200 schools. Within these schools an estimated 449,600 students and 19,000 teachers will be reached through a primary prevention and health promotion initiative. Furthermore, the projects will target approximately 284,000 parents through direct and indirect interventions. These numbers are based on the successful achievement of the milestones set in the PPA for each project and achievements of set

targets so far. It is quite likely that the numbers stated above will far exceed the expectations based on how the projects are progressing.

3.1 The macro environment for projects working with school health

To get a better understanding of the environment in which school health projects in the developing world operate, this section seeks to explore the different stakeholders and the existing policies related to health promotion and prevention in schools. Furthermore, the section provides insight to the different structural, social and economic barriers the projects have experienced.

3.1.1 Stakeholders

Even though the countries targeted by the school projects, differ in size, structure, demographics and climate the stakeholders indicated by the project partners are more or less the same. Global actors mentioned were the different UN agencies, including WHO and PAHO. On the national scene the Ministry of Health (MoH) and Ministry of Education (MoE) are important stakeholders, but they vary widely with degree of involvement and commitment. The provincial and regional directorates of health services are in general closer to the actual implementation of the projects and are therefore important actors. Furthermore, international and national Non-governmental organisations (NGOs) and diabetes associations are mentioned as stakeholders. Private actors identified are private research centres, hospitals and health clinics, pharmaceutical companies and the food industry. Lastly, schools, students, teachers, parents and communities are the most important stakeholders.

Based on the stakeholders identified, it can be inferred that the field of primary prevention is marked by a high number of stakeholders, ranging from large global organisations, to national and regional governmental bodies and private stakeholders, to school authorities, teachers, the individual student and their families and programmes must address them in one way or the other to achieve success and become sustainable.

3.1.2 Current policy environment

The High-Level meeting of the UN general assembly held on prevention and control of NCDs in September 2011, clearly marks a watershed wherein attention and action to address the major health burden posed by NCDs received widespread support from member states that made commitments to address the issue and allocate resources commensurate with their burden and ability. The political declaration from the high-level meeting creates a strong and important framework for initiatives in the fight against NCDs [39]. Nevertheless, global attention does not necessarily manifest itself into local action. There is a huge gap between the Political Declaration of the UN high-level meeting to the actual implementation of effective policies at regional and provincial administration levels.

None the less, projects included in the review all report an increased attention towards NCDs during the last few years. The steadily increasing evidence showing NCDs as being a major public health problem in developing countries is helping change the misconception

that NCDs are mainly diseases that affect elderly people from developed countries [3]. Consequently, several countries now report having a national NCD policy as project partner Dr Maina from Kenya states:

“Currently, prevention and control of NCDs is one of the priorities for most organisations in the country. Kenya is in the process of launching its new health policy framework, which has placed prevention and control of NCDs as one of its strategic objectives for the period 2011-2030” (Questionnaire H: Maina).

Nevertheless, lack of adequate and concrete action is still evident in many places. Project partner Dr Sheeladevi from India elaborates:

“The way the non-communicable diseases are increasing the initiatives taken by both the public and private sector at present is grossly inadequate in the country” (Questionnaire P: Sheeladevi).

Several project partners report that there is still a struggle between funding for communicable diseases and NCD's. The immediate consequences of many communicable diseases are more acute and visible and hence get the attention of donors, media and policymakers. Dr Vijayakumar from India confirms the battle for funding:

“The health system and the politicians focus on and prioritise communicable diseases, even now. There are no educational classes on how to prevent non-communicable diseases from the health sector so far” (Interview T: Vijayakumar).

The experience of the project partners confirms that despite the increased attention and awareness of NCDs there is still a discrepancy between talk and action as NCD prevention and care remains grossly underfunded in proportion to its burden.

3.1.3 School health policies

Despite many countries having an overarching NCD policy, with focus on prevention little attention is paid to specific policies regarding school health. Project partner Mr Rao from India confirms:

“There is no definite programme for comprehensive health promotion activities in schools” (Questionnaire N: Rao).

Nevertheless, there exist preliminary initiatives to promote school health in some countries. Partners in South Africa, Brazil, Caribbean region, and India report on a mid-day meal scheme in schools provided free or subsidised by the governments. The actual execution and objective is country specific, but most such schemes ensure a daily meal for school-attending children from economically challenged families. While targeting under nutrition and providing a meal to the underprivileged children the focus of the scheme is often to increase school attendance and provide calories, and not so much on quality of nutrition or linking it with nutrition education – a missed opportunity. Besides this policy, there are not many policies regulating nutrition in schools or if such policies exist they are not widely known. Most canteens and food vendors operating on school premises are run by private sub-contractors, which make it difficult for the schools to control what is sold.

With regards to physical activity, there is also a general lack of effective regulating policies. Physical education is on the curriculum in all countries surveyed, but only as a time slot on the timetable. The physical education classes are often unstructured, ungraded, and under-prioritised or sacrificed when teaching on other subjects falls behind the syllabus.

The most regulated area is policies concerning tobacco and alcohol. Generally, there is a ban on consumption of alcohol and tobacco in public places and restrictions with regards to purchase and consumption by minors. Laws with regard to sale of tobacco and alcohol close to school premises are generally in place but often not rigorously enforced.

In contrast to the general lack of effective national school health policies, the examination of the Indian school health projects revealed that the schools actually were overburdened with different programmes, which is also detrimental especially when these programmes are implemented without any central coordination. This will be explained in details in section 4.2.1. Lack of coordination in addition to weak enforcement of laws and policies were mentioned as barriers, which manifested the gap between speech and action.

“There are written policies in place, but these policies are not enforced or implemented”
(Questionnaire G: Halaweh).

3.1.4 Social and cultural environment

Besides the structural and political environment, the social and cultural environment has major influence on behaviour and consequently also on health promotion and primary prevention initiatives. Myths and misconceptions affect peoples' willingness to accept interventions. Furthermore, habits and norms often guide behaviour, which obstruct change [40].

All project partners reported locally prevailing myths and perceptions related to food, physical activity, and body image. The majority of the project partners included in this study reported perceptions regarding food, physical activity and body images where certain unhealthy habits were perceived to be associated with wealth and prosperity. Additionally, there were different norms for acceptable and respectable behaviour related to gender and religion in different cultural settings. The specific barriers will be explained in more detail in section 5.3, which discusses the project activities of the health promotion programmes examined as part of this review.

3.2 Initiation phase and approaches for school health programmes

Utilising schools as a focal point for primary prevention has been suggested as a very cost effective investment that both improves education and health [41]. The following sections present and discuss different modes and actions taken by the WDF supported projects to approach decision makers.

3.2.1 Obtaining permission and approaching officials and school leaders

Based on the experiences from the 15 project partners, it is evident that ensuring permission and inclusion of governmental bodies are paramount for the success of the different projects.

Of the 15 project partners included, 11 of them reported establishing contact with schools through official channels. By taking the authorities on board, access to the government schools is ensured and thereby the penetration of the project is improved. Dr Vijayakumar from India describes why they approached the local self-government (Panchayath):

“It is because they are the managers of all the government schools. They are the persons that should allow us to enter the schools. Only they can do that. So we approached the district Panchayath. The Panchayath President was completely with us and gave instruction to all the schools to cooperate with us. That was how we started. Getting the support from the district Panchayath meant that we could get entry to the schools. It ensured their cooperation” (Interview T: Vijayakumar).

But engaging the governmental bodies is a time consuming process as described by project partner Ms Nayyar from India:

“Actually, getting permission in government schools has been a challenge. It is not in the hands of the school principal and it becomes a lengthy process.” (Interview I: Nayyar)

A partner in Brazil shared this experience and it had consequences for how the project could continue as Dr Franco explains:

“We tried to contact the MoH. We tried the official channels first, but in the end we were not able to do that because of many complications and paper work to do. It was very difficult for us. So we started making contact with people who had a relation to the schools” (Interview E: Franco).

Using the approach of directly contacting the schools or getting access to the schools via personal contacts was reported by three of the project partners and has also proven to be effective. One project in India working with local patient groups uses the members of the patient’s organisation as entry point to the schools, as these members often are parents or grandparents:

“We target schools where the patients’ own children or grandchildren go. This makes it easier to get entry because either they are part of school committees or advisory boards, or they have some kind of linkage to the school through the local community” (Interview M: Rao).

Another advantage of including the local community is that it spreads knowledge regarding the project, which can get other schools interested in participating. Ms Nayyar from a project in Northern India explains:

“A few schools were quite easy for us to tap and then we would start our activities there. When gaining popularity from those schools, we took the success of the project to new

schools. And they were also happy to take on the programme in their schools” (Interview I: Nayyar).

Other projects have also experienced the advantage of good publicity as Dr Vijayakumar states:

“We had anticipated it would be difficult to target the private schools and therefore we did not target them. However, it was not difficult at all. In fact they wanted to be included” (Interview T: Vijayakumar).

As mentioned previously, partners in India reported that the large number of uncoordinated health related projects already implemented in the schools worked as a barrier to get access to the schools. The large number of programmes made school management, teachers and parents reluctant to accept another project. Project partner Mr Rao exemplifies:

“The schools are already overburdened with a multitude of programmes. There’s a national blindness programme, there’s a national leprosy programme, there’s a national anti-TB programme. There’s the nutrition programme – the mid-day meal scheme, women and child development scheme, vitamin-A deficiency scheme. Hundreds of schemes, literally. And the teachers are called upon to interpret or implement a lot of government schemes in the community. There are too many schemes and too much paper work.” (Interview M: Rao).

The schools find themselves overburdened with different kinds of health programmes every week and consequently the teacher are overloaded with the different programmes and loose interest in actively taking part in implementing the programme in their classes. In addition, if they spend time on health programmes, there is less time to prepare for exams and getting through the syllabus. Dr Praveen from the same Indian project contributes with a conversation he had with a teacher:

“One of the teachers said ‘do you want to make this a school or do you want to make this a hospital. Last week I had the psychiatrist who came and had a class for my children. The week before that the dentist came. We’re having 52 programmes. Each week we are having one doctor after the other, just dumping information. We are a little sick of that.’ So you have to take that into consideration” (Interview M: Praveen).

This issue shows that even the good intentions can be a barrier if the different initiatives are not centrally coordinated.

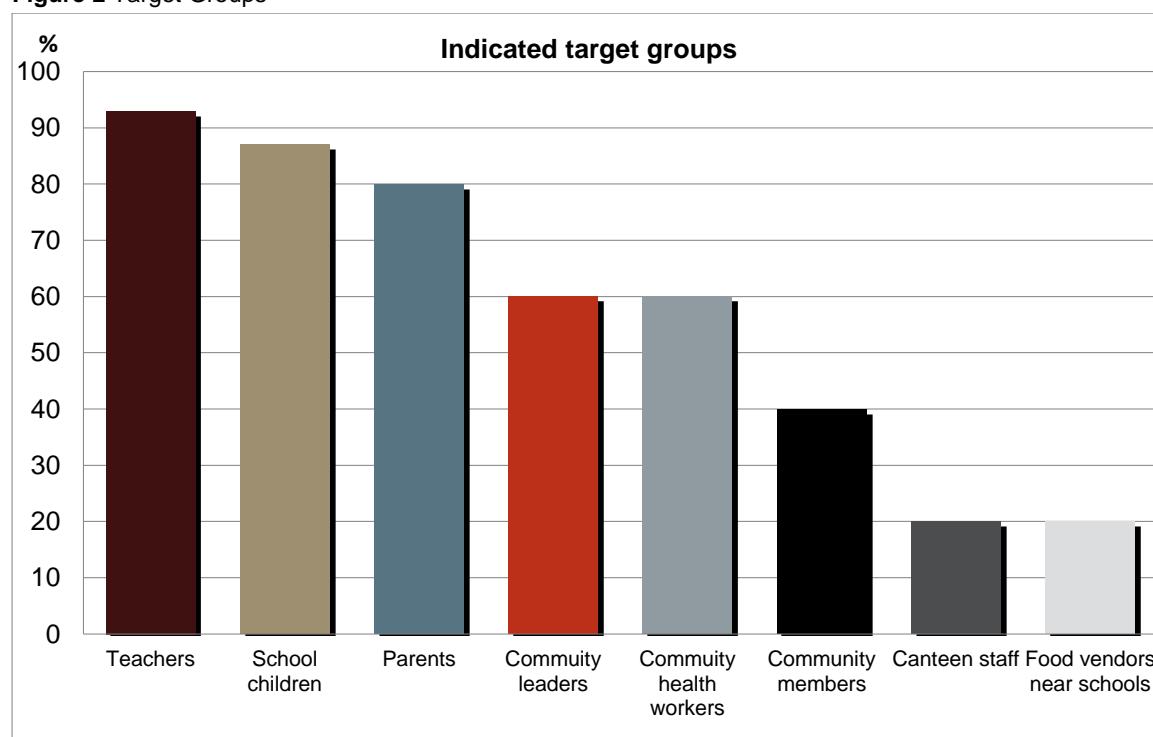
3.2.2 Target groups

In addition to targeting students, the project partners indicated several other target groups as shown in Figure 2 below. The three most predominant target groups were teachers, students, and parents. As for teachers, some projects targeted all teachers, whereas other projects focused on physical education teachers and science teachers. Several projects targeted the parents using the children as change agents, while other projects invited parents to screening camps or cooking competitions. The importance of including the parents are emphasised by project partner Ms Nayyar from India:

“The mothers are taking care of the health of the family. So if the mother is sensitised the whole family is sensitised.” (Interview I: Nayyar).

Furthermore, community leaders and community health workers were also identified as frequently targeted groups. They were reached through general awareness campaigns and through targeted advocacy interventions. The present review reveals that staff from school canteen and food vendors in the surrounding school environment are a grossly under prioritised target group as only three partners indicated targeting these groups. This is unfortunate as these groups are important for promoting healthy food in schools.

Figure 2 Target Groups



Several target groups have to be included and fully on board when implementing a health promotion programme in schools. Despite children spending a large part of their day in school, they also have to have a supportive environment at home and in the community in order to be able to make healthy choices, adapt and change behaviour successfully. Strategies for reaching these target groups have to be developed at the beginning of the programme.

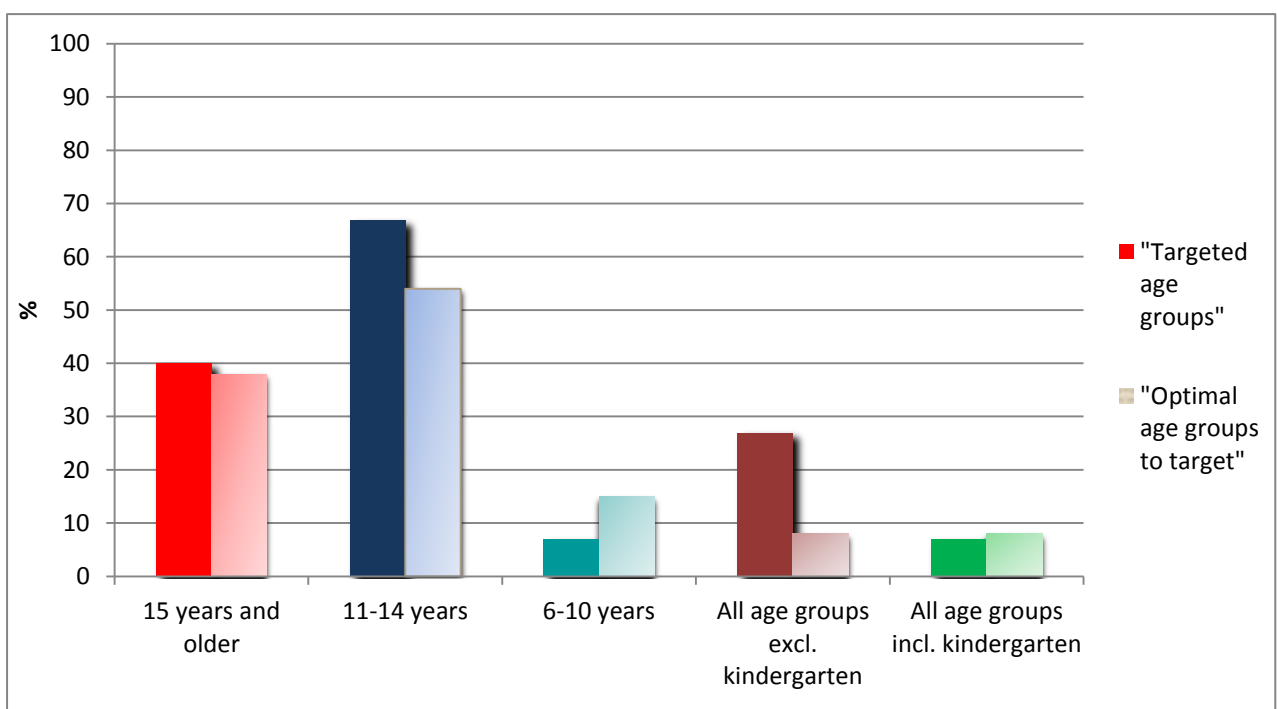
The main target group for school health programmes are the students. Both students and project partners appreciate the importance of targeting students as exemplified by the following two statements:

“The students of today are going to be the leaders of tomorrow in all walks of life” (Interview T: Vijayakumar)

“What use will I have of my studies if I fall ill?” (Focus group 9: Student).

All the projects included in the review have targeted the students directly, except from one where the students were targeted indirectly through the teachers. The projects have targeted students at various ages and some projects have targeted several age groups with their programme. Figure 3 shows that 67% (n=10) projects targeted the age-group 11-14 years, 40% (n=6) of the projects targeted the age group from 15 years and above, while 7% (n=1) of the projects targeted the age group from 6-10 years. Twenty-eight percent of the projects (n=4) indicated targeting all age groups excluding kindergarten and 28% (n=4) targeted all age groups including kindergarten.

Figure 3 Targeted Age Groups



The project partners present several reasons for targeting specific age groups. Mr Yates from Marshall Islands explains why they have targeted the younger age groups:

“When the children get to high school they are pretty well set in their ways and they pretty much know it all by hand, so we wanted to pick a teachable age and our primary goal is kindergarten through 4th grade” (Interview V: Yates).

Mr Rao explains why they targeted students in rural areas from the age of 11:

“We look at the age group between 11 and 18. There is a reason for this – a lot of children drop out at about the age of 14, in the rural areas” (Interview M: Rao).

Lastly, Ms Nayyar from urban India explains why they targeted the age groups from 11 to 16 years (grade 5th to 10th):

“After 10th grade the students become too focused on exams” (Interview I: Nayyar).

Besides examining the actual target age chosen by the projects, the project partners were furthermore asked, based on their current experience with project implementation, to identify the optimal age to target the children. The responses are shown in Figure 3. The majority of the partners (54%) indicated that the optimal target group was the age group from 11-14 years old, which corresponds to the group being the most frequently targeted age group. Seven partners specifically identified the age group between 10 and 12 years old as being optimal, which is explained by Dr Franco from Brazil:

“The optimal age is from 10 to 12 years, where acceptance and the interest are more evident” (Questionnaire F: Franco).

Evidently, the younger age groups are the preferred target group as they are more susceptible and open to behaviour change, as they have not developed firm habits yet. Mrs Bocage from the Caribbean also confirms this:

“Of the age groups selected (adolescents) in the project the younger range was most agreeable and amenable to change. Based on this experience and the literature it would have been best to target even younger children, possibly Grades 4-6 [9 to 12 years]” (Questionnaire B: Bocage).

3.3 Project Activities

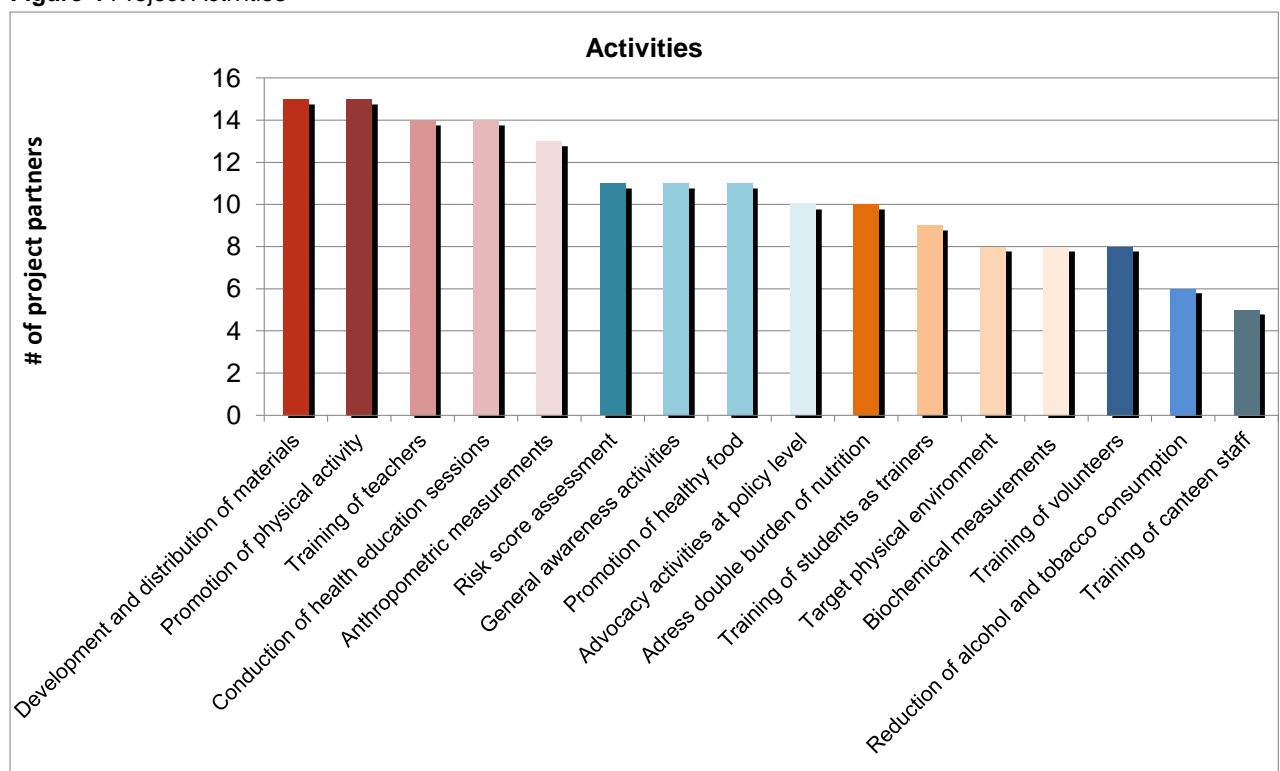
The core part of a school health programme is the specific activities included for the selected target groups. The following sections will examine and discuss the various project activities conducted by the projects and highlight which aspects to take into consideration when implementing the activities.

The project partners were asked to list the three main activities they had conducted without being helped by a predefined list of activities. This would serve as an indication of the activities they found to be most important. Ten project partners mentioned health education classes as one of the three main activities and seven project partners mentioned training of teachers as a main component of their project. This indicates that these activities are considered by many project partners to be essential for implementing a school health programme. Furthermore, physical activities such as sports tournaments and exercise classes were mentioned by five project partner and four partners mentioned health camps where teachers were screened for different risk factors as main activities in their projects. Three partners mentioned development of materials and school curricula and only two partners mentioned promotion of healthy food as a main activity.

Subsequently, the partners were provided a list of different activities and were asked to tick off which activities had been conducted. This was done in order to compare the activities mentioned by the partners themselves with what they answered to a predefined list. Please

consult Figure 4 for the different activities. All 15 partners had developed and distributed materials to the students and promoted physical activity. However, even though all partners mentioned distribution of materials it was not seen as one of the most important activities as inferred from the responses stated above. Nevertheless, it may signal that developing and distributing materials would be part and parcel of any school health programme. The high priority of conducting health education classes and training of teachers is also reflected on the pre-defined list as 14 projects reported this as one of their activities. Thirteen projects ticked anthropometric measurements as one of their activities in the pre-defined list, whereas only two projects mentioned this as a main activity. It is interesting to see that all the projects in some way promoted physical activity and that five partners indicated that this was one of three main activities. In contrast, 11 project partners promoted healthy food, but only two partners listed this as one of their main activities. It can be inferred that physical activity is given more attention in the school projects than promotion of healthy food and might also reflect the difficulties related to promoting healthy food options in the school canteens and changing food habits for the school children in general. This argument is furthermore supported as only five projects had training of school canteen staff as one of their activities. However, 10 projects also addressed the double burden of disease emphasising both under and over-nutrition and hereby shedding attention to the importance of healthy, balanced food.

Figure 4 Project Activities



3.3.1 Training of educators

One of the first activities for the school health projects under review is to train educators responsible for implementing and conducting the different activities. The projects have conducted this training in different ways and selected various groups responsible for the

implementation of activities. The projects have used teachers, selected student peers, volunteers, parents, health care staff, and project staff as educators.

All project partners trained teachers to implement some of the project activities. These trainings ranged from a session of 1.5 hours to a three days training camp. Some projects invited all teachers, whereas other projects focused on physical education teachers, teachers involved with health clubs, and life orientation teachers. Two projects reported conducting refresher trainings. The training of the teachers included amongst other the following themes; knowledge on healthy living, cooking classes, nutrition education training, physical activity training, detection of diabetes, prevention and managements of diabetes and other NCDs. Seemingly the teachers interviewed found the amount of training adequate to take on the project and educate the students, as reported by a teacher from DBGJ Government Boys School in India:

“Now we feel that we are able to educate the students on diabetes and healthy living and we were not able to do this before the training session” (Focus group 1: Teacher).

Some projects trained the students to be educators. These projects made use of students, which were members of the schools health club. Project partner Ms Nayyar from India explains their approach:

“In the schools, 2 children from each section were made in charge of health, and one student was made health monitor. In this way, we formulated an entire health club with student and teacher volunteers. The teacher and student volunteers were sensitised on healthy living and were trained to undertake health promotion activities among school children” (Questionnaire J: Nayyar).

By choosing this approach the project partner succeeded in actively engaging the students in the projects while at the same time increasing the students' sense of ownership, as Ms Nayyar states:

“So we give responsibility to one. It makes it easier, not only for us, but for the teachers as well. The students feel closely associated. They say ‘Yes, we are a part of the project” (Interview I: Nayyar).

Another Indian project trained students about risk factors and risk management for the students to be change agents in their own families. Project partner Dr Sheeladevi explains the training of the change agents:

“3 days training was given and one follow up after a year. The content included the digestive system, what is diabetes, how it affects the individuals, its risk factors, complications, how to identify the risk group. How to modify the risk factors etc.” (Questionnaire P: Sheeladevi).

The training sessions for students ranged from a half-day workshop to 3 days training camps. The training sessions focused broadly on healthy lifestyle. Some training sessions

also taught the students to calculate body mass index (BMI) and to do anthropometric measurements. A project in India expanded the training sessions teaching the students to do urine glucose test. This served the purpose of actively involving the students, screening the local population, and creating awareness through the discussions, which arose from the activity.

3.3.2 Health education sessions

One of the core activities implemented by the school projects is health education sessions. This activity was conducted by 14 of the projects. For many of the projects the health education session forms the basis on which the other activities are build. The health education sessions for many are seen as a prerequisite for other activities, as this is where the students get the knowledge and understanding of the importance of behavioural change. The sessions vary with respect to duration, frequency and content. The duration and frequency ranges from a 40 minutes session, to a one-day session, to a ten-week programme and to a programme with 48 planned sessions distributed over three years. The content of the sessions regarded causes, prevention, and consequences of NCDs. Please see Table 2 for an extensive list.

Table 2 Content of health education sessions

Key messages of health education classes	
Minimising risk factors	Causes, prevention, remediation, and management of NCDs,
Healthy eating, healthy living and smart living	Rising prevalence of NCDs
Adaption of healthy lifestyle behaviours	Link between lifestyle and NCDs
Importance of healthy lifestyle for academic studies and future life	NCD related complications
Lifestyle-related diseases	Identification of risk factors and high risk individuals
Prevention is possible through lifestyle changes	Healthy lifestyle begins in childhood
Identification of healthy vs. unhealthy food	Focus on a balanced and varied diet
Importance of regular food intake	Eat breakfast everyday
Bring healthy lunch boxes to school	Balance energy intake with energy usage,
Physical activity improves health	Adverse effects of a sedentary lifestyle,
Importance of daily physical activity	Types and intensity of different kinds of physical activity
Reduce mental stress	Avoid tobacco and alcohol

Several project partners stress the importance of actively engaging the students, so that the health education sessions are not merely sessions where the students passively receive health related messages, but instead sessions where the students actively participate. Thus, students were encouraged to take part in debates where they may be required to search and collate information and contribute with their own experience, and it also opened up for clarifying doubts. Project partner Mr Sibeko from South Africa explains:

“We used an active participatory approach, meaning everyone was a teacher and educator in the sessions, just to keep maximum participation” (Questionnaire R: Sibeko).

To support the messages conveyed in the health education sessions all project partners developed and distributed culturally appropriate materials. Several projects developed a pamphlet, which was written in the local language and using locally available food choices and physical activities. The purpose was for the students to bring the pamphlets home and in this way also reach the rest of the family. Some projects invited students and teachers to participate in the development of the materials as a way to engage the students and teachers in the project. A few projects developed and tested the material and only allowed the use of the developed material. This may improve quality and accuracy of messages but may lose out on building ownership.

“The materials were prepared while the workshops for the teachers were going on. Thus it became a group effort. The content focused on the local realities, like language, food available and the lifestyle of the people.” (Questionnaire P: Sheeladevi).

After conducting health education classes, most project partners implemented other activities to support the messages given in the classes.

3.3.3 Promotion of healthy food

One of the most sensitive and culturally dependent aspect of lifestyle is nutrition [42]. Many developing countries experience a westernisation of their food culture, or a nutrition transition where traditional and locally produced food is replaced with western junk food [43, 44]. Also acculturation and urbanisation is transforming local foods and eating behaviour particularly the widespread availability of processed and packaged local snack foods. Therefore food habits are one of the major challenges for health promotion and primary prevention projects in schools.

Promotion of healthy food was an activity which 11 project partners conducted, however only two partners listed it as one of their main activities, which reflects the difficulties related to food habits. The project partners used different approaches to promote healthy food and to change food habits and this section presents some of them. Additionally, the section contains a discussion of some of the challenges experienced by the partners while promoting healthy food.

The two projects from South Africa implemented food gardens in the school compounds. The idea was to help the canteen staff to provide fresh healthy food as well as actively engaging the students in gardening. A project in India banned junk food in the schools, so the school canteen redefined the food available. Furthermore, the parents were invited to a cooking competition with healthy recipes to emphasise the importance of a healthy school lunch. Selected student peers were appointed to monitor the students' packed lunch to ensure no junk food was brought. One project introduced a 10 minutes fruit break in the schools, ensuring that the students have time to eat fruits. Project partner Mr Rao explains how they approached the sensitive issue of food habits in their context:

“We are trying to put in some locally relevant or easy take-home messages like ‘One non-green vegetable and one green vegetable a day’. And when we want to give the message of 150 grams of vegetables per day, we say ‘a portion with the size of your fist’. It is something that can stay with the children and teachers (...). We try to see if there are locally available food items. And we talk about some times (occasional) food and every time (daily) foods. For example if there is a school programme where some local politician is sponsoring and serving sweets, how are you going to tell a group of malnourished children not to eat it? So instead we talk about the sometime and the every time food.” (Interview M: Rao).

Several project partners emphasise the need of approaching food habits cautiously as they are operating in areas where the economic status is not high. The food choices are guided by costs and in many countries fruits and vegetables are very costly, hence restricting economically challenged families from consuming it.

“Healthy food is more costly and a big problem in our economically backward district” (Focus group 1: teacher).

It is therefore difficult to implement healthy food in the canteens, as the children will not have the money to buy it. The principal from a private school in Delhi further elaborates this issue:

“Changing food in the canteen is very difficult because it is privately owned. He [canteen staff] says ‘I cannot sell healthy food for 10 rupees, because now vegetables and brown bread is so costly’. So he finds it very difficult” (Focus group 6: teacher).

The problem is that the food consumed is not healthy or balanced as project partner Dr Sheeladevi explains:

“In rural India, families with low socioeconomic status mainly eat rice and something to mix with the rice. It is not actually balanced or healthy” (Interview O: Sheeladevi).

This is also a known challenge in Brazil as project partner Dr Franco confirms, *“They don’t have enough money to buy healthy food. It is easier to buy rice and beans instead of fruits and vegetables” (Interview E: Franco).*

The project partners also stress that food choices are a question of availability. Pre-packaged junk food is readily available in the school canteens or from the street vendors outside the schools. The children like it, and furthermore pre-packaged food is perceived to be safer to eat as stated by project partner Dr Ogillo from Tanzania:

“Buying processed foods is considered safe and developed, compared to consumption of local fresh food items” (Questionnaire K: Ogillo).

Furthermore, the pre-packaged food has long shelf life, which makes it ideal for the canteens. The barriers to selling fresh healthy food are summed up by project partner Ms Nayyar from India:

“What came up as a major barrier is the shelf-life of healthy foods. Children are not very into buying fruits, so before it is sold it gets spoiled. The school canteens want to make profits as well and they were not able to get that on the healthy foods (Interview I: Nayyar).

Media and commercials also heavily influence the food choices and the food choices promoted are not necessarily healthy as Dr Vijayakumar affirms:

“Children are always attracted by advertisements and they prefer junk food popularised by film stars through advertisements,” (Questionnaire U: Vijayakumar).

“In the TV advertisements all what is promoted as healthy things is usually unhealthy” (Interview T: Vijayakumar).

A teacher from St. Paul’s school in Delhi supports this statement and confirms:

“There are some food brands that nobody knows is unhealthy, because on the package it says ‘healthy snack’” (Focus group 6: teacher).

Based on the experience of the 15 project partners different strategies can be applied to promote healthy food. Several barriers, such as price, availability, shelf life and advertisement exists and are contributing factors to unhealthy food habits in many countries.

3.3.4 Promotion of physical activity

The behaviour related to physical activity has changed dramatically throughout the developing world during recent years. Alongside urbanisation and mechanisation everyday life has become more sedentary [2]. With development there is less need to be physically active and being able to deselect hard work is seen as a sign of wealth. Project partner Dr Maina from Kenya elaborates:

“Use of motorised transport is taken as a sign of affluence and urbanization, and walking to work is taken as a poor man’s option” (Questionnaire H: Maina).

Therefore increased attention has to be paid on how to promote physical activity. This section presents some of the activities project partners have initiated in order to address this. Promotion of physical activity was one of the only activities that each project emphasised. As mentioned, most countries have physical education on the school curriculum, however project partner Mr Rao from India points at an important issue:

“The physical time is mostly unstructured and children are usually sent to a playground and let to play. Many children just use the time to sit around or relax” (Questionnaire N: Rao).

Additionally, the physical education classes have low priority resulting in other teachers using these time slots for other classes as is evident in the two following quotes:

“You see that physical education will be cut for physics or chemistry classes” (Interview T: Vijayakumar).

“There is one lecture per week dedicated for physical activities and sports, but usually schools tend to cancel this lecture and to use it's time for other lectures like science and math” (Questionnaire G: Halaweh)

These statements verify the low status and lack of emphasis put on physical activity in many schools in the project areas. One of the reasons why physical education has low priority is the predominant focus on academic achievement. This leaves little or no time for the students to play and be active.

“Students don't have much time to spend on physical activity. Academics are prioritised more. The parents tell the students to study, study, study!” (Focus group 2: teacher).

“The playground is usually abandoned. Nobody goes there and the children don't have the time. After the end of the class they will be rushing home to study. They will have tuition class both in the morning before (school) class and also in the evening after (school) class” (Interview T: Vijayakumar).

“Academically oriented teachers are a problem for physical activity. They have very little focus on physical activity” (Interview A: Bocage).

A general tendency that further obstructs physical activity is lack of suitable physical facilities in the schools. Several project partners mention unsafe roads, lack of parks and fear of crime as barriers for physical activity. Therefore eight of the project partners directly targeted the physical environment to promote physical activity. Some project partners adapted the planned activities to the facilities available. Other assessed the facilities together with school management and suggested improvements. Projects in South Africa and the Caribbean region provided the schools with equipment to promote physical activity.

The review of the 15 projects affirms that promotion of physical activity is of high priority and that it can be approached in multiple ways.

3.3.5 Health camps

Several project partners arranged so-called health camps. At these ventures teachers, students and sometimes parents would get a free health check. For students several projects collected anthropometric measurements, such as waist circumference, height and weight and used these both for educational purposes as well as for baseline data. Some projects engaged the students in these measurements and taught them how to conduct the measurements and furthermore taught them the different cut off points to be able to identify people at risk. Health camps for teachers are used as an incentive for the teachers to actively engage in the project. The message of the teachers own health status seemingly is a strong motivator and an effective way to emphasise the importance of lifestyle change in relation to NCDs. Receiving information regarding their own status, makes the risk of NCDs more tangible and present in the perception of the teachers.

“At the health camps we measured several things regarding body composition. Teachers who were interested gave blood samples and we did blood glucose and lipid profile. Based on these results, one week later, the teachers were counselled according to their results. A lot of things were discussed in the counselling and the teachers disseminated the information on to the students. Because the health check was free of charge almost all the teachers participated.” (Interview I: Nayyar).

Hence, the health camps had multiple purposes as it functioned as a pedagogical tool for increased participation, as a sort of honorarium for the teachers involved in the project and for scientific purposes as baseline data.

3.3.6 Other activities

Besides the above-mentioned activities, which most of the projects conducted, other inventive activities were implemented as well. This section presents some of these activities. A project partner in India introduced the concept of *Living with diabetes* in the schools. Based on their cooperation with local patient groups and the students' families they invited diabetes patients to come to the school and tell about their life with diabetes. This activity managed to relate the message of the need of preventive measures to the everyday life of the students.

Several projects used students as change agents for their own families. The students were taught how to identify risk factors by measuring BMI and sugar levels in the urine. Several partners report that when the students have the knowledge of risk factors and how to modify them, they will actively try to influence their family members. Mr Yates from Marshall Islands explains:

“The children will put pressure on their parents because they care about them and they don't want to see them ill. Once they have the knowledge children have a lot of power to help change behaviour of their parents” (Interview V: Yates).

This approach was supported by one of the teachers in an Indian project:

“The children go home and teach their parents and grandparents. The parents listen to what the students say. The change will be lifelong” (Focus group 2: Teacher).

Several different activities have been implemented in order to ensure active participation of the students. Amongst other role-plays, poster-making competitions, and quizzes should be mentioned. Both partners in India and in the Caribbean region confirmed the positive effect of introducing a slightly competitive element in the activities as a way of increasing the interest and engagement of the students.

3.4 Summary of findings

This section serves the purpose of summing up the main findings after reviewing the selected projects. Despite the increased attention and awareness of NCDs by many stakeholders, the project partners report that there is still a discrepancy between the

proportion of the NCD burden and adequate action. For example, there are not many policies regulating nutrition in schools besides the mid-day meal scheme in India.

Unfortunately, this meal scheme is not linked to education on healthy nutrition. Furthermore, most canteens and food vendors operating on school premises are run by private sub-contractors, which make it difficult for the schools to control what is sold. There is a general lack of effective regulating policies related to physical activity. Physical education is on the curriculum in all countries surveyed, but only as a time slot on the timetable. The physical education classes are often unstructured, ungraded and under-prioritised. The most regulated area is policies concerning tobacco and alcohol. Laws with regard to restriction of sale of tobacco and alcohol to minors and close to school premises are generally in place but often not enforced. Cultural barriers for effective project implementation are furthermore eminent as all project partners reported locally prevailing myths and cultural perceptions.

The majority of the project partners included in this study reported perceptions regarding food, physical activity and body images where certain unhealthy habits were perceived to be associated with wealth and prosperity.

Various stakeholders at different levels have been included as target groups by the project partners such as local, regional or national politicians; large global organisations; governmental bodies; NGOs and the individual students and teachers in the schools. When embarking on a school intervention project it is reported by several partners that ensuring permission and inclusion of governmental bodies are paramount factors for a successful start-up.

The three most predominant target groups were students between 11-14 years old, teachers and parents. Furthermore, community leaders and community health workers were also identified as frequently targeted groups. However, the review reveals that staff from school canteen and food vendors in the surrounding school environment are a grossly under-prioritised target group as only three partners indicated targeting these groups. Physical activity is given more attention in the school projects than promotion of healthy food, which might reflect the difficulties, related to promoting healthy food options in the school canteens and changing food habits for the school children in general. Promotion of healthy food was an activity, which 11 of the project partners had conducted, however only two partners listed it as one of their main activities, which also reflects the perception of difficulties related to food habits.

For many of the projects the health education session forms the basis upon which the other activities are built. Active participation in the health education sessions are seen as a prerequisite for other activities, as this is where the students get the fundamental understanding of behavioural change. All projects had some form of training component where teachers were trained to implement some of the project activities. Furthermore, some projects have trained selected student peers, volunteers, parents, health care staff and project staff to function as health educators. Promotion of physical activity was one of the only activities that each project emphasised. The physical education classes have in general a low priority resulting in other teachers using these time slots for other classes. One of the

reasons why physical education has low priority is the predominant focus on academic achievement. Several project partners also mention unsafe roads, lack of parks and fear of crime as barriers for physical activity. As a result, many of the project partners directly targeted the physical environment to promote physical activity. Several projects collected anthropometric measurements, such as waist circumference, height and weight and used these both for educational purposes as well as for baseline data for the students. Some projects engaged the students in these measurements and taught them how to conduct the measurements and the different cut off points to be able to identify people at risk. Some projects conducted health camps for teachers in order to involve the teachers more actively in the project. The message of the teachers own health status is seemingly a strong motivator and an effective way to emphasise the importance of lifestyle change in relation to NCDs. Receiving information regarding their own status, makes the risk of NCDs more tangible for the teachers.

4. Discussion of findings

4.1 Creating awareness and influencing decision-making

Awareness campaigns and advocacy are two distinct issues to focus on when designing and implementing a school health programme. In short, awareness activities include creating knowledge about NCDs and preventive measures among the general public or a defined target group such as a community, a district, a school or parents of the school children.

Hence, awareness activities aim at increasing the reach of the project activities by spreading it out to a larger target group. Advocacy activities include sensitising decision makers about an issue in order to influence their position on the matter. Successful advocacy activities can lead to policy changes, which improve the health of the citizens. However, oftentimes the two concepts are used interchangeably. This indicates that the concepts and related activities are misunderstood or maybe have different meanings in a local setting.

Nevertheless, creating awareness can be a means of influencing decision makers. Projects targeting children's health can be used to create awareness as initiatives on this issue help create attention. This section presents examples of the awareness and advocacy activities conducted by the different projects along with a discussion of the outcomes of these efforts. Many of the school health projects included in this review have conducted awareness activities for the surrounding communities targeting the general public. These activities include arranging public speeches, diabetes walks, media campaigns, and awareness classes. The aim is to increase the knowledge of NCDs, related risk factors, and how they can be prevented. Several of the project partners have used media to create attention and increased awareness in their communities. A project in South India has managed to create extensive media coverage of their project activities in addition to posting articles in local newspapers. A project in Brazil also managed to create a momentum of awareness of the problem of increasing childhood obesity, which can serve as a motivator for future health promoting interventions. While many projects have conducted awareness activities only few

projects have conducted actual advocacy activities targeted at decision-makers at various political levels. Mr Rao explains how they tried to affect policy makers to change the composition of the midday-meal so it would be healthy and balanced.

“We are trying to intervene at the policy level to make sure that mid-day meal at least is well-balanced” (Interview M: Rao).

Mr Halaweh explained how they contacted several stakeholders to gain support and involvement of decision and opinion makers:

“We contacted officials for their support. Furthermore, we involved both religious and political leaders, and parents’ unions” (Questionnaire G: Halaweh).

The shortage of organised advocacy activities can probably be ascribed to the fact that it demands very coordinated efforts to do effective advocacy towards the decision makers. Before embarking on advocacy activities it is necessary that the line of argumentation is well thought through and that a clear and concrete plan for the issues to be targeted is outlined. Effective advocacy at political levels cannot be done half-heartedly. Thus, unfortunately many projects have chosen not to go down this road from the beginning. Some projects have however found it possible at a later stage in the project period to use the momentum created in the target area to embark on advocacy activities towards the local politicians. Project partner Dr Vijayakumar and his colleagues were asked by the government to develop and implement a community based health care promotion pilot as a template for further expansion, due to the success of their school health project. Furthermore, project partner Mrs Bocage has used the data collected during the project to emphasise the need for continuous intervention with the children.

A possible reason for why advocating for primary prevention towards decision makers can be difficult is that the results are difficult to measure as the outcomes only are detectable years from now. The primary concern of the decision makers is to be re-elected and thus they need to be able to show results and resolutions. Therefore they are more attracted to policies showing immediate effects. Hence, the long-term effect such as possible reduction in NCDs by 2025 is possibly not a sure way to get re-elected. In this respect it is paramount to document and showcase the initiative, involve several stakeholders, and build awareness – the positive momentum generated is best way build advocacy as politicians often want to climb the wagon of potential success. The experiences from the included programmes show that projects that have built awareness, involved several stakeholders and attracted media attention have been able to advocate for their cause. It is only through engagement and investing in advocacy activities that the effects and sustainability of the school health projects are likely to improve. However advocacy alone does not work, it needs a solid platform of successful project implementation.

4.2 Addressing stakeholders

As mentioned multiple stakeholders are relevant in the field of health promotion in school settings. It can be difficult in the initiation phase of a project to know which stakeholders to

include in the planning and implementation of a project. However based on the broad experiences from the project partners included in this report one could emphasise the importance of including several stakeholders if not all initially, but certainly on an incremental basis as the project activities unfold. It is evident that political support from national and regional level is an advantage when it comes to publicity and political goodwill. However, national governments are distant from the actual implementation sites. Provincial and regional policy makers are in general closer to the implementation of the projects and therefore ensuring support at this organisational level is important for the successful implementation of the project. Policymakers at this level are probably easier to target with advocacy activities, as they are likely to feel more associated with a project concerning their own children and communities. Furthermore, by including stakeholders from several organisational levels valuable input and advice can be included from the beginning of a project thereby ensuring a more efficient programme [45, 46]. By having policymakers and politicians onboard the penetration of a programme can be improved. If policies were in place to ensure the commitment of school leaders to implement programmes many of the obstacles concerning access to schools experienced by the project partners included in this report would be overcome. Getting the appropriate permissions are important but also a time consuming process, and ways to approach officials applicable in one setting may not necessarily be applicable in other settings. However, ensuring the support and engagement from both public and private decision makers should not be neglected as it also serves as an important factor for increased sustainability [47]. Nevertheless one should not be tempted to believe that the existence of certain laws is the same as enforcement of these laws. As it is not possible for the implementing parties of a school health project to enforce laws, the real life experiences from the project implementation serve the purpose of showing lacunae in policy implementation and provide a platform for advocacy. By continuously advocating for increased political commitment and action project partners can potentially play a significant role in combating NCDs.

Another important point should be made in relation to including multiple stakeholders in the planning and implementation of a school health programme. Different stakeholders have different interests and function at different levels. By including policy makers the goal is to form policies, which facilitate and promote healthy lifestyles. By including teachers, school canteen staff and school management the aim is to ensure a health-promoting environment in the schools and also to ensure the sustainability of the project. By involving both students and teachers the hope is to create a sense of ownership and thereby improving the internalisation of the project activities. Thus each stakeholder at different level undertakes distinct tasks in the planning and implementation phases and they are therefore paramount for the success of a project. The effect of including multiple stakeholders is supported in the literature. A review performed by Franks et al., 2007, also emphasise inclusion of multiple stakeholders as an important factor related to the potential success of a school health programme [47].

Another reason for including several stakeholders in these processes is that the inclusion can reveal locally existing myths and barriers for successfully implementing the project. The stakeholders at community level have the highest level of insight in habits and possible misconceptions existing in their specific context. This type of knowledge is crucial to be able

to address these barriers. All project partners included in this report mentioned several prevailing myths and customs detrimental to health. Attempts to change such beliefs and misconceptions should be done in a considerate and culturally acceptable way, thereby emphasising the importance of including several stakeholders in the planning phase. It is paramount for the internalisation of a project that culturally sensitive issues are taken into account in order to avoid forcing behaviour upon a target group that do not understand and accept the proposed methods and underlying assumptions. Consequently, ensuring commitment from all target groups is necessary if the projects should have a reasonable chance of leading to permanent lifestyle changes to reduce the risk of diabetes and other NCDs in the population.

4.3 Health promotion and primary prevention

The purpose of introducing health promotion and primary prevention interventions in school settings is to avoid the onset of these illnesses later in life. The aim is to intervene before pathologic processes start by actively targeting established risk factors. The literature describes different strategies for primary prevention: health promotion, controlling environmental hazards, and reducing susceptibility to disease [48]. Health promotion promotes healthy behaviour through means of advice, persuasion or threats. Ensuring a safe and healthful indoor and outdoor environment can control the environmental hazards. Furthermore, by introducing structural changes in the environment these can serve to promote healthy behaviour. Lastly, reducing susceptibility can be done through improving nutritional status or immunisations (such as HPV¹ vaccine) [48]. These three basic strategies are combined in different ways and utilised to a varying degree by the project partners included in this report. The following section will discuss the different strategies employed. First a general discussion of the overall approach, including targeting different types of schools in different areas and the selected target groups is presented. This section is followed by a discussion of the specific approaches and activities chosen by the project partners. Lastly a discussion of lessons learned closes this section.

4.3.1 Target groups

The projects included in this review have all to some extent targeted public government funded schools, whilst half of the projects have also included / targeted private schools. By targeting government schools children with lower socioeconomic status are likely to benefit from the project, but this also means that the schools have less resources to implement activities. This can imply that other problems are of higher priority and are more present in the minds of the target groups and sustainability requires greater effort and advocacy. Therefore it is important that the proposed project is relevant also in the perceptions of the target groups. One way to ensure the relevance is to keep a broad approach to primary prevention, which permits interventions that are relevant in relation to multiple adverse health outcomes. For example in a community where the prevalence of diabetes is not very

¹ Human papilloma virus

high, it would not be relevant to implement a school health programme with its entry point in diabetes. Instead, if the project targets health behaviour in general and focus on academic achievements, which also are improved by having healthy food habits and being physically active, the relevance of the project for both students and teachers is increased.

The projects in this report target schools in urban, semi-urban and rural areas. It is important to keep in mind that the needs and preferences of target groups in these areas may vary largely both in terms of perceptions but also in terms of structural context. Consequently it is necessary to tailor the project to the specific context in which it is being implemented. Thus, it can be inferred that the same project needs to develop several different approaches and strategies if they plan to target schools in different geographical areas.

The review of the 15 project partners included in this report showed that the predominant part of them targeted the younger age groups, especially the age group from 10 to 12 years old. According to several project partners this is the ideal age group to target, as the students are old enough to understand the messages conveyed and also that this younger age group have not yet developed firm and rigid health behaviour. Little research has been done with regards to establishing the optimal age group to target with a school health programme. However the review of Kriemler et al., 2011 investigated which age groups were optimal for projects promoting physical activity. The authors were not able to draw a clear conclusion as some studies found best results when targeting adolescents while other studies did not support this [34]. Nevertheless, one should bear in mind that no matter which age group is chosen for the project activities the specific activities need to be adapted to match the target group.

Besides targeting teachers and students, some of the projects have also tried to include parents. The parents have been targeted through parent-teacher meetings, through cooking competitions or health camps where parent were offered a free health check-up including blood glucose testing and measurement of blood pressure. It is important for the overall impact of a school health programme to also have the parents on-board. If the parents become aware of the benefits of healthy food and physical activity and the possible risks related to the opposite they will further encourage their children to live healthy or reduce the pressure on academic activities at the cost of outdoor physical activity or sports. Furthermore, the parents decide what the students eat both during school hours and in the spare time and if the parents do not agree to suggested changes in food during school hours the school health programme will be of no effect. It is therefore vital to include the parents as a target group and actively involve them in some of the activities in order for them to understand the relevance and necessity of the project activities.

4.3.2 Training courses

Hereafter follows a discussion of the different approaches relating to the specific activities. As mentioned the projects included in this report have chosen different strategies for training the trainers. As it is not within the scope of this report to quantitatively or qualitatively assess the best approach to training the report will not attempt to conclude which cadre of trainees are to be selected or whether 2 hours, a whole day or several days training is preferable. However, whether a project chooses to train project staff, teachers, selected teachers,

volunteers or selected students as trainers it is important to include practical training sessions for all target groups involved in order to ensure that the knowledge transferred is actually absorbed by the trainees. Knowledge absorption is important if the trainees are to sincerely transfer their newly acquired knowledge to the students and the community at large. If the training of trainers is only theoretical or conducted in a rushed or superficial manner the training of trainers approach is of little use. It is therefore important to include a practical element to the training of trainers if such an approach is taken.

4.3.3 Health promotion activities in schools

When addressing the health education classes many things should be taken into account, as it is the main component of the intervention in most projects. The projects have chosen different target groups to be responsible for the health education classes. In some instances project staff has been responsible and in other instances teachers and selected students have been responsible. By choosing project staff to conduct the classes one can be sure that the information given is correct and that questions raised are answered correctly, as the project staff presumably have a thorough knowledge of the topics. Furthermore, when bringing somebody from outside, the message may be received as being more important by the student, as they experience that somebody finds the issue important enough to come to their school to conduct the class. Project staff may be perceived as having more prestige and thereby the messages they convey may be taken more seriously. However, on the other hand using teachers to convey the messages, the internalisation of the message may be better as the students can more easily relate to the messenger, and the teachers can also present the materials in an understandable way matching the capabilities of the students.

Moreover involving teachers provides the platform for continuity over years and greater sustainability. As teachers are often burdened with many activities ensuring their commitment not only requires special effort and engagement but requires that the contents are simple, concept easily explainable and process not too time consuming. Nevertheless, using either project staff or teachers to conduct the health education sessions, the most important thing is that the content of the classes are tailored according to the specific context and the age group of the students.

Complimentary to arranging health education classes most projects have arranged specific activities targeting food habits and physical activity. Based on the experiences of the project partners certain aspects of the different activities will be discussed. Food habits are strongly founded in the culture and hence targeting this behaviour is a difficult task. Three difficult issues are to be discussed.

- Firstly, the children's food habits in schools are strongly related to availability. In most canteens and kiosk on school premises junk food such as chips and soft drinks were available, whereas fruits and vegetables were not. This means that project partners needs to be aware that availability of healthy food choices in schools may be very low.
- Secondly, the cost of healthy food is higher and
- Thirdly fresh healthy food has relatively short shelf life.

Project partners should keep these barriers in mind and come up with ways to overcome them. For instance, by providing locally produced healthy food the cost may be reduced. Additionally, project partners should come up with incentives for the food providers to sell healthy food, while empowering the children to choose the healthy food items so that wastage is limited and prices can be kept reasonable. Furthermore, it is relevant for the project partners to keep in mind that students are highly affected by their peers. If it is possible to get a group of students to eat healthy food, the probability that the other students will follow as well is higher. Project partner Ms Nayyar confirms the effectiveness of the above mentioned suggestions in the following quote:

“So we told the students to have healthy food, but they didn’t make any change. Then we did something about the availability and targeted the canteens. So if junk food is not available for them the students will not develop the taste for it. And if one popular student is eating healthy other students are likely to follow” (Interview I: Nayyar).

Besides using the health promotion strategy to target food habits, few project partners also used a more structural approach targeting canteens and canteen staff. It is evident that this is an under-prioritised target group and that those who tried did not succeed very well [21]. Nevertheless, if the strategy is thought through and school management is able to restrict sale of unhealthy food items, this may be an effective way to affect availability and thereby a good way to change unhealthy food habits. This concept is more likely to work in private schools where affluent parents may not mind paying extra for healthy food.

Based on the experiences of the project partners, most countries have physical activity on the school curriculum, however the time slot is often unstructured and voluntary. Hence this is an area with great potential for improvement by programmes focusing on school health. As the policy already is in place, increased advocacy and awareness has to be raised among the school management, teachers and in particular parents in order to get better utilisation of the physical education classes. One should keep in mind that suggestions of students spending more time on physical activity can be met with resistance from both school management, teachers and parents. Teachers will often use the timeslots for physical activity if they did not have enough time to complete the syllabus. Parents in many countries feel that academic achievements are more important than engaging the students in physical activities. In this relation projects can emphasise the importance of students being in good health as a prerequisite for academic success. Project partner Mr Rao supports this:

“We talk to teachers about ‘active learning’ and the concept of a child being a good learner when they are physical active. We also discuss and debate with parents and teachers about the need for physical activity and the kinds of physical activity” (Questionnaire N: Rao).

It is evident from this review that the focus on promotion of physical activity is highly prioritised with different attempts to try to make the activities culturally suitable. In India many projects included yoga, in South Africa soccer games played an important part etc. A strategy not used by any of the projects in this report, but which has played an important role in other projects are increased physical activity after school hours. By also emphasising this the total time spent on physical activity would increase noticeably [34].

In addition to changing food habits and physical activity patterns, project partners have also targeted overweight and obesity as a continuously emerging problem. In some countries there are still prevalent perceptions of slight obesity being a sign of wealth and being overweight means that you are financially well off as exemplified by project partner Dr Maina:

“People with overweight and obesity are considered to be well fed, wealthy and living well while lean people are taken to be 'stressed', poor, underfed and probably having some unexplained illness” (Questionnaire H: Maina).

Furthermore, in some African countries, being slim or lean means that the person might be HIV positive. These perceptions confirm that there are still incentives in some countries for people to be overweight. The focus on overweight and obesity seems as a paradox in developing countries, where the general perception is that such countries only have problems of under-nutrition. However, several developing countries face the challenge of double burden of nutrition, meaning that both under and over nutrition co-exist in the population. Often under nutrition is found in rural areas and in lower socioeconomic strata, whereas over nutrition is found in urban areas and in higher socioeconomic strata. It is important to investigate the distribution of both over and under nutrition in order to be able to sufficiently design interventions relevant for the target groups.

The last activity to be discussed is the health camps. Several project partners conducted health camps where foremost teachers and parents could come and have a free health check. The camps served multiple purposes. Firstly, the results could be collected and used for estimating prevalence of different parameters. Secondly, several project partners reported that the results were a powerful messenger, which underpinned the relevance and importance of the interventions as many of the teachers and parents were either in high risk of NCDs or had already developed one. Thirdly, by gathering the teachers and parents the health camp was a good setting for including them in the projects and could also be a strategy for a larger awareness programme. Evidently, it was important that the health camp was free of charge, and that it also served as an incentive for the teachers to participate in the project. For the health camps to be successful it is important that the teachers and parents are given information on how to tackle possible risk factors identified and that these individuals are referred for further treatment and guidance. Furthermore, the high-risk individuals should be encouraged to change behaviour in order to boost their self-efficacy, so they feel ensured that they are in fact able to change their own future prospects.

4.3.4 Lessons learned

This section will discuss some of the lessons learned by the project partners. Firstly, a point mentioned by most project partners is the need and importance of follow-up activities in the schools. If the intended behavioural changes should be long lasting it is paramount that the activities in the schools are followed up. A follow-up component gives the project partner the possibility to see how the activities have been implemented and to encourage continued work. Furthermore a follow up can serve important scientific purposes as it allows the project partner to assess the effect of the programme. To have well-documented and well-

functioning activities is important if the efforts to combat NCDs should continue in the most effective way.

Another important lesson conveyed by the project partners is that the intervention should be easily implemented and preferably integrated into existing activities going on in the schools. By successfully integrating the activities the project will not be seen as an extra burden for the teachers, but rather as an integral part of their daily work. One can expect to receive resistance if the teachers feel they are burdened with an extra task, which they are not paid to do. To increase the legitimacy several project partners have advocated for inclusion of the project in the school curriculum. By having it on the school curriculum the teachers cannot resist it and also the sustainability of the project is perceived to increase. Nevertheless one should remember that including the project in the school curriculum is not a guarantee of successful outcomes. If the target groups do not feel associated with the project, a top-down approach is of no use. Few project partners have tried different strategies in order to ensure that both students and teachers feel related to the project. For example one project invited parents and grandparents with established diabetes to come to the school and tell the students about their life with diabetes. Another project selected students to act like health prefects, which increased the students' sense of ownership of the project. Yet another project used empowered students to screen for risk factors in their community.

Ensuring the sense of ownership is as mentioned another important point. This can be done by delegating responsibility to the students. Increased responsibility can further serve as a motivating factor for the students to take active part. Active involvement is paramount if the students are to internalise and understand the messages conveyed. They need to be active participants in the activities rather than passive recipients. The project partners have included several activities, which focus on student participation such as debates, quizzes and role-plays. Involving an element of competition has proven to be an effective way to engage and motivate the students to participate. Lastly, the programme should boost the students' sense of self-efficacy, as this is vital for the successful and continued behavioural change.

To have committed teachers involved in the project is one of the most important criteria for success. The teachers need to implement the intervention with fidelity otherwise the desired changes may have limited effect. A suggestion on how to ensure the continued commitment of the teachers and school management is to share the information and results collected in the schools. In this way they feel included and also the effect of the intervention is made clear.

4.4 Financial estimates of costs

The projects included in this review vary greatly in terms of WDF grant size as well as the activities included and the geographical scope of the intervention. The following section seeks to make a small financial analysis of the average costs entailed with implementing a school health programme similar to the ones reviewed above. The result should be treated with care as they are ball park figures and in no way provide a representative average cost of a programme due to the limited number of projects included and the great diversity

amongst them. However, this analysis provides a pointer to the costs of reaching any given number of schools, teachers and students, which could be expected when implementing a school health programme.

The framework of the financial calculations presented below is the amount of WDF funding allocated for the school health programmes. In the case of the fully-fledged school programmes this amount would reflect the total WDF grant to the project. For the project with a school component the amount used for the calculation is the portion of the WDF grant, which is allocated specifically to implementing the school health programme. The proportion of the WDF grant is then divided by the total number of schools, teachers and students which have been reached by the completed projects or which are to be reached at project completion by the on-going projects. The total number of schools, teachers and students is found based on the interviews and the questionnaires from the project partners and verified against the milestones set in the project partnership agreements and the project completion reports.

The analysis does not take into account that some projects conduct activities in the schools for several days whereas other projects only conduct health education talks during one day. Thus, the analysis does not attempt to examine the cost-effectiveness of the different interventions.

Table 3 Average Cost for Reaching Target Groups

Average cost (USD) for reaching:	All projects	Fully fledged school projects	Projects with school component	Indian projects
One School	7.079 (n=17)	10.741 (n=8)	3.824 (n=9)	3.209 (n=5)
One Teacher	1.360 (n=17)	615 (n=8)	2.023 (n=9)	239 (n=5)
One Student	121 (n=16)	62 (n=8)	146 (n=7)	63 (n=5)

Table 3 shows that the average cost for reaching one school are USD 7.079 whereas the cost decreases to USD 3.209 for the Indian projects. Similarly, the average cost per teacher for all programmes is USD 1.360 and drops to only USD 239 for the Indian projects. The average cost for reaching one student declines from USD 121 for all projects to USD 63 when making the calculation for the Indian projects alone. The remarkably lower cost of the Indian programmes, can likely be explained due to the large number of schools, teachers and students targeted in each project. When the initial costs of designing the programmes are covered, it is ready to be rolled out in a large number of schools where the cost of each extra school decreases. In this way it is possible that the Indian programmes gain from economies of scale.

It is interesting to note that even though differences in costs exist between the fully-fledged school programmes and the programmes with a school component, it is not possible to conclude which programme is cheaper to implement. On one hand the average costs of reaching one teacher and student is significantly lower for the fully-fledged programmes (USD 615 and 62) compared to the matching figures within the programmes with a school component (USD 2.023 and USD 146). However, on the other hand it seems more expensive to reach each school within the fully-fledged programmes (USD 10.741)

compared to the programmes with a school component (USD 3.824). The most plausible conclusion to this mismatch can be found in the limited number of projects examined and the great variety of the projects in terms of targeted number of schools, teachers and students. As mentioned previously, while some projects chose to do in-depth interventions for a limited number of teachers and students other project may choose to focus on reaching a larger target group.

Even though the programmes vary widely with regards to scope, design and setting a comparison of the cost of reaching one school per programme was calculated. The most expensive programme was from South Africa where the price of reaching one school was USD 31.048. This programme was exceptional as it was the only programme to include a comprehensive research component. The second most expensive programme was from Marshall Islands where the cost of reaching one school was USD 25.000. It should be noted that this could be caused by high cost of transport between the islands. This could also be one of the explanations to the third most expensive programme, which was a regional programme in the Caribbean where the cost of reaching one school was USD 17.188. At the other end of the scale were three Indian programmes, where the cost of reaching one school ranged from only USD 190 to USD 578. The reason for the very low cost of the Indian programmes could probably be that a large part of program implementation has been based on projects' volunteering time and therefore lower costs on project staff, in general lower costs for inputs and consumables and also to advantages of economies of scale given the dense Indian population.

This minor analysis gives a pointer of the cost, which could be expected related to reaching one school, one teacher and one student. Furthermore, it becomes evident that there is a lack of data, which can be used in establishing the cost-effectiveness of the school health programmes. Such data is essential for assessing the efficacy of primary prevention and health promotion in school settings.

4.5 Addressing sustainability of school health programmes

The long-term viability of health promotion programmes is a subject of increasing attention. As argued by Shediak-Rizkallah and Bone sustainability should be incorporated in any programme because it is counterproductive to the effects of the intervention if the health promotion is disrupted, as behavioural change is a continuous process. Furthermore, the start-up cost of a programme is substantial in terms of monetary, human and technological resources, and to sustain the activities after the funding has ended is therefore crucial for the impact of the project [49]. This section presents different definitions of sustainability together with a discussion of how sustainability can be included in school health programmes. Several definitions of sustainability exist in the literature. However, three main understandings can be pointed out which relate to school health programmes.

Firstly, sustainability can be understood as emphasising the long-term health benefits for the beneficiaries. Hence, sustainability depends on the programme's capability to deliver its intended benefits after funding has ended.

Secondly, sustainability can be examined by evaluating how the programme has succeeded in institutionalising the activities, thereby emphasising persistence of the programme within an organisational structure rather than focusing on the immediate benefits it delivers. Lastly, sustainability can be understood as the capacity building of the beneficiaries. In this way, health promotion messages can continuously be spread through the creation of local ownership among the target groups and thereby the impact of the programme will be sustained [49].

Despite the many different understandings of sustainability they all share a common understanding in relation to the school health programmes examined by this review. Sustainability concerns the process of continuing either the programme activities in the schools or ensuring that health promotion messages are ingrained in the local communities. Creating behavioural change takes a long time and it is thus essential that the school health programmes address the issue of sustainability in one way or the other. The abovementioned understandings serve as a framework of common understanding in which the sustainability of the school health programmes can be discussed below.

By paying attention to the continuation of the intended health benefits of the school health programmes, sustainability concerns the continued healthy behaviour proposed by the programmes. However, since the programmes included in this review are on-going or have been completed recently, it is not possible to quantify the health outcomes. As a consequence, the expected lifestyle changes have not yet manifested themselves in reduction of NCDs – a reduction, which will not be detectable for many years. As sustainability of the programmes is not immediately measurable this section presents a discussion of factors, which will promote the sustainability of the programmes.

To sustain the healthy behaviour of the students, the teachers have to be actively engaged in the programme and the sensitisation has to be continuous. This means creating a sense of ownership among the targeted teachers, where they appreciate the importance of the messages they convey. By having the teachers and school management fully on board the programme can be institutionalised by adapting the school curriculum to the programme activities. Project partner Dr de Villiers from South Africa explains how they aimed at making their programme sustainable:

“We worked towards a sustainable programme by designing a programme that could fit into the normal schedule of the schools and thereby ensuring that it was not seen as an “add on”. By placing the behaviour outcomes into the existing curriculum and doing it in such a way that it could easily blend into to the normal teaching schedule we tried to make the programme sustainable” (Questionnaire D: de Villiers).

Furthermore, by having dedicated teachers to continue the project activities, the message of primary prevention will also reach students from other grades and students enrolled in subsequent years. By taking this approach the benefits from the programme will sustain

even after the scheduled programme activities have stopped. Project partner Ms Nayyar further explains:

“The teachers organised various health awareness activities in the schools on their own. This shows that even in our absence the project progress is not affected. Student and teacher volunteers have actively spearheaded the project in their respective schools” (Questionnaire J: Nayyar).

However, ensuring sustainability is not easy and the ‘dispersion nature’ of students is one of the main barriers to measuring sustainability [34]. Additionally, some project partners report that it was very difficult to engage the already heavy overburdened teachers in a new programme.

“We had difficulties with the teachers. They started out very well, but then they started to object. They wanted to be paid extra, even though we did not ask them to teach outside their teaching time” (Interview A: Bocage).

Besides holding the teachers responsible for the continuation of the programme, several project partners have tried to increase sustainability by educating students to be change agents. By building capacities of the students, their sense of ownership will increase and they will feel more closely associated with the programme. Furthermore, if the students are able to affect the lifestyle of their family members, the intended health benefits of the programme will sustain and the message will reach more beneficiaries. Additionally, by learning good habits in childhood the goal is that these will persist into adulthood. This makes the behaviour change life long and future family members will potentially benefit as well. This notion is well understood by a student from Vijaya High School in Bangalore: “Maintaining a change in lifestyle is difficult. In the beginning it is very difficult, but we can practise it by including it into our daily routines” (Focus group 10: Student).

By creating systems within the schools or the communities where the health promotion messages are continuously repeated also after the completion of a programme the essential reinforcement of behavioural change can take place.

An additional element in sustainability is the ability of the projects to build advocacy resulting in Governments at local or provincial level getting engaged in supporting health promoting schools as seen in a WDF supported project in Kerala, India, or that elements of knowledge about risk factors for NCDs get incorporated into school curriculum and text books as seen in a project in Nepal (not included in this review as the project primarily is a community project). Additionally, when projects are able to attract media attention it has a cascading effect of not only creating more awareness about the risk factors but also demand from other schools for material and support to implement the project in their school due to competitive pressure as seen in a project in North India. Thus a new social norm can be established. Conclusively it can be said that sustainability is a multidimensional concept, which occurs on organisational, individual and network levels. The framework of different understandings of sustainability illustrates how several facets should be included in the planning of a school health programme in order to ensure sustainability in a broad sense of the concept.

5. Guidance for future school health programmes

The purpose of the review is to investigate and highlight applicable and important aspects that could be included in future programmes with school health components. A set of recommendations, which can be used as an inspirational guide for planning a school health programme follows in this section. The recommendations should be seen as key suggestions, rather than a universally applicable model. Consequently, each suggestion has to be adjusted according to the local context. The recommendations are deliberately outlined in a short concise format in order to function as a tool kit for concrete usage. If more information is sought regarding the specific points below reference is made to the other sections of the review. The suggestions cover the planning and preparation phase as well as the concrete implementation phase.

Planning and preparation phase:

- *Ensuring stakeholder support:* Identifying stakeholders should be taken seriously from the very initiation of a programme as the support of different stakeholders can serve as a guarantor for the successful implementation of the programme [47]. Efforts should be made to seek a broad representation of stakeholders.
- *Training of educators:* According to available resources and local settings project partners should decide upon the purpose of training and whom to select for training.
 - i. **Project staff:** It should be considered if project staff is to conduct health education classes and assess if they possess the necessary competencies or need a training course in primary prevention and/or communication and teaching skills.
 - ii. **Health care professionals/volunteers:** Volunteers working for the project may have a background in health care and know how to do a blood glucose test and measure the blood pressure. However, this may not necessarily mean that the health care professionals are good at communicating the message about primary prevention to the different target groups. When used in the program they should receive appropriate training.
 - iii. **Teachers:** Training of teachers should be organised if the intent is to have the teachers to conduct the health education sessions for the students in the long run.
 - iv. **Selected students:** Training of students should be considered if some students are selected to organise any kind of health promotion activities for their peers.
 - v. **Training of trainers:** To increase sustainability of the programme a training of trainers component could be included. Emphasising and encouraging the schools to take on the training of additional teachers will increase the scope of the programme.

Evaluation and follow-up: It is recommendable to consider follow-up activities from the beginning of the programme so these come as a natural extension of the programme. Additionally, it would be preferable to include indicators, which can be used for continuous evaluation of the programme. The evaluations are important knowledge which future programmes can benefit from.

Implementation phase:

- *Health promotion and primary prevention:* The programme could be designed as a multi-component intervention, utilizing the basic concepts of primary prevention [34]. A programme could try to include both health promotion with focus on health education classes and interactive activities such as debates or sports competitions in addition to structural approaches targeting environmental changes such as adjustment of curriculums and influencing food served in canteens.
 - i. **Target groups:** It is recommended that the intended target groups should be identified as one of the first things. In some settings it would be better to focus the intervention at a few selected target groups instead of trying to include as many as possible. An incremental approach as the programme unfolds maybe useful. This is to ensure the optimal effect of the interventions and that resources and energy are best spent. Target groups to consider could be teachers, students, parents, school management, canteen staff, relevant stakeholders in the communities such as village leaders and health care providers, as well as decision-makers and politicians.
 - ii. **Health education sessions:** The sessions should aim for easily understandable and context specific messages in these sessions instead of trying to make the lectures more comprehensive. The idea should be to provide skills that can be used in real life situation rather than making the student merely knowledgeable. It could be considered including small activities such as quizzes or role-plays to ensure active involvement of the students. It is recommended that the project staff actively considers if project staff or teachers should conduct the sessions, as there are advantages and disadvantages of both. It is advisable to consider if materials could be made to facilitate and compliment the sessions.
 - iii. **Nutrition:** The projects should keep in mind that the issue of food habits are culturally sensitive. It is recommended that a project addresses both availability and prices of healthy food provided in the schools. Easily understandable messages relating healthy food habits should be included in the health education classes. Additionally, activities that actively engage the students such as establishment of food gardens or cooking competitions could be implemented. Furthermore, if applicable one could consider to directly target school canteen staff and emphasise preparation of healthy food and restrict sale of unhealthy food in and around the school premises, ensuring that unhealthy snacks are priced higher to cross subsidise fruits or other perishable healthy snacks.
 - iv. **Physical activity:** a first step to promote physical activity is to emphasise that the schools efficiently utilise time slots for physical activity already in place on the school curriculum. One could also consider suggesting that physical activity is graded on similar lines as academic activity if this is not the case in the local setting. Secondly, concrete physical activities popular in the specific context could be implemented. It is worthwhile taking into account if it is possible to promote physical activities after school as well in order to increase the impact of the intervention.
 - v. **Health camps:** If health camps are conducted it is recommended to keep them free of charge for the participants. In connection to the health camps it should be

considered if the results should be used for scientific purposes as well and making sure that relevant permissions are in place.

- *Engaging media:* Health issues and risks to health of young children often attracts media attention, using events and school based activities to engage media serves many purposes – helps showcase the activity, raises awareness, creates sense of pride and achievement amongst those involved and thus reinforces the purpose and determination, helps gain attention of policy makers and local politicians and thus serves a platform for advocacy.
- *Advocacy:* Even though advocacy is a difficult task, it would be beneficial to include such activities to a smaller or larger degree. One should ensure a clear line of argumentation when embarking on advocacy activities. It could also be preferable to focus on a selected few issues instead advocating too many messages.

6. Strengths and limitations

This review has examined 17 WDF funded projects implemented by 15 different project partners in 10 countries spread over 5 different regions. The limited number of projects included has implications for the validity of the conclusions drawn throughout the analysis. However, the high response rate from the project partners and the geographical spread of the projects included strengthens the overall validity of the review.

The fact that it has not been possible to visit all the included projects creates an unintended bias towards the Indian context as the three projects visited were all from India. This is sought overcome by deliberately including comments and quotes from all countries and projects examined.

Regarding the strengths and limitations of the methodology chosen for the review it should be mentioned that the analysis is based on an interpretation of written and oral sources. Thus, it should be remembered that these sources are interpreted subjectively and consequently subject to the reviewers' interpretation of the interviews. Thus, discrepancy may exist in the perception of concepts between the interviewees and the interviewers. This criticism is sought overcome by ensuring that central concepts were clarified during the interviews in order to be sure that the interviewee attributed the same meaning to the concept as the interviewer [13]. Furthermore, any possible subjectivity is sought overcome by verifying the statements of the partners against the written project material and by including the actual quotes from the interviews with the partners into the review for the readers to assess the quotes and make their own judgement of the statements.

In connection to the qualitative interviews, it is relevant to reflect on whether the interviewees have consciously or unconsciously kept issues hidden during the interviews, which could have altered the conclusions of the review. This is however always an issue when using the qualitative method and it is not the perception that the interviewees have had any specific reasons for consciously excluding issues from the interviews. One could however always contemplate that some project partners intentionally or unintentionally may not want to

disclose any problems or difficulties faced during their project implementation due to the fear of not getting a potential future WDF application approved. This issue is sought overcome by clearly explaining in writing and orally to all interviewees that the intention of the review is not to make an assessment of their specific project, but rather to draw valuable lessons learned from their experiences during the project implementation. Reviewing the responses given by the project partners shows that obstacles and shortcomings are mentioned in all the interviews. Thus, withholding of information by the project partners is likely kept to a minimum.

The review has had school health interventions as the focal point of the analysis. The overall assumption the analysis has been built upon is that health promotion activities in school settings are an effective way to promote healthy lifestyle of children. In this respect it is relevant to reflect on whether the overall assumption of the review is relevant. If this assumption was not taken in the beginning the review would have been forced to also examine in which settings it makes sense to do health promotion activities. The analysis would thereby have been broader and would not have been able to go into depth with the specific school activities to the extent that has been done.

Finally, one could question the generalizability of the proposed guidance for future projects as they are based on experiences from a limited number of programmes, which vary greatly with i.e. problems of under-nutrition in India to over-nutrition in Marshall Island. However it is not the intention of the review to generalise the findings of the limited number of projects examined to a general law or theory. As Flyvbjerg argues generalisation is highly overrated as the single source for scientific development [50]. Science is about the accumulation of knowledge, which can also take place within a descriptive, explorative and/or explanatory study. Thus, this review is used to advance scientific knowledge about a concrete phenomenon – the WDF funded projects focusing on school health interventions.

7. Conclusion

The purpose of this review was to analyse the WDF programmes targeting health promotion in schools to collate the valuable experiences obtained by the project partners and by analysing the different approaches formulate guidance for future programmes.

After having reviewed 17 projects implemented by 15 project partners various recommendations have emerged regarding training approaches, target groups, health promotion activities and advocacy efforts.

It is advisable to apply a broad approach to health promotion and primary prevention in schools instead of focusing on only one or two NCDs such as diabetes or hypertension. By applying a broad approach targeting common risk factors the relevance of the programme is increased. A two-pronged approach is recommended, where health promotion activities are implemented to change individual behaviour together with interventions targeting the surrounding environment of the students. By applying this public health approach to school

health programmes several factors are targeted simultaneously and structural changes are put in place to support individual change. Thus, by including parents, school premises such as playgrounds, canteens and food stands near school and the community at large a supporting environment encourages changes at the individual level.

Furthermore, to promote individual change a participatory approach is recommended as this increases the understanding and internalisation of the project activities for the students. When practical elements are included the students are motivated and hence the sustainability of the programme will increase. It is paramount that the interventions are adapted to the local context and to the target groups in question.

To improve the effect of future programmes it is recommendable that ways to increase the sustainability of the programme should be considered in the planning phase together with suitable follow-up activities. Sustainability functions on several levels and by consciously considering these possibilities from the beginning the long-term impact of the programme will improve. Furthermore, addressing advocacy at political level can support environmental change, individual change and enhance the sustainability of the programme. Based on this review of WDF supported school health programmes it is evident that by structured planning and multidisciplinary activities conducting primary prevention interventions with school based settings is a good way to take the first steps to change the future prospects of the coming generation.

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Focus Groups

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2. Government Higher Secondary School Omalloor. Focus group with 3 teachers. 23rd November 2011. Kerala. Facilitators: EMLK & XMSR
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7. St Paul's School. Focus group with 2 students. 17th November 2011. Delhi. Facilitators EMLK and XMSR
8. Tagore International School. Focus group with 2 teachers. 17th November 2011. Delhi. Facilitators EMLK and XMSR
9. Tagore International School. Focus group with 4 students. 17th November 2011. Delhi. Facilitators EMLK and XMSR
10. Vijaya High School. Focus group with 10 teachers. 23rd November 2011. Bangalore. Facilitators EMLK and XMSR
11. Vijaya High School. Focus group with 10 students. 23rd November 2011. Bangalore. Facilitators EMLK and XMSR

Appendix

Financial calculations of costs

Project #	Country	Full-fledged	Semi School project	Indian projects	WDF amount to school component (USD)	# schools	# teachers	# students
02-010	Palestine		1		206.855,00	30	159	1255
05-120	India	1		1	252.597,00	92	9500	69930
05-137	India	1		1	129.290,00	679	8288	119743
05-139	Caribbean	1			275.000,00	16	487	1004
06-170	West bank and Gaza		1		147.701,00	30	100	1000
06-174	South Africa	1			248.385,00	8	703	2500
06-212	Tanzania		1		93.583,00	80	131	
07-236	India	1		1	500.000,00	865	8000	260000
08-402	Brazil	1			298.690,00	62	248	36000
09-411	Sri Lanka		1		104.166,00	30	8	150
09-436	Kenya		1		130.488,00	50	400	
09-450	Tanzania		1		50.000,00	65	270	28383
09-456	India		1	1	58.348,00	140	716	14980
09-463	Cambodia		1		100.000,00	49	1079	48555
09-477	India		1	1	302.854,00	25	300	1000
10-502	South Africa	1			87.156,00	20	67	4188
10-524	Marshall Islands	1			250.000,00	10	180	2900
Total	-	8	9	5	3.235.113,00	2.251	30.636	591.588

Cost of reaching one school, one teacher and one student

Fully fledged	Project #	USD/school	USD/teacher	USD/student
	05-137	190,41	15,60	1,08
	07-236	578,03	62,50	1,92
	05-120	2.745,62	26,59	3,61
	10-502	4.357,80	1.300,84	20,81
	08-402	4.817,58	1.204,40	8,30
	05-139	17.187,50	564,68	273,90
	10-524	25.000,00	1.388,89	86,21
	06-174	31.048,13	353,32	99,35
	Average	10.740,63	614,60	61,90
Semi school programme	Project #	USD/school	USD/teacher	USD/student
	09-456	416,77	81,49	3,90
	09-450	769,23	185,19	1,76
	06-212	1.169,79	714,37	-
	09-463	2.040,82	92,68	2,06
	09-436	2.609,76	326,22	-
	09-411	3.472,20	13.020,75	694,44
	06-170	4.923,37	1.477,01	147,70
	02-010	6.895,17	1.300,97	164,82
	09-477	12.114,16	1.009,51	302,85
	Average	3.823,47	2.023,13	146,39