THERE IS WORRISOME evidence of continued growth in the incidence and prevalence of diabetes all over the world. All countries, rich and poor, are suffering from the impact of this epidemic. However, it is notable that 80 per cent of those affected live in low- or middle-income countries, where the World Diabetes Foundation (WDF) works.

Globally, the total number of people affected by diabetes is now more than 400 million, and will reach approximately 600 million in 2035. Furthermore, there will be nearly 500 million individuals with pre-stages of diabetes in 2035. Thus, in total, more than 1 billion people will be affected by some kind of glucose intolerance – all with a high susceptibility to the devastating effects of late stage macro- and microvascular complications.

The increase in incidence and prevalence of diabetes is significant in the different regions where WDF operates. In India, for instance, there are now more than 100 million patients living with diabetes, with a predicted growth of 70 per cent, and, in Africa, a 100 per cent increase in numbers is expected over the next 20 years.
DIABETES AND NUTRITION
A major factor contributing to the diabetes epidemic is the simultaneous global obesity epidemic, which is due to excessive caloric intake, an escalation in the consumption of processed food and a significant reduction in physical activity. The impact of this change in living behaviour is more visible in people who are used to lower caloric intake, high physical activity and unprocessed food, which is one of the reasons the epidemic is especially severe in low- and middle-income countries.

It is well known that obese people have a much higher risk of developing diabetes; approximately 75-80 per cent of people with type 2 diabetes are obese or overweight. Obesity results in decreasing insulin sensitivity, which causes an imbalance between intake of glucose and the capacity for glucose storage in muscle, fat and liver tissue. As a result, the overweight or obese patient becomes diabetic.

We also need to focus much more on the treatment of glucose intolerance in pregnant women. If this condition is not properly treated, there is a very high risk that these mothers and their offspring will become affected by diabetes in later life due to epigenetic changes related to nutrition. If the mother develops high blood glucose during pregnancy, the offspring will become hyperglycaemic with raised insulin levels. This leads to increased storage of fat and growth, resulting in increased weight and insulin resistance in the offspring with a high risk of becoming diabetic later in life. Likewise, if the mother is undernourished, the offspring will adjust, storing more available calories. A more liberal access to calories after birth will then lead to obesity and increased risk of diabetes at a young age.

SRI LANKA: A PROGRAMMATIC APPROACH
One of WDF’s key priorities is prevention; we recently funded a meeting in Sri Lanka about the primary prevention of diabetes through a programmatic approach. Knowledge and awareness are, of course, important aspects for facilitating behaviour change. The very first step is to ensure that the individual has been informed about the benefits of such a change. However, this is only a small part of behaviour change; this knowledge will not guarantee that people will actually change their behaviour. For example, most smokers are well aware that smoking is extremely harmful to their health – yet they continue to smoke.

In addition to knowledge and awareness, it is also necessary to include programmatic components that can change cultural and social norms and values as well as components that can provide the necessary structural framework for facilitating certain behaviours – this could, for example, be laws that promote certain behaviours.

EFFECTIVENESS CRITERIA
There are various approaches to assessing the effectiveness of programmes related to behaviour change. Traditionally (and still most often), programmes are assessed based on process indicators. This could, for example, be based on how many people have received information about the benefits of a certain behaviour, or the number of people self-reporting that they will now change their behaviour in the desired direction.

However, this does not say much about whether the targeted population did, in fact, change their behaviour. When dealing with behaviour change in diabetes and pre-diabetes, clinical impact indicators are important in order to assess if people have engaged in more exercise or changed their diet; such indicators could be improvement in impaired glucose tolerance, blood pressure, Body Mass Index, waist circumference, etc. Changes in these indicators will tell us if the programme has been implemented and, more importantly, if the intervention has been effective or not.

ANALYSING IMPACT
WDF is in the process of introducing the above mentioned clinical indicators related to behaviour change and prevention as a fixed part of its projects. Once this is up and running, it will be much easier to detect the interventions that are having a positive impact on the health of the targeted population.
that have had a positive impact on behaviour change and clinical impact. This will provide an evidence-based platform for replicating best practices.

Nevertheless, the comprehensive portfolio of WDF projects and valuable lessons learned already indicates that local ownership and in-depth knowledge of the target groups addressed are key ingredients in a successful behaviour change intervention.

AGE-APPROPRIATE INTERVENTIONS
When assessing new projects within behaviour change and prevention, WDF finds it very important that the partner has thorough knowledge about and insight into the targeted population and its surroundings, or will attempt to obtain this information. It is key to understand the target group in order to target an intervention to that specific demographic.

For example, school children may have very different reasons for not exercising compared to employees in a factory. There may be differences in their knowledge, in the socio-cultural framework and also in the opportunities for exercising at the school and factory. Therefore, it is essential to understand the target group and its surroundings in order to design the intervention accordingly.

SCHOOL-BASED PROJECTS
WDF conducted a qualitative study of 17 school-based projects across Africa, the Caribbean, South and Central America, South East Asia and the Western Pacific. The main conclusion is that it is possible to change behaviour and clinical phenotype. However, sustainability is difficult and requires a prolonged focus from the planning phase and throughout the programme.

Common barriers to the development of healthy lifestyles for children included persuading parents and teachers who were more focused on academics to prioritise physical activity. In order for children to change their behaviour it is vital that the necessary environment is provided for them to be able, and encouraged, to adopt healthier lifestyles. The closest authorities to the children need to be involved.

To persuade parents and teachers to take part in interventions that promote healthy lifestyles for children, it would be advisable to set up a structural framework that ensures this (a fixed school curriculum that demands more exercise for the children, for instance) and introduce new sociocultural norm sets. For example, schools or communities can appoint ambassadors who demonstrate the benefits of healthy living – thereby involving parents and teachers directly, and encouraging them to change their own lifestyle and behaviour.

Critical success factors involve all key stakeholders: the child (especially at-risk children), school teachers, parents, canteen personnel, media, governmental policy makers and people responsible for school facilities like gardening and playgrounds. Training, information, commitment and active involvement, monitoring, evaluation and follow-up are key activities. All interventions should be easily implementable – preferably part of existing activities, or if not, then easy to integrate.

We did not see any striking difference between regions, but it is, of course, critical that the interventions applied are adjusted according to local cultural behaviour and lifestyles.

TOWARDS SUSTAINABLE PROGRESS
The most important long-term goal is to break the curve of the global diabetes epidemic, especially in the developing world where the problem has the highest human toll. This requires that all nations establish national plans detailing how to fight the diabetes tsunami and other noncommunicable diseases (NCDs) that are currently escalating.

Furthermore, these plans need to be prioritised and implemented. It is an important step forward that the recently proposed UN Sustainable Development Goals address the need to reduce the burden of NCDs, including diabetes. This calls for national prioritisation and resource allocation around the globe. We need all stakeholders, from the food processing industry and global health administrators to the individual person, to recognise their responsibility: to wish for – and work towards – the needed change.

WDF’s mission
- Create partnerships to assist people with diabetes and those at risk, acting as a catalyst to help others do more
- Link people and resources to educate and advocate globally and provide care locally
- Support the poorest of the poor
- Empower local communities to achieve sustainable solutions and yield replicable models
- Encourage innovative strategies to prevent diabetes and its consequences