

Editorial

Diabetes prevention: A call to action

Over the past half century the global prevalence of diabetes mellitus, currently estimated to be approximately 10 per cent (age standardised)¹, has risen so sharply that it is now commonly referred to as an epidemic^{2,3}. Diabetes is a chronic disease associated with many co-morbidities such as obesity, depression and cardiovascular disease and can cause serious microvascular complications such as blindness, renal failure and amputation⁴. The growing global prevalence and health burden associated with the disease has recently led to the World Health Organization to classify high blood glucose as the third leading cause of premature mortality globally⁵. The annual global health care burden associated with diabetes is currently estimated to be at least 376 billion USD, accounting for 7, 10, 11 and 14 per cent of total health care expenditure in Sub-Saharan Africa, Europe, South East Asia and North America, respectively⁶. These figures are set to rise in the future and will place an unsustainable burden on health care resources, if left unchecked. This trend is particularly concerning for low and middle income countries which account for 4 out of 5 of all cases of diabetes and where the vast majority of mortality due to the disease occurs in an economically productive age group⁷. Furthermore, the projected growth in the global prevalence and economic burden of type 2 diabetes will further disproportionately affect low and middle income countries in the future. For example, in India the prevalence of diabetes is projected to increase by 60 per cent to 80 million cases by 2030 and its economic burden is projected to increase by almost 50 per cent to at least 4.8 billion USD over the same period^{6,8}.

Type 2 diabetes accounts for over 80 per cent of all cases of the disease and as such drives the

vast majority of the health and economic burden attributable to diabetes. It is now widely recognised that the upward trend in the prevalence of type 2 diabetes witnessed over the last century is the result of the ever increasing number of counter-regulatory lifestyle practices associated industrialisation, where energy dense, highly processed and additive-ridden foods are plentiful and the need for physical activity in daily life has disappeared. Indeed, observational research has consistently shown that 80-90 per cent of all cases of type 2 diabetes result from an unhealthy lifestyle^{9,10} and evidences from randomised controlled trials across diverse countries and populations have shown that the risk of progressing to type 2 diabetes in high risk populations can be reduced by up to 60 per cent in those receiving lifestyle interventions aimed at promoting moderate- to vigorous-intensity physical activity, a healthy diet, and weight loss/maintenance¹¹, or by over 90 per cent in those achieving all of the prescribed lifestyle goals compared to those achieving none¹²⁻¹⁴. This strong link between industrialisation, lifestyle and diabetes represents both a curse and an opportunity: American novelist Richard Bach noted “there’s no disaster that can’t become a blessing, and no blessing that can’t become a disaster”. If left unchecked, the conventionally viewed blessing of technological advancement and emergence of ever more ingenious devices designed to limit movement and increase in food availability witnessed in all corners of the globe will continue to encroach on the diminishing number of non-sedentary activities still associated with every life and support an environment conducive to furthering the upwards trends in obesity rates, leaving ever spiralling

rates of diabetes in its wake. Conversely, the strong link to lifestyle also represents the fundamental solution because it implies the disease is highly preventable through lifestyle change; therefore, action is urgently needed to change our deleterious relationship with our environment.

Many governments have started to respond to this challenge by prioritising medical models and policies that focus on the prevention of non-communicable diseases, such as type 2 diabetes. For example, the National Programme for Prevention and Control of Cancer, Diabetes, CVD and Stroke was recently launched in India. The need to focus on prevention is also recognized internationally¹⁵. European level guidance on the prevention of type 2 diabetes was published recently¹⁶, the United Nations adopted a resolution on diabetes mellitus in December 2006 and in September 2011 the United Nations will hold a summit on non-communicable disease prevention and control. This marks only the second time in the history of the United Nations that its General Assembly has been convened to tackle an emerging health issue.

Not surprisingly, the re-focusing of national and international health policy towards prevention has coincided with increased academic investigation into optimal methods of translating “gold standard” diabetes prevention research programmes into “real world” health care settings. Although highly successful, evaluated prevention programmes have relied on highly resource intensive behaviour change techniques that, given the numbers requiring preventive action (up to 1 in 2 individuals are estimated to have prediabetes or intermediate hyperglycaemia in some populations¹⁷, would bankrupt even the wealthiest health care systems if rolled out universally even if theoretically cost-effective or cost saving over the longer-term. Therefore, diabetes prevention pathways that are tailored to national and regional health care systems, need to be developed and evaluated. In order to help achieve this aim, a four-level public health initiative has been proposed that provides guidance for establishing milestones and strategies for prevention programmes¹⁸. Over recent years, several countries have also supported initiatives aimed at developing and evaluating pragmatic methods of identifying high risk individuals and enrolling them into diabetes prevention programmes in routine health care setting¹⁹⁻²³. Interestingly most of this work, often through independent routes, has commonly led to programmes that utilized risk scores

in the identification of high risk individuals and group-based education models underpinned by a combination of motivational and self-regulatory behaviour theory for supporting health behaviour change. For example, in the United Kingdom, we have developed a validated diabetes risk score that can either be self-administered or run on General Practitioner databases and shown that a 3-hour group-based structured education programme with minimal ongoing behaviour change support leads to long-term changes to health behaviour and glucose control in those with a high risk of diabetes²⁴⁻²⁷. As this prevention pathway was intentionally based on a self-management model utilized in the management of those with diagnosed type 2 diabetes, we have been successful in helping primary care organisations slot this programme into their routine health care models in many parts of the country. Similarly, we have also shown that a group-based programme centred on 12 sessions of 90 min, developed for implementation in Germany, was also successful at promoting behaviour change and improving health in those identified with a high risk of diabetes^{28,29}. Significant investment has been given to, and learning generated from these translation studies in high income countries with multi-ethnic populations; funding structures are now needed to ensure this experience is disseminated, through multi-national collaborations, to middle and lower income countries that lack the resources and infrastructure to recreate the full development and evaluation cycle. Some institutions, like the International Diabetes Federation, have recognised this need and provide small funding schemes designed to enable the global flow of learning through collaborative action in the primary and secondary prevention of diabetes. However, much more support is needed if those countries hit hardest by the disease are to effectively target its burgeoning prevalence and economic cost.

The scale of the health and economic burden linked to type 2 diabetes has also led to the creation of bottom-up advocacy groups and an international diabetes prevention network that supports a dedicated electronic platform for bringing together patients, health care professionals and academics in facilitating the rapid dissemination of knowledge and enabling the cross-fertilisation of ideas on a global scale [<http://nebel.tumainiserver.de/dp/>]. At the time of writing, this network had almost 4000 members from 148 countries and as directly contributed to some significant developments including the publication of a book that catalogues best practice examples and knowledge gained from diabetes

prevention initiatives that have taken place around the globe and the posting of translated diabetes risk scores and prevention tools that are freely available for download¹⁸.

Much of the current focus on diabetes prevention in general has concentrated on strategies for identifying and intervening in those with a high risk of the disease. However, as Geoffrey Rose pointed out 30 years ago with his widely publicised “prevention paradox”, strategies designed to shift the population distribution of known risk factors are inherently the only way of effectively tackling a mass disease³⁰. For example, it has recently been estimated that a 1 per cent decrease in BMI across the whole population would avoid over 2 million new cases of diabetes in the United States within the next 20 years³¹. Therefore, along with high risk and disease management strategies that remain important as long as the disease is widely prevalent, action is also needed to target population level behaviour and attitudes. Mass action, similar to that employed to target smoking, is needed involving government policy, legislative and taxation support and industry compliance to alter the default patterns of behaviour associated with our everyday environments. However, therein lays the paradox, as interventions applied to the population can lead to little individual benefit and can even cause some individual harm, inconvenience or annoyance. For example, a healthy individual may reasonably wonder why their “right” to eat what they like is being infringed by a differential taxation system that targets foods high in saturated fat. Therefore, as with other serious health conditions and behaviours, concerted and sustained effort is also needed to educate the public and change social norms in order to create the environment that allows for and supports policy change. To do nothing, or to continually tinker around the edges with ineffectual policy, will expose billions of individuals to this deleterious disease for generations to come.

In summary, on the advent of this year’s World Diabetes Day, we take heart that the importance of tackling diabetes and other non-communicable diseases through preventative action appears to be gaining increasing national and international momentum, however, increased political and global awareness should only be considered success in the first of many battles to come; the fight must go on across multiple fronts if we are to truly start reversing the global diabetes epidemic.

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