In this edition of Baker IDI PERSPECTIVES

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In the award-winning documentary, Super Size Me, filmmaker Morgan Spurlock experiments with a diet consisting entirely of junk food. We watch with horror and repulsion as he consumes a fatty diet high in salt and sugar all day, every day, for a month. The result is potentially catastrophic for his health. It is an extreme extrapolation of a ‘maladaptive lifestyle’. As the word suggests, maladaptation is the inability of a species to effectively adapt and survive in response to changes to its environment. It could be argued that the current obesity epidemic and its impact on chronic disease is the result of a maladaptive lifestyle dominated by too much fat, refined sugars and too little exercise.

Obesity is emerging as both a major co-morbidity and a precursor to a range of chronic diseases including hypertension, diabetes, metabolic syndrome, sleep apnoea, cardiovascular and musculoskeletal diseases and certain cancers. Not everyone will have the full combination but the vast majority of obese people will have at least one of these conditions in addition to obesity. The overlap with obesity and the interaction with chronic disease is important, both at the biological level and in attempting to untangle the causes and optimal treatments for the complications.

It begs the question as to whether it is helpful to categorise and treat individual diseases when they are all so critically interrelated. It may be that we need to come to a different kind of understanding and recognise that probably all chronic diseases have either their origins in, or are exaggerated by, a maladaptive lifestyle superimposed on a patchwork of genetic traits and environmental influences in each individual. The World Health Organisation calls these ‘non-communicable diseases’ and they are now the major cause of death in both developing and emerging economies. In other words, chronic diseases are accentuated by lifestyle choices and there is evidence that there is a case to be made that maladaptation is the real epidemic of this century.
It used to be that developed countries like Australia, Great Britain and the United States shouldered the greatest burden of death from non-communicable diseases. However, increasingly we’re seeing a rising tide of chronic disease in low and middle-income countries as they assume a western lifestyle and ‘quality of life’. China’s obesity and overweight levels in children, for example, are over 25 per cent and rising. Asia now accounts for about 60 per cent of the global population of diabetes sufferers.

Prevention, diagnosis and treatment of lifestyle disorders is complex. Freedom of individual choice is the bedrock of established and emerging democracies. Interference by the state can be interpreted as a loss of liberty, as evidenced by the crude arguments cobbled together by the tobacco industry in Australia to challenge plain packaging legislation.

Educating the public about the dangers associated with obesity is a good start but not all fat is equally dangerous, and not everyone who is obese self-identifies with that description. Abdominal obesity is actually more dangerous than pear-shaped body fat. And even two people with ‘pot bellies’ can fare differently. Some people carry most of the fat inside their abdominal cavity and metabolically, that seems to impact very negatively on their health. Others carry fat in a superficial layer around the waist which is less threatening. So even measuring waist circumference is not a reliable indicator of the risks associated with overweight and obesity, although it is a lot better than just jumping on the scales, or calculating BMI.

Complicating matters even further is research showing that some people who are overweight – albeit a very small minority – are quite healthy and never suffer any adverse health consequences, especially if they are fit and overweight. This highlights an identification and risk stratification challenge for physicians and community health professionals.

Many of the risk guidelines we use today are based on the Framingham Risk Score which was developed in the 1950s, before obesity became such a widespread and endemic problem. It would certainly be useful to have better diagnostic markers which could identify if someone was at risk from their excess weight, as opposed to just identifying if they are overweight or not.

Unfortunately, diagnosis of overweight or obesity is not followed with a universally effective treatment. Whereas we now have highly-effective treatments for HIV and cancer for example, we’ve yet to develop a silver bullet for obesity – with the possible exception of bariatric surgery. For the pharmaceutical industry, developing a treatment for obesity has been one of their least successful fields of endeavour, perhaps second only to psychiatric disease.

Unlike HIV, where a single-message social education campaign on safe sex has had a dramatic impact on prevention, the contributing factors to obesity and chronic disease are difficult to distil into a single, succinct message and even more difficult to implement. No one wants to take on a health problem that is seemingly insoluble but we can take heart from some important initiatives offering a glimmer of hope.

In September 2011 the UN, for the first time, hosted a summit on non-communicable diseases. One of the key objectives of the summit was to develop a UN resolution on tackling chronic disease, a status applied previously only to HIV-AIDS when the disease was emerging and there was heightened fear around the disease. We are right to be just as fearful now of non-communicable diseases, as the number of people affected rises relentlessly around the world.

To date, it’s been difficult to get chronic disease on the agenda of international health organisations or even the big charities such as the Bill and Melinda Gates Foundation, because of the focus on preventing infectious diseases and the importance of vaccination. The summit is therefore a very important step in elevating the issue globally and highlighting the need for a comprehensive and coordinated approach.

We are also starting to see some very progressive initiatives by global food manufacturers who, if only for their own enlightened self-interest, have commenced research and development into new products that are less harmful but continue to deliver the same appealing taste combinations that make their products so popular. Under the leadership of CEO Indra Nooyi, PepsiCo has hired the company’s first scientific officer and increased its investment in R&D. The company is working on reducing salt and sugar content in their products, eliminating the use of trans-fats and developing new products such as a natural sweetener with zero calories. The new holy grail for food technologists is products and flavour combinations that evoke the same hedonics of fat, starch and salt, without the negative side effects. If they can achieve that, then we might reach a stage where we can live with the social and economic changes which are pushing people toward processed, convenience foods.

For all species, adaptation to changing conditions is critical to enable them to survive and thrive.
The rapid pace of lifestyle change experienced by the human species in the last fifty years presents a significant danger to health. Science has a critical role to play in addressing this challenge and helping the species to adapt. Whether it’s informing new guidelines about sedentary behaviour in the workplace, developing better diagnostic markers of risk, breakthroughs in treatment and behavioural science, or working in partnership with the food industry to modify foods so they are less harmful, science has an important contribution to make to the adaptation process.

Discoveries on the causes of chronic disease such as heart disease, stroke, dementia and the things that lead to it like diabetes, hypertension and obesity are the primary remit of Baker IDI. We believe that only an integrated approach involving fundamental discovery, clinical science, public and population health will provide solutions. One exciting example of this is the nexus between observations linking birth weight and risk of diabetes in adulthood, with the developing science of epigenetics, a focus of our institute. This helps not only explain the biology of the association but offers the promise of interventions in early life that can be applied at the population level to head off maladaptation at the outset. But there is more research to be done!

### Bariatric interventions for obese type 2 diabetes: the ‘doctor’s dilemma’.

Obesity and type 2 diabetes (T2D) are very closely related chronic conditions that are rising dramatically in prevalence and generating major global health and economic issues. Although population-based initiatives must be pursued to prevent the onset of obesity and T2D, a range of effective treatments must also be available for people who develop the conditions associated with T2D.

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Type 2 diabetes is a progressive disorder and it is unrealistic to expect that any one pharmaceutical drug, or even a combination of two or more, will control one of the world’s fastest growing epidemics. The anti-diabetic drugs in use, including traditional agents such as sulphonylureas and metformin and more recent agents, all have a role. However, they do not provide the solution to the progressive nature of T2D, which calls for regular ongoing assessment of therapy to control not only the blood sugar level but also other cardiovascular disease risk factors.

Current treatment patterns usually see a need to intensify therapy, adding extra anti-diabetic medications in increasing doses with increasing duration of diabetes. Not infrequently, this leads to increasing weight gain which is counterintuitive for treating T2D.

Treating people with T2D and severe obesity is challenging and targets are difficult to achieve. This reflects the ‘doctor’s dilemma’ on what ultimately is the best strategy to maintain acceptable levels of metabolic control. Against this background, it is little wonder that bariatric surgery may have some appeal for improving management of T2D.

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Bariatric surgery was originally developed to treat clinically severe obesity. It should now be considered as a component of regimens to complement (but not replace) lifestyle measures and established medical therapies in the management of obese patients with T2D. This is based on a growing body of evidence showing that surgery has the ability to improve blood sugar control and other serious co-morbidities of obesity.

The emerging role of bariatric surgery in the management of T2D in obese people prompted the International Diabetes Federation (IDF) Taskforce on Epidemiology and Prevention of Diabetes to convene a consensus working group of diabetologists, endocrinologists, surgeons and public health experts to develop a position statement on the topic. The specific goals were:

1. To develop practical recommendations for clinicians regarding patient selection.
2. To identify barriers to surgical access.
3. To suggest interventions for health policy changes that ensure equitable access to surgery when indicated.
4. To identify priorities for research.

A compelling reason for producing the IDF Position Statement was the need to place the role of bariatric intervention into a public health, clinical, and socioeconomic perspective. It had become a ‘last resort’ rather than an option to consider earlier in the management of T2D.

For obese patients with T2D, clinical inertia and frustration are associated with the often repeated failure of lifestyle programs to achieve sustained weight loss. Unfortunately, while this is often the norm for many physiological reasons, obese people with T2D are labeled as poorly compliant or poorly motivated, as if they were demonstrating psychological or behavioral weaknesses.

The available evidence now indicates that bariatric surgery is the most effective treatment for achieving and sustaining significant weight loss. It can result in major improvements in diabetes control, or even remission, in many people with T2D. It also improves other important obesity-related conditions including lipid disorders, sleep apnoea and hypertension, reduces cardiovascular risk, and improves quality of life.

Morbidity and mortality associated with current conventional bariatric procedures, such as lap-bandng and gastric bypass, is generally low and similar to that of gallbladder surgery. Evidence to date also indicates that bariatric surgery for obese patients with T2D is cost-effective.

The IDF Position Statement indicates that bariatric surgery is an appropriate treatment for people with T2D and obesity who are not achieving...
recommended treatment targets with existing medical therapies, especially in the presence of other major co-morbidities. Currently, less than one per cent of those who are either eligible or prioritised for bariatric surgery have this therapy considered.

Proposed eligibility and prioritisation of patients with T2D for bariatric surgery, based on failed non-surgical weight loss therapy and body mass index, is shown in table 1 on the previous page.

The IDF statement recommends that bariatric procedures should be undertaken within accepted national guidelines by a multidisciplinary team which undertakes patient assessment and education and longer-term ongoing care, as well as safe and standardised surgical procedures. National guidelines for bariatric surgery need to be developed for people with T2D.

Representing over 200 national societies worldwide, many in low and middle income nations, the IDF considers equity of access to bariatric surgery to be a very important issue. The position statement recognises the plight of people with diabetes who lack insulin, drugs and diabetic supplies and recommends each health system determine whether bariatric surgery, with its support services, is economically appropriate.

In conclusion, the IDF Position Statement is intended to create awareness of the availability of other options to treat T2D, when existing medical therapies fail to achieve acceptable targets designed to reduce complications and improve quality of life.

So, will diabetes care change as a result of introducing initially riskier surgical options? The IDF Position statement is likely to be a game changer, with the introduction of surgery into treatment algorithms transforming diabetes care at large. Bariatric surgery may now be considered earlier in the treatment of type 2 diabetes and should no longer be seen as a last resort.

References:

Obesity prevention interventions should target all members of the community, including children, young people and their families.

The rising prevalence of chronic disease in adults in Australia – including diabetes and obesity – is well documented. How much of an issue is this for children and adolescents and what are the potential solutions?

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Both effective prevention of obesity, as well as treatment of those already affected by it, are necessary if we are to respond appropriately to the problem of child and adolescent obesity.

In Australia, overweight and obesity currently affect approximately 21-25 per cent of school-aged children and adolescents, with obesity alone affecting 5-6 per cent. The prevalence of overweight and obesity rose fairly dramatically from the mid 1980s to the mid 1990s. This was followed by a more moderate increase into the early 2000s, and since then, a leveling off in prevalence. This recent plateauing of prevalence is mirrored in the USA, many parts of Europe and Japan. However, some paediatric population sub-groups within Australia continue to have a greater risk of overweight and obesity, including those who are socially
disadvantaged and those of Middle-Eastern and Mediterranean ethnic backgrounds.

What about younger children? The Longitudinal Study of Australian Children provides information about the prevalence of overweight and obesity in four and five year old children prior to school entry. In the early 2000s, one in five children in this age group was overweight or obese, with prevalence rates being substantially higher in both disadvantaged as well as Indigenous children. There is very little information about trends over time in young Australian children. The World Health Organization however, estimates that the prevalence of overweight and obesity in preschool-aged children continues to rise in all regions internationally, including in developed countries.

The above information on prevalence rates is based on body mass index (BMI; calculated as weight divided by height squared), which gives a reasonable measure of total body fatness. However, fat distribution is also important. Central body fat – fat distributed around the abdomen, leading to an increased waist circumference and an increased waist-to-height ratio – is associated with an increased prevalence of risk factors for heart disease and diabetes. Simply put, if the waist-to-height ratio is greater than 0.5 (i.e. if your waist is more than half your height), then health risks increase in both adults and children. In Australia, the proportion of school-aged children with a waist-to-height ratio greater than 0.5 has steadily increased from 8.6 per cent in 1985 to 13.6 per cent in 1995 and 18.3 per cent in 2007. It appears that Australian children are changing shape to a more central fat distribution. The implications for future health remain unknown, although it is likely to have an adverse effect.

The 2004 NSW Schools Physical Activity and Nutrition Survey, which included a biomarker sub-study in randomly selected 15-year-old students, showed a high prevalence of chronic disease risk factors in adolescents. In particular, risk factors for heart disease (such as high blood pressure and abnormal blood lipids), diabetes (raised insulin levels) and fatty liver disease were present in many obese, as well as overweight, adolescent boys. Obese girls also had a higher prevalence of risk, although they did not seem to be as adversely affected as adolescent boys. The propensity for body size, eating and physical activity behaviours and risk factors to track from adolescence through to adulthood, would suggest that health care systems can expect a greater burden of disease from obesity-related conditions when today’s young people achieve adulthood.

Given the extent of the problem of child and adolescent obesity, governments and communities have rightly been concerned about how to tackle the issue. If any medium or long-term decrease in obesity prevalence is to occur, then investment in a range of obesity prevention interventions should occur, in a way that affects all members of the community including children, young people and their families. At the same time, there is also a need to provide effective and accessible treatment services for those people already affected by obesity. What options are available for each of these approaches?

In 2009 the National Preventative Health Taskforce released its detailed recommendations on obesity prevention in Australia. These have been the focus of a previous Perspective series. The common theme of the recommendations is the enabling of healthy personal choices around eating and physical activity, through modification of the broader environment. Other important elements include: the use of a range of multi-level, multi-faceted interventions that influence different aspects of the food and physical activity environments; engagement of national, state and local governments, the media, a range of industries, local communities and individuals; and the need for political leadership, supporting a coordinated, inter-sectoral approach.

In tackling obesity prevention, what approaches should be avoided? The following, examples of what has been termed ‘the futility of isolated initiatives’, are extremely unlikely to modify obesity prevalence: focusing on one setting, such as sole school-based interventions, without engagement of the family or broader community; using a single approach, such as social marketing, in the absence of any other community-level change; and ‘cherry picking’ a few interventions without using the underpinning principles noted above.

Finally, what about treating those who are already affected by obesity? Unfortunately, clinical services for obese children and adolescents are currently very limited in all states and territories. Some of the potential strategies for intervention include:

- Developing and implementing a comprehensive and coordinated model of care for moderate and severe obesity, including paediatric obesity, across primary, secondary and tertiary levels of care.

- The resourcing of multidisciplinary paediatric obesity management services within the public health system.
• Resourcing bariatric surgery services in the public health system within each state and territory, including services for selected older adolescents.

• Establishing dedicated training posts so that nurses, allied health professionals and doctors can be given training in paediatric obesity management.

• Implementing undergraduate and postgraduate health professional training in the assessment and management of people affected by obesity.

This is the responsibility of state and territory government health departments, universities and health professional colleges and bodies.

Both effective prevention of obesity, as well as treatment of those already affected by it, are necessary if we are to respond appropriately to the problem of child and adolescent obesity. There are a range of potential solutions. Perhaps the biggest challenge is the political will to address them.

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**The meteoric rise of obesity: why the numbers are stacked against us and the need for realistic targets.**

In 2025, it is predicted that two thirds of the Australian population aged over 25 will be overweight or obese if current trends continue to rise. To paint the picture more crudely, it means that a person of normal weight will soon be the exception rather than the rule. These predictions, using data from the Baker IDI-led AusDiab surveys on more than 11,000 Australians who were tracked over five years, made national headlines late last year. But should the community be shocked? Perhaps more pointedly, shouldn’t we, as epidemiologists, have predicted this a long time ago? Well, not necessarily.

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For the past few years we’ve heard about an obesity epidemic taking a stranglehold on our nation but just how it got to this dire situation, seemingly with little advance warning, warrants a brief examination of the epidemiology of obesity and provides an insight into why science is at a loss to explain it. Perhaps most importantly though, it highlights why we must come to terms with the numbers, and quickly, in order to start setting realistic targets, or face a vastly different-looking community of the future.

For thousands of centuries, obesity was rarely seen. But that doesn’t mean that genetic factors were not at play during pre-historic times, with human physiology playing a leading role in obesity. In fact, humans have evolved to be highly inept at weight maintenance. The propensity to lose weight quickly would have been a characteristic which would not have been useful in times of famine. So part of the reason why we find weight loss so difficult is because it goes against our basic design. A popular theory which accommodates this view is the thrifty gene hypothesis. It proposes that thrifty genes which now predispose people to diabetes and, in turn, obesity were historically advantageous during times of food scarcity. However, in modern societies with an abundance of food, this genotype is preparing individuals for a famine that never comes. When you introduce over-nutrition, increases in portion sizes, increases in fast food intake and lack of physical activity, the result is a recipe for disaster.

So here we have this twentieth century phenomenon where genetic and environmental factors have spectacularly collided and only in the past decade or two has obesity as a major burden of disease really started to rate a mention. Even the World Health Organisation didn’t formally recognise obesity as a global epidemic until 1997 while diabetes, intrinsically linked
to obesity, was only recognised as a chronic, debilitating and costly disease by the United Nations General Assembly in 2006.

The data on diabetes is equally formidable, with its prevalence increasing beyond what would have been expected due solely to our ageing population. In Australia alone, the prevalence of diabetes doubled between 1981 and 2000 and projections show as high as 17 per cent of our population – that’s nearly one in five people – could have diabetes in 2025 if trends continue to rise. When people talk about the problems of diabetes and obesity, the biggest problem is that is has been really, really rapid which is what makes people think there has been some sort of environmental trigger other than eating too much and exercising too less. All our normal pathways of science can’t explain why the increases have been so rapid.

So while we’re grappling with the numbers, the ability to reverse this trend is all but being lost. In 2008, The Council of Australian Governments (COAG) set a target: to increase by five per cent the proportion of Australian adults at a healthy body weight by 2017, from 2009. While target-setting is a critical component of public health policy for obesity prevention, we recently analysed the changes in current weight gain that would be required to meet Australian targets and the news is grim. It has been well demonstrated that the prevalence of healthy weight is expected to plummet in the coming decade with a likely decrease among Australian adults from 35 per cent in 2010 to 30 per cent in 2020 if current trends persist. For diabetes, the target is to be back to levels seen in 2000 by the year 2025. To achieve those figures, we modelled how long it would take based on our current intervention practice. The numbers again tell a shocking story – we won’t even get close.

As epidemiologists, we’re used to working with figures but interestingly, the numbers continue to take most people by surprise and yet we are only beginning to come to grips with the rapid escalation of both obesity and diabetes. In coming to terms with this epidemic, we must also face the associated economic cost of obesity. Research published in the MJA in 2010 by the University of Sydney’s Boden Institute of Obesity Nutrition and Exercise showed that the total direct cost of overweight and obesity in Australia is $21 billion a year. In 2007-08, that represented close to one fifth of Australia’s entire $103.6 billion health expenditure budget. Perhaps most concerning of all is that just over $3 billion that year was allocated for preventive services or health promotion. Even without passing judgement on who should be doing what and what form that might take, it is easy to see how the community and policy makers might become disillusioned and question our ability to halt, let alone reverse, the trends of overweight and obese people in Australia. We need to set realistic and practical targets because we know that any road to major change will take decades – even with major investment, commitment and goodwill. In this context then, even maintenance of current levels of healthy weight might be considered a marker of success.
Obesity and cancer: the links and implications.

Links between obesity and the risk of developing cancer have only started to become apparent over the last two decades. Evidence is growing of a link between obesity and certain cancers. However, the causal relationship is only part of the story, as obesity also affects treatment outcomes for cancer patients.

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Research into the relationship between obesity and cancer has lagged behind the strong links that were established much earlier between obesity, heart disease and diabetes. For this reason, until recently, cancer agencies have not been in a sufficiently strong position to justify action on obesity. This position is now changing due to research producing more evidence to justify key players in the cancer community becoming partners in strategies against obesity.

The change began with the establishment of large, prospective cohort studies, principally researching links between diet and cancer, which commenced during the last decades of the twentieth century. These cohort studies followed groups over a period of time to observe outcomes related to dietary factors. The studies were largely conducted in America, Europe and Australia and the majority of the studies collected self-reported data on height and weight. A few of the studies repeated these measures during their follow-up.

It is important to note that very few studies that look at obesity and cancer have collected direct physical measurements. This is important, as self-reported body dimensions are prone to error. Overweight people commonly tend to underestimate and underweight people tend to overestimate their true weight. This contributes to reducing the strength of any estimate of association, so the real associations between cancer and obesity might be stronger than observed.

It is interesting to reflect that the early findings on diet and cancer risk obtained from retrospective case-control studies have mostly been contradicted by the findings from cohort studies (the retrospective studies involved researchers working backwards, looking at data for selected subjects with known outcomes). The exception to this has been the consistent associations reported, regardless of study type, between body mass index or BMI, (the measure of overweight and obesity based on height and weight), and cancer risk. This is probably because height and weight are single measures that can be recalled reliably and with more precision than other factors, such as past dietary habits. So far, epidemiological research has not implicated obesity in increasing all forms of cancer. Furthermore, any association differs in strength depending on gender, the type of cancer and the age of the patient at diagnosis.

The cancers for which we have convincing evidence of an association with overweight and obesity include breast, colon, rectum, prostate, endometrium, pancreas, oesophagus, kidney and gall bladder.

Based on current evidence we estimate that about 5 per cent of cancers are attributable to overweight and obesity but this percentage will grow as more people increase their BMI. The extent of the link also differs by cancer type and is as high as 39 per cent for endometrial cancer, 37 per cent for cancer of the oesophagus and 25 per cent for renal cancer. It has been estimated that up to a third of cancers can be prevented through modifying aspects of lifestyle such as smoking, diet, alcohol and physical activity.

Most of the evidence we have on obesity and cancer is based on adult BMI data collected at the recruitment stage of research studies. Few studies have collected information about body sizes at other times of life and we do not know at what time of life obesity might be most important to carcinogenesis (i.e. whether this could be a bigger factor in infancy, childhood, adolescence or adulthood). Similarly, we do not yet know for how long a person must be obese to increase their risk of developing cancer, and we do not know whether weight reduction will actually deliver reduced cancer risk outcomes.
Researchers are currently looking at the extent to which obesity influences cancer risk by exploring similar biological pathways to those that are known to be important to heart disease and diabetes. There is emerging evidence that obesity might influence the growth of cancer cells through insulin and insulin-like growth factors or via sex hormones, particularly oestrogens. There is also evidence that suggests cancer development is promoted via the pro-inflammatory responses associated with obesity.

There is still a long way to go with researching the links between obesity and cancer before we have a full understanding of the relationship. What we do know is that it is far more difficult to treat obese patients for certain cancers. There are a number of examples of this, such as late-stage bowel cancer which is difficult to treat due to surgical risk associated with anaesthetics, long and complex operations and obesity. For obese patients, cancer is also harder to diagnose due to the excess body fat concealing tumors and the presence of other health conditions and symptoms associated with obesity.

An increasing number of studies have demonstrated poorer survival outcomes for overweight and obese cancer patients, independent of their treatment. This observation is probably linked to some of the physiological consequences of being obese such as systemic low-grade inflammation. The pressing question is: what are the implications for health planning and preventive medicine?

Unlike cardiovascular disease and diabetes, we have little evidence that reversing obesity will actually reduce cancer risk – although intuitively, it should. This lack of evidence should not deter us from taking a stance analogous to that taken with respect to The Broad Street Pump, a famous case study in the history of epidemiology where a physician, John Snow, gathered evidence that showed a cholera outbreak in Soho, London, centred on a particular well. Without understanding anything about germ theory and causation of cholera, he removed the pump from the well in Broad Street and the epidemic abated.

Undoubtedly, the evolving evidence of links between obesity and various cancers will give additional momentum to the development and strengthening of policies, regulation and interventions to combat the obesity epidemic. Like John Snow in the The Broad Street Pump case study, we have enough evidence that obesity is connected to cancer risk, even if we don’t understand all the biological pathways. This is enough evidence for us to take action. Key players in the cancer community, such as the Cancer Council, are becoming partners in strategies against obesity alongside organisations such as Diabetes Australia, the Heart Foundation and VicHealth, as well as with universities and research institutes.

Tighter regulation around factors that could contribute to the obesity epidemic, such as junk food marketing, advertising, tax, food pricing and food labeling, will hopefully come into effect as a result of changes in policy. Obesity intervention programs that aim to bring about social change around diet and exercise, although in relatively early research stages, are also beginning to show promising behavioural changes.

So, as we now have mounting evidence that obesity increases the risk of developing cancer and decreases the chances of surviving it, we should be considering the links, implications and preventive options.

A wide range of factors contribute to the obesity epidemic: it is a complex problem. It is widely recognised that one measure on its own will not create change; we need a comprehensive, multi-strategy approach. It has been demonstrated in tobacco control that a mix of programs, social marketing, policy and regulatory changes can favourably influence cancer trends. The same approach is required in the battle against the obesity epidemic.
Investment in diabetes education in remote Indigenous communities should not be undervalued.

With chronic disease devastating Indigenous communities and a lack of research compounding the problem, lessons and observations from remote community clinics can be invaluable. Steve’s journey is just one of many and highlights the myriad of challenges facing Indigenous Australians trying to manage their health.

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Arrangements have been made to occupy a small, unventilated room in the town’s health centre for the next two days to run a diabetes clinic. The four-wheel drive is packed with medical supplies as the team set out on the three-hour trip to the remote community outside Alice Springs. Also on board are visual education aides including healthy eating charts and a life-size felt man with stick-on pieces to demonstrate how insulin works in the body. Less than 70 per cent of Australia’s Indigenous students meet the minimum reading standards so novel approaches to education are required. Our visit includes a basic cooking demonstration by one of our diabetes educators on the basketball court as part of efforts to promote healthy eating.

Word about the clinic is spreading but whether patients like Steve will show up for their appointment – their only consult with a specialist in six months – is less certain. At just 22 years of age, Steve has been referred to the clinic after presenting at the Alice Springs hospital acutely unwell earlier in the year. His blood sugar level was so high he was disorientated and his vision blurry; the fact he hadn’t collapsed was surprising. He was also suffering from anaemia, pneumonia and a urinary tract infection. Unfortunately, patients like Steve, who present with a range of co-morbidities, are not uncommon in Central Australia. Diagnosed with type 2 diabetes mellitus, Steve is at the beginning of a long journey in the management of his disease, a journey he may or may not make with a range of primary healthcare providers in the region. Being diagnosed at such a young age might ring alarm bells for some but for Steve, it’s just another issue in a long line of competing priorities. At the time of his diagnosis, he was more concerned about returning to his family in a remote community several hours away to attend a funeral.

Steve made it to his first consultation, thanks to urging from his grandmother. Most of the family has type 2 diabetes, some try their best to manage it. Steve nods in understanding as the diabetes educator takes him through the healthy eating chart. The likelihood he will buy any of the small array of fruit and vegetables on offer at the only store in town is slim, with accessibility and the cost of fresh food working against him. A survey in the Northern Territory in 2006, for example, found that the average cost of a standard food basket in remote stores was 29 per cent more expensive than a Darwin supermarket, while a remote store in the Barkly region was 56 per cent higher than the metropolitan area, with the cost differences particularly high for fruit and vegetables. For diabetes patients already facing a myriad of challenges in managing their health, environmental influences are additional unwelcome distractions. It is therefore hard to know what Steve makes of the chat about the importance of lifestyle modification.

Good glycaemic control is another ongoing challenge for people with diabetes. A few days after Steve’s clinic appointment, he had lost his blood glucose machine and in any case, he didn’t have anywhere to store his insulin. He doesn’t know that his blood sugar levels are continuing to go up, not down. If he comes back for another check-up, the team can ensure that he has a replacement monitor and the Alice Springs hospital can download the results and track his progress remotely. They can also talk about a secure, refrigerated place to store his insulin. Despite appearances, Steve has been thinking about the impact of diabetes on his relatives, many of whom are visibly suffering complications of the disease.

For the fly-in, fly-out medical team, there are many hurdles to effective diabetes management.
in remote communities. The likelihood that Steve will end up with diabetic complications such as retinopathy, vascular and kidney disease is high. The Alice Springs Hospital – Steve’s main link to emergency care – is home to the single largest freestanding dialysis unit in the southern hemisphere and 87 per cent of patients who enter the unit already have diabetes. For people with type 2 diabetes, a decline in kidney function over 10 to 15 years is not uncommon. But for a new generation of Indigenous people like Steve, cases of rapid deterioration in much shorter timeframes are becoming more frequent. While retinopathy is another possibility, it doesn’t have to be that way. Dr Shane Durkin, a Fred Hollows Fellow based at the Alice Springs Hospital told a diabetes symposium earlier this year that 98 per cent of people with diabetes should have good vision and didn’t need to suffer vision loss. Nevertheless, he said a clinic-based study of eye disease in Central Australia found that 35 per cent of people with diabetes had retinopathy, including vision-threatening retinopathy.

What’s more, the likelihood that Steve will live to the age of 65 is statistically unlikely, with life expectancy rates working against him. The chance of reaching the age of 65 for an Indigenous male is 25 per cent – compared to 90 per cent for the rest of Australia. If Steve develops complications, the cost of caring for him will also double from about $5000 to $10,000 per annum but it is the impact on his quality of life that will be most profound.

However, there is an upside for people like Steve. Despite a shortage of healthcare professionals in remote areas, a great deal of routine diabetes care can be provided by non-physicians based in the community. Structured care in remote settings can improve control of blood pressure and reduce complications, especially infections, in high-risk populations. A one-year study by McDemott in 2003, for example, showed improved diabetes care processes and reduced admissions to hospital when local indigenous health workers used registers, recall and reminder systems as well as basic diabetes care plans supported by specialist outreach services. More specifically, the proportion of people with good glycaemic control increased from 18 per cent to 25 per cent in line with increased use of insulin from 7 to 16 per cent. Change can also be introduced swiftly. We’ve been known to conduct clinics on the veranda of remote outstations where blood glucose and HbA1c measurements were done on the spot and treatment changes made.

Basic, grassroots approaches such as the inclusion of a diabetes educator in the clinical outreach team and the introduction of more continuous care between remote nursing staff, diabetes educators and treating specialists is helping to improve all aspects of diabetes management. For Steve, simple steps like monitoring his blood sugar levels regularly and making even minor adjustments to his diet could have a big impact. These simple adjustments may not be the panacea to the Indigenous health divide, but they are a start. Economically, they also make sense. A diabetes educator made available for every community may sound idealistic but if it helps to cut rates of chronic disease, reduce complications and improve a person’s quality of life, it could pave the way for better health for future generations.