

Baker IDI PERSPECTIVES

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In this edition of Baker IDI PERSPECTIVES

JOHN B DIXON AND PAUL ZIMMET

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PAUL ZIMMET AND DAVID HILLMAN

With the rise in type 2 diabetes and obesity in our community we are seeing a new health burden: sleep apnoea.

Whether or not obesity is increasing too many people are too overweight for good health.

GARRY JENNINGS AM

Director, Baker IDI Heart and Diabetes Institute

There is no doubt the controversy surrounding public obesity figures has intensified in the last 12 months with some commentators suggesting our nation's "obesity hysteria" is based more on moral handwringing and research trendiness than on actual waistlines. In particular, reporting of childhood obesity figures has been keenly debated, with some researchers suggesting obesity in children has in fact plateaued since the 1980s and there may be no further cause for alarm. As the dire health consequences of obesity – diabetes and heart, stroke and vascular disease – permeate the public consciousness at every level, from the school canteen to health research priorities and even informing government and bureaucratic priorities, a backlash is inevitable. Different research methods and methods of analysis of existing research will always give rise to varying statistics.

What we can say with authority, however, and the reason we have taken this important health issue as the theme to launch our inaugural publication, *Baker IDI Perspectives*, is that we are by no means becoming slimmer as a nation and we are paying dearly for this fact, both socially and economically. Just how many of us are fat and where we sit on an international scale of obesity, some issues explored last year around the release of our widely controversial publication *Fat Bomb* is a moot point. It remains indisputable

that obesity continues to contribute to premature death and ill health and that lifestyle factors play an important part in the development of obesity. As such, the medical research community carries a responsibility to continue a broad range of research activity into the causes and the effects of obesity while simultaneously investigating strategies to combat this problem; both in the development of meaningful lifestyle interventions and in the development of novel therapies. Whether we believe the



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highest rate, from last year's *Fat Bomb* report, or the most recent rates from the Australian Institute of Health and Welfare and other studies, is something we do not agree on ourselves, but either way it is too high.

**AN EXTRACT FROM THE
NATIONAL PREVENTATIVE HEALTH
TASKFORCE'S TECHNICAL PAPER
ON OBESITY CONFIRMS THE EXTENT
OF THE PROBLEM:**

"The prevalence of overweight and obesity has been increasing significantly over the last two decades. Data from the 2004–2005 National Health Survey indicate that nearly half of all Australian adults (based on self-reported height and weight) were overweight or obese in 2004–2005: around 7.4 million adults were overweight or obese (over one-third of these were obese) and close to three in every 10 Australian children and young people were overweight or obese... Over the past 20 years, the average weight of Australian adults increased by around 0.5 to 1kg per year, attributable to a mean energy imbalance of around 100 kcal per day."

The upshot is that obesity leads to a range of conditions that compromise health and shorten life. From the major consequence of cardiovascular disease and diabetes, we are also witnessing some cancers, back and reproductive problems and sleep apnoea. As the report states, overweight and obese children and adolescents face the same health consequences as adults and "may be particularly sensitive to the effects on their self-esteem and peer-group relationships."

Whether or not obesity is increasing too many people are too overweight for good health. In fact, even if childhood obesity figures are relaxing, this is not the best way to gauge a public health epidemic: we know that many overweight and obese adults describe themselves as of a normal weight, or even "skinny", as children. We know that abdominal fat is more important for health than fat elsewhere in the body, leading to false insecurities in many people who, without their pot bellies could be svelte. Getting people into good habits at every stage of their lives and refusing to waiver from the argument that excess weight carries an excess disease burden is crucial. We must continue to educate children about what they must do to avoid poor health because we know that the majority of problems brought on by obesity come home to roost in middle age. New research, much of it carried out at Baker IDI, is increasingly showing that poor health is genetic – epigenetic, in fact. That the physical changes brought about by a poor diet in your lifetime have the capacity to influence your offspring's propensity for health and disease. Waiting on the sidelines until you become fat before acting to improve your diet and lifestyle is too late. We need broad community intervention and reminders of the value of maintaining a healthy weight. Maybe just assessing the average kilograms of our children is too simplistic – science is certainly telling us so. Social disadvantage plays a significant role in health and disease, and there is a phenomenon increasingly known as "recession fat", because in many parts of the world the foods worst for health are the cheapest. Obesity is a complex social and physiological state. Let's not get bogged down in dubious figures and pedantic debate if we are serious about improving health. The focus on childhood obesity – indeed, obesity in the general community – needs to be more sophisticated than counting the number of fat kiddies we see on the street.

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The disaster of Black Saturday we witnessed in Victoria in February touched the hearts of Australians across the nation and also around the world.

The magnitude of the fires and the sheer devastation they wreaked astonished and appalled us. Understood to be the worst peace-time loss of life in Australian history, the fires also left many hundreds of families homeless. Indeed entire communities – the worst hit being Kinglake and Marysville – were burnt to the ground, virtually nothing remaining and no sign of town infrastructure. Rebuilding these communities is a long and difficult process, but the generosity and care shown to survivors by the broader population – with donations of time, money and shelter – has reminded us all that even in tragedy there is some sign of hope. Maybe the phoenix is there under the ashes.

GARRY JENNINGS

There is a radical idea I'd like to propose and at its heart is the notion that when we rebuild, perhaps we can take the opportunity to be stronger, smarter and healthier. A model of town design developed in France, called EPODE, an acronym for Ensemble, Prevenons L'Obesite Des Enfants – translated as Together, Let's Prevent Childhood Obesity – has shown great success where it has been implemented. To date, there are 167 such towns in France and the idea is being extended across Europe.

Strikingly simple at its heart, the idea of EPODE towns is a pragmatic implementation for, with and by communities of steps to "fat-proof" environments while initiating intensive prevention programs. It certainly involves coordination and commitment and the resources of local farmers, dieticians, doctors and even pharmacists. It was developed in the early 2000s after growing national concern at childhood obesity rates.

The program aims to address a growing ignorance of food with an understanding of what is local and what is in season – and how to prepare such ingredients. It also has child-friendly walking-to-school routes to encourage children of primary school age to walk to school together in the morning safely. It is tied in with information on a healthy and nutritious breakfast for every child at home to discourage the need for a 10am snack at school. Children are weighed and measured once a year and the parents of those believed to be obese, or at risk of obesity, are encouraged to attend information sessions and to see their local GP. Information nights are held for parents at local schools and the menus offered at schools which often serve lunch

and at day-care centres, which always do – are encouraged to be modified to contain less salt, sugar and fat. Go into a local pharmacy and see a pamphlet on local produce in season. Exercise is encouraged according to the age groups involved – what eight-year-old doesn't like ball tiggly?

If it sounds familiar it may well be – celebrity chef Jamie Oliver took on such principles in his series focusing on improving school lunch menus in rural Britain.

Children in Victoria's Kinglake or Marysville may not be more overweight on the whole than counterparts in other areas but research confirms that there is a greater problem with obesity and overweight, high blood pressure and blood glucose levels, outside metropolitan cities. If we can accept that we are moving away from traditional, unprocessed food sources and we know that children are exercising less, we can also surmise that there is a need for better education about health and exercise and that such education needs to be approached holistically. Our best hope of health for future generations lies in supporting and educating whole communities and not just individuals.

We have a clean slate in these towns – brought about by tragedy, yes – but maybe we also have the unparalleled opportunity to trial a program that has had strong success overseas.

Together, let's prevent childhood obesity.

We are getting fatter as a nation and as a consequence we are finding new ways to conquer fat.

Obesity is a term that outlines a serious public health threat, with devastating consequences including type 2 diabetes, heart disease and some cancers. Worse still is the scientific understanding that changes in cells and metabolism caused by obesity in one generation are being passed on to the next. You are not just what you eat, research is showing us, but quite possibly what your great-grandmother ate too. We are becoming inured to larger profiles on the street, and the word obesity itself is becoming fatigued. But without proper intervention and public support for the importance of weight loss in the overweight, the true cost – social, economic and personal – will be felt and carried by our own grandchildren. We talk about going green to save future generations – we must not forget the importance of also going “lean” for posterity.

JOHN B DIXON AND PAUL ZIMMET, AO

Soon after the media images of Christmas indulgence abated we were inundated with messages on how to lose weight and the weight loss industry itself cranked up a notch. It is a sad cycle and one that for some among us who are morbidly obese may end in surgery. It is this growing trend, of bariatric (weight loss) surgery as a solution to obesity, that has us concerned as researchers and as clinicians. It is our firm professional view that obesity surgery does not provide the solution to this escalating public health threat.

Not in question is the safety and efficacy of some forms of bariatric surgery. So many large and wide-ranging studies have now been conducted that it is generally accepted in the medical community that bariatric surgery provides significantly more sustained, long term weight loss than any other medical treatments. The effects of this weight loss on other conditions such as type 2 diabetes as well as the improvements seen in parameters such as coronary heart risk factors and quality of life have also been well documented. Surgery provides proven benefits with obesity-related illnesses and ultimately saves lives. As yet unexplained, but very enticing from a research point of view, is that an improvement in diabetes control may be seen even prior to the weight loss with some forms of surgery. This suggests that the procedure has some, as yet unidentified, important metabolic effect. Indeed, why surgery is such an effective weight loss therapy remains a mystery and of great research interest.

Also not in debate is the use of surgery in patients with severe (morbid) obesity before other therapies

have been tried. Of course the less invasive treatments should be used first.

Having said this, it is very rare to see a morbidly obese person with a body mass index (BMI) of 45 who has never before seriously tried to lose weight – quite the converse is the case, and often soon after the Christmas season. Most have struggled with many different therapies and the decision to have surgery is not taken lightly. It is no quick fix and the nature of the surgery is not something that most normal or overweight people would ever like to contemplate for themselves.

But bariatric surgery will not stop the epidemic of obesity. Surgery is about treating severe obesity – not preventing the upward drift of the general population's weight. There should be funding for both prevention and treatment.

For the present, it is essential that the debate should focus on the group of people who are most likely to benefit and whose treatment will eventually pay for itself in future health cost savings. The limited healthcare resources we have, given our population and our health problems, should be directed to those with the highest BMI and those with a high BMI coupled with serious weight-related illness such as heart disease, type 2 diabetes, arthritis and sleep apnoea. There are many in this category now and they are not receiving adequate care in our health system.

This should not be an emotive issue just as the decision to refer for a heart bypass operation is not. Serious health problems deserve more than a “bandaid” approach.

Careful selection of those most likely to benefit will ensure the credibility of the use of bariatric surgery. Irresponsible selection of patients will not help the cause of improving general health.

Consideration of people for surgery, for example our indigenous and overseas immigrant communities, should also take into account social and cultural issues relating to both surgery and obesity. Why it is that Tasmania has the highest rate of bariatric surgery – in both the public and the private health systems – given its relatively small population should pose some questions for state-based attitudes and medical trends.

Nevertheless further research into understanding why the surgery is so effective and why it can benefit patients with type 2 diabetes may lead to new therapies. Let us keep the debate alive but in perspective. Let's ensure that the government targets funding to those most in need of this intervention.

Dr. John B Dixon is head of obesity research at the school of Primary Health Care at Monash University and a senior clinical scientist at Baker IDI Heart and Diabetes Institute.

Professor Paul Zimmet is Director Emeritus of Baker IDI.

It is indisputable we need to eat less and exercise more.

How to do this without feeling hungry and unhappy is the subject of much research. Whether changing the composition of the diet to include more protein or making it Mediterranean in style – with boosted olive oil and its traditional accompaniment, tomatoes – aids long-term compliance to a reduced energy intake is not clear.

PETER CLIFTON

A recent large study in the US concluded that macronutrient composition (macronutrients being nutrients that the body uses in relatively large amounts - proteins, carbohydrates, and fats, as opposed to micronutrients, which the body requires in smaller amounts, such as vitamins and minerals) made no difference and only good attendance at support classes helped.

There was however some evidence within the study to suggest that higher protein levels may achieve better results. Still, a recent Israeli study over two years suggested that macronutrients do matter – at least in a workplace setting where the volunteers environment is more controlled. Low carbohydrate, high-protein diets and Mediterranean diets may be better than low fat diets. All of these studies randomised people and of course the results might have been quite different if people

were allowed to choose their preferred diet over a two-to-three-year period. Surprisingly this has never been done.

Ensuring compliance to long-term energy reduction requires psychological support for some people. This may best be delivered in person but we can now investigate new, tech-friendly options that suit some: phone/SMS and online support should all be considered.

It is clear that such an individualised approach has not been taken in most studies; intervention research studies need to cater better to the lifestyles and demands of those who need the support. This is one clear area that needs closer attention. Testing these approaches in large groups of volunteers is one research gap that remains to be filled.

There is some evidence that a person's degree of insulin resistance

– a precursor to type 2 diabetes and all its complications – will predict either the amount of weight lost or the beneficial response of weight loss on blood fats, glucose and inflammatory markers. This group is an important target when we address the efficacy of our lifestyle interventions, interventions that are increasingly important as we try to address the health complications and subsequent social and economic burden of our previous poor lifestyle choices. It is clear that preaching will not work alone. We need to have research and technology on our side as we aim to redress these poor choices, and future approaches must utilise these tools.

Professor Peter Clifton is head of Nutritional Intervention at the Adelaide campus of Baker IDI.

The greatest risk factor for poor health and the complications of obesity – cardiovascular disease, kidney disease and diabetes – exists in people from disadvantaged backgrounds.

McDonald's, the internationally-powerful and phenomenally successful fast-food chain, has reportedly earned an 80 per cent rise in global profit in the last financial year. That this staggering increase has come at a time when most families and individuals are feeling the pinch of the economic crisis that has gripped the world is unlikely a coincidence.

GARRY JENNINGS AND KERIN O'DEA, AO

The decline of "fine dining", the rise in fruit and vegetable prices brought on by drought and high fuel prices and the rise of fast food sales is consistent with our research that shows there is a strong link between poverty and overweight. The greatest risk factor for poor health and the complications of obesity – cardiovascular disease, kidney disease and diabetes – exists in people from disadvantaged backgrounds.

It can be a hard idea to get your head around in downtown Melbourne or Sydney but malnutrition and obesity can, and frequently do, co-exist - in one person, in one family and frequently, it cascades through generations. We are not talking about far-flung countries or some war-torn, famine-stricken, headline-grabbing place. Even in impoverished Australian societies we can see the effects on community of the combination of poor education, limited resources, and distance from fresh food sources.

Research has shown us that indigenous diets have inherent protective qualities and that problems in health are most likely to occur when communities move away from their traditional diets. This is as true in Australia's Aboriginal community as it is in the nation's Greek, Italian, Arabic and African communities. Traditional diets evolved over centuries and meal preparation was always closely aligned with food freshness, seasonal availability, and lifestyle. Today, there is a great gulf between the move towards "convenience" foods and calorie expenditure; food affordability and nutrition. In short, the poorer you are, the less bang you get for your food buck. Food choice is not just personal, it's political.

Plot a graph of calories and kilojoules per gram, versus calories and kilojoules per dollar, and we find an inverse relationship. All the foods we are telling people not to eat are in fact the best value for money when you're hungry and feeding a family on few dollars. All the food that we are encouraging: fruit, vegetables, lean meat and fish are very expensive. And the further you move away from the city centre, the more expensive they are.

Those living in poverty are often desperately hungry and chronic hunger drives unhealthy eating patterns. Eating large amounts of whatever is available is a natural response to prolonged periods of insufficient food and in terms of health it is the worst possible way to eat.

When money is tight parents, often mothers, will sacrifice for their children. In times when there is plenty of food around, those parents will often, even more than other people, eat a huge amount when they can. It is possibly the worst way to eat if you are to avoid gaining weight. Add to that the fact that the types of foods chosen are frequently the worst choices, because they are the cheapest.

And so we see serious weight problems, most prevalent, as research confirms, in disadvantaged groups. We have to shake off the notion that obesity is a sign of affluence – increasingly, it is a sign of poverty, and one of the most powerful symbols of Western privilege is a slim and toned adult physique. Over-nutrition and under-nutrition exist in the same household – put bluntly, fat adults and skinny kids, or fat adults and fat kids. It is all a sign of malnutrition. Skinny kids in fat households often means that the

child still has a faster working metabolism and has not yet learned to overcompensate when food is available.

We know that most people are spending half of their income on food. In many instances, that is not money spent on a good diet. We have calculated that if people spent another 20 per cent of their income – which they can't do, that would be 70 per cent – they could afford a healthier, more reasonable diet. But it's hard enough to survive on welfare without food being 50 per cent more expensive as it often is in remote communities, fresh food in particular.

A lot of the diet-related conditions that are plaguing our community are driven by poverty, not bad behaviour or even lack of education. When you are poor in an affluent society you want to maximise calories per dollar. People want to feel full. Put simply, the best calories per dollar are fat, oil, sugar and flour – unchecked, these are the greatest contributors to our obesity problem.

We have some ideas about how to best use the health prevention dollar that exists in the Australian

Government's health budget – given that obesity (as the main cause of some of the nation's most serious and expensive health problems) is now a welcome national health priority. Looking into food availability and source; looking to supplement the diet of remote and regional communities, or even just the children of these communities at schools, is one option. In a partnership with schools, child care centres and local councils, a plan that reduced the cost of fresh food and boosted its availability in the most disadvantaged areas might be an option worth exploring. We certainly welcome the opportunity to look at obesity as a problem that goes beyond the individual and penetrates the most serious inequities in our society.

Professor Garry Jennings is director of Baker IDI Heart and Diabetes Institute and Professor Kerin O'Dea was previously part of the Baker IDI population health and nutrition group and is now with the University of South Australia.

Far from being a passive activity, sleep is a working, regenerative state that is vital for good health.

We have long known that sleep is critical for the development of infants, and that during this important time of rest little brains develop and make the neurological connections and growth that lead to intellectual development. At all ages sleep disruption impairs the ability to think, learn, remain vigilant and control emotions. Among other things these impairments lead to poor productivity and increased accident risk, with huge costs to individuals and society. A recent Access Economics analysis suggested that sleep disorders cost Australia \$10 billion annually.

PAUL ZIMMET AND DAVID HILLMAN

Despite this there is widespread complacency about the importance of adequate sleep and the effects that poor sleep, as well as not enough sleep, can have on our overall health.

With the rise in type 2 diabetes and obesity in our community – indisputably now an epidemic in developed and developing nations alike – we are seeing a new health burden: sleep apnoea.

Characterised by repetitive brief collapse of the upper airways during sleep, this condition remains difficult to diagnose without close surveillance. We do know, however, that a high proportion of people

with type 2 diabetes also suffer from sleep apnoea. They can, in extreme cases, stop breathing hundreds of times a night, sometimes for periods exceeding a minute before arousing. These arousals may only last for seconds, and so are not recalled by the sufferer. However they are enough to disrupt sleep making it unrefreshing and leading to daytime tiredness and lethargy that is often very disabling. Because of the brevity of the arousals, many sufferers are unaware that this is even occurring in their sleep. So while they awake feeling tired, and struggle to function during the day, they may have no idea of the root of their problem. Their partners may

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complain of the loud snoring that usually accompanies sleep apnoea and may have noticed the interruptions to their breathing pattern.

Compounding the dilemma of proper diagnosis and appropriate treatment for people with type 2 diabetes is that the tiredness is often attributed to the diabetes itself. Without identification of the obstructive sleep apnoea it is easy for those people who do seek medical advice to be given extra treatment for their diabetes to address the symptom – leaving the underlying problem unaddressed.

So grave and yet unrecognised is this health burden, the International Diabetes Federation in June 2008 issued a Consensus Statement on Sleep Apnoea and Type 2 Diabetes. This was designed to help clinicians in diagnosis, treatment and prevention of the disorder. The statement was published in the July 2008 issue of Diabetes Research and Clinical Practice bringing the issue to international prominence.

In the IDF statement, to which we contributed, it was noted that: *“Recent research demonstrated the likelihood of a relationship between sleep-disordered breathing (SDB) and type 2 diabetes...(while) the exact nature between the two conditions remains uncertain, the association between them has important implications for public health and for individuals. Additionally, both Type 2 diabetes and SDB are strongly associated with cardiovascular disease.”*

We are gratified that obstructive sleep apnoea is gaining international recognition as an important health problem in its own right and that its relationship with type 2 diabetes and with obesity is acknowledged. We hope that this will lead to heightened awareness among the community and the medical profession, improved clinical methods of diagnosis and treatment, and further scientific investigation into the links

between type 2 diabetes and OSA. Both conditions increase the risk of cardiovascular complications and are associated with premature ill health and disability.

There are good epidemiological studies showing that disordered sleep is associated with increased risk of workplace and motor vehicle accidents, reduced productivity and mood disturbances including depression. We believe that the effects on our broader society of poor sleep, brought about by years of poor sleep habits (including inappropriate shift work schedules) and undiagnosed sleep disorders are yet to be fully understood. In the Access Economics report referred to earlier, a striking finding was that while there was a \$10 billion a year cost associated with untreated sleep disorders. Only \$200 million per year was spent identifying and treating them.

A greater awareness of the problem of sleep disturbance is crucial. GPs need to be aware of this common accompaniment of type 2 diabetes and of obesity. There are measures available to help, including continuous positive airway pressure therapy (an Australian invention) which is a very successful form of treatment, particularly where sleep apnoea is moderately severe or worse.

We urge all practitioners to better understand the complex process that is sleep; and to recognise poor sleep has long-term health consequences of its own. Treat the diabetes and its co-morbidities is our message.

Professor Paul Zimmet is Director Emeritus at Baker IDI.

Professor David Hillman is head of the Department of Pulmonary Physiology at the Sir Charles Gairdner Hospital in Perth and a leading authority on sleep.

‘We urge all practitioners to better understand the complex process that is sleep; and to recognise poor sleep has long-term health consequences of its own. Treat the diabetes and its co-morbidities is our message.’



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MELBOURNE

ADELAIDE

ALICE SPRINGS