A weighty inheritance

SOMETHING inherently wrong with our lifestyle is making us fat. Research suggests the western world is experiencing an obesity epidemic with grave health and economic consequences.

With more than 60 per cent of adult Australians classified as overweight or obese, it presents a huge challenge for governments and has population health researchers looking for answers to this modern condition.

Up until a few thousand years ago, having reserves of body fat was of great value during times when food was scarce. But in the developed western world, times of feast are no longer interspersed with times of famine. For most of us, food is plentiful and it's a feast all year round.

The health significance of our expanding waistlines is enormous. For the individual, carrying a lot of extra body fat increases the risk of heart disease, diabetes and some cancers, while for government, obesity is already a major cause of rising health expenditure and will increase over the next 20 years.

What's most concerning to many researchers is the fact that obesity is creeping into generations of Australian families.

While food quantity and lack of physical activity are well documented causes of obesity, UniSA Deputy Vice Chancellor: Research and Innovation, Professor Caroline McMillen, believes that developmental factors are also important in programming our body weight in adult life.

Prof McMillen is co-director, with Dr Janna Morrison, of UniSA's Early Origins of Adult Health Research Group, which researches how the early nutritional environment of the embryo, fetus and infant is important in determining risk of disease in adult life.

She said research across the world had shown patterns of growth before birth had everything to do with body weight and the risk of developing obesity in later life.

"A large number of studies worldwide have shown that when women go into pregnancy heavy, they have large babies, and those babies then go on to become heavy later in life," she said. "This has prompted a number of world agencies to consider that in the western world we're currently experiencing an intergenerational cycle of obesity.

"Our group is working to understand why it is that the baby born to the overweight or obese mother has an increased likelihood of being obese in childhood and in adult life.

"We have proposed that when the embryo and fetus are exposed to relative over-nutrition, there are early changes in the fat cells and the appetite regulatory centre of that baby which are programmed for life, and make them develop very efficient fat storing mechanisms for life."

Prof McMillen and Dr Morrison are currently leading a National Health and Medical Research Council (NHMRC) funded project into the role of maternal nutrition around the time of conception and the programming of later obesity in the mother's offspring. They will compare the mechanisms which contribute to obesity in later life after exposure to a high level of maternal nutrition either during the development of the early embryo or during later pregnancy. They are building on work by PhD student Leewen Rattanatray on the specific effects of periconceptual over-nutrition.

"Knowing more about what it is that shapes our metabolism in early life will provide us with a deeper understanding that it's not just willpower that's required to overcome the obesity epidemic," Prof McMillen said.

This is a significant point, especially as obesity has largely been treated by health professionals and governments as an individual problem. But with the ever-rising costs associated with obesity, governments are taking action to address the wider problem through social marketing campaigns and policy development.

In South Australia, the annual cost of obesity including the associated burden of disease, has been estimated at around $4 billion.

The State Government allocated $11 million in 2009-2010 to tackle obesity and support healthy eating and physical activity. SA Health runs a number of programs targeting obesity including the Obesity Prevention and Lifestyle (OPAL) program for children and families, and the Go for 2&5 fruit and vegetables campaign.

UniSA Sansom Institute for Health, Research Director, Professor Kerin O'Dea said programs like OPAL, based on a successful French program, had a lot of merit.

"Obesity is an important focus for government simply because of all the adverse health consequences," Prof O'Dea said.

"The OPAL program is based on early intervention and I absolutely agree with that. It's also looking at the things I don't think we have previously done enough of, which is working with local government on things like bicycle paths and walking tracks, and solutions outside of the health system."

Prof O'Dea recently won an $8 million grant from the NHMRC to better understand diabetes and cardiovascular disease in Indigenous people, which is around 10 times higher than in non-indigenous people.

Prof O'Dea said Australia had adopted many American cultural values towards food.

"At social functions, theatres, movies, even relatively short corporate meetings, food is everywhere," she said. "We have access to food all the time and it's energy dense. We can drink calories, we can eat calories, and food labels shout messages at us like 'low fat' when actually they're high in sugar.

"We go to the movies and you hear the rustle of chip packets, Maltesers and popcorn, but to sit and consume food like that in such a passive way outside of meal times is outrageous."

Prof O'Dea was recently appointed a member of the NHMRC and inaugural Chair of the Council's new Prevention and Community Health Committee. She has been researching health issues for more than 30 years and says central obesity, where fat accumulates on the stomach, is the biggest concern.