



DISCOVER

ENGAGE

IMPACT



LONG LIVE HEALTH

UQ's Emeritus Professor Jake Najman is behind one of the longest-running studies of mothers and children in the world, producing results that have changed the way medical researchers think about what 'passes down the line'.

In one of the longest-running investigations of its kind in the world, UQ researchers have been studying thousands of Queensland mothers and their families for more than 35 years to gain unique insights into their mental and physical health.

And their findings have produced some surprising results that have had a big impact on many areas of health research.

For example, they found that mental illness rarely runs in families, and that a mother's physical characteristics are stronger predictors of her pregnancy outcomes than her socio-economic background.

So how were these fascinating facts discovered?

In 1981, led by Emeritus Professor Jake Najman from the School of Public Health and School of Social Science, Queensland researchers recruited 8556 pregnant women giving birth at South Brisbane's Mater Misericordiae Mothers' Hospital - 98 per cent of all public-patient births at the hospital that year.

The women were recruited for the Mater-University of Queensland Study of Pregnancy (MUSP), aimed at monitoring mental and physical health of mothers and their children over time and to investigate how health and wellbeing change across the life course.

The children were followed up many times over the years, with data collected when the children were aged around six months, then five, 14, 21 and 30 years.

Emeritus Professor Najman has been involved in this study for its duration, helping to create an unparalleled source of health information.

"The story actually began when I was on study leave in 1978," he says. "I was in Aberdeen, Scotland, and met some colleagues at the university there who had been collecting data on 50,000 births at the local obstetric hospital.

"The issue that concerned them, among others, was the relationship between poverty and the outcome of a pregnancy.

"A very well-known Scottish obstetrician, Dugald Baird, had written an article some years earlier suggesting that a family's income was more important in determining the outcome of the mother's pregnancy than anything an obstetrician could do.

"I was very impressed by that, and thought this was an interesting issue to take up when I returned to Australia."

Once back in Brisbane, Emeritus Professor Najman was approached by three obstetricians from the Mater Misericordiae Mothers' Hospital, one of whom had trained in Aberdeen, who were also keen to set up a study investigating these issues.

Over the years, and with successive grants from the NHMRC, a broad team of researchers, clinicians and PhD students have collected data and analysed results, but currently, the principal investigators include Associate Professor Michael O'Callaghan and Dr William Bor from Mater Health Services; Professor Gail Williams, Associate Professor Abdullah Al Mamun and Professor Rosa Alati from the School of Social Science; Associate Professor Alexandra Clavarino from the School of Pharmacy; and Associate Professor James Scott from the UQ Centre for Clinical Research (UQCCR).

On most Mondays the group meets at the School of Public Health to discuss the study.

Associate Professor James Scott, UQCCR researcher and clinical psychiatrist at the Royal Brisbane and Women's Hospital (RBWH) says he finds the meetings extremely valuable.

"No matter what job I've had, I always prioritise these meetings. And the reason is that we've got such a brilliant group of researchers and clinicians from various disciplines coming together to share knowledge," he says.

The knowledge that has emerged is both comprehensive and diverse, with more than 250 academic papers published as a result - a huge outcome from modest beginnings.

The original aim of the study, investigating the link between poverty and the outcomes of pregnancy, has been greatly enlarged to include more predictors and many more outcomes. The data collected in the MUSP has become a huge bank of knowledge from which researchers have drawn different conclusions than they originally predicted.

For example, one paper, 'Socio-economic status and pregnancy outcome: an Australian study', published in 1989 in the *British Journal of Obstetrics and Gynaecology*, found that pregnancy outcomes were more likely to be affected by the mother's characteristics (such as height and weight) and her lifestyle, rather than the parents' socio-economic status.

However, follow-up research conducted when the children were five years old highlighted some of the impacts of socio-economic status. In 1992, a paper on 'Child developmental delay and socio-economic disadvantage in Australia: a longitudinal study' found that the mothers with the lowest socio-economic status were most likely to have children showing developmental delays. Quite a different emphasis.

“The longer we continue, the more compelling we find the research, because we’re actually observing the lives of not only the children, but also of the mothers, as they unfold,” says Emeritus Professor Najman.

Emeritus Professor Najman says some of the MUSP data didn’t support the expected findings.

“We’re finding that the generational transmission of mental illness is substantially less common than we expected, and that the vast majority of children whose mothers have a mental illness, like depression, don’t have depression themselves.”

Associate Professor Scott, who has also studied the generational transmission of mental illness, agrees that MUSP has been particularly valuable in analysing the complex causes of mental illness.

“This is what MUSP allows – you can look at these sort of trajectories and, rather than just going for the biological reductionist model that it’s genes running through families, you start to see the complex interplay of environmental factors that certainly explain a proportion of the mental illness that’s intergenerationally transmitted.”

Although much of the research based on MUSP data has focused on mental health issues, many other health issues have also been investigated, from sleep quality to the effects of breastfeeding on diabetes risk.

Rebecca Armstrong is currently completing her PhD in speech pathology, and has used MUSP data to investigate early-life predictors of language outcomes.

“The MUSP has some language measures when the kids started school, and then again at 21, so we were able to track their progress over that 16-year period and look at whether there were any early-life predictors of outcomes at 21.”

She says predictors identified included mothers who smoked during pregnancy, fathers who didn’t complete secondary education, and children who displayed internalising behaviours such as high levels of anxiety at five years of age.

Ms Armstrong hopes that by identifying these predictors, they may be able to develop early intervention programs to help prevent language difficulties. She would also like to investigate literacy and cognitive data that were gathered when the children were around 14 years old, to see if that can expand on her PhD research.

Today, the study is starting to examine the third generation of the cohort – the grandchildren of the original mothers. Researchers are hoping to look at issues such as childhood and adolescent obesity, and the generational transmission of antisocial behaviour.

“We’ve now collected data on about 2000 grandchildren, so in that sense we’ve made

some reasonable progress,” says Emeritus Professor Najman.

“The impression I’m getting is that the world is changing, and that many of the findings of earlier studies may not be replicated.”

Associate Professor Scott is hoping to examine attention deficit hyperactivity disorder (ADHD), particularly adult ADHD.

“We’re finding that the adults who are diagnosed with ADHD at the moment didn’t have ADHD in childhood, and most of the kids who had attentional problems in childhood don’t have ADHD in adulthood.”

Associate Professor Scott hopes to examine whether adult ADHD is an extension of childhood ADHD, or a separate disorder, and says the data from MUSP is an unparalleled resource.

“There are very few studies in the world that can look at this, because you need 35 years of follow-up,” he says.

“You would spend tens of millions of dollars if you tried to set that [type of study] up today.”

Indeed, Associate Professor Scott believes there are infinite areas to explore within the MUSP data. “Dozens of potential studies could be done, and really the limitation is people’s time, and people’s intellectual imagination.”

This is a boon for any future researchers in the broad field of health looking to effect change.

Although MUSP continues as strongly as ever, it has already developed a legacy of rich data and academic collaboration. Professor John McGrath from the Queensland Brain Institute, the Queensland Centre for Mental Health Research, and the National Centre for Register-Based Research at Aarhus University, Denmark, says the most impressive thing about MUSP is its scope.

“These studies are very hard to do, and it is a credit to Jake [Najman] and his team to establish and run this massive study.”

Associate Professor Scott says particular praise must go to the early collaborators on the study, including Professor Najman, Professor Williams, Associate Professor Michael O’Callaghan and Dr William Bor.

“They’ve set up this magnificent study, which I think has benefited millions upon millions of people from the knowledge that’s come from it.

“That’s quite a legacy for those researchers.”

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Progress to date:

1978: Emeritus Professor Jake Najman considers idea of longitudinal health study in Brisbane

1981: 8556 pregnant women and their children recruited for Mater-University of Queensland Study of Pregnancy (MUSP)

1981-82: MUSP researchers collect health data on six-month-old babies

1986-87: MUSP researchers collect health data on five-year-old children

1995-96: MUSP researchers collect health data on 14-year-old teenagers

2002-03: MUSP researchers collect health data on 21-year-old adults

2011-12: MUSP researchers collect health data on 30-year-old adults

2016-17: MUSP researchers collect health and behaviour data on the children of the children

2017: The National Health and Medical Research Council honours Professor Jake Najman and his team with a 10 of the Best award for their work following the lives of mothers and their children for almost 40 years to identify the genetic and environmental contributions to mental illness

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