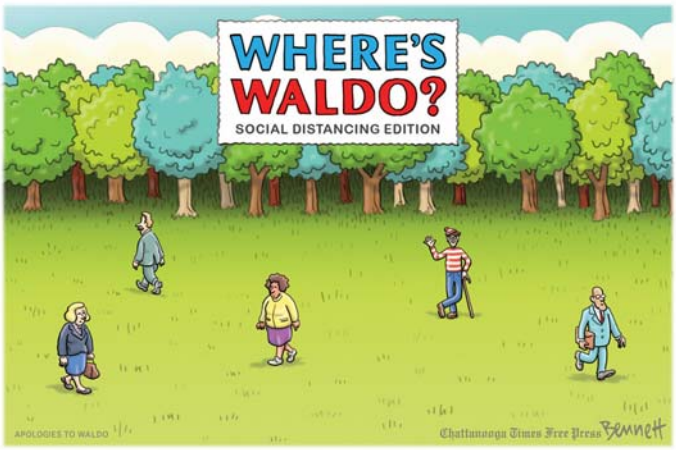
The Dunedin Study Newsletter 2020

Dear Study members,



I am sending you all my best wishes, wherever you may be.

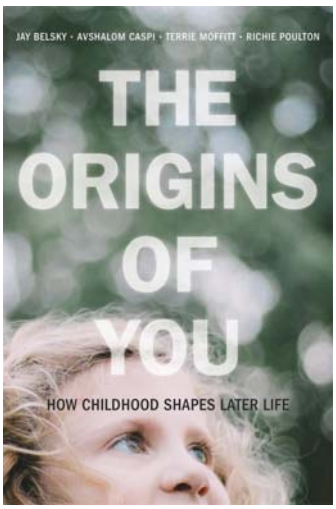
These are strange times, and although many keep describing them as unprecedented, I find it vaguely reassuring to know that our forebears experienced - and overcame - similarly massive challenges in the past, most recently the 1918 global flu pandemic.

If you feel anxious and stressed, that's entirely reasonable in the circumstances. The core of overwhelming anxiety sits at the junction of two dimensions: a sense of low controllability and low predictability. COVID-19 is sneaky insomuch as it registers high on both.

I have been working with an NGO here in NZ to develop an online, strongly evidence-based programme to help those who may need some extra support to deal with the types of feelings COVID-19 may have brought to the fore: *justathought.co.nz*

Be kind during this high stress time (to yourself and others), and take the opportunity to connect with those in your world, when and wherever, as well as those less fortunate/more vulnerable.

What is unprecedented though is that for a study like ours, which began at birth and is now in its 5th decade, 94.1% of you agreed to be assessed at the most recent phase. You, our Study members, set another world record! We are humbled and grateful for your commitment. This allowed us to get on with the important work of using your information for research which we hope will influence prevention efforts, treatment and policy.



On another happy note we have recently published a book, "The Origins of You—How childhood shapes later life". I look forward to gifting a copy of this book to you all when I see you at the next assessment. The book is about how we develop through childhood, adolescence, and adulthood, about genes and parenting, and about vulnerability, resilience, and success. I sincerely hope you will enjoy it.

Stay safe and well everyone,

Kia kaha (be strong), kia māia (be brave), kia manawanui (be steadfast)

Richie Poulton
Director

How much cannabis do New Zealanders actually use?

In June this year, we launched a new website to make accessible the evidence around the consequences of using cannabis and to help inform voters ahead of the NZ cannabis referendum vote. Visit: **cannabisreferendum.co.nz**

Based on a paper co-written by Richie and his colleagues, and published by the Royal Society of New Zealand, much of the evidence comes from the Dunedin Study research combined with findings from the Christchurch longitudinal study, so thank you again Study members.

When you visit the website, you will see that many of the facts being widely quoted in the media were based on this research. For example, the statistic that 80 percent of Kiwis born in the 1970s have used cannabis at least once, despite it being illegal! And that most of those who used it have experienced little or no consequences.

One key take away is that young adolescent cannabis use is to be avoided as this is when the brain is still developing and there is an increased risk of developing negative consequences.

Does your jaw click?

For those of you who participated in the dental examinations, you might recall that the dentists felt around your jaw joint and asked you to open and close, to see if your jaw joint clicked. Many orthodontists claim that having crooked teeth causes jaw joint problems.

Thanks to the comprehensive orthodontic examinations done when you were teenagers, we were able to investigate this and found that these supposedly 'risky' dental features made no difference as to whether you ended up with a clicking jaw joint.

Kidneys—Offally important!

Kidneys help to remove waste from our blood and keep the right balance of fluid and essential minerals in our bodies. In other words, kidneys make urine! At the last assessment phase, you gave us a sample so that we could look at how well everyone's kidneys are working. Scientists currently know a lot about how kidney function declines after age 65, but not much about what changes might happen earlier in adulthood. Along with blood tests and other information we have collected over the years, the urine samples you provided are helping us to understand how kidney function changes from young adulthood to age 45, and to see if we can predict who might be at risk of developing kidney problems later on. We are working on this project with kidney experts from the University of Otago School of Medicine and the Prince of Wales Hospital in Sydney. We hope the results will provide useful new information for doctors so they can screen people for risk factors early and help people to take action to prevent later kidney disease.

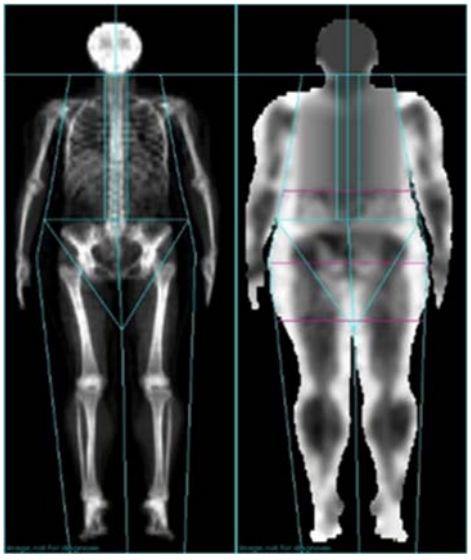
Do men and women hear differently?

Remember the booth you went into where you listened to all those strange recordings? This was the re-introduction of hearing measures into the Dunedin Study at Phase 45, and was the first step towards tracking your hearing over time and identifying which lifestyle factors affect it.

One of the most interesting results has been the appearance of gender differences in hearing. We found that while males and females have similar hearing for low-pitched sounds (e.g. lawn mowers, trucks, cars, and speech sounds such 'as', 'ah', 'm', and 'b'), women are better at hearing high-pitched sounds (e.g. a phone ringing, birds chirping, and speech sounds such as 's', 't', and 'f'). Additionally, women are better at hearing sounds pitched at 4000 Hz which are emitted by such things as airplane engines and power tools. One possible explanation for this may be linked to noise exposure at work (...or perhaps the man cave?).

We also found that females are better at differentiating between different people talking, and locating where different speakers are coming from.

BONING UP on what we are made of…



During the last phase most of you kindly agreed to be scanned on the DXA machine at the hospital. The DXA machine looks inside your body to understand what it is made up of and how strong your bones are (bone density).

Bone density is measured by looking in more detail at your hip bone. We found that both men and women tend to have healthy bones. Also, we are very interested in visceral fat - the fat that sits around our organs that you cannot see. Here, we found that men tend to carry their extra weight in a different way than women. We are in the process of publishing this information.

We also tested Body Mass Index (BMI) as a measure. BMI is often criticised for misclassifying people who may carry large amounts of muscle, rather than fat. The All Blacks famously show up as obese on BMI! We found that it looks as though BMI is a valid measure for the obese but perhaps not for those who are just overweight.

Some of you might remember Kim who did your DXA scan as very pregnant and having to squeeze round the side of the scanner. Well that situation has now resolved itself!

(How cute is this photo !!)

“Slice of Life” …… The Dunedin Study travelling exhibition

As you will know from the booklet we gave you at Phase 45, Sean Hogan worked with staff from Toitū to devise and build an exhibition about the Study. It had an extended season at Toitū and over about 11 months 200,000 people visited.

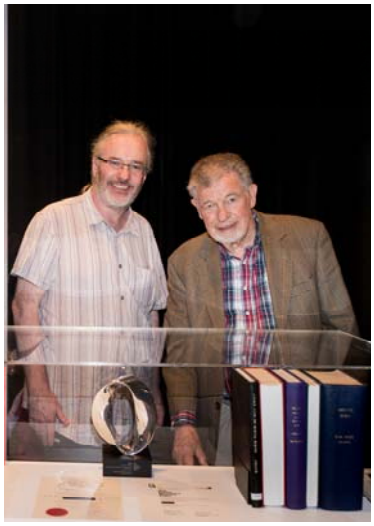
Sean was not happy to just leave it at that so he sought support from the University of Otago and Lotteries, and with permission from Toitū, devised and built a travelling version of the exhibition. It opened at Christchurch museum last November, and despite lockdown managed to attract 256,000 visits before it moved to MOTAT in Auckland - sadly just in time for the new Auckland lockdown!

Nevertheless, the feedback from Auckland is that people are loving the exhibition, and Minister David Parker sent Richie the above photo from a major Auckland intersection.

The exhibition has been carefully designed to celebrate your lives with a room for each of the first four decades of your life. In front of every room is a case filled with iconic items that you should remember well.

Phil Silva (pictured below with Sean) now lives in Christchurch and was a regular visitor while it was at Canterbury Museum.

As Sean said, “*This travelling exhibition “Slice of Life” is a great way to share the findings with the New Zealand public, and it’s also a very special way to honour the Study members who continue to give us all so much*.”



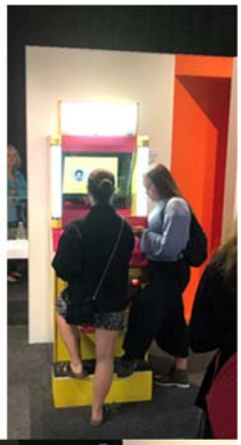
This is the 1980's bedroom and as you can see music was pretty important! The other rooms are: a 1970's lounge room playing "It's In The Bag" from Dunedin on an old style TV; a 1990's student bedroom complete with a stained carpet and an empty grog bottle – the TV in that room is playing "The Young Ones"; and finally a 2000's lounge which brings us more changes with a potty and a mountain buggy pram leaning up against the big old computer.

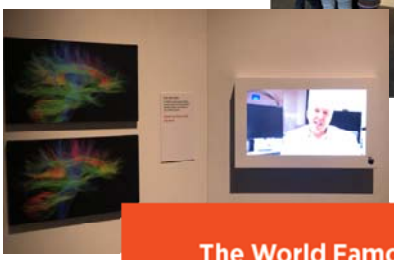
A new interactive called "the Agenator" joins "the Cardiator" and the Timepilot spacies machine that you know very well!

The exhibition will be at Nelson Museum from 13th of November 2020 right through to 26th of April 2021.

The last word on the exhibition goes to Rebecca Britt, Exhibition Manager at MOTAT:

"*Our visitors are connecting not only with each other as they discuss the changes to New Zealand lives over the last 45 years, but they are also engaging with and discussing the issues raised by the study. Congratulations on curating this exhibition and thank you to the University of Otago for generously facilitating its tour. This is a world-famous study that deserves to be seen New Zealand-wide. MOTAT is grateful for the opportunity to share it with the people of Auckland.*"





It’s important to know this

Did you know that most of you (86%), and therefore most of us, have struggled with mental health issues at some point in your lives? And that was before COVID-19 hit the world! When the research team reviewed four decades of the Dunedin Study mental health data this was one of their key findings. This high level is a surprise to many but it has also been found by other studies around the world. This means it is rare for an individual to go through life without needing extra help and support at some point, so let’s be kind to each other.

The surprising thing about walking speed

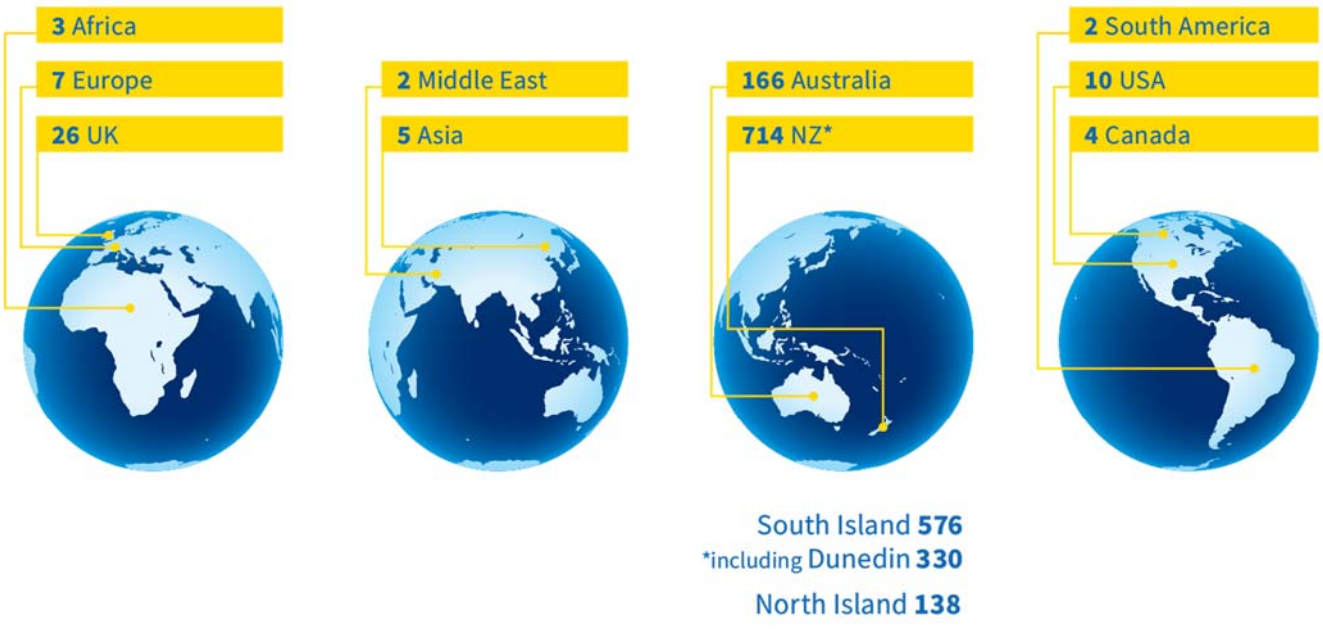
The Dunedin Study made international news again in October 2019 when a group of Dunedin Study researchers, led by our Associate Director Professor Terrie Moffitt and Line Rasmussen, based at Duke University in the US, published their findings on walking speed (gait speed). They were surprised how much they could learn about a person's health and wellbeing from how fast they walk.

If you remember, at the last phase for the first time your gait speed was measured by walking on a special 20-foot long pad equipped with sensors, under three conditions: normal walking; walking while doing another task (in our case, reciting every other letter of the alphabet - not easy!); and maximum gait speed.

There was large variation in how fast people walked. The speed at which people walked relates to physical and cognitive function, as well as how well we age, and could be a valuable sign of our health at midlife.

This research shows that measuring how fast we walk, which is cheap, easy and repeatable, could be used as an assessment tool for our health, and may allow for interventions aimed at improving people’s health while they are still young.

So where do you all live now?



A tooth a child? Drawing by the Morelli family (Emma Morelli, periodontist, and mum to Lily Morelli)

Parents' Dental Health

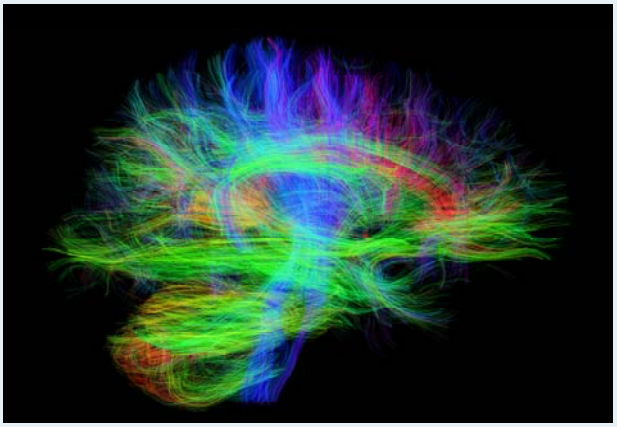
Over the years the Dunedin Study has made some important contributions to the understanding of dental health conditions like tooth decay and gum disease.

A lot of people believe that having children causes dental health problems so the Dunedin Study dental team, led by Jonathan Broadbent and Emma Morelli, together with a team of periodontal (gum) specialists investigated the dental health of parents relative to the number of children they had.

They found that a mother's dental health was not affected by biological factors to do with having children. In fact, associations between the number of children and dental health were just as noteworthy among men as among women.

What's going on inside that head of yours?

Have you ever wondered what's going on inside someone's head? We did, so for the first time we had a look. We used MRI (Magnetic Resonance Imaging) scans to see what your brain looks like and also how it reacts to the different things you were asked to do while in the scanner. Mid-life is a good time to do MRIs as it is before the start of most age-related health issues in the brain. This allows us to have a baseline to which we can compare future changes. We can also look into the past, sometimes as far back as age 3, and see if there are connections between things in the first half of your life and what is happening in your middle-aged brain.



This is Richie's brain– he's well connected!

We were blown away that so many of you agreed to do scans (93% of those who did the rest of the phase). Some people went above and beyond, dealing with claustrophobia, because they were so keen to help. We thank you for putting up with 70 minutes of scanning where you had to lie as still as possible on your back with your head enclosed, in a confined space, with annoying noises, and the occasional bad joke from the interviewer. It was worth it however, because we got large amounts of data, which have now been published in high-quality scientific journals.

Some of the interesting things that we've discovered so far are:

- Having an older-looking brain makes it more likely that someone will also show signs of faster aging in general.
- Walking speed reflects differences between people's brains.
- Differences in mental health between people are connected to differences in brain structure.
- There are links between people's brain structure and the types of antisocial behaviour they've engaged in during their lives.

For more details about these results, as well as explanations of what was done during the MRI scans and why, links to the actual published papers, and answers to some questions that you may have, take a look at the new MRI Project section of the Dunedin Study website dunedinstudy.otago.ac.nz.

The Next Generation really move

We have been privileged to see 612 young people as part of the Next Generation Study. As part of that research, a Life History Calendar, similar to that completed each phase was completed for the Next Generation Study participants, the difference being that it covered their whole lives – birth to age 15, or 180 months. These calendars, in addition to being an impressive feat of memory, have provided valuable insights into the lives of these young people.

We know, for example, that they have typically moved house five times by age 15 and that only about 20% of Next Generation participants have spent all their lives with only nuclear family members, that is biological parents and siblings. These young people have lived with a huge range of other family/whānau members, as well as exchange students and family friends who have all shared their (and your) homes. And of course, we also know that many young people are in some form of shared care, meaning that they live in multiple homes. Overall, the Next Generation participants have a much more diverse range of family circumstances than the Dunedin Study members did. These findings have provided important information about changes to family life over time and are also in keeping with changes in family life across Aotearoa New Zealand.

Director of the Dunedin Study recognised with Distinguished Research Medal

In 2019 Richie was presented with the University of Otago's most prestigious award, the Distinguished Research Medal, given in recognition of his work with the Dunedin Study.

Richie has been involved with the Dunedin Study since 1985, when you were 13 years old and he did the neuropsychological assessments (then with lots of earrings and a mohawk, or was it a mullet?!). He has met virtually every study member since joining the Study permanently in 1995 as Deputy Director, eventually taking over as Director of the Study in 2000.

"*My goal is to make sure what we do ends up helping people so the award says righto, get on with it*."

From fresh faced Deputy Director to now….25 years on!

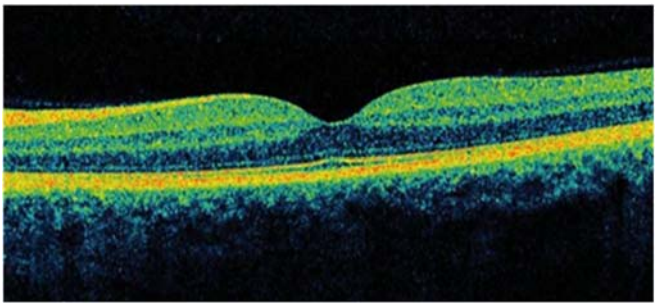
You can watch Richie's entertaining award lecture "The Dunedin Study – Making Sense of Life?" by searching for the title on YouTube.

(Spoiler alert: it includes one of his old school reports and some interesting photos!)

Visions of the future

The most common reaction when we took you into the vision room was “Oh wow!” It certainly looked impressive, with a bunch of high-tech machines and many cameras. Ophthalmology leads the world in technology, and it is incredible what we can see with this modern equipment.

The last time we assessed your vision was when you were children. Now, 30 years later, we studied your eyes again – largely to get a baseline measure so that we can keep OUR eye on what happens to YOUR eyes in the future (perhaps with even more impressive equipment!).



An OCT image showing all the different layers of the retina.

For example, in Phase 45 we looked at how good your vision was, and the shape and size of your eyeball. We did a series of dry eye tests, and a visual field (peripheral vision) test. We took a photo of your retina (at the back of your eye), and we also did an OCT scan, which is an incredibly detailed 3D scan of the layers of the retina and the fibres of the optic nerve (the nerve that connects your eye to your brain). The eye is the only place in the body we can actually visualise your nerves without cutting you open! The retina itself is technically part of the brain, and looking into the eyes can give us some clues about what is going on in the brain, and also - somewhat surprisingly - what is going on in the heart and kidneys!

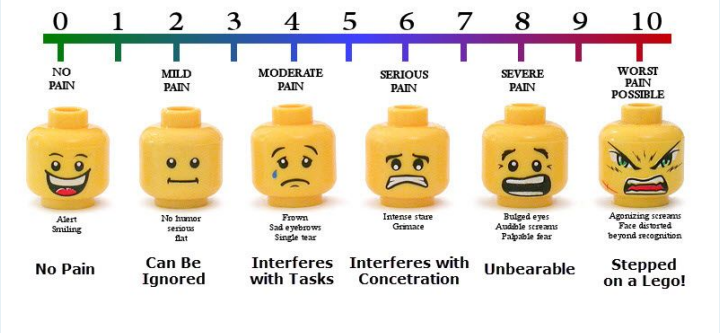
So what do 45-year-old eyes look like?

Exactly 50% of you reported that you had had glasses or contact lenses to correct your vision since Phase 38. Almost all of you mentioned that you had either just got reading glasses or were aware that you were starting to need them, and many of you were reluctant to wear them because it made you feel old. In fact, needing reading glasses is known to be an incredibly accurate biological measure of age! So, hitting 45 and needing reading glasses couldn’t be more normal! No need to be embarrassed about it.

Painful experience

One in five New Zealanders suffer from persistent (chronic) pain, so it is a significant problem for many of you. As part of the Phase 45 assessments, our researchers wanted to understand your pain experiences, and whether early life and lifestyle factors are linked in any way.

Almost two-thirds of you reported having musculo-skeletal pain in the past year, and the top four pain sites were lower back, neck, shoulders, and knees. Interestingly our researchers found that women had a lower pain threshold (I’m sure some of you will be surprised by that!!), experienced higher pain intensity, and found pain interfered in daily activities. We also found that childhood experiences and sleep patterns did affect pain experienced by you in later life. This research will help clinicians to develop a holistic approach to pain management.



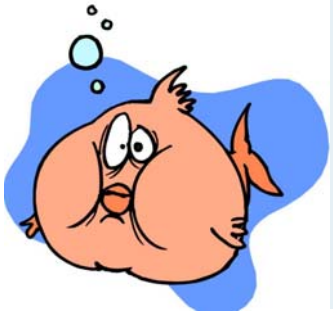
Associate Director Terrie Moffitt elected to US National Academy of Medicine

We are delighted that our Associate Director Terrie Moffitt, based at Duke University in the US, has been elected to the US National Academy of Medicine. This is one of the highest honours in the fields of health and medicine and Temi (as she is known to us) will be providing analysis and advice on critical national public policy decisions in health, science, and medicine in the US.

Temi joined the Study at Phase 13 and one of the key components of her work has been the development of the theory of antisocial behaviour, which has generated decades of research. Her work has been highly influential, both in the clinical treatment of childhood conduct disorders and also in the courtroom. Once again our heartfelt thanks to you and your families for being part of the Study for so many decades and making this research possible.

Don't hold your breath, some things take time!

The respiratory team, led by Bob Hancox, tells us that work is ongoing to track lung function from childhood (age 9) up to age 45, and bring together the thousands of measurements we have taken from you during these 10 assessment phases. We have more data on breathing than any other study in the world. Early findings show that for most people, your lung function by age 9 gives a great indication of what your adult lung function will be. A few people did not follow this pattern - predictably, those who smoked tended to do worse, but also those with asthma and those who became obese. We are using the varied data you provided to try and understand the other influences that cause early decline of lung function in adulthood.



The Dunedin Study has some of the world's best data on cannabis use and respiratory health, and, as mentioned in a previous article, these Study findings were used to inform the science advice around the referendum. Preliminary findings from age 45 show that smoking cannabis does impact your lung function. Cannabis users tend to develop nasty bronchitis (cough and phlegm) and are also more likely to wheeze or get short of breath. Surprisingly, the effects on lung function are quite different from tobacco, but that does not necessarily mean that cannabis is less harmful. Work is ongoing to try to work out why cannabis and tobacco have different effects.

Please keep in touch

Thank you so much for your continued support. If any of your contact details have changed or are about to, please let us know. We have enclosed a form that you can use to update your details and post to us in the envelope provided (no stamp needed) or you can simply email your new details to dmhdru@otago.ac.nz or visit the contact page on our website dunedinstudy.otago.ac.nz.

7 Reasons for hope

Finally a message from Richie Poulton and Atawhai Tibble (the Social Wellbeing Agency's chief Māori adviser).

The COVID-19 pandemic has catapulted us into unfamiliar territory. However, research and history show we have the inherent resilience to cope. We believe there are seven good reasons to be hopeful as we - and the rest of the world - wait for a COVID-19 vaccine.

1. While anxiety and a sense of helplessness are legitimate responses to the unpredictability of the COVID-19 virus, we are more resilient than we might think. Take for example the Blitz during World War Two in which the Germans repeatedly bombed London while civilians hid in underground bunkers, not knowing where the next bomb would fall. At the time it was assumed that many would emerge from these horrors permanently psychologically damaged, yet the opposite occurred. Most came through pretty much unscathed in the psychological sense. It seems human beings are far more resilient to existential threatening challenges than we typically assume.

2. This is reinforced by the findings of the Dunedin Study. These show that people who have coped with great adversity not only get on with life, but also regularly contribute to the Study simply because it might help others, and we thank our Study members for that. The bottom line … people are far stronger, adaptable and dignified in the face of adversity than they give themselves credit for. Knowing this should embolden all of us in this time of great adversity.

3. Our DNA gives us good reason for hope. Whether they were Polynesian voyagers or those who boarded ships in Great Britain or elsewhere, our descendants all faced a new and unfamiliar land. They learned to be brave and caring, with the vision, positivity and innovation to fashion a new life. Our whānau have overcome enormous challenges on a regular basis - world wars, the Spanish flu, land confiscations, the Great Depression - we can be inspired by them. They helped turn resilience into a lifestyle choice. And we can do it again.

4. We are lucky to live in a digital world which enables us to maintain social connection even when physically distanced. While digital connection can never replace the real thing, it does help us mitigate the risks of social isolation and social fragmentation.

5. Amazing stories from the present show that, despite personal sacrifices and challenges, we can unite and work together for the common good. Building on the ANZAC spirit, this may be a time when Māori constructs such as manawaroa (courage in adversity) and piripono (commitment to a shared purpose) become the values that all New Zealanders can embrace. We seem better equipped than most nations to pull this off.

6. Our remote location was once perceived as a negative in our national psyche: now it is our strength. Physical distancing is like a behavioural vaccine and, when done correctly, can be almost as effective as a biological vaccine.

7. COVID-19 represents a massive, disorienting threat to people all around the world, but the "good news" is that the best therapeutic approaches for dealing with extreme anxiety and sadness are just a few key-strokes away. E-therapy approaches are supported by dozens of gold-standard controlled trials showing that they are just as effective as standard face-to-face therapy treatments and are available to anyone who has the internet. One such tool is justathought.co.nz.

Our Funders

The Dunedin Study is funded by the Health Research Council of New Zealand, with additional support from the US National Institutes of Health, the UK Medical Research Council and the New Zealand Ministry of Business Innovation & Enterprise (MBIE).