

THE SOCIAL AND ECONOMIC COSTS OF STROKE IN NEW ZEALAND 2020

*New Zealand Institute of Economic Research report
for the Stroke Foundation of New Zealand*



COMMENTS



MARK VIVIAN

The cost and impact of stroke continues to change year on year and clarity around these figures is paramount to understanding the severe financial impact it can have on New Zealand. In 2009, Dr Paul Brown, then a Health Economist at Auckland University, published research into the cost of stroke. Up until late last year, figures from this research were still being used.

For an updated insight in 2020, we asked the New Zealand Institute of Economic Research (NZIER) to estimate the social and economic costs of stroke today, how this is likely to increase in the next decade, and the impact these costs have to both the New Zealand economy and New Zealanders.

At the Stroke Foundation, we are immersed in the impacts of stroke everyday – but we wanted to learn more about the wider effects of stroke to the general public.

Many of the insights delivered by NZIER have uncovered opportunities to progress our services, and with this information we can now make even more significant steps in the stroke prevention and recovery space – but most importantly, it has allowed us to identify opportunities where we need to advocate for change.

We work to prevent stroke, improve outcomes and save lives. We will use this research to bring about significant change to support and empower those affected by stroke.



Mark Vivian
Chief Executive Officer, Stroke Foundation



LAURENCE KUBIAK

The New Zealand Institute of Economic Research was commissioned by the Stroke Foundation to estimate the social and economic costs of stroke in New Zealand.

We brought together a wide range of evidence and data to estimate these costs and forecast the impact this is likely to have in the next two decades. The research has shown us that not only does stroke create heavy health system costs, but the burden of stroke on individuals and families in the form of lost quality of life, lost income and premature death, is substantial.

New Zealanders are living longer, resulting in greater demands on the health and disability system. Although these demands are expected to increase, the level of funding and therefore resources available may not.

Economics provides tools which can help to identify areas where growth in needs warrants growth in investment. This is critical to decision-making that supports both efficiency and equity in the health and disability system.

Until now, relatively little funding has gone into stroke research. Our hope is that this document and our full report help in some small way to fill an important gap in the research landscape and that this might ultimately influence investment to reduce the very heavy burden of stroke in New Zealand.



Laurence Kubiak
Chief Executive, NZIER

INTRODUCTION

The aim of this document is to highlight some of the key takeaways from research conducted by the New Zealand Institute of Economic Research (NZIER) on the economic cost of stroke to New Zealand, as well as the measures taken by the Stroke Foundation to reduce this social and economic burden.

The research estimates the cost of stroke to New Zealand and New Zealanders, but most importantly, the research has helped us to identify the critical areas where more funding is needed in order to reduce the overall cost of stroke.

The research shows that there has been a significant decrease in mortality from stroke over recent decades in developed countries, and this is true of New Zealand. In contrast, more people surviving a stroke increases the prevalence of stroke related disabilities. This has, and will continue to, put further pressure on the health

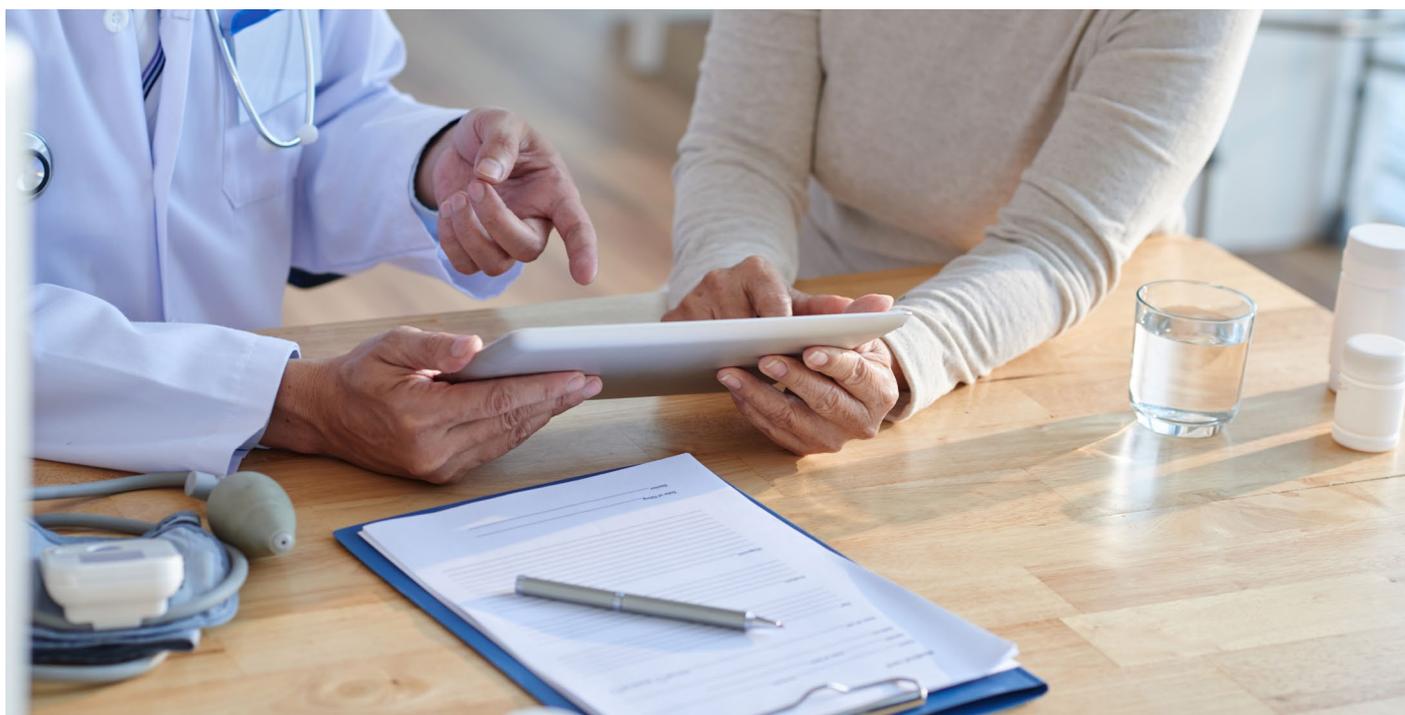
sector, with the need to respond to more people, grow rehabilitation services and residential care facilities.

The estimates provided by NZIER have enabled us to begin work calculating savings made through our critical services. As a result, we are able to highlight the benefits of the work we are doing to help raise awareness of the risk factors associated with stroke, as well as our work to support those who have been affected by stroke. This benchmark gives us the opportunity to draw up ambitious plans to expand and enhance our current services, investigate new service offerings and identify opportunities to advocate for significant national change.

New Zealand should be able to reduce the burden of stroke, but the motivation to achieve this relies on decision-makers being aware of the social and economic burden of stroke, as well as opportunities to improve services already available.



NEW ZEALAND SHOULD BE ABLE TO REDUCE THE BURDEN OF STROKE, BUT THE MOTIVATION TO ACHIEVE THIS RELIES ON DECISION-MAKERS BEING AWARE OF THE SOCIAL AND ECONOMIC BURDEN OF STROKE, AS WELL AS OPPORTUNITIES TO IMPROVE SERVICES ALREADY AVAILABLE.



COST OF STROKE

The cost of stroke on the New Zealand economy is significant and should be of great concern. Based on the most conservative expectations, the NZIER research estimates the cost of stroke to New Zealand to be at least \$1.1 billion in 2020. This figure is projected to increase to \$1.7 billion by 2038.

Each stroke costs New Zealand approximately \$105,000 over five years.

These costs have been carefully researched by NZIER and incorporate a number of contributing factors:

- Initial response and hospitalisation
- Rehabilitation and ongoing support (including long-term residential care)
- Employment effects and income support
- Burden on informal caregivers
- Quality of life and premature mortality.

The Stroke Foundation will use this research to interrogate the economic costs of stroke, along with the personal costs incurred for those affected by stroke.



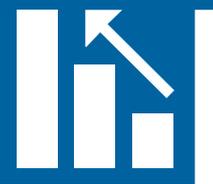
**THE PREDICTED COST OF STROKE FOR NEW ZEALAND
IN 2020 IS APPROXIMATELY**

\$1.1 BILLION

THIS FIGURE IS EXPECTED TO INCREASE TO

\$1.7 BILLION

BY 2038



\$105,000

PER STROKE OVER 5 YEARS

WHO IS AFFECTED?

At present, we know that stroke affects over 9,000 people every year. The NZIER research forecasts that in 2020, 11,169 people will experience a stroke.

Stroke incidence increases as people age, but there are a number of risk factors associated with stroke that can affect people of any age:

- High blood cholesterol level
- High blood pressure
- Smoking
- Diabetes
- Obesity
- Physical inactivity
- A family history of atherosclerotic disease or stroke.

Although stroke is strongly associated with older age groups, 25% to 30% of strokes occur in people under the age of 65. At any age, stroke can result in death, or for survivors, short-term or permanent disability.

Older stroke survivors face a higher risk of admission to residential care. Younger stroke survivors face risk of disability; shown to have a significant and long-lasting effect on employment and income. This in turn, impacts



AROUND

9,000

**NEW ZEALANDERS
EXPERIENCE A STROKE
EVERY YEAR**



NZIER RESEARCH FORECASTS THAT

11,169 

**PEOPLE WILL EXPERIENCE A STROKE
IN 2020**



25-30%

**OF STROKES OCCUR IN
PEOPLE UNDER THE AGE
OF 65**



the overall cost of stroke to New Zealand and New Zealanders.

We've noted the economic cost of stroke, but it is also important to reflect on the loss of quality of life that often comes with experiencing a stroke, as this too has both social and economic value. The term 'loss of quality of life' includes disability, change of residence that often occurs post-stroke, anxiety, depression and premature death. These factors have an enormous impact on stroke survivors and their families.

MĀORI AND PACIFIC

There is a significant disparity between the proportion of Māori and Pacific people suffering directly from the impacts of stroke, compared to non-Māori, non-Pacific populations.

According to the NZIER research, Māori and Pacific people are significantly more likely to experience a stroke during their working lives and are, on average, up to 15 years younger than New Zealand Europeans who are affected by stroke.

As shown in the figure taken from the NZIER research below, nearly 60% of strokes in Māori and Pacific people occur between age 15 and 65, compared with only 20% of strokes in people of other ethnicities (grouped).

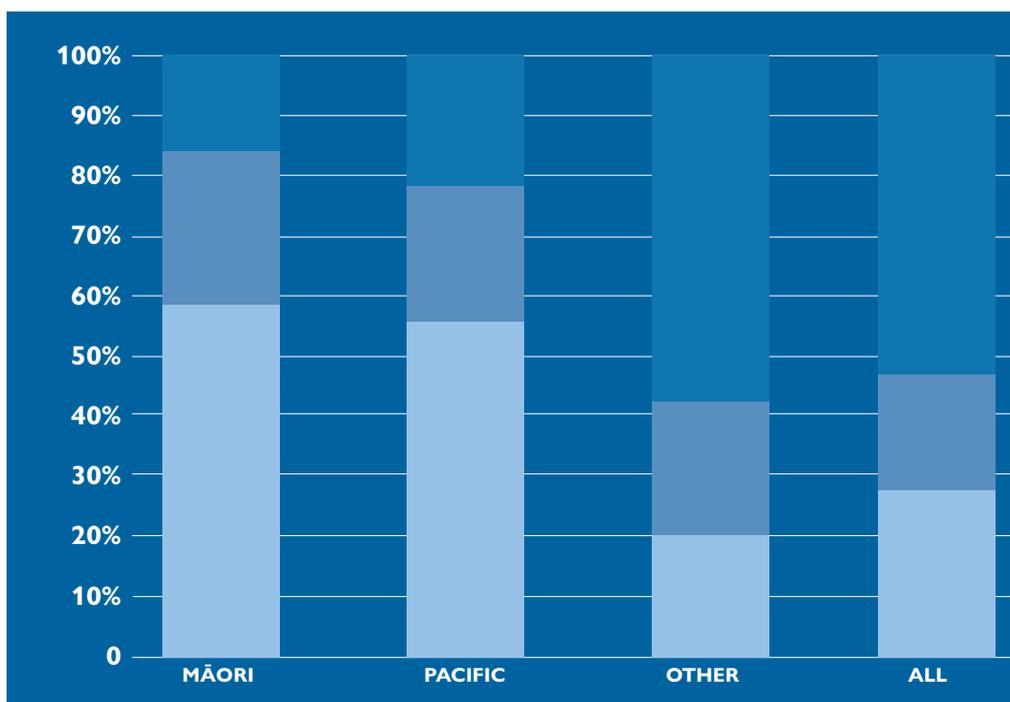
Strokes in working age people can have a financially and emotionally devastating effect on families as a result of death or disability of a primary income earner or caregiver. Māori and Pacific families are nearly three times as likely as non-Māori, non-Pacific families to experience these effects first-hand.

The NZIER research states that a lack of spend on prevention for Māori and Pacific people heavily contributes to the overall cost of stroke.

Stroke prevention, treatment and rehabilitation services achieve a number of objectives. Stroke survivors are able to: maintain employment or return to employment after rehabilitation; continue living independently, avoiding long-term residential care and further strokes to maximise quality of life.

PERCENTAGE OF STROKES IN PEOPLE OF WORKING AGE VS OLDER PEOPLE, BY ETHNICITY

Based on 2016/17 hospitalisations with ICD-10 code I60-I69 (Cerebrovascular diseases)



Key

■ Strokes between 15 - 64 year olds ■ Strokes between 65 - 74 year olds ■ Strokes at or over 75

Source: NZIER, based on Ministry of Health data (Ministry of Health, 2018)

PREVENTION

The research by NZIER shows that New Zealand is under investing in prevention, as the projected number of hospitalisations for stroke is increasing every year. But we know that 75% of strokes are preventable.

One of our biggest prevention initiatives is our Big Blood Pressure Check campaign. Introduced to raise awareness of high blood pressure, the number one modifiable risk factor for stroke, we encourage New Zealanders to check their blood pressure regularly and inspire them to maintain a healthy blood pressure.

The Big Blood Pressure Check campaign was first launched in 2008. On the first Saturday in October, we provided free blood pressure checks to New Zealanders at supermarket sites across the country.

Over the last 12 years, the campaign has expanded and in 2019, we worked with Unichem and Life Pharmacies to offer free blood pressure checks throughout the whole month of October, to complement our Big Blood Pressure Check day.

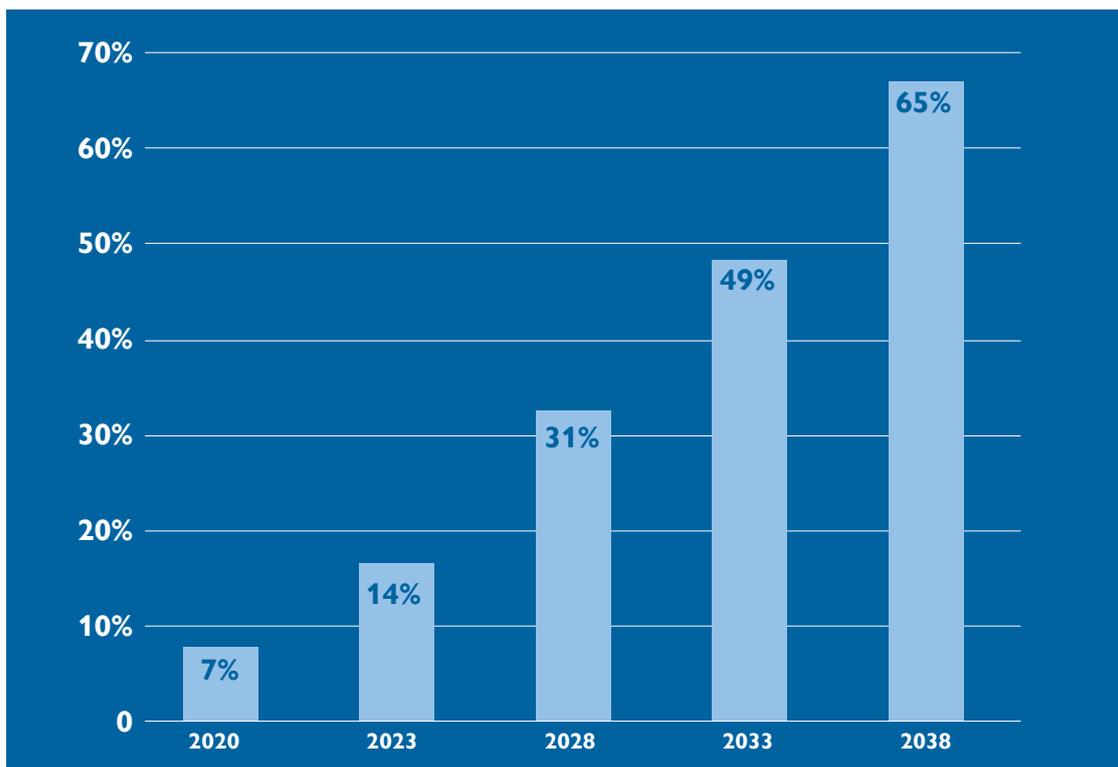
Another advancement was introducing a Big Blood Pressure Check Van. Celebrating the 10th anniversary of the campaign in 2018, we partnered with Ryman Healthcare to develop the van, which travelled around the country offering even more free checks.

One of our major priorities for the van is to target communities with a greater risk of high blood pressure and stroke. We did this in 2019 by prioritising PAK'nSAVE stores over New World supermarkets during our Big Blood Pressure Check campaign and attending events such as Waitangi Day celebrations in the Far North, Te Matatini in Wellington and ASB Polyfest in Auckland.

When the van first launched, it travelled the country providing potentially life-saving checks to thousands of New Zealanders. Since June 2019, the van has been based in Auckland.

Of the 23,990 people we tested for high blood pressure in the last financial year, 10,490 were tested in the van. Of that 10,490, 1% were referred to a GP that day for

PROJECTED GROWTH IN ANNUAL STROKE HOSPITALISATIONS FROM 2018



Source: NZIER

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WE ALREADY HAVE PLANS IN PLACE TO EXTEND OUR FLEET TO THREE VANS WITH ONE BASED IN AUCKLAND SERVICING THE UPPER NORTH ISLAND, ONE BASED IN WELLINGTON SERVICING THE LOWER NORTH ISLAND AND ONE IN CHRISTCHURCH SERVICING THE SOUTH ISLAND.



immediate medical attention. Based on this, we have conservatively calculated that the van has helped to save a staggering \$2,205,000.

If we could provide 50,000 free checks to New Zealanders each year, this figure would exceed a saving of \$10 million.

After distributing a follow up survey to those who received free checks, we found that 50% took action to better manage their health, including visiting the doctor to have their blood pressure retested, making a change to their diet and/or exercising more.

For us, the research by NZIER has identified a huge additional saving that we could be making in the prevention space. We already have plans in place to extend our fleet to three vans with one based in Auckland servicing the upper North Island, one based in Wellington servicing the lower North Island and one in Christchurch servicing the South Island. We want to make this life-saving service available year round to all New Zealanders.

At present, the Government does not fund any of our work to provide free blood pressure checks to the public, including the running and operating of the Big Blood Pressure Check Van. We rely on the generosity of corporate donations, trust grants, individual giving and bequests to operate these services.

23,990

PEOPLE TESTED FOR HIGH BLOOD PRESSURE WITH US LAST YEAR,

10,490

WERE TESTED IN THE VAN



1%

WERE REFERRED FOR IMMEDIATE MEDICAL ATTENTION DUE TO AN EXTREMELY HIGH READING

50,000

FREE CHECKS WOULD LEAD TO A

\$10,500,000

SAVING ON THE COST OF STROKE

RECOVERY

COMMUNITY STROKE ADVISORS

The NZIER research shows that the number of people living with the effects of stroke will increase from 55% to 60% by 2038. This supports the work carried out by Associate Professor Anna Ranta, Head of the Department of Medicine at the University of Otago, Wellington, who last year found that stroke volumes will grow by around 40% in the next decade.

While our goal is to significantly reduce the total number of strokes through our prevention work, our work in the recovery space will continue to improve the lives of stroke survivors and their families, reducing the economic burden on New Zealand.

Our Community Stroke Advisors (CSAs) work with stroke survivors, their families and carers to achieve the best possible outcomes after stroke.

Stroke affects everyone differently, so our CSAs discuss and develop a plan to meet each survivor's needs. They provide support, information and advice to build knowledge and skills; liaise with stroke clubs and other community recreational groups; and network in the community to ensure a stroke survivor, their family and carers are getting the right services.

In the last financial year, we received 4,024 new referrals to this service.

We were pleased to see that 70% of our clients left the service having achieved their personal goals.

Linking this to the burden of stroke, the cost for us to employ a full time CSA is \$80,900 per year. We invest \$1.4 million each year to provide our CSA service, but the Government contributes less than 25% to this cost.



28 COMMUNITY STROKE ADVISORS WORKING ACROSS THE COUNTRY

CSA SERVICE COSTS

\$1.4M

BUT THE GOVERNMENT FUNDS LESS THAN 25%

4,024 NEW REFERRALS

\$84 RECEIVED PER NEW CLIENT FROM THE GOVERNMENT



70% OF OUR CLIENTS LEFT THE SERVICE BECAUSE THEY HAD ACHIEVED THEIR PERSONAL GOALS

We received \$84 in Government support per new referral in the last financial year. Based on the \$1.1 billion cost of stroke in 2020, the Government's investment represents around 0.03%. This service is the only stroke specific community based service available nationally.

As an organisation, we are expected to do more with less. If the number of stroke survivors is likely to increase by at least 40% in the next decade, based on these growth estimates, we should increase our staffing by 40% to meet this need. This will cost us a further \$886,600 per year. Increased funding for this service is vital if we are to meet the present and future need, while continuing to offer a professional high-quality service to all stroke survivors.

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WE RECEIVED \$84 IN GOVERNMENT SUPPORT PER NEW REFERRAL IN THE LAST FINANCIAL YEAR. BASED ON THE \$1.1 BILLION COST OF STROKE IN 2020, THE GOVERNMENT'S INVESTMENT REPRESENTS AROUND 0.03%. THIS SERVICE IS THE ONLY STROKE SPECIFIC COMMUNITY BASED SERVICE AVAILABLE NATIONALLY.



THE NUMBER OF STROKE SURVIVORS IS LIKELY TO INCREASE BY

40%

IN THE NEXT DECADE



WE NEED TO INCREASE OUR STAFFING BY

40%

TO MEET THE NEED



RECOVERY

RETURN TO WORK

The NZIER research draws on the New Zealand Treasury's 2015 paper, 'The Employment and Income Effects of Eight Chronic and Acute Health Conditions', which revealed that stroke had an immediate and significant impact on employment.

With 25% of all hospitalised strokes occurring in people of working age and 75.2% of those being in paid employment prior to their stroke, the NZIER research shows that the total income loss will be over \$125 million in 2020.

As a consequence of lost income, the Government pays a significant amount in benefit payments to stroke survivors.

We know that getting back to work after a stroke can be a critical part of a survivor's recovery, both physically and mentally.

Our Return to Work service provides expertise and support to guide stroke survivors through the process of returning to gainful employment. We currently offer this

free service to stroke survivors under the age of 65 in the Greater Auckland and Christchurch regions.

In the last financial year, we saw a 12% increase in the number of stroke survivors engaging with our Return to Work programme. So far, 56% of those who have used this service have re-entered the workforce.

Over the last four years that the Return to Work service has been operating in both Auckland and Christchurch, we have supported 178 stroke survivors back into work.

It costs us \$3,172 per person to help stroke survivors return to employment. A very conservative calculation suggests a saving of at least \$57 million in benefits over the benefit lifetime of participants on our programme.

The Treasury research shows that the Government is not only losing money on income tax that would have been received from working age individuals in employment had they not experienced a stroke, but that a substantial amount would have been paid to stroke survivors

LOST PRODUCTIVITY OF A SINGLE COHORT OF WORKING AGE STROKE VICTIMS

SURVIVORS	YEAR OF ESTIMATE	YEAR POST-STROKE					TOTAL
		YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	
PREVIOUSLY EMPLOYED STROKE SURVIVORS	2018	1314	1176	1065	999	963	
	2020	1702	1523	1379	1294	1247	
AVERAGE INCOME LOSS PER EMPLOYED PERSON (UNDISCOUNTED)	2018	\$17,916	\$17,304	\$17,304	\$17,304	\$17,304	\$87,132
	2020	\$19,662	\$18,990	\$18,990	\$18,990	\$18,990	\$95,622
AVERAGE INCOME LOSS PER EMPLOYED PERSON (DISCOUNTED)	2018	\$17,916	\$16,325	\$15,400	\$14,529	\$13,706	\$77,876
	2020	\$19,662	\$18,021	\$17,187	\$16,420	\$15,734	\$87,024
TOTAL INCOME LOSS (UNDISCOUNTED) (000s)	2018	\$23,534	\$20,343	\$18,431	\$17,288	\$16,666	\$96,263
	2020	\$33,457	\$28,920	\$26,191	\$24,567	\$23,682	\$136,818
TOTAL INCOME LOSS (DISCOUNTED) (000s)	2018	\$23,534	\$19,192	\$16,404	\$14,516	\$13,201	\$86,846
	2020	\$33,457	\$27,445	\$23,704	\$21,243	\$19,622	\$125,470
EXPECTED INCOME LOSS PER STROKE (UNDISCOUNTED)	2018	\$2,456	\$2,003	\$1,712	\$1,515	\$1,378	\$9,063
	2020	\$2,696	\$2,330	\$2,110	\$1,980	\$1,908	\$11,025
EXPECTED INCOME LOSS PER STROKE (DISCOUNTED)	2018	\$2,456	\$2,003	\$1,712	\$1,515	\$1,378	\$9,063
	2020	\$3,491	\$2,864	\$2,474	\$2,217	\$2,048	\$13,093

Source: NZIER

through benefits.

Well placed investment is cost effective and elicits significant savings. With more funding, we would be able to extend this service to other parts of the country, helping more people and saving many more millions in benefit savings, in addition to improving the lives of stroke survivors and their families.

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WE CURRENTLY OFFER THIS FREE SERVICE TO STROKE SURVIVORS UNDER THE AGE OF 65 IN THE GREATER AUCKLAND AND CHRISTCHURCH REGIONS.

355 STROKE SURVIVORS ENGAGED WITH OUR RETURN TO WORK PROGRAMME



\$3,172

INVESTMENT PER PARTICIPANT CREATES

\$4.9M

SAVINGS IN THE FIRST YEAR

\$57M



SAVINGS IN BENEFIT PAYMENTS OVER THE BENEFIT LIFETIME OF PARTICIPANTS

56%

OF THOSE WHO JOINED THE PROGRAMME WERE ABLE TO RETURN TO WORK IN THE LAST FINANCIAL YEAR



CONCLUSION

The social and economic cost of stroke to New Zealand and New Zealanders is an immense burden, and the NZIER research highlighted in this document indicates that this figure will dramatically increase over the next two decades.

This increase will also lead to significantly increased costs to the Stroke Foundation to meet the growing need and close what is projected to be an increasing gap.

Commissioning this research and the inferences we've been able to make from the statistics have allowed us to quantify the impact of stroke and more importantly, understand where improvements can be made to reduce this burden, not just for the Stroke Foundation but all of New Zealand.

The report confirms our belief that more funding invested into prevention work will play a big part in the reduction of this burden. Stroke can affect someone at any age, so it's vital that we raise awareness and risk factors associated with stroke to help lessen the incidence of stroke in New Zealand.

We know that the work we are doing around prevention is proving to have an incredibly positive impact, with

many taking life-saving steps to better their health and reduce their risk of stroke after having their blood pressure checked with us. But the amount of funding provided by the Government increasingly falls short of what is required for us to continue this prevention work and for us to develop current and future services to reach those most at-risk.

Another key takeaway from this research is a consideration of the loss of income from those who are unable to work following a stroke. This is likely to have long-lasting economic effects on families who have been impacted by stroke.

We have been able to show that the more we do, the better outcomes we will see and at a cost that is significantly less than what is currently being paid out by the Government to help those affected by stroke.

Our vision is to ensure that significant steps are taken to reduce the number of strokes; that everyone understands and responds to key risk factors; and that anyone affected by stroke is supported and empowered. We hope that this NZIER research will support us to achieve our goal through increased investment and successful advocacy for national change.





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