This year, the Heart Foundation launched a compelling campaign to remind Australians that heart disease is the single leading cause of death. Despite big improvements in prevention and treatment over the past few decades, we still lose 51 lives a day to heart disease. That’s an average of one Australian every 28 minutes, according to the Australian Bureau of Statistics1.

This cannot be allowed to continue.

There is still much to be done to reduce risk factors, provide support for people living with heart disease and improve the environments in which we live, making them heart-healthier places.

In addition to the personal costs of the disease, cardiovascular disease (CVD) is one of the most expensive diseases to treat. CVD was the main cause for more than 575,000 hospitalisations in 2016-172. In 2012-13, $5 billion was spent providing healthcare to admitted patients with CVD. This accounted for 11.1 percent of total admitted health expenditure – the largest share of health expenditure of any disease group3. In 2017 CVD accounted for 12.3 percent of the total burden of disease in Australia4.

That is why we are publishing this pre-election policy paper setting out priorities for the next Australian Government. These cost-effective initiatives will address identified gaps in prevention, diagnosis and treatment, support and care, and research to address Australia’s biggest killer – cardiovascular disease – responsible for nearly 30% of all deaths1. We look forward to working with the next Australian Government to help individuals and communities to achieve better heart health.

Adjunct Prof John G Kelly AM
Group CEO
National Heart Foundation of Australia

"Preventing cardiovascular disease, and improving outcomes for those who live with, and are at risk of these diseases, should be a high priority for governments and the community."
The cost of Cardiovascular Disease in Australia
Cardiovascular disease includes all conditions affecting the heart, blood vessels and the circulatory system. It includes heart attacks, stroke, angina and heart failure.

THE FACTS ABOUT CARDIOVASCULAR DISEASE

- MOSTLY PREVENTABLE
- $5 BILLION SPENT EACH YEAR PROVIDING HEALTHCARE SERVICES TO PATIENTS WITH CVD
- A LEADING CAUSE OF TOTAL BURDEN OF DISEASE 12.3%
- AFFECTS 4 MILLION AUSTRALIANS
### Summary of the Action Areas:

<table>
<thead>
<tr>
<th>ACTIONS</th>
<th>Expected Cost</th>
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<tbody>
<tr>
<td>HELPING AUSTRALIAN FAMILIES MAKE HEART HEALTHY CHOICES</td>
<td></td>
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<tr>
<td>• Deliver a funded National Physical Activity Plan to get all Australians moving more and sitting less.</td>
<td>$30 million per year for 3 years</td>
</tr>
<tr>
<td>• Deliver a national grant scheme to fund infrastructure which supports safer active travel to schools. Fund Active School Travel Officers to work locally with Government agencies and developers to improve active travel infrastructure around schools and address local barriers, such as safety risks identified by parents.</td>
<td>$10 million over 5 years</td>
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<tr>
<td>• Infrastructure Australia to incorporate best-practice active transport infrastructure provisions (walking and cycling) into its assessment criteria for commonwealth funding for new road and rail projects.</td>
<td>$25 million over 5 years</td>
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<tr>
<td>• Deliver a National Nutrition Strategy to improve current eating patterns in Australia to reduce the burden of non-communicable diseases including heart disease.</td>
<td>No additional cost</td>
</tr>
<tr>
<td>• Establish ongoing funding to implement a six-year rolling Australian National Health Measures Survey, that includes biomedical risk factors and 24-hour urinary sodium excretion studies in the biomedical component of the Survey.</td>
<td>To be scoped</td>
</tr>
<tr>
<td>• Save lives with more Australians knowing the warning signs of a heart attack through a national community awareness program with a focus on local community engagement.</td>
<td>$12 million for the biomedical survey as part of the broader $87 million for the Health Survey over 6 years</td>
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<tr>
<td>REDUCING PREVENTABLE HEART ATTACKS BY SUPPORTING VULNERABLE COMMUNITIES</td>
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<tr>
<td>• Commit to a new National Tobacco Strategy (NTS) to replace the 2012-2018 Strategy and provide significant funding to support its effective implementation across Australia including: reinstating a population-based TV-led National Tobacco Campaign, funding a dedicated National Cessation Strategy, delivering targeted programs that will provide additional support to groups in the population experiencing the highest levels of disadvantage.</td>
<td>$25 million per year</td>
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<tr>
<td>• Provide $170 million over 4 years to deliver the END RHD action plan so that no child born in Australia today dies from Rheumatic heart disease.</td>
<td>$10 million per year</td>
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<tr>
<td>• Continue funding existing hospitals participating in the Lighthouse Hospital Project and increase the number of hospitals in the Project up to 20 to address disparities in treatments and care for Aboriginal and Torres Strait Islander peoples. Strategies include a strong and visible Aboriginal and Torres Strait Islander workforce; a commitment to co-design and involving Aboriginal community and organisations in all improvement activities; a culturally competent and responsive non-Indigenous workforce; workforce development including flexible approaches that meet the needs of local services and Aboriginal and Torres Strait Islander communities.</td>
<td>$15 million per year</td>
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<td>$170 million over 4 years</td>
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<td>$9.5 million over 3 years</td>
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## Summary of the Action Areas:

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<td>3 GETTING THE CARE YOU DESERVE AND MAKING THE BEST RECOVERY POSSIBLE</td>
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<tr>
<td>- Work with state and territory governments to support the development of a National Cardiac Registry including cardiac rehabilitation quality indicators.</td>
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<tr>
<td>4 RESEARCH</td>
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<tr>
<td>Investing in Young Australians:</td>
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<tr>
<td>- Support the best laboratory and clinical cardiovascular disease (CVD) researchers at every stage of their career, in particular, young scientists to provide the opportunity to continue to progress into tomorrow’s senior leaders.</td>
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<tr>
<td>Supporting more clinicians to do research:</td>
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<tr>
<td>- Innovative, enhanced and flexible funding schemes to provide opportunities for health professionals to manage both their clinical and research careers.</td>
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Action Area 1:

Helping Australian families make heart healthy choices

1.1 Show leadership in getting Australians active, develop a National plan with key actionable measures, and invest in active transport infrastructure.

What are we asking the next Government to do?

Deliver, implement and monitor a funded National Physical Activity Plan with key actionable measures that educate, motivate and enable physical activity particularly walking.

Deliver smart strategic investments in transportation that elevate the importance of the pedestrian and bike rider in planning, in order to provide equitable modal choices and improve the health of our communities.

- Infrastructure Australia to incorporate best-practice active transport infrastructure provisions (walking and cycling) into its assessment criteria for commonwealth funding for new road and rail projects.
- A national grant scheme to fund infrastructure which supports safer active travel to schools – cost $10 million over 5 years. Fund Active School Travel Officers to work locally with Government agencies and developers to improve active travel infrastructure around schools and address local barriers, such as safety risks identified by parents – cost $25 million over 5 years.

Why is this important?

- Physical inactivity is responsible for one third of the burden of CVD in Australia and only 14.8 percent of people (15 years and over) met the physical activity guidelines. Participating in regular physical activity can reduce cardiovascular disease related deaths by up to 35%.
- Overweight and obesity are major risk factors for cardiovascular disease. Alarmingly Australia’s rates of overweight and obesity are at an all-time high:
  - In 2017-18, two thirds (67%) of Australian adults were overweight or obese (12.5 million people);
  - Almost one quarter (24.9%) of children aged 5-17 years were overweight or obese in 2017-18 (17% overweight and 8.1% obese).
- Congestion threatens to cost Australia $53 billion by 2031 in the absence of additional capacity or demand management. The passenger transport across road and public transport is projected to increase by 58% from 622 million km per day in 2011 to 982 million km per day in 2031 in the six largest capital cities in Australia.
- 71% of Australian children do not walk or ride to school in a typical week.
- Only 14% of Australians travel to work by public transport.
- The built environment can either discourage or facilitate healthy choices. A focus is needed on creating supportive environments for behaviour change through partnerships between health and planning, transport and infrastructure, recreation and sport and across all levels of Government.

* Physical activity includes walking for transport, walking for fitness, sport or recreation, moderate exercise and/or vigorous exercise, which was undertaken in the last week.
What are we asking the next Government to do?

A large proportion of the burden of disease in Australia is due to poor nutrition, related to: an excessive intake of discretionary foods that are high in kilojoules, saturated fat, added sugars and salt; and an inadequate intake of healthy foods associated with a decreased risk of disease, such as vegetables, fruit and whole grain cereals.

Evidence-based strategies that will address this imbalance are required in order to minimise risk factors for heart disease and stroke, including high blood pressure, high cholesterol, obesity and diabetes. Strategies to improve healthy eating patterns should include a focus on priority populations, particularly including access to affordable, nutritious food. The previous National Nutrition Policy from 1992 urgently needs updating and expanding.

The Heart Foundation is calling for the Australian Government to develop and fund a National Nutrition Strategy to improve current eating patterns in Australia to reduce burden of non-communicable diseases including heart disease. A National Nutrition Strategy should focus on:

- A strong evidence base with regular reviews to the Australian Dietary Guidelines;
- Transparent labelling on processed food products, including mandatory labelling of kilojoules for foods purchased outside the home, and mandatory labelling of added sugars and fat profiles (including saturated, monounsaturated, polyunsaturated and trans-fat) on packaged food products;
- Establish food standards that place strong emphasis on healthy food and drink environments outside the home with robust targets for salt reformulation, portion size and a recommended mix of healthy versus unhealthy foods;
- Improve access to healthier food options particularly for rural, regional and remote communities; and
- Ensure transparent governance, monitoring, reporting and surveillance including regular National Nutrition Survey as part of the Australian Health Survey.

Why is this important?

- According to the National Health Survey\(^7\), in 2017-18, two thirds (67%) of Australian adults were overweight or obese (12.5 million people) and almost one quarter (24.9%) of children aged 5-17 years were overweight or obese.
- Heart disease is the single leading cause of death in Australia and poor diet (or dietary risk) is responsible for the largest proportion of the burden of heart disease. In fact, dietary risk accounts for 65.5 percent of the total burden of heart disease\(^12\).
- Only 5% of the population met fruit and vegetable consumption recommendations in 2017-18\(^7\). If all Australians ate the recommended daily intake of vegetables it would reduce the risk of CVD by approximately 16.6%\(^14\).
- Over 25% of the average food budget is spent on food eaten outside of the home\(^15\). Much of this food is discretionary food that is high in energy, saturated fat, salt and added sugars, making a significant contribution to poor diets.

In 2017-18, 67% of Australian adults were overweight and or obese (12.5 million people)\(^7\)
1.3 National Health Measures Survey

What we are asking the next Government to do?

The Australian Health Survey is the largest and most comprehensive health survey ever conducted in Australia collecting information about various health conditions, health status, risk factors, medications, health service usage, demographic and socioeconomic factors. In 2011-13, this survey also included for the first time, a Biomedical Survey which included blood and urine tests which were analysed for biomarkers for chronic disease.

The Heart Foundation is calling on the next Australian Government to establish ongoing funding to implement a five-year rolling Australian National Health Measures Survey, that continuously includes biomedical risk factors and 24-hour urinary sodium excretion studies in the biomedical component of the Survey.

The cost of the Survey in total is around $87m. The cost of the biomedical survey – around $12m – is insignificant compared to the human and economic cost of chronic disease burden. Failure to invest in the survey, especially the biomedical component, will lead to suboptimal investment of resources (waste and inefficiency) and poorer health outcomes for Australians.

Why is it important?

- The biomedical survey is a key component of the Australian Health Measures Survey in which critical biomedical data is collected from a representative sample of 11,000 volunteers. Australia cannot effectively or efficiently tackle the growing burden of chronic disease if it does not have detailed data to monitor progress and evaluate interventions.
- The last Australian Health Biomedical Survey to collect data on risk factors including those relating to heart disease and stroke was conducted by the Australian Bureau of Statistics (ABS) in 2011-2012.
- It is important that the National Health Measures Survey be undertaken every five to six years, because it provides researchers, decision-makers and health professionals, among many others, with the data to understand the health of the nation, this status and impact of key risk factors and the effectiveness of interventions. Without this data, we are, to a great extent, flying blind not knowing what the long-term trends and impacts are of Australia’s diet.

1.4 Save lives by more Australians knowing the warning signs of a heart attack

What we are asking the next Government to do?

Increase community awareness about heart attack warning signs with a focus on local community engagement. This includes special consideration of Aboriginal and Torres Strait Islander peoples, rural and remote communities and low socio-economic groups. Based on a pilot program in 2018, this program can be scaled up across Australia at a cost of $2.1 million per year.

Why is this important?

- The average person takes around six hours to call Triple Zero (000) when experiencing symptoms of a heart attack, well exceeding the recommended best practice of two hours.
- Currently, more than one in three people cannot recognise the common signs of heart attack such as chest, arm, shoulder, neck, jaw or back pain.
- Delays in treatment can lead to irreversible damage to the heart.
- Knowing the warning signs of a heart attack and acting fast can reduce damage to the heart and increase the chance of survival.
- Raising awareness of the warning signs of heart attack amongst all Australians has the potential to save lives across the country.
Why I care about this issue – Nicole Vera, parent

This is an issue which is very important to me. I have 2 children aged 9 and 10 and I’d love them to be able to walk to school. When I went to school I used to walk or ride a bike. I loved it – it’s a great way to start the day. My kids are quite active and they would love to be able to walk.

We only live 1.5 kms away from the school – about a 2 minute drive and definitely walkable. But I can’t let my children walk. It’s too dangerous. There are too many trucks, too much traffic and no safe paths. There are 3 estates around the school with lots of children and more houses are being built. They’ve said there are plans for a walkway which would be amazing, but we haven’t seen anything yet. Why can’t they build them at the same time? It should be part of the plan and not an add-on in the future.

This is more important than ever to us as a family. My brother had a heart attack at the end of last year and it was a big wake up call. If we can get kids into the habit of walking and getting exercise as part of their everyday life that will be much better for their health all their lives.
What are we asking the next Government to do?
Commit to a new National Tobacco Strategy (NTS) to replace the 2012-2018 Strategy and provide significant funding to support its effective implementation across Australia. This should include:

- $25m per annum to reinstate, and maintain for the period of the NTS, a population based TV-led National Tobacco Campaign, targeting adult tobacco users in all states and territories which is evidence-based in both creative development and audience exposure, and supported with rigorous developmental research and campaign evaluation;
- $10m per annum to create and fund a dedicated National Cessation Strategy within the National Tobacco Strategy to facilitate a consistent, evidence-based national approach to smoking cessation service provision. This would include the development and dissemination of national clinical guidelines and program support to embed the treatment of tobacco dependence into health services, primary care, and community and social service organisations as part of routine care, and the provision of a national Quitline™ as a referral, training and behavioural support provider;
- $15m per annum to specific, targeted programs that will provide additional support to groups in the population experiencing the highest levels of disadvantage. This will primarily be done through partnerships with the public health and community service sectors to provide direct services to high needs populations.

These activities should be undertaken as part of a comprehensive National Tobacco Strategy that also addresses regulatory issues, including those associated with the sale, promotion and supply of tobacco.

Why is this important?
- Tobacco smoking is the leading preventable cause of death and disease in Australia and a leading risk factor for many chronic conditions, including heart disease21.
- The 2018 Heart Attack Survivors Survey undertaken by the Heart Foundation found that more than half of those who smoked prior to their heart attack, continued to do so after22. Quitting smoking is one of the most effective ways of reducing repeat heart attacks and improving health after a heart attack.
- Most smokers want to quit smoking and we owe it to them to offer the support we know works. While quit rates have slowed across the population, the people with the highest smoking rates who need the greatest help – the lowest socio-economic group – have continued to show statistically significant reductions23.

Smokers are 3x more likely to suffer sudden cardiac death24.
Increasing Government funded quit smoking campaigns and supporting activity to evidence based levels will not only help current smokers to quit, it will support ex-smokers to maintain their healthier lifestyle and ensure that young people don’t become addicted to one of the greatest risks to their heart and health.

Evaluation\(^{25}\) of the first National Tobacco Campaign in 1997 showed that, over a sustained six-month period, the campaign yielded $740.6 million in direct healthcare savings, prevented 55,000 deaths and gained 323,000 life-years.

Adjusting for inflation and the costs of campaign renewal, the $9 million invested in 1997 (returning $740.6m) translates to circa $15.6 million in 2019 – with well over $1.3 billion in expected returns, given the inflated healthcare costs over two decades\(^{27}\).

Australia currently collects around $12 billion in tobacco excise\(^{28}\). Yet investment in areas such as mass media anti-smoking campaigns for the general population is at its lowest point in 20 years, while funding for all measures shown to reduce prevalence is well below benchmarks.

### 2.2 END RHD

**What are we asking the next Government to do?**

Provide $170 million over 4 years to deliver the END RHD action plan so that no child born in Australia dies from Rheumatic Heart Disease (RHD).

**Why is this important?**

- RHD is primarily a disease of social disadvantage. In Australia the highest burden, falls on Aboriginal and Torres Strait Islander peoples. It is a ‘third world disease’ that unnecessarily adds to the already high burden of cardiovascular disease for Aboriginal and Torres Strait Islander people.
- Australia has one of the highest recorded rates of RHD in the world with 92% of the of the people with RHD being Aboriginal and Torres Strait Islander peoples. 85% of these people live in remote communities and towns\(^{29}\).
- Cardiovascular disease is the leading cause of death for Aboriginal and Torres Strait Islander peoples\(^{1}\).
2.3 Lighthouse Hospital Project

What are we asking the next Government to do?
Commit to ongoing funding to implement Phase 4 of the Lighthouse Hospital Project (to support up to 20 existing and new hospitals). An investment of $9.5 million over 3 years in Phase 4 Lighthouse Hospital Project will enable the Heart Foundation to:

- Reduce the incidence and impact of Discharge against Medical Advice (DAMA) for Aboriginal and Torres Strait Islander peoples admitted with a cardiac condition;
- Improve access to evidence-based care for Aboriginal and Torres Strait Islander peoples from their initial presentation through to post-discharge;
- Embed cultural competency as a strategic and resourced priority;
- Improve Aboriginal and Torres Strait Islander workforce integration into cardiac care teams;
- Strengthen the relationship between the hospital cardiac care teams, and Aboriginal and Torres Strait Islander community and community organisations;
- Reduce incidence of representation to emergency departments for Aboriginal and Torres Strait Islander patients with cardiovascular disease; and
- Increase individual understanding and management of culturally appropriate flexible care for cardiovascular disease within hospitals.

Why is this important?
- Coronary heart disease (CHD) is the single leading cause of death for Aboriginal and Torres Strait Islander peoples in Australia, with 344 lives lost to the disease in 2017\(^{30}\). Aboriginal and Torres Strait Islander peoples are almost twice as likely to die from heart disease than non-Indigenous Australians\(^{30}\). Perhaps most disturbing is the fact that death rates are much higher at younger ages. Aboriginal and Torres Strait Islander peoples aged 35–44 years are at least eight times more likely to die from heart disease than non-Indigenous Australians\(^{31}\).
- The Heart Foundation leads the national fight against heart disease. Since 2012, funding from the Australian Government Department of Health enabled the Heart Foundation to work together with hospital staff, Aboriginal Medical Services and primary health care networks to reduce the disparities in care experienced by Aboriginal and Torres Strait Islander peoples with CHD. We are helping to close the gap in Aboriginal and Torres Strait Islander heart health outcomes. Despite the achievements of the past ten years, Aboriginal and Torres Strait Islander peoples continue to live at least 10 years fewer than other Australians\(^{32}\). Their mortality rates are on a par with some of the world’s most impoverished nations. More work is needed.
- The Lighthouse Project has proven impact in bringing about a reduction in DAMA rates, large scale system changes and engagement with Aboriginal and Torres Strait Islander health professionals and hospital executives. The Lighthouse Hospital Project Phase 4 proposal provides an opportunity to build on these strong existing frameworks and learnings from previous project phases to address the priorities of the Australian Government.

Aboriginal and Torres Strait Islander peoples are almost twice as likely to die from heart disease than non-Indigenous Australians\(^{30}\)
Smoking continues to be a significant cause of heart disease and other illnesses. We know that smoking kills two thirds of long-term smokers but just as tragically it damages the health of every smoker. As a cardiologist I see the impact of that damage every day.

The damage smoking does to hearts has been known for over 50 years. And yet tobacco companies continue to sell and promote their products. While this is the case we need to continue to do everything we can to persuade smokers to stop smoking and prevent young people from taking it up. In 2012-2013 the Government spent around $15.2 million per year on mass media campaigns to warn people of the dangers of smoking and support them to quit. In 2017-2018, they spent $5.8 million.

The Government has had great success in reducing smoking rates but now is not the time to cut back on the activities we know work in helping people to quit smoking. While young people are still taking up smoking and while the industry is still looking for ways to keep its customers hooked on its products, we need to keep up the Quit campaigns. We especially need campaigns for population groups where we know smoking rates are much higher. I support the Heart Foundation’s call for increased spending on Quit smoking campaigns.
Getting the care you deserve and making the best recovery possible

3.1 Reduce preventable repeat heart attacks by increasing participation in cardiac rehabilitation

What are we asking the next Government to do?
The Australian Government must work with state and territory governments to support the development of a National Cardiac Registry which includes a set of cardiac rehabilitation quality indicators.

A national cardiac registry would support continuous improvement of clinical practice and patient outcomes in cardiovascular disease by linking evidence, practice recommendations, and patient care, by allowing us to:

- Evaluate and improve clinical practice, providing registry data collection points aligned with national standards and evidence-based clinical guideline recommendations
- Identify gaps in care, where further research or practice interventions may be required
- Utilise registry data to inform future iterations of evidence-based guidelines and recommendations.

Why is this important?

- Every year, 57,000 Australians have a heart attack. Of those who survive their heart attack, an alarmingly high one-in-three will go on to have another heart attack – most of them within 12 months.
- Cardiac rehabilitation is a critical step in a patient’s journey to better health after a cardiac event. In fact, guidelines indicate that all patients with a diagnosis of Acute Coronary Syndrome (ACS) should be referred to a cardiac rehabilitation program.
- International literature has found people are 4-30% less likely to be readmitted to hospital and 14-36% less likely to die from CVD if they have participated in a cardiac rehabilitation service. Yet despite its benefits, uptake of cardiac rehabilitation remains low.
- Attending cardiac rehabilitation is not only important for saving lives, reducing unplanned hospital readmissions and improving quality of life, it is also good for the health of our economy. Economic modelling suggests that if over a ten-year period uptake of cardiac rehabilitation increased from 30% - 65% (in keeping with international good practice) then there would be net social and economic benefits of $227.2 million in the state of Victoria alone.
- To improve health outcomes across Australia, we must not only increase access and availability to services, but we also need to understand the current landscape of cardiac rehabilitation to drive quality improvement. The lack of consistent definitions and measures of cardiac rehabilitation makes it difficult to effectively monitor and evaluate cardiac rehabilitation services to drive quality improvement. An important step in this process is to develop and implement a National Cardiac Registry which includes consistent quality indicators, supported by cardiac registries in the states and territories. Further work can then be undertaken to improve models of care, such as telehealth.
- This work should be undertaken in close consultation with the Australian Government Department of Health, state and territory governments, health professionals, and the broader health community.
Why I care about this issue – Jacki Osborn, heart attack survivor

I had a heart attack while I was on holidays in Barcelona 2 years ago. Like many women I just thought my symptoms were indigestion but one night when I was walking back to my hotel the pain came on again with cold sweats, nausea and numbness. The pain woke me up at 2am and by midday the next day I was in hospital having a stent inserted to deal with the 95% blockage of my left anterior descending (LAD) artery. This was a total shock. I had no risk factors, no family history and I was fit and healthy. I had always done exercise, yoga and meditation. I didn’t know anything about heart disease or what I needed to do. So I phoned the Heart Foundation and they provided incredible support to help me understand what had happened to me. I was shocked to learn that 27% of heart attacks are in people with none of the usual risk factors.

One thing they suggested was attending a cardiac rehabilitation service. I booked in to the classes at Royal North Shore Hospital (once a week for 6 weeks) and it was very useful. You get knowledge - about how your heart works, diets, exercise – but also emotional support, especially from other patients. It’s hard to understand what effect a heart attack has on you unless you’ve had one yourself. At cardiac rehabilitation everyone gets it. I’m still going to exercise classes with the group 2 years later. I think everyone should go to cardiac rehabilitation. Hospitals need to make sure everyone is referred to a service and GPs need to encourage their patients to attend. It needs to be part of the system. Otherwise people just fall through the cracks and that can have a terrible impact on people’s lives.

“Hospitals need to make sure that everyone is referred to a cardiac rehab service…it needs to be part of the system.”
Research

4.1 Investing in our people

What are we asking the next Government to do?

Health and medical research reaps enormous social and economic benefits and drives improvement in healthcare quality and outcomes. The Heart Foundation is calling for the Australian Government to commit to:

- **Investing in Young Australians:** To continue Australia’s proud future as a leader in research in CVD in the coming decades, we need to support the best laboratory and clinical CVD researchers at every stage of their career, in particular, young scientists to provide the opportunity to continue to progress into tomorrow’s senior leaders.

- **Supporting more clinicians to do research:** The involvement of clinicians in research drives up standards of care for patients that leads to both better outcomes and less burden on the health system. Greater opportunities and support is needed to encourage health professionals to enter cardiovascular research. There needs to be enhanced and flexible funding schemes to provide opportunities for health professionals to manage both their clinical and research careers.

Why is it important?

- Heart disease is the largest killer of Australians¹ and the most expensive disease in terms of direct health care costs². Cardiovascular disease is also responsible for the second highest burden of disease, accounting for 12.3% of the total burden in Australia in 2017³.

- Cardiovascular disease research is an investment in the social and economic well-being of the nation that returns $9.80 for every $1 invested³⁷. It also offers the potential to address obesity-related illness through innovation and improved linkages between knowledge generation and health outcomes.

- The community benefits directly from the application of evidence-based research in CVD prevention, treatment, care, and rehabilitation because many advances in cardiovascular health have had their foundation in health and medical research discoveries. Populations with special needs especially benefit from research that helps address disparities in heart health for all Australians.
As a biological engineer, I am fascinated by how we can now grow artificial tissue in the laboratory to perform a range of functions that are normally done by a living organ in the body.

We know that heart disease is the single leading cause of death. Yet, despite all the wonderful advances in medicine, right now there are no effective treatments for damaged heart tissue caused by a heart attack.

A heart attack can result in the heart muscle being permanently damaged, leaving it weakened, and unable to pump as much blood as usual.

My research is aiming to advance the technology that could one day repair the hearts of people living with a damaged heart. This work is looking to take us one step closer to using bioengineered tissues as a viable alternative to donor organs.

In the lab today, we can grow ‘cardiac patches’ which are simple, heart tissue analogues, aimed at replacing damaged heart muscle. This approach has a lot of potential to be the clinical alternative to heart transplantation. However, the effectiveness of cardiac patches developed in a laboratory is currently limited; they’re very small and do not integrate effectively with the human body.

Normally, in the human body, survival of cells is maintained by an extensive network of blood vessels. These blood vessels deliver oxygen and nutrients to every cell in the body and also take away harmful waste products.

We can already build many tissues such as skin, bone, and muscle in the laboratory, but the biggest barrier to upscaling has been the lack of a blood supply.

The goal of my research is to develop cardiac patches by populating silk materials with isolated cells and investigating strategies that promote rapid and robust blood vessel formation.

There are two major parts to my research:

- The first is finding the best way to promote vascularisation using silk as a scaffolding material to build the tissue around;
- The second is to determine the cells most suitable for the job, with stem cells being the leading contender.

Our vision is a future in which we can offer novel treatment options for patients suffering from cardiovascular disease by growing replacement tissues in the laboratory. It’s obviously quite a challenge, but I am working with a talented, multidisciplinary team to meet it.

“Why I care about this issue – Dr Jelena Rnjak-Kovacina, Heart Foundation Future Leader Fellow”
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