

## Robot nation? The impact of disruptive technologies on Kiwis

The Chartered Accountants of Australia and New Zealand (CAANZ) engaged NZIER to carry out research into the way that disruptive technologies might affect Kiwi households.

Drawing on the international research, we explored what some of the technological and social changes might look like for New Zealanders: what industries, jobs and regions might be most affected by the changes, and how well placed are we to adapt to them?

We also worked with Colmar Brunton to survey 2,300 New Zealanders on their attitudes to disruptive technology, whether they thought their jobs are at risk and who should be responsible for the training needed for new jobs. A summary of our findings is below. The full report can be read at: <http://nzier.org.nz/publication/robot-nation-the-impact-of-disruptive-technologies-on-kiwis>

### Key points

- **Kiwi households are well aware of disruptive technologies such as driverless cars, life extending medical technology and solar panels.**
- **They are thinking carefully and rationally about disruptive technology, and can see the potential costs and benefits that lie ahead.**
- **While there are threats to employment from disruptive technologies, particularly for rural New Zealand, the low-skilled and men, many new jobs will be created too.**
- **New Zealand's policy settings are conducive to building a flexible, dynamic economy that can adjust to disruption.**
- **Improving the adaptability of the workforce will be crucial to securing the benefits and minimising the risks from technological change.**
- **It is imperative that we are mindful of the purposes for which we are employing technology to ensure we don't lose the essence of what it means to be human.**

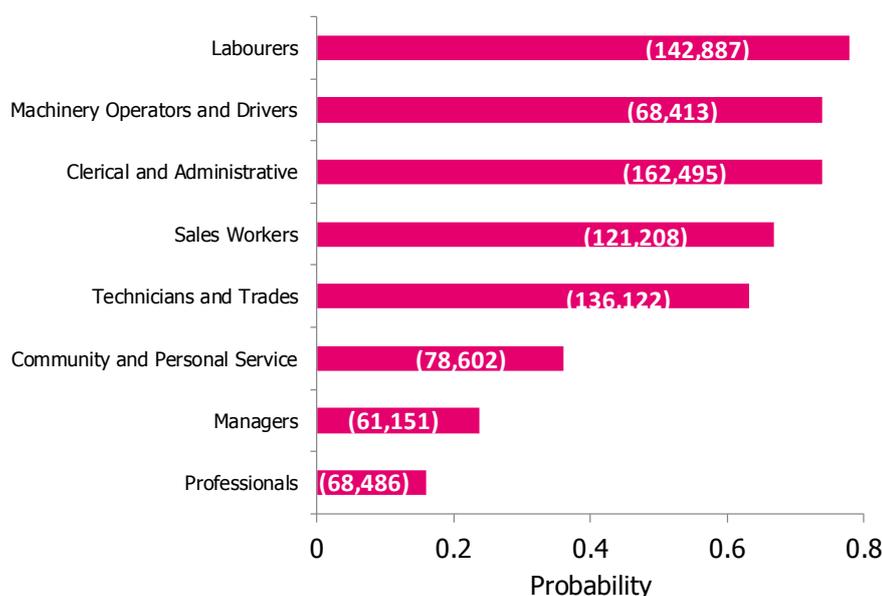
### Almost half of all jobs – and not just manual labour roles – are at risk

Based on NZIER's analysis, roughly half of all jobs in New Zealand today are at risk of technological displacement over the next few decades.

This includes jobs in sectors that have not traditionally borne the brunt of technological displacement such as financial services, public administration, and scientific and technical services, as well as more repetitive, manual roles.

### Employment at high risk of automation by occupation

Numbers in brackets represent the number of jobs at high risk



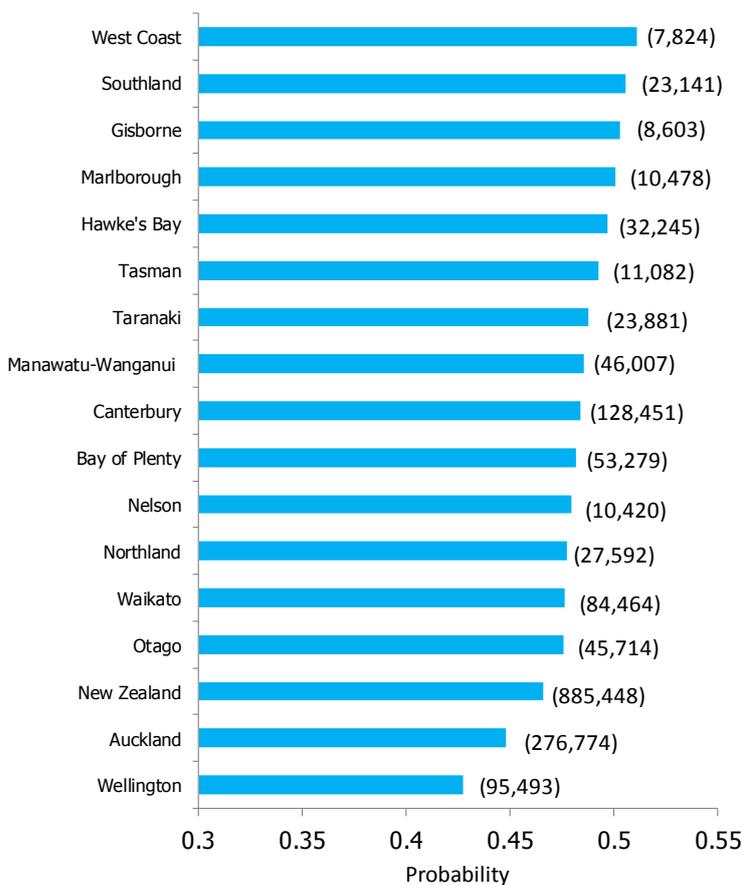
Source: NZIER, Statistics NZ, based on Frey and Osborne (2013) ([http://www.oxfordmartin.ox.ac.uk/downloads/academic/The\\_Future\\_of\\_Employment.pdf](http://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf))

## Rural workers and men are most likely to be displaced

The risk of job displacement falls more heavily on provincial New Zealand than the cities, due to the heavier role of services sectors in the big cities which are less susceptible to automation. This will potentially exacerbate the long-running urbanisation trend in New Zealand.

It also falls more heavily on men, who are over-represented in at-risk occupations like transport, construction and manufacturing.

### Number of jobs at risk by region



Source: NZIER, Statistics NZ

## But disruptive technology creates jobs too

US research suggests around 500,000 new jobs have been created over the past 15 years in occupations that did not even exist 15 years ago (e.g. computer network specialists, information security analysts or web developers).

Home grown companies such as Xero, Gameloft and Rocket Labs show we are not just fast adopters of technology – we are also able to push the frontier of technological change and create globally competitive new products and services.

## 60% of Kiwis say that technological change has lifted their productivity

5% said that their productivity had *dropped* in the past 5 years as a result of new technology.

But a further 60% said that their productivity had improved, so on balance, this is a positive story for economic growth and living standards.

## Getting ready for change requires individual and firm responsibility

Kiwi workers are pragmatic about how they need to prepare for disruptive technology: a third suggests that their employers should be helping them to upskill and move into new jobs and 44% think the responsibility for preparing should fall on the individual. Just a quarter think it's the government's role.

## Kiwis are open-minded about driverless cars

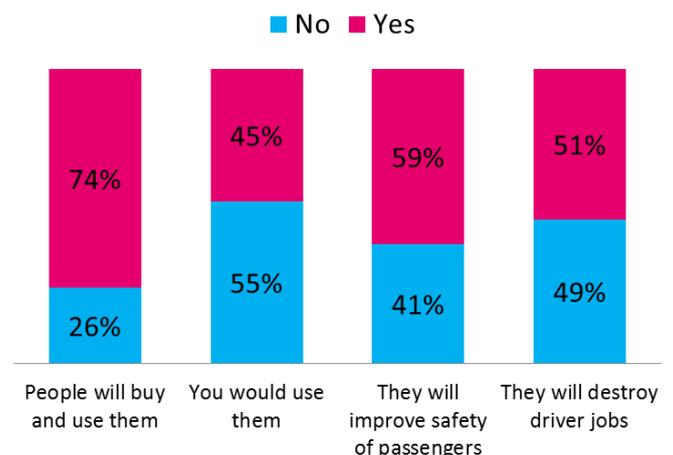
Almost 75% of those surveyed said they expect people to buy and use driverless cars, although they were less convinced that they themselves would do so at about 50%.

Households think that road transport will become less risky, with 60% expecting safety improvements. But the survey also asked about an interesting legal issue: who should be liable for the costs of an accident involving driverless cars?

- 13% said it should be the car manufacturer.
- 22% thought the passenger in the car at the time.
- But the most popular response at 31% was that the software supplier of the driverless system should be liable.

## What will be the impact of driverless cars?

Results weighted by age, gender, and region



Source: NZIER, Colmar Brunton

### Medical advances need to be available to all

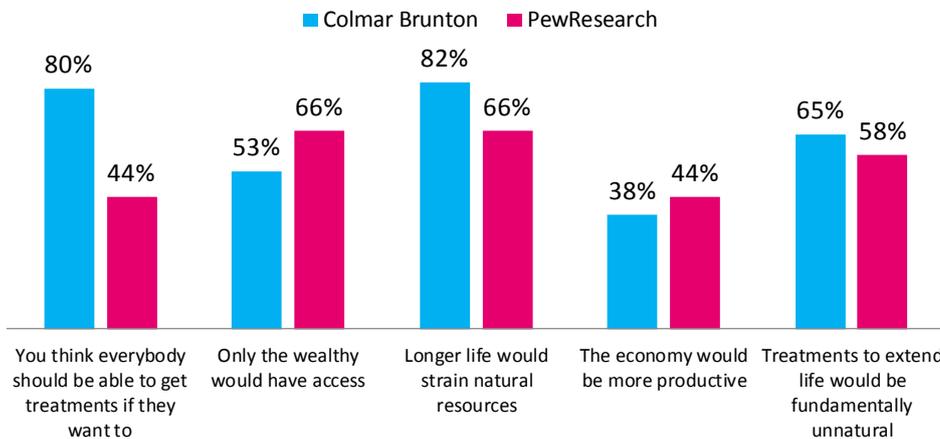
62% of Kiwis want to live decades longer. This compares to just 38% in the United States, probably due to our different approach to healthcare.

Kiwis are keen to ensure that access to new medicines that extend life expectancy is not just for the wealthy few: over 80% want such technologies to be available to all New Zealanders.

And households had a clear message for government on whether the age of superannuation should rise with improved life expectancy: over 60% say yes, it should.

#### With which of the following do you think would you agree regarding life extension treatment?

Results weighted by age, gender, and region



Source: NZIER, Colmar Brunton

### So is New Zealand ready for disruption?

Overall, we think there are good reasons to be positive about the coming wave of technological innovation and New Zealand’s ability to make the most of it.

Our survey results suggest that there is a reasonable level of awareness of technological change and the importance of individual responsibility to cope with it.

New Zealand’s policy settings are – on the whole – conducive to building a flexible, dynamic economy.

This conclusion does not mean we should be complacent. The scale of change from automation, and related changes in business models, is projected to be very large.

While we can be positive about the longer run, short-term downside employment and business risks are apparent. There are also potentially regional and gender elements to these risks – jobs held by males and jobs in the provinces may be most vulnerable to automation.

Policy makers and business need to be attuned to these risks and consider how they can reap opportunities and minimise adjustment costs.

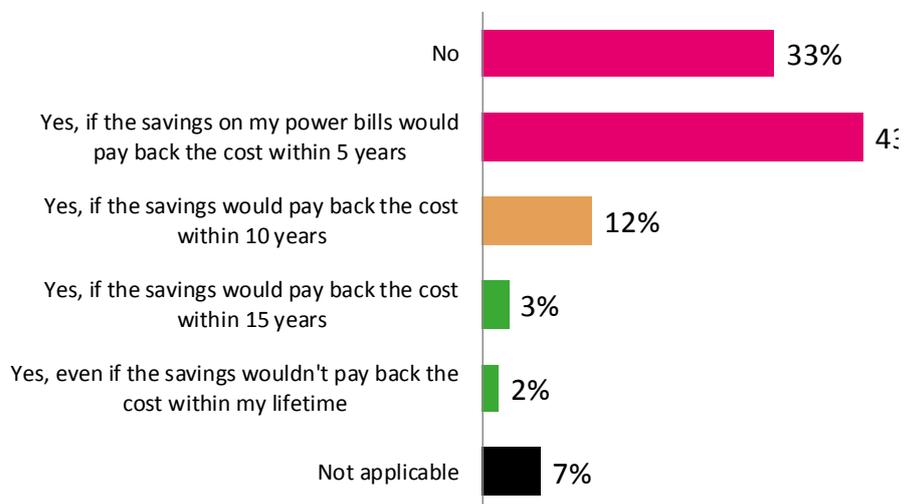
### Solar panels not yet a compelling option for households

We estimate that by 2030, cost savings on power bills due to greater use of solar panels could be as large as \$700 million per year, or \$335 per household. But the upfront cost – currently around \$10,000 to 15,000 per household – is too high for most.

Some 73% of Kiwis said they would buy or lease panels if the power bill savings were as large as or larger than the upfront cost.

43% would only invest if the payback period was less than 5 years. This is highly unlikely given current technologies. Only 5% would pay \$10,000 to \$15,000 for panels if the payback period was 15 years or longer.

#### Would you spend \$10,000 to \$15,000 on solar panels for your house?



Source: NZIER, Colmar Brunton

## Recommendations to make the most of technological changes

Recommendations to policy makers	
1.	As the largest investor in science and technology in New Zealand, the government needs to ensure public research institutions play a pivotal role in facilitating the rapid adoption of technology, as most new technology is developed offshore.
2.	Create a dynamic register of jobs and sectors at most risk (positive and negative) of technological disruption based on academic research, and offshore and local experience. Communicate register with business, unions and other stakeholders.
3.	Examine the extent to which present regulatory settings unnecessarily encumber technology uptake. Be proactive in adjusting settings in response to new business models and in seizing technology opportunities, whether or not they have reached New Zealand's shores.
4.	Consider whether the education system is equipping both children and adults with the skills needed to meet technological changes and enter a rapidly changing environment where the ability to quickly adapt and continuously upskill will be lifetime assets.
5.	Assess how government infrastructure spending needs to change in the face of emerging technological disruption, particularly in transport networks where there is a risk that some investments such as public transport will be stranded as driverless technologies evolve.
Recommendations to business	
1.	Regularly consider how business models, growth targets and investment plans may be affected by technological shifts.
2.	Communicate with employees the implications of technological change and encourage on the job training and upskilling where needed.
3.	Be fast adopters – experiment with new technologies that can deliver the same or better outcomes for customers.
4.	Be prepared to go global with commercialisation of new technologies and business models. As part of this, seek outside capital and business support when needed.
Recommendations to households	
1.	Keep abreast of technological and business model changes that affect your occupation and understand the implications for future careers.
2.	Be ready to re-invest in training several times in a career and proactively pursue retraining opportunities if you find yourself in a “sunset” occupation.
3.	Be fast adopters – realise the increased consumption choices, cost savings and potential income sources that new technologies can bring.
4.	Take care to avoid being constrained by perceptions of traditional gender roles in your career choices – the outlook is for occupations dominated by men to be most at risk of job dislocation.

Source: NZIER

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