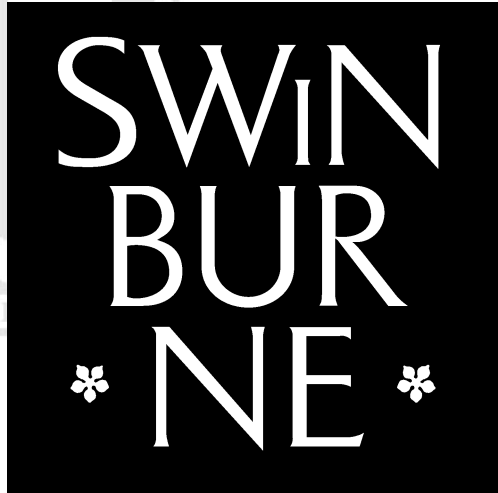


# The Swinburne National Technology and Society Monitor

Social Psychology Research Unit  
Psychological Sciences & Statistics  
Faculty of Life & Social Sciences  
Swinburne University of Technology

2011 Monitor



SWINBURNE UNIVERSITY  
OF TECHNOLOGY

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## Executive Summary

The Swinburne National Technology and Society Monitor provides an annual 'snapshot' of public perceptions of technological change. The Monitor is based on a national survey of 1000 Australian adults aged 18 to 94. The main findings of the 2011 Monitor are:

1. In general, Australians are comfortable with the rate of technological change in the world today.
2. Most Australians are very comfortable with having wind farms in Australia but are not comfortable with having nuclear power plants in Australia.
3. The degree of comfort with genetically modified (GM) plants and animals for food remains relatively low.
4. Australians trust scientific institutions and the non-commercial media for information about new technologies. They have less trust in major companies and the churches, with the least trust in the commercial media.
5. Australians report higher levels of trust in medical doctors than in mental health professionals.
6. When asked what social issues were the most important for Australia today, issues related to public health and quality of life were the most cited social concerns. Also often cited were environmental and population issues.
7. Australians reported low levels of awareness and knowledge regarding nanotechnology, and the vast majority had not participated in any activities related to nanotechnology. However, after being given some information about nanotechnology, findings suggested that:
  - a. Australians are generally comfortable with the use of nanotechnology in a variety of contexts.
  - b. Australians perceive mostly benefits from the use of nanotechnology, particularly for future generations.

# Introduction

## Background

Information and life science technologies have profound social, political, psychological and ethical implications. Public perceptions of such technologies are potentially volatile.

The Swinburne National Technology and Society Monitor was developed in 2003 at Swinburne University of Technology. It involves a representative nationwide survey of Australians, and provides an annual 'snapshot' of public perceptions regarding new technologies in Australia.

The 2011 Monitor is the ninth edition of the Swinburne National Technology and Society Monitor. It provides a general account of public perceptions about new technologies in Australia, including trust in institutions that provide information about new technologies. In addition, it involves an assessment of current social concerns, and an in-depth profile on public perceptions about nanotechnology research.

## The Survey

The 2011 survey included 1000 respondents. Participants in the national survey were asked:

- ◆ How comfortable they were with the current rate of technological change.
- ◆ How comfortable they were in relation to various technologies.
- ◆ The extent to which they agreed or disagreed with statements about the value of science and technology, and their beliefs as to the amount of control science should have over nature.
- ◆ How much they trusted various institutions, organisations and groups for information about new technologies.
- ◆ What they thought were important social issues for Australia at present.
- ◆ How comfortable they were in relation to nanotechnology research in different contexts.

## Measures

### Perceptions of New Technologies

Comfort with technologies was measured on an eleven point Likert scale where 0=not at all comfortable and 10=very comfortable.

Statements about science and technology were measured on an eleven point agreement scale where 0=strongly disagree and 10=strongly agree.

Trust was measured on a six point Likert scale where 0=don't trust at all and 5=trust a very great deal.

### Perceptions of Social Concerns

Perceptions of important social issues were gained through an open-ended question inviting respondents to nominate what they thought were the three most important issues or problems for Australia at present.

### Perceptions of Nanotechnology

The nanotechnology section started with questions about awareness and knowledge of nanotechnology. Each question was measured on an eleven point Likert scale where 0 = completely unaware / no knowledge at all and 10 = completely aware / very knowledgeable.

Following this, respondents were read a paragraph with a definition of nanotechnology and some information on potential uses of nanotechnology, and then asked how comfortable they were with scientists applying nanotechnology in a variety of contexts. Once again an eleven point Likert scale was used, where 0 = not at all comfortable and 10 = very comfortable.

Next respondents were asked to think about potential risks or benefits of the possible applications of nanotechnology, firstly in general terms and then more specifically in relation to themselves, the average Australian, society as a whole and future generations. A five point scale was used where 1 = mostly risks; 2 = some risks; 3 = no risks or benefits; 4 = some benefits; 5 = mostly benefits.

Finally respondents were asked how often they had done a variety of activities related to nanotechnology (never; a few times; sometimes; regularly; often).

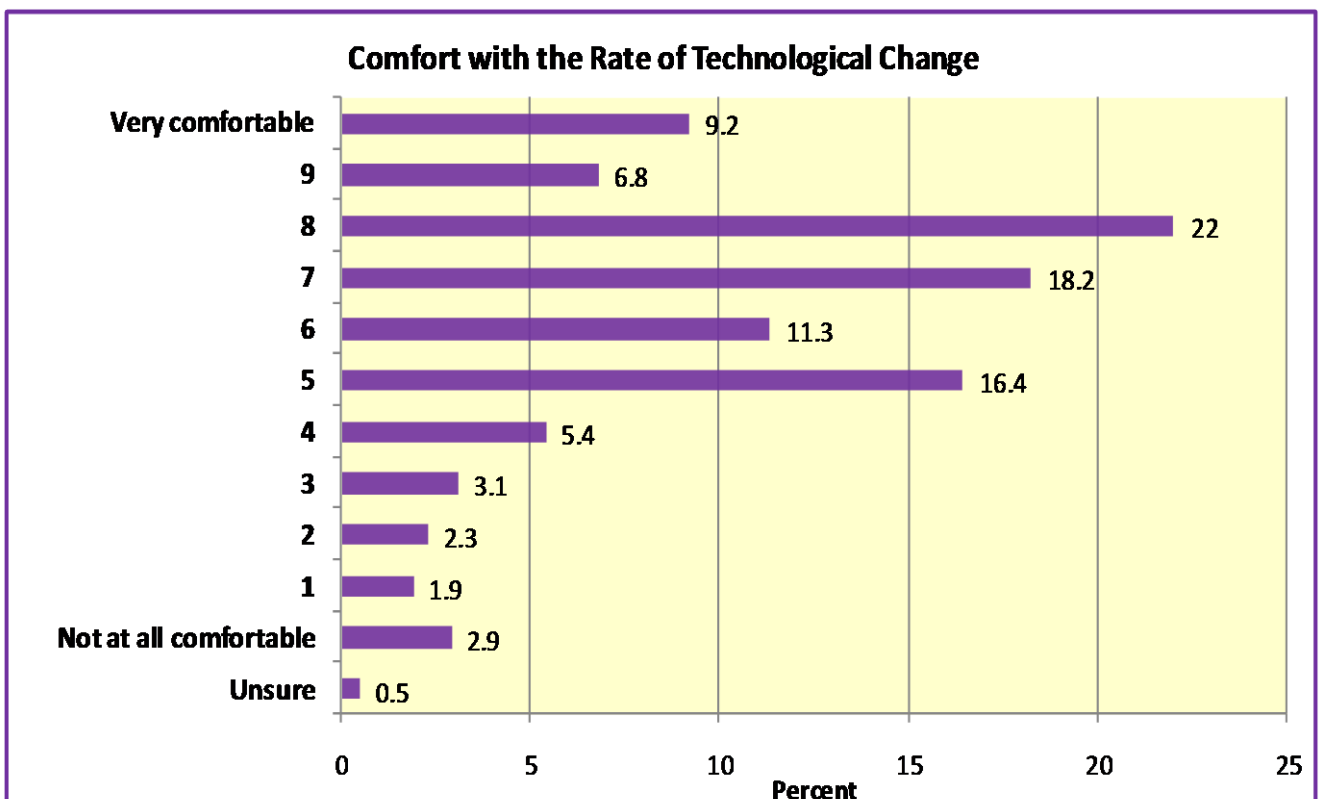
# Comfort with the Rate of Technological Change

In general, Australians are comfortable with the rate of technological change in the world today (average rating = 6.5).

Sixty seven percent of the sample gave ratings above the mid-point of 5 on the 0 - 10 rating scale, while sixteen percent gave a rating below the mid-point of 5.

Sixteen percent of the sample reported they were neither comfortable nor uncomfortable (rating at mid-point of 5), and less than one percent reported being unsure of their comfort level with the rate of technological change.

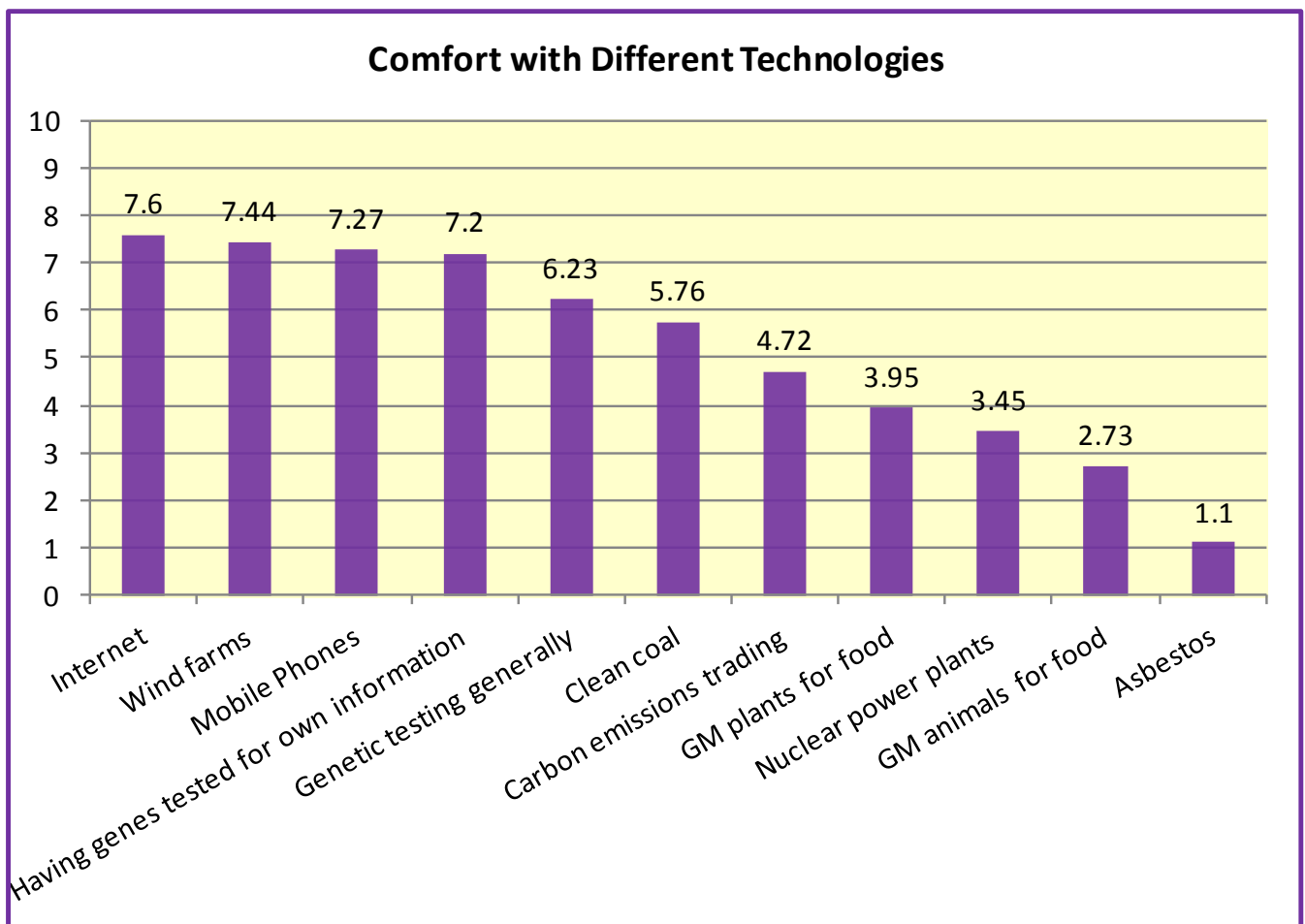
Men were significantly more comfortable with the rate of technological change than women, and younger people were significantly more comfortable than older people.



# Comfort with Different Technologies

Australians are comfortable with the internet, wind farms, mobile phones, clean coal and genetic testing. However, Australians are significantly more comfortable with genetic testing for their own information than with genetic testing generally.

Australians are not comfortable with the government's pollution reduction scheme, nuclear power plants or genetically modified foods. They are less comfortable with genetically modified animals for food than with genetically modified plants for food.



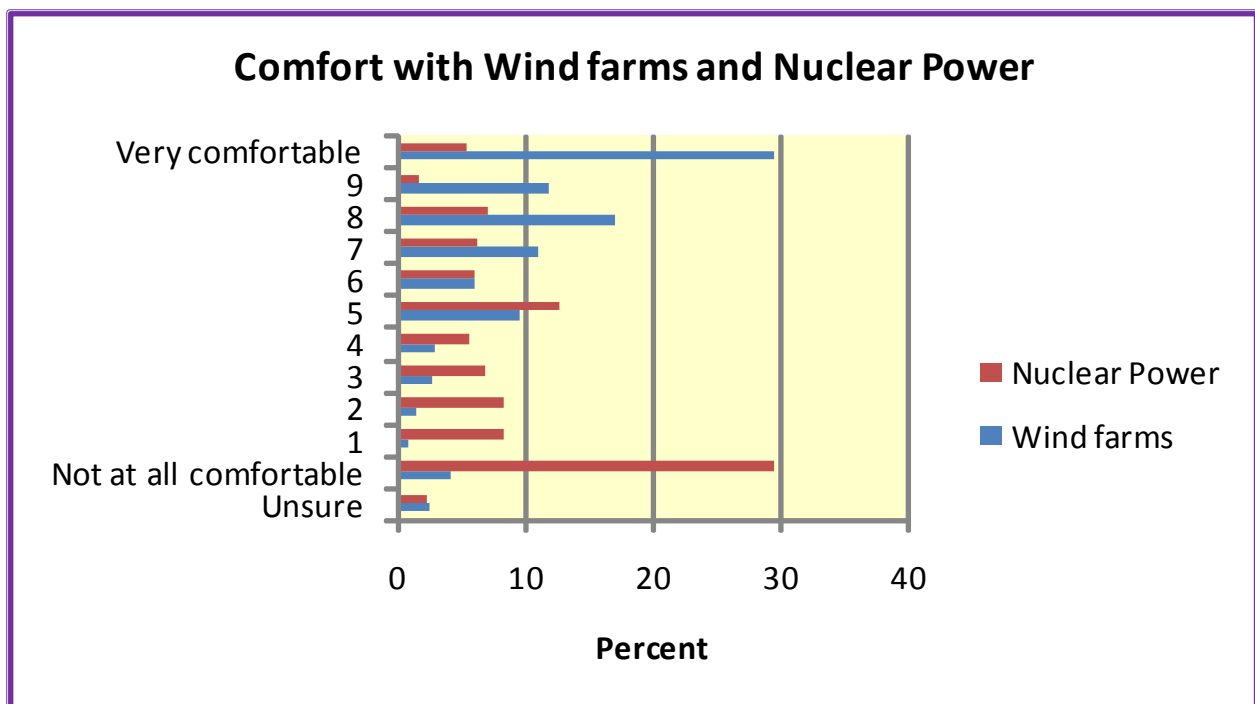
## Comfort with Wind Farms and Nuclear Power Plants in Australia

In 2006 we examined, for the first time, Australians' levels of comfort with the thought of nuclear power plants in their own country. In 2007 we also examined the level of comfort with wind farms. Our 2011 data suggests continued discomfort with nuclear power in Australia, but high levels of comfort with wind farms.

On average, the level of comfort with wind farms in Australia was quite high (average rating = 7.4) while the level of comfort with nuclear power plants was fairly low (average rating = 3.5). Seventy-six percent of respondents reported some level of comfort with wind farms, with 30% reporting they were very comfortable. By contrast, 27% of Australians reported some degree of comfort with nuclear power plants with only 6% reporting they were very comfortable.

Fifty-nine percent of the sample reported some degree of discomfort with nuclear power plants, with 30% giving comfort ratings of 0, indicating they were not at all comfortable. By comparison only 12% of the sample reported any discomfort with wind farms. A further 12% were unsure about wind farms and 15% were unsure about nuclear power plants in Australia.

On average, men were significantly more comfortable with nuclear power than women were. Men and women did not differ in their comfort with wind farms.



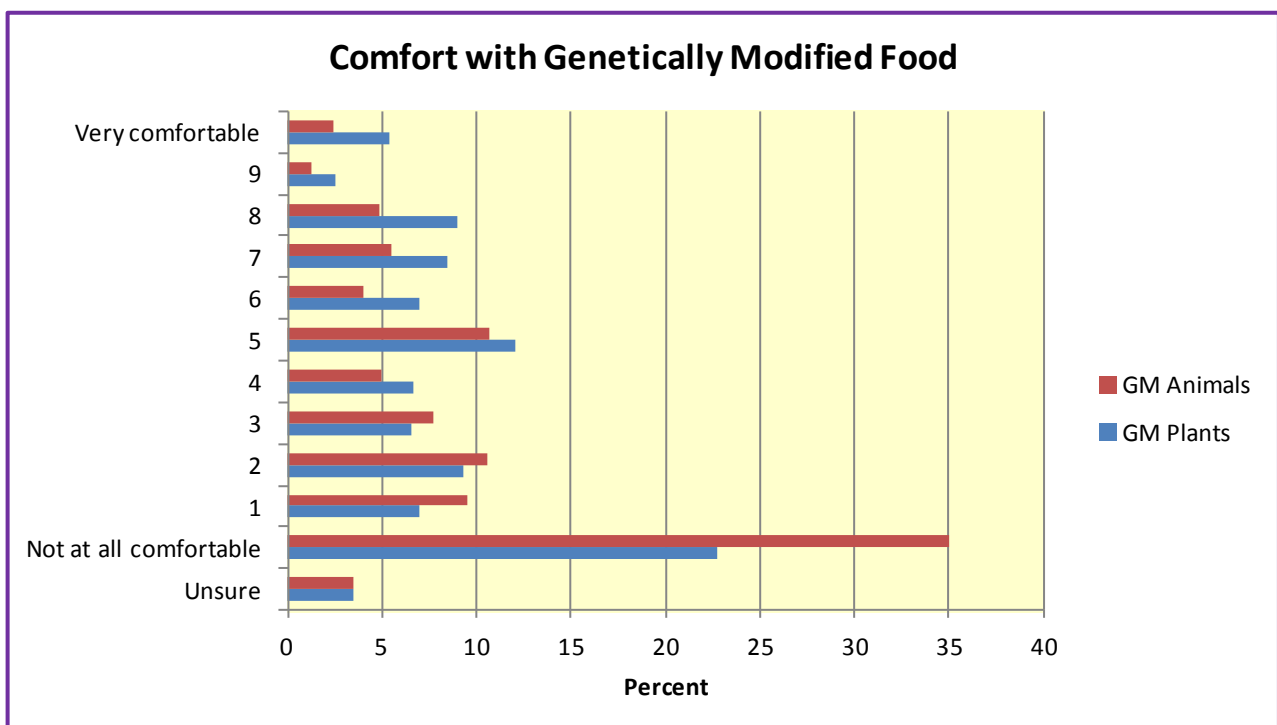
## Comfort with GM Plants and Animals for Food

On average, Australians were more comfortable with genetically modified plants for food (average rating = 3.9) than with genetically modified animals for food (average rating = 2.7), but the degree of comfort for both is relatively low.

Thirty-two percent of the sample reported some comfort with genetically modified plants for food (rating above the midpoint of 5 on the scale), while 18% reported some level of comfort with genetically modified animals for food.

The majority of the sample was not comfortable (rating below the midpoint of 5 on the scale) with genetically modified plants (52%) and animals (68%) for food. Of these respondents, most reported they were not at all comfortable with GM plants (23%) or animals (35%) for food. A further 15% reported being unsure of their comfort with genetically modified plants for food, while 14% reported being unsure of their comfort with genetically modified animals for food.

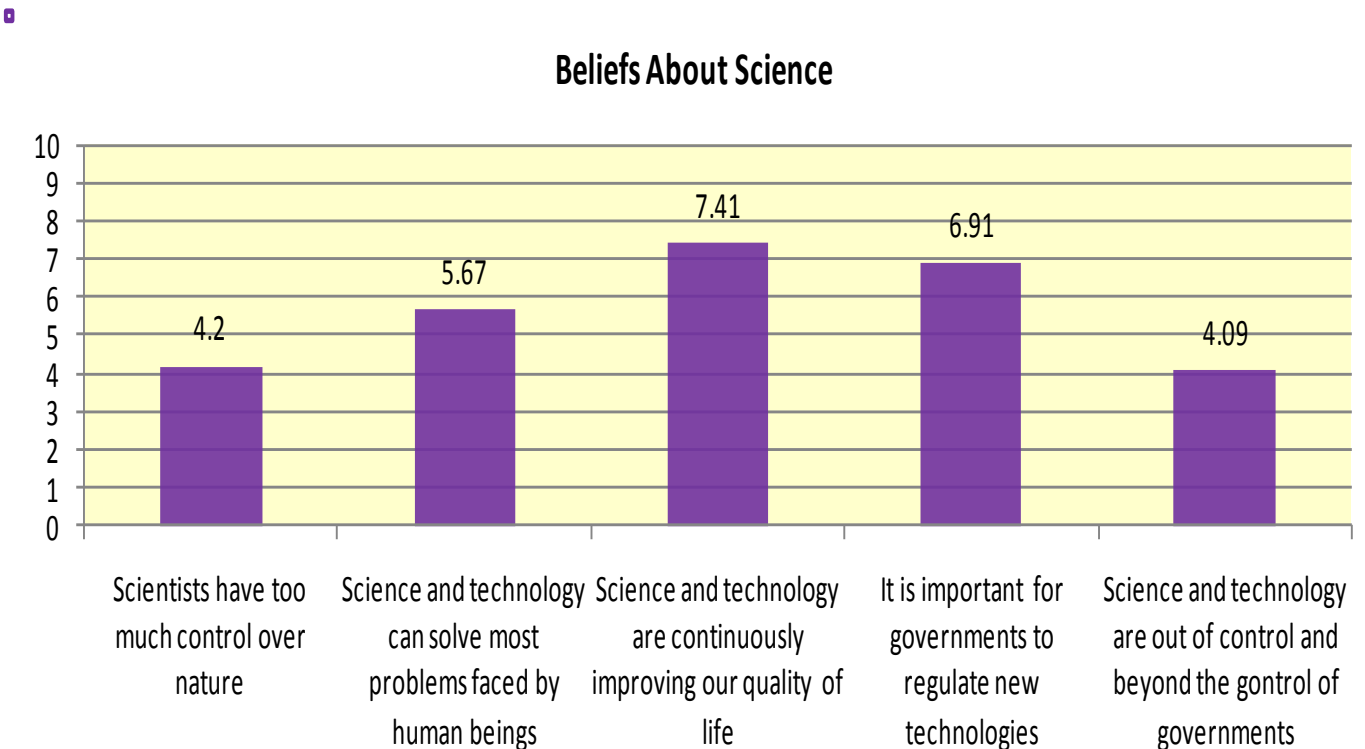
Men were significantly more comfortable with GM plants and animals for food than women were.



# Attitudes Towards Science and Technology

Australians generally agree that science and technology are improving our quality of life, and think it is important for governments to regulate new technologies.

There is somewhat less agreement about the level of control scientist have over nature, the degree to which science and technology can solve problems faced by human beings and the level of control that governments have over science and technology.



## Trust in Organisations

The overall pattern of results for Australians' trust in people and organisations, in relation to information about science and technology, is very similar to the pattern of results found in previous years.

Australians continue to have the most trust in scientific institutions (such as CSIRO, universities and hospitals). Australians have a degree of trust in the environmental movement, the public service and major Australian companies, but they do not trust the churches, major international companies, governments or trade unions.

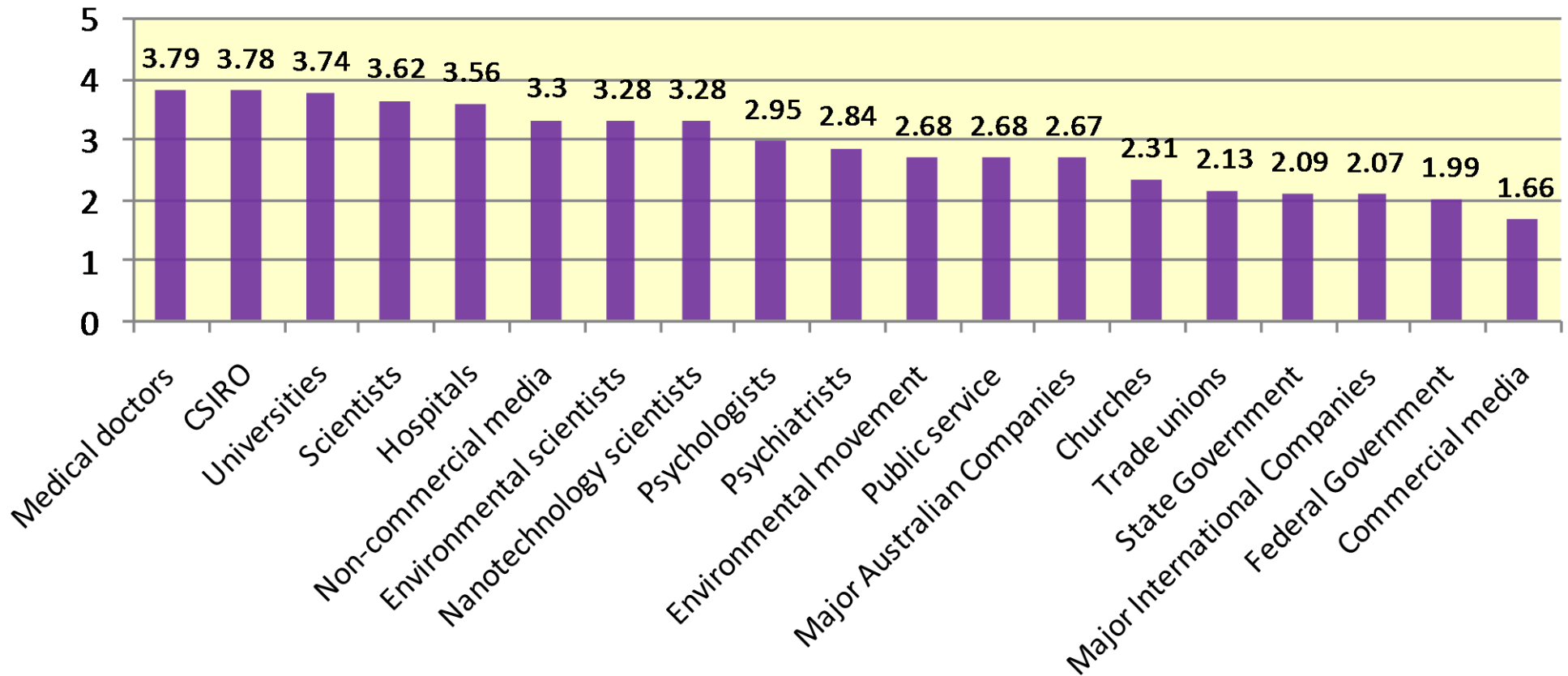
In 2011 respondents were asked to rate trust in environmental scientists for the first time. Results indicate that trust in environmental scientists is significantly higher than trust in the environmental movement in general.

While trust for governments was generally low, trust in State governments was significantly higher than trust in the Federal government. In 2011 trust in the Federal government was at the lowest level it has been since the Monitor started in 2003.

In 2008 respondents were asked to rate their degree of trust in major international companies for the first time. Results in 2011 indicate that trust in major international companies remains significantly lower than trust in major Australian companies.

Consistent with previous results, the level of trust in non-commercial media is similar to levels of trust in scientific organisations, while trust in the commercial media is the lowest of all the organisations.

### Trust in Organisations



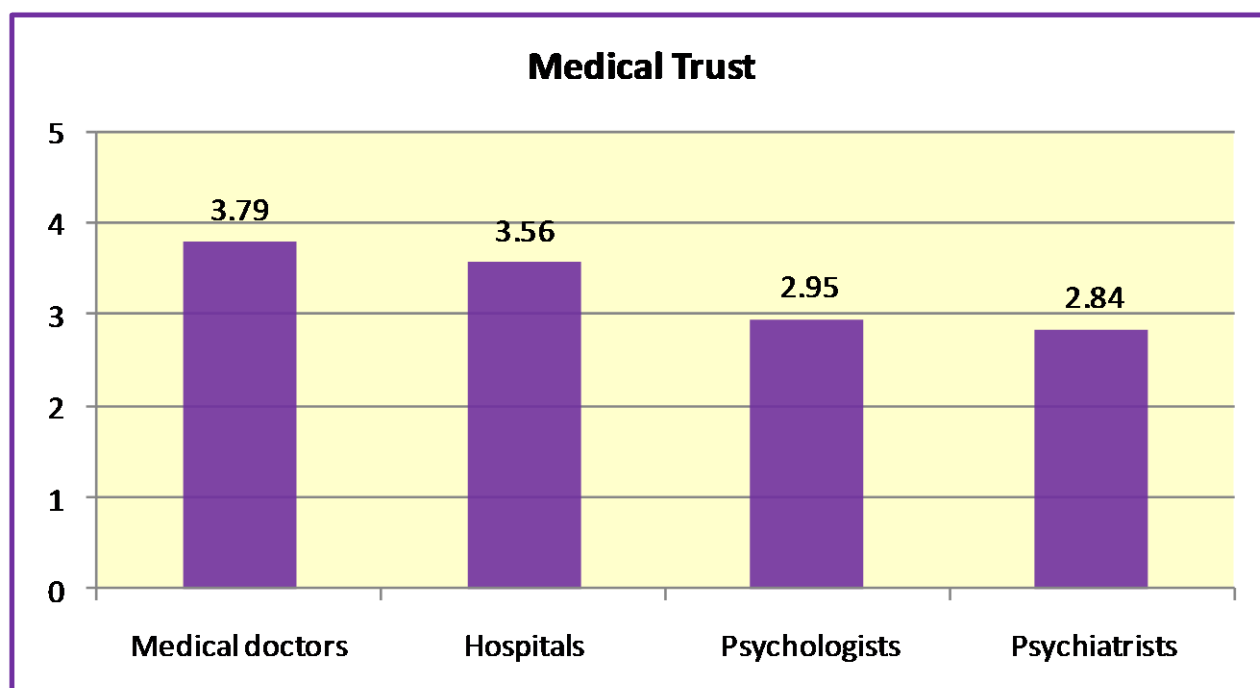
## Medical Trust

In addition to the standard SNTSM question about trust in hospitals, the 2011 respondents were asked how much they trust medical doctors, psychologists and psychiatrists. Each medical trust target was rated on a 0 to 5 scale (0 = no trust at all, 5 = a great deal of trust).

Overall, Australian adults reported relatively high levels of trust in medical doctors and hospitals but lower trust in mental health professionals. Comparing respondents' trust scores across the four medical targets showed significantly higher public trust in medical doctors than in hospitals or mental health professionals, with trust in psychologists rated higher than trust in psychiatrists (all differences were significant at  $p < .001$ ).

This sample reported similar levels of trust in medical doctors (3.79) as they reported for trust in universities (3.74) and the CSIRO (3.78). Trust ratings for mental health professionals were lower (psychologists = 2.95; psychiatrists = 2.84) and more in line with trust in the environmental movement (2.68) and the public service (2.68).

There were no differences between men and women in their degree of trust in psychiatrists. However, men reported greater trust in both hospitals and medical doctors than did women, while women reported greater trust in psychologists than did men.

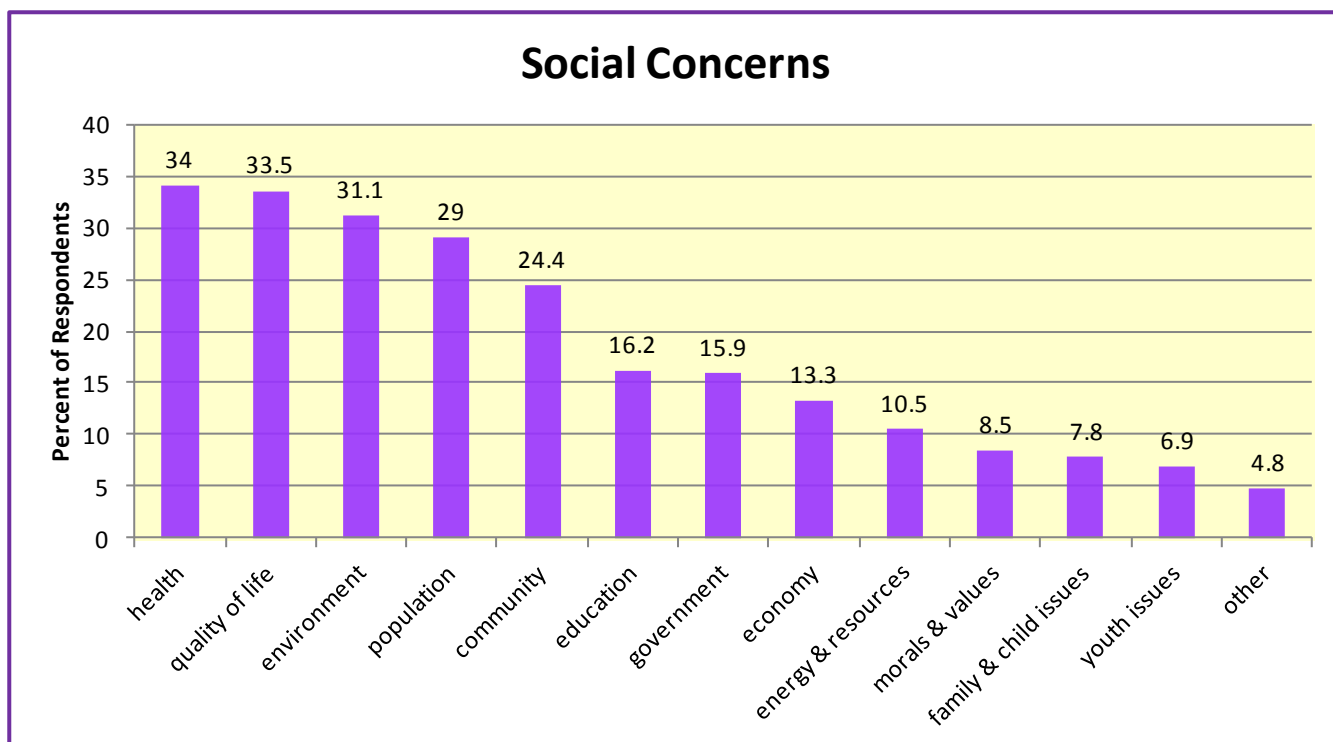


## Concern About Social Issues

In 2011 respondents were asked an open-ended question inviting them to nominate up to three issues that they felt were the most important issues or problems for Australia at present. If respondents nominated a very broad area (e.g. education), they were asked if there was some specific aspect of that issue that was of particular concern. Responses were firstly divided into broad categories and then into subcategories of the broader social concern.

Issues related to public health were the most often cited social concern (34% of respondents), closely followed by issues related to quality of life (33.5%). Within the health category, people most often cited problems related to drugs and alcohol (26%), general health services and funding (20%), hospital staffing and waiting lists (19%) and mental health (16%). The most frequently cited quality of life issues related to employment (26%), social services and welfare (18%), homelessness (16%) and the economic divide between the rich and the poor (15%).

Also often cited were environmental issues (31.1% of respondents) and population issues (29%). Environmental concerns centred on climate change (36%) and the carbon tax which was still under government discussion at the time of the survey (29%). Population issues were mostly focussed on refugees / asylum seekers (47%) and integration / assimilation problems (14%).



## Subcategories of Social Concerns

The information below details the most frequently cited subcategories within the broad social concerns nominated by respondents (less frequently cited issues are not included). The subcategories are listed in descending order of frequency of response.

### Health

Drugs & alcohol  
Health services & funding  
Hospital staffing & waiting lists  
Mental health

### Quality of Life

Employment  
Social services & welfare  
Homelessness  
Economic divide (rich & poor)

### Environment

Climate change  
Carbon tax  
Sustainability / conservation  
Pollution / waste

### Population

Refugees / asylum seekers  
Integration / assimilation  
Immigration (general)

### Community

Law & order / crime & violence  
Aging population / aged care  
Housing

### Education

Curriculum content  
Funding  
Inequality of opportunities

### Government

Leadership  
Policies / direction  
Honesty & integrity

### Economy

Inflation / cost of living  
Financial stability / crisis  
Taxation

### Energy & Resources

Farming & agriculture  
Mining  
Renewable energy  
Water

### Morals & Values

Moral decline  
Greed / selfishness  
Animal welfare

### Family & Child Issues

Child protection / welfare  
Parenting  
Family breakdown / divorce

### Youth Issues

Discipline / behaviour problems  
Attitudes / lack of respect  
Social media

There were a few issues that could not easily be grouped under the main concerns listed above. These were grouped into an 'other' category. The most frequently cited issue in this group related to the use and misuse of the media in influencing public opinion.

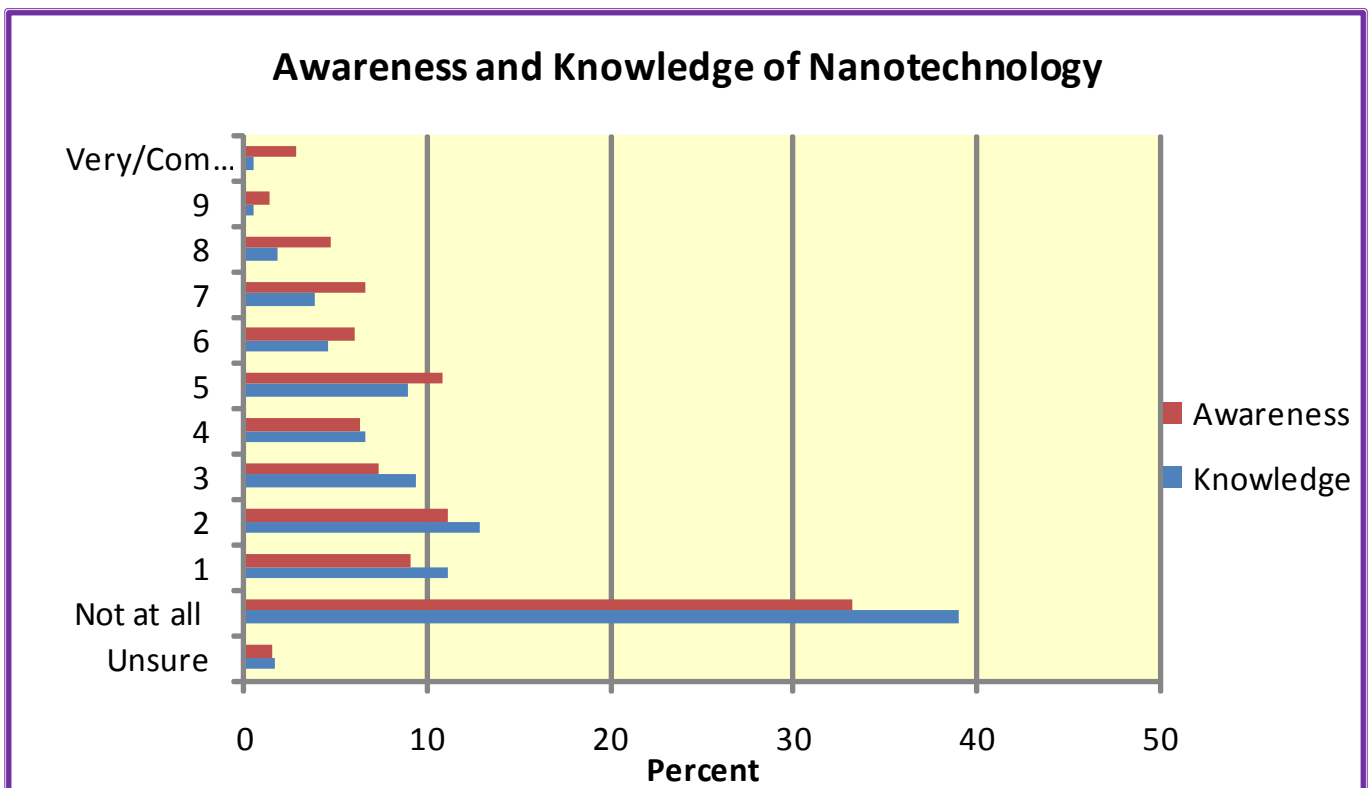
# Nanotechnology

## Awareness and Knowledge

In 2011 we had a special focus on nanotechnology. Initially respondents were asked to rate the degree to which they were aware of and knowledgeable about nanotechnology on zero to 10 scales (0 = completely unaware / no knowledge at all to 10 = completely aware / very knowledgeable). Respondents' average ratings of awareness (2.93) and knowledge (2.15) were both quite low.

The majority of respondents (66.7%) reported limited awareness of nanotechnology (rating below the mid-point of 5), with 33% reporting they were completely unaware of nanotechnology. A higher proportion of respondents (78.6%) reported limited knowledge of nanotechnology, with 39% reporting they had no knowledge at all about nanotechnology.

Men reported significantly higher awareness of nanotechnology and knowledge about nanotechnology than women did.



## Comfort with Nanotechnology

Following the initial questions about awareness and knowledge, respondents were read a paragraph which provided a definition of nanotechnology.

Respondents were then asked how comfortable they were with scientists using nanotechnology in a variety of contexts. Average ratings were above the mid-point of 5 for all the suggested uses of nanotechnology, indicating that respondents were generally comfortable with the idea of nanotechnology. However, the degree of comfort varied across the different suggested uses of nanotechnology.

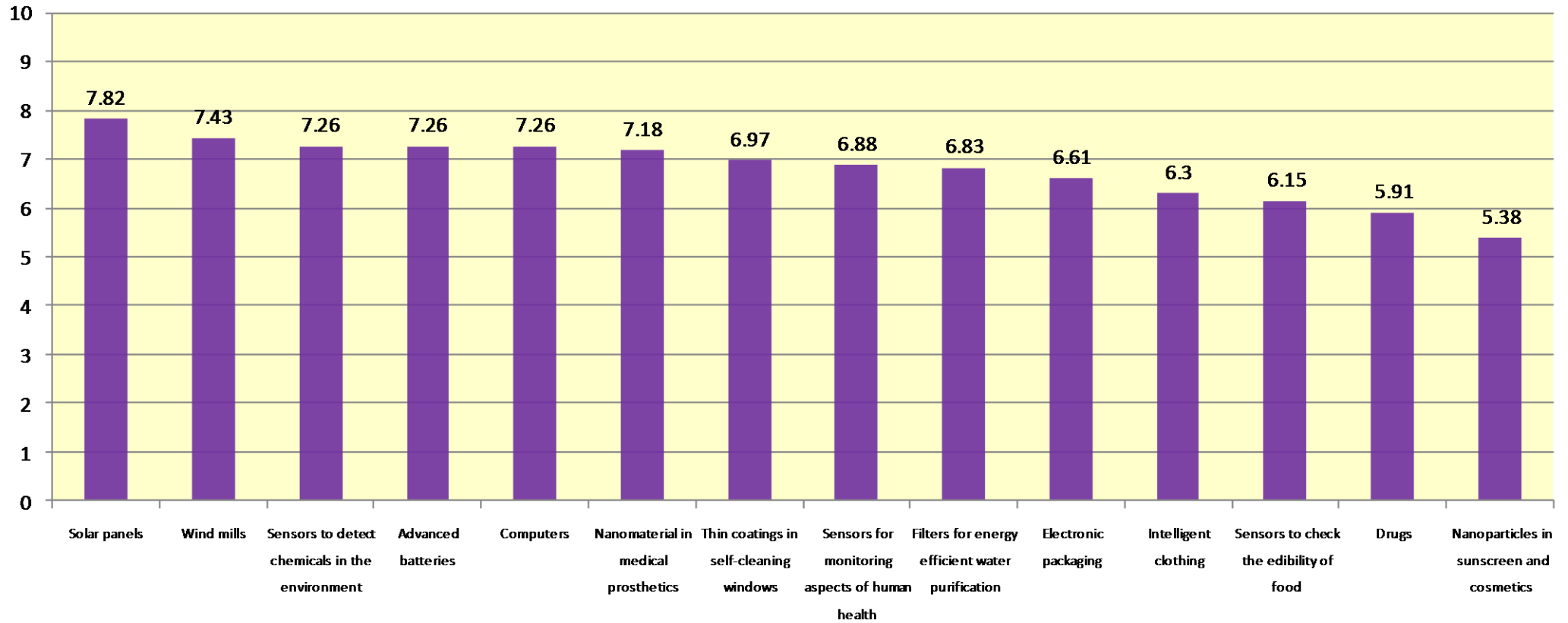
Respondents were most comfortable with the use of nanotechnology in solar panels (average rating = 7.82), and reported the least comfort with nanoparticles in sunscreen and cosmetics (average rating = 5.38).

In addition, paired-samples t-tests indicated that comfort ratings differed significantly in the use of nanotechnology in the following contexts:

- solar panels compared with wind mills
- medical prosthetics compared with coatings in self-cleaning windows
- filters for water purification compared with electronic packaging
- electronic packaging compared with intelligent clothing
- sensors to detect edibility of food compared with nanoparticles in drugs
- nanoparticles in drugs compared with nanoparticles in sunscreen and cosmetics

Men reported significantly higher levels of comfort than women across all the suggested uses of nanotechnology, with the greatest difference in mean rating being for the use of nanoparticles in sunscreen and cosmetics (men: average rating = 6.15; women: average rating = 4.91).

## Comfort with Nanotechnologies

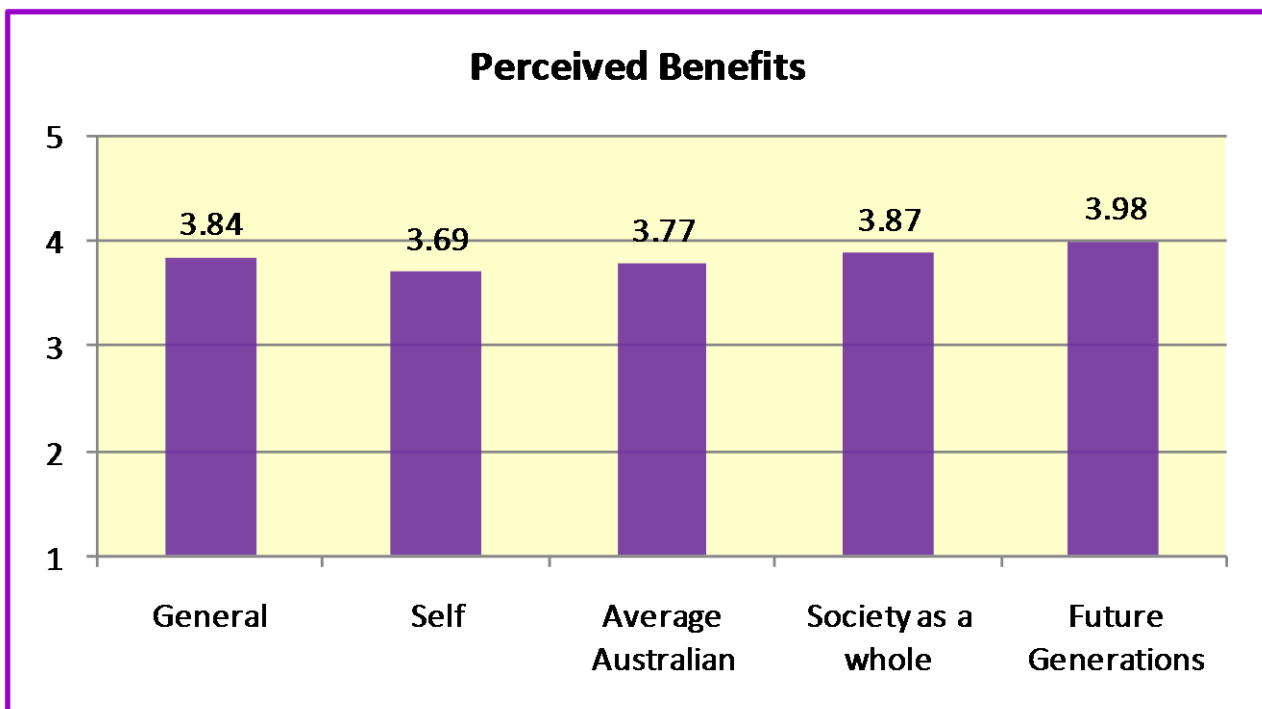


## Perceived Benefits of Nanotechnology

Respondents were asked to think about the potential risks or benefits of the uses of nanotechnology, firstly in a general sense, and then more specifically in different contexts.

Overall, respondents perceived mostly benefits from uses of nanotechnology. Respondents perceived the highest benefits of nanotechnology for future generations, with significant differences in ratings for each of the categories of self; the average Australian; society as a whole and future generations.

Men perceived greater potential benefits of nanotechnology than women did within each category.

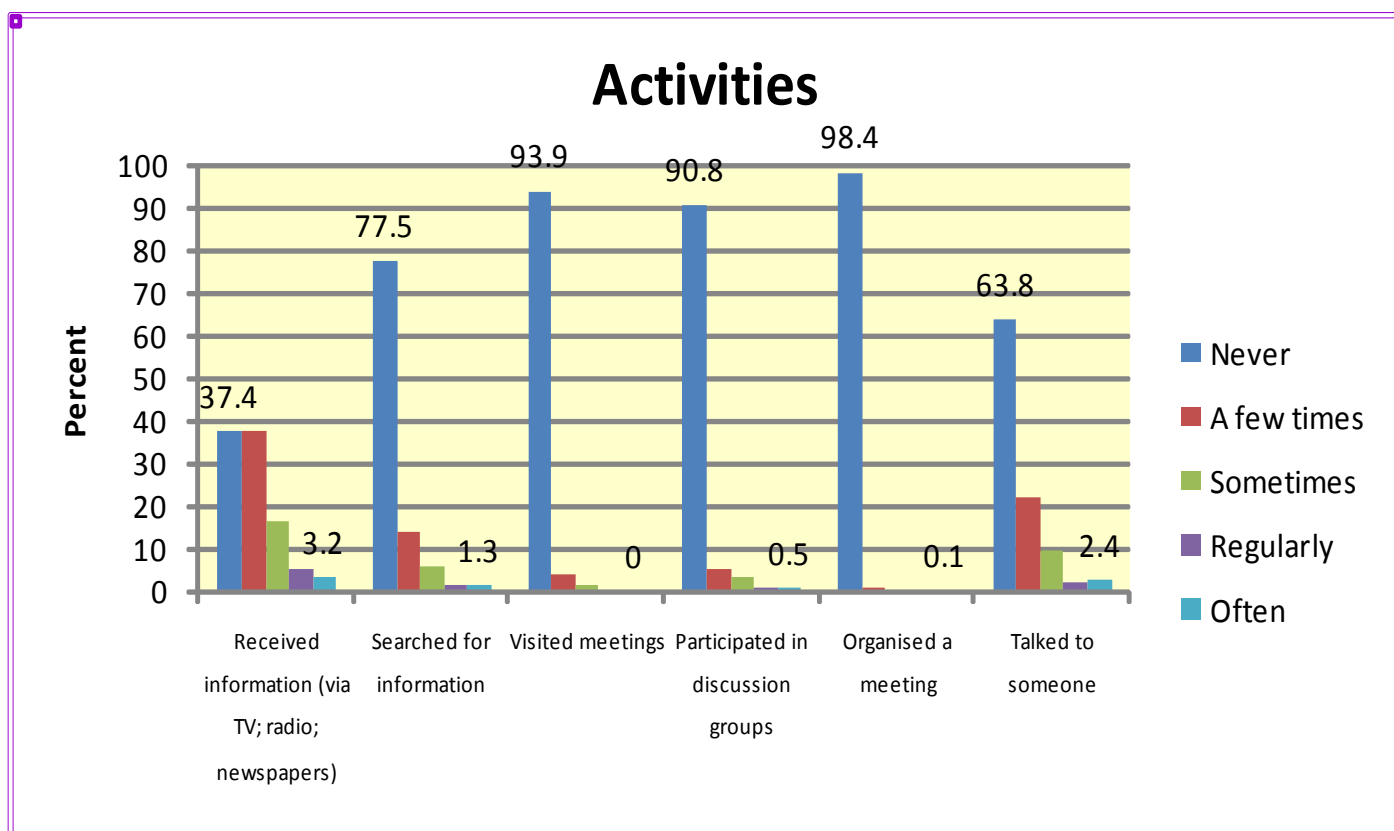


## Participation in Activities Related to Nanotechnology

Respondents were also asked how often they participated in a variety of activities related to nanotechnology. With the exception of receiving information about nanotechnology via news media (TV, radio, newspapers), the vast majority of respondents had never participated in any activities related to nanotechnology.

Less than 1% of respondents reported they either regularly or often visited meetings (such as public lectures or hearings), participated in discussion groups, or organised meetings about nanotechnology. Approximately 3-4% of respondents reported they either regularly or often searched for information or talked to someone about nanotechnology.

Men reported higher frequency of searching for and receiving information about nanotechnology. Men also reported visiting meetings and talking to someone about nanotechnology more frequently than women did. There was no difference between men and women in the reported frequency of participating in discussion groups or organising meetings about nanotechnology.

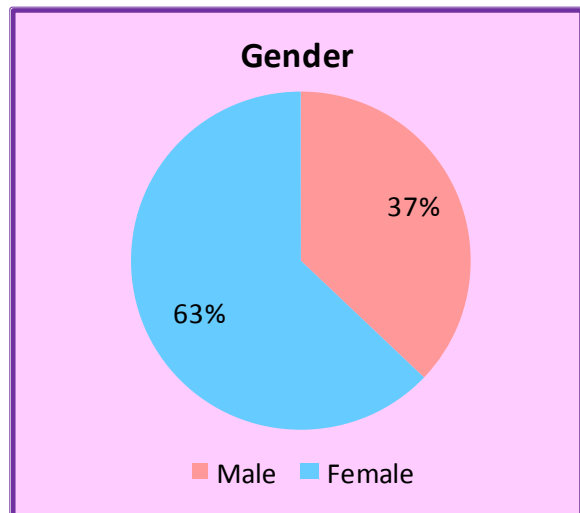
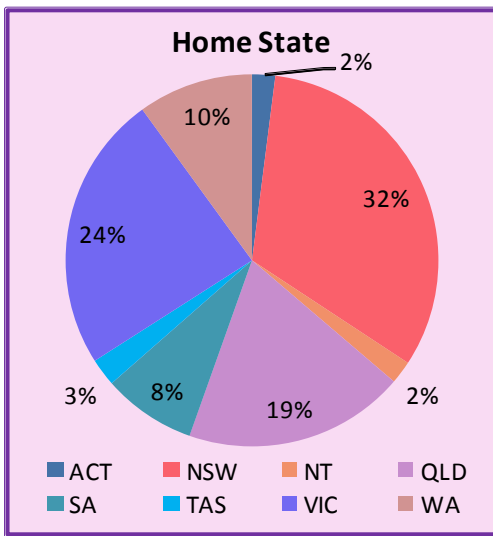


Note: For purposes of clarity, data labels are only shown for 'never' and 'often' response categories.

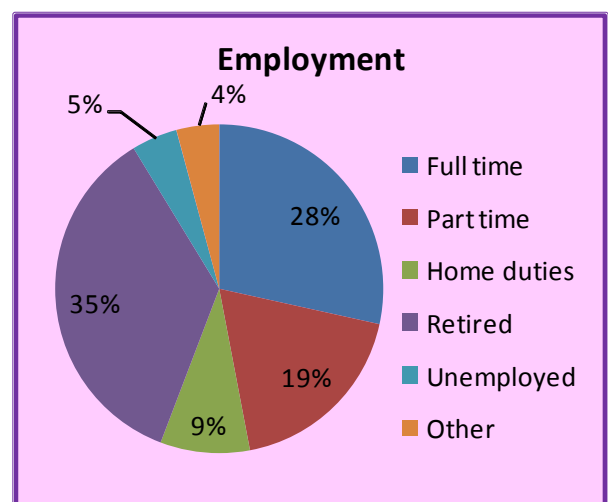
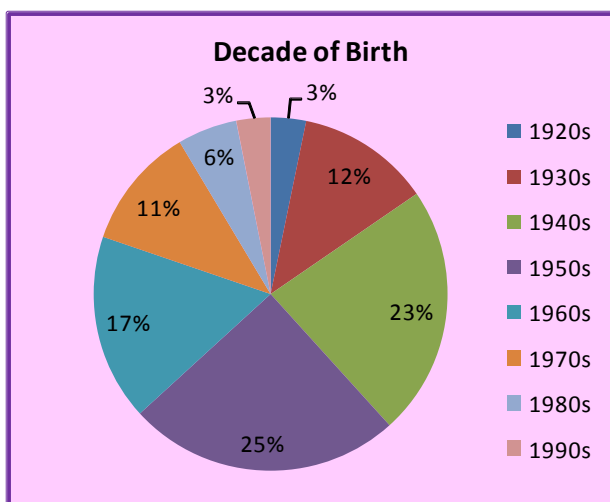
## The National Survey Sample

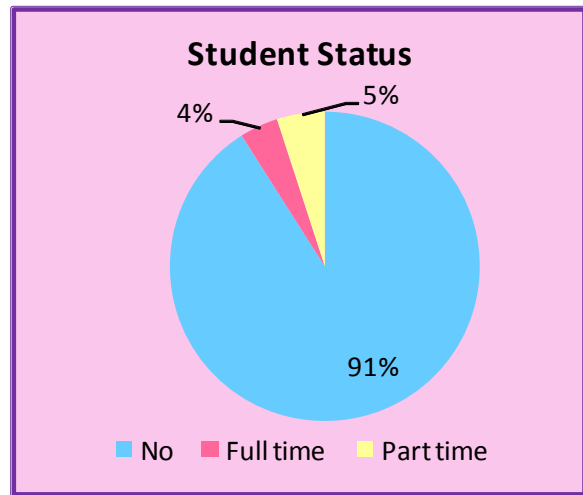
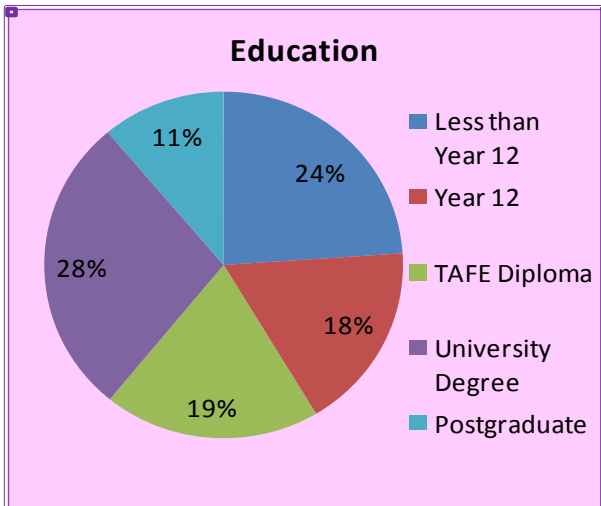
1000 respondents took part in the 2011 national survey. The target population was the Australian general public aged 18 years and over. The survey was conducted between 30<sup>th</sup> August and 16<sup>th</sup> September 2011 using Computer Assisted Telephone Interviewing (CATI) technology.

The following charts provide a graphical representation of the percentage of respondents in each demographic category.

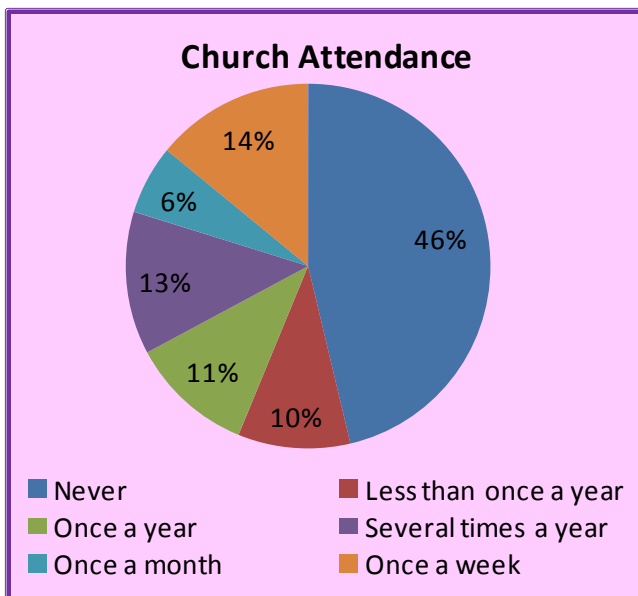


All states and territories were represented in the sample. Sixty-three percent of the sample was female. The average age of the sample was 55 years, and approximately half of the sample (47%) was currently employed.





The majority of the sample (58%) had completed tertiary education, and only 9% were currently students.



Forty-six percent of the sample never attended church. Of those that did attend church, 14% did so at least once per week.

## **Social Psychology Research Unit**

The Monitor is produced by the Social Psychology Research Unit (SPRU) located within Psychological Sciences and Statistics (PSS) at Swinburne University. Any questions can be directed towards the directors of SPRU:

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### **Swinburne University CATI Facility**

The Swinburne University Computer Assisted Telephone Interviewing (CATI) Facility is part of PSS, within the Faculty of Life & Social Sciences.

The CATI Facility specialises in designing and conducting high quality telephone surveys for academic, government and private organisations. Our aim is to simplify data collection for our clients while maintaining rigorous research standards.

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Finally, SPRU and the CATI Facility wish to thank the supervisors and telephone interviewers who conducted the interviews for the 2011 Monitor.

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