

91584R



Mana Tohu Mātauranga o Aotearoa  
New Zealand Qualifications Authority

## Level 3 Mathematics and Statistics (Statistics) 2023

**91584 Evaluate statistically based reports**

Credits: Four

### RESOURCE BOOKLET

Refer to this booklet to answer the questions for Mathematics and Statistics (Statistics) 91584.

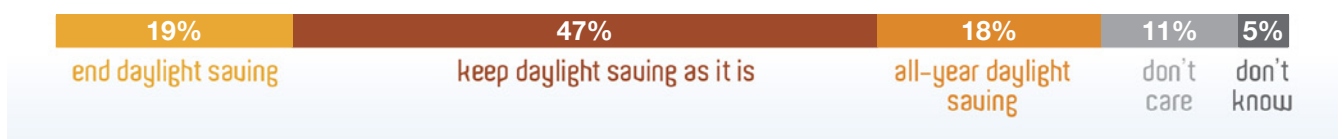
Check that this booklet has pages 2–4 in the correct order and that none of these pages is blank.

**YOU MAY KEEP THIS BOOKLET AT THE END OF THE EXAMINATION.**

## RESOURCE ONE: DAYLIGHT SAVING

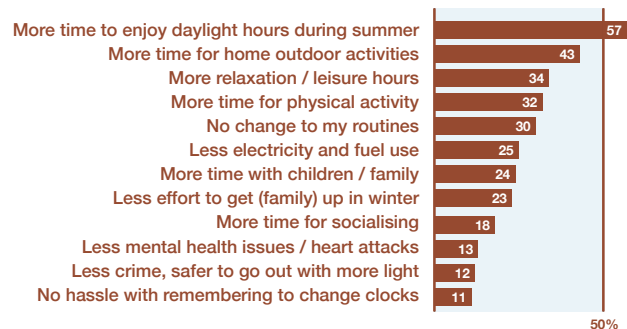


In 2008, 90% of New Zealanders were in favour of daylight saving in New Zealand. With recent international discussion about extending it all year round, we polled public support for keeping the current daylight saving system (47%), ending daylight saving (19%), or for permanently moving the clocks forward (18%) – and the reasons why.



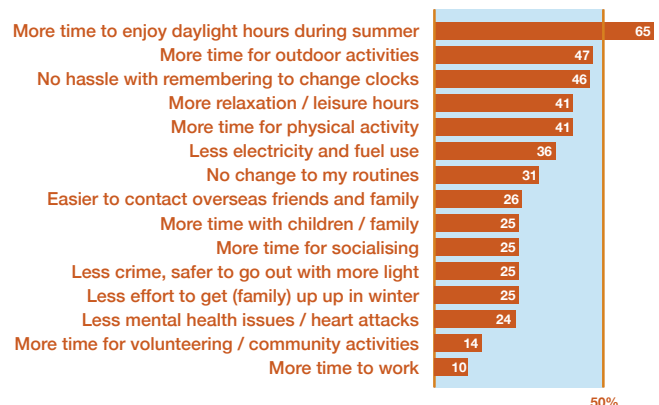
**Figure 1(a): Keep daylight saving as it is**

The main reasons given by those in favour of **keeping** the current daylight saving system were activity related. Well over half stated it gives *more time to enjoy daylight hours during summer* (57%), over two-fifths like *more time for outdoor activities at home* (43%), while a third enjoy *more relaxation / leisure hours* (34%), and *more time for physical activity* (32%).



**Figure 1(b): All-year daylight saving**

Two-thirds (65%) of respondents in favour of moving our clocks forward permanently reported it would give *more time to enjoy daylight hours during summer / warmer weather*, and half reported there would be *more time for outdoor activities* (47%), but also *no hassle with remembering to change clocks* (46%).



### Methodology

These results are based on our surveys of 1 010 independent respondents between 26 and 29 March, 2021, aged 18 years and over, each sourced from Dynata, and conducted online. The maximum margin of error is  $\pm 3.1\%$  (at the 95% confidence level). The samples have been weighted by gender and age to ensure the results are representative of the population 18 years and over. The surveys were not undertaken on behalf of any organisation, but as part of Research New Zealand's social polling of New Zealanders' opinions about current issues.

## RESOURCE TWO: A TOWEL LESS: HOW PSYCHOLOGISTS HARNESS SOCIABILITY TO CUT WASTE

Hotel guests can be gently persuaded to reduce the number of towels they use each day, psychology researchers at the University of Luxembourg have found. With fewer towels to wash, this reduces the waste of water, energy, and detergent. This is good news for the environment and it cuts costs, helping hotels to reduce prices.

From previous research in the US, the researchers of this study hypothesised that they would find guests receiving the message including the phrase “75% of guests in this room” would use the least towels.

Two hotels in Swiss and Austrian ski resorts helped with this experiment in early 2013. The participants of the study were 132 hotel guests who spent their holiday in one of two hotels. Guests were not aware that they were participants in the study, and were randomly assigned to one of three conditions. In each of the conditions, a message urged guests’ participation in the towel re-use programme, printed on signs that were placed obviously in the guests’ bathrooms. All signs gently reminded guests of the environmental impact of towel use. However, one of the signs added that: “75% of guests in this hotel reuse their towels” with another sign talking of: “75% of guests in this room reuse their towels”. The signs were in both German and English, so would have been understood by most guests in these alpine resorts.

The hotel room staff collected towel use data while they were servicing the guests rooms. These staff were blinded to the researchers’ hypothesis.

“We found that guests cut their towel use significantly when told of the behavior of previous guests in their room,” said the lead researcher Dr Gerhard Reese. In the “room” scenario, guests used, on average, one towel per person per day. This compared with 1.6 towels per person per day for those told of behaviour in the hotel as a whole. This amounted to a 40% saving in the number of towels needing to be washed.

These results are consistent with a handful of similar studies conducted in the US. This research points to the possibility of finding other ways to persuade people to do the right thing using such subtle pressure.

**Figure 2: Bathroom messages for each of the three experimental conditions**

Condition 1	Condition 2	Condition 3

## RESOURCE THREE: WHERE ARE THE AUDIENCES?

The 2021 New Zealand on Air survey has found that young New Zealanders are continuing to lead a march away from traditional media. Netflix is still growing at pace, but TV is still the media New Zealanders spend the most time with overall in a day. Survey results are summarised in Figure 3.

### Methodology

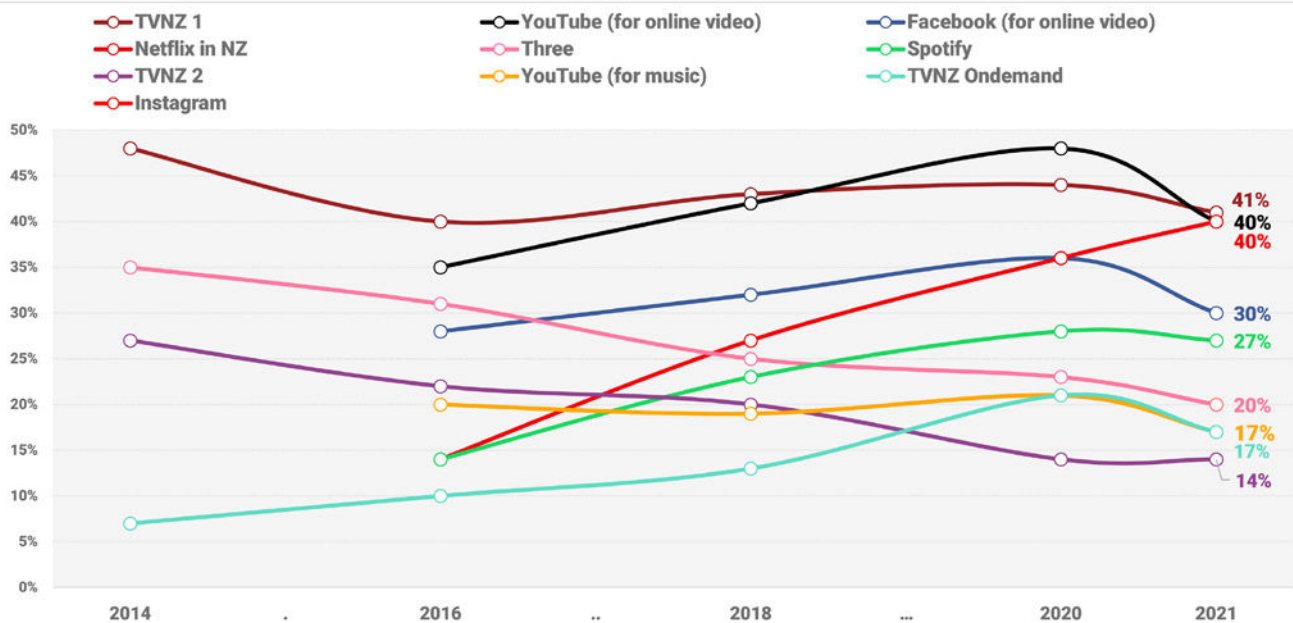
Interviews were completed by telephone using random digit dialling and were completed online using Consumer Link's Flybuys research panel. The online interviews were conducted among New Zealanders without access to a home landline, with all interviews conducted between 27 April and 24 May 2021. The target population was defined as all New Zealanders aged 15 and over. The sampling method included regional sample stratification, and minimum quotas for males, 15–24 year olds, and ethnic groups. The total sample was post-weighted by factors of access to a landline, gender, age, and ethnicity to ensure it was representative of the New Zealand population aged 15 and over.

The research approach aimed to keep methodology, sampling methods, question flow, and wording consistent with all previous studies. One key technique used was asking respondents about their behaviour “yesterday”.

**Figure 3: Most popular channels, sites, and stations**

#### Most popular channels, sites & stations – all New Zealanders 15+

Q: Which of the following did you use yesterday?



Source: <https://www.nzonair.govt.nz/research/where-are-audiences-2021/>