

91584R



NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

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Level 3 Mathematics and Statistics (Statistics), 2019

91584 Evaluate statistically based reports

9.30 a.m. Thursday 28 November 2019

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.

REPORT 1

Cycle lanes and walkways cut car use, reduce emissions, study finds

Researchers have shown for the first time that investing in cycle lanes and walkways encourages people to drive less and cuts carbon emissions. The researchers, from the University of Otago and Victoria University, studied the impact of new cycling and walking paths built in New Plymouth and Hastings in 2011.

In 2014, three years after the development, they found there was a reduction of 1.6% in motor vehicle kilometres travelled, resulting in a 1% drop in carbon emissions.

If the same level of investment was made nationwide, it could reduce the country's carbon dioxide emissions by at least 0.23 million tonnes over three years, the researchers say.

The researchers used a variety of methods to collect information on car usage: conducting face-to-face interviews with householders, analysing odometer readings from licensing data, and reviewing details on car ownership from the New Zealand Household Travel Survey.

The data from New Plymouth and Hastings (populations 74 200 and 86 600 respectively) were compared with information from Whanganui and Masterton (populations 40 900 and 25 200 respectively) – two nearby provincial cities that received no additional government funding for cycleways or walking paths.

Adapted from www.otago.ac.nz/news/news/otago701085.html

REPORT 2

Plastic Bags Survey – the results

937 people took part in a council's survey gauging attitudes to plastic bags and their use. Marlborough District Council wanted to know whether a charge would discourage the use of plastic bags, why some people choose not to use them at all, and whether people's attitudes to plastic bags are changing. The survey was conducted by a mixture of online returns and posting of forms in pre-paid envelopes that were delivered to all households in the Marlborough District Council area.

The Marlborough District Council says the survey suggests the majority would not be unhappy about a small charge for plastic bags, but more than half the respondents also said a small charge wouldn't necessarily deter them from using the bags. The council said the results suggest that there could be unintended consequences if the bags were removed overnight: "Charging for bags would likely change people's behaviour eventually, but how much change we'd see would depend how much was being charged for the bags."

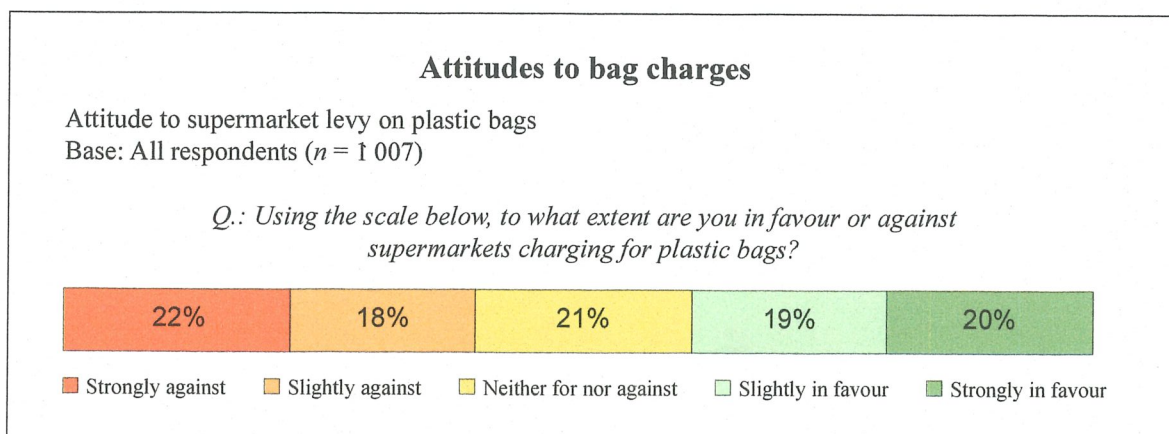
Three quarters of respondents considered that plastic bags litter the environment, and more than 90% would like the opportunity to recycle their plastic bags. About half of those who took the time to fill out the survey already take their own re-usable bags to the supermarket when they go shopping.

The first question asked shoppers whether they are currently using plastic bags when getting their shopping. 35.1% of respondents said they regularly do, whilst 47.9% of respondents said they only occasionally do. The council says this may indicate views on plastic bags have already shifted more than previously thought.

About half of the respondents think a reward scheme would encourage people to use re-usable bags, while almost as many believe that introducing a charge for plastic bags would be the incentive that would get them using re-usable bags.

Overall, 80% of respondents would be happy to support a small charge per plastic bag – say 10 cents. However, 63% would still use them, whether they're paying a small fee or not.

Figure 1



REPORT 3

School's DIY trial supports omega 3

Early results are in on New Zealand's first classroom-based experiment on the benefits of omega 3 (fish oil). And those initial results are good, according to a North Shore (Auckland) primary school principal. The principal was inspired to try this approach after reading the results of a study, which suggested that in healthy young people, working memory improved by 23% after a long period of taking omega 3 supplements.

The principal contacted a North Shore-based natural health products company, who agreed to supply the school with omega 3 tablets. Twenty-one of the school's students, aged between 11 and 13, took omega 3 tablets once a day for the first month, and continued to take them twice a day for the following two months. Another student group of the same size and roughly the same demographic makeup served as the control group – not taking the tablets but engaging in the same lessons.

The two groups were tested on a range of disciplines, undergoing a series of academic tests. The first of the tests, focused on writing, was completed recently. The control group's writing was as expected, but the children taking omega 3 had shown a definite improvement in writing and general focus, the principal said. That followed his expectations that the children taking omega 3 would have higher motivation, more concentration, and improved basic skills.

The chief executive of the natural health products company said he hoped the trial would prompt more formal trials in New Zealand to test if omega 3 did genuinely improve the well-being of children.

Adapted from www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=10542321

Additional information sourced from www.ncbi.nlm.nih.gov/pmc/articles/PMC3463539/ and www.cognitune.com/fish-oil-benefits/