

91584R



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## Level 3 Mathematics and Statistics (Statistics) 2020

### 91584 Evaluate statistically based reports

9.30 a.m. Wednesday 18 November 2020

Credits: Four

## RESOURCE BOOKLET

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

Check that this booklet has pages 2–5 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

### Majority of workers unable to afford necessities – union

Workers are doing it tough trying to meet rising costs of living on their pay, and bad workplace culture is costing our society, a union says.

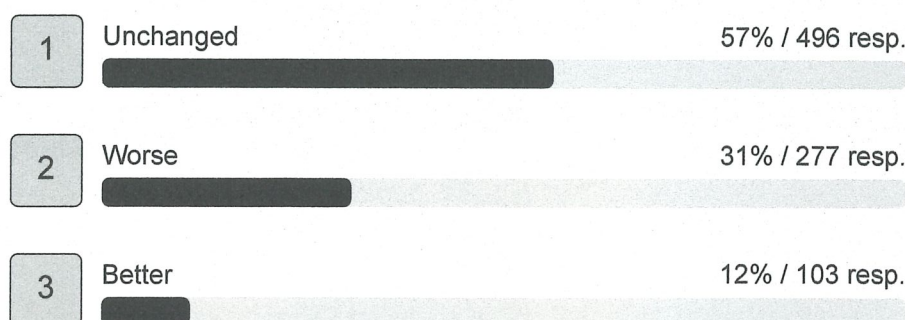
876 people responded to the Council of Trade Unions (CTU) annual 'Together Survey', carried out from 3 to 5 January 2020. The survey aimed to investigate the views and attitudes of working people in New Zealand towards their jobs and workplaces. The survey was undertaken online, with survey participants volunteering to participate. All survey participants were members of unions connected to the CTU.

Bullying was a problem for almost half of respondents, and 56% were unable to afford necessities like rent, power, and petrol. Almost 60% said they were not paid fairly for the work they did, nearly 50% said their workload got worse, and 31% said their hours of work were worse.

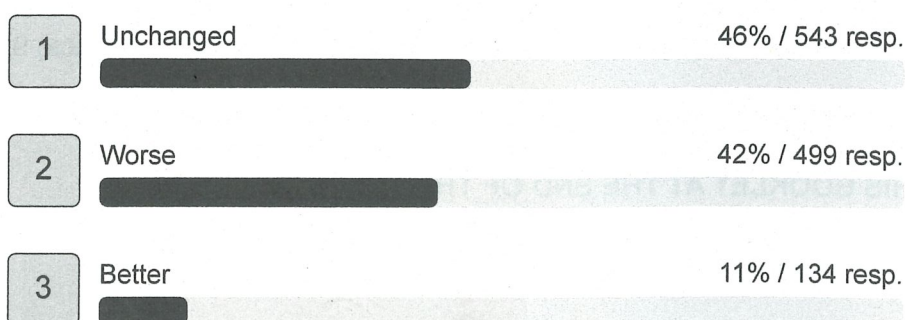
In the survey, 5% of respondents believed that their income was keeping pace with their cost of living, which was an increase on the previous year's survey. One positive change compared to the previous year's survey, was that the percentage of workers who believe their hours of work are worse, decreased from 42% to 31% over this time (2019 to 2020).

Only about 20% of workers were members of unions, the CTU president said, and a political fix was needed for this imbalance.

**Figure 1A: 2020 Together Survey results for weekly hours of work ( $n = 876$ )**



**Figure 1B: 2019 Together Survey results for weekly hours of work ( $n = 1176$ )**



Adapted from <https://www.rnz.co.nz/news/national/406787/wages-up-but-not-enough-to-balance-living-costs-union>

Additional information sourced from <https://nzctu.typeform.com/report/SooQGIJSjKInVZPS0TqmQp>

and <https://nzctu.typeform.com/report/StNjy0/2uHwC3RTLKj19cSt>

## REPORT 2

### **Beauty sleep: experimental study on the perceived attractiveness of sleep-deprived people**

Scientists investigated whether sleep-deprived people are perceived as less attractive than after a normal night's sleep. The investigation took place in a sleep laboratory in Stockholm, Sweden during 2010.

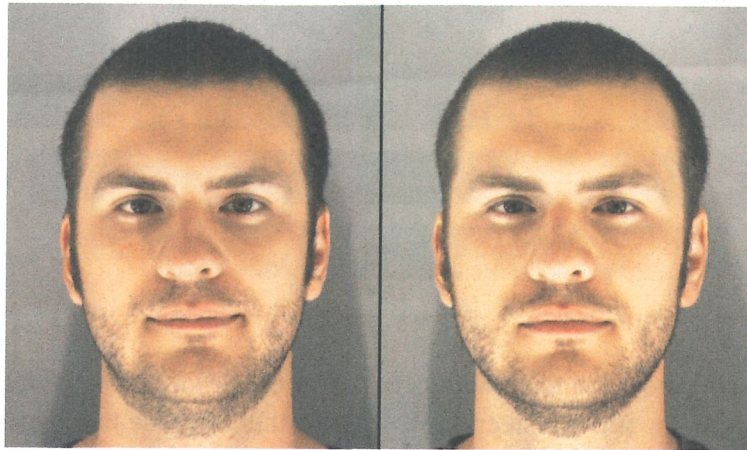
Two photographs were taken of each of 23 healthy adults aged 18–31 years (the subjects). Eleven of the subjects were women.

The first photograph was taken after a period of normal sleep (eight hours).

The second photograph was taken when the subjects were sleep-deprived. Subjects were allowed a controlled period of sleep of less than 8 hours, followed by being kept awake for a period of 31 hours.

For the photo shoot, subjects wore no make-up, had their hair loose (combed backwards if long), underwent similar cleaning or shaving procedures for both conditions, and were instructed to “sit with a straight back, and look straight into the camera with a neutral, relaxed facial expression.”

**Figure 2: Subject after a normal night's sleep (left) and after sleep deprivation (right)**



The 46 photographs (two photographs of each subject) were shown to the 65 untrained observers (mostly students, mean age 30 years, range 18–61 years, 40 women) in a randomised order.

The observers rated perceived attractiveness using a scale from 0 to 100. Sleep-deprived people were rated as less attractive (mean score 38 vs 40) than after a normal night's sleep. Compared with the normal sleep condition, perceptions of attractiveness in the sleep-deprived condition decreased on average by 4%.

The scientists concluded that sleep-deprived people appear less attractive compared with when they are well rested. This suggests that humans are sensitive to sleep-related facial indicators, with potential implications for social and job-related decisions.

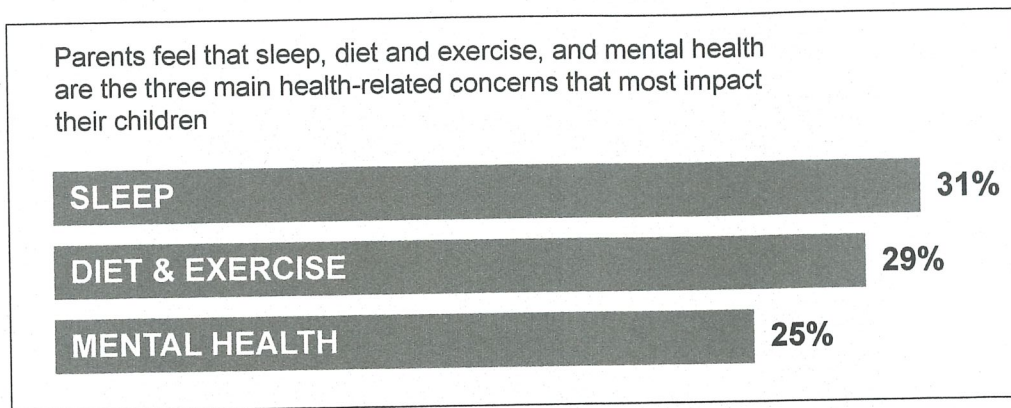
## REPORT 3

### Parenting survey highlights sleep as parents' biggest health concern for their children

A major New Zealand health insurance company has released the results from its 'State of the Nation Parenting Survey', taking a thorough look into the concerns and trends facing parents in New Zealand today.

1200 New Zealand parents (including step-parents, guardians, and caregivers with children 17 years or younger) were surveyed. Among these parents, issues around quality of sleep were most commonly mentioned as the biggest overall health concern – with 31% of those surveyed reporting this as the issue they believe most impacts their children. Coming in at a close second was diet and exercise, at 29%. 44% said they place less priority on their own health than they do on their children's.

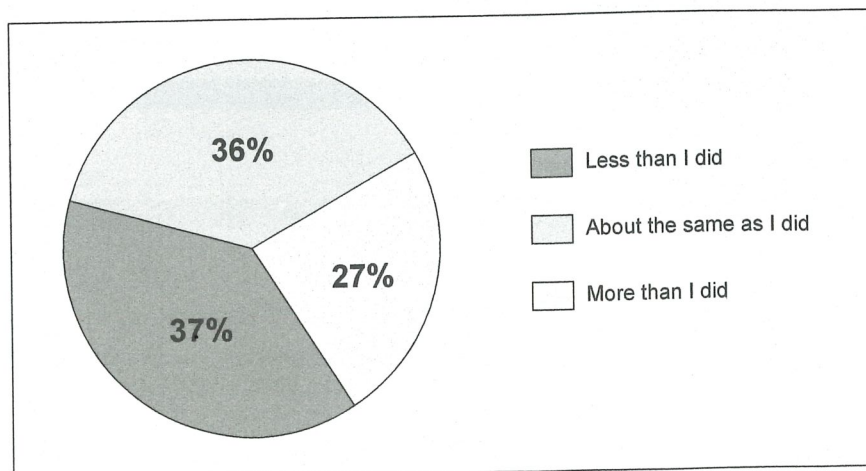
**Figure 3A: Top three concerns from parents/caregivers from State of the Nation Parenting Survey, June 2019**



Worryingly, 41% of parents who cited health concerns for their children also reported being unable to access the necessary level of support for sleep problems – either because they would not know where to start, or because they believe there is nothing available in their region.

The survey also looked into parents' attitudes to the amount of sport their children took part in, compared to when they were children. As Figure 3B shows, only around a quarter of those asked said their children did more sport compared to when they were children.

**Figure 3B: Parents'/caregivers' perceptions of how much sport their child(ren) participate in, compared to when they were children**



The survey findings also highlighted that New Zealand parents are ready to embrace digital healthcare solutions, with 65% of respondents saying they were comfortable with the idea of using a digital or online healthcare service – including online consultations with medical professionals, chatbots, and use of mobile applications to assist in medical diagnoses.

The Chief Executive Officer (CEO) of the health insurance company said this particular statistic should be encouraging news for healthcare and related providers, who have, or are looking to incorporate, online or digital solutions into their offer.

“Historically, there’s probably been a sense among consumers that digital and online solutions don’t offer the same level of care as a face-to-face consultation – but in reality, these technologies provide massive benefits in terms of access and personalisation, and save patients time and money,” the CEO said.

The margin of error for the survey is  $\pm 2.9\%$ .

Adapted from <https://www.nib.co.nz/news-and-media/news-details/nib-parenting-survey-highlights-sleep-as-parents'-biggest-health-concern>  
Survey results adapted from [https://assets.ctfassets.net/ja9v5o5o08yv/5VILFDewE2IDN7DIMhvCIu/28f137c77fc31f9bea0e899d8e8efb5b/nib\\_Parenting\\_Survey\\_Full\\_Report.pdf](https://assets.ctfassets.net/ja9v5o5o08yv/5VILFDewE2IDN7DIMhvCIu/28f137c77fc31f9bea0e899d8e8efb5b/nib_Parenting_Survey_Full_Report.pdf)