

Data Visualisation

Screen Time and Mental Illness

Screen Time

I am interested in finding data that shows the changes in screen time or digital media usage over time. It is something we talk about a lot and I presume everyone is well aware that screens are becoming more and more prevalent in todays context. Research is rapidly increasing to discover the adverse physiological and psychological effects this extended time spent on screens has (Pandya & Lodha, 2021), not only to toddlers but especially to developing teenagers. Research surrounding screen time and its effects can help us to build systems and habits to combat the potential risk for developing youth.

Investigating Correlation

I wonder which comes first, the mental illness or the increased screen time. I understand that some may suggest that increased screen time will lead to decreased mental health (Pandya & Lodha, 2021) but others would say that when their mental health is not in good shape, the screen seems to be an escape. I wonder whether the two are linked but because big tech makes a large profit from platforms like social media, they are not concerned about the effects on young people and we need to be self regulating instead (Sibronney, 2022). If there is a significant link then it makes me wonder why schools are deciding to move to an increasingly online learning space.

Mental Illness

Mental illness seems to be an increasingly prevalent issue in New Zealand and my previous projects gain me a curiosity and a passion to finding out more. We seem to talk about mental health more and more but I wonder what the actual data can tell us about these changes over time. I worry that people are still not aware of the effect of mental illness on young people and I want to look at data for young New Zealanders who are in my age bracket. I am curious to look into some of the reasons why the data has changed in the way it has and whether we can discover if these two areas of life are related in some way.

Social Media and Internet Use Data Investigating Increase in Screen Time

Frequency Table 1

Social Media and Internet Use

Indicator	2008	2009	2010	2011	2012	2013	2014	Year	2015	2016	2017	2018	2019	2020	2021	2022
Internet Penetration (%)									89%	89%	88%	93%	94%	94%		
Internet Penetration (Global)	24%								35%							
Social Media Users (%)									51%							
20-29 Hours Weekly Screen Time 15-17yo (hrs)									70%	74%	71%	75%	82%	89%		
30+ Hours Weekly Screen Time 15-17yo (%)									45%	51%						
Daily Digital Hours (USA)	2.7	3.0	3.2	3.7	4.6	4.9	5.3	5.4	5.7	5.9	6.0	6.3	7.8			

Note: This Data was collected by eMarketer New Zealand (2021). (ii) Aotearoa (Active NZ Surveys: Sport New Zealand - Ihi Aotearoa, 2019) and Bond Internet Trends Analysis (Internet Trends, 2019) and has been reconstructed in favour for the purpose of this Pathways to Research Project (Data is rounded to 1 decimal).

Figure 1 Daily Hours Spent with Digital Media per Adult User, USA

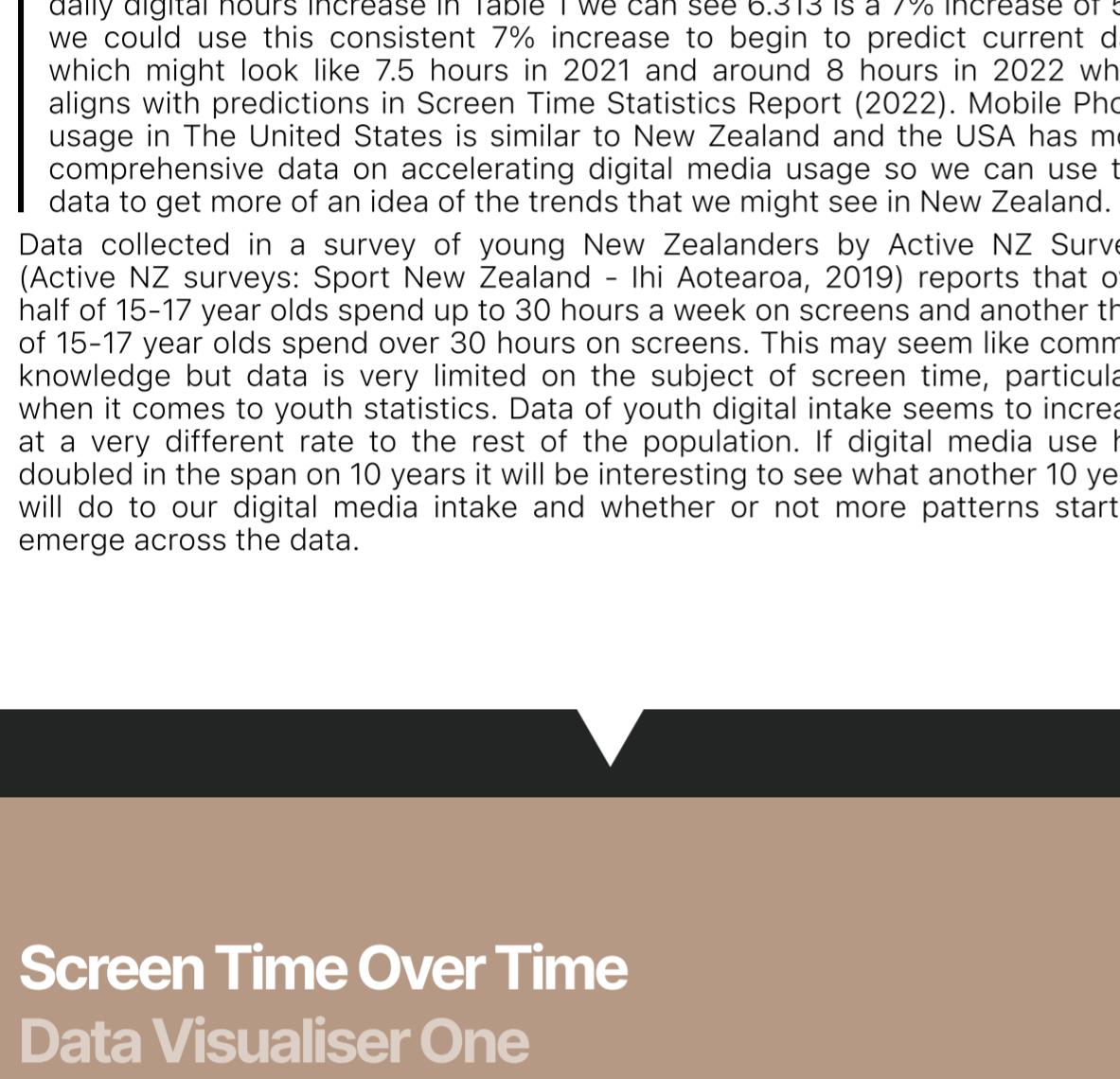


Figure 1. BOND, Internet Trends (2019).

Screen Time Data Interpretation

Digital Media usage has increased steadily year after year but comprehensive statistics about the current screen time rates of young New Zealanders is not available at this time. However, what we are seeing is a significant increase in internet usage and digital media usage around the world. By looking at the daily digital hours increase in Table 1 we can see 6.313 is a 7% increase of 5.9, we could use this consistent 7% increase to begin to predict current data which might look like 7.5 hours in 2021 and around 8 hours in 2022 which aligns with predictions in Screen Time Statistics Report (2022). Mobile Phone usage in The United States is similar to New Zealand and the USA has more comprehensive data on accelerating digital media usage so we can use this data to get more of an idea of the trends that we might see in New Zealand.

Data collected in a survey of young New Zealanders by Active NZ Surveys (Active NZ surveys: Sport New Zealand - Ihi Aotearoa, 2019) reports that over half of 15-17 year olds spend up to 30 hours a week on screens and another third of 15-17 year olds spend over 30 hours on screens. This may seem like common knowledge but data is very limited on the subject of screen time, particularly when it comes to youth statistics. Data of youth digital intake seems to increase at a very different rate to the rest of the population. If digital media use has doubled in the span on 10 years it will be interesting to see what another 10 years will do to our digital media intake and whether or not more patterns start to emerge across the data.

New Zealand Health Survey Data Mental Health Changes Over Time

Frequency Table 2

Adults Mental Health in New Zealand (Age > 15 Years)

Indicator	Year										Changes Between 2011/12 and 2020/21	P
	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21		
Psychological distress	4.6%	6.2%	6.2%	6.9%	7.6%	8.6%	8.3%	7.5%	9.6%			<0.01
Mood and/or Anxiety Disorder	16.2%	16.3%	18.5%	17.3%	18.8%	20%	21%	19.8%	20.1%	21.5%		<0.01
Depression	14.2%	14.4%	15.4%	14.5%	15.4%	16.7%	16.7%	15.7%	16.4%	17%		<0.01
Bipolar disorder	0.8%	0.9%	1%	0.8%	1%	1.1%	1%	1%	0.9%	0.9%		0.582
Anxiety disorder	6.1%	6.6%	8.4%	7.8%	9.5%	10.3%	11.1%	11.1%	12.4%			<0.01
Most disorder (depression and/or bipolar)	14.3%	14.5%	15.4%	14.7%	15.5%	16.8%	16.9%	15.9%	16.4%	17.2%		<0.01

Note: This survey was conducted by the Ministry of Health where they collected data from over 100,000 New Zealanders over 10 years. The raw data has been taken from the Ministry of Health Website as a csv file and reconstructed in Jamovi for the purpose of this Pathways to Research Project (Data is rounded to 1 digit).

Frequency Table 3
Changes in Prevalence of Diagnosed Depression in Youth Aged 15-24

Age Group (Years)	Year										Changes Between 2011/12 and 2020/21	P
	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21		
15-17	3.0%	4.1%	3.6%	4.2%	4.3%	4.7%	6.3%	5.6%	8.7%	7.3%		0.0421
18-24	10.7%	10.7%	11.2%	9.6%	10.4%	14.6%	13.3%	12.9%	19.2%			<0.01 (n=0)
15-24	8.3%	8.7%	8.9%	8%	8.6%	11.7%	11.2%	12%	12.6%	15.6%		<0.01 (n=0)

Note: This survey was conducted by the Ministry of Health where they collected data from over 100,000 New Zealanders over 10 years. The raw data has been taken from the Ministry of Health Website as a csv file and reconstructed in Jamovi for the purpose of this Pathways to Research Project (Data is rounded to 1 digit).

(Annual update of key results 2020/21: New Zealand Health Survey, 2021)

Psychological Distress Data Interpretation

What we are seeing in Frequency Table 2 are statistics gathered from the Annual update of key results 2020/21: New Zealand Health Survey (2021) of over 100,000 New Zealanders over 10 years. They help to show us a broad overview of the percentages of the sampled population that are suffering with various types of mental illness. We can also see the increase over each year along with the p-value in the far right column which shows us the statistical significance in the change of data over the 10 years it was gathered. All the data shows an increased percentage of the population suffering with mental illness except bipolar which does not show a statistically significant increase. A statistically significant difference is likely to represent a real change in mental illness over time rather than a random variation due to the sampling process and a significance level measured at 0.01 shows a 1% significance level which gives us 99% confidence in the changes we see in the data.

The changes in diagnosed depression New Zealand Youth aged 15-24 is shown in Table 3 where it shows the percentage of youth diagnosed with depression over the span of 10 years. The increase in diagnosed depression is significant in 15-17 year olds at the 5% significance level and 95% confidence interval and the increase is even more significant in 18-24 year olds because we see a 1% significance level and a 99% confidence interval. The increases seen in Frequency Table 4 show us more age specific data about the psychological distress item in Table 2 and gives us a more accurate perspective on the data being seen in young New Zealanders. The data increase here in psychological distress is also very significant and I have highlighted the age range of 15-24 year olds in dark blue as we see this huge jump from 5.1% (1 in 20 people) to 19.2% (1 in 5) suffering with psychological distress. These consistent increases appear as though they will keep continuing to grow as more and more young New Zealanders face mental illness with limited access to mental health services.

Screen Time Over Time Data Visualiser One

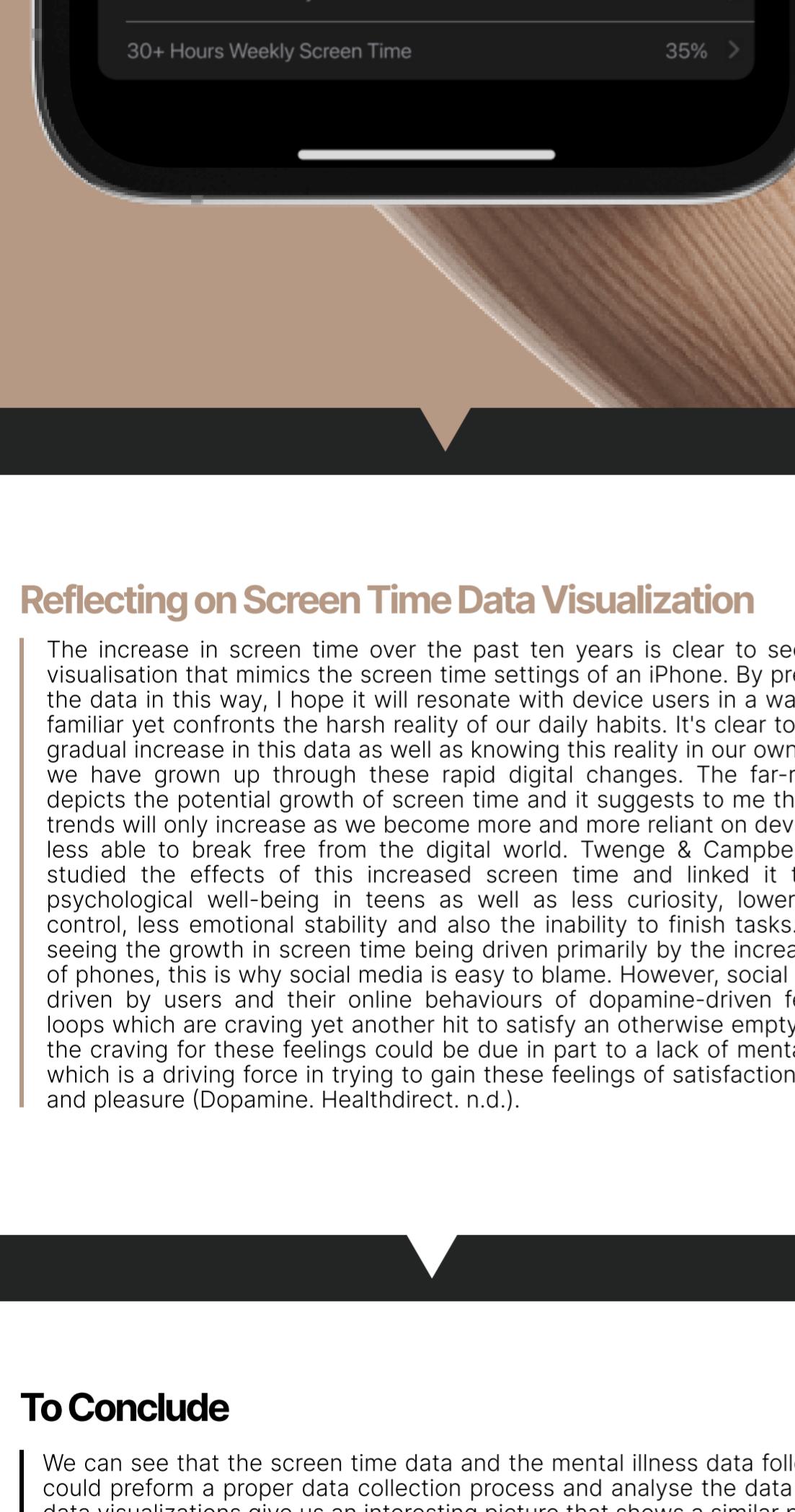


Figure 2. BOND, Internet Trends (2019).

Mental Illness Prevalence Over Time Data Visualiser Two



Figure 3. BOND, Internet Trends (2019).

Reflecting on Screen Time Data Visualization

The increase in screen time over the past ten years is clear to see in this visualization that mimics the screen time settings of an iPhone. By presenting the data in this way, I hope it will resonate with device users in a way that is familiar yet confronts the harsh reality of our daily habits. It's clear to see the gradual increase in this data as well as knowing this reality in our own lives as we have grown up through these rapid digital changes. The far-right bar depicts the exponential growth of screen time and it suggests to me that these trends will only increase as we become more and more reliant on devices and less able to break free from the digital world. Twenge and Campbell (2018) studied the effects of this increased screen time and linked it to lower psychological well-being in teens as well as less curiosity, lowered self-control, less emotional stability and also the inability to finish tasks. We are seeing the growth in screen time being driven primarily by the increased use