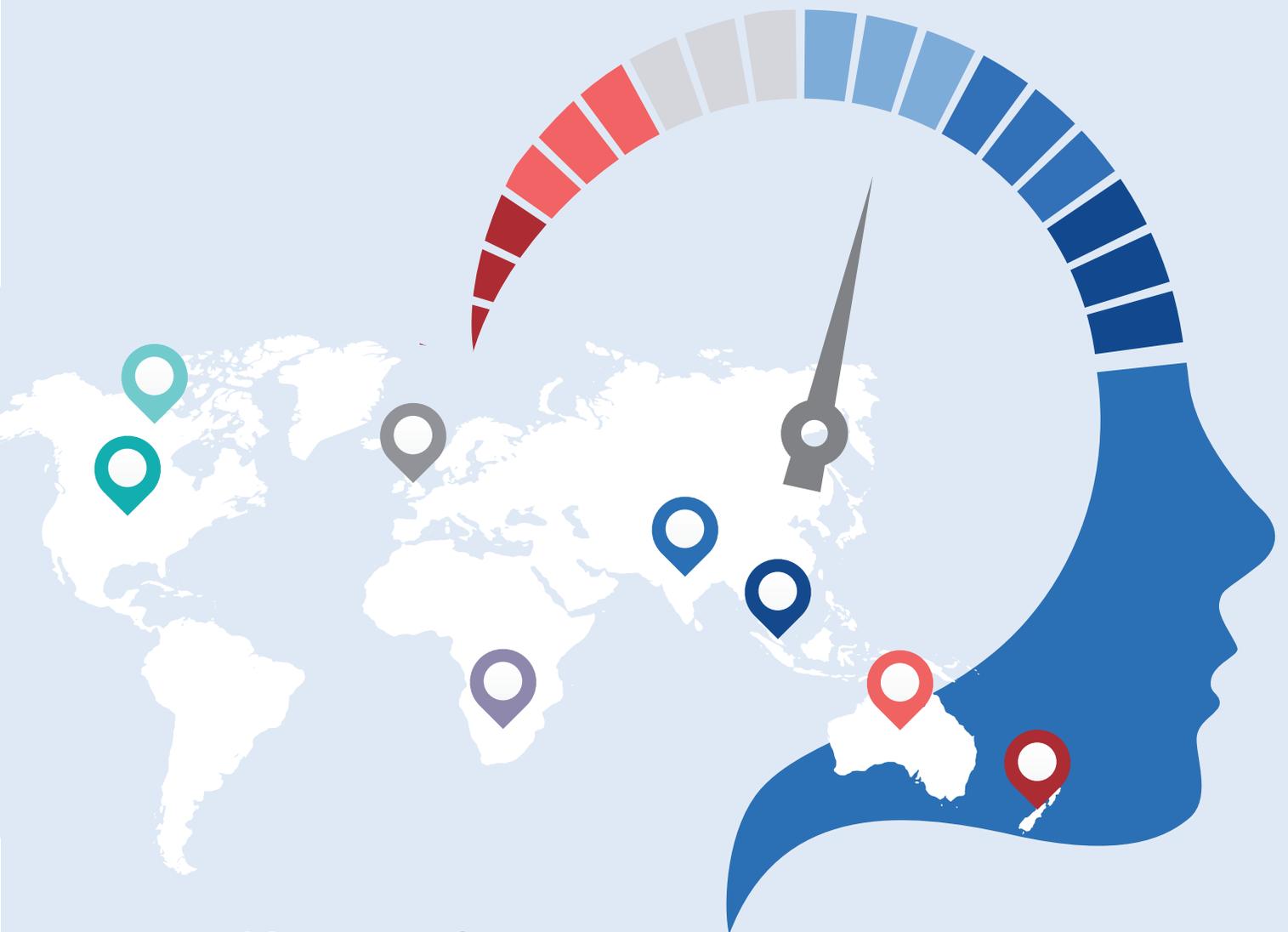


Mental State of the World 2020



A publication of
the Mental Health
Million Project

Dear Reader,

Mental wellbeing extends beyond our feelings of happiness or life satisfaction to encompass the breadth of our emotional, cognitive and social function and capabilities. Understanding where we stand collectively on the spectrum of mental wellbeing serves as an important barometer of the health of our society.

The Mental Health Million project was conceived and developed at Sapien Labs as a public interest project to enable a comprehensive view of the evolving mental wellbeing of our world so that we can better manage it both individually and collectively. The project utilizes a uniquely designed online assessment called the Mental Health Quotient, or MHQ. The MHQ scores mental wellbeing based on a comprehensive list of capabilities or assets as well as challenges that encompass symptoms across ten major mental health disorders, to reflect the spectrum of mental wellbeing across the general population. Furthermore, by incorporating demographic and life experience elements it can be used to gain deep insights into what drives our mental wellbeing status.

In this first year since launch of the project in English we have captured ~49,000 responses, primarily across 8 English speaking countries enabling a profile of these countries. Over the next few years its reach will expand to many more languages and countries. This report provides comparisons of aggregate mental wellbeing and its six functional dimensions by countries, age groups and gender, with a particular focus this year on the impact of major lifestyle factors and Covid-19 related adversities and traumas. While the data represented in this report was collected beginning in April 2020 following the start of the Covid-19 lockdowns, a few thousand people were surveyed in 2019 offering an approximate point of comparison. While it is clear that Covid-19 has had, and continues to have, a significant impact on our mental wellbeing, the data tells a story of more long-term global challenges, only exacerbated by the ongoing pandemic.

Achieving our objective of generating a truly global representation of our collective mental wellbeing depends on public support including partnerships to spread the word as well as financial contributions. As an individual you can contribute your own state of mind to our collective understanding of mental wellbeing across the globe by taking the MHQ at sapienlabs.org/mhq.

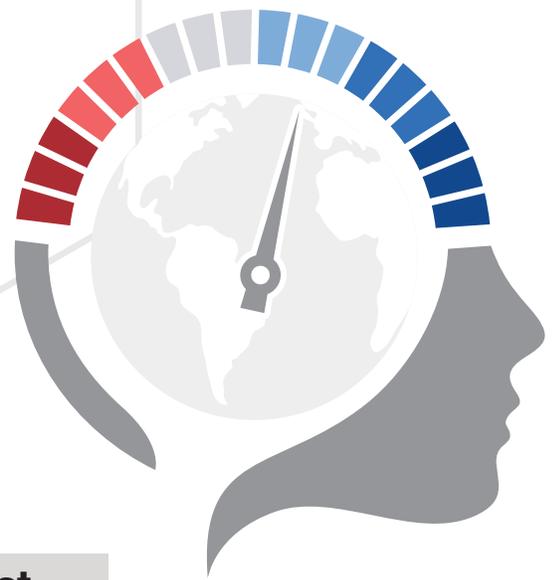
Success of the Mental Health Million project ultimately lies in the utilization of insights arising from this project at various levels from governments, institutions and companies through to families and individuals to better manage our collective mental wellbeing across all sectors of our society. We look forward to engaging in these conversations.

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A report of the Mental Health Million project

sapienlabs.org/mental-health-million-project

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Executive Summary

This represents the first annual report of the Mental Health Million project, an ongoing effort to measure and track the mental wellbeing of our global population, with the goal of providing deep insights into its drivers that can be used to guide the development of effective policy and intervention. Mental wellbeing, as measured by the Mental Health Quotient or MHQ, a free and anonymous online assessment tool, encompasses a comprehensive view of our emotional, social and cognitive function and capability. In its first year, the Mental Health Million project obtained data from ~49,000 people across 8 English speaking countries: United States, Canada, United Kingdom, Australia, New Zealand and the substantial English speaking populations of South Africa, India and Singapore. This report provides a descriptive view of [this data](#) with the caveat that the samples may not be fully representative of a country.

Aggregate mental wellbeing shows a profound drop from 2019. In the aggregate, the overall mental wellbeing score for 2020 was 66 relative to a score of 90 obtained in 2019 from a different and relatively smaller sample of 2000 people from the same countries, representing an 8% shift down the MHQ scale (which ranges from -100 to 200). The percentage of respondents with clinical level risk increased from 14% in 2019 to 26% in 2020. The drop relative to 2019 was most pronounced for young adults aged 18-24.

The mental wellbeing of countries: United Kingdom struggling. The average mental wellbeing score was highest for respondents from Singapore and the United States and lowest for those from the United Kingdom and South Africa overall, and across multiple dimensions. Respondents from India, while in the middle overall, varied the most across dimensions of mental wellbeing. Furthermore, respondents across countries differed in the individual elements of strength and challenge while those living in big cities fared better than countries overall.

A crisis in young adults. MHQ scores were 86 points lower in young adults aged 18-24 compared to older adults (65+), representing a shift of 27% along the MHQ scale, with mental wellbeing decreasing systematically with each younger generation. With 44% of young adult respondents reporting clinical level risk (compared to 6% of 65+) this adds to the growing alarm of a profound societal mental health crisis. In particular, young adults had significantly compromised self-worth and confidence as well as focus and concentration and struggled with feelings of sadness and distress and unwanted and obsessive thoughts.

A country specific gender gap that diminishes with age. Mental wellbeing was statistically higher in males than females across all countries combined, though the differences were small. However, this aggregate number reflected a larger gender gap in young adults that reduced with increasing age and reversed in favor of females after age 65. Overall, the gender gap was largest in Singapore.

Male and female groups also differed in their relative strengths and problem areas.

Nonbinary/Third Gender at highest risk for suicide. Nonbinary/third gender adults had significantly compromised mental wellbeing with over 50% in the category of clinical level risk, and average MHQ scores ~47 points lower than males and females combined (17% lower along the MHQ scale). Particularly, they reported substantial suicidal thoughts and intentions relative to other groups.

The importance of sleep, social interaction and exercise: an unexpected magnitude. MHQ scores were shifted 82 points (27% lower along the MHQ scale) in those who rarely had a good night's sleep relative to those who always did; 66 points lower on the MHQ scale in those who (before the pandemic) rarely or never engaged in face-to-face social interactions with friends and family at least three times a week compared to those who rarely or never did; and 46 points lower on the MHQ scale in those who never exercised compared to those who exercised at least 30 minutes a day. The impacts for all three – sleep, socializing and exercise - were present across all facets of mental wellbeing although specific elements of mental wellbeing that were most impacted across sleep, socializing and exercise, differed.

The mental cost of the Covid-19 pandemic on mental wellbeing. 3.9% of respondents reported having had a Covid-19 infection of which 0.7% reported a severe case, roughly in line with the global infection rate in 2020. On the other hand, a full 57% of people experienced a range of negative health, financial or social consequences. Particularly, the 2% of respondents who were unable to get critical care for other existing health conditions due the pandemic reported the worst mental wellbeing that was 61 points or 20% lower along the MHQ scale than those who experienced none of the negative consequences. The 1.4% of people who struggled to make ends meet for basic necessities had the second worst mental wellbeing at 18% lower along the full extent of the MHQ scale. Having reduced household income was also associated with a shift of 4% down the MHQ scale but impacted a full 17% of people. Social isolation shifted MHQ scores ~20 points down the scale for all age groups. However, this same shift represented a 65% drop relative to the scores of young adults aged 18-24 with no Covid-19 related adversities on average but only ~17% for those 65+. We also note that greater incidence of lifetime traumas and adversities was systematically associated with lower mental wellbeing scores, pointing to the potential long-term impact of these Covid-19 related changes.

Conclusions and recommendations Altogether we advocate for embedding a population-based approach to mental wellbeing into social and economic policy. We also join a growing call for greater research investment into understanding the drivers of the mental health crisis of young adults and nonbinary/third gender adults, and in understanding the factors that impact people's lifestyle habits relating to exercising, socializing and sleep. Finally, we encourage a greater role for schools, universities and companies in actively enabling the mental wellbeing of their students and workforce.

Introduction

Our collective mental wellbeing in 2020

2020 was a year unlike any other in our life experience. The arrival of the Covid-19 pandemic touched all corners of the globe, causing illness, distress and uncertainty along with an economic fallout that is unrivalled in recent history. The tremendous toll it has taken on our collective mental health has been highlighted repeatedly in the media and scientific literature (Holmes et al., 2020; Pierce et al., 2020; Serafini et al., 2020) and also reminds us that mental health and wellbeing isn't just about clinical diagnoses. Our lives come naturally with adversity, and although not every mental challenge or moment of sadness warrants labelling as a clinical disorder, our mental wellbeing can still feel compromised at times.

Beyond happiness and disorders

Although there are different perspectives and definitions of mental wellbeing, here we use the term to represent the spectrum of our emotional, social and cognitive function and capability. In this regard, our mental wellbeing score is a reflection of how well-equipped we feel to handle life's challenges, rebound from adversities and capitalize on opportunities to contribute productively to society.

Our mental wellbeing measure therefore spans a spectrum from *Clinical* to *Thriving* and encompasses a host of emotional, social, cognitive, and physical functions that need to operate in line with, or beyond, the demands of any situation. These broadly span the dimensions of Mood & Outlook, Drive & Motivation, our Social Self, our Core and Complex Cognition and our Mind-body Connection. Importantly, therefore, **mental wellbeing**, although related, **is not the same as happiness or life satisfaction**.

While the extreme impairment of one or more functions are considered mental health disorders, focusing on these clinical disorders alone hinders our understanding of the spectrum of mental wellbeing in the general population. Only by considering this diversity will we be able to make progress that improves the lives of everyone.



“Mental health is a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community.”

- WHO

Mental wellbeing, as measured by the MHQ, represents the spectrum of our emotional, social and cognitive function and capability, a reflection of how well-equipped we feel to handle both life's adversities and opportunities.

From silos to holistic understanding

Understanding the status of mental wellbeing across populations and identifying the factors that impact mental wellbeing systemically is of paramount importance for effective policy making and appropriate provision of mental health resources (Patel et al., 2018). As a global population, we exhibit a huge diversity in our state of mental health and wellbeing. Although there is some data on the prevalence of individual disorders like depression, anxiety, and addiction (Kessler et al., 2009; Steel et al., 2014; James et al., 2018; Ritchie and Roser, 2018; World Health Organization, 2018) that provide an indication of how many people are suffering from serious challenges to their mental health, there is currently no big picture understanding of our collective mental wellbeing on the spectrum from *Clinical* to *Thriving* and along major functional dimensions.

Although pockets of data exist within current mental health surveillance systems, and information sources are more readily available in some countries, there are still many gaps that need to be filled. Special Initiatives on mental health from the World Health Organization (WHO, 2019b) and the inclusion of Good Health and Wellbeing as one of the United Nations' Sustainable Development Goals (UN, 2020) highlights the importance of plugging these gaps to facilitate the allocation of resources and support to individuals and populations who are most at risk.

The challenge of measurement

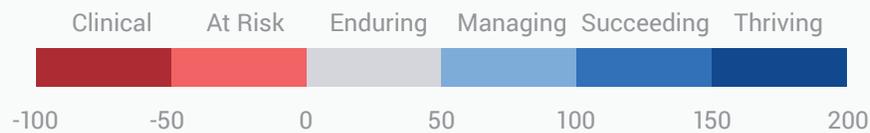
One challenge to achieving this goal is of measurement. The assessment of mental health is fraught with several challenges from a bias towards capturing clinical disorder rather than overall wellbeing, to poor standardization across assessment tools such that the same disorder may be diagnosed differently with different tools (Newson et al., 2020). The Mental Health Million project uses a unique scientifically developed tool called the Mental Health Quotient, or MHQ, (Newson and Thiagarajan, 2020), designed to overcome the various limitations of measurement tools today. Based on a systematic coding of 10,000 questions across 126 DSM-based assessment tools and inclusion of additional criteria from the Research Domain Criteria (RDoC) put forth by the National Institute of Mental Health in the United States (Insel et al., 2010), the MHQ captures the full breadth of symptoms across ten

We can't manage our collective mental wellbeing effectively if we don't measure it.

different disorders as well as positive mental attributes on a life impact scale to position individuals on the spectrum from *Clinical* to *Thriving*, in the aggregate, and across six functional dimensions (see Appendix 1 for more details on how the MHQ was developed).

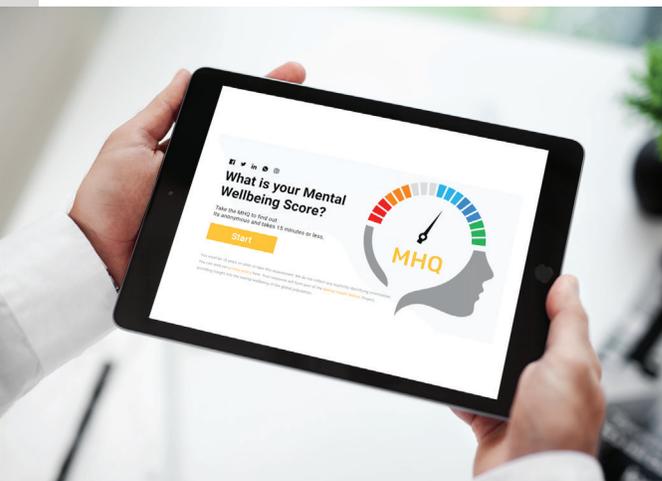
The MHQ and mental wellbeing

The MHQ is a unique tool that measures problems that map to symptom profiles across ten common mental health disorders as well as positive mental attributes to position people on a spectrum of mental wellbeing from *Clinical* to *Thriving*.



The Mental Health Million project

The objective of the **Mental Health Million project** is to provide an evolving global map of mental wellbeing and enable deep insights into its drivers that can be used for more effective management of population mental wellbeing through evidence-based social policy and interventions. This project utilizes the **MHQ** delivered as an open online anonymous survey that takes approximately 15 minutes to complete and returns overall wellbeing scores as well as a comprehensive report with tailored lifestyle recommendations via email, encouraging honest responses.



Available for everyone at sapienlabs.org/mhq

Launched in April of 2020 in English, this first year has focused on adults 18 and older in eight English speaking countries that include the United States, Canada, United Kingdom, Australia, New Zealand, and India's, South Africa's and Singapore's considerable English-speaking populations. While the Mental Health Million project will launch in multiple languages in 2021 and beyond, here we present insights into the mental wellbeing of the English-speaking world in 2020. This includes data obtained from ~49,000 people across these countries, recruited through Internet

search and social media which, while similarly recruited, may not be a fully representative sample of any

country. While this report provides a top-line description of this data, much more can be mined from it. The Mental Health Million project is therefore structured as an open data project where researchers can access the data on request. Information on how this data was obtained can be found in Appendix 2.

What's in this report.

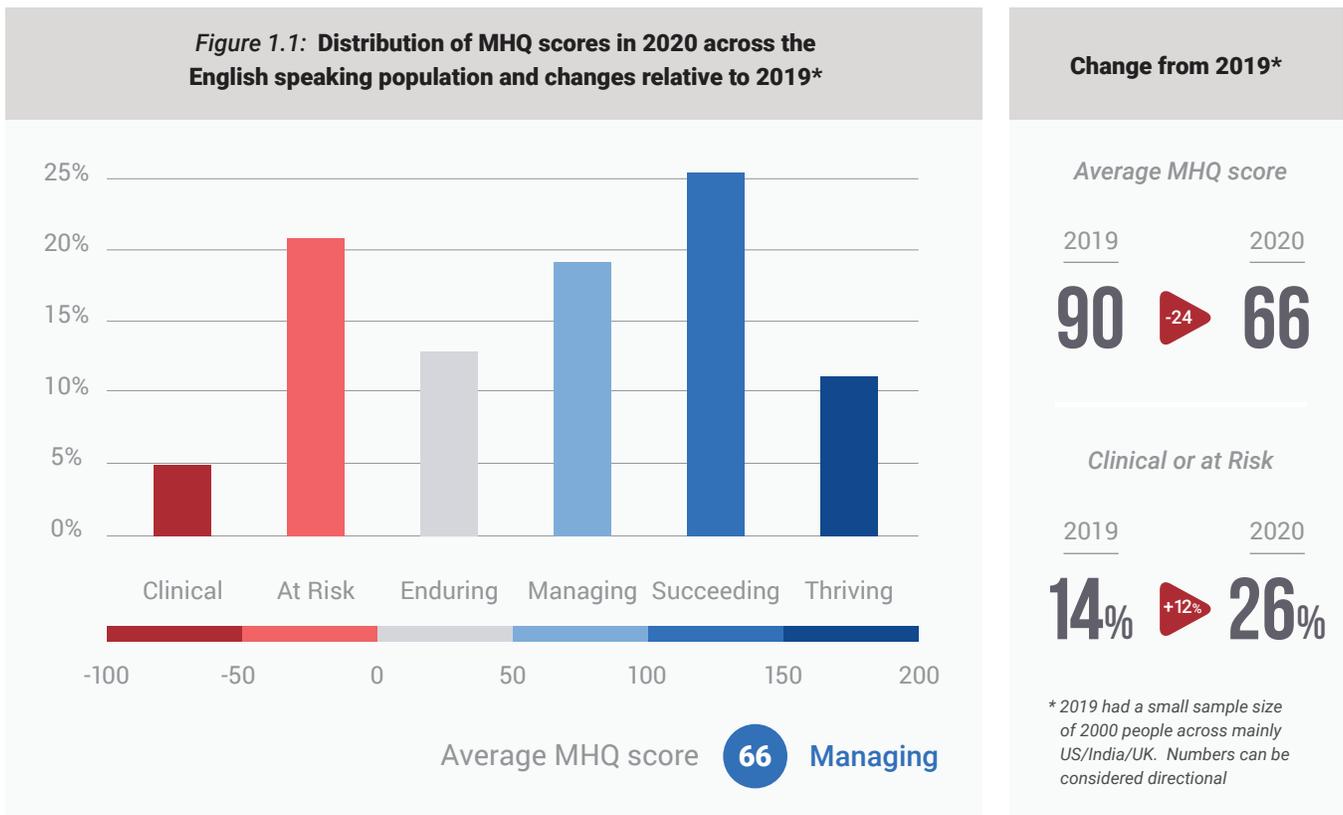
In this report we show a comparison of mental wellbeing profiles of eight countries, as well as highlight differences across age and gender groups based on this data. We also report on key lifestyle factors that are revealing themselves as important drivers of mental wellbeing and discuss the impact of adversities and traumas associated with the Covid-19 pandemic.



1. The Mental State of the (English Speaking) World

An aggregate view

The average mental wellbeing score across 8 English speaking countries in 2020 was 66, a decline of 24 points relative to a smaller sample from 2019 that represents an 8% downward shift on the MHQ scale. The percentage of people at risk for, or with clinical disorders was 26%, 12% higher compared to 2019. MHQ estimates of clinical burden in 2019 are broadly in line with estimates of annual prevalence rates of mental health disorders reported from other sources such as the surveys from the World Health Organization and the Global Burden of Disease Study which have made estimates in the range of 9.8-19.1% (Kessler et al., 2009; Steel et al., 2014; James et al., 2018) while 2020 estimates are aligned with the finding of increased prevalence of mental health challenges in 2020 (e.g. Pierce et al., 2020; Serafini et al., 2020).



The Six Dimensions of Mental Wellbeing in The MHQ



Mood & Outlook

The ability to manage and regulate your emotions effectively and to have a constructive or optimistic outlook for the future.



Social Self

How you interact with, relate to and see yourself with respect to others.



Drive & Motivation

The ability to work towards achieving your desired goals and to initiate, persevere and complete activities in your daily life.



Core Cognition

The health of your basic cognitive skills which allow you to function effectively and independently on a moment to moment basis.



Complex Cognition

The ability to synthesize and make sense of complex sets of events and situations and display a longer-term perspective in your thoughts and behavior.



Mind-Body Connection

The regulation of the balance between your mind and body.

These overall scores are based on averages for respondents from each country weighted by their relative adult populations. For each country, average scores were first obtained for each age and gender group and then weighted by their proportion of the population (for more details on analysis methods, see Appendix 2). Note that 2019 data included 2000 people primarily across United States, India and the United Kingdom.

Functional dimensions of mental wellbeing

Within this aggregate view of mental wellbeing, what did distinct functional dimensions of mental wellbeing look like?

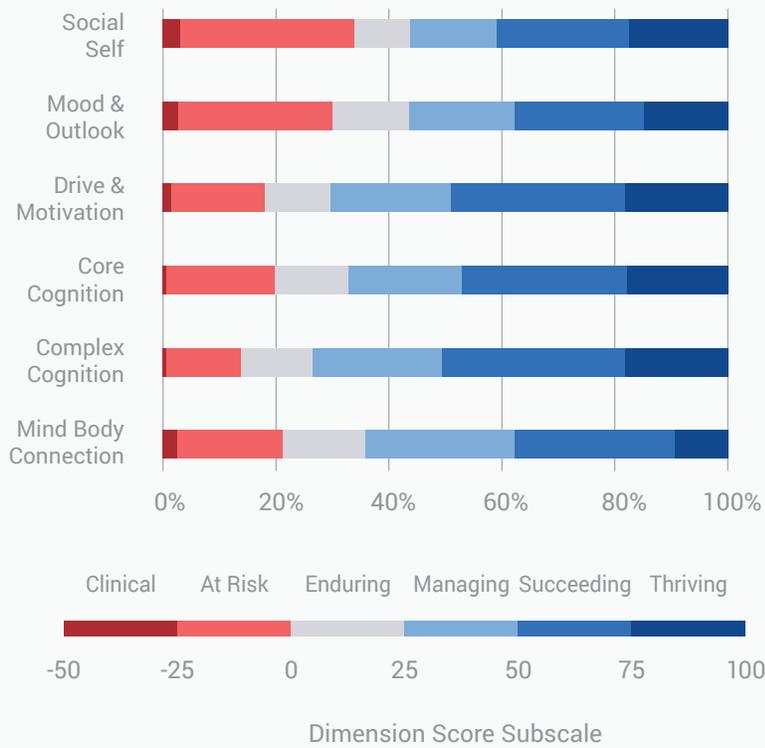
Respondents felt most positive about their Complex Cognition overall with less than 15% experiencing serious risks and 50% *Succeeding* or *Thriving* on this dimension. They were similarly confident in their Drive & Motivation and Core Cognition where about half were *Succeeding* or *Thriving* and 20% or less of the population struggled on each of these dimensions.

Respondents felt most positive about their Complex Cognition overall with less than 15% experiencing serious risks and 50% Succeeding or Thriving on this dimension.

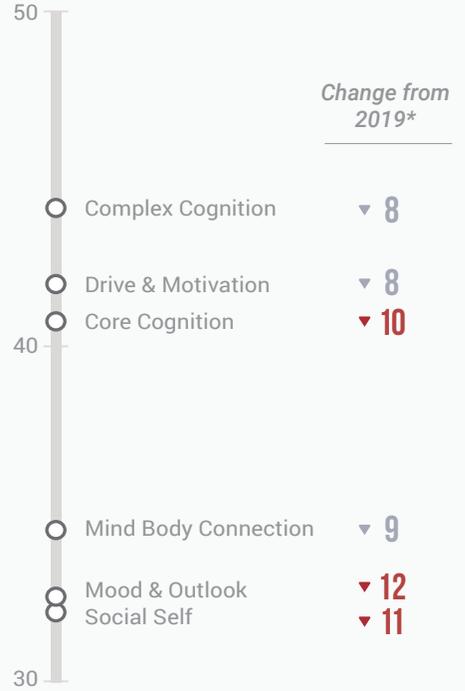
On the other hand, people struggled most in their Social Self. Over 30% of respondents had significant risks and challenges in their Social Self, the way they relate to, and see themselves with respect to others in the world, with only 40% *Succeeding* or *Thriving*. Similarly, nearly a third of respondents struggled with serious challenges to their Mood & Outlook, the ability to regulate their emotions and see the world optimistically. These scores were most different from 2019 decreasing 11 and 12 points for Social Self and Mood & Outlook (a downward shift of 7-8% on these dimension subscales) respectively while Drive & Motivation and Complex Cognition declined relatively less (both 8 points or 5% on the subscale).

Over 30% of respondents had significant risks and challenges in their Social Self; the way they relate to, and see themselves with respect to others in the world.

Figure 1.2: MHQ score distributions across the six functional dimensions of mental wellbeing and changes relative to 2019*



Average Dimension Score

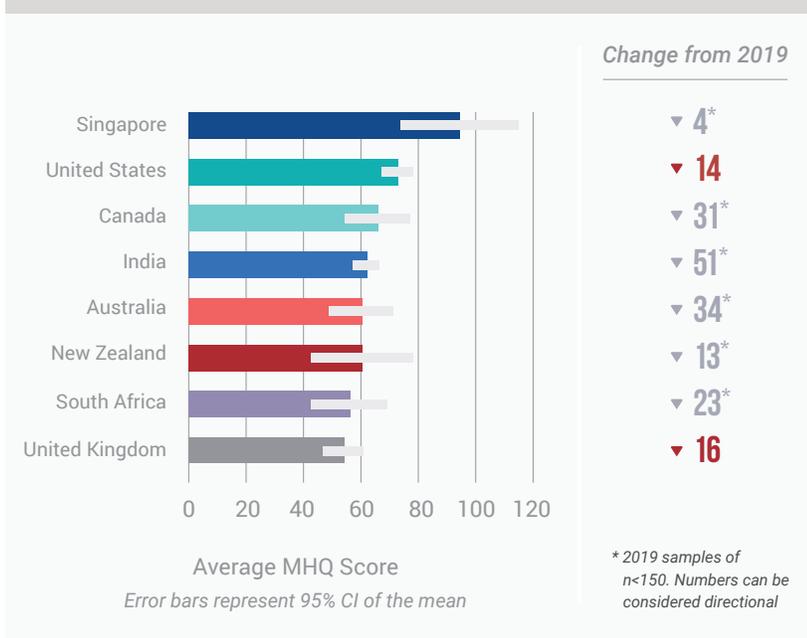


* 2019 had a small sample size of 2000 people across mainly US/India/UK. Numbers can be considered directional

2. The Mental Wellbeing of Countries

In this first year we have focused on English speaking people from 8 countries: United States, Canada, United Kingdom, Australia, New Zealand, Singapore, India and South Africa. How did mental wellbeing look across these countries overall and across different dimensions in 2020?

Figure 2.1: Average MHQ Score by Country for 2020 and change from 2019



Aggregate mental wellbeing of countries

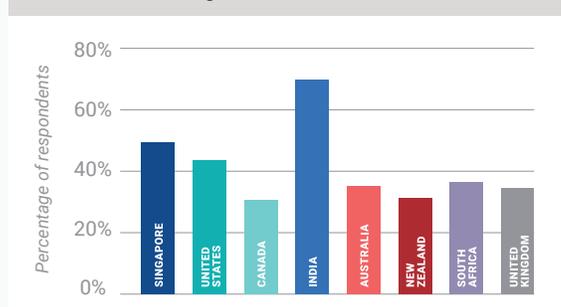
Altogether respondents from Singapore had the highest mental wellbeing score with an average MHQ of 94 followed by the United States with an MHQ of 72. Those from United Kingdom and South Africa had the poorest mental wellbeing with scores of 54 and 56 respectively, a 13% range on the MHQ scale. We note that our results reflect weighted average responses by age and gender distributions in the country in order to provide a truer picture of the

population mental wellbeing. However, it is important to keep in mind that the English speaking Internet enabled populace is not necessarily representative of each country as a whole. Further, not all differences between countries are statistically significant. For example, Singapore is not significantly different from the United States due to its small sample size, although both are significantly higher than the United Kingdom. All statistics are provided in a supplementary downloadable file.

India's English speaking more educated populace.

India's English speaking population while substantial at ~128 million, is still only a small proportion of the population and represents a relatively more educated group. Reflecting this, while the proportion of respondents with a college level education or more were approximately 10% higher than adult demographics for most countries, for India it was 70%, a 7-8 fold difference from the country proportion of <10%. This must be kept in mind when interpreting comparisons.

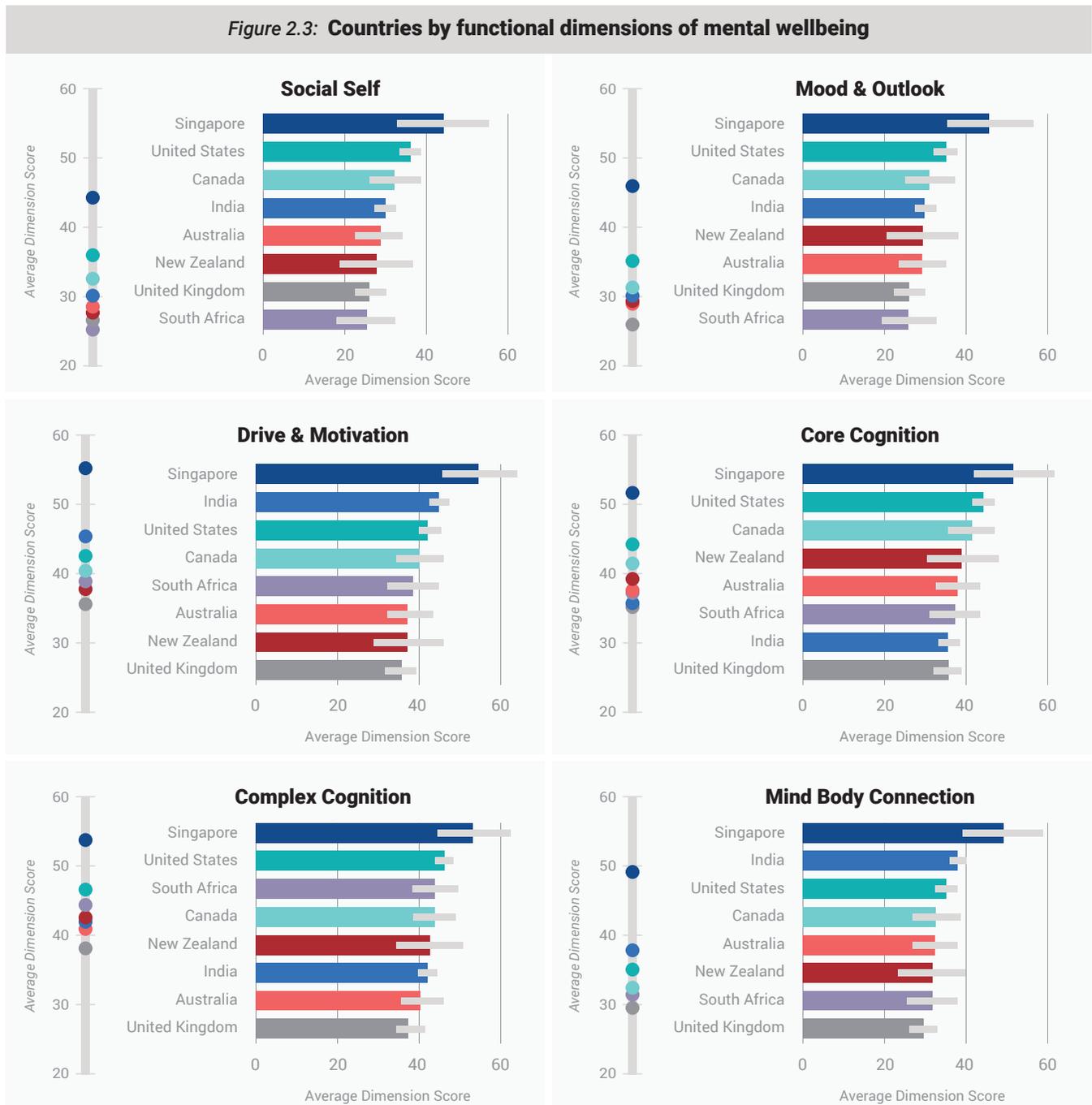
Figure 2.2: Proportion of respondents with Bachelor's degree and above across countries



Country scores along functional dimensions

Within this data, Singapore had higher scores on all dimensions, while the United Kingdom had the lowest for four out of six dimensions, and second lowest on the other two. Singapore, United States, Canada, Australia and New Zealand maintained their relative positions to one another across all dimensions while India and South Africa had the greatest variability. India was relatively higher on Drive & Motivation and Mind-Body Connection and lower on Core Cognition and Complex Cognition respectively. Similarly, South Africa was relatively higher on Drive & Motivation and Complex Cognition.

Figure 2.3: Countries by functional dimensions of mental wellbeing



We note that differences in the average score **may or may not be statistically significant depending on relative sample sizes**. All statistics are provided in a supplementary download.

The distinct assets and problems of countries

Countries with similar overall MHQ scores still differed in their specific profile of mental wellbeing. Here we looked at the top three assets that differed for each country relative to the United States, in both negative and positive directions and the top three problem areas that differed in either the positive or negative direction.

For instance, the biggest differences between respondents from Singapore and the United States were that those from Singapore had **better** *Appetite regulation, Self-image and Sleep quality* but also experienced **less** *Pain, had less Physical health issues and Feelings of sadness, distress or hopelessness*.

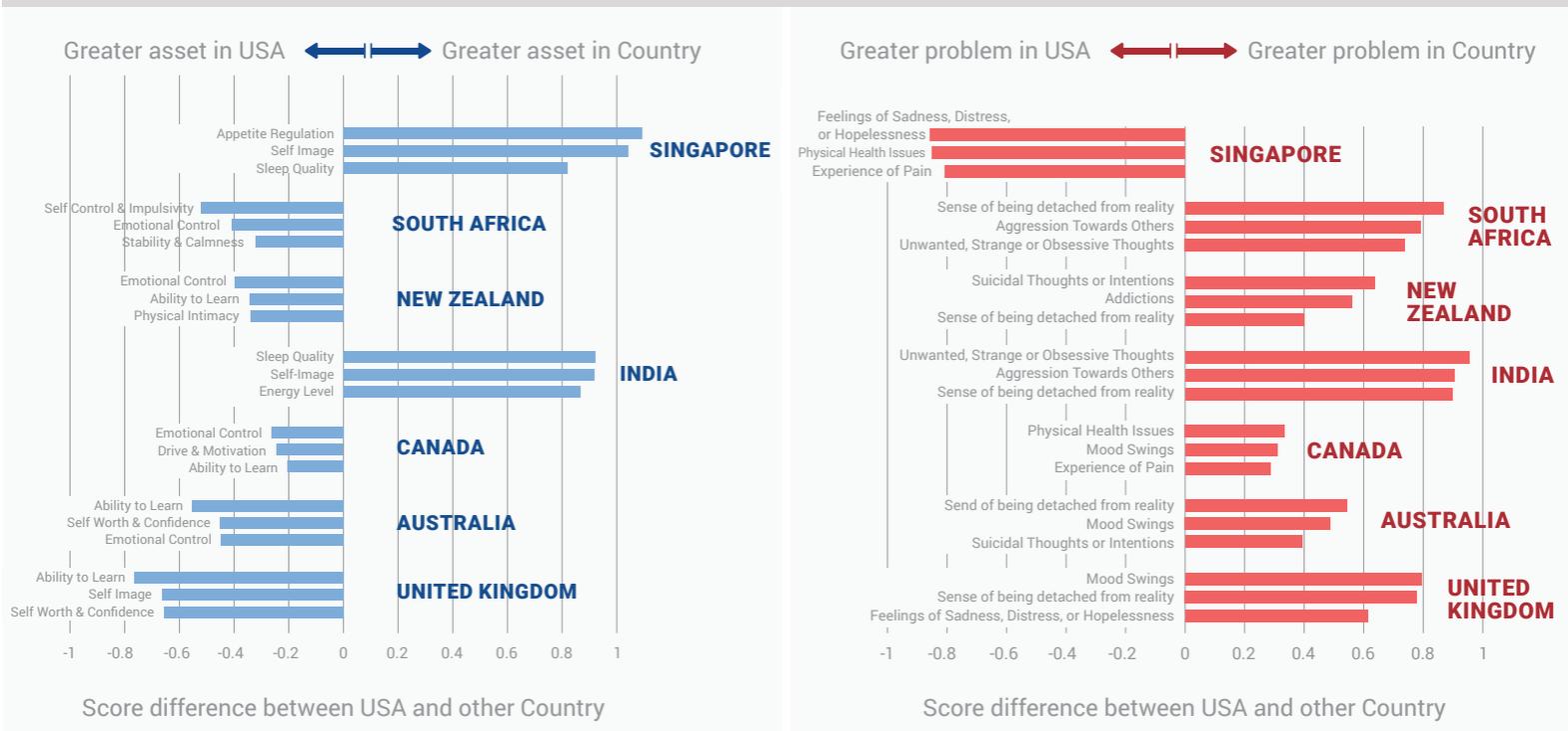
Indian respondents similarly had **better** *Sleep quality, Self-image and Energy levels* relative to the United States. On the other hand they had worse problems with *Unwanted, strange or obsessive thoughts, Aggression towards others and a Sense of being detached from reality*.

Those from United Kingdom had poorer *Ability to Learn, Self image and Self worth and confidence* relative to the United States and also struggled more with *Mood swings, Sense of being detached from reality and Feelings of sadness, distress or hopelessness*. All comparisons are in Figures 2.4 (Left: Assets; Right: Problems).

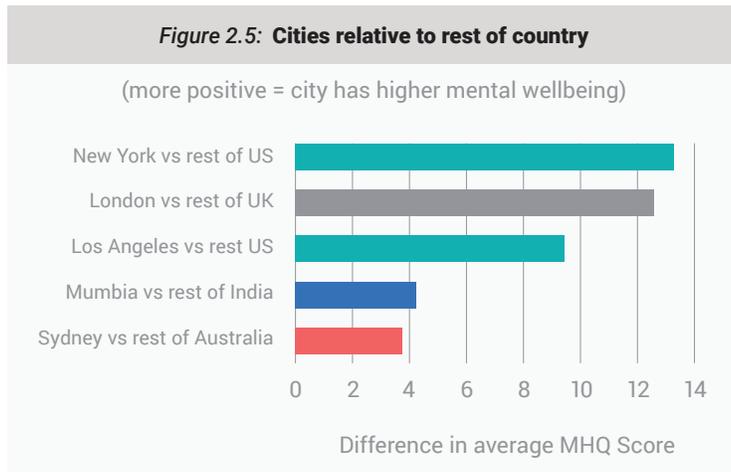
Figure 2.4:

Top three differences in mental assets relative to the USA, either negative or positive

Top three differences in problem areas relative to the USA, either negative or positive



Big cities fare better



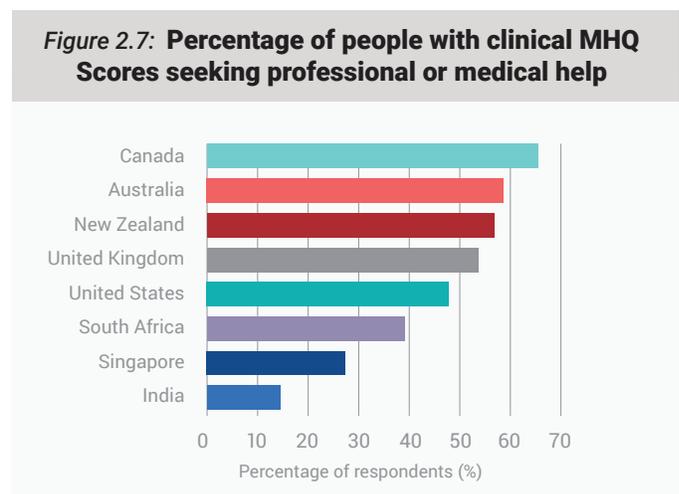
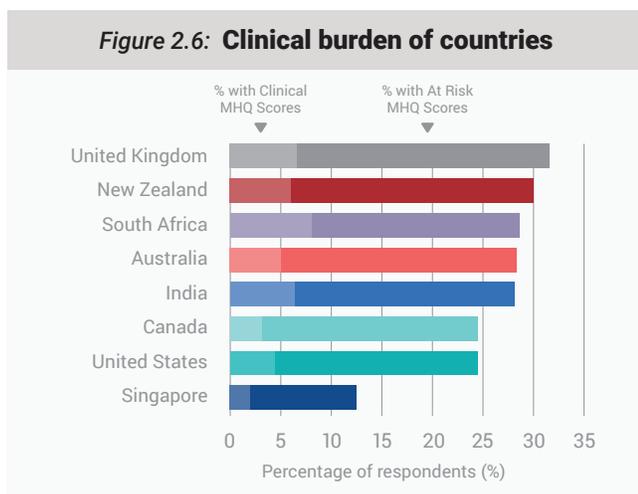
Big cities are a distinct ecosystem with higher density and faster pace. Does this make mental wellbeing better or worse? Respondents from five major cities - New York, Los Angeles, London, Sydney, and Mumbai had MHQ scores higher relative to the rest of their respective countries. Particularly, these city folks felt greater Drive & Motivation and Core and Complex Cognition compared to the rest of their respective countries. While Singapore,

which is a city-state, still had the highest MHQ, the gap between Singapore and New York City was less than half the gap with the United States overall.

The clinical burden of countries

Overall, 26% of respondents were at risk for clinical-level challenges (5% Clinical and 21% At Risk) representing a considerable clinical burden. This burden was highest in South Africa at 8% followed by United Kingdom, India and New Zealand ranging from 6 to 6.5% and lowest in Singapore at 2%. On the other hand, when including those at risk of clinical-level challenges the burden was highest in the United Kingdom at 31.5% followed by New Zealand at 30% and substantially lower in Singapore at 12.4%.

Country groups also differed substantially in the percentage of the adult population with clinical-level challenges seeking professional help. Respondents from Canada were the highest at 65.2% followed by Australia at 58.6%. In contrast, a very low 14.5% of those with clinical-level challenges from India sought professional help followed by Singapore at 27.3%.



Psychiatry resources and outcomes

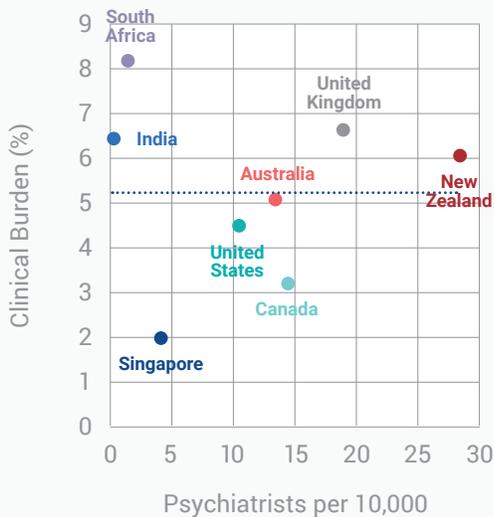
How does the mental health resource ecosystem correlate with the percentage seeking help? Across this group of countries, the number of psychiatrists working in the mental health sector per 100,000 people are lowest for India and South Africa at 0.3 and 1.5 respectively where the percentage seeking help is very low compared to 14.7 in Canada and 13.5 in Australia respectively where it is high (WHO, 2019a). Overall, there was a generally linear relationship between the percentage seeking help and the number of psychiatrists, suggesting that the availability of mental health support is a critical factor in help seeking. However, there are likely to be other factors which also play a role.

For example, cultural reasons may create hesitancy in seeking help for fear of stigma or discrimination. Financial constraints in countries without free healthcare systems is also likely to be a factor.

Figure 2.8: Psychiatrists per 10,000 correlates with percentage seeking help across countries



Figure 2.9: Clinical burden of countries was unrelated to psychiatry resources



On the other hand, is it the case that having more psychiatrists results in a lower clinical burden? A comparison of the clinical and total risk burden versus the number of psychiatrists per 100,000 suggests that this is not the case. Clinical burden was unrelated to the availability of psychiatrists. There are likely numerous reasons for this. Among them may be the current lack of effective treatments and tools available for mental disorders.

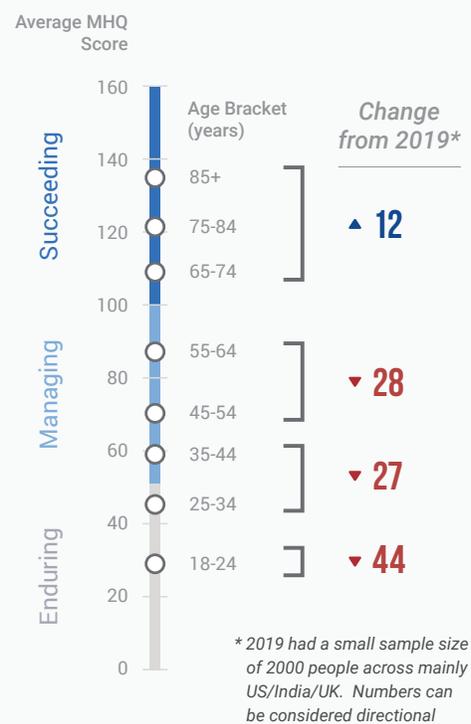
3. Age and Mental Wellbeing

Mental wellbeing is diminished in younger adults

Within this dataset the average MHQ score for adults aged 65 and over was 115 and decreased with each successive generation. Respondents 18-24 years old had an average score of 29, 29% lower on the MHQ scale than those 65+. Correspondingly, the proportion of respondents in the *Clinical* and *At risk* categories was only ~6% among the 65+ but 44% in the 18-24 group. Conversely, 70% of those aged 65+ were in the categories *Succeeding* or *Thriving* compared to only 17% of 18-24 year olds. This is a profound difference. Along with other studies that suggest that mental health challenges are disproportionately affecting younger people with increasing prevalence (Twenge et al., 2019), the magnitude of difference along such an aggregate measure must sound a loud alarm.

A full 44% of respondents aged 18-24 years were Clinical or At risk of a clinical disorder compared to only 6% of those 65 and older. Such a profound difference in mental wellbeing must sound a loud alarm.

Figure 3.1: Mental wellbeing is progressively worse for each younger generation. Covid-19 also had a more dramatic impact on younger adults



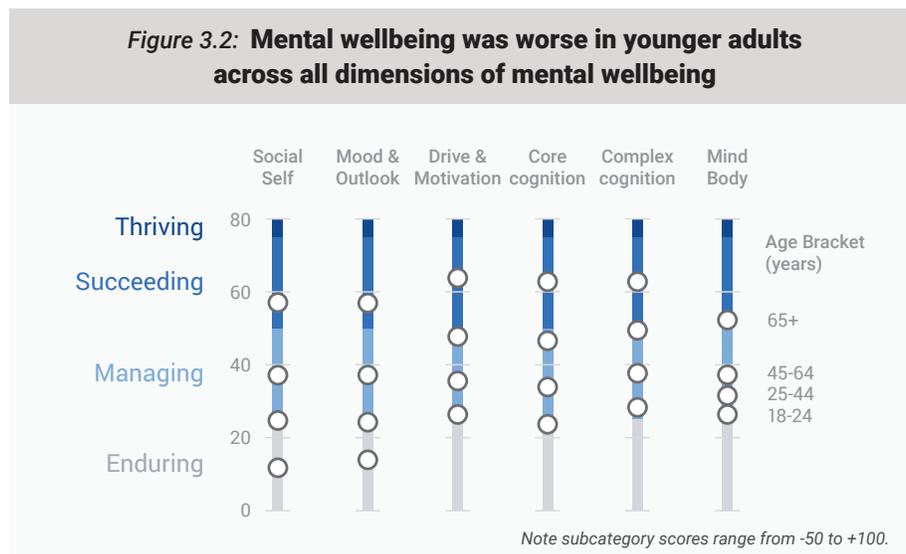
* 2019 had a small sample size of 2000 people across mainly US/India/UK. Numbers can be considered directional

This generational decline in mental wellbeing is a global phenomenon present in all 8 countries. While the magnitude of this gap was large everywhere, it was greatest for respondents living in Singapore, and smallest for those living in Canada (67 and 50 MHQ point difference between adults under age 45 and over 45 respectively).

Notably this difference between younger and older adults has been substantially exacerbated in 2020 by the Covid-19 pandemic. Mental wellbeing decreased most dramatically in 2020 (relative to 2019) for those aged 18-24, with a decrease of 44 MHQ points (a 15% shift along the MHQ scale). For those aged 25-64, there were also decreases of smaller magnitude (27 or 28 MHQ score points), while surprisingly, those 65 and above actually fared better in 2020, possibly reflecting a bias in this sample of older adults with the health and faculties to complete a mental health assessment online. This finding tracks with other reports that the consequences of the pandemic are having a disproportionate impact on the young (Varma et al., 2020), even though this group is at least risk of severe illness or death from Covid-19.

Dimensions of mental wellbeing across age groups

Are these differences between age groups specific to certain dimensions? Remarkably, the same trend is present across the 6 dimensions of wellbeing although it is particularly amplified in the dimensions of Social Self and Mood & Outlook.



With respect to specific elements of mental wellbeing, positive aspects that increased the most substantially with age included *Self-image, Self-worth and Confidence, Focus and Concentration* and *Emotional resilience*. Conversely young adults struggled substantially more with *Feelings of sadness, distress or hopelessness, Unwanted, strange or obsessive thoughts, Mood swings* and *Guilt and blame*, compared to those aged 65+. In contrast, the more prominent challenges for those aged above 24

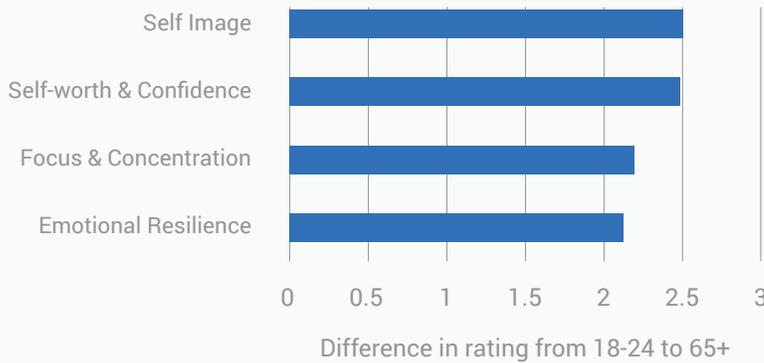
and into middle age were *Fear and anxiety* and *Avoidance and withdrawal* while those older still (65+) increasingly struggled with *Physical health issues*. As in this data, for those over 65, studies have shown that lower mental wellbeing scores are more likely to be driven by physical health issues (Fiske et al., 2009; Doherty and Gaughran, 2014).

Figure 3.3:

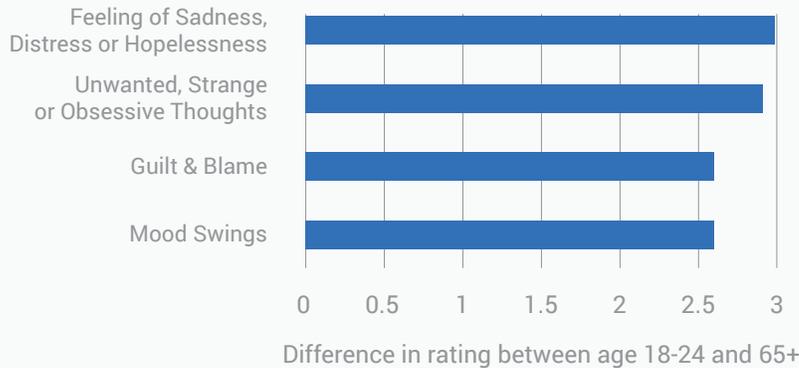
Key differences between age groups 18-24 and 65+

Top problems for each age group

Key assets in the elderly (65+) relative to 18-24



Biggest problems in the young (18-24) relative to 65+



AGE 18-24

- Feelings of Sadness, Distress or Hopelessness **41.0%**
- Unwanted, Strange or Obsessive Thoughts **39.4%**

AGE 25-44

- Fear & Anxiety **31.0%**
- Avoidance & Withdrawal **28.6%**

AGE 45-64

- Fear & Anxiety **19.2%**
- Avoidance & Withdrawal **17.9%**

AGE 65+

- Physical Health Issues **11.1%**
- Fear & Anxiety **8.8%**

The major challenges reported by the 18-24 year old group in this 2020 dataset are similar to those reported in our smaller 2019 sample, although the relative ranking of these challenges has changed slightly. For 18-24 year olds, poor *Self-image*, *Unwanted, strange or obsessive thoughts* and *Mood swings* dominated in 2019. While almost all elements of wellbeing deteriorated in 2020 for this younger age group relative to 2019, the biggest changes (although not the most prevalent challenges) were in deteriorating *Relationships with others*, *Suicidal thoughts and intentions*, *Fear and anxiety*, *Confused and slow thinking* and *Repetitive and compulsive actions*.

Explaining the generational gap in mental wellbeing

What accounts for this profound difference across generations among the English speaking Internet enabled? Is it that we become increasingly better equipped to cope with life as we age? Or is it that the changing forces of the world have had a disproportionate impact on the younger groups? Learning the answers to these questions is exceedingly important for us to understand the future of society.

Arguing in favor of the former is that the reductions in mental wellbeing in young adults are across the board from Social Self to Core Cognition. This suggests that young adults may not be well equipped to calibrate their expectations or self-perceptions relative to society as a whole. The higher self-confidence and emotional resilience with age may also suggest a natural maturing and perspective as we age. Indeed, despite declining abilities, older adults have more favorable perceptions of their mental status (Reed and Carstensen, 2012). Some aspects of the difference may also relate to a shadow effect, where major issues such as *Feelings of sadness, distress or hopelessness* cast a shadow on how the individual views other aspects of their functioning.

What does the future look like for a society that is profoundly compromised in its focus and concentration, and consumed with strange and unwanted thoughts and feelings of distress and hopelessness? The consequences of these differences across age groups cannot be taken lightly.

On the other hand, the vastly greater presence of strange and unwanted thoughts, substantial challenges in focus and concentration, and feelings of hopelessness in the 18-24 age group are warning signs of more worrying forces at play. What if these challenges persist as they transition to middle age and beyond? What are the consequences of a society that lacks focus and concentration and where unwanted, strange and obsessive thoughts run amok? Studies suggests that 75% of adults with a mental health disorder have experienced its onset by the age of 24 (Kessler et al., 2005; Kessler et al., 2007). Furthermore, recent research shows that mental health struggles in early life can lead to poorer physical health in middle-age and advanced aging (Richmond-Rakerd et al., 2021; Wertz et al., 2021). With 44% of young adults having or at risk for clinical-level issues, what does this mean for the future of society? 18-24 year olds are the first generation to grow up immersed fully in an internet-connected world. Are the major societal shifts brought about by the Internet to blame? It is imperative that we invest fully as a society to understand the drivers of this considerable generation shift in mental wellbeing and address them at their root causes.

The Mental Health Million project will be able to look longitudinally to see how this year's 18-24 year olds fare in their next decade, providing increasingly deeper insight that can help drive mitigating strategies and track their success.

4. Gender and Mental Wellbeing

The male-female gender gap

The prevalence of disorders such as depression, post-traumatic stress disorder (PTSD) and generalized anxiety disorder, has typically been found to be higher for women compared to men (Kessler et al., 1993; Van de Velde et al., 2010; McLean et al., 2011; Ditlevsen and Elklit, 2012; Salk et al., 2017). In contrast, suicide rates are often higher in men compared to women (Freeman et al., 2017; Naghavi, 2019), and men are often more reticent to speak out about mental health challenges (Galdas et al., 2005). Here we provide insight into the difference between genders across the spectrum of mental wellbeing.

Overall, in 2020 our data shows that female respondents had a slightly lower MHQ scores overall relative to male respondents. However, they also fared better in 2020 relative to a smaller 2019 sample with a lower drop of 19 MHQ points compared to 28 in men.

Figure 4.1: There was a small difference between males and females overall while nonbinary/third gender had substantially poorer mental wellbeing

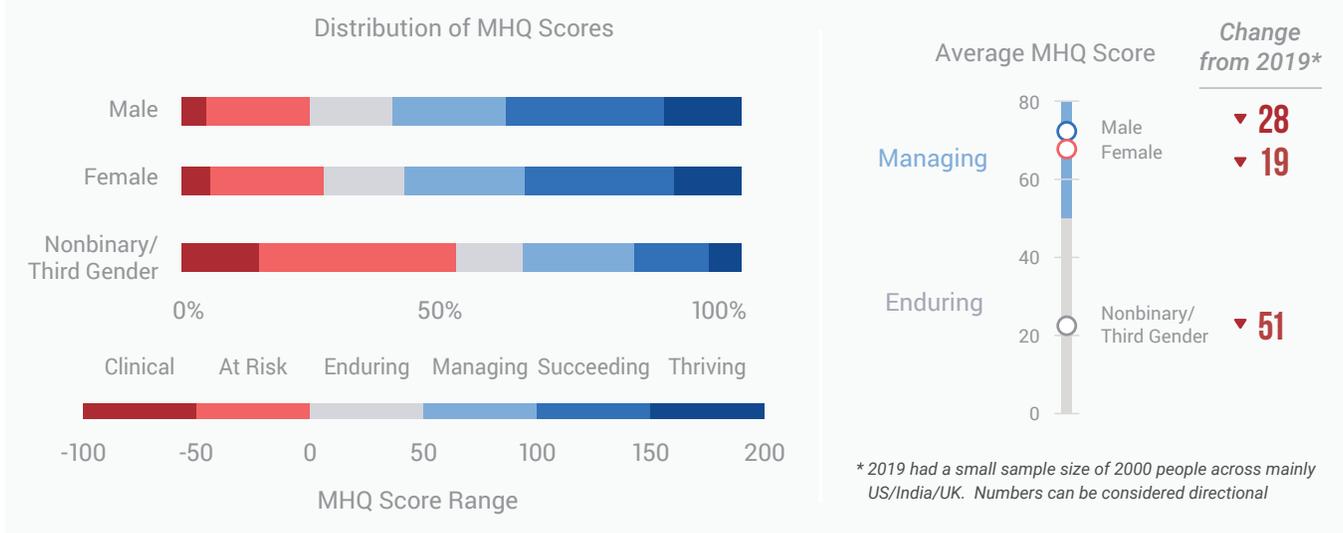
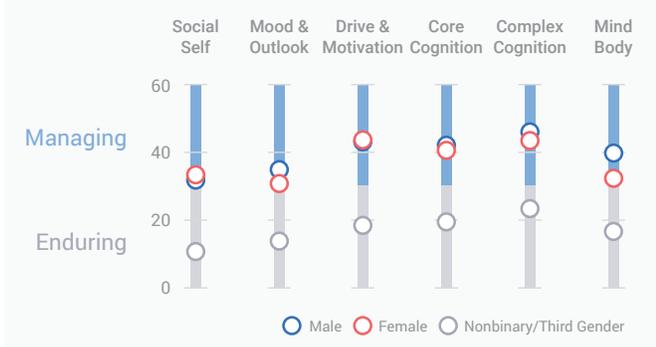


Figure 4.2: MHQ scores for each gender group across each functional dimension



Note that dimension scales range from -50 to +100.

This difference between men and women predominantly reflected differences along the dimension of Mind-Body Connection followed by Mood & Outlook (a 3-5% difference along these dimension scales). Relative to men, women had greater *Experience of pain* and *Fear and anxiety*. Conversely men had greater issues with *Addictions* and *Empathy* than women.

A gender gap that diminishes with age

Interestingly, this gender gap between men and women diminished with age. For young adults, there was a sizable gender gap of 17 MHQ score points (6% of the MHQ scale) with men reporting higher mental wellbeing compared to women. The gap was progressively lower for older generations, reversing in direction for those aged 65+. Notably, at all ages, the difference between males and females were many fold smaller than the generational gaps reported above.

Figure 4.3: Male-female gender gap by age
(more positive = males have higher mental wellbeing)

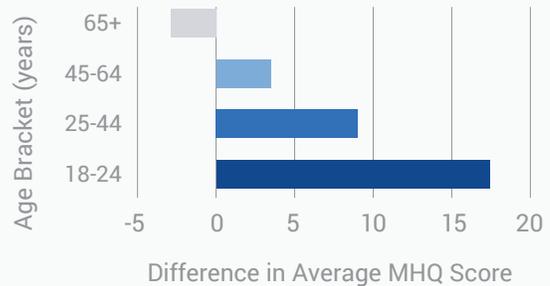
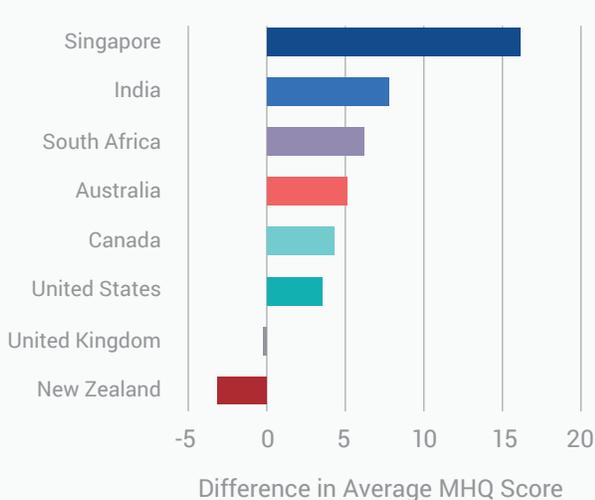


Figure 4.4: Male-female gender gap across respondents living in different countries
(more positive = males have higher mental wellbeing)



The gender gap also varied across respondents living in different countries with most populations reporting slightly higher mental wellbeing for men compared to women. It is considerably larger for respondents living in Singapore (+16 MHQ points or 5% of the MHQ scale) compared to other countries. On the other hand, respondents living in the United Kingdom had gender parity overall, and the gap was reversed for respondents living in New Zealand where women were higher overall. In these countries, higher MHQ scores for men persisted in the 18-24 range but quickly reached parity thereafter and reversed in favor of women after age 55.

The enormous challenge for nonbinary/third gender

While the differences between males and females were hardly a few MHQ points overall, those respondents who were nonbinary/third gender had strikingly lower mental wellbeing compared to either males or females. On average, MHQ scores were 50 MHQ points lower for nonbinary/third gender respondents (average MHQ of 22) compared to male respondents (average MHQ of 71). This is in line with other studies that have highlighted the specific challenges faced by this population (Cochran et al., 2003; Meyer, 2003; Russell and Fish, 2016). Sadly, those who responded as nonbinary/third gender had consistently poorer mental wellbeing across all 6 dimensions, but in particular for the dimensions of Social Self and Drive & Motivation. Particularly, relative to males or females, this group had substantially greater troubles with *Suicidal thoughts or intentions* and a *Sense of being detached from reality*.

5.

Lifestyle Factors That Impact Mental Wellbeing

We know that sleep, exercise and social contact are key influencers of our mental wellbeing. For example, research has shown that poor sleep quality leads to impaired cognitive performance (McCoy and Strecker, 2011; Lowe et al., 2017; Dzierzewski et al., 2018), increases stress reactivity (Meerlo et al., 2008) and is both a trigger and a consequence of poor mental and cognitive health (Krystal, 2012; Hvolby, 2015; Meerlo et al., 2015). Similarly, research is finding that exercise is essential for our mental wellbeing (Di Lorito et al., 2020; Hu et al., 2020) and that without regular contact with friends and family, people experience social isolation and loneliness (Hawkley and Cacioppo, 2010; Lim et al., 2018; Wang et al., 2018), leading to increased stress levels (Brown et al., 2018) and poorer mental and physical health.

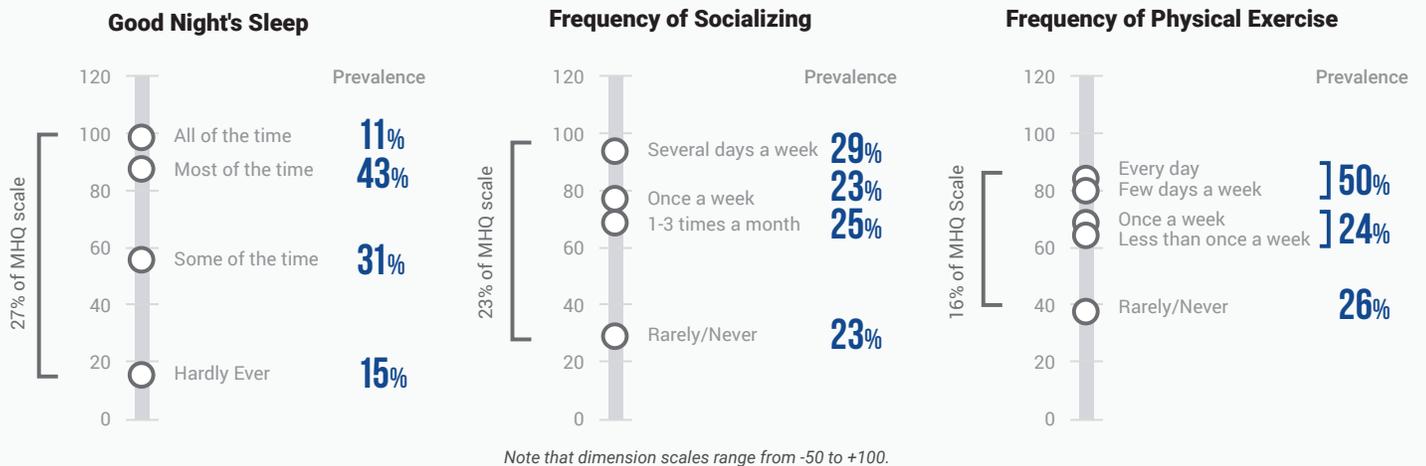
Here we show how lifestyle behaviors vary across different groups and highlight the surprisingly large magnitude of their impact on mental wellbeing overall, as well as on its individual elements. We note that data on social interaction shown here was captured to reflect people's typical behavior when not in lockdown, while social isolation due to Covid-19 was separately assessed and highlighted in the section on Covid.

The magnitude of influence of lifestyle factors

The biggest surprise was the magnitude of difference in MHQ points along the scales of sleep, socializing and exercise. Those respondents who always got a good night's sleep had overall mental wellbeing scores that were 82 points higher than those who hardly ever did (a shift of 27% along the MHQ scale). Similarly, those who typically socialized with friends and family several days a week had mental wellbeing scores 66 points higher than those who rarely or never did, and those who exercised at least 30 minutes everyday had mental wellbeing scores 46 points higher than those who rarely or never exercised. Clinical risk too had proportionate disparities.

Over 50% of those who rarely or never got a good night's sleep had clinical level challenges or risks; 44% of those who rarely or never socialized had clinical level challenges or risks; and 39% of those who rarely or never exercised had clinical level challenges or risks. These are not small numbers and are a profound testament to the foundational importance of these elements to human mental function. Yet, almost half of respondents struggled on each of these factors.

Figure 5.1: MHQ scores and prevalence in the population for different categories of sleep, socializing and exercise

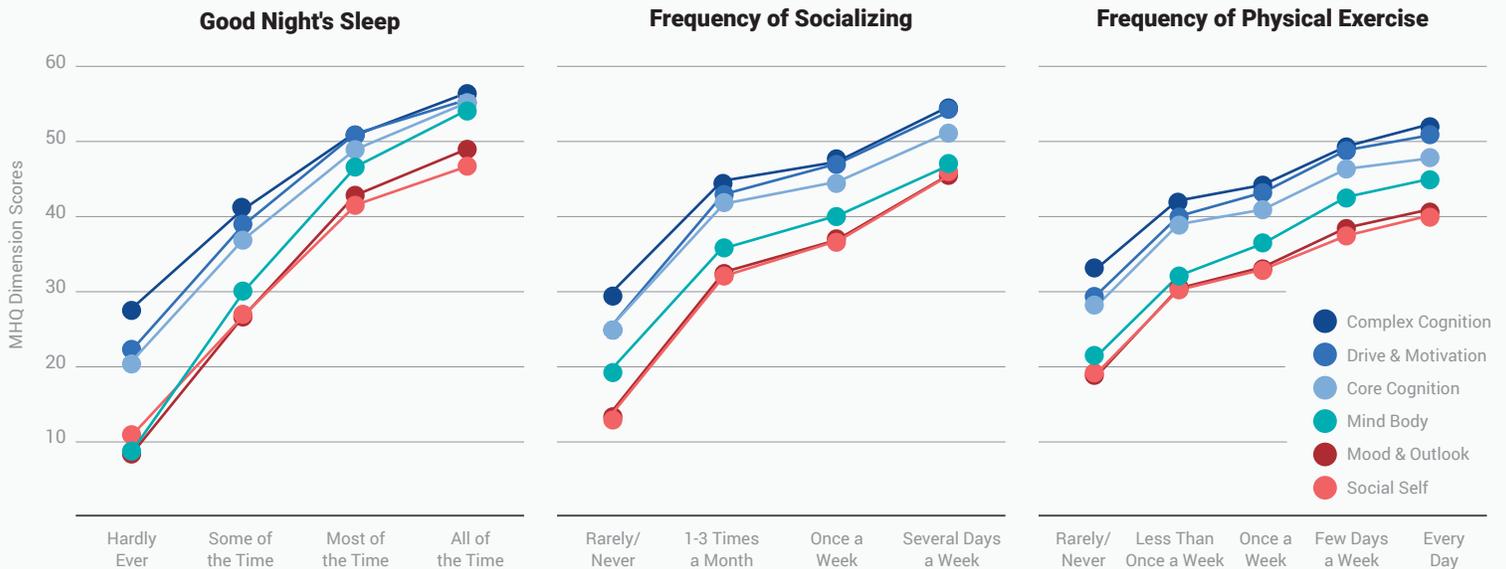


Everything is worse without sleep, socializing and exercise

Studies on sleep, exercise and social interaction have typically focused on their impact on a single disorder or mental function. When we look across the full spectrum of mental function, however, which dimensions are most likely to be impacted by each of these factors? Surprisingly, each factor appears to impact not just every functional domain but virtually every element within them. In all three cases, every asset of mental function was diminished between the lowest and highest groups on each dimension, and every problem area was magnified. Most prominently affected by inadequate sleep, were *Self-image*, *Appetite regulation* and *Outlook and optimism* as well a greater *Experience of pain*, *Guilt and blame*; and *Feelings of sadness, distress or hopelessness*. Those with a lack of social interaction were most prominently compromised in their *Relationships with others*, *Outlook and optimism* and *Self-image* as well as reporting challenges with *Avoidance and withdrawal*, *Guilt and blame*; and *Feelings of sadness, distress or hopelessness*, while those who rarely exercised were most prominently compromised in their *Appetite regulation*, *Energy levels* and *Drive and motivation*, in addition to reporting more *Physical health issues*, *Feelings of sadness, distress or hopelessness* and *Avoidance and withdrawal*. Only a few aspects such as *Sensory acuity* or problems with *Hallucinations* were unchanged.

Sleep, social interaction and exercise substantially impact all facets of mental function. Those who regularly got adequate sleep, social interaction and physical exercise had MHQ scores 27% , 23% and 16% higher along the MHQ scale respectively than those who rarely or never did.

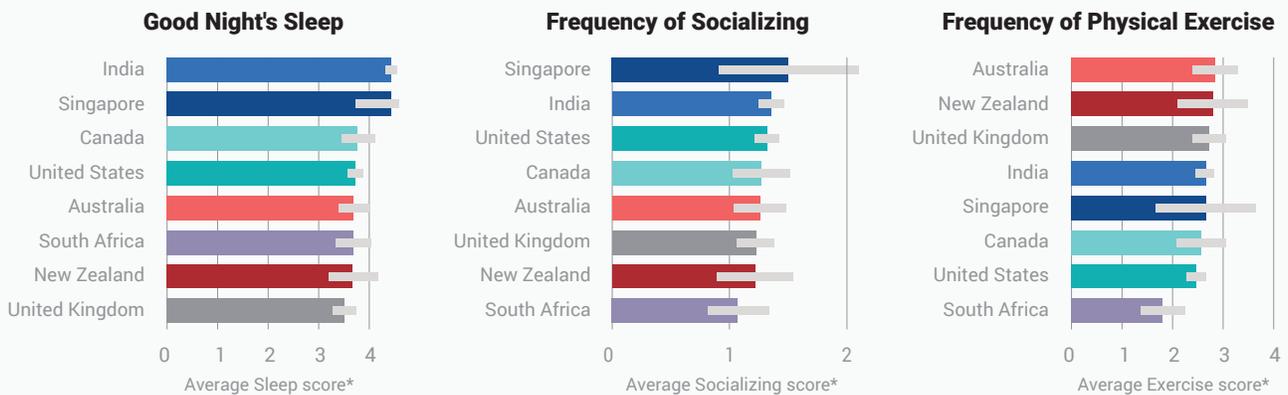
Figure 5.2: MHQ dimension scores by frequency of sleep, socializing and exercise



Lifestyle factors by country

The differences across respondents from each country along these lifestyle dimensions were not dramatic. However, what does stand out is that those living in India and Singapore had the best Sleep and Socializing scores while those living in Australia and New Zealand were highest on Exercise. Notably respondents living in South Africa were significantly lower than all other countries with respect to Socializing and Exercise scores while those in the United Kingdom had the poorest sleep. Scores represent an estimate of days per week (see Appendix 2).

Figure 5.3: Average frequency of sleep, socializing and exercise by country



* Scores calculated by transforming answer labels to numerical values

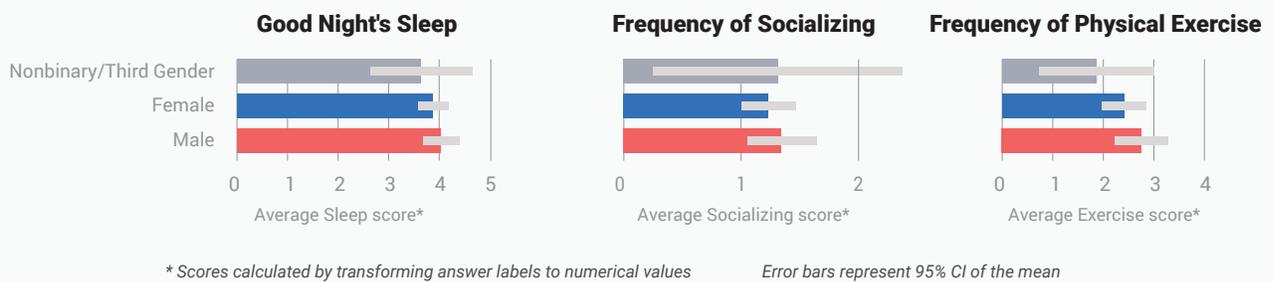
Error bars represent 95% CI of the mean

We note that other surveys of sleep (e.g. Tozer, 2018) focusing on different aspects such as time in bed showed different rankings between countries with Singapore having fewer hours in bed relative to most other countries on this list. However, both hours in bed and sleep quality may vary based on numerous factors from diet to stress levels such that hours in bed is not directly comparable to one's sense of having had a good night's sleep.

Lifestyle factors by age and gender demographics

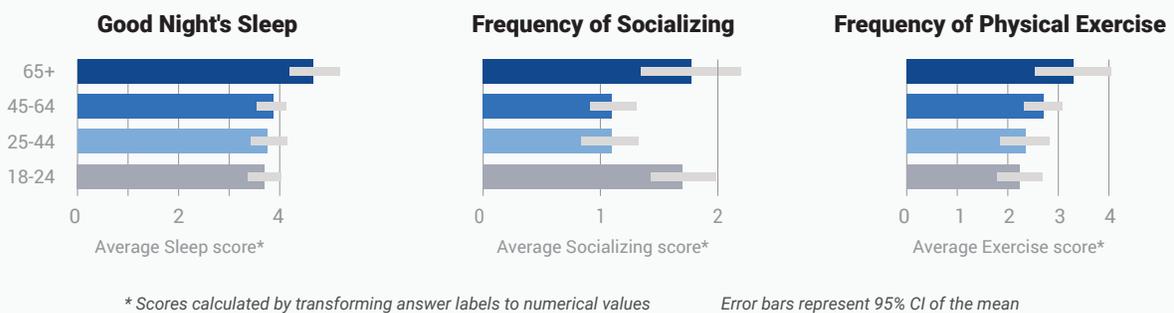
Can differences in these factors explain the differences between genders and age groups? There were no dramatic or statistically significant differences between any of the gender groups in sleep, socializing and exercise, although the nonbinary/third gender group had slightly poorer sleep scores and lower exercise scores than either males or females.

Figure 5.4: Average frequency of good sleep, socializing and exercise by gender groups



On the other hand, age differences were more apparent. Those 65 and above slept well, exercised and socialized most regularly. Both sleep and exercise frequency were progressively worse for each younger age group, although not significantly so. On the other hand, respondents aged 18-24 had as much social interaction as those aged 65 and older while those aged 25-64 socialized substantially less.

Figure 5.5: Average frequency of good sleep, socializing and exercise by age groups



Altogether, while these factors impact all age groups, the differences between age and gender groups are fairly small and are not likely the core drivers of gender and generational disparities.

Untangling cause and effect

Sleep, exercise and social interaction are all highly correlated lifestyle factors that feedback on one another. Those who exercise more sleep better and those who sleep better exercise more. Similarly, those who interact socially more frequently, exercise more regularly on average and vice versa. Conversely those who sleep poorly tend to exercise less on average and have less social interaction. Thus, untangling the impact of each relative to the other requires deeper analysis. More important however, is understanding what can help the large proportion of the population (~50% in this dataset) who are struggling with sleep, exercise and social interaction. Not all aspects relating to sleep and social interaction can be fully controlled by us individually. One can go to bed fully hoping for a good night's sleep but not achieve it while others may want social interaction but be unable to find it. The best solutions therefore may not be individual in nature. The challenge is to understand the causes of the widespread compromise of these fundamental human needs and design interventions that can result in fundamental societal shifts.

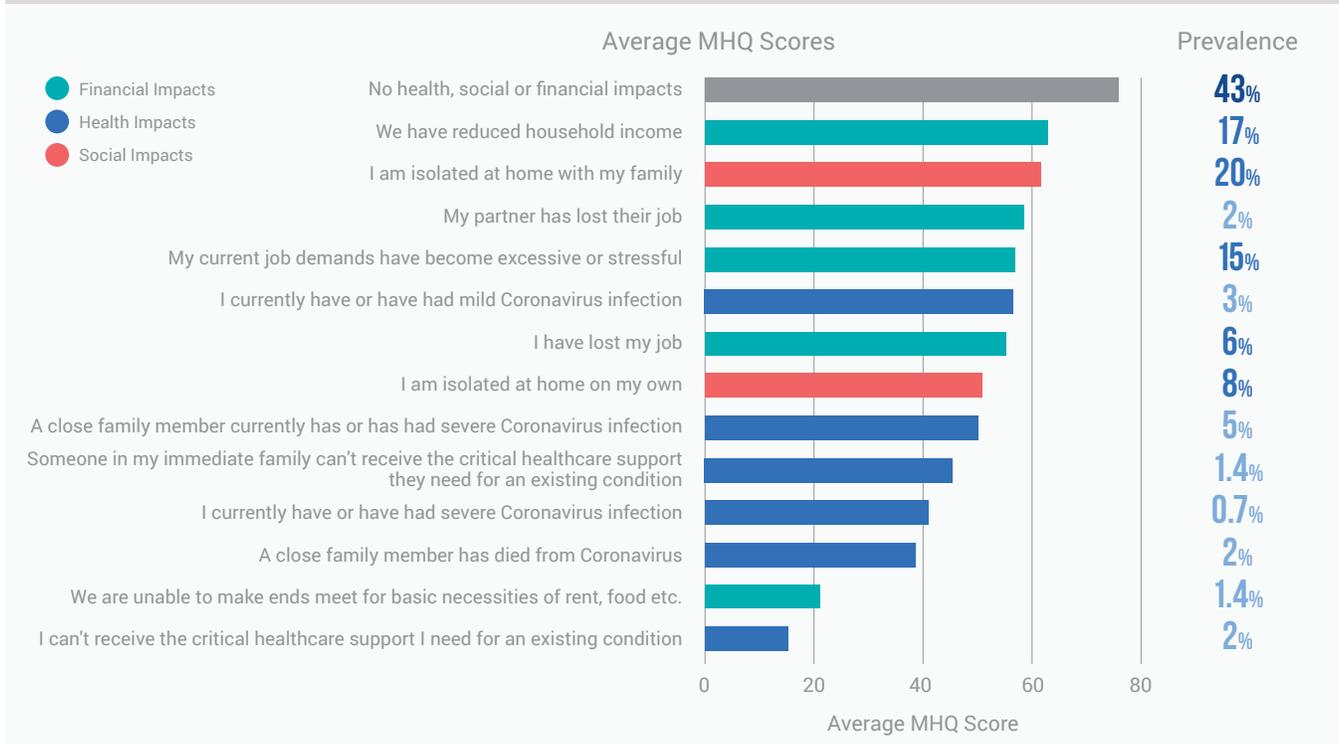
6. The Mental Cost of the Covid-19 Pandemic

It has now been established that beyond physical illness, the economic uncertainty and social isolation of the Covid-19 pandemic has taken a substantial and unprecedented toll on our physical and mental health (Holmes et al., 2020; Pierce et al., 2020; Serafini et al., 2020). How have these different consequences impacted us, and how does it differ across the globe and for different age and gender groups?

What hit us the hardest in 2020?

3.9% of respondents reported having had a Covid-19 infection of which 0.7% reported a severe case, roughly reflecting the global infection rate in 2020. On the other hand, a full 57% experienced a range of negative health, financial and/or social consequences. Figure 6.1 shows the MHQ scores of respondents who reported each of a list of health, financial or social challenges arising from the pandemic.

Figure 6.1: Average MHQ scores for adults impacted by each of various health, financial and social challenges due to Covid-19



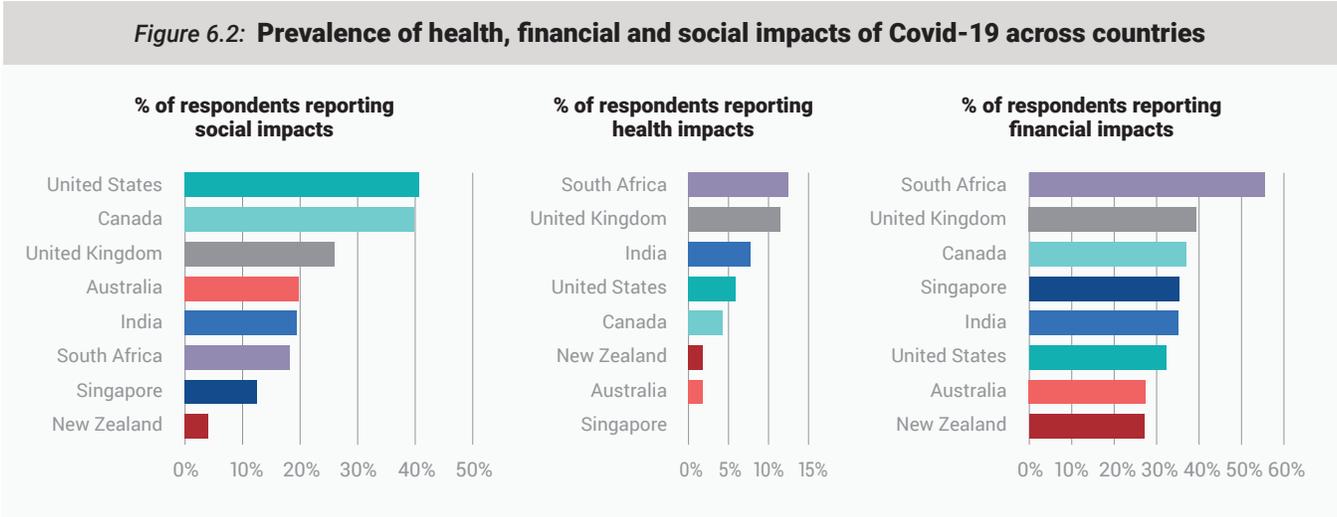
The 2% of respondents who were unable to get critical care for other existing health conditions due to the pandemic reported the poorest mental wellbeing at 61 MHQ points lower than those who experienced none of the key listed consequences (20% along the MHQ scale). In contrast, the 0.7% who reported having had a severe case of Covid-19 had lower mental wellbeing scores by 35 MHQ points and the ~2% who lost a close family member to Covid-19 had lower mental wellbeing scores by 37 MHQ points.

After those who could not receive critical care for other conditions, the 1.4% of people who struggled to make ends meet for basic necessities had the worst mental wellbeing at 55 MHQ points lower than those who experienced none of the listed consequences. Those with reduced household income were 13 MHQ points lower but constituted a full 17% of the sample. Social isolation along with family, while only 14 points lower, impacted the largest number of people at 20%. It is also worth noting that even those who were not impacted by any of the specific challenges listed in Fig. 6.1 nonetheless had a reduced MHQ score of 76 compared to the mean of 90 in the smaller 2019 sample.

Thus, the toll of the pandemic and the measures taken to control it have had a multifaceted impact that must be taken into consideration. However, more analysis will be necessary to specifically identify the individual impact of each factor, as many people experienced multiple challenges.

Covid-19 related impact across countries

Overall, respondents from South Africa followed by those from the United Kingdom experienced the greatest health and financial impacts perhaps underpinning their substantially lower mental wellbeing overall relative to other countries (see Fig. 2.1). On the other hand, those in the United States and Canada saw the biggest impact with respect to social isolation. In contrast, the impact of Covid-19 was lowest for those in New Zealand across all dimensions overall and those living in Singapore had the smallest health impact at <1%.

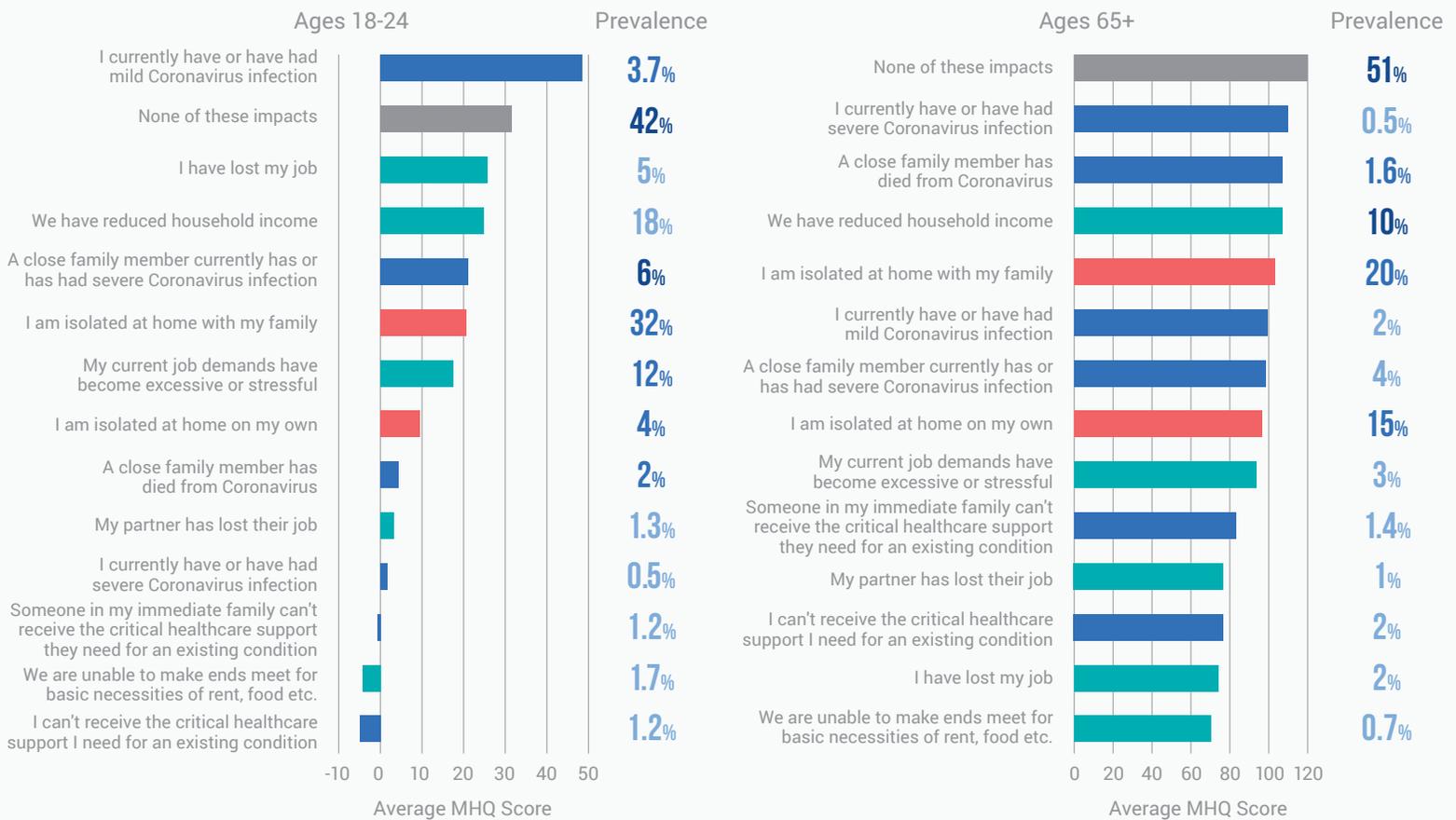


Differential impact of circumstances on different age groups

Crucially, circumstances surrounding the pandemic impacted different age groups differently. Here we show, as an example, a comparison of respondents aged 18-24 relative to those aged 65 and above.

For those aged 18-24 who had had a mild coronavirus infection, mental wellbeing was 16 MHQ points **better** than those who had faced no direct health, social or financial consequences from the pandemic (5% shift on the MHQ scale but a 50% improvement in score). On the other hand, those who had had a severe Covid-19 infection had mental wellbeing scores 95% lower than those who had experienced no adverse impact of Covid-19. In contrast, respondents 65+ who had experienced a severe case of Covid-19 had only 10% lower mental wellbeing scores. Similarly, 18-24 year olds who had lost a family member to Covid-19 had 33% lower mental wellbeing scores while those 65+ who had lost a family member to Covid-19 were lower by only 12%.

Figure 6.3: Differing mental wellbeing impact of Covid-19 related challenges by age group



The impact of social isolation also differed substantially. For those aged 18-24, social isolation, with family or alone, had an enormous toll with mental wellbeing at 35% and 69% lower respectively compared

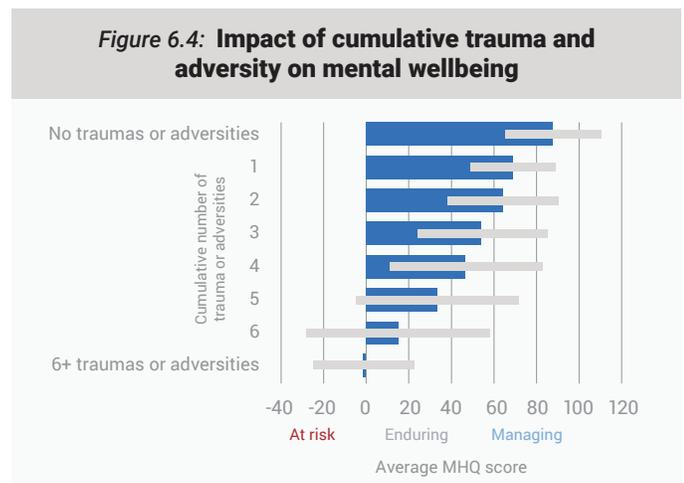
to those who had no Covid-19 related adversities. In contrast, social isolation had a milder impact in those aged 65+ with mental wellbeing scores only 14-20% lower in our 2020 dataset, although a roughly equal proportion of both groups experienced social isolation.

On the other hand, severe issues such as not being able to make ends meet or being unable to receive critical care for a pre-existing condition had a dramatic toll on both age groups. It is also worth noting that the financial impacts had more severe differential in mental wellbeing scores overall in the 25-64 age group (not shown here) compared to both of these age groups and also that these profiles differed across respondents living in different countries. It will be of considerable interest to probe these differential effects and impacts in more depth. This will require further analysis in order to untangle the relative impact of individual factors as people with a particular financial impact may also have experienced a health or social challenge from the pandemic and vice versa.

As data collection continues into 2021, the health and economic fallouts of Covid-19, and the eventual post-Covid-19 recovery, will be monitored throughout the project.

The long-term impact of trauma and adversity

Life comes with adversity and hardship. Few manage to sail through life untouched by the experience of the death of a close family member, the breakdown of a relationship or family or financial hardships. On the other hand, some experience horrific traumas from abuse and assault, death of family members in war, devastation from natural disasters and displacement from their homes. Naturally, trauma and adversity have an impact on mental wellbeing. Research shows that across the lifespan, cumulative trauma and adversity take their toll on mental wellbeing (Turner and Lloyd, 1995) with early childhood being an especially vulnerable period (Green et al., 2010; Kessler et al., 2010; McLaughlin et al., 2010; McGrath et al., 2017). This goes beyond post-traumatic stress disorder, with other disorders also being associated with, or triggered by, traumatic or adverse life experiences and resulting in trauma becoming a significant public health concern (Kleber, 2019). It is therefore important to put the impact of the Covid-19 pandemic into this larger context.



We have often heard the saying that what doesn't kill you makes you stronger with some studies showing evidence of a benefit of moderate adversity in enhancing resilience (Seery et al., 2010). However, in this data, mental wellbeing scores declined systematically with the experience of more adversities and traumas over the lifetime, consistent with other reports (Fernandez et al., 2020). One might consider the analogy to physical injury where repeated injuries over a lifetime from broken bones to muscle tears might heal but leave the body physically compromised and less capable than before the injury. Thus, the consequences of the Covid-19 pandemic and their impact on mental wellbeing may reverberate for years to come.

7. Conclusions & Recommendations

The two overarching messages of this data are the enormous impact of societal circumstance and behavior on mental wellbeing and the alarming and all-encompassing crisis of mental wellbeing in young people and those who identify as nonbinary or third gender.

A population-based approach to mental wellbeing

The magnitude of the impact of the health, financial and social strains of the Covid-19 pandemic have highlighted just how much societal circumstances dictate our mental wellbeing. Not just our feelings of distress or mood and outlook, but every aspect from our cognition to our drive and motivation. In addition, the unexpectedly high magnitude of differences along the dimensions of sleep, social interaction and exercise tells us that our lifestyle and social behaviors impact our mental wellbeing far more than we may have appreciated. While much of the focus in the mental health arena has been on self-care through apps, therapy and other programs, social and economic policy and institutional culture may have a large role to play in the mitigation of our present mental health crisis and prevention of future crises.

For instance, the data indicates that government policies that force social isolation will have a greater impact on the mental wellbeing of young people than older people, pushing many into a zone of clinical risk and raising the risk of suicide. We also now know that lack of access to critical care for other existing health conditions during the pandemic has created a clinical level mental health crisis in an already vulnerable population. Such factors may be considered when formulating policy in the management of the pandemic as we move forward. Finally, this data adds to evidence that economic circumstances are not divorced from our mental wellbeing but are central to it. Jobs and financial stability may play a key role in preventing a shift of more people into a zone of clinical mental health disorders. As such, taking into consideration mental wellbeing as one of the key objectives of social and economic policy can help ensure a stronger populace.

Another important rationale for a population-based approach to mental wellbeing is the lack of effective treatments for mental health disorders. Although access to psychiatric resources helps, it is not a panacea. While we found a strong correlation between help seeking behavior and the availability of psychiatrists, there was no correlation with clinical burden.

Many others have called for a population-based approach to mental wellbeing arguing that it has the potential to induce large-scale shifts in population wellbeing which could benefit the lives of hundreds, thousands, or millions of people (Huppert, 2009; Sampson and Galea, 2018; Fuhrer and Keyes, 2019). However, to bring such an approach to fruition, what is needed is large scale population data that measures and tracks changes in mental wellbeing across the population beyond just the prevalence of clinical disorders, as well as providing the necessary insights to inform decision making. Thus far such a perspective has been lacking and we offer this project as a starting point for this ambitious goal.

Tackling the youth mental wellbeing crisis

The mental wellbeing of young adults is a global societal crisis that needs immediate attention. With a full 44% of respondents aged 18-24 exhibiting clinical level risk, this puts the future of humanity at risk if not understood and mitigated. With research suggesting that 75% of adults with a mental health disorder had experienced its onset by the age of 24 (Kessler et al., 2005; Kessler et al., 2007) and that poorer mental health during youth has long-term effects on physical health and quality of life in middle age and beyond (Richmond-Rakerd et al., 2021), this points towards a crisis that this generation will carry into its future. Improvements in sleep and exercise habits may help but are not likely to be at the root of the large differential between younger and older adults which was present even before the pandemic. It is imperative that the causes are fully understood so that solutions can be formulated at a policy level and at the level of institutions such as schools and universities. While this data does not provide any direct evidence of a root cause, the key challenges of *Self-Image, Self-worth & confidence* and *Focus & concentration* lend to the long existing hypothesis of the negative impacts of the Internet and in particular social media. Adults 18-24 years old are the first generation to grow up fully Internet immersed. It is crucial that countries make it a priority to invest in research in this area to untangle root causes and identify solutions. For a crisis of this scale and magnitude with such potentially far-reaching consequences, recommendations for individual behaviors are not enough.

Tackling the nonbinary/third gender crisis

Those who identified as nonbinary/third gender had the poorest mental wellbeing of any demographic group with over 50% in a clinical risk category and the highest level of *Suicidal thoughts and intentions*. While the fraction of the global population who are nonbinary or third gender is estimated at approximately 0.5%, estimates are ambiguous. In this data 0.9% identified as being nonbinary. Furthermore, studies suggest that it is rising over time, which is also borne out in our results where there is a higher fraction in each younger decade.

The challenges that this group faces are many, and working to understand and mitigate both the social and biological traumas that they experience is essential. A substantial difference in the mental wellbeing

status of this group across geographies points to a substantial social component. The challenge is understanding key drivers that can be addressed, perhaps through early intervention and support.

Cracking sleep and self care

The large difference in mental wellbeing between always having a good night's sleep and rarely having good sleep underscores its core position as a driver of mental wellbeing. However, sleep has strong correlations to various other factors including social interaction and exercise. Thus, understanding what helps drive sleep is crucial to successful functioning as a society. This goes beyond measuring and tracking our sleep to gaining deeper understanding of how wake-time behaviors from diet and exercise to social behaviors and technology impact the quality of our sleep.

We recommend that the importance of the triad of sleep, socializing and exercise, as well as strategies to manage them, should be taught from an early age to build self-care skills for life. However, importantly, beyond teaching these elements, schools and colleges may have an important role to play in facilitating these aspects as part of their structure such that children grow up with the strong social connections, sleep and exercise habits for a successful future. We also recommend that companies pay more active attention to policies and work culture that impact these core areas as part of a key strategy to support the mental wellbeing of their workforce.

Altogether we advocate for embedding a population-based approach to mental wellbeing into social and economic policy. We also join a growing call for greater research investment in understanding the drivers of the mental health crisis of young adults and those who are nonbinary/third gender, and in understanding the wake-time factors that impact sleep. Finally, we encourage a greater role for schools, universities and companies in actively managing the mental wellbeing of their students and workforce.

Looking ahead

2020 was the first year of the Mental Health Million project. We have achieved the milestone of ~49,000 responses over a period of 9 months, spanning primarily 8 countries but with a reach that extended to English speakers in over 130 countries. This is the beginning of an ambitious journey that aims to map the evolving mental wellbeing of the world, track the impact of both global and local societal changes and provide deep insights to help better guide our course. Fortuitously, the project launched to provide a crucial view into the impact of the Covid-19 pandemic and will help us understand, track and manage our recovery over the coming years.

Expanding our reach

Today we have a steady addition of 15,000+ new MHQ respondents each month as we work towards our goal of over 1 million responses each year from across the globe. With the addition of translations in Spanish and Arabic we will expand our reach to 30 countries in 2021. Translations in French, German, Russian, Hindi, Tamil, Swahili and Japanese will follow thereafter with further expansion across the globe. With the expansion both in breadth across the globe and depth of reach within each country we will be able to provide increasingly representative and localized perspectives with the potential for deeper insights into underlying drivers.

Expanded research and insights

The insights in this report represent only the tip of the iceberg. We can dig deeper to untangle the causal factors that can make the biggest impact if managed. We can triangulate data with other data sources, both environmental and societal, to understand relationships. We can understand how specific clinical risk profiles differ across geographies and demographics. The possibilities are many. Access to the real time data from the Mental Health Million project is therefore freely available on request to researchers and organizations for not-for-profit research. It is our hope that organizations will use this data effectively for greater impact.

Donations and partnership support

Reaching our goals of a truly global view that helps us actively and effectively manage the mental wellbeing of society requires multifaceted support from around the world. We look to our readers and stakeholders to support our effort to expand across the globe and also to partner with us to make effective use of the insights this data offers. Donations can be made through our website or by contacting us. We also welcome partnerships to expand reach to particular geographies or demographic groups, and to help bring the insights of this data into policy and interventions that can positively impact the future mental wellbeing of the world.

Appendix 1:

Understanding the MHQ

About the MHQ

Data for the Mental Health Million project is collected using an online assessment tool called the Mental Health Quotient (MHQ) that was developed by scientists at Sapien Labs. The MHQ is a unique comprehensive assessment of mental wellbeing comprised of 47 elements of mental function including both problems and assets (Newson and Thiagarajan, 2020). It uses these elements to provide an aggregate score positioned on a spectrum from *Clinical* to *Thriving* as well as sub-scores across six broad functional dimensions.

The MHQ is freely available online, is anonymous and takes ~15 minutes to complete. It is currently available in English with additional translations planned for 2021 and beyond. In addition to the 47 scored questions, respondents answer questions relating to their demographics, life experience, lifestyle and current situation. To encourage thoughtful and honest responses, respondents receive an MHQ score along with tailored feedback on completion of the MHQ and can opt to receive a more detailed report with recommendations for action via email.

Rationale behind the MHQ

The MHQ was developed to address existing challenges with mental health assessment, and the diversity and comorbid nature of mental illness. A study by Sapien Labs of 126 commonly used mental health questionnaires and interviews, spanning 10 disorders showed that questionnaires and interviews assessing the same disorder were only 29-58% similar in terms of the symptoms captured, depending on the particular disorder (Newson et al., 2020). Conversely, 60% of symptoms were assessed in at least half of all disorders illustrating the extensive overlap between disorder-specific assessment tools. Furthermore, no cross-disorder tools available assessed the full spectrum of symptoms or considered positive dimensions of mental wellbeing. The MHQ was therefore born out of the need for a global standard in mental health assessment which spanned the breadth of symptoms of mental health disorders, but was also relevant to the wider population who do not necessarily exhibit symptoms at a clinical level, but nonetheless may experience natural fluctuations in their mental wellbeing.

Development of the MHQ

Coded Questions

The MHQ was developed based on a comprehensive coding of symptoms and mental elements across 126 different mental health questionnaires and interviews spanning depression, anxiety, bipolar disorder, attention-deficit/hyperactivity disorder (ADHD), post-traumatic stress disorder (PTSD), obsessive-compulsive disorder (OCD), addiction, schizophrenia, eating disorder, and autism spectrum disorder (ASD), and cross-disorder tools (Newson et al., 2020). A total of 10,154 questions were coded and consolidated into a set of 43 symptom categories. The resultant items were then reviewed in the context of other transdiagnostic frameworks including the Research Domain Criteria (RDoC) put forward by the National Institute of Mental Health (Insel et al., 2010) and symptoms relevant to dementia, and reorganized into a set of 47 elements of mental wellbeing.

Use of a life impact rating scale

Across the 126 tools studied, the evaluation of symptoms was highly heterogeneous ranging from presence or frequency to severity and duration of symptoms on various time scales from days to months. Taking instead the position that the ultimate goal of mental health intervention is to mitigate the impact of mental distress on one's life experience and functioning, the MHQ uniquely captures these symptoms and mental attributes using a 9-point life-impact rating scale. The MHQ contains two types of mental elements. Those that could exist on a spectrum from positive to negative and those that are problems of varying degrees of severity.

9 → Assess your: **Adaptability to Change**

*"Your ability to be flexible when faced with societal changes, or changes in your daily routine or environment, and to adopt new ways of living or working accordingly"**

Look at the **scale below**. Choose a number of stars between **1 and 9** which represents your **adaptability to change**.



36 → Assess your: **Restlessness & Hyperactivity**

*"The experience of being so fidgety or active that you are unable to relax or be still, even when it is required"**

Look at the **scale below**. Choose a number between **1 and 9** which represents your **restlessness & hyperactivity**.



Demographic, Experiential, and Momentary Questions

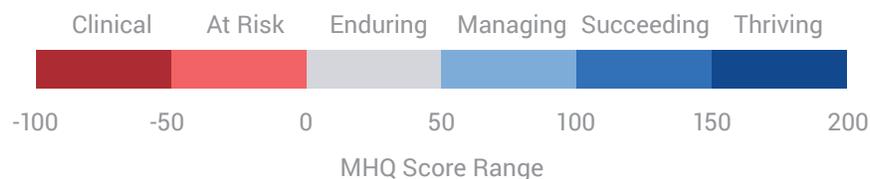
The MHQ also includes numerous un-scored questions relating to demographic, life experience, lifestyle and situational information that can be of value in understanding contextual triggers, drivers and determinants of mental wellbeing.

The MHQ scale

The MHQ positions individuals on the spectrum from *Clinical* to *Thriving*, spanning a possible range of scores from -100 to +200 where negative scores indicate clinical risk. Importantly the MHQ score is not based on a simple averaging of question ratings but rather each individual rating is nonlinearly transformed such that someone whose symptoms map to one or more clinical disorder are scored in the negative range of clinical risk (elements of the MHQ map to DSM-based symptom criteria, so for example, a rating of severity of negative life impact of a problem at 8 or 9 is considered a symptom). The thresholds between negative and positive are optimized and calibrated such that <1% of those in the positive range have severe problems that map to any clinical disorder and >99% of those in the *Clinical* category map to at least one disorder. Thus someone with three very significant issues which have a significant negative impact to their life and meet a diagnostic criteria based on symptom severity would be classified as *Clinical* even though they may have a high average rating score overall on other dimensions. On the other hand, someone with a low average rating overall but no individual item meeting a threshold of severity for clinical diagnosis would not be classified as *Clinical* but rather in a normal, positive range.

Modeling on the IQ scale, positive scores, which are largely normally distributed, are calibrated to a mean of 100 based on our 2019 sample and can range from 1 to 200. Negative scores, on the other hand, have a long-tailed distribution due to the nonlinear transformations required for clinical identification. In order to ensure that overall average scores are not inordinately determined by the small number of individuals in the long tail, the negative scale was compressed to a smaller scale of 0 to -100 in order to mitigate the impact of negative scores on the population average.

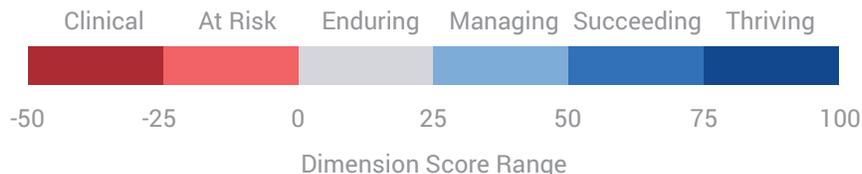
More details of this methodology are provided in (Newson and Thiagarajan, 2020) .



Computation of MHQ dimension scores

MHQ dimension scores are computed for 6 broad dimensions of mental health: Core Cognition, Complex Cognition, Mood & Outlook, Drive & Motivation, Social Self, and Mind-Body Connection, that have overlap and parallels with the RDoC principles of domains and constructs (Insel et al., 2010). To compute these dimension scores, a weighted average of items for each dimension is calculated by weighting spectrum or problem items core to the dimension as 1 and spectrum or problem items secondary to the dimension

as 0.5. This weighting algorithm was developed based on a review of cognitive and neuroscience models of brain functioning. For example, the item *Stability and calmness* is coded with a primary 1 weighting in the Mood & Outlook dimension and a secondary 0.5 weighting in the Mind-Body dimension to reflect its dual components of emotion and physiological response, whereas the item *Unwanted, strange, or obsessive thoughts* is dual coded with a primary weighting in the Core Cognition dimension and a secondary weighting in the Mood & Outlook dimension to reflect both the cognitive and emotional elements of this item. In this regard, an item could be assigned to 2 different dimensions and occasionally to 3. Overall, each dimension comprised 10 to 24 items. The dimension scores were then normalized to constrain them to a smaller scale than the overall MHQ to distinguish them from the overall score. Positive scores are normalized to the range of 0 to 100, whereas negative scores are normalized to the range of -1 to -50.



Appendix 2:

Data Collection & Analysis Methods

Recruitment of respondents

48,808 respondents from around the world completed the MHQ assessment between April 9th and December 31st 2020. Participants were recruited through advertising on Google and Facebook by targeting a broad audience within each age-gender demographic across a wide geography within each of 8 English speaking countries (United States, United Kingdom, Canada, South Africa, Singapore, Australia, New Zealand and India). Recruitment from April 2020 initially focused on the United States, India and the United Kingdom, initially with Google Ads alone, and was later expanded in September 2020 to include Canada, South Africa, New Zealand, Australia and Singapore.

Overall, a greater proportion of respondents were recruited through Facebook (78%) compared to Google Ads (19%) with an additional 3% arriving at the MHQ landing page from other sources (e.g. social media shares, blog links). The Google Ads outreach specifically targeted those individuals who were searching for terms relevant to mental health (e.g. psychological test, cognitive assessment test, mental health assessment) and were applied consistently across all countries. Those recruited through this stream may therefore have had a specific interest or concern relating to their mental health. In contrast, Facebook outreach was much broader, spanning individuals who had shown a previous interest in mental health and wellness topics, as well as all adults in that country with the simple tagline *What is your mental wellbeing score?* Those recruited through this stream were therefore not specifically searching for information relating to a mental health interest or concern.

Table A2.1: Number of respondents from each country

Countries (n)
United States (14582)
Canada (2668)
United Kingdom (6616)
India (14411)*
Australia (3694)
New Zealand (1239)
South Africa (1957)*
Singapore (374)*
Other ES Respondents (998)

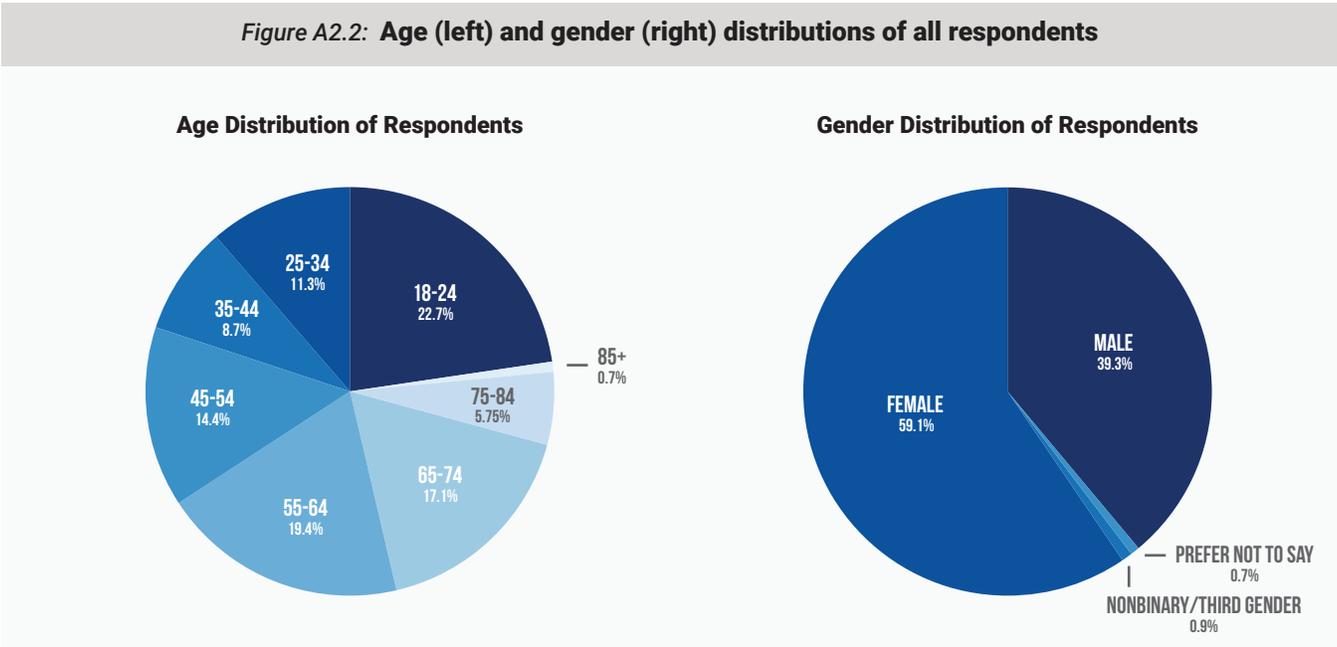
* English speaking population

Due to these differing strategies (inherent to the different structure of the two platforms) those recruited through Google Ads had a greater bias towards mental health difficulties compared to those recruited through Facebook. To take into account potential biases in these two recruitment streams, we balanced the numbers of respondents arising from these two streams across countries where possible. This involved re-balancing presence across the two platforms where necessary and excluding a portion of respondents from India (5%) and the United Kingdom (5%) where a greater number of respondents were recruited via Google Ads early on. However, it should be noted that New Zealand, Australia and South Africa had a greater number of respondents recruited through Facebook (range 90% to 93%) compared to most of the other countries (range 71% to 87%).

We also note that while the numbers for Singapore were small in 2020, Singapore was included in the country comparison as significantly higher numbers obtained in January 2021 reinforced the trends in the 2020 data.

Data distribution

The number of respondents for each targeted country is shown in Table A2.1. Respondents outside of these countries grouped into “Other English speaking (ES) respondents” spanned 125 countries and were included in global analyses where appropriate.



Respondents spanned all age groups roughly equally (Figure A2.2 left) while the gender split was 59.1% female, 39.3% male and 0.9% nonbinary/third gender (Figure A2.2 right).

Exclusions and adjustments

Only those respondents who stated that they found the MHQ easy to understand were included in the analysis. This exclusion criterion was applied by only selecting respondents who answered “Yes” to the final question in the MHQ which asks them “Did you find this assessment easy to understand?”. Those who answered no were excluded from the analysis. In addition, only respondents who were over 18 were included. Those who responded that they were “Under 18” were unable to continue with the assessment and so were automatically excluded. No other inclusion or exclusion criteria were applied to the data. After these exclusions and rebalancing of responses through different channels, a total of 46,539 respondents were included in the final analysis.

Data analysis

Computing average MHQ Scores

The spread of respondents across age and gender groups was not an accurate representation of their proportion of the population in each country. Furthermore, the proportion of respondents in each age-gender group were not identical across countries. Thus, to enable a more representative view of a country’s population, and more accurate comparisons between countries, scores were first computed for each age-gender group and then a weighted average score was computed based on the relative proportions of each group within individual countries. In specific instances where analyses compared between cities rather than countries, a similar weighting strategy was applied, but here weighting values were based on demographic distributions of the individual cities, rather than countries.

Computation of the global overall MHQ and dimension scores (Section 1) were not a simple average across countries but were additionally weighted based on the overall population aged over 18 of each country. This was done to ensure the global score was reflective of the country population distributions across the globe. The global scores were computed based on the 8 countries of interest and excluded the “Other ES speaking respondents” as reliable estimates of the global second-language English speaking population for those aged over 18 are not available.

Analyses comparing age brackets were only weighted by gender, while conversely, analyses comparing genders were only weighted by age.

All population estimates and age-gender distributions that are utilized for these weightings are taken from the latest governmental statistics or where that was not available, data from the latest census. For South Africa and Singapore data alignment was not fully possible for the youngest age bracket (18-24 years) due to the way that the population statistics were estimated and so were aligned with the closest available age bracket for which there was data (20-24 years). As there are no reliable statistics for the proportion of nonbinary/third gender individuals across all countries, we used a broad population

estimate weighting of 0.5% across all countries, which was decided on after reviewing a number of sources (Flores et al., 2016; Meerwijk and Sevelius, 2017), although we acknowledge, similar to other sources, that this may be an underestimate.

Weighting of MHQ data when comparing cities

There were 6 cities of interest that included New York, Los Angeles, London, Mumbai, Sydney - as well as Singapore (a city state). Data on city location was extracted from a question which asked about the respondent’s zip code, or where that was not available, the name of the closest town or city to where they live (with the exception of Singapore where data was extracted from answers to the country question). Data from respondents living in each city of interest was weighted according to the age and gender profile of that city. These weightings were extracted from population estimates taken from the latest governmental statistics or where that was not available, data from the latest census. Weighting values were applied to the average of each age and gender group separately for each city and these values were averaged together to create a weighted average for each city.

Calculation of sleep, exercise and socializing scores

Three lifestyle questions are included in the MHQ that ask about how frequently respondents get a good night’s sleep, exercise, and socialize face to face (the latter based on pre-Covid-19 habits) based on broad groupings such as ‘Everyday’, ‘Several days a week’, to ‘Rarely/Never’. To facilitate analysis, these text-based multiple choice answers were transformed into numerical values (Section 5). This transformation allowed us to compare answers more easily between countries, age groups and genders. The transformation was done by assigning a number to each answer that was roughly equivalent to the text description. For example, the “Every day” answer option for the question “How regularly to you engage in physical exercise (30 minutes or more)?” was assigned a value of 7 to reflect 7 days a week, while “Less than once a week” was assigned a value of 0.5.

Table A2.2: Scoring of categories for computation of average category scores

Sleep	Value	Exercise	Value	Face to Face Socializing	Value
All of the time	7	Every day	7	Several days a week	3.5
Most of the time	5	Few days a week	3.5	Once a week	1
Some of the time	3	Once a week	1	1-3 times a month	0.5
Hardly ever	1	Less than once a week	0.5	Rarely/Never	0
		Rarely/Never	0		

Computing score differences

We typically report differences in terms of MHQ points and the corresponding % shift along a 300-point scale i.e. $((\text{Value 1} - \text{Value 2})/300) * 100$. For instance, 75 points represents 25% of the possible length of the scale. Thus a 75-point shift or difference between groups would be a 25% shift along this scale.

In some cases where this is relevant, we additionally report the percentage drop of one number relative to one another $((\text{Value 1} - \text{Value 2})/\text{Value 1}) * 100$ where Value 1 is the higher number.

Statistical analysis

Statistics were computed for by comparing groups using a standard t-test. P-values obtained were then corrected for multiple comparisons using a Bonferroni correction. All statistical tables showing these corrected p-values are provided in a supplementary download along with the report.

Challenges of sampling and data interpretation

Although respondents were similarly recruited across all countries, two key caveats must be highlighted. First, these samples may not reflect a true sample of any country's population and will be biased by those with English speaking proficiency, Internet access and the willingness to spend 15 minutes completing an online assessment. For instance, India's Internet-enabled English-speaking populace, while substantial, is a minority with significantly higher education levels relative to the rest of the country. Thus results must be interpreted strictly in this context. Second, cultural differences in language usage and culture itself can significantly influence how people interpret and respond to each individual question. Any individual country's results will therefore reflect these differential effects of culture, compromising the ability for a direct comparison.

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