SAPIEN LABS

Eating from plastic containers is associated with diminished mind health and wellbeing

RAPID REPORT
THE GLOBAL MIND PROJECT

OCTOBER 2025

Dear Reader,

When reports emerged in the past year revealing the presence of microplastics in the human brain, we wondered what effect this might be having on our mental capacities. Through the Global Mind Project we can rapidly explore the association between various lifestyle behaviors and our full spectrum of mental health and wellbeing or what we call 'mind health'. One possible source of plastic in the brain is consuming food or drink from plastic containers.

This rapid report examines the association between how often we consume food or drink, and in particular hot food, from plastic containers, based on data from 273,735 people across the globe who participated in the Global Mind Project between 2024 and 2025. The results reveal a consistent and significant trend: the more often people consume food or drink from plastic containers, the poorer their 'mind health', regardless of whether they have an otherwise healthy diet or not. Eating hot food from plastic containers accounted for most, though not all, of this effect.

This result is perhaps not surprising: having microplastics in the brain is unlikely to be beneficial. What is surprising, however, is the pattern of impact. Unlike other factors such as eating too much ultra-processed food or growing up on smartphones which are strongly and significantly associated with some mental health symptoms relative to others (e.g. sadness and hopelessness and poor emotional control in the former, and suicidal thoughts and a sense of feeling detached from reality in the latter), regularly consuming food or drink from plastic containers showed a broader, more diffuse effect across all mental capacities.

Finally, about half the modern world eats hot food from plastic containers every week, enough to raise real concern about the impact on mental health. Rates are highest in East Asia (nearly 70%), followed by South-East Asia and North America. While further research is still needed to fully understand how microplastics are affecting the brain, these findings are yet another reason to limit how much you eat and drink from plastic containers. Carrying a stainless-steel water bottle and making sure you do not microwave food in plastic containers are two easy places to start.

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Founder and Chief Scientist

Executive Summary

Research question

With plastics now in ubiquitous daily use, they are commonly found in the human body and at higher concentrations in the brain compared to other organs. Consumption of food and drinks packaged in plastic containers is one major source of plastic ingestion. In particular, hot food in plastic containers results in greater leaching of plastic into the food. This raises the question of whether more frequently consuming food from plastic containers has an impact on mental capacities and health.

This report investigates the relationship between frequency of consumption of food/drinks packaged in plastic containers or eating hot food out of plastic containers and mind health and wellbeing. The findings are based on data from 273,735 individuals obtained as a part of the Global Mind Project between 2024 and 2025. Data were collected using an assessment known as the Mind Health Quotient (MHQ), which evaluates 47 aspects of emotional, social, and cognitive function, from which an aggregate MHQ score and dimensional scores are computed. In addition, demographic, life experience, and lifestyle data were collected, including the frequency of consumption of food/drinks packaged in plastic containers, eating hot food out of plastic containers, and ultra-processed food (UPF) consumption.

Key findings

1. Mind health decreases with more frequent consumption of food/drinks packaged in plastic containers (from 79 points for those selecting rarely/never to 54 points for those selecting daily) or eating hot food out of plastic containers (from 74 points for those who rarely/never do it to 50 points for those who do it daily). This effect persists both in individuals with daily and rare/no UPF consumption.

2. Daily consumption of food/drinks packaged in plastic containers or eating hot food out of plastic containers daily are associated with a negative impact on all dimensions of mind health.

3. Frequent consumption of food/drinks packaged in plastic containers and eating hot food out of plastic containers are widespread across all age groups and particularly prevalent among younger people.

4. East and South-East Asia, North America, and Western Europe are the world regions with highest percent of people consuming food/drinks packaged in plastic containers at least weekly with East and South-East Asia most likely to consume hot food from plastic containers.

Conclusion

This report provides a first glimpse into the negative association of frequency of consumption of food/drinks packaged in plastic containers or eating hot food out of plastic containers with mind health. This negative association was present across all tested dimensions of mental function.
With frequent consumption of food/drinks packaged in plastic containers prevalent across the world, and particularly in younger age groups, this may represent a significant contributor to the growing mind health burden.

The term “Mind Health” reflects the overall health of people’s mental processes, including their emotional, social, and cognitive abilities. It encompasses mental health symptoms, feelings of happiness, and people’s capacity to function effectively in daily life and to navigate life challenges.

Introduction

Approximately 40% of plastics produced since the 1950s have been used for packaging, and, among them, 41% specifically for the packaging of food and drinks [1, 2]. The frequent use of plastic containers for foods and drinks can be attributed to their low cost, versatility, and ability to facilitate food hygiene, transportation, and preservation.

However, packaging-derived microplastics and nanoplastics (MNPs) (tiny plastic particles), bisphenols, and plasticizers (such as phthalates) have been shown to migrate from plastic containers into foods and beverages, including meat, seafood, fruits, vegetables, and water [3-7]. In addition, the migration of MNPs and chemicals from packaging into food products may be accelerated by heating [8, 9].

MNPs, bisphenols, and phthalates have been detected in various human body fluids and organs, including the brain [10-12], where they may elicit different effects. Bisphenols and phthalates have been shown to act as endocrine disruptors that can interfere with the hormone (endocrine) system of the body and can elicit complex and multifaceted effects [13]. Moreover, early-life exposure to bisphenols and phthalates has been associated with social and cognitive deficits [14]. Animal studies have indicated a neurotoxic potential of MNPs, while their effect on the human brain remains to be investigated [15].

This rapid report from the Global Mind Project, which aims to track and gain insight into our evolving mind health, investigates and provides a first glimpse into the relationship between self-reported consumption of food/drinks packaged in plastic containers or eating hot food out of plastic containers and mind health.

About the Global Mind Project

The Global Mind Project is the most comprehensive and largest global database of mind health, which employs an assessment called the MHQ to collect data across 47 aspects of mind health in combination with data on demographics, life experience, and lifestyle. The project spans 130 countries and 21 languages. It encompasses mind health profiles from more than 2 million internet-enabled people, and 1,000–2,000 new profiles are created each day. The Global Mind Project provides a unique opportunity to investigate global trends of self-reported consumption of food/drinks packaged in plastic containers or eating hot food out of plastic containers as well as their impact on mind health and wellbeing. Data from this ongoing study are openly available to academic and nonprofit research organizations and access can be requested here.

Key Findings

1. Mind health decreases with more frequent consumption of food/drinks packaged in plastic containers or more frequently eating hot food out of plastic containers. This effect persists both in individuals with daily and rare/no ultra-processed food (UPF) consumption.

Overall mind health, assessed using MHQ scores, worsened with increased frequency of both consumption of food/drinks packaged in plastic containers or eating hot food out of plastic containers. For consumption of food/drinks packaged in plastic containers, the mean global MHQ score decreased from 79 points for those selecting rarely/never to 54 points for those selecting daily. Moreover, the percent of distressed/struggling individuals (those with typically 5+ clinically significant symptoms) increased from 21% among those who rarely/never consume food/drinks packaged in plastic containers to 30% among those who do it daily. For eating hot food out of plastic containers, the mean MHQ score decreased from 74 points for those who rarely/never do it to 50 points for those who do it daily. The percentage of distressed/struggling individuals increased from 22% among those who rarely/never eat hot food out of plastic containers to 35% among those who do it daily.

Controlling for Ultra-processed food (UPF) consumption: Plastic containers are commonly utilized for storage of UPFs, and UPF consumption has been associated with strong negative impact on mental health [16, 17]. This could indicate that UPF may impact the relationship between the frequency of consumption of food/drinks packaged in plastic containers or eating hot food out of plastic containers and mind health. As reported previously, the frequency of UPF consumption by itself had a profound impact on mind health, and those who consumed UPF daily had worse MHQ scores for all levels of plastic use. However, the magnitude of mind health decline with increased frequency of plastic container use was preserved both in those consuming UPFs daily and those rarely/never consuming UPFs.

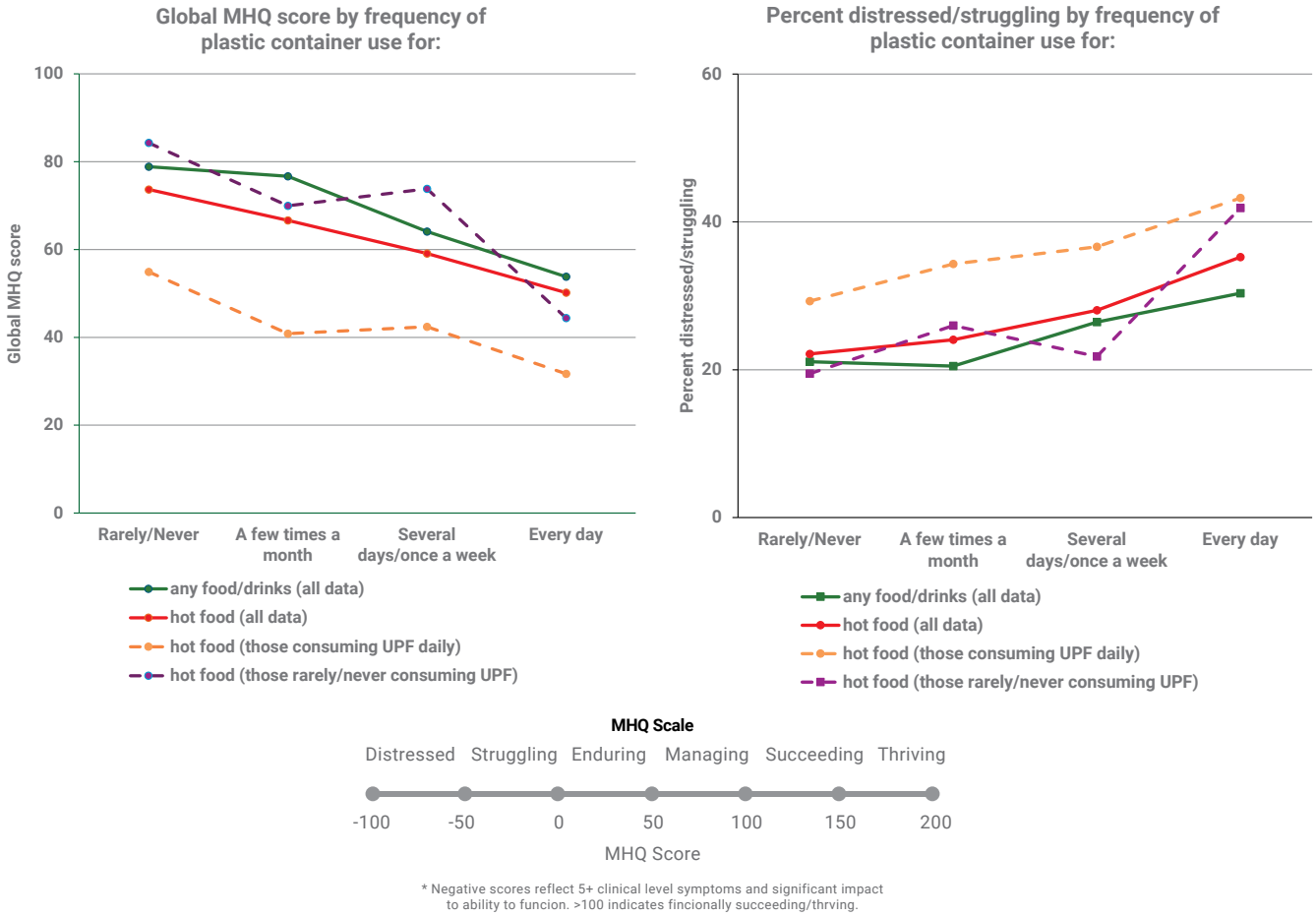

Figure 1. *Global MHQ score (**A**) and percentage of distressed/struggling individuals (**B**) by frequency of consumption of food/drinks packaged in plastic containers and eating hot food out of plastic containers. Overall data and data stratified by the frequency of ultra-processed food (UPF) consumption.*

2. Daily consumption of food/drinks packaged in plastic containers or eating hot food out of plastic containers is associated with a negative impact on all dimensions of mind health.

Besides MHQ scores, MHQ sub-scores for six dimensions of mind health (Adaptability & Resilience, Cognition, Drive & Motivation, Mind-Body Connection, Mood & Outlook, and Social Self) are also computed. Daily consumption of food/drinks packaged in plastic containers or eating hot food out of plastic containers was associated with lower scores than rare/no consumption across all six dimensions. The extent of dimensional score reduction with daily plastic container use was comparable across dimensions (20 to 29 points), although highest for Adaptability and Resilience. Furthermore, the dimensional score reductions with hot food consumption were almost as high as for overall plastic use, suggesting that consuming hot food from plastic may contribute much of the effect. Thus, daily consumption of food/drinks and particularly hot food from plastic containers is associated with a broad decline in all facets of mind health.

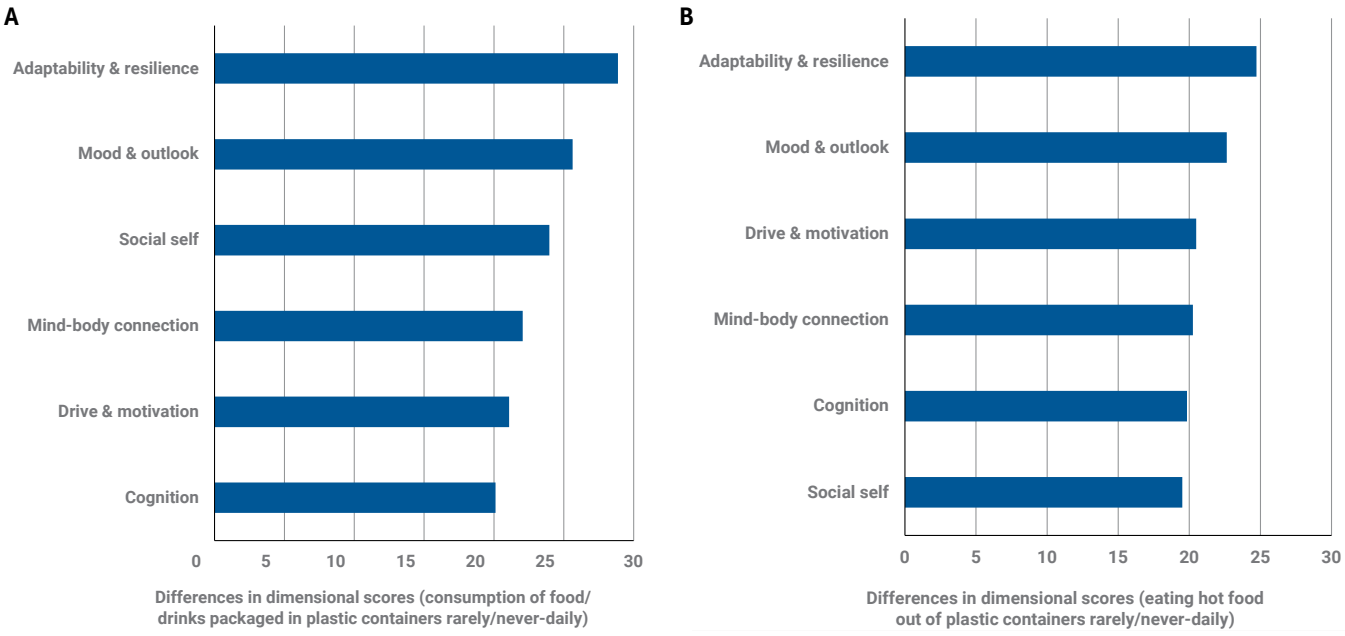

Figure 2. *Differences in dimensional scores among people who consume food/drinks packaged in plastic containers (**A**) or eat hot food out of plastic containers (**B**) rarely/never or daily.*

3. Frequent consumption of food/drinks packaged in plastic containers and eating hot food out of plastic containers are widespread across all age groups and particularly prevalent among younger people.

The percent of individuals in the different age groups who consume food/drinks packaged in plastic containers at least weekly ranged between 56% in those aged 18–24 years and 43% in those aged 65–74 years. Among this subset of the study population, the percent of people eating hot food out of plastic containers at least weekly ranged between 51% in the 25–34 years and 36% in the 65–74 years age group. Thus, consumption of food/drinks packaged in plastic containers and eating hot food out of plastic containers were common across all age groups and particularly frequent among younger individuals.

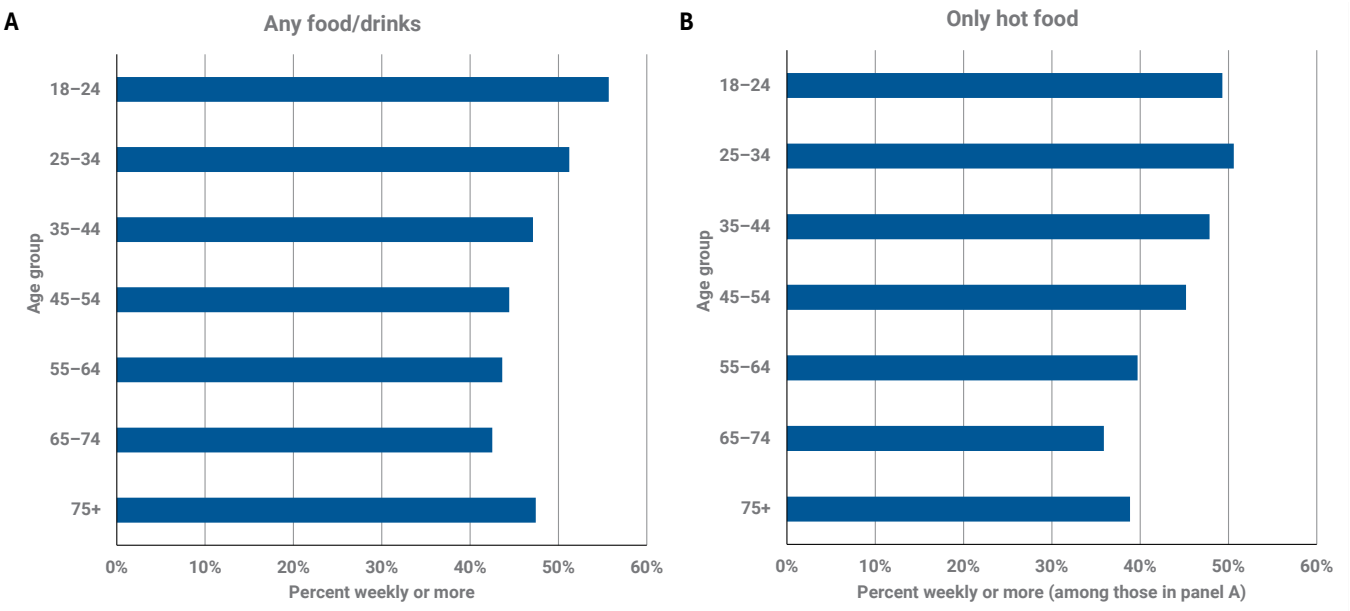

Figure 3. *Percent of people for each age group consuming food/drinks packaged in plastic containers at least weekly (**A**) and percent of those among them eating hot food out of plastic containers at least weekly (**B**).*

4. East and South-East Asia, North America, and Western Europe are the world regions with highest percent of people consuming food/drinks packaged in plastic containers at least weekly.

The world regions with highest percent of people consuming food/drinks packaged in plastic containers at least weekly included East Asia (69%), North America (60%), South-East Asia (56%), and Western Europe (54%). Among these individuals, the highest percent of people eating hot food out of plastic containers at least weekly were from East and South-East Asia.

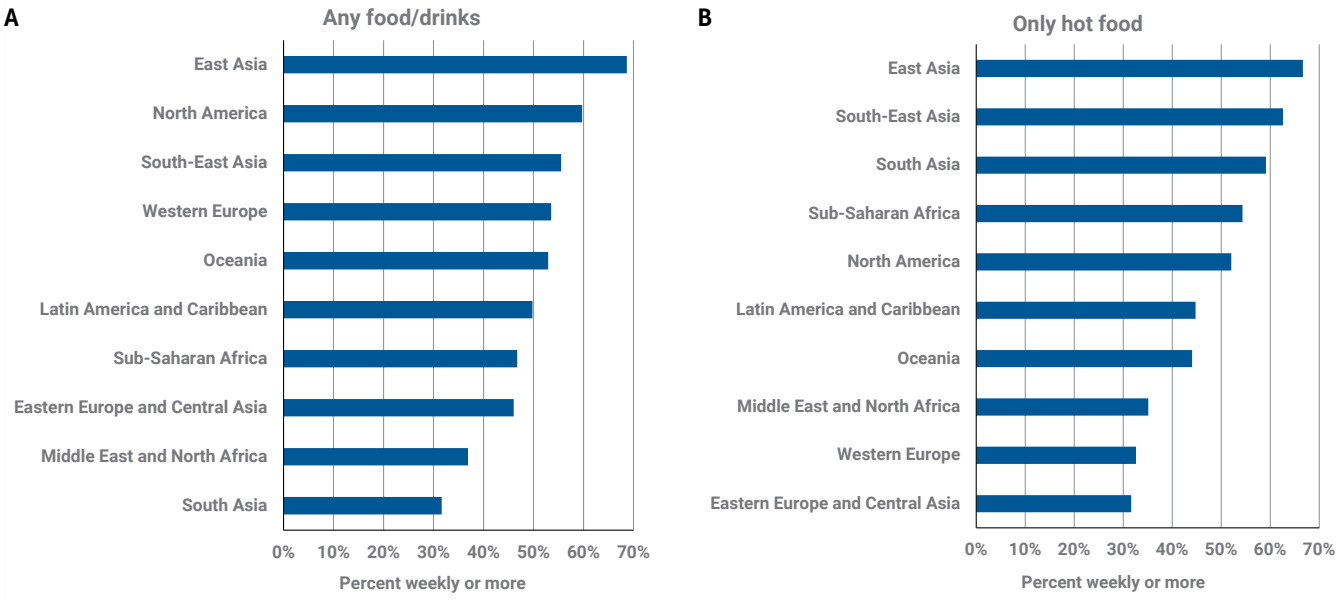

Figure 4. *Percent of people consuming food/drinks packaged in plastic containers at least weekly (**A**) and percent of those among them eating hot food out of plastic containers at least weekly (**B**) by world region.*

Insights and Interpretations

This rapid report describes a link between poor mind health and frequent consumption of food/drinks packaged in plastic containers or eating of hot food out of plastic containers that persists across individuals with high and low UPF consumption.

A first glimpse into the association of consuming food/drinks packaged in plastic containers and mind health

The findings of this rapid report provide a first glimpse into the association between consumption of food/drinks packaged in plastic containers or eating hot food out of plastic containers and mind health, suggesting a progressive effect of more frequent consumption. The magnitude of this effect was 20 MHQ points with daily consumption of food from plastic containers, potentially responsible for clinical level mind health challenges in 5%–8% of the population. The effects of daily consumption of food/drinks packaged in plastic containers and daily consumption of hot food out of plastic containers on mind health were similar in magnitude, suggesting that consuming hot food out of plastic containers may play an important role in the observed impact.

Broad impact across mind health dimensions

Daily consumption of food/drinks packaged in plastic containers or daily consumption of hot food out of plastic containers was associated with decreased dimensional scores across all six dimensions of mind health, including Adaptability & Resilience, Cognition, Drive & Motivation, Mind-Body Connection, Mood & Outlook, and Social Self, reflecting broad decreases across most of the 47 queried items. The findings imply a broad impact of daily consumption of food/drinks packaged in plastic containers or daily eating hot food out of plastic containers on mind health. These broad effects are a stark contrast to more specific effects of other factors, such as UPF and early age of smartphone use, which more significantly impact specific functional aspects. The specific mechanisms by which plastic in the brain could disrupts mental processes is unknown. However, one possibility to consider is that plastics may play a broadly obstructive role to cellular processes in the brain, possibly creating micro-suffocation.

Methodology

The Global Mind Project

The Global Mind Project collects data from at least 18-year-old literate and internet-enabled people around the world, using the MHQ, which is a comprehensive, self-report, online assessment. The MHQ is anonymous and freely accessible online and can be completed in approximately 15 minutes. It encompasses questions on mental feeling and function as well as demographic, life experience, and lifestyle questions.

Participants are recruited by broadly targeting people from each age-gender group across 130 countries and 21 languages using advertising on Facebook and Google. After completing the MHQ, respondents obtain their mind health scores and detailed reports with self-help guidance. Currently, 1,000–2,000 individuals complete the assessment daily, and their profiles are included in a dynamic database.

The Global Mind Project is a public-interest project. An ethical approval for the project was obtained from the Health Media Lab Institutional Review Board (HML IRB), which is an independent IRB providing assurance for the protection of human subjects in international social and behavioral research (OHRP Institutional Review Board #00001211, Federal Wide Assurance #00001102, IORG #0000850). The Global Mind Project database is freely available for non-commercial purposes to researchers from nonprofit and government organizations. Access to the Global Mind Project can be requested here.

The MHQ

The MHQ comprehensively assesses mind health by evaluating both positive assets and problems across 47 elements of mental feeling and function, spanning the symptoms of ten major mental disorders. The 47 items are rated on a 9-point life impact scale based on respondents' current perception of themselves and reflect the impact on their ability to function. For spectrum items (such as self-image) that are on a spectrum from positive to negative, 9 on the 9-point scale indicates "It is a real asset to my life and my performance," 5 indicates "Sometimes I wish it was better, but it's ok," and 1 indicates "It is a real challenge and impacts my ability to function." For problem items (such as suicidal thoughts) with varying degrees of problem severity, 9 on the 9-point scale refers to "Has a constant and severe impact on my ability to function," 5 refers to "Sometimes causes me difficulties or distress but I can manage," and 1 refers to "Never causes me any problems."

An aggregate MHQ score of mind health is calculated based on these 47 elements. It positions individuals on a spectrum from Distressed to Thriving, spanning a possible score range from –100 to +200. Negative MHQ scores indicate a mind health status with significant negative impact on the ability to function (corresponding to a Distressed or Struggling MHQ status). In addition, dimensional scores are calculated across six broad functional dimensions of mind health (Adaptability & Resilience, Cognition, Drive & Motivation, Mind-Body Connection, Mood & Outlook, and Social Self).

Data used in this report

This report includes responses collected for the Global Mind Project between 2024 and 2025, resulting in a total sample size of 273,735 individuals (see associated tables for N values stratified by UPF consumption, age, and world region) after applying exclusion criteria described below.

Data fields included in this report encompassed: 1) ratings to all 47 mind health questions; 2) computed global MHQ scores and dimensional scores; and 3) responses to the following questions on frequency of consuming food/drinks packaged in plastic containers, eating hot food out of plastic containers, and UPF consumption.

How often do you consume food/drinks that are packaged in plastic containers? This includes plastic food storage, takeout containers, drinks/water bottles, microwave meals.

- Rarely/Never
- A few times a month
- Once a week
- A few times a week
- Once a day
- Multiple times a day

How often do you eat hot food out of plastic containers (e.g., take-out food, microwave food in plastic containers)?

- Rarely/Never
- A few times a month
- Once a week
- A few times a week
- Once a day
- Multiple times a day

How frequently do you consume ultra-processed food e.g., McDonalds, Dominos, microwave meals, ultra-processed canned food, deli meats/cold cuts, noodles in a cup, packaged crisps/chips, sweets/candies, sodas/fizzy drinks?

- Several times a day
- Once a day
- A few times a week
- A few times a month
- Rarely/Never

Data exclusion criteria

Respondents who answered "No" to the MHQ question: "Did you find this assessment easy to understand?" were removed from the analysis. Assessments completed in under 7 minutes (the shortest time needed to read and respond to the MHQ) and over 1 hour were also excluded. Assessments with response ratings with a standard deviation (SD) lower than 0.2 were excluded, as this low SD indicates that the same rating value was selected across all 47 items. Respondents who did not report their age or did not answer plastic use questions were also removed from the analysis. Only data for countries with at least 200 respondents were included.

Data analysis and statistics

Mean global MHQ scores and mean dimensional scores were computed for the frequency of consuming food/drinks packaged in plastic containers and frequency of eating hot food out of plastic containers for all respondents for the response categories "Rarely/Never," "A few times a month," "Several days/Once a week" (combining the responses "Once a week" and "A few times a week"), and "Every day" (combining the responses "Once a day" and "Multiple times a day"). These scores were calculated altogether and for each age-gender group, and overall averages were computed as non-weighted averages of age-gender prevalence. The estimates for age were weighted by gender group proportions in age groups. The global and region estimates were weighted by corresponding internet population. The mean values, standard deviations, and N values for all comparisons are presented in the associated data tables.

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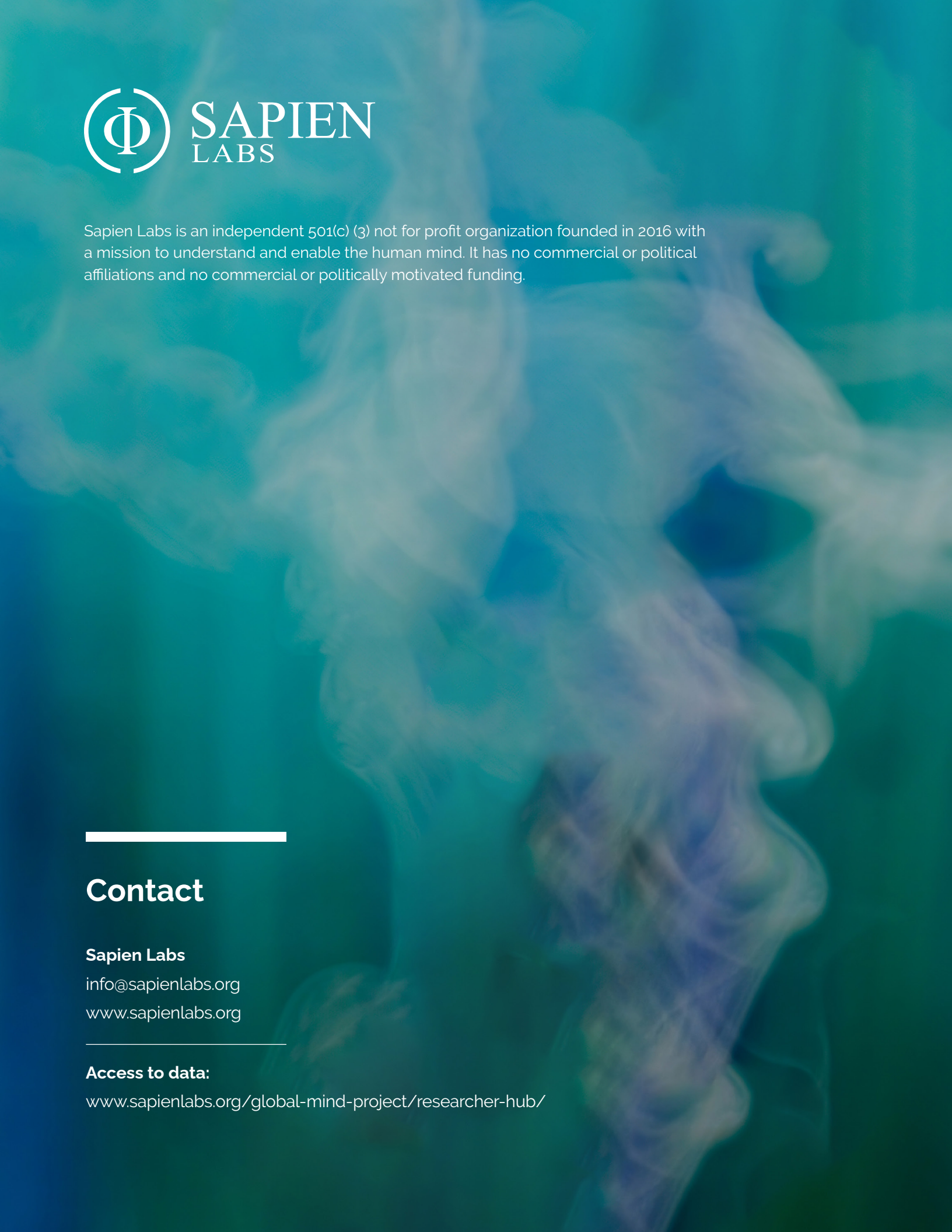

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Access to data:

www.sapienlabs.org/global-mind-project/researcher-hub/