Neurotoxins in Food and Drinks Could Lead to Mental Health Crisis

Dr. Nathalie Jurjus
Faculty of Human Sciences
Saint Joseph University,
Lebanon

Vanessa Boustani, MSc
Faculty of Medicine
American University of
Beirut - Lebanon

This work draws upon publications up until 2025. From an observational perspective, within Lebanon, there has been a noticeable rise in discussions surrounding mental health conditions. Available data also indicate an increased demand for psychiatric medications, which appears to correlate with the ongoing national socio-economic crisis. These trends collectively suggest a growing burden of psychological distress with the population.

The Unexplained Decline in Youth Mental Health

In the recent decades, the emotional and psychological stability of young people around the world has noticeably worsened. Findings shared by the Global Mind Project show a dramatic shift with almost half of individuals between 18 and 24 experiencing considerable mental strain and presenting five or more symptoms that raise clinical concern. In contrast, less than one-tenth of people from their grandparents' generation reported similar difficulties. Alongside this trend, diagnoses of childhood neurodevelopmental disorders have become much more common.

Many young people today describe feelings such as persistent worry, difficulty concentrating, intrusive thoughts, damaged self-esteem, sadness, disconnection from themselves or others, and challenges regulating their emotions.

Major Sources of Neurotoxic and Neuro-Disruptive Exposure

This article outlines four main groups of chemical exposures that enter the body primarily through what we eat and drink. Children and adolescents are more vulnerable than adults because their brains are still developing, they have lower body mass, and their detoxification systems are not fully mature.

1- Agricultural Pesticides

The global application of pesticides per unit of farmland has been steadily rising since the 1990s. One major source of concern is the widespread use of pesticides. In 2022 alone, an estimated 3.7 million metric tons of these substances were used globally. Residues of chemicals such as organophosphates, pyrethroids, and neonicotinoids have been detected in breast milk, amniotic fluid, umbilical cord blood, and even brain tissue—proving that they can pass both the placenta and the blood-brain barrier.

Exposure to such compounds has been linked to delays and impairments in language, social development, and cognition, along with changes in brain structure and connectivity. Because pesticides often act as endocrine disruptors and interfere with gut-brain communication and neurotransmitter activity, even small continuous exposures may have long-term neurological consequences.

2- Heavy Metals in Soil and Water

Metals like lead, arsenic, mercury, and cadmium enter the environment mainly through industry and contaminated fertilizers. They settle in the soil, infiltrate groundwater, and eventually make their way into crops, drinking water, and the wider food chain. These metals have been detected in blood samples, cerebrospinal fluid, breast milk, and in brain tissue.

There is no known safe exposure level for children when it comes to lead or mercury. Contact with these metals is associated with increased risks of anxiety, mood disorders, cognitive decline, and developmental conditions such as ADHD and autism spectrum disorder.

3- Additives in Ultra-Processed Foods (UPFs)

Ultra-processed foods contain artificial sweeteners, preservatives, stabilizers, and emulsifiers designed to improve taste, texture, and shelf-life. Teenagers are the highest consumers with UPFs sometimes reaching over half of their total daily calories.

Studies suggest that the more UPFs are consumed, the higher is the likelihood of depressive symptoms, emotional instability, and behavioral issues. Even maternal diets rich in processed food may negatively influence a child's later cognitive development. These products disturb the gut microbiome, disrupt gut-brain signaling, and may contribute to loss of myelin and structural alterations in the brain. Between 1999 and 2018, UPF consumption among young people in the United States rose from 61% to 67% of their total caloric intake.

4- Microplastics, Bisphenols & Phthalates from Packaging

The global production of plastics has risen sharply since the mid-20th century, increasing cumulative exposure risk. Plastics used for food containers and bottles release bisphenols, microplastic particles, and phthalates, especially when heated. These substances have been measured in blood, spinal fluid, and brain tissue, confirming their ability to cross protective physiological barriers. They behave like hormones, disrupt receptor signaling, and interfere with the HPA axis and hormone-regulated brain development. Prenatal or early-life exposure correlates with higher rates of ADHD- and ASD-related traits, as well as difficulties in social interaction and cognition.

Urgent Need for Action

There is an urgent call for action facing these chemicals. Constant exposure from pregnancy through adolescence may progressively weaken neurological development and metabolic functions. If unaddressed, this could pose a serious threat to the mental health of future generations. Research remains incomplete, especially regarding micro- and nanoplastics, and progress is slowed by issues like the diversity of chemicals, rapid breakdown products, lack of labeling transparency, cost of analytical testing, and difficulty tracking exposure over a lifetime. Few neuroscience and psychiatry studies have examined chemical exposure at this depth, indicating a gap in scientific focus. We call for immediate investment in research, tighter regulations, and long-term multidisciplinary studies bringing together experts in toxicology, neuroscience, and mental health. Stronger collaboration and monitoring systems are essential to protect the well-being of upcoming generations.

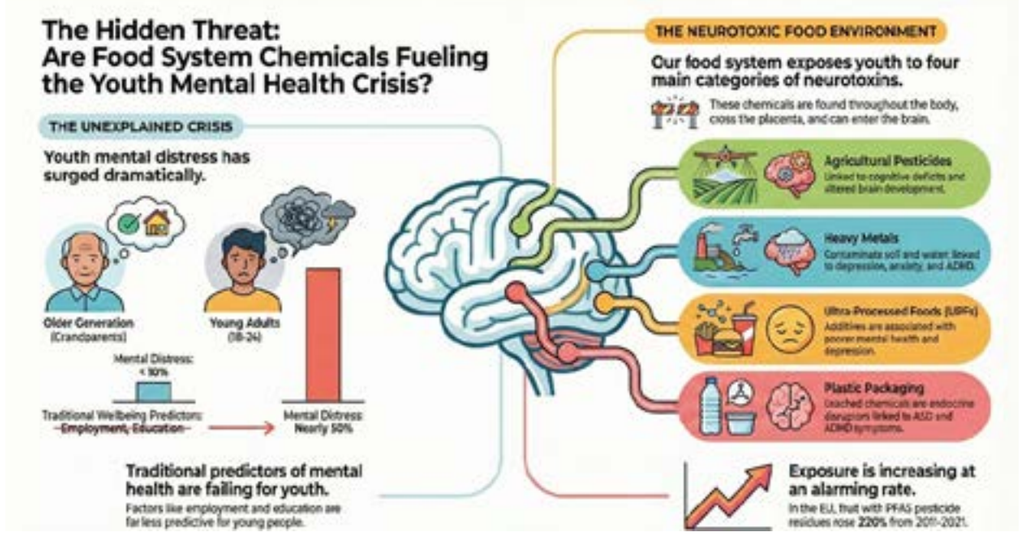

Figure 1: Disrupters of mental health