'OF TWO MINDS' – One Human, One Not
"Can we keep them both healthy? That is unclear."

Mental Health in the Era of Artificial Intelligence

TEXT OF ADDRESS
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I have been asked to speak about an analysis we did last year called 'OF TWO MINDS – ONE HUMAN, ONE NOT … MENTAL HEALTH IN THE ERA OF ARTIFICIAL INTELLIGENCE.'

This is available in summary and in complete form at www.mentalhealthinternational.ca.

The stated premise for this report is this:

"The world is entering an historic bridge spanning human and artificial intelligence and the result is a meeting of two minds – one human, one not. Can we keep them both healthy? That is unclear."

The report is dedicated to the late Michael Wilson, a great Canadian statesmen and my partner in mental health for these past 20 years. Michael passed away last year.

Canada's first and only mental health statesman.

The report – OF TWO MINDS - was written and distributed to encourage leaders in government and business to tread very carefully in introducing AI into places of work …. these technologies must not replace people, but supplement and support them.

We recommend billions of dollars of investments to "re-skill" people whose jobs will be affected by technologies that can do repetitive work and large-scale calculations faster and more efficiently than we human beings.

At the heart of our analysis is this: the supremacy, the sanctity, the essentiality of the human being must be re-affirmed as the cornerstone of this new age of machines.

Since the advent of machines, technology has wrought uncertainty and apprehension in society. In this case, if introduced harshly and carelessly, artificial intelligence will become a superpower of stress in the workplace.

Mental disorders are not exclusively – or even mainly – 'mental' at all. These conditions have physical properties, physical origins, physical and psychological effects. The Depression MATRIX is one of the most vivid expressions of the physical properties and impact of mental disorders.

The Report is framed by the observation by Dr. Alan Bernstein, President and CEO, Canadian Institute for Advanced Research:

" The revolutions in genomics and artificial intelligence are forcing us to re-visit long-held, cherished views of what it means to be human. "

Part One: What it means to be human in the era of artificial intelligence

- One thing it means to be human is living with mental illness… every living person is vulnerable… no exceptions.

- Another is to engage basic human qualities – love, compassion, knowledge, courage and discernment – to lighten that burden.

- Yet another is the wisdom to use all of the tools available including genetics – specifically epigenetics - and artificial intelligence to fight this fight.

- But AI is a quandary: its technologies may represent new tools to fight mental illness, but its vast infusion into society could worsen the problem.

- AI may force 375 million people to switch occupations in workplace operations and job markets across the world, producing invasive uncertainty, creating apprehension and threatening employees' sense of identity.

- AI may well produce the kinds of stress that constitute a "negative valence system" producing specific risks of mental illness.

- **THERE IS ANOTHER SIDE TO THIS COMPLICATED COIN:**

- Along with progress in the fields of neuroscience, genetics and epigenetics, artificial intelligence may well help open new doors of real hope that mental illness can be conquered.

- The timing is acutely 'right' for investments in brain-based mental health.

- The world has entered a brain-based economy that puts a premium on brain-based skills which are vulnerable to stress as a forerunner to and cause of mental illness.

Part Two: Implications of the Revolution in Artificial Intelligence

- Human vulnerability to artificial intelligence will likely be expressed by how artificial intelligence is steered into everyday life and various/all functions of society and the economy.

- Dropped like a bomb or introduced like a blizzard, AI will destroy the sense of self of human beings and the loss of this quality – key to human identify, individuality and function - will diminish what it means to be human.

- What it means to be human (?) is answered in significant measure by our self-awareness as to why we exist and whether, as we perceive it, we have the competence to live fulfilling lives on our own terms.

Notably:

- If AI deepens the effects of distraction, isolation, fear and uncertainty which feed mental unrest, disquiet, disorder and illness, then AI will damage society.

- If AI enters the mainstream of life cloaked in confusion and a lack of transparency as to its purposes and effects, then human apprehension will be embedded.

- If AI is displaces human beings from their jobs, without producing new employment opportunities through re-training and a re-focus of distinctly human qualities, then AI will be unwelcome.

Top scientists and business people are warning society about the dangers of unintended consequence of artificial intelligence. To illustrate:

- The Canadian Institute for Advanced Science is examining, as part of its commission to develop a Pan-Canadian AI strategy, the effects of artificial intelligence on life.

- The 'Montreal Declaration" by AI advocates and scientists propounds the necessity to ensure AI benefits humanity.

- The Treasury Board of Canada has published a ' Directive for Automated Decision-Making' based on a paper concerning, among many other things, the "physical and mental harms" and "discriminatory applications" of AI.

- The famous Institute for Life organized signatories from 90 countries for a "Pledge for World Safety" which includes a vow never to develop killer robots." The late Stephen Hawing is among those ho signed it.

- European Union countries passed a motion to rebut the risks of indigenously-intelligent weapons systems deployed for military purposes.

- The "Asilomar Principles" were assembled by a broad coalition of AI leaders and among the stated purposes is to "create not undirected artificial intelligence but beneficial artificial intelligence."

- AI pioneer Kai-Fu Lee warns of greater inequality among and within nations while the CEO of IBM points to "social unrest" if workers are not prepared for the effects of an AI future through re-training and new jobs.

These concerns represent one side of the AI (potential) experience. There is another side – part of which is captured in the book "Artificial Intelligence and Behavioral Healthcare.'

- Research underway to map the human brain using super-computing advancements; to model neural networks, important to understanding how and why brain circuits are affected by mental illness.

- Also, AI will facilitate testing models of psychiatric illness and care to produce better outcomes of treating mental illness; one research team is modeling how schizophrenia develops;

- Machine-brain coupling experiments foresee new ways to treat non-congenital blindness.

- 'Robots in Society' studies are aimed at helping the elderly to maintain their independence;

- Augmented reality is being used to develop therapies for children living with autism and treating malignant melanoma.

Innovations in mental health are blossoming through the applications of artificial intelligence:

- New IBM research is using AI and machine learning algorithms to identify instances of schizophrenia with 74% accuracy combined with a capability to predict severity.

Meanwhile:

- A new discipline, "computational psychiatry" will help clinicians "access and treat patients more quickly".

- Interestingly, computational psychiatry can be seen as a tool for psychiatrists to move past reliance on "subjective" evidence of the presence of mental illness.

- The overarching goal of the National Institute for Mental Health in advancing computational psychiatry is to "identify and validate biomarkers and treatment targets relevant to the prevention, treatment and recovery of psychiatric disorders."

AI and Mental Health Innovations

- AI instruments are being developed to improve access to early detection, improved care and treatment outcomes of mental ill health.

- **Canadian Daniel Martz, CEO of Equinox**, has introduced AI programs to expand access to cognitive and mental health therapy through virtual means 24/7 in Canada's both official languages – a first.

- I have just joined the board of a public company dedicated to the development and deployment of new treatments for depression that will produce symptom relief in days not weeks or months.

- This is a pending revolution in defeating this invasive condition. Sand I use the phrase 'defeat depression' intentionally – this is the 20th anniversary of the first-ever Business Plan to Defeat Depression we introduced to the world

Part Three: Implications of the Revolution in Genetics and Epigenetics

- The revolutions in artificial intelligence, genomics, genetics and epigenetics hold our intriguing promise for the future.

- Genetic discoveries "represent the first absolutely objective clues as to what mental illnesses are a very basic cellular level." In other words, what mental illnesses are in an underlying, physical sense.

- Human genetic studies can be well-designed and carefully interpreted to create a "direct route" to spelling out the mechanisms in the human brain that produce mental illness – a critical step toward better treatments.

- Epigenetics has potential for leading us to the prevention of mental disorders by reducing risk forming through the intersection of our genes and the environments we are born into and in which we live and work.

- One reason for this: "epigenetics stands at the interface of the genome, human development and environmental exposure."

- As such, "epigenetics helps strengthen the actual prediction of risk." This takes into account that for "nearly all common diseases, both genetic pre-disposition and environmental influences shape risk."

- In the light cast by epigenetics, we now have a scientific premise to affirm what was generally but obliquely known – that environments contribute to the cause of mental illness.

And we now know this:

- Stress is the "overwhelming, even dominant cause of mental illness." And environments are believed to constitute 80% of disease risk among human beings.

- This proposition opens-up the idea of preventing the risks of mental illness by changing, reforming and essentially 'humanizing' those environments – such as the workplace – which produce chronic stress, often routinely.

- Genetic studies have come upon new ways to "pry open" schizophrenia to uncover the biological mechanisms of this serious condition – conceivably, a turning point, in early detection, new treatments and even prevention

- Genetic studies of large population groups have established there are common variants among depression, schizophrenia and bipolar disorder, meaning that these conditions are not 'water-tight compartments.'

- Psychiatry's diagnostic guidelines (DSM-V) confirms this: "future (studies) will focus on mental illnesses as dimensions or spectrums of symptoms" rather than the more narrowly-define and labeled disorders.

- This approach represents a step away from the current subjective basis of diagnosing mental illnesses and replacing it with the means to diagnose mental disorders with the same precision as physical conditions.

Current labels of mental illnesses (depression, bipolar etc.) "do not represent valid disease entities," according to the US Government's mental health research funding agency.

The new research criteria introduced by the National Institute for Mental Health incorporates neurobiology into the causes and constituencies of mental illness, emphasizing mental disorders as:

- Brain circuit disorders and neurodevelopmental in nature starting in fetal or early post-natal life. In turn, this means that prevention starts early in life even before symptoms materialize.

Part Four: The Biology of the Human Brain

New scientific knowledge about autism, schizophrenia, depression, and Alzheimer's Disease help human beings understand the brain circuits involved in social discourse, thoughts, feelings, behavior, memory and creativity.

This new knowledge produces greater understanding of the biological processes of mental illness, thus enhancing future knowledge of treatments and early interventions that really work.

The brain, of course, has physical properties and both physical and psychological effects. As a brain-based disorder, mental illness, therefore, has the same: physical properties and psychological effects.

One profound illustration of the biological power of mental illness is the impact of the condition we know as depression on the course of other so-called bodily (physical) chronic disorder such as diabetes and cardiovascular disease.

THE DEPRESSION MATRIX demonstrates depression's links with heart disease and stroke, pain including arthritis, cancer, obesity, head trauma, diabetes, asthma, Parkinson's Disease, to name several dangerous depression co-morbidities.

Part Five: Interpretations and Conclusions

- Among those living with major mental illnesses, life expectancy is dropping. But what are we/they dying from? Pretty well what everyone else is dying from. Suicide is not the principal cause of early death within this population.

- That said, suicide is reaching epidemic proportions, it is now the leading cause of violent death in the world, and in nine of ten cases, it is a fatality of depression.

- AI and mental health are linked on three levels:

1. The risk of AI as a source of deep stress imposed upon working populations which can be the trigger of emotional distress, mental disquiet and brain-based mental disorders.

2. AI is based on human intelligence, therefore, its features must be modeled on how a healthy brain functions. There has been evidence that smart machines can also detect and "learn" thinking that is disordered and distressed.

3. AI may well provide the capacity to manage and distill huge amounts of data produced through epigenetics to shed light on the causes of mental illness that flow from the interplay between genes and environment.

- The principal, damaging impact of AI will likely be felt in working populations through job displacement and job loss.

- If AI "blows like a blizzard or drops like a bomb on the workplace as the world transitions to a brain-based, digital economy," then its effect will be unwelcome.

- Working populations must be prepared through re-training and 're-skilling' through this period of transition without the threat of job loss hanging over them.

- This calls for a 'sophisticated, well-funded and techno-savvy campaign by employers in both the public and private sector including government as the largest employer of all.

- Otherwise, the general uncertainty of artificial intelligence as to its likely effects on job security, income and family wellbeing will manifest like hurricane making land-fall with no preparations in hand.

- Pervasive uncertainty can produce deep stress which is at the root of severe frustration, fear, anger and risk factors that shake employee self-awareness and personal identity at work.

- Self-awareness is not a 'bland psychological concept.' It is, in fact, everything – our understanding of who we are and what we are here to do.

- It might be said AI is 'just another' technology coming on-stream and like all previous advancements of a technological nature, it will stoke and spike fears.

- This is incorrect. This revolution is producing machines that are designed to think - even independently.

- This is the first time that technology replicates (or tries to) human beings. This creates a significant ethical departure that merits close scrutiny. All major experts agree on this.

Going forward, we foresee the need for:

- Changes in accounting practices and tax policy to establish spending on employee supports and re-training/re-skilling a capital investment: the "Human Capitalization of the AI Workplace and Digital Economy."

- Mental health considerations be incorporated into the design/development of the Pan-Canadian Strategy on Artificial Intelligence and Quebec's International Observatory on the Societal Effects of Artificial Intelligence.

- Development of clear standards to guide the implementation of AI into the workplace and the retraining/re-skilling of employees without job loss.

- Collaboration across scientific disciplines and industry sectors to deploy AI as a tool in an overall global effort to prevent the disabling and deadly effects of mental illness.

- In fact: society and science must come together in a **"Declaration of Prevention and Cure**" of the deadly and disabling effects of mental illness in the third decade of the 21st century.

CLOSING REMARKS

Accessibility … Reachability … now more than ever.

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