substantive professional development when in practice, despite their concerns about needing to improve student mental health.\(^7\)

Fundamentally, teacher training should not only explore in depth all the aspects of mental health literacy, but also provide practical classroom strategies, and further focus on early identification of mental disorders and how to link students in need with appropriate services within and outside the school community. Moreover, teacher training should consider guiding teachers to learn how to care for their own mental health.

Recognizing the lack of progress in this area to date, Canadian educators have begun to address this issue. For example, informed by inputs from more than 30 faculties of education in Canada, a freely available online learning platform has been created that can be applied in both undergraduate or postgraduate teacher education as well as for self-study professional development (www.teachmentalhealth.org). This is now being used in many faculties of education across Canada and globally by interested stakeholders. Robust research evaluating the effectiveness of this intervention is underway, but has yet to be published.

Lastly, school-based health centers, which comprise full health/human services embedded into schools, may be the most parsimonious approach to addressing student’s mental health care needs, while concurrently supporting their other health care needs and social service requirements.

Some of their advantages are that: a) they provide the greatest ease of access for the largest number of young people; b) they are designed to be youth friendly; c) they can provide a full range of health/mental health interventions (from promotion to prevention to care); d) they can be seamlessly linked to primary health care providers; e) they are relatively inexpensive to establish (i.e., require limited new infrastructure costs); f) they provide an easily accessible site for additional human health services; g) they can be enhanced by adding human resources such as mental health clinicians, h) they have a reasonable evidence base of positive results, that include better and more equitable academic, health and social outcomes.\(^8\)

When properly implemented, such centers can provide both site-based integration of services and horizontal integration into primary health care and social services. However, governance can be a challenge (who “owns” and who funds). They are not likely to be “branded” and so may not be good at raising funds from non-government sources. While well established in some developed countries, they are not well known in other countries; and full services sites may not be economically feasible in very small schools.

Taken together, the above three components constitute the essential core elements of school mental health, and have a reasonable body of research that demonstrates their positive impact. They can be integrated into existing education and health infrastructure and are ready for scale-out in both low- and high-income settings.\(^9\)

Globally, governments should consider applying these school mental health interventions into their youth mental health policies, plans and programs.

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**Intergenerational psychiatry: a new look at a powerful perspective**

Intergenerational psychiatry focuses on disorder-related phenotypes in one generation following the manifestation of a psychiatric disorder, or the exposure to adversity, in the prior one.

Intense interest in families has a long history in psychiatry. We argue that new concepts, tools and research findings coalescing around the area of intergenerational psychiatry have the potential to make the focus on familial risk even more relevant to understanding the roots of mental disorders and, most importantly, how, when and with whom to intervene.

Intergenerational psychiatry integrates three lines of investigation. The first, familial high-risk studies, examines risk of mental disorder as it travels within families.\(^1\)\(^-\)\(^2\) Studying individuals at risk by virtue of their familial background, this approach helps isolate pathways by which mental disorder is transmitted in families, as well as endophenotypes predating disorder onset such as, for instance, cortical thinning and altered neural connectivity.\(^3\)

The second, intergenerational effects of trauma, considers the effects of parental exposure to trauma on psychiatric outcomes in the next generation. These studies have, for example, started to identify variation in stress regulation in children of Holocaust survivors as well as war veterans, independent of the children’s direct exposure to significant life stressors.\(^4\)

Finally, fetal programming studies have shown that “the womb may be as important as the home” in putting a child at risk for compromised neurobehavioral outcomes following prenatal exposures to stress or anxiety/depression. This work establishes an individual’s first environment as the in utero milieu.

Whereas the first approach emphasizes parental psychopathology as the primary component of intergenerational processes, the second highlights parental trauma, and principally, trauma

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occurring during parents’ adulthood prior to conceiving children. Finally, the third emphasizes gestation as the time period during which familial non-genetic influences on child outcomes can occur. We argue for integrating these paradigms to encompass the life course nature of risk and exposure emanating from the parent (and grandparents) to impact the child.

Our current understanding of the mechanisms of intergenerational transmission is still in its early stages. Familial high-risk studies have excelled in identifying parent-to-offspring transmission and correlates of psychiatric risk. They have shed light on certain mechanistic processes by which disorders are transferred from one generation to the next, suggesting, for example, neural endophenotypes of risk and resilience.

Studies focused on intergenerational effects of trauma have produced additional mechanistic insights. These include germ-line epigenetic effects of pre-conception trauma, both maternal and paternal. Yet, most of these preclinical insights remain un-proven in humans.

Finally, fetal programming studies have mostly focused on gestational experiences versus those from a mother’s lifetime (or her mother’s) that might influence her oocyte and/or her health during childbearing years.

Building on these foundational paradigms, intergenerational psychiatry can apply a wider investigative lens in terms of the sources (maternal and paternal), types, and timing of exposures. It considers, as relevant exposures for the next generation, parental psychopathology and trauma as well as experiences of psychosocial adversity (e.g., famine/starvation, social isolation, discrimination, poverty) and expands the time frame of these exposures, by considering parents’ adulthood experiences, as well as those of their childhood, or even before.

Central hypotheses of intergenerational psychiatry are ripe for testing. First, advances in fetal and perinatal neurobehavioral assessments have converged with our capacity to detect disruptions in brain circuitry in the first days following birth, or even before, in utero (e.g., fetal brain imaging). Second, the steady progress in molecular psychiatry, with advances in genetic, epigenetic and other molecular techniques, is providing unparalleled opportunities to identify variations in gene regulatory pathways and quantify heritable effects on psychiatric phenotypes (e.g., polygenic risk scores). Third, data science offers the methods to harness the large number of variables needed to test complex interactions (e.g., environment x gene x epigenome x development) inherent in intergenerational processes. Leveraging these research tools, intergenerational psychiatry will generate predictive models of behaviors across generations with greater and earlier explanatory capability than the ones we currently have.

As fruitful as this line of inquiry is, intergenerational human cohorts are uncommon. The examples that do exist still lack the depth of phenotypical and biological information needed. One solution is to pursue intergenerational assessments of existing large initiatives – e.g., the Avon Longitudinal Study of Parents and Children (ALSPAC) G2 Cohort – which could be joined by others – e.g., US National Institutes of Health’s Environment on Child Health Outcomes (ECHO) and All of Us Research Program; UK Biobank; and Scandinavian Registries.

The investment will pay off. Knowledge about familial determinants of mental disorders beyond shared genes of risk or shared current environment would expand personalized medicine to include the family’s life course and the individual’s cumulative attempts to adapt to it.

Intergenerational psychiatry will identify new prevention targets. We know, for example, that if we successfully treat depressed mothers, their symptomatic children improve, even if we have never directly cared for their offspring. Would we increase our impact, potentially preventing the onset of child symptoms, if mothers were treated during pregnancy (e.g., ClinicalTrials.gov NCT03011801, NCT03283254), or long before conception? How much do we gain by treating fathers or targeting those exposed to adversities? Within this life course approach, interventions can be staged at the optimal developmental time.

The observation of the familial nature of mental disorders has intrigued psychiatry since its earliest days, from Freud to the G- nain quadruplets. We argue that established lines of research (familial high-risk studies, intergenerational trauma, fetal programming model), furthered by the application of new technologies (fetal/perinatal assessments and imaging, molecular psychiatry, and advances in data science) can provide novel information with a dramatic impact on prevention.

This new look means expanding our lens away from a focus on the individual and immediate context to look across family members over their life courses. Ultimately, it may even potentially re-define mental illness — a descriptor of an individual in static time versus the manifestation of cumulative adaptations related to developmental influences over at least a generation.

Intergenerational psychiatry is poised to bring unprecedented information about how psychiatric dysfunction may get handed off from one generation to the next, amplifying our opportunities and choices about how to intervene.

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