

ADVANCING CHILD NUTRITION

THE CENTRE FOR CHILD
NUTRITION, HEALTH
AND DEVELOPMENT



UNIVERSITY OF TORONTO
FACULTY OF MEDICINE
Centre for Child Nutrition, Health & Development

BOUNDLESS



TABLE OF CONTENTS

- 2 Executive Summary
- 4 A Growing Crisis
- 6 A New Approach
- 8 The Centre for Child Nutrition,
Health and Development
- 10 Research
- 14 Partnerships
- 16 Education
- 18 Knowledge Translation
- 20 The Centre's Impact
- 22 Funding Opportunities
- 24 Conclusion



“Children around the world face malnutrition, obesity, and food and nutrient inadequacy. Together, we can find comprehensive, society-wide solutions to these pressing health challenges.”



DR. HARVEY ANDERSON is the inaugural Executive Director of the Centre for Child Nutrition, Health and Development. His research interests include protein and amino acid metabolism, food selection and intake regulation in adults and children, diet and behaviour, infant nutrition, total parenteral nutrition, and diet and chronic disease.

EXECUTIVE SUMMARY

The steady increase in the number of overweight and obese children in recent decades has been well-documented. Despite its prominence, this issue is just a symptom of a larger challenge facing young people today—poor nutrition. Far too many youth have diets that are laden with calories, “bad” fats, sugar and salt with relatively few nutrients. Conversely, a very significant number of youth struggle to eat enough at all.

Poor diet has been shown to negatively affect school performance, energy levels, and social behaviour with trajectories often established toward chronic disease. This crisis has been unfolding for approximately the last 30 years with complex causes frequently cited that include fewer home-cooked meals, unstable households, uncertain employment, ubiquitous and affordable fast foods and snacks, and sedentary lifestyles. The Centre for Child Nutrition, Health and Development is aimed squarely at these issues among youth aged seven to 17 and their families. Anchored within the University of Toronto’s renowned Faculty of Medicine and

integrated with Toronto’s remarkable health sciences research cluster, it is a fusion of world-leading researchers and academics working closely with government, agriculture, the food industry, health care and practitioners. Its goals are to lever strengths across research, scholarship and education in order to:

- » measurably improve child health outcomes;
- » positively impact the nutritional quality of the food supply;
- » contribute to social and economic prosperity.

Its formidable expertise and resources and its close collaboration with key

players make the Centre the most ideally-positioned organization in the world today for achieving these breakthroughs. The compelling nature of its mission has been demonstrated repeatedly both through its ability to attract enthusiastic partners as well as through significant and generous early donations from visionary philanthropists, most notably Joannah and Brian Lawson. With the Centre now established, further philanthropic gifts can be applied to hands-on work, allowing accelerated efforts to dramatically improve health outcomes for children and families through diet.



A GROWING CRISIS

Malnourished children and youth defy stereotype. One may indulge too much in the wrong kinds of food. The family of another may not be able to afford enough groceries, particularly fresh produce. One child might live in a remote setting with limited deliveries of supplies. A teenager could live in an apartment in a “food desert” in the inner suburbs of a big city. Still another might come from a culture that places differing emphases on food and exercise. A malnourished child may present as obese, thin, athletic or average in body type.

Whatever their circumstances, the result is the same—a growing number of children, teens and young adults are severely compromised physically, cognitively, socially and emotionally because their bodies are not receiving the full range of foods and nutrients that they need to thrive.

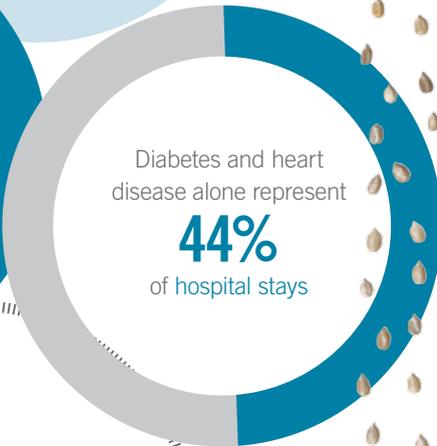
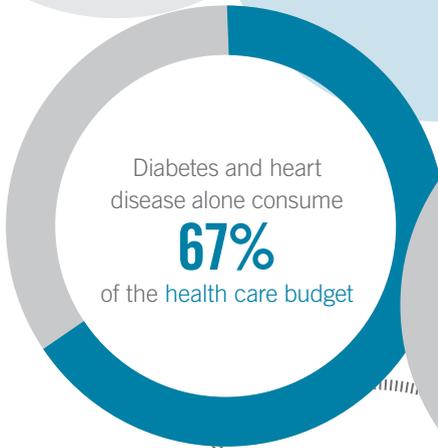
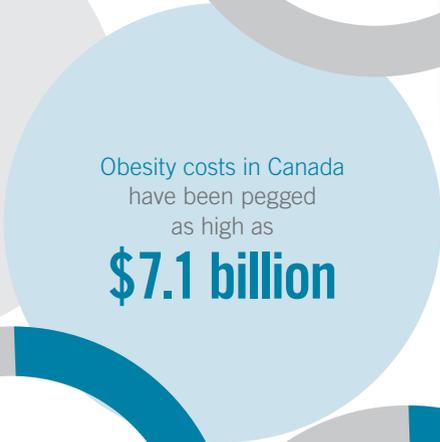
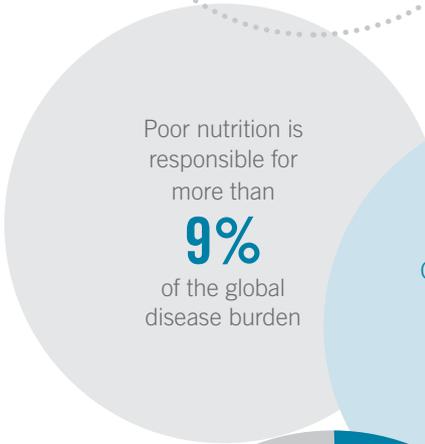
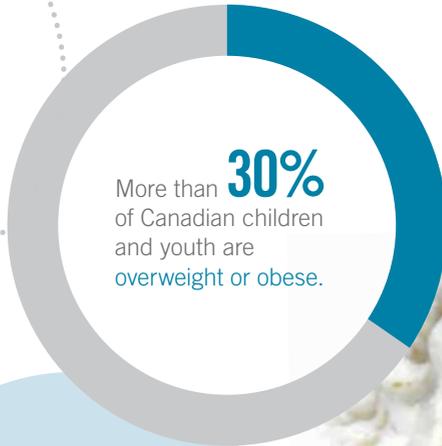
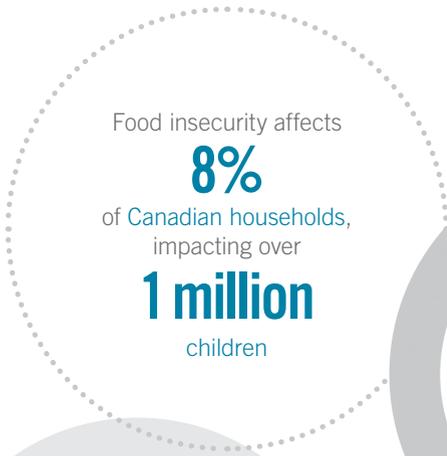
Effects can be short-term, such as lethargy or depression, as well as long-term with trajectories toward disease including diabetes, cancer, heart disease, and immune deficiencies.

If we continue on this path, the result in years to come will be health care systems—which already dominate provincial budgets—that risk being overwhelmed by a growing chronic disease toll.

Beyond health care costs, poor diet also exacts additional significant tolls on society. These include direct losses through a physical inability to work, as well as the indirect losses caused by impaired cognitive development that can

hamper performance in school and employment prospects.

The greatest costs by far, however, are borne by afflicted individuals and their loved ones. These costs will come in the form of mental, emotional and physical suffering, to be sure. But they will also come in opportunity cost—all the daily joys, experiences, and potential never realized during lifetimes marred by chronic, debilitating poor health.



A NEW APPROACH

If simply telling families to eat better and exercise more was enough, it would have worked already. These messages have abounded for decades precisely at the same time as our current health crisis has unfolded. The factors that are preventing people from eating enough healthy food and causing them to lead sedentary lifestyles are powerful and difficult to counteract, even for those who are fully informed and have the best intentions. It's time for a new approach.

We need to make significant changes to our food, public policy, lifestyle and other influences to make it easier for families with children to live in a healthy manner. This is a ground shift that, while challenging, is far from unprecedented. Broad-based public health achievements around the globe include everything from plummeting rates of smoking and a drop in the use of trans fats in Canadian restaurants to

a national effort in Finland to reduce rates of heart disease.

This case for support for the Centre for Child Nutrition, Health and Development outlines a plan to lead such a movement. The Centre has been specifically designed to act as a catalyst for an aggressive, proactive effort enlisting broad sectors of our community.

Our goals are to:

- » Improve the health of our children and break the trajectory of chronic disease in later life;
- » Improve the nutritional quality of the food supply;
- » Enhance social and economic prosperity by reducing overall health spending and increasing labour productivity.

EXPERTISE AND INFLUENCE

Leading thinkers associated with the Centre for Child Nutrition, Health and Development have an extensive history of influencing policy and practice:

The Trans Fat Task Force helped the food industry achieve a

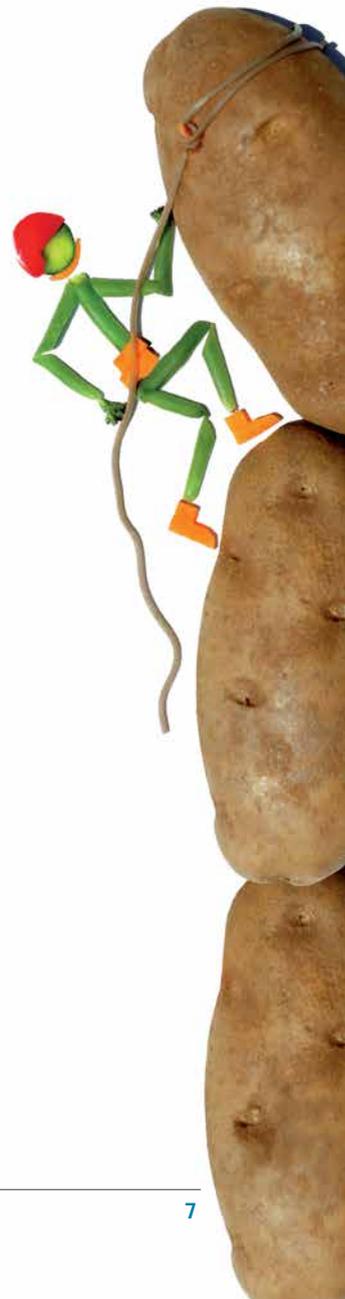
97%

compliance rate with trans fat guidelines.

The Sodium Working Group established national individual standards for salt intake. It also developed an app used by half a million people.

A critical review of plant sterols outlined their role in lowering blood cholesterol levels.

A Guidance Document on the Use of the Term “Prebiotic(s)” on Food Labels and in Advertising was created for Health Canada.



THE CENTRE FOR CHILD NUTRITION, HEALTH AND DEVELOPMENT

The Centre for Child Nutrition, Health and Development was launched under the umbrella of three departments within the University of Toronto's globally renowned Faculty of Medicine. The Departments of Nutritional Sciences, Family and Community Medicine (DFCM), and Paediatrics form the core of a vast network of expertise and resources that extends from doctors' offices and other local clinical settings to global collaborations among leading academics and researchers.

This network includes some of the most robust patient cohort studies and clinical research resources in the world, tying the Centre's cutting-edge nutritional research to the realities of daily patient care.

With these strengths and backed by the full commitment of University leadership, the Centre is not only a formidable research enterprise but also possesses the exceptional capacity to nurture nutrition leaders by

educating entire cohorts of students, professionals and practitioners with curricula informed by the latest research findings.

While research and education are inherent strengths, two other essential features have been built in by design: partnerships and knowledge translation. The Centre has attracted considerable interest and engagement from key players responsible for the food supply including government,

the food industry, and thought leaders from across the disciplinary landscape. Furthermore, the Centre has incorporated knowledge translation as a core function, getting evidence-based research into the hands of those who can put it to use.

The Centre's ability to conduct cutting-edge research, educate thought leaders, engage key partners and translate knowledge are discussed in further detail on the following pages.

THE U OF T ADVANTAGE

The Faculty of Medicine is an integral part of the Toronto Academic Health Science Network that includes nine fully affiliated hospitals and research institutes and 11 community-affiliated sites.

The Department of Nutritional Sciences alone boasts more than 50 accomplished nutrition researchers.

U of T's Department of Paediatrics is the largest in Canada and is affiliated with world-renowned SickKids Hospital.

Toronto is the second-largest food cluster in North America with **\$20 billion** in annual industry revenue.

The DFCM is the largest family medicine training program in North America—and one of the largest in the world—with approximately **1,400 faculty** and 400 family medicine residents serving approximately one million patients.

The rich ethnic, cultural and socioeconomic diversity of Toronto makes it an ideal living laboratory for population studies.



RESEARCH

The Centre established five research themes in order to focus its vast research capacity on the areas where further knowledge is most urgently needed and where it has strengths. These areas encompass the broadest possible spectrum of inquiry into child nutrition, health and development—from examining the genetic profile of one child to exploring issues of national policy such as food safety and access. Such breadth is the only way to understand the inter-connected factors that influence nutrition, health and development.

Food Behaviour in Children and Families

How are we influenced by the environment in our approach to eating and the nutritional quality of our diet? These inquiries include probing the effect of a family's nutritional literacy and awareness on a child's food behaviour. Studies encompass the effect on food behaviour caused by interactions between environment and the physiological changes of puberty. These include factors such as hormonal development and influences such as food, technology, activity, peer pressure, social status and ethnicity.



DR. JILL HAMILTON's roles include that of Senior Associate Scientist, Physiology and Experimental Medicine, at SickKids Hospital. She holds the Mead Johnson Research Chair in Nutritional Science. Her research looks at determinants of risk for diabetes in childhood obesity, and exploring biologic and psychosocial factors that may predispose one to weight gain and impact on treatment outcomes.

Nutrient Sensing and Personalized Health

This area encompasses a number of rapidly growing areas of inquiry, many of which have been made possible only in recent years through new technology. By and large, these inquiries can be summarized as efforts to gain a clearer understanding of how each of us digests and processes food and the effect of these functions on our body. Studies include the genetic determinants of food metabolism, lipid and glucose biomarkers, gut and microbiome health, and the effect of breast milk composition on infant development.



DR. ELENA COMELLI is the Lawson Family Chair in Microbiome Nutrition Research. Current research focuses on interaction between diet and the gut microbiome in health and disease. Investigations include how vitamin D during pregnancy and breastfeeding affects the gut microbiome of offspring in health and in context of metabolic syndrome. Studies also look at probiotics and their ability to sustain the intestinal barrier and prevent infection.



Nutritional Interventions in Children's Health Promotion and Disease Prevention

A central concern of this theme is the transmission of information between clinical settings and the community. Efforts here include randomized, controlled clinical trials that are relevant and generalizable to primary care settings; testing methods to facilitate uptake of evidence-based interventions into primary care and public health settings; enhancing implementability of clinical practice guidelines; chronic disease surveillance; reducing health disparities and promoting equity for vulnerable populations; and development and evaluation of integrated models of care targeting high-needs populations.



Among his roles, **DR. JOHN SIEVENPIPER** is a physician in the Division of Endocrinology & Metabolism at St. Michael's Hospital and Associate Professor in Nutritional Sciences at U of T. His research focuses on randomized controlled trials and meta-analyses that pool the results from different studies to answer diet and disease questions and inform clinical practice guidelines and public health policy.

Children's Food and Nutritional Policy

This area is concerned with developing evidence-based food and nutrition policy for children. These policies must be based on research that supports change in food production and foods ultimately available to children. A major focus is the linkage of the food supply with the goal of healthier diets for children, as well as food security. Established partnerships among government, universities, and the food and health sectors provide a framework for the initiative.



DR. MARY L'ABBÉ is the Chair of the Department of Nutritional Sciences. Her research looks at the effects and bioavailability of minerals and trace elements in our diet; food and nutrition policy such as labelling; and assessing and modelling nutrition policies and population intakes using food consumption survey data.

Global Child Nutrition

This theme considers international issues related to child nutrition. It will explore ways in which the Centre can provide leadership on international child nutrition public policy. Global Child Nutrition also seeks to learn from international experience, both carrying out and examining studies of nutrition during childhood in international environments.



Among her roles, **DR. VALERIE TARASUK** is a professor in the Department of Nutritional Sciences. Her research examines the scope and nature of household food insecurity in Canada and looks at policy and programmatic responses. Interests also include Canadian food policy and population-level dietary assessment.

Poor nutrition is responsible for more than

9%

of the global disease burden

In many countries, both malnutrition and obesity are problems. In China, some

20%

of the urban population is obese whereas malnutrition is an issue in rural areas.

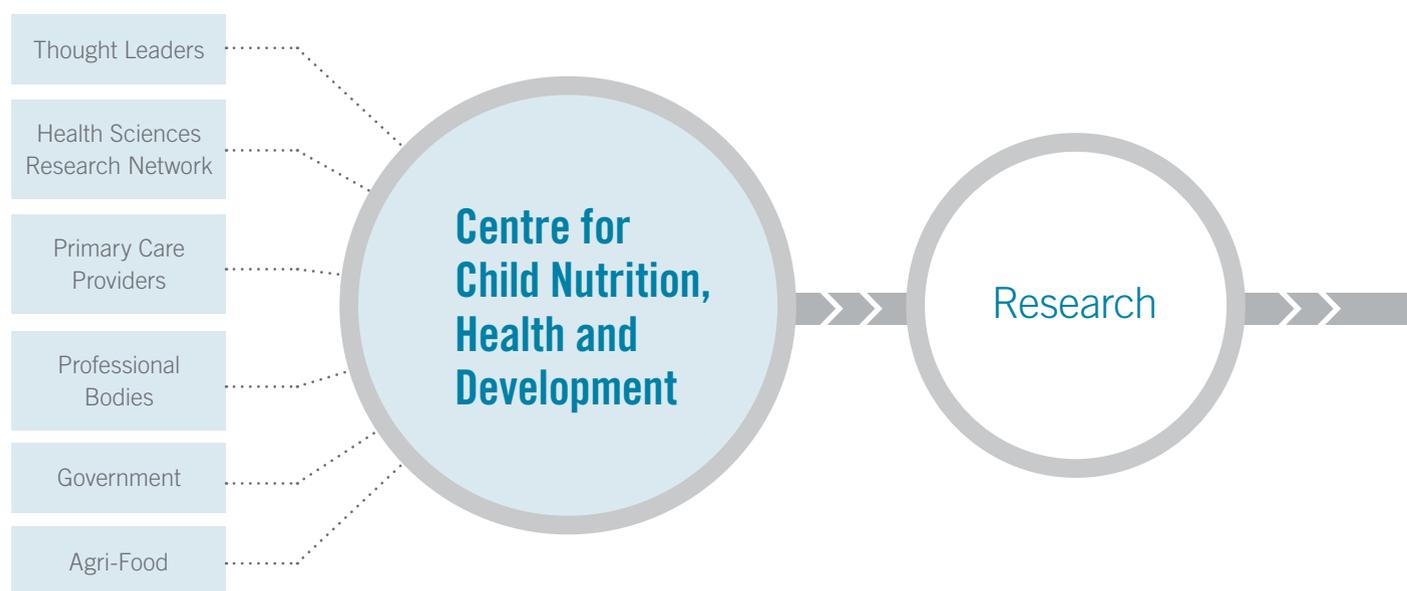


At **37.8%**,
Canada's
Aboriginal people
have strikingly high
obesity rates.

The World Health
Organization says rates of
**obesity nearly
doubled**
in every region of the world
from 1980 to 2008.

PARTNERSHIPS

One of the major stumbling blocks to progress in child and youth nutrition and health has been the uncoordinated nature of initiatives by different bodies and organizations that have often been at cross purposes. Consequently, a driving force behind the creation of the Centre for Child Nutrition, Health and Development was to provide the means by which key sectors could work together.



The lead department, Nutritional Sciences, has built a foundation of expertise in training and research into the basic, clinical and public health science of nutrition. It has established partnerships with many international and national agencies and governments, universities, public sector groups and the private sector including the agri-food sector and it is well recognized for contributions to food policy and dietary guidelines, nationally and globally.

Principal partnerships come from the Centre's positioning within the University of Toronto and its full integration as part of Toronto's health care and health sciences research cluster—one of the most advanced in the world. Formal collaboration with the Li Ka Shing Knowledge Institute at St. Michael's Hospital, the Fraser Mustard Institute for Human Development at U of T, the Hospital for Sick Children and Mount Sinai Hospital furnishes a wealth of expertise and infrastructure across clinical care, child development, knowledge translation and other areas.

Beyond this academic and research cluster, the Centre ensures that sectors responsible for the food supply have a forum to meet and to inform the Centre. An Advisory Council brings together representatives from the food industry, government, NGOs, and professional bodies to lend their expertise. This council builds on the long history in Nutritional Sciences of working with these sectors through the Program in Food Safety, Nutrition and Regulatory Affairs and through collaborative research projects.

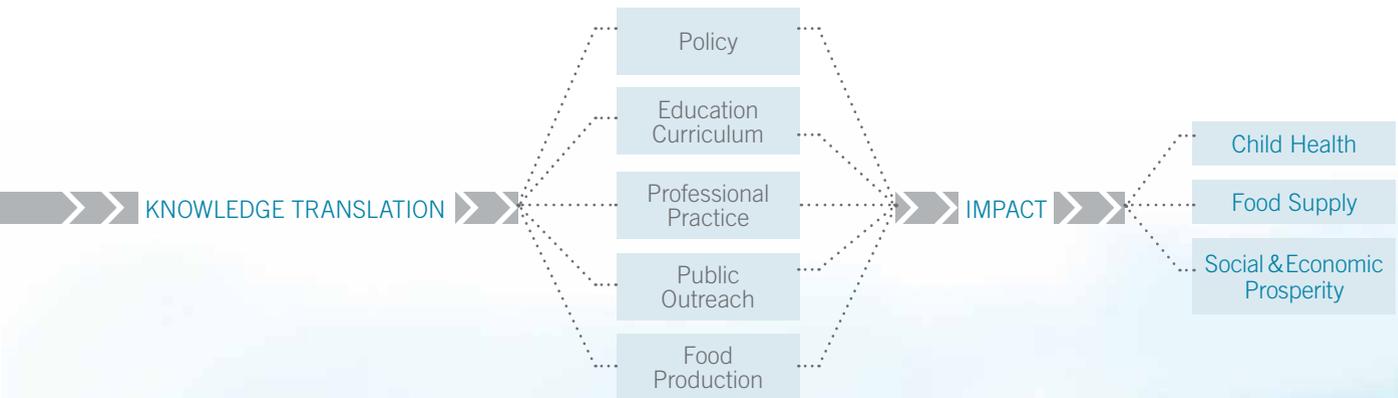
A UNIQUELY POWERFUL RESOURCE PLATFORM

The Centre's research efforts are built upon a platform that includes remarkably robust research studies and networks that provide detailed information about patient health and responses to intervention. These include:

The Applied Research Group for Kids (TarGETKids!), run through SickKids and the Department of Paediatrics, is tracking more than 4,000 children to link exposures in early life to health problems later including obesity, micronutrient deficiencies, and developmental problems.

The University of Toronto Practice-Based Research Network (UTOPIAN) brings together DFCM researchers, primary care clinicians and practices from its 14 academic sites across Greater Toronto to answer important health care questions and translate findings into practice.

Electronic Medical Record Administrative Data Linked Database (EMRALD), another initiative closely connected to DFCM, furnishes powerful data by bringing together electronic medical records with administrative information such as billing data from OHIP and hospital discharge records.



EDUCATION

With our positioning within the University of Toronto, the Centre for Child Nutrition, Health and Development takes responsibility for educating thought leaders in nutrition with the skills to forge knowledge, influence policy and practice, educate and engage, and work within complex worldwide networks to effect change.

Education initiatives build on substantial strengths already present at the University of Toronto. One key activity is enhancing the medical school curriculum so that doctors are equipped with in-depth knowledge of child nutrition and better able to find solutions to complex, nutrition-related health issues.

Clinicians, post-doctoral fellows and trainees are engaged in cross-disciplinary research projects and mentored to enhance research skills and quality of care. Specialized training is helping researchers conduct collaborative work, write grants, and build knowledge translation into their research programs. Specific

programming initiatives include Master's programs in Nutrition in Global Health; MBA in Nutrition and Food Systems Regulation; and Public Health Nutrition Policy. A seminar series is also being established for trainees participating in cross-disciplinary research on child's nutrition.

Lastly, graduate students are the backbone of the research enterprise in any laboratory. Increased research inquiries therefore require greater ability to support graduate students. This capacity can be increased through targeted academic fellowships in key areas and industrial scholarships and programs.





LEADERSHIP IN NUTRITION EDUCATION

200

undergraduate students majoring in nutrition

100

graduate students focussed on nutrition

More than

1,500

undergrad Arts and Sciences students enrolled annually in nutritional sciences courses

Department of Nutritional Sciences one of only a few in North America situated within a Faculty of Medicine

Food Safety, Nutrition and Regulatory Affairs program requires collaboration with food industry, government and NGOs

KNOWLEDGE TRANSLATION

Ensuring that knowledge generated through research is transmitted to those who can put it into action is a core function. The Centre leverages its network of affiliated organizations to engage and partner with key external stakeholders, including government, education leaders, professional bodies, not-for-profit charitable funds, and public policy leaders. A partnership with the Li Ka Shing Knowledge Institute at St. Michael's Hospital is proving particularly valuable for ensuring best practices for translating discovery about the role of children's nutrition into new models of social and health care and for policy recommendations.

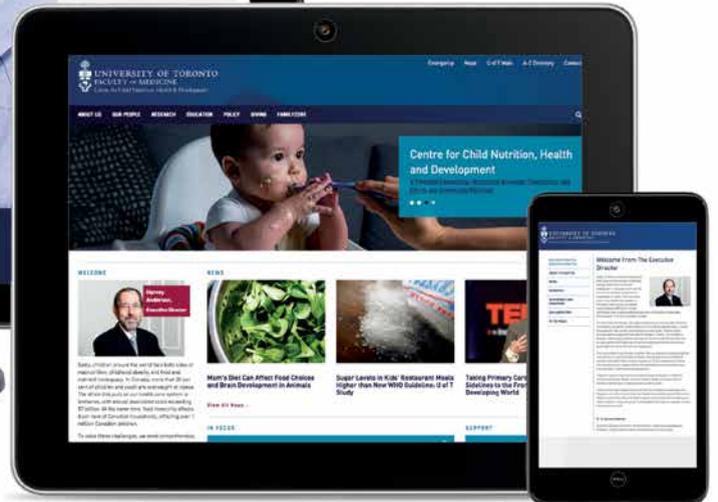
For practitioners, clinical research with basic science is creating an evidence-based culture in primary care practice. A great deal of the translation that affects health care and clinical practice occurs within a family doctor's office, the most common setting for chronic disease prevention and screening. Initiatives include developing web-based tools that health professionals can use to incorporate food and dietary advice into care.

The growth in information and communications technology is also opening up exciting new opportunities for direct connection with the public to help eliminate confusion and misinformation. Dr. Mike Evans, Chair in Patient Engagement in Child Nutrition, has demonstrated the overwhelming appetite for trustworthy and engaging information provided directly from reputable thought leaders. His YouTube Whiteboard series on

various health issues have attracted approximately 10 million views. Overall, the Centre is positioned to become the go-to source for sound, evidence-based and easy-to-understand nutrition information and guidance for professionals, media and the public. This is a critical role in order to offset the vast quantity of confusing, conflicting and often simply untrue messages about nutrition with which we are all inundated daily.



Dr. Mike Evans,
Chair in Patient Engagement
in Child Nutrition



ADDITIONAL KNOWLEDGE EXCHANGE OPPORTUNITIES:

- » Annual child nutrition and health summit
- » Children's Nutrition Rounds
- » Scientific Advisory Board
- » Publications and publishing
- » Conferences
- » International panels and boards
- » University/MaRS-based programs
- » Faculty exchanges
- » Industrial interactions and exchanges
- » Public outreach with child-centred organizations

THE CENTRE'S IMPACT

Ultimately, all efforts by the Centre for Child Nutrition, Health and Development are intended to achieve measurable impact in the following areas: child health outcomes, the nutritional quality of the food supply, and social and economic prosperity. This last point reflects the enormous toll that poor nutrition and chronic disease place on our communities through direct losses that include absenteeism, reduced productivity and the strain on our health care system. Indirect costs in the form of poor cognitive development and underachievement in school that rob children of their potential are much more difficult to quantify but are also devastating to individuals, families and communities.

Specific areas of inquiry in which the Centre is active include:

Maternal and Child Health

- » Guiding pregnant women in healthy eating and lifestyle habits for their child
- » Understanding the response of underweight babies to high-calorie diets
- » Development of healthy microbiota (gut bacteria) pre- and post-natal
- » Metabolic reactions to eating certain types of food
- » Understanding differing responses to foods based on individual genetic profiles

School system

- » Informing exercise guidelines
- » Healthy lunches and snacks
- » Spreading food literacy

Food Supply

- » Incorporating healthier ingredients such as pulses (e.g. kidney beans, pinto beans, lentils) into existing foods like macaroni and cheese
- » Developing healthy, appetizing snacking options
- » Food labelling in restaurants; food literacy
- » Understanding food access

Agriculture

- » Working with farmers to develop crops that accommodate healthier eating and cooking methods

Social determinants

- » Providing built environments that encourage physical activity
- » Understanding linkages between poor nutrition and wage levels, housing, poverty
- » Interventions for at-risk populations such as Indigenous communities and others worldwide



FUNDING OPPORTUNITIES

The Centre for Child Nutrition, Health and Development is seeking philanthropic gifts totalling \$20 million from private and corporate donors and foundations in order to fully realize its vision. Early investments have helped launch the Centre, permitting future donors to choose from a number of clearly defined initiatives that are directly related to the Centre's core activities across research, education and knowledge translation.

Philanthropy attached to the Centre is particularly potent because many of our areas of inquiry, such as the microbiome and epigenetics, are relatively new fields that have accelerated only in recent years thanks to technological and scientific advances and have enormous potential in many areas yet to be explored.

Areas requiring investment include:

- » Research leadership including Chairs in key areas
- » Infrastructure to accommodate growing research activities in cutting-edge areas of inquiry
- » Research support in the form of postdoctoral fellowships and graduate student awards
- » Funding for internet and mobile technology to support collaboration and public engagement
- » Knowledge translation opportunities including seminars, symposia and workshops



MOMENTUM FOR CHANGE

A \$5 million gift from Joannah and Brian Lawson supported the creation of the Chair in Patient Engagement in Child Nutrition and the Lawson Family Chair in Microbiome Nutrition Research, among other research and education initiatives.

The Faculty of Medicine has made an additional \$6 million commitment in support of capital funding while more than \$1.5 million has been pledged from individual and corporate donors for programming.

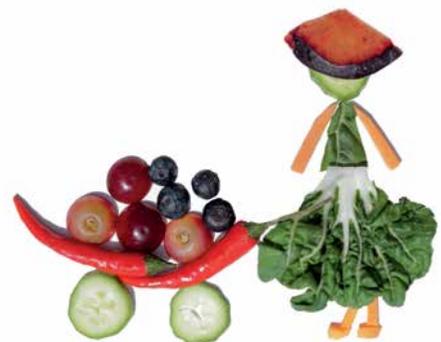


CONCLUSION

The creation of the Centre for Child Nutrition, Health and Development is in response to the growing, widespread desire to stem the tide of poor nutrition that is threatening the well-being of our children. The eagerness of disparate groups including the food industry, government, professional bodies, health care and others to join forces under the banner of the Centre is a testament to this desire and recognition of the Centre's unique capacity to lead change.

Adding momentum to the Centre's mandate is the fact that there has never been a more opportune time to reshape our approach to child nutrition. Transformative trends have converged, including: rapidly evolving research landscapes in areas including nutrigenomics and the microbiome; vastly improved bioinformatics to analyze enormous datasets; the availability of robust and globally unique cohort studies such as TarGETkids!; web-based tools to communicate effectively among far-flung partners and with the public; and heightened public awareness and engagement surrounding the issue of healthy eating.

With all these factors in play, the question quickly becomes: "If not now, when?" The time is ripe for visionary donors to make a tremendous difference. There are now many opportunities to invest directly in research activities and for donations to be magnified by allowing researchers to achieve initial success and attract further funding. In these early stages, high-profile recognition opportunities are also still available.



Thank you for your interest in the Centre for Child Nutrition, Health and Development. No other organization, anywhere, is as ideally equipped to address the nutritional crisis facing young people and their families. The Centre is established with the full backing of the University. Key partners from across the spectrum of food and nutrition are fully engaged and onboard. Formidable resources in terms of expertise and infrastructure are in place.

The missing ingredient to fully realize these strengths is strategic philanthropy from visionary donors.

It is possible to stop and reverse the decades-long decline in the health of children. Together, we can achieve measurable progress toward our stated goals: to improve the health of our children and break the trajectory of chronic disease; improve the nutritional quality of the food supply; and enhance social and economic prosperity by allowing every child to realize his or her full potential.

BOUNDLESS

Funds raised for the Centre for Child Nutrition, Health and Development are part of the Faculty of Medicine's \$500 million campaign, which is a cornerstone of the University of Toronto's unprecedented \$2 billion Boundless campaign. The Faculty's campaign—the largest fundraising initiative for a medical school in Canadian history—is helping to build its strengths as a world-leading medical school that continues to improve the health of Canadians and people around the world.



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