



A partnership of:



BILL & MELINDA GATES foundation



UBS Optimus Foundation



## News Release

January 16, 2017

# Maternal Micronutrients, Nurturing Environment Boost Child Development

*Maternal micronutrient supplements during pregnancy and a strong nurturing environment result in measurably greater child development and cognitive ability at age 9-12*

**Mataram, Indonesia / Toronto, Canada:** Mothers who take multi-micronutrient supplements during pregnancy can add the equivalent of up to one full year of schooling to a child's cognitive abilities at age 9-12, says a new study published today.

Other essential ingredients in the recipe for smarter kids include early life nurturing, happy moms, and educated parents, according to the research conducted in Indonesia.

As well, the study finds that a child's nurturing environment is more strongly correlated than biological factors to brain development and general intellectual ability, declarative memory, procedural memory, executive function, academic achievement, fine motor dexterity, and socio-emotional health.

Funded by the Government of Canada through Grand Challenges Canada's Saving Brains program, the study appears today, January 16, 2017 in the prestigious journal, *Lancet Global Health*: [bit.ly/2jvvM9E](http://bit.ly/2jvvM9E).

The research was conducted by international group of researchers from Indonesia (Summit Institute of Development, the study leader, and the Center for Research on Language and Culture, University of Mataram), the United States (Harvard T.H. Chan School of Public Health, the University of California, Davis, and Georgetown University) the United Kingdom (University of Lancaster) and Australia (Deakin University).

Between 2012 and 2014, the researchers tested extensively almost 3,000 Indonesian school children, then 9 to 12 years old, whose mothers had participated in an earlier study into the effects of consuming either multiple micronutrient (MMN) supplements or standard iron-folic acid (IFA) supplements during pregnancy.

In the earlier "Supplementation with Multiple Micronutrients Intervention Trial" (SUMMIT), conducted between 2001 and 2004, half of the 31,290 participating Indonesian mothers consumed MMN supplements; the other half received IFA supplements. The MMN supplements were similar to the pre-natal multivitamin supplements consumed by many women in Canada, the United States, and other countries during pregnancy.

The latest follow-up study revealed impressive long-term benefits to children whose mothers took MMN supplements, including better "procedural memory" equivalent to the increase in score typical after an additional half-year of schooling.

The procedural memory is tied to the learning of new skills and the processing of established perceptual, motor, and cognitive skills. Procedural memory is important for a child's



A partnership of:



BILL & MELINDA GATES foundation



UBS Optimus Foundation



UBS



Palix Foundation



academic performance and daily life, and is tied to activities such as driving, typing, reading, arithmetic, reading, speaking and understanding language, and learning sequences, rules, and categories.

Children of anemic mothers in the MMN group scored substantially higher in general intellectual ability, a difference comparable to the increase associated with an additional full year of schooling.

What further impressed and surprised the researchers: The strength of the relationship between cognitive abilities and early life social and environmental conditions.

Biological factors such as maternal nutritional status during pregnancy, low infant birth weight, premature birth, poor infant physical growth and nutritional status at follow-up were not as strongly linked to cognitive ability as the socio-environmental factors assessed during the study: home environment, maternal depression, parental education and socio-economic status.

This suggests that current public health programs focused only on biological factors may not sufficiently enhance child cognition, and that programs addressing socio-environmental factors are essential to achieve thriving populations, according to the study.

In Indonesia's West Nusa Tenggara province, where the study was carried out, officials are already taking action in light of the research results.

Says Provincial Secretary General Dr. Rosiady Sayuti: "The findings led us to create, with the Summit Institute of Development and colleagues, the inter-sectoral Golden Generation Program to enhance social interventions to foster early childhood development."

Adds Dr. Nurhandini Eka Dewi, Head of the Provincial Health Office of West Nusa Tenggara: "We are procuring multiple micronutrients and scaling-up the Golden Generation Program for family nurturing. These will inform efforts to scale the work nationally."

## Quotes

*"Previous studies had hinted at the importance of social determinants, but it was the extent of our detailed cognitive assessments and the number of children tested, together with data from the pregnancy onward, that enabled us to clearly quantify the effects, and the results were surprising."*

Dr. Elizabeth Prado, University of California, Davis, the study's lead author

*"With the new emphasis in public health going beyond saving lives toward fostering thriving children, these findings indicate the need to restructure front line health and development work to focus on family welfare and support for nurturing and stimulation, and helping future parents stay in school."*

Dr. Anuraj Shankar, Harvard T.H. Chan School of Public Health, senior author and co-Principal Investigator

*"No one on the team had anticipated the extent to which social and environmental factors would exceed biological factors as the determinants of cognitive function — 2- to 3-fold by some measurements. This work has global implications as countries are currently planning how to achieve the global Sustainable Development Goals with targets for improved childhood development."*

Dr. Husni Muadz, University of Mataram, co-Principal Investigator



A partnership of:



BILL & MELINDA GATES foundation



UBS Optimus Foundation



*“This unprecedented work indicates how local community-driven research approaches exemplified by SUMMIT and the Summit Institute of Development provide high value for local and global health and development. We have now created a real-time information platform with the government that coordinates multiple front line workers to enhance early childhood development, this enables rapid scaling in Indonesia and beyond.”*

Mandri Apriatni, CEO, Summit Institute of Development

*“This study shows that maternal micronutrients and a nurturing environment in early life save brains and help children thrive and succeed. A more prosperous and peaceful world starts with our children’s early brain development.”*

Dr. Peter A. Singer, CEO, Grand Challenges Canada

*“This study shows that mothers who take multiple micronutrient supplements during pregnancy can give their child an advantage in life. But healthy development needs public health investments to go beyond bio-medical strategies aimed at mothers-to-be, expectant mothers, babies and children. Beefed-up efforts to improve the nurturing environment in which kids spend their first 1,000 days are also essential.”*

Dr. Karlee Silver, VP Programs, Grand Challenges Canada

*“This study is the latest example of Canada’s seminal contributions to the field of early childhood development on a global scale. Through Grand Challenges Canada’s Saving Brains program, important progress toward the Sustainable Development Goals is being made as we seek to build a world where every child has the opportunity not only to survive, but to thrive.”*

Dr. Jack P. Shonkoff, Director of the Center on the Developing Child at Harvard University

*“This study underscores the importance of providing micronutrients to pregnant women to help their children not only survive at birth but thrive later in life. The Micronutrient Initiative is proud to be an ally of Grand Challenges Canada and the innovations it supports.”*

Joel Spicer, President and CEO, Micronutrient Initiative

– 30 –

### **About Grand Challenges Canada**

Grand Challenges Canada is dedicated to supporting **Bold Ideas with Big Impact®** in global health. We are funded by the Government of Canada and we support innovators in low- and middle-income countries and Canada. The bold ideas we support integrate science and technology, social and business innovation – we call this **Integrated Innovation®**. Grand Challenges Canada focuses on innovator-defined challenges through its Stars in Global Health program and on targeted challenges in its Saving Lives at Birth, Saving Brains and Global Mental Health programs. Grand Challenges Canada works closely with Canada’s International Development Research Centre (IDRC), the Canadian Institutes of Health Research (CIHR) and Global Affairs Canada to catalyze scale, sustainability and impact. We have a determined focus on results, and on saving and improving lives.

[www.grandchallenges.ca](http://www.grandchallenges.ca)

### **About Saving Brains**

Saving Brains is a partnership of Grand Challenges Canada, Aga Khan Foundation Canada, the Bernard van Leer Foundation, the Bill & Melinda Gates Foundation, The ELMA Foundation, Grand Challenges Ethiopia, the Maria Cecilia Souto Vidigal Foundation, the Palix Foundation, UBS Optimus Foundation and World Vision Canada. It seeks and supports bold ideas for products, services and implementation models that protect and



A partnership of:



BILL & MELINDA GATES foundation



UBS Optimus Foundation



nurture early brain development relevant to poor, marginalized populations in low- or middle-income countries. [www.savingbrainsinnovation.net](http://www.savingbrainsinnovation.net)

**About Summit Institute of Development**

Summit Institute of Development (SID) is a non-profit NGO in Indonesia conducting research and development in the fields of health, education and human capital development. SID focuses on creating evidence-based programs and a path to scale through policy and direct engagement with government and private sectors. Through integrated innovation and implementation SID aims for scalable solutions to improve the quality of life at the community level via open participation and free exchange of information and ideas. Current priorities include: [1] improving maternal and child health, [2] catalyzing human development and agents-of-change and empowerment at the community level, [3] establishing grass roots communication and information systems enabling communities to generate and access evidence for decision-making. For more information visit [www.sid-indonesia.org](http://www.sid-indonesia.org)

**FOR MEDIA ENQUIRIES**

**LIAM BROWN**

Press Officer  
Grand Challenges Canada  
T. +1.416.583.5821 Ext. 5564 / +1.416.673.6542  
[liam.brown@grandchallenges.ca](mailto:liam.brown@grandchallenges.ca)

**MANDRI S. APRIATNI**

Chief Executive Officer  
Summit Institute of Development  
T. +62.370.644.347 / +62.81.236.286.005  
[mandri.apriatni@sid-indonesia.org](mailto:mandri.apriatni@sid-indonesia.org)

**PAT BAILEY**

UC Davis News and Media Relations  
T. +1.530.752.9843 / +1.530.219.9640  
[Pjbailey@ucdavis.edu](mailto:Pjbailey@ucdavis.edu)

**MARGE DWYER**

Harvard T.H. Chan School of Public Health  
T. +1.617.432.8416  
[mhdwyer@hsph.harvard.edu](mailto:mhdwyer@hsph.harvard.edu)