Impacts of Childhood Undernutrition in the face of Climate Change

Jacqueline McGlade

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eng'eno e puaan

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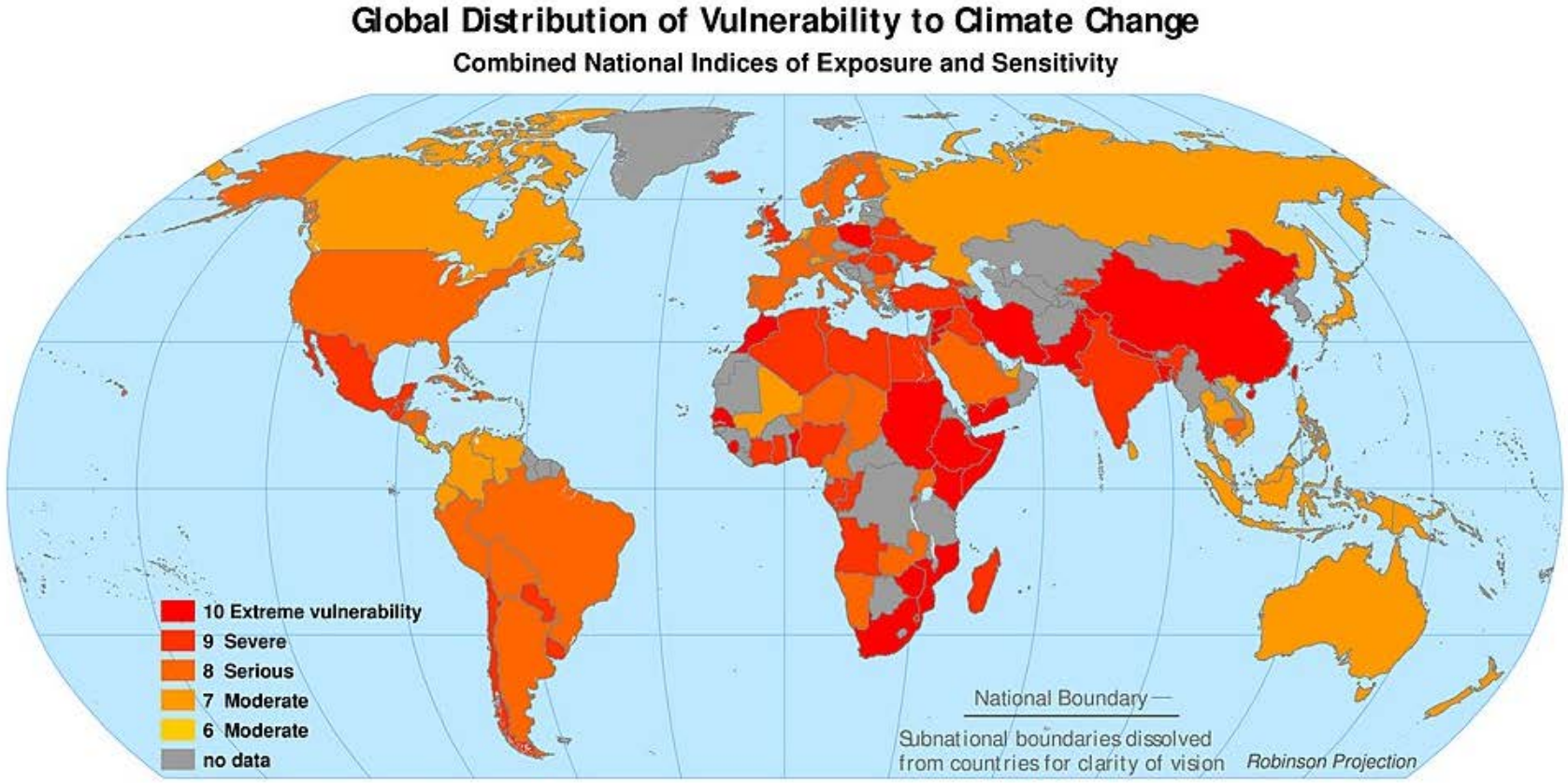
Impacts of Climate Change and Childhood Undernutrition



http://ciesin.columbia.edu/data/climate/

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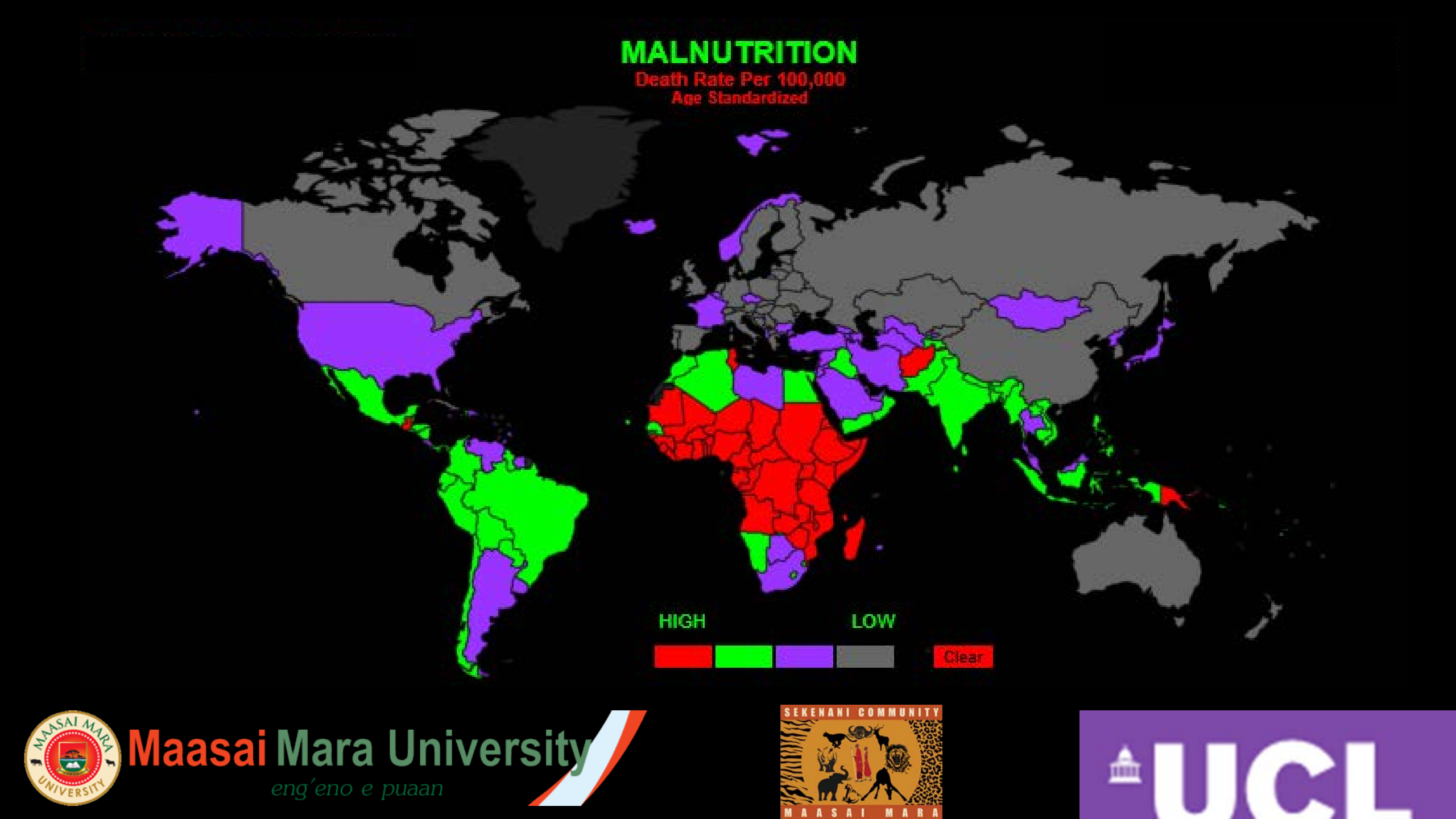
Impacts of Childhood Undernutrition

Nearly 46% of deaths in children under 5 are attributable to undernutrition. This translates into the unnecessary loss of about 3 million young lives a year.

20 million children suffer annually from severe acute malnutrition; and 160 million from stunting.

Malnourished children have lowered resistance to infection; they are more likely to die from common childhood ailments like diarrhoeal diseases and respiratory infections.

For those who survive, frequent illness saps their nutritional status, locking them into a vicious cycle of recurring sickness, faltering growth and diminished learning ability.



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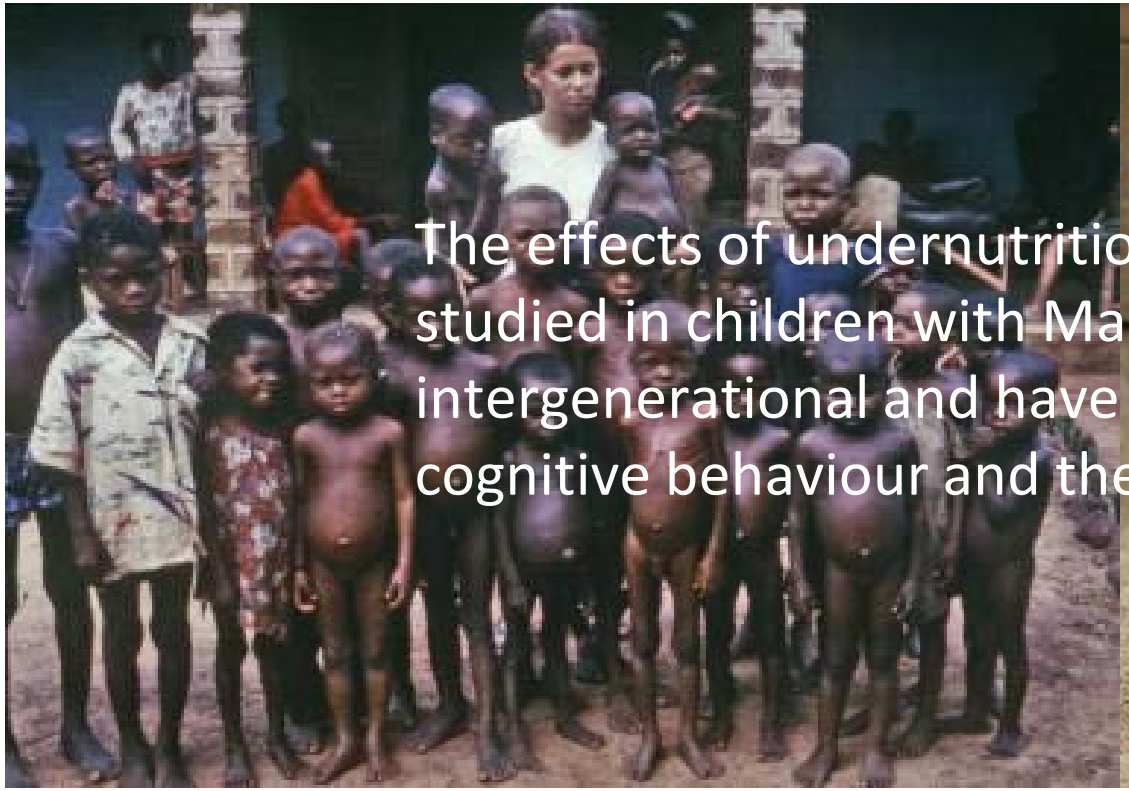
Kwashikor

Marasmus



The effects of undernutrition during the first 1000 days, studied in children with Marasmus and Kwashikor are intergenerational and have a potentially devastating impact on cognitive behaviour and the development of executive powers

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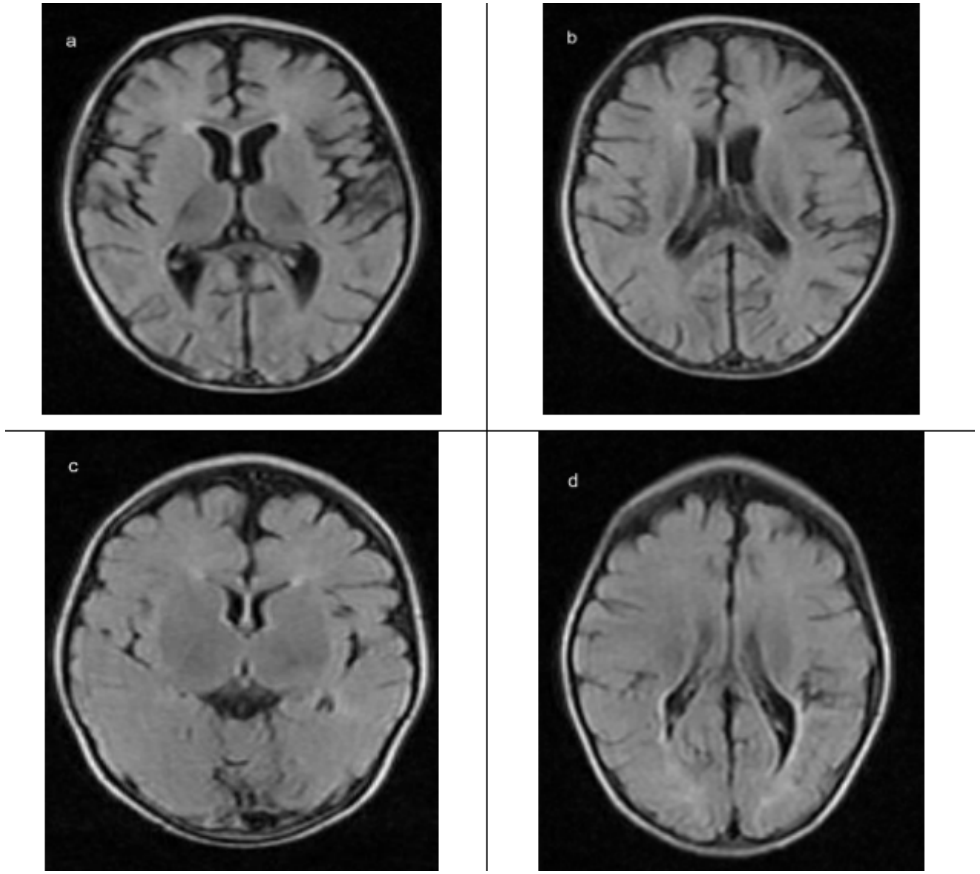
Malnutrition and Brain Atrophy



a and b 10 months old patient showing mild brain atrophy in the form of dilated ventricles and prominent cortical sulci.

c and d follow-up MRI of the same patient at day 90 after treatment showing resolution of the signs of cerebral atrophy with normal ventricular size and cortical sulci.

Cerebral atrophy and ventricular dilatation commonly occur in the brains of children suffering from moderate and severe Protein Energy Malnutrition. Children with both edematous and non-edematous types are almost equally affected.

These changes can be reversible if treated in the first 1000 days

El-Sherif, Babrs and Ismail Life Science Journal 2012

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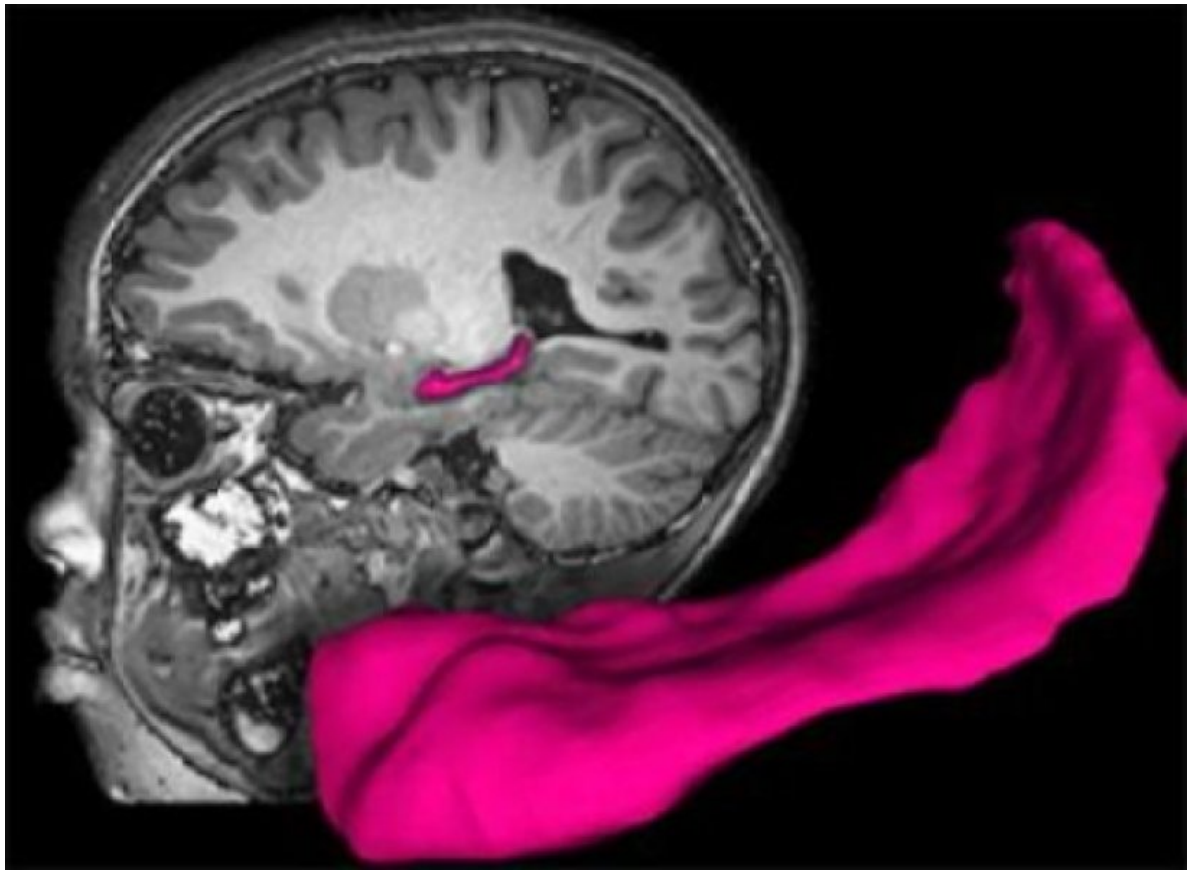
The Hippocampus & Poverty



MRI scan highlighting the hippocampus (pink) in a child's brain. Washington University researchers found that poor children with parents who were not very nurturing were likely to have a smaller hippocampus than those raised by more attentive parents.
Washington University Early Emotional Development Program

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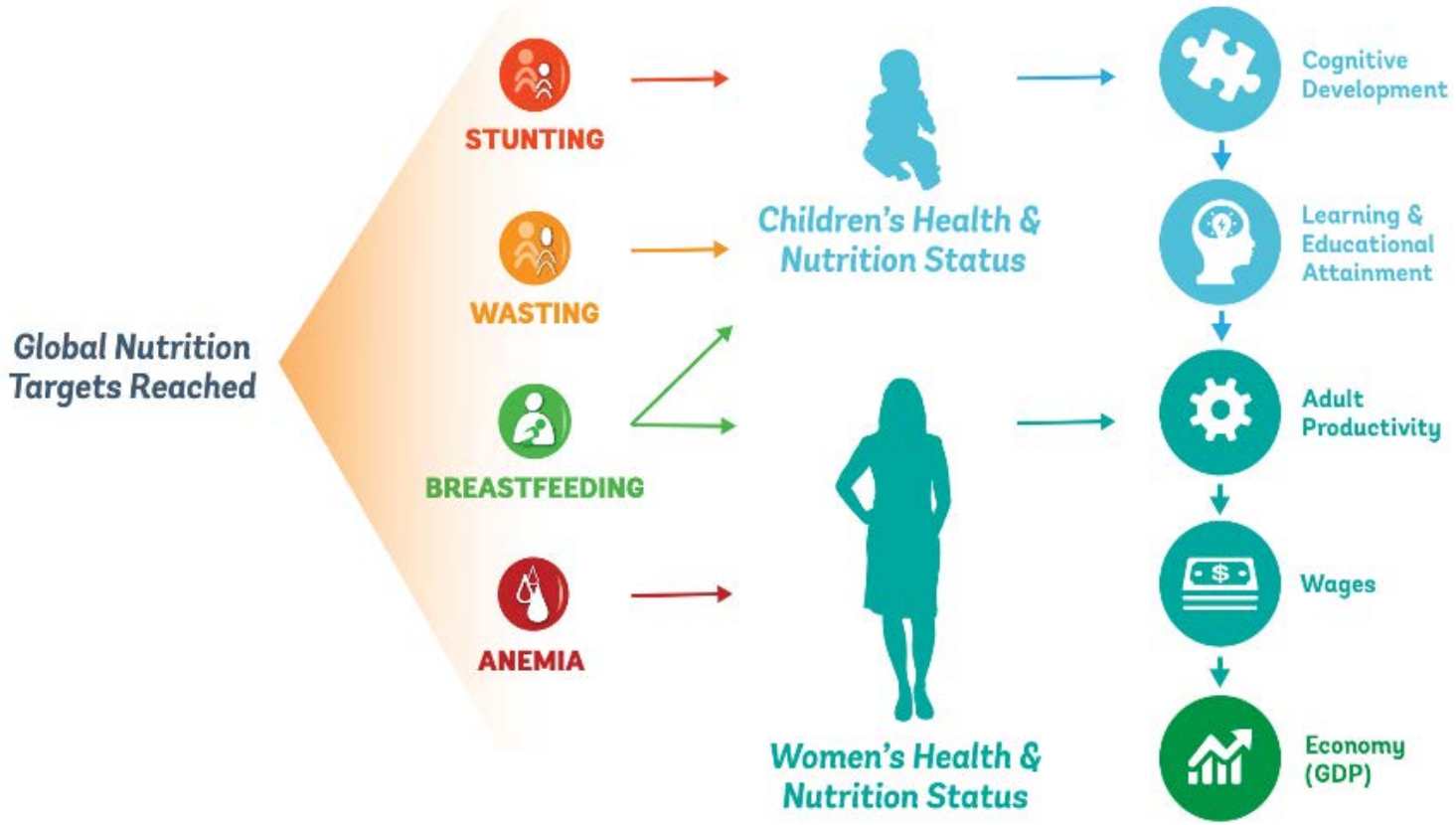
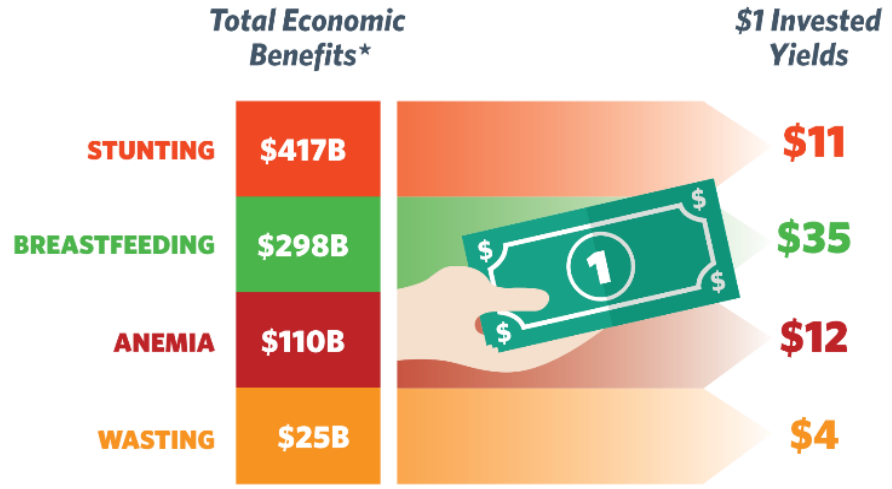
Tackling Childhood Malnutrition





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Tackling malnutrition

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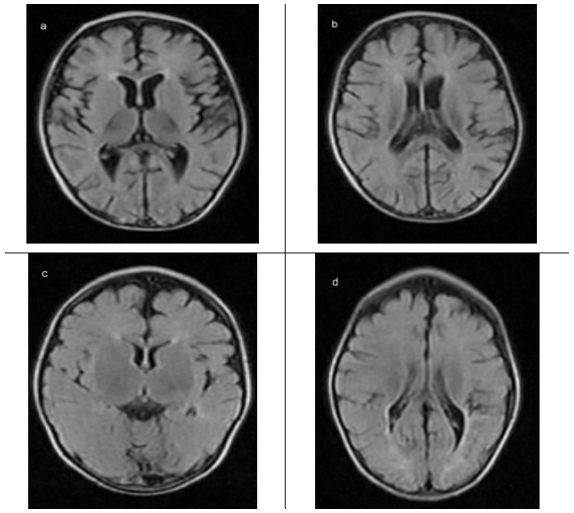
Exploring the possibilities of AI to repair cognitive damage



Reversal of loss of development through protein energy and micronutrients in the first 1000 days

Deep learning techniques to train a convolutional neural network to understand how to rebuild and restore the connectome crucial for cognitive development and executive powers

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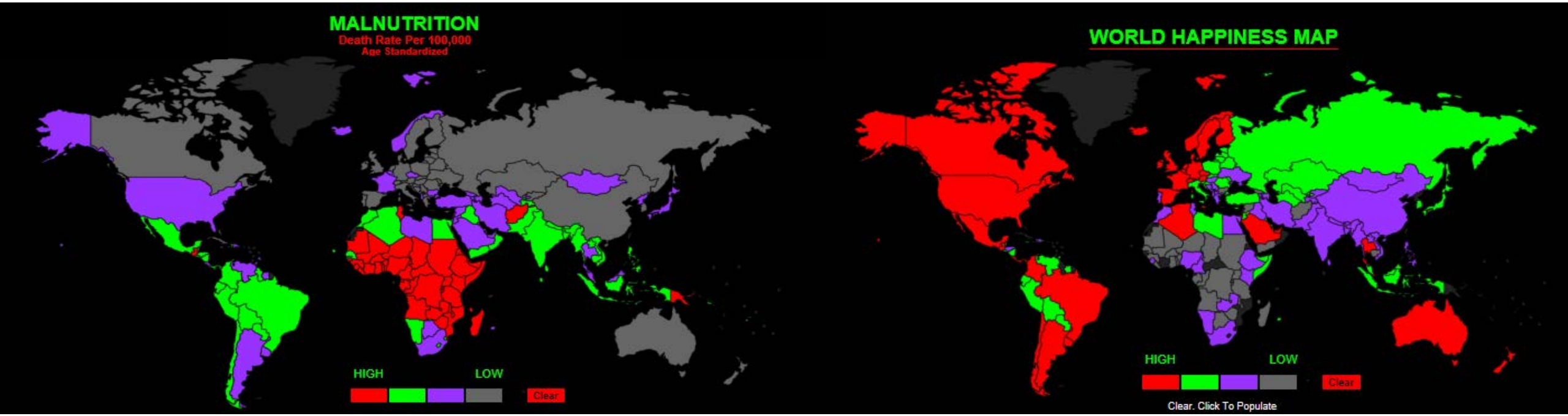
Mapping future cognitive behaviour



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