Childhood malnutrition
Exporting violence or happiness?

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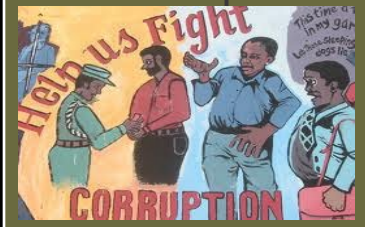
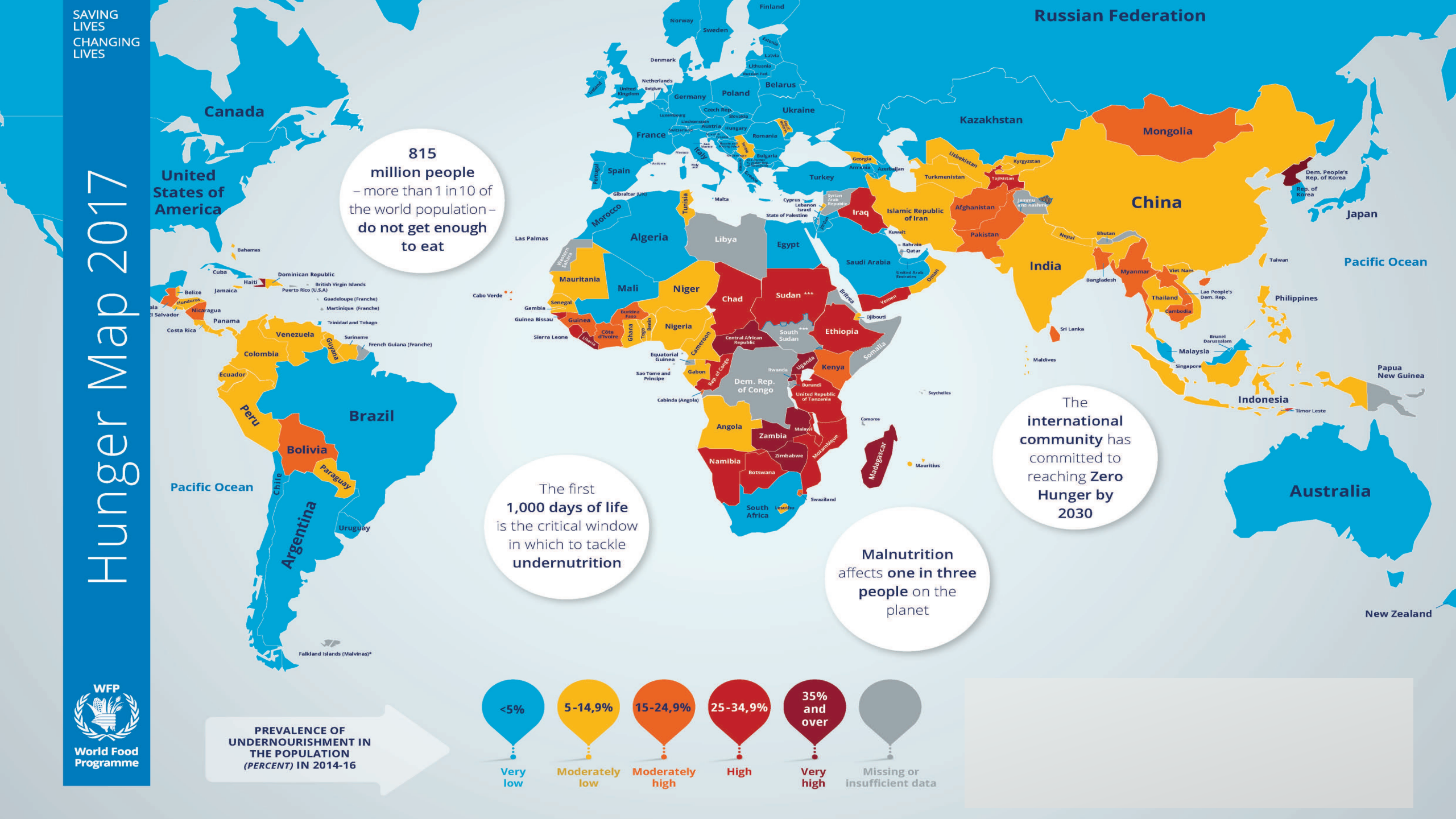
Sustainable Development & Malnutrition

Social Development	Economic Development	Environmental Sustainability	Governance, peace and security
Child Nutrition 	Per capita GDP 	Climate + energy 	Anti-corruption 
Infant mortality 	Youth employment 	Healthy ecosystems 	Peace for all 
Community health 	Access to markets 	Green chemicals 	Security for all 

SAVING LIVES
CHANGING LIVES

Hunger Map 2017



WFP
World Food Programme

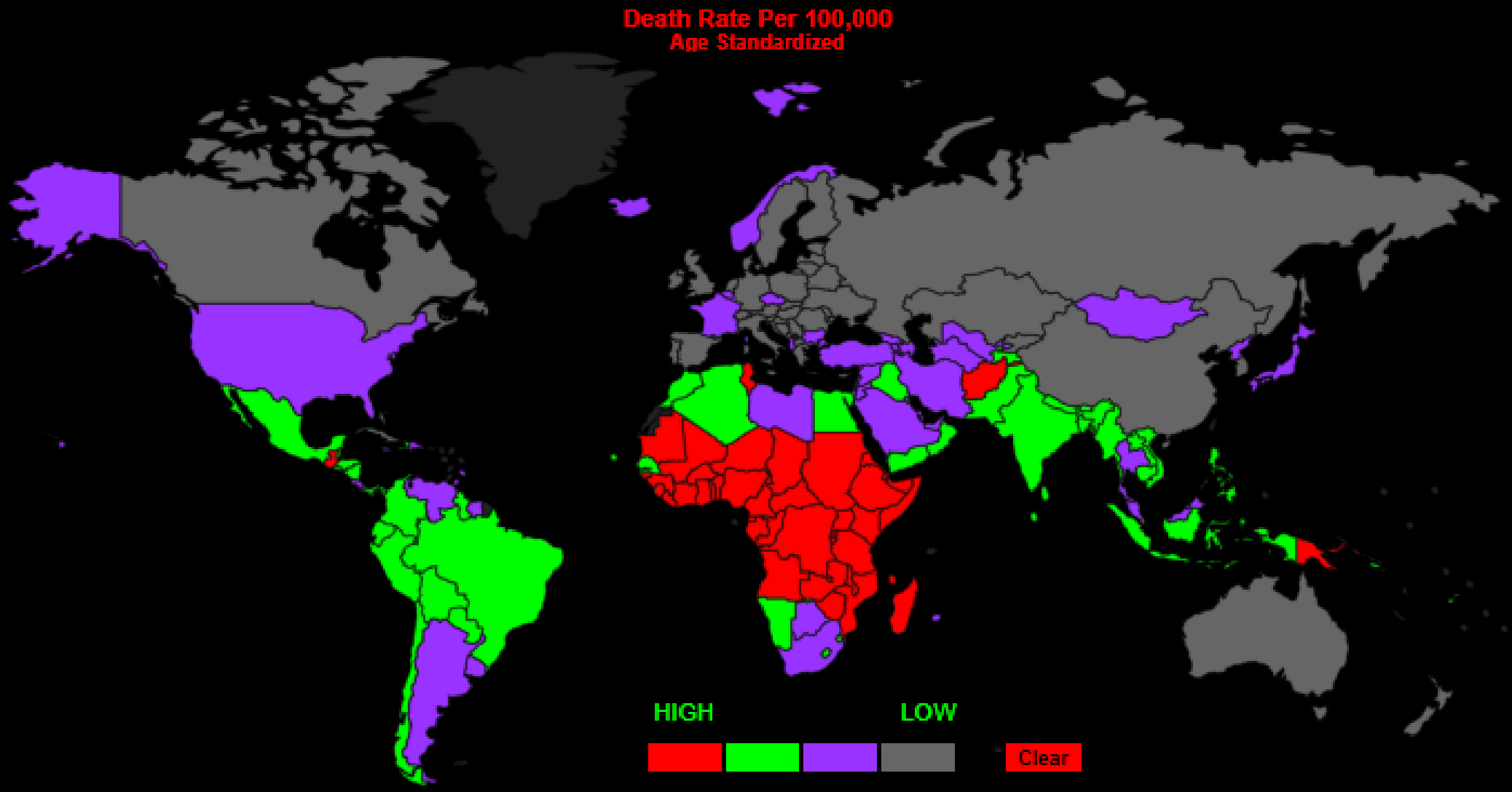
Today’s Reality of Childhood Undernutrition

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.



MALNOURISHMENT RELATED DEATHS

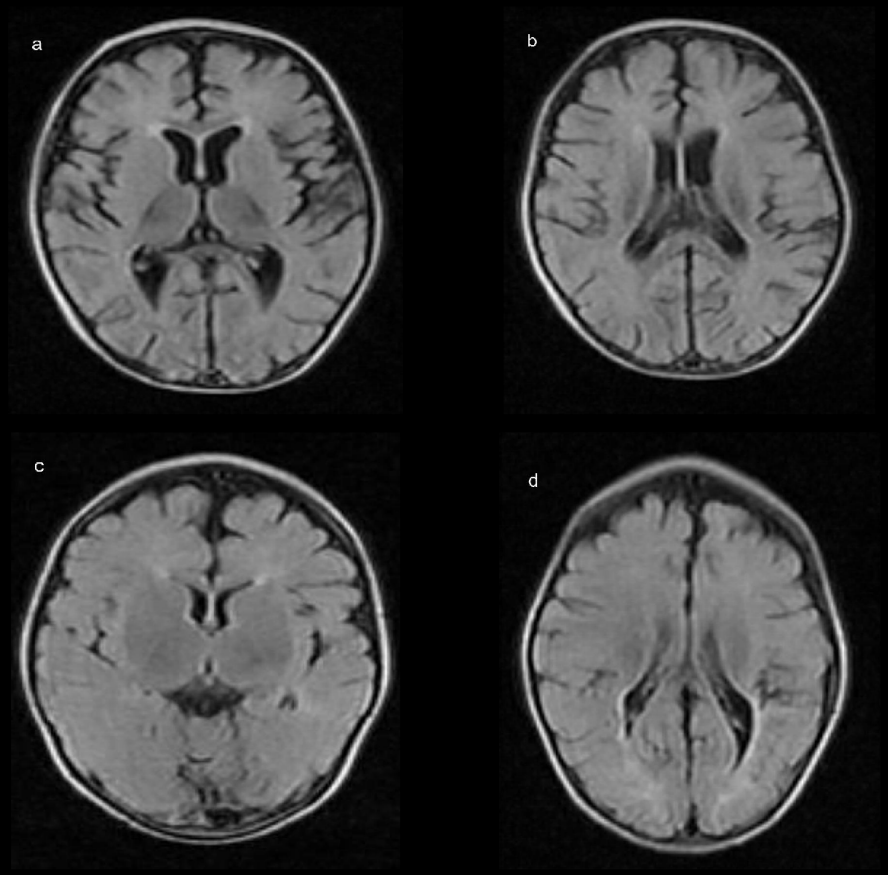
Tackling malnutrition

Kwashiorkor

Marasmus

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

Malnutrition and Brain Atrophy



El-Sherif, Babrs and Ismail Life Science Journal 2012

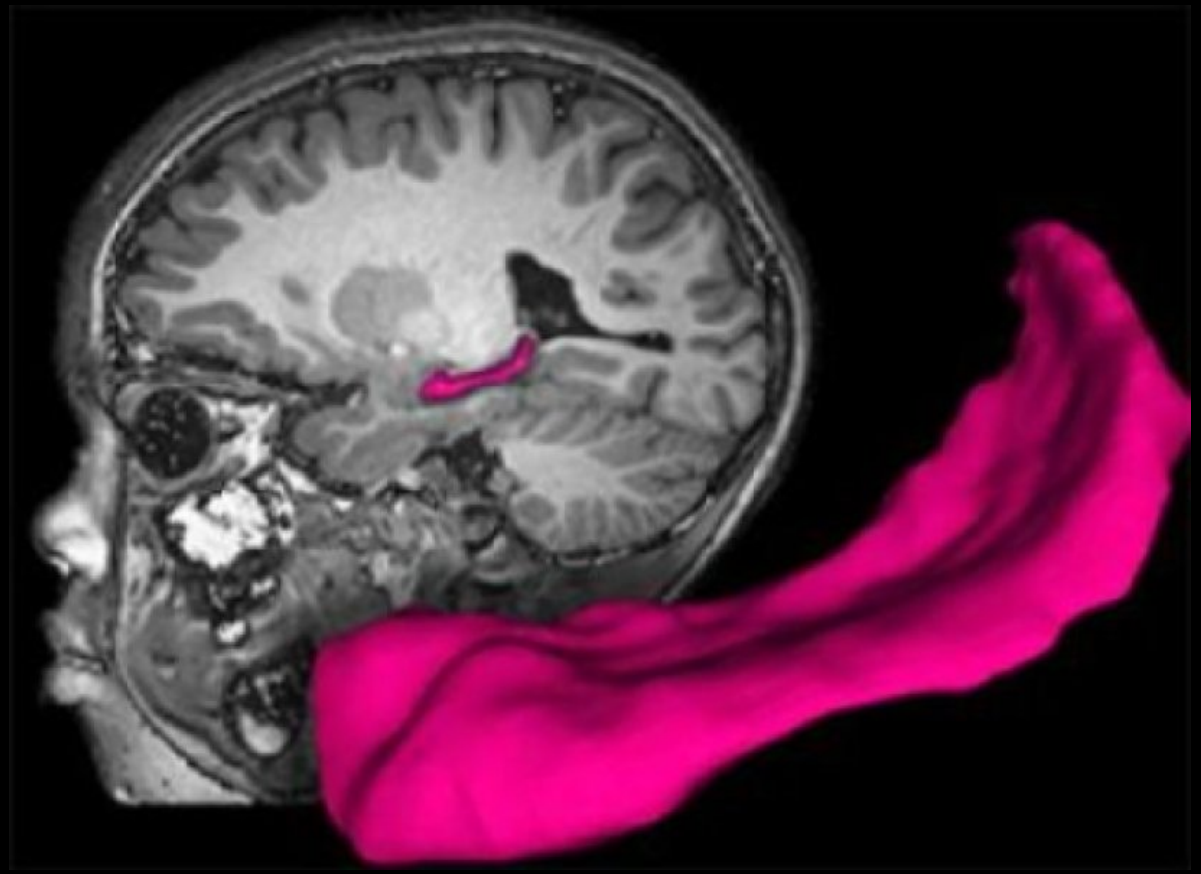
a and b 10 months old patient showing mild brain atrophy in the form of dilated ventricles and prominent cortical sulci.

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.

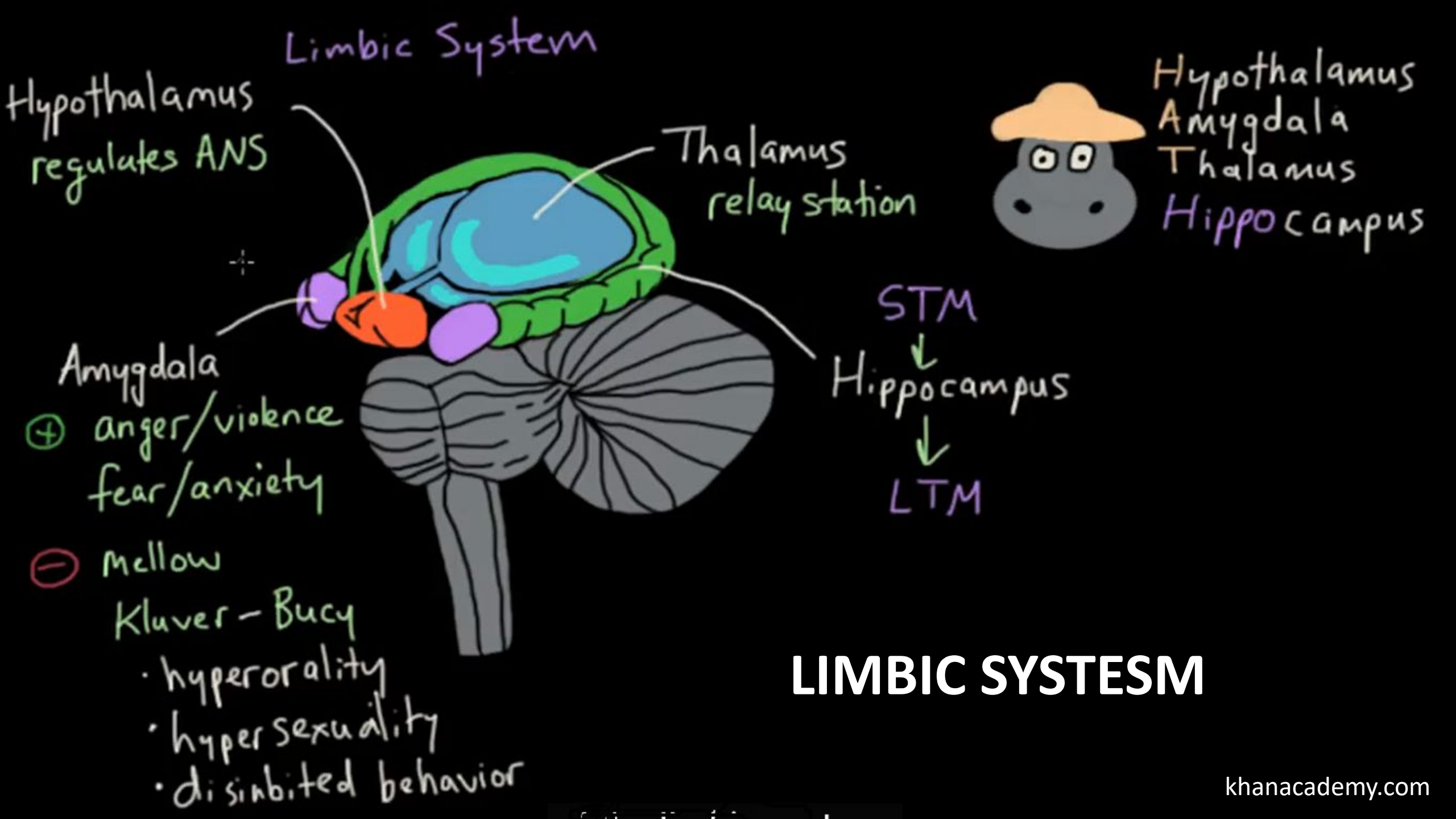
Cerebral atrophy and ventricular dilatation commonly occur in the brains of children suffering from moderate and severe Protein Energy Malnutrition. Children with both edematous and non-edematous types are almost equally affected.

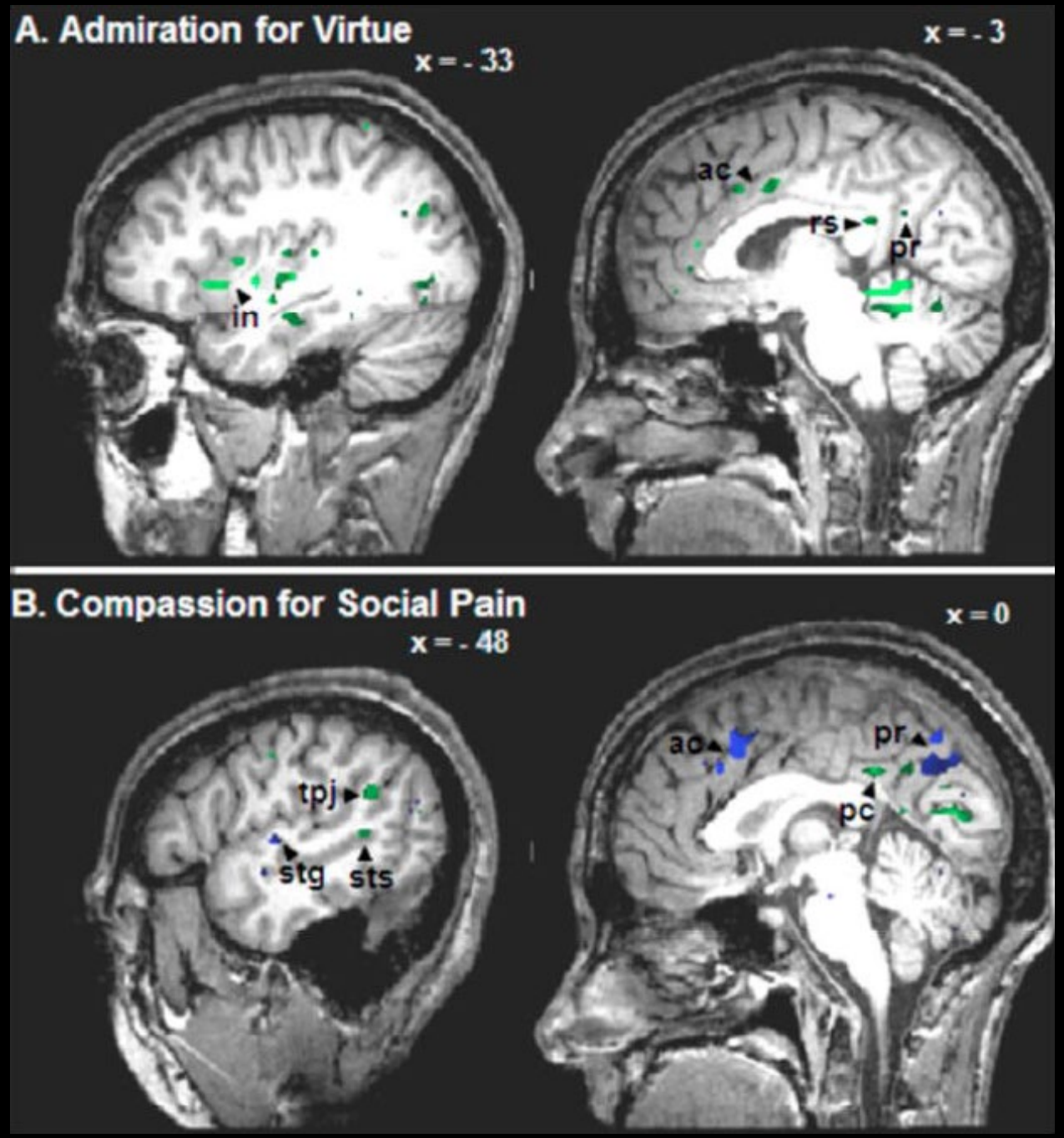
These changes can be reversible if treated in the first 1000 days

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

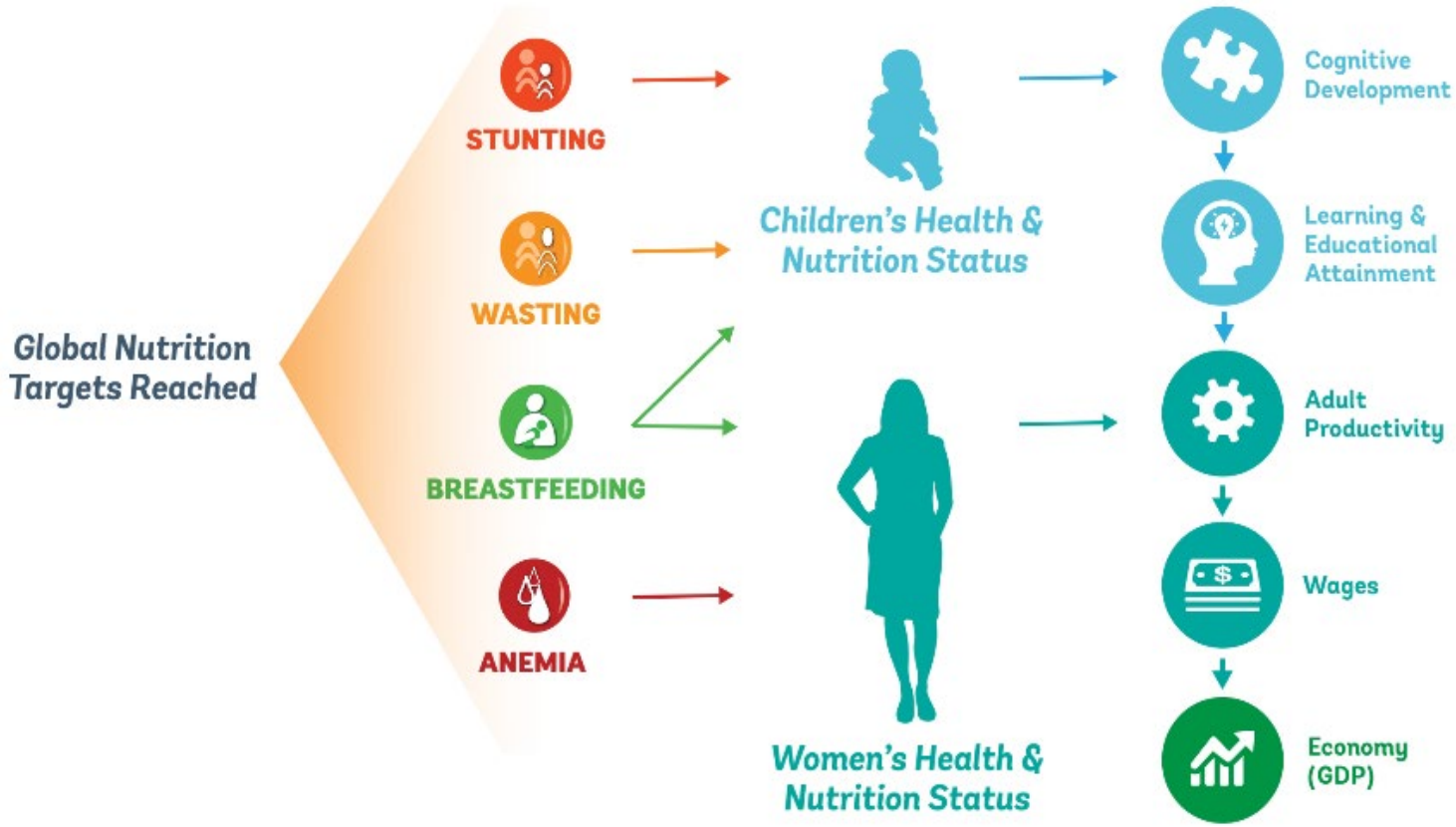

Limbic System
Hypothalamus
regulates ANS
Thalamus
relay station
Amygdala
⊕ anger/violence
fear/anxiety
⊖ mellow
Kluver-Bucy
· hyperorality
· hypersexuality
· disinbited behavior
STM
↓
Hippocampus
↓
LTM
Hypothalamus
Amygdala
Thalamus
Hippocampus
LIMBIC SYSTESM
khanacademy.com

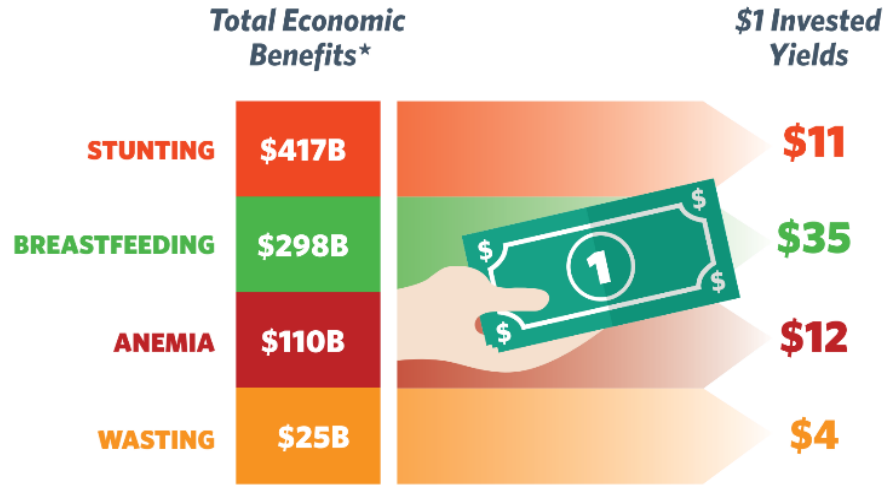


The Hippocampus and Emotional

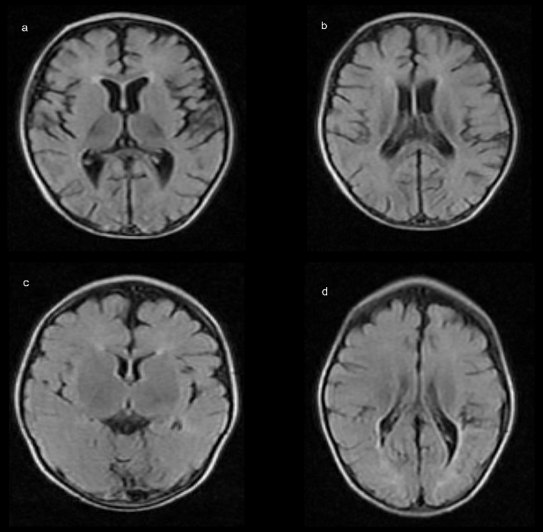
Granger causality maps depicting connectivity of the right hippocampus during admiration for virtue (A) and compassion for social pain (B). fMRI data are from thirteen subjects, displayed on the brain of one subject

Tackling Childhood Malnutrition





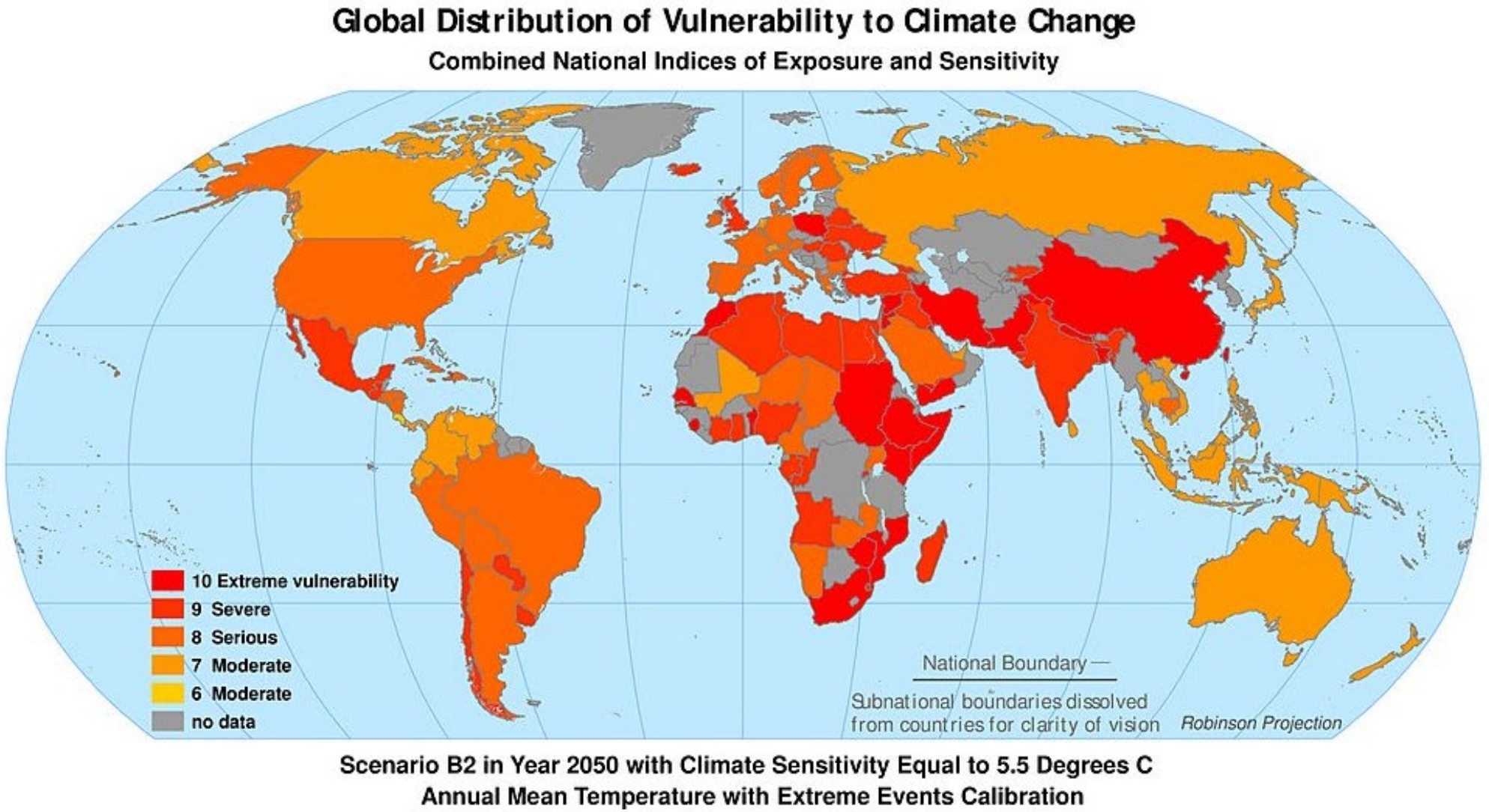
Exploring the possibilities of AI to repair cognitive damage



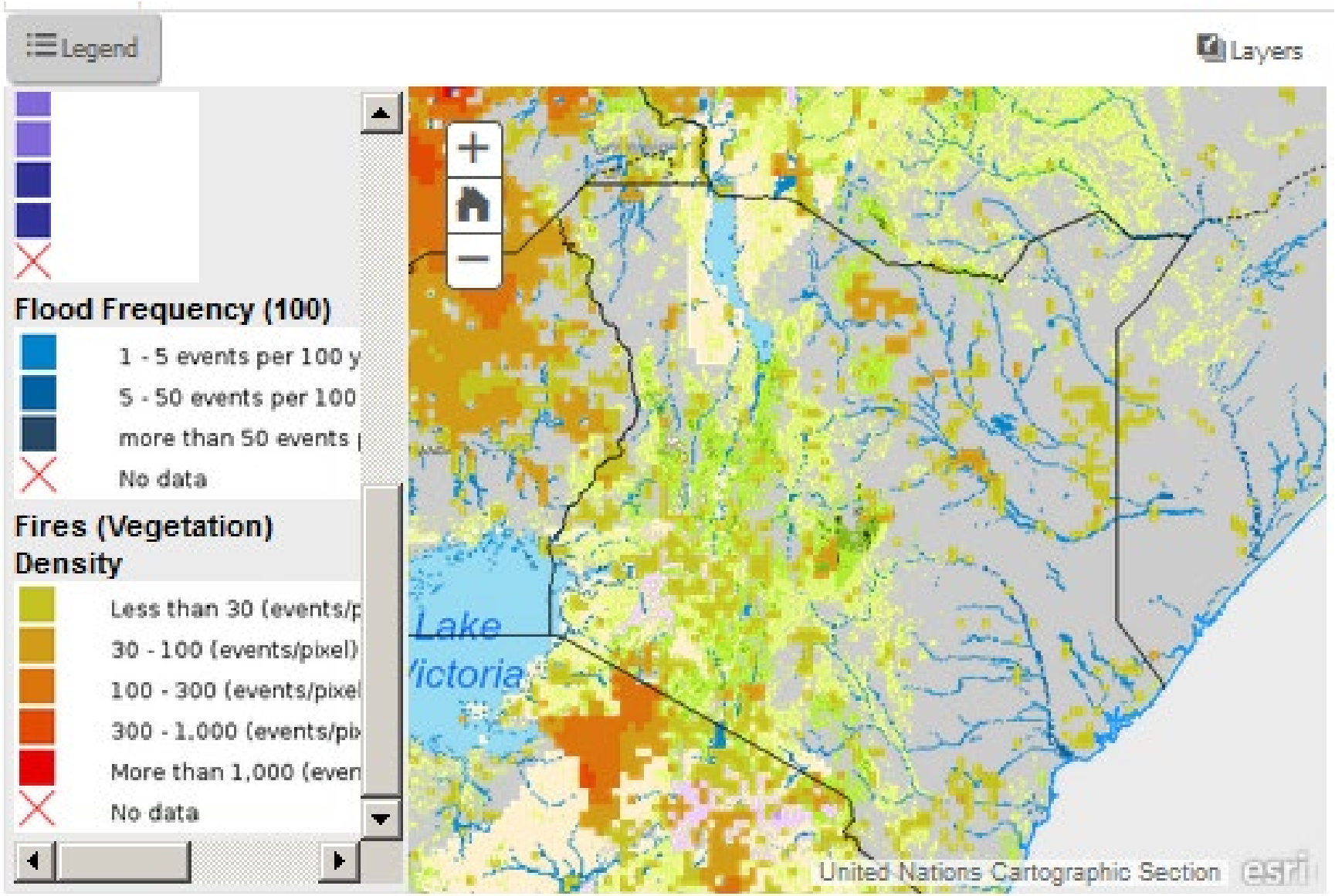
Reversal of loss of development through protein energy and micronutrients in the first 1000 days

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

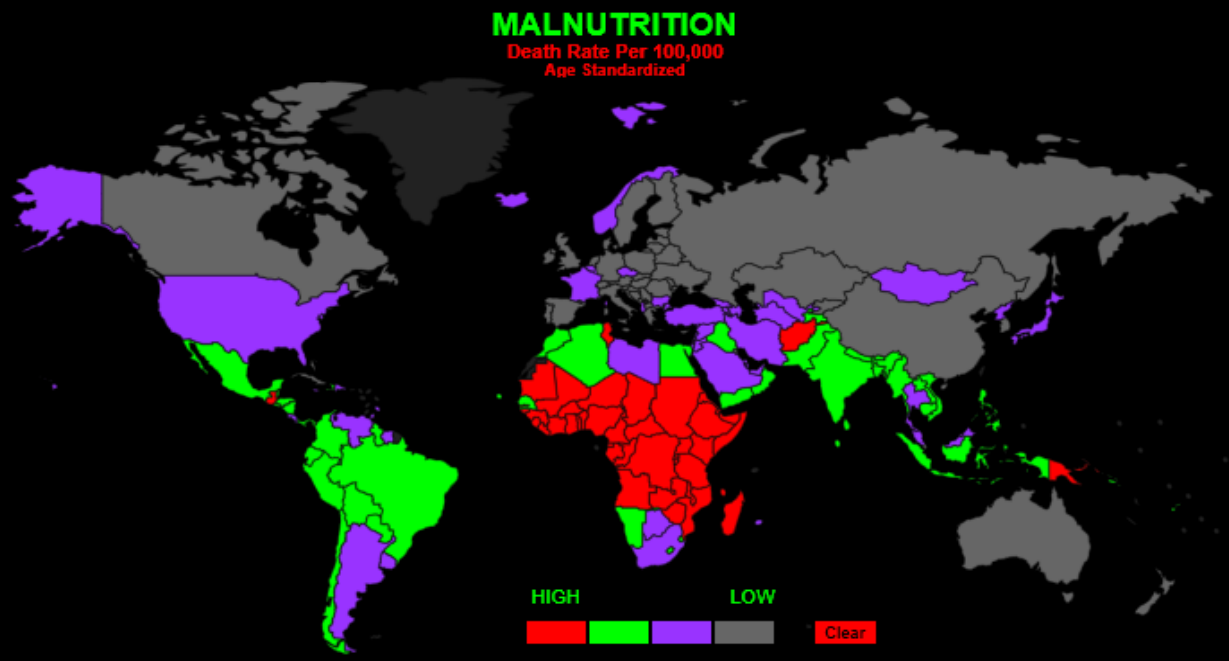
Impacts of Climate Change and Childhood Undernutrition

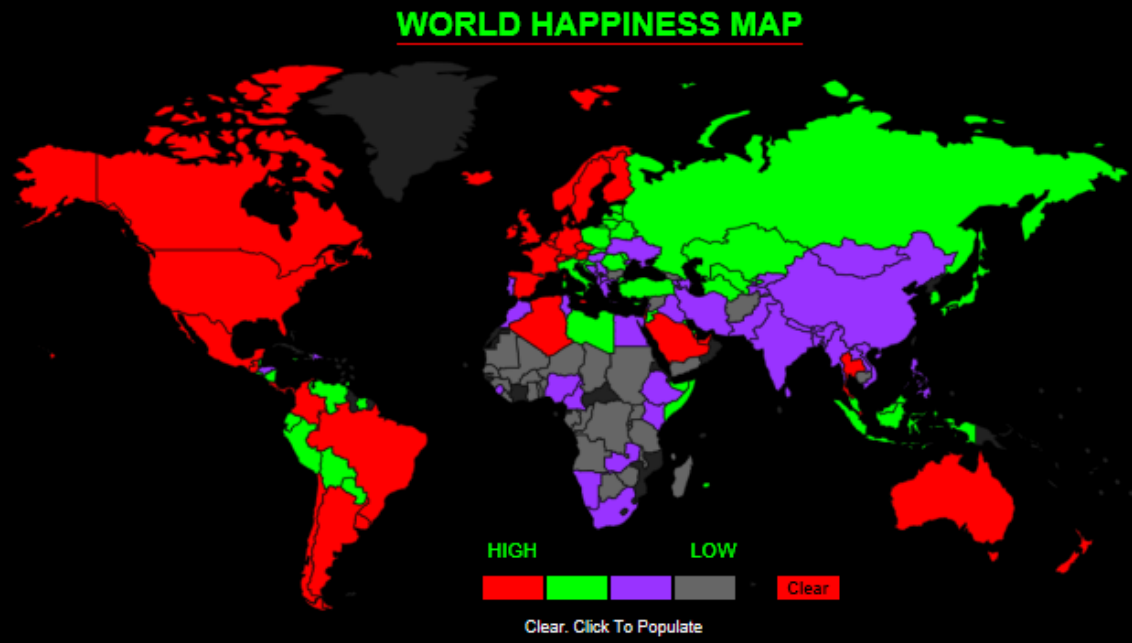


Disasters, Conflicts and Risks – Human and Ecosystem Health



Mapping future cognitive behaviour





Terrorism?

Prosperity?