Policy for Enabling Achievement of Height

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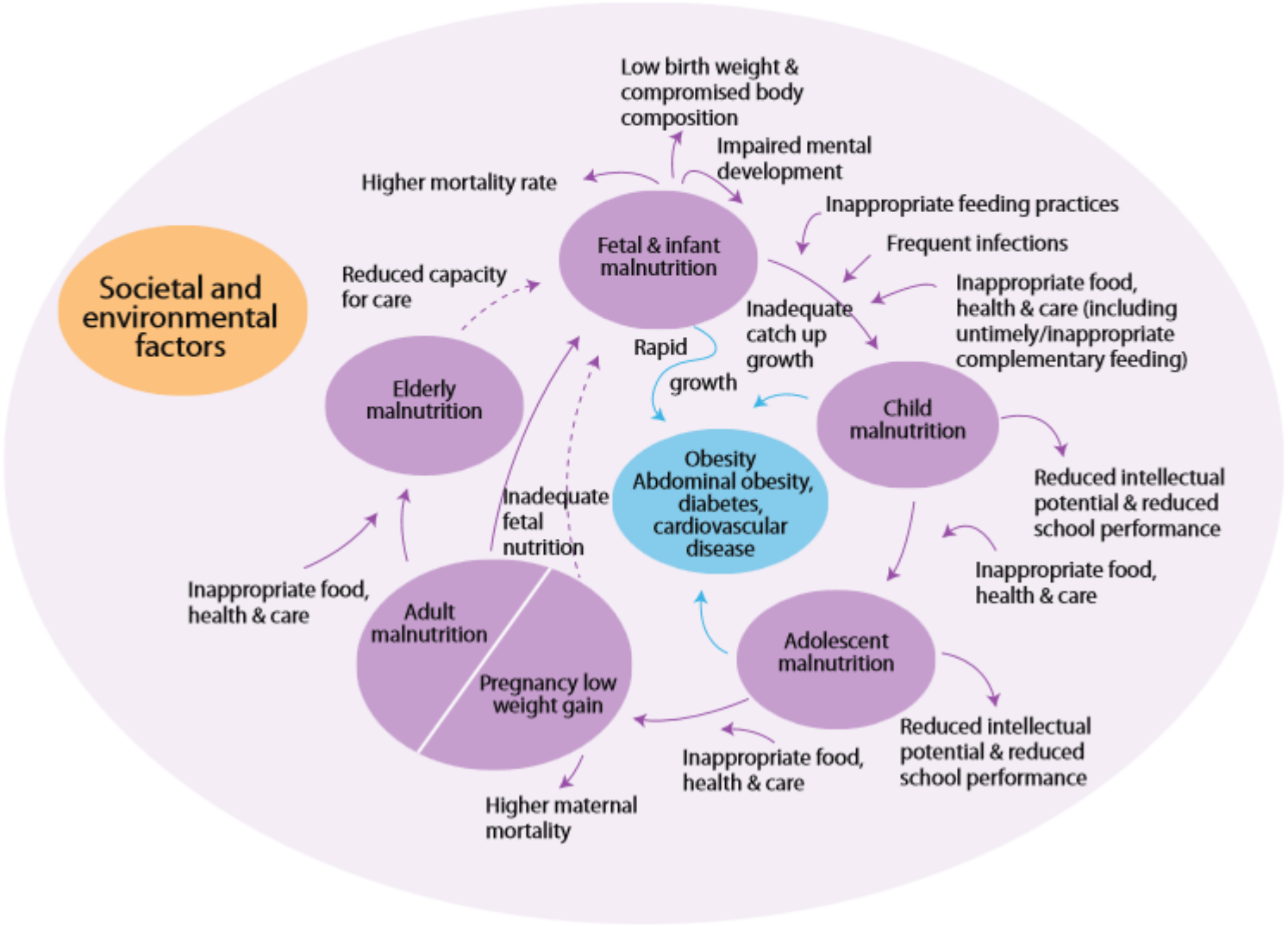
The Southampton Biomedical Research Centre is funded by the National Institute for Health Research (NIHR) and is a partnership between University Hospital Southampton Foundation Trust and the University of Southampton

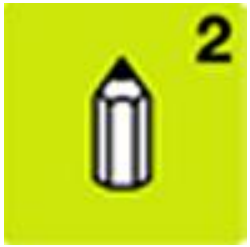
Fig. 1. Life-course: the proposed causal links[6]

Linear growth: Genes, hormonal milieu, energy and nutrients: supportive environment



Achieving the Millennium Development Goals

Eradicate extreme poverty and hunger



Achieve Universal Primary Education

Promote Gender Equality and Empower Women

Reduce Child Mortality

Improve Maternal Health

Combat HIV, AIDS Malaria and other Diseases

Ensure Environmental Sustainability

Develop a Global Partnership for Development

To achieve these goals, poorer countries pledged to improve policies and governance and increase accountability to their own citizens; wealthy countries pledged to provide the resources.

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Global trend towards increase weight and height:

generally desirable:

BUT

increase in weight achieved
- before increase in height

Increase in childhood overweight and adiposity

Increased risk of shortness/stunting and obesity

Quality of Growth as Well as Quantity of Growth

STUNTING: low height for age

More common than wasting
(thinness, severe acute malnutrition)

↑ mortality

↑ morbidity

↓ physical work performance

↓ intellectual function

WHA Global Nutrition Targets 2025:
Policy Brief Series

http://www.who.int/nutrition/topics/nutrition_globaltargets2025/en/

1. achieve a 40% reduction in the number of children under-5 who are stunted;
2. achieve a 50% reduction of anaemia in women of reproductive age;
3. achieve a 30% reduction in low birth weight;
4. ensure that there is no increase in childhood overweight;
5. increase the rate of exclusive breastfeeding in the first 6 months up to at least 50%; and
6. reduce and maintain childhood wasting to less than 5%.

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General Model of Growth

ICP Model – Infant: Childhood: Pubertal

Karlberg et al, Eur J Clin Nutr, 1994

Infant: continuation of fetal growth trajectory, primarily substrate driven.

Childhood: onset 6 months to 2 years, primarily growth hormone driven.

Pubertal: onset around 11 years, primarily sex-steroid driven.

Infant – Child – Puberty (ICP) Model of growth

Three independent phases
Of growth

Each under independent
endocrine system control

Each phase builds on the
platform of the previous
Phase

Failure of transition leads
to growth deficit

Inflammation: impairs growth
plate (allostatic load)

Karlberg

Europe: Secular Increase in Height

Plateau ~1.8 m:

Denmark, Sweden,
Norway, Netherlands
?genetic potential

Increasing:

Belgium, Spain,
Italy, Portugal

Larnkjaer et al Acta Paediatrica 2006

Europe: secular increase in height:

Stopped, 18 years following post-neonatal mortality around 4/1000 deliveries.

Improving socio-economic conditions

better nutrition – healthier diet

decrease in infectious diseases

Evidence for interventions to enable height gain:

Singe interventions limited effect.

Multiple supportive interventions significant effect.

Prospective longitudinal studies: markers for cancer risk.