Food systems for nutrition
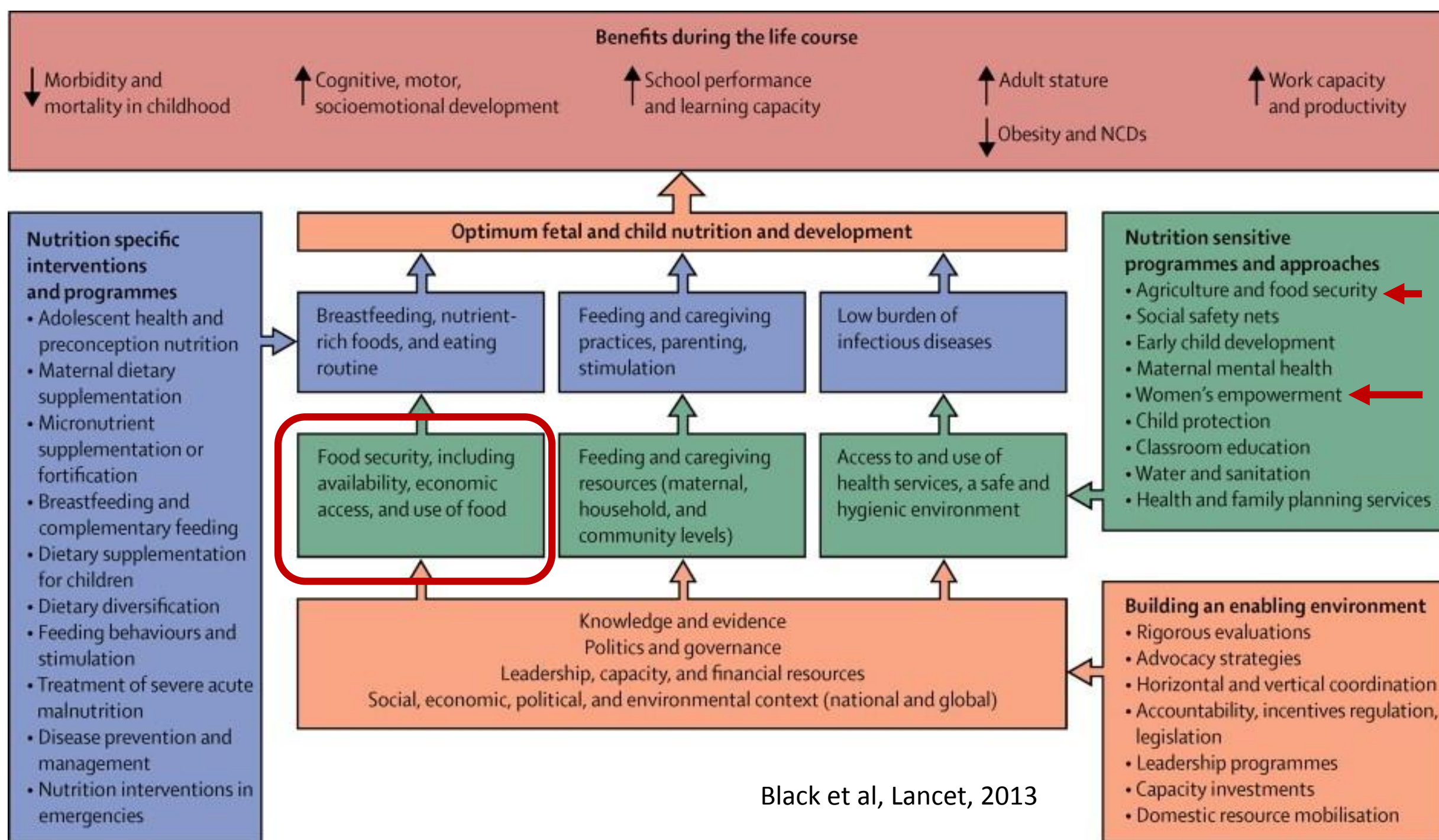
E Ferguson, S Kadiyala, B Shankar, B Haesler, P Dominguez-Salas, D Grace

LSHTM, SOAS, RVC, ILRI

Benefits during the life course

↓ Morbidity and mortality in childhood

↑ Cognitive, motor, socioemotional development

↑ School performance and learning capacity

↑ Adult stature

↓ Obesity and NCDs

↑ Work capacity and productivity

Optimum fetal and child nutrition and development

Nutrition specific interventions and programmes
- Adolescent health and preconception nutrition
- Maternal dietary supplementation
- Micronutrient supplementation or fortification
- Breastfeeding and complementary feeding
- Dietary supplementation for children
- Dietary diversification
- Feeding behaviours and stimulation
- Treatment of severe acute malnutrition
- Disease prevention and management
- Nutrition interventions in emergencies

Breastfeeding, nutrient-rich foods, and eating routine

Feeding and caregiving practices, parenting, stimulation

Low burden of infectious diseases

Food security, including availability, economic access, and use of food

Feeding and caregiving resources (maternal, household, and community levels)

Access to and use of health services, a safe and hygienic environment

Nutrition sensitive programmes and approaches
- Agriculture and food security
- Social safety nets
- Early child development
- Maternal mental health
- Women's empowerment
- Child protection
- Classroom education
- Water and sanitation
- Health and family planning services

Knowledge and evidence
Politics and governance
Leadership, capacity, and financial resources
Social, economic, political, and environmental context (national and global)

Building an enabling environment
- Rigorous evaluations
- Advocacy strategies
- Horizontal and vertical coordination
- Accountability, incentives regulation, legislation
- Leadership programmes
- Capacity investments
- Domestic resource mobilisation

Black et al, Lancet, 2013

- Profiling food environments & diets
- Mapping nutritious and safe food value chains

Assessing potential impact - Modeling & scenario building for decision making
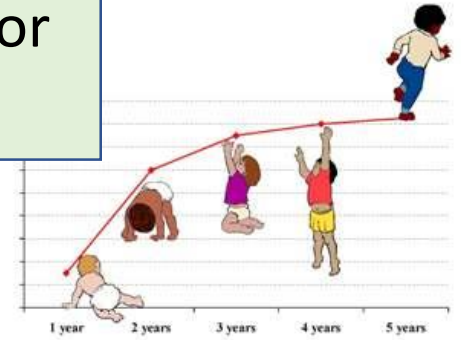
Food system

- Production
- Storage & distribution
- Processing & packaging
- Retail & market

'Safe & nutritious' value chains

Food Environment

External
Supply side

- Food availability
- Vendor & product
- Food prices
- Marketing & regulations

Personal
Demand side

- Affordability
- Accessibility
- Desirability
- Convenience

Diet

Intervention

Agrifood: an innovative tool for diagnostics and interventions development

Value Chain & Food Safety risk assessment

Profiling Food Environments

Food Environment WORKING GROUP: TECHNICAL BRIEF
Concepts and methods for food environment research in low and middle income countries

Figure 2: Food environment domains and dimensions

Prices
Monetary value of food products

Marketing and Regulation
Promotional information, branding, advertising, sponsorship, labelling, policies

Availability
Presence of a food vendor or product

Vendor and Product Properties
Vendor properties (typology, opening hours, services), and product properties (food quality, composition, safety, level of processing, shelf-life, packaging)

EXTERNAL FOOD ENVIRONMENT

Affordability
Purchasing power

Accessibility
Physical distance, time, space and place, individual activity spaces, daily mobility, mode of transport

PERSONAL FOOD ENVIRONMENT

Desirability
Preferences, acceptability, tastes, desires, attitudes, culture, knowledge and skills

Convenience
Relative time and effort of preparing, cooking and consuming food product, time allocation

Agrifood Tool

- Inform decision-makers
  - Agriculture-nutrition programme planners, policy-makers
- Builds on Optifood – a tool based on linear programming
  - Identify nutrient gaps
  - Identify most nutritious foods to strengthen in the food value chain
- Model at household level
- Take into account other factors, such as
  - Women's time use
  - Land/water use
  - Epigenetics/microbiome
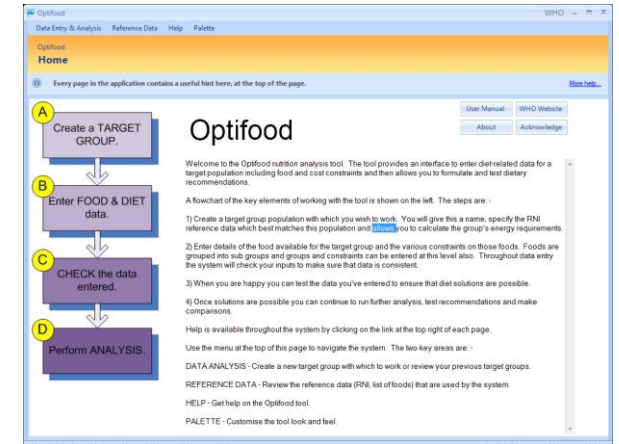
Simulations: Assessing potential implications of interventions

- **Broad approach:**
  - Source data ➡ Food Environment & Value Chains
  - Hold participatory model building sessions
  - Assimilate all the information into a **System Dynamics** simulation modelling framework that captures the various interconnections and complexities
    - It models complex dynamic systems characterized by interdependence, mutual interaction, information feedback, and circular causality." (Source: System Dynamics Society) via nonlinearities, delays & feedback loops
    - Particularly valuable for quantitatively integrating data and concepts from multiple disciplines and sectors.

- **<u>Simulated scenarios</u>** inform programmers/policy-makers on the potential implications of interventions or changes for key outcomes.
  - Focus on the value chains of selected nutritious foods
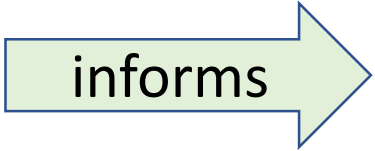
Provides information on pathogen/hazard
- *Critical nodes* - hotspots for introduction or emergence
- *Connectedness* –transmission in the chain
- *Risky practices* – contamination, poor hygiene, etc.

informs →

Food safety risk assessment
including biological sample taking and testing

integration →

Value chain plus risk assessment information helps answering the following questions:
- WHAT pathogens/hazards? WHERE occur ? WHEN?
- WHO may be at risk?   WHY? HOW BIG is the risk (impact)? HOW to manage?

Summary

- Need for inter-disciplinary team's ⟶ the integration of tools, for simulations, and expertise, which are essential to understand the complexities of food systems and determine how to strengthen them for reducing malnutrition

- View this component and linking closely with others presented today:
  - BCC to increase demand for nutritious foods
  - Diets to influence epigenetics/microbiome
  - Reduce influence of parasites/pathogens
  - Optimising environment for full child development

- Other important links are with policy-makers, programme-planners and the private sector to strengthen the enabling environment for improving maternal and child nutrition and address stunting

Thank-you!