Diet transformation and food environments:
Introduction to panels and Q&A on improving nutrition through private sector engagement

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Diet transformation and food environments:
Evidence needed to improve diet quality through private sector engagement

- **Diet quality**, beyond calories to lifelong health
- **Levers of change** to transform food systems
- **Progress to date** in global food environments
Research on food played a key role in the history of science

- Limes prevent scurvy (J. Lind in Britain, 1747)
- Food contains energy (A. Lavoisier in France, 1770)
- Boiling & sealing preserves food (N. Appert in France, 1810)
- Energy can be protein, fats, carbs (J. Liebig in Germany, 1840)
- Germ theory & pasteurization of milk (L. Pasteur in France, 1864)
- “Vitamines” must exist, as rice husks prevent beriberi (1912)
- Vitamin C is first to be isolated, shown to prevent scurvy (1936)

New attributes & functions are still being discovered

- Nutrient adequacy was focus of first dietary guidelines (1941)
- Epidemiological data demonstrates additional role of food groups (1990s)
- Trans fats found harmful, mandatory disclosure (2006) then removal (2015)

Measuring diet quality: What do we know about diets & health?
Improving diet quality: From daily energy to long-term health

• Daily energy needs are fixed around metabolic set points
  o intake & needs are poorly measured, except in laboratories
    driven mainly by total body weight (me ≈ 2260 kcal/day)
    also adjust for physical activity (my runs ≈ 10 kcal/min)
    and adjust for metabolism & disease (age, height, gut health)
  o worst undernutrition is seen in infants under 2, has lifelong consequences
  o overconsumption accumulates in later life, also difficult to reverse

• Higher quality diets improve body composition and health
  o different energy sources (protein, fats, carbs) are metabolized differently
  o ‘essential’ nutrients (vitamins & minerals) are needed for specific functions
  o many other food attributes (fiber, omega-3 etc.) alter health and disease risk
    o some attributes have U-shaped benefits (sodium etc.)
    o harmful components may be new (e.g. trans fats) or ancient (molds)
Levers of change: How can diet quality be improved?

- **Income growth and safety nets**, in cash or in kind
- **Relative prices and convenience**, for healthier vs. less healthy items
- **Consumption norms and preferences**, among all options at home and away
- **Standards and regulation**, when consumers cannot see food content

For example:
- Britain creates Assize of Bread and Ale for quality & weight (1266)
- U.S. creates the FDA & has USDA inspect meat (from 1906)
- Supreme Court rules against false advertising (vinegar, in 1924)
- FDA sets first packaged food standard (canned tomatoes, in 1939)
- FDA defines and regulates additives, creates GRAS list (in 1958)
- Organic standards introduced (in 1990)
- Nutrient fact panels introduced (in 1993 for packaged foods, 2018 for menus)
- Harmful nutrients disclosed then removed (e.g. trans fats, from 2006)

Ross 1956; FDA 2018
Progress to date in global food systems: From *more* food to *better* foods

Dietary transformation towards more and more diverse foods, 1961-2013

Food systems link farms to consumers through agribusiness and food companies

Manufacturing enterprises with economies of scale & scope

- Agribusinesses (seeds, fertilizer & chemicals, veterinary care & machinery)
- Food companies (ingredients, processing, distribution & sales)
- Agriculture (helps end undernutrition through more abundant food)
- Food systems (helps end other forms of malnutrition, with better food)

Input supply

Family farms

Food industry

Food consumers

Household activities limited by time & resources

- Family workers remain more competitive than employees for most field crops (corporate farms succeed primarily for sugar, tea, horticulture and livestock operations)
- Family diets are driven by income and time constraints, prices & preferences (and face big differences in food environments over time and space)

Agriculture helps end undernutrition through more abundant food

Food systems help end other forms of malnutrition, with better food
For agriculture, the rise and then fall of rural population drives change in average farm size

**UN estimates of total rural population, 1950-2050**

- **China's rural population** stopped growing in the early 1990s.
- **India's rural population** will stop growing in the 2020s.
- **Africa's rural population** will keep growing through the 2050s.

Africa's rising rural population keeps workers in agriculture, and keeps children in poverty, until farming conditions improve.

Data shown are author’s calculations from UN World Urbanization Prospects, 2014 Revision, from [http://esa.un.org/unpd/wup](http://esa.un.org/unpd/wup).
At each level of national income, agriculture employs a larger share of workers in Africa than in other regions. Africa’s rising rural population keeps an unusually large fraction of African workers on farms. These are “Preston curves”, showing national averages at each level of per-capita income. At each level of national income, agriculture employs a larger share of workers in Africa than in other regions...and at each income level, there was no shift from 1990s to 2010s.
At each income level, African children are more likely to be stunted, but big gains over time

African adults are less likely to be obese, but prevalence is worsening quickly.

In Africa, there is a strong income gradient and little upward shift in obesity prevalence at each income level, at least by 2010.

From 1990 to 2010, there was a shift up at each income level in richer countries.

Diet transformation and food environments:
Conclusions and introduction to the panels on improving diet quality through private sector engagement

- **Diet quality**, beyond calories to lifelong health
  - *Can we meet nutrient needs within energy balances, to end undernutrition without overshooting?*

- **Levers of change** to transform food systems
  - *Can we use all the tools at our disposal, including safety nets, relative prices, cultural norms & regulation?*

- **Progress to date** in global food environments
  - *Can we continue success with maternal & child nutrition, and extend gains to remaining population groups?*