Overview

Childhood obesity is on the rise around the world, and often persists into adulthood with lifelong consequences for health and wellbeing. At the same time, millions of children fail to receive the nutrients they need for healthy development of minds and bodies. Schools are a natural context in which to provide healthy meals and combat nutrition-related ill health. But ensuring that schools provide healthy foods can be challenging, given the different perspectives of regulators, canteen operators, schools and other stakeholders.

Local Context

In recent years, Malaysia has topped Asia in rates of obesity and overweight; nearly half of all Malaysian adults are now overweight, and this number is rising. In the Malaysian public school system, food provision is generally contracted out to local operators. Despite efforts to ensure high food quality, school canteen foods in Malaysia are often of low nutritional value. This case study explores the mechanisms that potentially underlie this situation.

Addressing the Problem

Two Malaysian ministries are responsible for regulating school food quality: the Ministries of Education (MoE) and Health (MoH). They use three broad mechanisms: setting food quality standards for school canteens, providing food preparation training programmes for canteen operators, and
requiring schools to monitor canteen food quality. This system is designed to be self-correcting: when canteens fail to meet food quality standards, this is picked up by monitoring and penalties are imposed, thus motivating canteen operators to improve quality. Training programmes ensure that canteen operators have the knowledge capacity to produce nutritious food.

**Figure 1:** Regulatory interventions for improving food quality. Interventions are shown in red. A central assumption is that penalties based on monitoring will provide incentives to maintain food quality – this is reflected in the balancing feedback loop (B1) seen here.

**Box 1: Training – Language Barriers**

MoH/MoE train incoming canteen operators to develop their capacity to provide nutritious food at school. Training is delivered in standard *Bahasa Malaysia* (the national language). However, Malaysia is highly culturally diverse. Many operators are non-Malay, with poor command of *Bahasa*, and thus have difficulties benefiting from the training. This is a further challenge for school nutrition in predominantly non-Malay communities.

**Exploring the System**

Several obstacles complicate the MoE and MoH efforts. For one, the effectiveness of monitoring depends on schools. But school administrations and teachers are tasked with many responsibilities beyond their primary goal of education: monitoring canteen foods may not be a high priority.

Even when school personnel understand the value of nutrition to student health and educational outcomes, the perceived importance of monitoring depends on whether it is seen to achieve desired outcomes. However, canteen operators are rarely penalized for serving non-nutritious food; rather, action is taken only in clear cases of food poisoning.

**Figure 2:** Daily monitoring check-list consisting of thirty-five items.

School personnel may therefore come to view monitoring the quality of food as inconsequential, creating a self-perpetuating cycle: shortfalls in food quality go undetected or unreported, opportunities for enforcing penalties are limited, and this further reinforces the perception that monitoring is irrelevant. The monitoring feedback loop, meant to be a virtuous reinforcing cycle, becomes a downward spiral instead.

**Figure 3:** The effectiveness of monitoring by schools depends on intrinsic motivation for food quality and perceived importance of monitoring. If monitoring results in penalties when food quality standards are violated, this reinforces the importance of monitoring among school actors, encouraging continued diligence in monitoring. This is reflected in the reinforcing loop (R1) seen here.
MoE and MoH policy must also account for the influence of financial pressures on canteen operators. Providing healthy food may require more expensive ingredients and higher labour costs, cutting into profit margins. The rental auction policy (see Box 2) and the extent to which students and parents are willing to pay for healthy foods may further impact operator profits.

Box 2: Policy Conflicts – Canteen Operator Tenure and Selection

School canteen operators typically receive two-year contracts, extendable for a third upon satisfactory performance. Contracts are non-renewable and regulatory barriers make it difficult for operators to shift to a different school. This policy, meant to share out the economic benefits of this opportunity, has the unintended consequence of limiting operator experience and increasing training costs.

School canteen contracts are awarded via auction, with the operator offering the highest rent winning the contract. While this generates funds for the school, it also creates a new financial pressure for canteen operators, which in turn limits their means and willingness to purchase and use healthy ingredients.

When profits are low, canteen operators may compromise food quality standards, creating a balancing feedback loop (B2) that works against the regulatory incentive loop (B1). Increasing penalty enforcement and severity might counteract this, but too much pressure may result in canteen operators opting out altogether.

Figure 4: Regulatory interventions for food quality are counteracted by canteen operator financial pressures. Providing high-quality food raises costs and lowers profitability, and low profit margins reduce motivation and ability of operators to provide high quality food, reflected in the balancing loop, B2. Low parent and student willingness to pay for quality food and auction policies for school canteen contracts increase the pressure imposed by B2. Lack of contract renewal options limit operator experience and knowledge capacity.

Systems Solutions

Using systems thinking to examine the interactions between policy-makers, schools, and canteen operators reveals a set of incentives and feedback loops that explains some of the difficulties of providing healthy food in Malaysian public schools. This case study suggests several possible leverage points where interventions might take advantage of this system to produce better outcomes:

1. Allow canteen operator contracts to be renewed, conditional on the provision of food that meets quality standards. This would not only generate incentive for canteen operators to provide healthy foods, but also create new reinforcing loops that increases operator experience and capacity (R2) and commitment to healthy food goals (R3).

2. Implement strategies to increase the willingness of parents and students to pay for healthy foods. This may include increasing awareness among parents of nutritious food benefits, expanding the supplementary food programme to cover more financially vulnerable students, and preventing competing sales of non-nutritious food (by school organisations in fund-raising activities or hawkers outside the school compound), which disadvantages compliant canteen operators.

Box 3: The Supplementary Food Programme

The goal of the supplementary food programme (Program Rancangan Makanan Tambahan) is to improving the physical and mental health of vulnerable school children. Primary school children from families falling below the hardcore poverty line are eligible. Meals are provided via school canteens for up to 190 school days per year. The budgeted amount per meal is RM 2.50 in Peninsular Malaysia, and RM 3.00 in Sabah and Sarawak.
3. Change the auction-based contract system. One alternative is for MoE/MoH to pay school canteen operators for a service, instead of canteen operators receiving payment from students. This would give MoE/MoH more control over menus and relieve financial pressure on canteen operators. Implementing such a change would require financial investment from both Ministries.

4. Improve the monitoring system by (i) enforcing penalties for failing to meet food quality standards, so that school personnel see their monitoring efforts as impactful; (ii) provide financial and personnel resources for schools to carry out nutrition monitoring; and (iii) create an incentive for schools to prioritize monitoring by conducting periodic MoE/MoH inspections, with penalties for schools that fail to achieve food quality standards, creating a reinforcing loop (R4) that improves monitoring.

Further Reading

1. Ensuring healthier school meals

2. The supplementary food programme

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**Reading Influence Diagrams**

Relationships between two variables are represented with arrows. Here, positive relationships (change in X results in a change in the same direction for Y) are described with blue arrows and a “+” sign; negative relationships (change in X results in a change in the opposite direction for Y) are described with red arrows and a “−” sign.

When two or more variables form a loop, it can be reinforcing – amplifying the effects of the relationships, or balancing – bringing the effects of the loop to some equilibrium. These loops and their interactions with each other drive systems behaviours, often in surprising ways.