Effectiveness of Provider Incentives for Anemia Reduction in Rural China

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Sector(s): Health

Location: China

Sample: 72 rural primary schools, 3553 students

Target group: Primary schools

Outcome of interest: Anemia Student learning

Intervention type: Information Subsidies Monetary incentives

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Encouraging the adoption of health seeking behaviors remains a challenge today, despite the affordability and availability of health improving technologies and services. Researchers tested whether providing principals in rural primary schools in China with information, school subsidies, and performance based financial incentives reduced the prevalence of anemia in schools. Only schools receiving the financial incentive showed a significant decrease in anemia prevalence; however when pre-existing incentives for educational performance were also present, both the information and the financial incentives were effective in reducing anemia.

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Despite the availability of cheap and accessible health improving technologies and services, there is traditionally low awareness and low take-up of such products. Misaligned incentives between healthcare providers and health outcomes may explain inefficient distribution and consequently low take up of products like insecticide-treated bednets, oral re-hydration salts, fortified

food staples, or other basic healthcare services. If this is the case, then rewarding providers for achieving socially desirable outcomes, and specifically pay-for-performance schemes for improving health outcomes, may help motivate improvements in service delivery.

Schools may be a good venue to cost-effectively and conveniently reach more children since schools are more widespread than clinics in most countries, absenteeism among teachers is typically half that of health workers, and improving health and nutrition outcomes for school-going children might impact education and economic outcomes as well. Can financial incentives for service providers, including teachers and school administrators, effectively improve health outcomes?

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The study was conducted in rural primary schools in the northwest region of China. Despite China's rapid economic growth, prevalence of anemia among children in rural China ranges from 20 to 60 percent, implying more than ten million affected children Childhood anemia is known to lead to a number of adverse outcomes, including fatigue, stunted growth, and inhibited cognitive development. Ultimately, anemia can inhibit the development of employable skill sets, which can lower future socioeconomic status. Nevertheless, there is potential for these continuing problems to be solved with simple, low-cost nutritional interventions.

Researchers identified ten nationally designated poor counties across two districts with high anemia rates: Ningxia and Qinghai. The study focused on 4th and 5th grade students within selected schools, as they are old enough for test scores to be relevant, but too young to have reached puberty, where nutritional requirements are different.



Children eat their lunch at school in China.

Photo credit: Grant Miller, Stanford University

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Researchers conducted a randomized evaluation to test whether providing information, school subsidies, and performance based financial incentives to school principals to promote improved health outcomes can reduce anemia prevalence. The sample consisted of 3553 4th and 5th grade students ages 9 to 11 in 72 randomly selected rural primary schools across northwest China.

Schools were randomly assigned to one of three interventions, described below.

1. *Information Campaign*: School principals in fifteen schools received three types of information about anemia: (1) the share of enrolled students in their school who were anemic, (2) a description of effective methods for reducing iron deficiency, and (3) details about the relationship between anemia and school attendance, performance and cognitive development
2. *Information Campaign* + *Subsides*: School principals in fifteen schools received the same information as above, plus a subsidy of 1.5 yen (approximately US $0.22) per student, which was to be used for nutrition related expenses to reduce anemia.
3. *Information Campaign* + *Subsidies* + *Incentives*: School principals in fifteen schools were given both of the above interventions, plus a performance payment for anemia reduction among their study body. Principals were rewarded 150 yen (approximately US$22.50) per student who changed from anemic to non-anemic over the course of the program.

A fourth randomly selected set of 27 schools was assigned none of the above programs and served as a comparison group.

To understand the context in which these interventions were functioning, researchers collected information on pre-existing financial incentives that local education bureaus were offering schools for good test scores. Approximately 20 percent of the schools within the sample were already receiving education incentives before the intervention through China's cadre evaluation system. These education incentives existed in a non-random subset of schools within the sample, and were implemented independently of the health incentives.

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Only those schools receiving the performance-based financial incentive showed a significant decrease in anemia prevalence; however when pre-existing incentives for educational performance were also present, both the information campaign and the financial incentives were effective in reducing anemia. Principals receiving the incentives were more likely to employ targeted strategies to increase iron intake and reduce anemia prevalence in their schools.

Changes in hemoglobin concentration and anemia prevalence: Only the group receiving financial incentives had a statistically significant increase in hemoglobin levels and reduction in anemia prevalence among students. The incentive group showed 2.4 g/L higher hemoglobin levels and a 5 percentage point reduction in anemia prevalence relative to the comparison group.

Test score incentives: In the presence of pre-existing incentives for educational performance, the information and the incentive groups were much more effective. These interventions raised hemoglobin levels by 9.8 g/L and 8.6 g/L more than schools without the test score incentives, respectively. Additionally, there was a corresponding 11 percentage point reduction in the probability of anemia in the information group, and a 6 percentage point reduction in the incentive group. The effect of the subsidy alone did not vary with academic performance incentives.

Behavioral Responses of Principals: In response to the above interventions, principals employed three major strategies for reducing anemia. First, compared to the subsidy group, principals in the performance incentive group used strategies that narrowly targeted increasing iron intake as opposed to broad nutritional intake, which is consistent with having a direct incentive to reduce anemia. Second, consistent with research linking school performance to nutritional gains, principals with performance incentives were more likely to focus on feeding programs than other groups. Third, relative to the comparison group, principals in all intervention groups were more likely to provide parents with information about anemia. However, principals in the information

arm did so more intensively if their school also had incentives for improving academic performance.

Performance incentives to promote health outcomes may hold promise for improving service delivery and increasing take up of health improving products and services; however, context matters, and such incentives should be implemented in harmony with other pre-existing incentives. To better understand the effects of different combinations of incentives and program resources, researchers conducted a follow-up study on the implementation of a similar school-based anemia reduction program in western China.

Renfu Luo, Grant Miller, Linxiu Zhang, Sean Sylvia, Yaojiang Shi, Patricia Foo, Qiran Zhao, et al. 2012. "Effectiveness of Provider Incentives for Anaemia Reduction in Rural China: A Cluster Randomised Trial." BMJ, 345:e4809