WFP EVALUATION

Impact Evaluation of the Home-Grown School Meals Programme in The Gambia

Impact Evaluation Report

March 2025

WFP
World Food Programme
SAVING LIVES
CHANGING LIVES

Acknowledgements

The work described in this report is the result of a collaboration between the World Food Programme (WFP) Office of Evaluation and the World Bank's Development Impact Evaluation (DIME) department.

THE WORLD BANK
IBRD • IDA | WORLD BANK GROUP
Development Economics • Impact

The study has been pre-registered in the American Economic Association Randomized Control Trials (AEA RCT) registry at: https://www.socialscienceregistry.org/trials/11324

We are grateful to all individuals who contributed to this evaluation and, in particular, the respondents for their time.

Suggested Citation: Barro, D., Bogaards, C., Christian, P., Heirman, J., Kelley, E., Khincha, R., Kondylis, F., La, M.P., Lane, G., Lerva, B., Lombardini, S., Zwager, A. (2025). Impact Evaluation of the Home-Grown School Meals Programme in The Gambia. World Food Programme Office of Evaluation.

Contact:
Simone Lombardini (simone.lombardini@wfp.org)
Astrid Zwager (azwager@worldbank.org)

Key personnel for the evaluation

WFP OFFICE OF EVALUATION

Director of evaluation	Anne-Claire Luzot
Head of impact evaluation unit	Dr Jonas Heirman
Impact evaluation officer	Simone Lombardini
Monitoring and evaluation officer	Minh Phuong La
Evaluation analyst	Armand Degla

THE WORLD BANK DEVELOPMENT IMPACT EVALUATION (DIME) DEPARTMENT

Research manager	Dr Florence Kondylis
Senior economist	Dr Paul Christian
Economist	Dr Erin Kelley
Economist	Dr Gregory Lane
Economist	Dr Benedetta Lerva
Research officer	Astrid Zwager
Research analyst	Roshni Khincha
Impact evaluation analyst	Cox Bogaards
Field coordinator	Daniele Barro

WFP THE GAMBIA COUNTRY OFFICE

Country director	Miranda Sende
Deputy country director	Malick Ndiaye
Policy officer	Tamsir Cham
Vulnerability analysis and mapping officer	Salifu Jaiteh
Partnership officer	Anta Kahjanneh

Contents

List of figures

List of tables

Key takeaways

1. School meals directly translated into improved food security and dietary diversity, with greater impacts observed among girls.
2. Mental well-being improved substantially (decreased rates of stress and depression), especially among girls, because of school meals.
3. Implementing an accountability system based on teacher incentives was an effective way to increase teacher attendance, with a main effect observed among female teachers.
4. School meals and teacher incentives both increased child attendance and reduced dropout rates during the school year among children whose attendance was low to begin with.
5. Despite higher attendance, there were limited improvements in children's literacy test scores during the evaluation period. However, combining school meals and teacher incentives led to improved performance on basic reading tasks.
6. School meals, with or without teacher incentives, were as cost-effective as cash transfers or school inputs (e.g. providing textbooks, uniforms, etc.) for improving learning-adjusted years of schooling.

Executive summary

1. School meals represent one of the most widespread social safety nets in the world – an estimated 418 million children benefit from school meals globally. School meals also encourage families to send their children to school. Once in the classroom, school meals ensure that children are well nourished and ready to learn. Therefore, school meals programmes are crucial for promoting children's health, nutrition, education and learning. Although evidence exists that school feeding impacts children's enrolment at schools, more evidence is needed on the impacts of these programmes on health, nutrition, human capital outcomes and social protection, particularly from a gender perspective.

2. In 2021, the World Food Programme (WFP), in partnership with the World Bank, launched the School-based Programmes (SBP) Impact Evaluation Window to generate a portfolio of impact evaluation evidence on school feeding programmes to inform policy decisions and programmes. Since then, six randomized control trials have been launched in The Gambia, Jordan, Burundi, Guatemala, Malawi and Madagascar.

3. The SBP Impact Evaluation Window contributes to the global evidence base on school meals to help institutions and governments with designing and scaling up their programmes. The SBP Impact Evaluation Window aims to establish portfolios of impact evaluations across a series of countries using the same or similar designs to increase the generalizability of results and contribute to closing key knowledge gaps. The evaluations in this window focus on: (i) documenting the impacts of school meals programmes on health, nutrition, human capital outcomes, gender-based outcomes, social protection and social cohesion (including identifying complementary interventions that can maximize learning impacts); (ii) generating evidence on how best to design home-grown school feeding (HGSF) programmes (as many programmes and governments are increasingly sourcing food for school meals locally from smallholder farmers with the aim of supporting local agriculture); and (iii) informing the optimization and transition to government-led national school feeding programmes.

4. This report presents the results from an impact evaluation conducted in the context of the WFP school meals programme in The Gambia. The evaluation took place in the context of the Global Agriculture and Food Security Program (GAFSP) -financed Home-Grown School Feeding Programme. The evaluation began in October 2022. In alignment with the pre-analysis plan, the evaluation focused on a subset of 92 schools that had no recent experience with school meals programmes. The evaluation period began when the first such meals were provided to students in January 2023 and concluded with the recording of student outcomes in October of the same year.

5. Connected to the objectives and theory underlying the programme, this impact evaluation aims to answer the following questions:

    - Does the provision of HGSF interventions impact children's food security, nutrition, health and education outcomes?
    - Are there heterogeneous impacts of providing home-grown school meals to primary school students in terms of gender?
    - Do school feeding programmes mitigate children's vulnerability to seasonal fluctuations and shocks?
    - Does greater teacher attendance, improved through an accountability system based on monetary teacher incentives, increase the impacts of school feeding programmes on educational outcomes?
    - What is the cost effectiveness of school feeding relative to other interventions?

6. The impact evaluation was designed as a phased-in cluster randomized control trial comparing grade 3 children in 92 schools (totalling 2,175 children) across four groups:

    - School feeding-only group (23 schools): All children in these schools receive a daily meal. Grade 3 teachers do not receive additional incentives.
    - Teacher incentives-only group (23 schools): All grade 3 teachers in these schools are enrolled in an accountability system to receive an incentive aimed at increasing their attendance. Children do not receive a daily meal.

- School feeding and teacher incentives group (23 schools): All children in these schools receive a daily meal and all grade 3 teachers are enrolled in an accountability system to receive an incentive.
- Comparison group (23 schools): Schools do not receive school meals or teacher incentives during the evaluation period.

Schools in groups with no school feeding during the evaluation period were prioritized for the phase-in of the programme upon completion of the evaluation.

7. The evaluation strategy combined several sources of data: the evaluation team collected five rounds of high-frequency child surveys in schools and conducted teacher spot-check visits. In addition, the evaluation team collaborated with the WFP country office and the Ministry of Education to digitize administrative, education and project implementation data and costs.
8. Self-reports from children during the high-frequency surveys indicated successful delivery of the school meals programme. Of those children assigned to receive school meals, 78 to 93 percent reported having received a meal. In the comparison group, this rate fluctuated between 0 and 7 percent.
9. The school meals directly translated into improved food security and dietary diversity. The share of children with acceptable levels of food security increased by 12 percent. These results were driven by greater impacts on girls, who experienced an increase in food security of 16 percent. As a result of this increase, the evaluation found improved measures of mental well-being, especially among girls. Although the children experienced fluctuations in food security throughout the year, there was no indication that school meals reduced the variability in children's food security or school attendance throughout the year.
10. Teacher incentives were successful at increasing teacher attendance. The attendance of teachers enrolled in the accountability system in which they received monetary incentives to go to work increased from 74 to 84 percent. Teacher retention also increased in the following 2023/24 academic year by 17 percentage points (from 70 to 87 percent). These effects were mainly driven by female teachers.
11. School meals and teacher incentives both increased child attendance (especially among children whose attendance was low to begin with) and reduced dropouts during the school year. The attendance of children in the bottom 20th percentile increased from 20 to 54 percent. The dropout rate during the year reduced from 15 to 9 percent. By tracking children into the 2023/24 academic year, the evaluation also saw that the receipt of any of these interventions led to a 7-percentage point increase (from 70 to 77 percent) in the fraction of children who were promoted to the next grade.
12. Although the school meals and teacher incentives both improved child and teacher engagement with the school, neither of these interventions led to improvements in children's cognitive abilities or test scores as measured during the evaluation period. However, the evaluation found suggestive evidence indicating that combining school meals and teacher incentives improved children's reading ability.
13. The evaluation did not find that school meals had any effect on proxies for malnutrition such as obesity, overweight, thinness or stunting. Similarly, school meals did not affect children's reported feelings regarding social cohesion, inclusion, belonging and trust.
14. The positive impacts of school meals on children's food security and dietary diversity are concentrated among girls; similarly, decreases in the proportion of children reporting moderate to severe depression and medium to high levels of stress were concentrated among girls.
15. School meals programmes are effective at improving child outcomes across multiple dimensions, such as food security, education attendance and mental well-being. However, they might not be sufficient to achieve improvements in educational outcomes if the educational system in which they are implemented is not able to translate these outcomes into improved learning. This evaluation showed that adding an accountability system based on teacher incentives can be a cost-effective way to increase teacher attendance, which, combined with school feeding, can lead to better learning outcomes. Comparing the cost effectiveness results with a wide range of education interventions shows that school feeding alone or combined with teacher incentives is as cost-effective as cash transfers or school inputs (e.g. providing textbooks, uniforms, etc.) for increasing learning-adjusted

years of schooling (LAYS). More evidence is needed to determine the effects of implementing such measures on the local economy when the school meals procurement occurs within local markets.

16. These results can inform ongoing school meals programmes in The Gambia and globally. The positive observed outcomes for children's health and nutrition support the scaling up of school meals programmes. Similarly, complementary activities might also be considered to improve educational outcomes. How home-grown procurement practices might affect local economies should also be explored in greater detail.

1. Introduction

17. School meals represent one of the most widespread social safety nets in the world, with an estimated 418 million children currently benefiting from them globally.[1] School meals are intended to have positive effects on children's nutrition and health. They also encourage families to send their children to school. Once in the classroom, school meals ensure that children are well nourished and ready to learn.[2] For these reasons, school meals programmes play an important role in promoting children's health, nutrition, education and learning.

18. This impact evaluation is part of the School-based Programmes (SBP) Impact Evaluation Window, which was created in 2021 by the World Food Programme (WFP) Office of Evaluation, SBP Division, with the Development Impact Evaluation (DIME) department of the World Bank.[3] The SBP Impact Evaluation Window aims to establish portfolios of impact evaluations across a series of countries to understand the impacts of school meals on three main thematic areas: health and education; local economies and food systems; and programme optimization and cost effectiveness. The SBP Impact Evaluation Window deploys consistent measurement approaches and similar designs to increase the generalizability of the results obtained.

19. WFP The Gambia joined the SBP Impact Evaluation Window in March 2022 to contribute to the evidence regarding the impacts of home-grown school feeding (HGSF) on children's health, nutrition, education and learning outcomes and to provide policy-relevant evidence to inform the scaling up of programmes.

20. School meals play a role in attracting, feeding and nurturing children while in school. This evaluation investigates the effects of school meals on children's nutrition, health and social cohesion outcomes. However, in instances where schools are unable to provide their full range of potential services, such as when teachers are absent, households may feel less inclined to send their children to school and children may be less likely to learn. This evaluation investigates the effects of school meals on educational and learning outcomes and of complementary activities designed to reduce teacher absenteeism. By piloting a teacher incentive scheme, this evaluation aims to examine whether school-based interventions can significantly improve the impacts of child interventions, particularly on learning outcomes. Finally, this evaluation also investigates the extent to which school meals act as a social safety net, protecting boys and girls during shocks and seasonal fluctuations. Using high-frequency data, this evaluation explores whether the benefits of school feeding programmes vary throughout the year depending on seasonal fluctuations, shocks and stressors, providing valuable evidence to facilitate the scaling up of such programmes.

21. The report begins by describing briefly the context of The Gambia and the programme. This is followed by a discussion of the implementation of the project. This is followed by a discussion of the evaluation methodology and design, data sources, and the ethical considerations. The report then presents the results, combining all of the data sources. Lastly, the report discusses the main findings and presents the conclusions and considerations that follow from the results. The annexes offer additional details: Annex 1 describes all of the outcomes of interest. Annex 2 provides the baseline balance tables. Annex 3 presents the estimation strategies. Annex 4 provides an overview of the findings. Annex 5 describes the stakeholder analysis. Annex 6 presents an overview of the findings disaggregated by gender. Annex 7 includes an overview of the findings with control variables. Annex 8 presents the limitations. Annex 9 provides a detailed description of data collection. Finally, Annex 10 describes all costing assumptions for the cost effectiveness analysis.

[1] WFP. (2022). *State of School Feeding Worldwide 2022.*

[2] Snilstveit, B., Stevenson, J., Phillips, D. et al. (2015). Interventions for Improving Learning Outcomes and Access to Education in Low- and Middle-Income Countries: A Systematic Review. Technical report. 3ie.

[3] WFP. (2021a). School-based Impact Evaluation Window: Concept Note.

1.1 Evaluation features

22. The Gambia country office of WFP requested an impact evaluation and was included in the SBP Impact Evaluation Window in May 2022. The pre-analysis plan for this evaluation was published on the American Economic Association (AEA) Randomized Control Trial (RCT) Registry in May 2023.

23. The evaluation implemented a RCT design across 92 primary schools with five waves of panel surveys of 2,175 children, capturing a wide range of outcomes such as health, nutrition, human capital outcomes, social protection and social cohesion. In addition, the evaluation cross-randomized and implemented teacher incentives in 23 schools receiving school feeding and 23 schools not receiving school feeding. Teachers were asked to engage in a remunerated data collection task that required to be present in school and that aimed to reduce teacher absenteeism, which is likely to affect children's learning outcomes.

24. This evaluation combines multiple sources of data. The evaluation collected five rounds of high-frequency child surveys. In addition, the evaluation team worked with the WFP country office to set up a system to digitize child and teacher attendance records. Finally, the evaluation conducted teacher spot-check visits in all 114 grade 3 classes in all 92 schools.

25. The central purposes of this evaluation are to assess the impacts of HGSF interventions on children's outcomes and to contribute to the literature on health and education systems. The specific objectives are to:

- quantify the impacts of HGSF programmes on children's education, nutrition, health outcomes and food security outcomes;
- determine whether there are heterogeneous impacts of providing home-grown school meals to primary school students in terms of gender;
- determine whether school meals programmes mitigate children's vulnerability to seasonal fluctuations and shocks;
- investigate whether greater teacher attendance increases the impacts of school meals programmes on educational outcomes; and
- investigate the cost effectiveness of school feeding (and its combination with teacher incentives) relative to other interventions.

26. The primary audience for this evaluation includes the WFP country office for The Gambia and its partners, including major donors (e.g. the World Bank, the International Monetary Fund and the African Development Bank) and the Government of The Gambia. Additionally, it is intended to be useful to a wide audience of stakeholders, including policymakers and organizations focused on school health and nutrition, particularly in the context of The Gambia and similar regions. The results obtained are expected to provide insights that will help to refine both ongoing and future WFP school meals programmes.

1.2 Country context

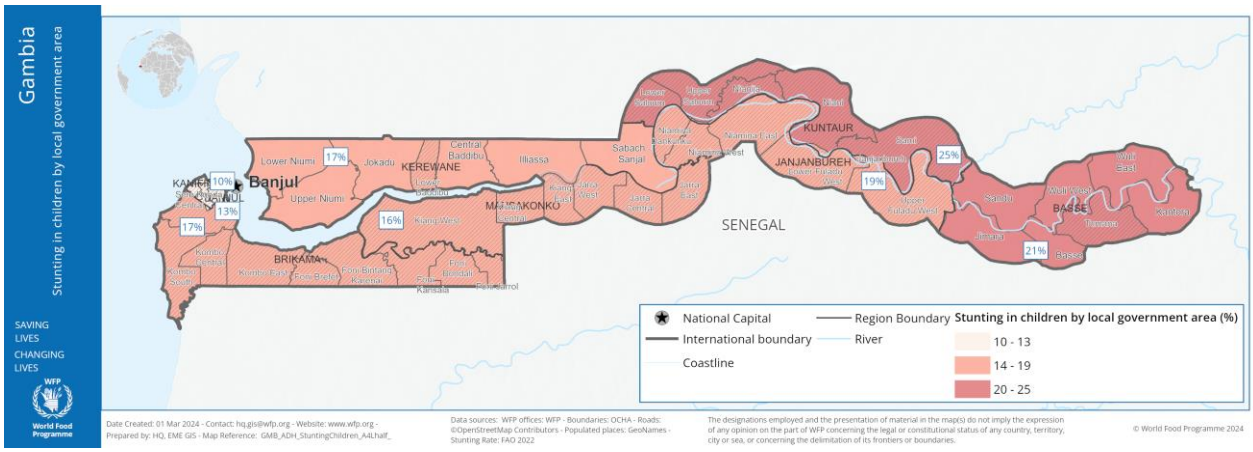
27. The Gambia is one of the poorest countries in the world, with nearly half of the population of the country living below the poverty line.[4] Approximately 80 percent of the population of the country depends on agriculture for their livelihood. This agriculture is predominantly rain-fed, with the rainy season in The Gambia occurring between June and October, which coincides with the lean season. For common crops, sowing occurs in June/July. The maize-harvesting season starts in September, with other crops (e.g. millet, sorghum, rice and groundnuts) being sown in October/November. Food insecurity is particularly pronounced in rural areas, occurring at a rate of 23.9 percent compared with 10.8 percent in urban areas.[5]

[4] IFAD. (2019). *Investing in Rural People in The Gambia*. International Fund for Agricultural Development.

[5] WFP. (2021c). *State of Food Security in The Gambia*.

28. The rates of stunting are relatively high in The Gambia, with most districts exhibiting under-5 stunting rates of 15 percent or higher.[6] Figure 1 depicts the regions included in this impact evaluation, where rates of stunting vary between 10 and 20 percent. This situation has become worse due to exogenous shocks such as the COVID-19 pandemic and climate change. The 2021 Comprehensive Food Security and Vulnerability Analysis showed an overall deterioration in food and nutrition security in the region. When compared with the previous Comprehensive Food Security and Vulnerability Analysis assessment, which took place in 2016, the results showed a 30-percent increase in people who were marginally food insecure, a 4.2-percent increase in people who were moderately food insecure and a 1.2-percent increase in people who were severely food insecure.[7]

Figure 1: Under-5 stunting rate by region



Source: WFP, reproduced from FAO, EU & CIRAD. (2022).

29. School completion rates remain low throughout the country, with an average primary school completion rate of 65 percent. This average masks substantial regional variation, with primary school completion rates varying from 36 percent in the east to 81 percent in the west, as is shown in Figure 2. Moreover, what children learn while at school is limited: only 9 percent of grade 3 students demonstrate the expected reading level for their grade.[8]

30. As The Gambia continues to respond to rapid increases in primary school enrolment, the evidence suggests that teacher absenteeism has been a consistent challenge. A recent study conducted in The Gambia found that 14 percent of teachers reported being absent from school at least once a week.[9] Teacher absenteeism is an issue that affects both learning outcomes and school management. Several reports have suggested that teacher attendance monitoring is one of the key measures to reduce teacher absenteeism in The Gambia,[10] and that combining such monitoring with incentives for teachers may improve teacher attendance and punctuality.[11]

[6] FAO, EU & CIRAD. (2022). *Food Systems Profile – The Gambia: Catalysing the Sustainable and Inclusive Transformation of Food Systems*. .

[7] IFAD. (2019). *Investing in Rural People in The Gambia*. International Fund for Agricultural Development.

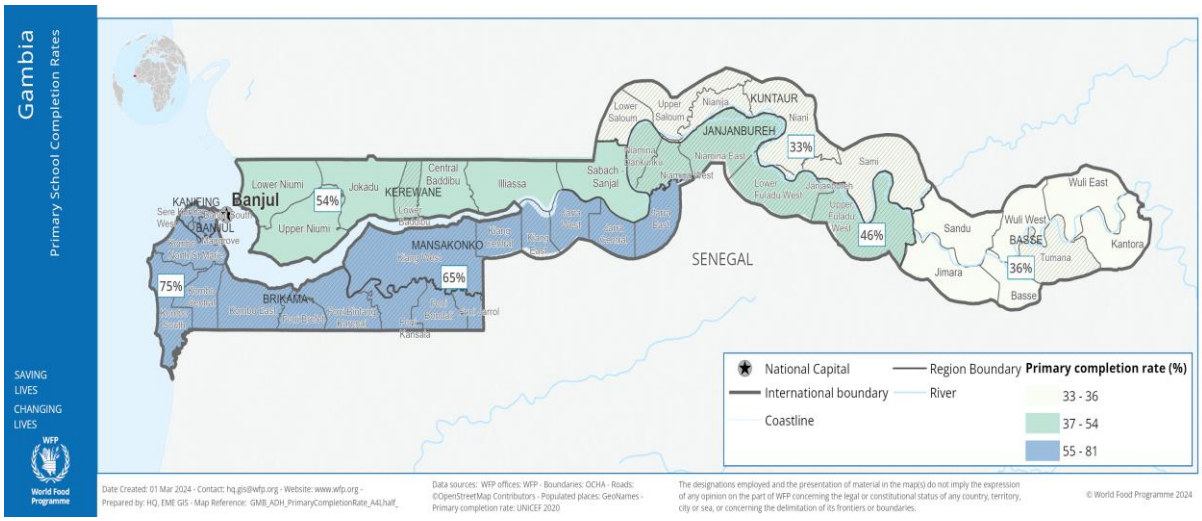
[8] UNICEF. (2018). The Gambia Education Fact Sheets – 2020. Technical report.

[9] UNICEF. (2022). Time to Teach: Teacher Attendance and Time on Task in Primary Schools.

[10] World Bank. (2011). The Gambia Education Country Status Report. Technical report.

[11] UNICEF. (2022). *Time to Teach: Teacher Attendance and Time on Task in Primary Schools*.

Figure 2: Primary school completion rate by region



Source: WFP, reproduced from UNICEF. (2018).

31. The school feeding programme reaches an estimated 42 percent of children in pre-school and primary school across all six regions of The Gambia.[12] The Government has ownership of the school feeding agenda and has expressed a commitment to reach universal coverage by joining the School Meals Coalition, which aims for every child to have the opportunity to receive a healthy, nutritious meal in school by 2030. Moreover, the Education Sector Strategic Plan 2016–2030 describes universal coverage of school feeding for students from early childhood education to upper basic school and senior secondary school, including Madrassah Arabic schools, as one of the priority areas to ensure equal access to education.

[12] WFP, ECOWAS, CERFAM & the Research Consortium for School Health and Nutrition, an Initiative of the School Meals Coalition. (2024). *Home-Grown School Feeding in West Africa: A Landscape Analysis*.

2. Programme description

32. The Home-Grown School Feeding Programme in The Gambia is funded by the Global Agriculture and Food Security Program (GAFSP) through The Gambia Agriculture and Food Security Project as well as other funding sources. It is implemented by WFP through the Ministry of Basic Education. It covers 421 schools in three of the six regions of the country: the North Bank, Central River and Upper River regions (Regions 3, 5 and 6, respectively). These regions are selected based on programmatic targeting criteria such as education and nutritional indicators. This evaluation began in October 2022, focusing on GAFSP-funded schools. The first meals were provided to students as part of the evaluation in January 2023. The GAFSP-funded programme is expected to run for five years, ending in 2028. The interventions of the programme align with the country strategy plan of WFP that aims to support the Government in its implementation of the national school feeding programme, to promote a HGSF approach and to prepare to hand the programme over to the Government.

33. Schools receive resources from WFP to provide meals to students five days a week. The target is to provide children with a meal containing a daily average of 580 kcal. The meals are composed of nine items, of which four are perishable and five are non-perishable, and they include five typical Gambian dishes: *benachin* (rice, vegetables and dried fish), *plasas* (rice, groundnuts, green leaves, onions and tomatoes), *mbahal* (rice, groundnuts, dried fish and okra/bitter tomatoes and beans), *cherreh*/rice with groundnut soup (millet/maize/rice, groundnut paste and vegetables) and cassava with beans (cassava, beans and bread). Meals are served during the regular 30-minute break and consumed on school premises in varying locations depending on the school infrastructure (e.g. classrooms or gardens). The total cost[13] of the school feeding programme equates to USD 343,510 in total or approximately USD 14 per child for 115 meal-days across seven months.

34. Each school food management committee is responsible for selecting local suppliers and organizing the daily preparation of the meals. WFP sends funds to school bank accounts[14] based on student enrolment data. Schools purchase food items from local communities, and WFP provides technical support while monitoring the procurement practices of the schools to ensure that they adhere to procurement guidelines.

35. To support the country office in addressing low teacher attendance, which could undermine the learning benefits resulting from improved child attendance rates due to the introduction of school meals, an accountability system based on teacher incentives was implemented among a sample of grade 3 teachers in selected schools. The incentive involved providing a monetary bonus to the teachers if they performed a daily data collection task that required them to be present at the school. Teachers are asked to keep daily records of which children received a school meal (in schools receiving school feeding) or brought/bought breakfast before coming to school (in schools not receiving school feeding) and to record that information in a meal ledger provided to them. Teachers assigned to the incentive programme would receive a monthly bonus equal to GMD 500 (approximately 10 percent of their monthly salary) for filling in the meal ledger. This amount was benchmarked to The Gambian hardship allowance incentive scheme that provides teachers stationed in remote areas with a 10-percent increase to their monthly salary. As such, it is within a similar

[13] The Innovations for Poverty Actions automated cost collection tool was used to calculate the total cost, which was an adapted version of the "ingredients method of costing" (Levin, H.M. & McEwan, P.J. (2001). *Cost-Effectiveness Analysis: Methods and Application*. Thousand Oaks, CA, USA, SAGE); see: Dhaliwal, I., Duflo, E., Glennerster, R. & Tulloch, C. (2013). Comparative Cost-Effectiveness Analysis to Inform Policy in Developing Countries: A General Framework with Applications for Education. In Glewwe, P. (ed.), *Education Policy in Developing Countries*. Chicago, IL, USA, University of Chicago Press..

[14] To facilitate the financial transactions WFP collaborates with The Gambia Teachers' Union Cooperative Credit Union, which has branches throughout the country.

range to the teacher incentive schemes used in other low-income countries.[15,16,17,18,19,20,21,22] Payments were made upon the condition of filling in the ledger for at least 50 percent of the month and proportional to the number of unique photographs taken of the filled ledger during the previous month.[23,24] The total cost[25] of the teacher incentive programme equated to USD 59,358 or USD 2.4 per child for teacher incentives for 115 grade 3 teachers across seven months.

3. Evaluation design and methodology

36. This impact evaluation aimed to support programme learning while also adding to the global evidence base on school feeding by contributing to the SBP Impact Evaluation Window. This section outlines how the evaluation questions (EQs) and literature informed the impact evaluation design.

3.1 Evaluation theory

37. First, this evaluation provides a causal estimate of the impacts of HGSF. The Home-Grown School Feeding Programme means that children can expect to receive a healthy lunch. There is a growing literature that documents the positive impacts of school feeding programmes on school participation, learning and anthropometric outcomes.[26] A systematic review of 216 education programmes in 52 low- and middle income countries found that school feeding programmes represent one of the few educational interventions that positively impact school participation (enrolment, attendance and completion) and learning (scores on cognitive, language and mathematics tests).[27] The impacts of school meals on attendance are comparable to

[15] Muralidharan, K. & Sundararaman, V. (2011). Teacher Performance Pay: Experimental Evidence from India. *Journal of Political Economy*, 119(1): 39–77.

[16] Duflo, E., Hanna, R. & Ryan, S.P. (2012). Incentives Work: Getting Teachers to Come to School. *American Economic Review*, 102(4): 1241–78.

[17] Barrera-Osorio, F. & Raju, D. (2017). Teacher Performance Pay: Experimental Evidence from Pakistan. *Journal of Public Economics*, 148: 75–91.

[18] Barrera-Osorio, F., Cilliers, J., Cloutier, M.-H. & Filmer, D. (2021). *Heterogenous Teacher Effects of Two Incentive Schemes: Evidence from a Low-Income Country*. World Bank Policy Research Working Paper No. 9652.

[19] Cilliers, J., Kasirye, I., Leaver, C. et al. (2018). Pay for Locally Monitored Performance? A Welfare Analysis for Teacher Attendance in Ugandan Primary Schools. *Journal of Public Economics*, 167: 69–90.

[20] Mbiti, I., Romero, M. & Schipper, Y. (2019). *Designing Effective Teacher Performance Pay Programs: Experimental Evidence from Tanzania*. Cambridge, MA, National Bureau of Economic Research.

[21] Chang, F., Wang, H., Qu, Y. et al. (2020). The Impact of Pay-for-Percentile Incentive on Low-Achieving Students in Rural China. *Economics of Education Review*, 75: 101954.

[22] Andrabi, T. & Brown, C. (2022) *Subjective versus Objective Incentives and Teacher Productivity*. RISE Working Paper Series. 22/092.

[23] The ledger data were not used to make systematic comparisons between groups, as teachers working in a school without school feeding filled in a slightly different version of the ledger than teachers working in a school with school feeding.

[24] The meal ledgers provided to teachers in schools with school feeding required them to enter information on whether children received the school meal, whereas the meal ledgers provided to teachers in schools without school feeding required them to enter information on whether children ate breakfast.

[25] The IPA automated cost collection tool was used to calculate the total cost, which was an adapted version of the "ingredients method of costing" (Levin, H.M. & McEwan, P.J. (2001). *Cost-Effectiveness Analysis: Methods and Application*. Thousand Oaks, CA, USA, SAGE); see: Dhaliwal, I., Duflo, E., Glennerster, R. & Tulloch, C. (2013). Comparative Cost-Effectiveness Analysis to Inform Policy in Developing Countries: A General Framework with Applications for Education. In Glewwe, P. (ed.), *Education Policy in Developing Countries*. Chicago, IL, USA, University of Chicago Press.

[26] WFP. (2021b). School Feeding Programmes in Low- and Lower-Middle-Income Countries: A Focused Review of Recent Evidence from Impact Evaluations.

[27] Snilstveit, B., Stevenson, J., Phillips, D. et al. (2015). *Interventions for Improving Learning Outcomes and Access to Education in Low- and Middle-Income Countries: A Systematic Review*. Technical report. 3ie.

those of deworming and greater than providing free books or incentives to students for performance; their impacts on enrolment are less pronounced.[28]

38. Second, this evaluation analyses the potential role of school feeding programmes as a social safety net for protecting children against shocks and stressors by collecting data at various points throughout the year. The benefits of school feeding may be concentrated in the lean season, when household incomes are at their lowest. This is a time when vulnerable households often rely on coping strategies such as withdrawing their children from school, engaging children in work-related tasks or consuming fewer calories (which can further compromise learning capabilities). Recent evidence from Malawi shows that when there is overlap between the school calendar and peak farming periods, school advancement decreases.[29]

39. Finally, this evaluation assesses the importance of securing teacher attendance for improving the impacts of school feeding programmes on educational outcomes. In The Gambia, 14 percent of teachers reported being absent from school at least once a week, which may have limited the learning opportunities of the children they teach.[30] Work on monitoring and teacher performance-related pay suggests that positive outcomes can be achieved when additional accountability and incentive structures are provided for teachers.[31,32,33] The teacher incentive programme assessed in this evaluation provided teachers with a monetary incentive connected to their school attendance. The benefits of school feeding and incentive programmes have been studied independently,[34] and they have been shown to be effective: according to a review conducted by the Abdul Latif Jameel Poverty Action Lab (J-PAL), incentives rank fourth and school meals rank fifth out of 23 education interventions reported as having impacts on attendance.[35] However, their complementarities remain largely unknown.

40. The first set of hypotheses in this evaluation is as follows:

    a. School feeding improves children's dietary diversity and food security, especially during the lean season.

    b. Teacher incentives improve teacher attendance.

41. The second set of hypotheses, which builds on the first set, is as follows:

    a. Consumption of more and better-quality food improves children's physical and mental health.

    b. School feeding improves educational outcomes by increasing the time children spend in the classroom, and their improved diets help them focus better in the classroom.

    c. Teacher incentives improve educational outcomes by increasing teacher attendance.

    d. Combining school feeding and teacher incentives improves educational outcomes more than each individual intervention.

---

[28] J-PAL. (2017). *Roll Call: Getting Children into School*. Technical report,. Abdul Latif Jameel Poverty Action Lab.

[29] Allen IV, J. (2024). Double-Booked: Effects of Overlap between School and Farming Calendars on Education and Child Labor. IFPRI Discussion Paper 2235. International Food Policy Research Institute.

[30] UNICEF. (2022). Time to Teach: Teacher Attendance and Time on Task in Primary Schools. UNICEF.

[31] Duflo, E., Hanna, R. & Ryan, S.P. (2012). Incentives Work: Getting Teachers to Come to School. *American Economic Review*, 102(4): 1241–78.

[32] Mbiti, I., Romero, M. & Schipper, Y. (2019). *Designing Effective Teacher Performance Pay Programs: Experimental Evidence from Tanzania*. Cambridge, MA, National Bureau of Economic Research.

[33] Andrabi, T. & Brown, C. (2022) *Subjective versus Objective Incentives and Teacher Productivity*. RISE Working Paper Series. 22/092.

[34] Snilstveit, B., Stevenson, J., Phillips, D. et al. (2015). *Interventions for Improving Learning Outcomes and Access to Education in Low- and Middle-Income Countries: A Systematic Review*. Technical report. 3ie.

[35] J-PAL. (2017). *Roll Call: Getting Children into School*. Technical report. Abdul Latif Jameel Poverty Action Lab.

3.2 Evaluation questions

42. Connected to the programme objectives and theory, the impact EQs are as follows:

EQ1. Does the provision of HGSF interventions impact children's food security, nutrition, health and education outcomes?

EQ2. Do the impacts of providing home-grown school meals to primary school students vary according to the gender of the child?

EQ3. Do school feeding programmes mitigate children's vulnerability to seasonal fluctuations and shocks?

EQ4. Does greater teacher attendance, improved through an accountability system based on monetary teacher incentives, improve the impacts of school feeding programmes on educational outcomes? What is the relative cost-effectiveness?

EQ5. What is the cost effectiveness of school feeding relative to other interventions?

3.3 Evaluation design

43. To identify the causal impacts of the WFP intervention, this impact evaluation employed a clustered RCT design.

44. The study sample focused on schools that had not received school feeding in the recent past (in the last three years) and had not previously been selected to benefit from similar programmes.[36] To identify schools without recent experience with school feeding, the evaluation team conducted an extensive review of the previous programming of the WFP country office and scheduled in-depth interviews with staff from the regional offices of the Ministry of Education, who provided records of all the donor-funded or government-led school feeding programmes in the country. The team identified 206 schools with no recent school feeding experience in Region 3 (North Bank) and Region 6 (Upper River). Among these, 52 are public schools and 154 are private schools.[37]

45. During the evaluation design phase in May 2022, the WFP country office determined that it would be able to roll out the programme in 46 new schools during the 2022/23 school year. To ensure that an equal-sized comparison group could be obtained, the team set the evaluation sample at 92 schools. A power calculation analysis can be found in the pre-analysis plan. The team included all 52 eligible public schools in the study and 40 randomly selected private schools. The team prioritized public schools for the programme because the long-term goal of WFP is to transition the entire school feeding programme to the Government. The evaluation team and programme team agreed to randomly select the intervention schools from these 92 schools.

46. The team cross-randomized the school feeding intervention and teacher incentives to study their impacts on children's outcomes. This resulted in four groups: (i) school feeding only; (ii) teacher incentives only; (iii) school feeding and teacher incentives; and (iv) neither. The team conducted the intervention assignment at the school level, stratified by region and school type. Within each school, the study focused on students from grade 3, in which most children are expected to be at least 8 years of age. This is the youngest age at which most of the survey instruments can reasonably be implemented. The results of the randomization are shown in Figure 3.

47. For the school feeding intervention, schools received resources from WFP to provide meals to students five days a week. Each school food management committee had responsibility for selecting local suppliers

[36] The programme covered schools that had pre-existing school feeding programmes. These schools were excluded from the sample study as this might have led to underestimation of programme impacts if school feeding generates long-term benefits that gradually attenuate over time.

[37] Public schools are government-sponsored schools with English as the main teaching language and a common curriculum decided by the Ministry of Basic and Secondary Education. Private schools are operated by private individuals, communities or Islamic organizations with technical and financial support from Ministry of Basic and Secondary Education.

and organizing the daily preparation of the meals. WFP sent funds to school bank accounts[38] based on student enrolment data. Schools purchased food items from local communities, and WFP provided technical support by monitoring the procurement practices of the schools to ensure that they adhered to procurement guidelines. The schools served the meals during a regular 30-minute break in the school day. Children consumed the meals on the school premises in varying locations depending on the school infrastructure (e.g. classrooms or gardens).

48. For the teacher incentive intervention, teachers assigned to receive the incentive were provided with a monthly bonus equal to GMD 500 (equivalent to approximately USD 7.4), or approximately 10 percent of their monthly salary, for filling in the meal ledger. This amount was selected based on the hardship allowance incentive scheme that provides a 10-percent increase to a teacher's monthly salary to motivate teachers to work in remote areas; it fell within the range provided by teacher incentive schemes in other low-income countries.[39,40,41,42,43,44,45,46] The work is monitored by asking them to take daily timestamped photographs of the filled-in ledgers, and WFP field officers regularly verified the timestamped photographs. Teachers received payments based on the number of unique photographs taken during the previous month. If the number of unique photographs was less than 50 percent of the total number of days during which the school was in session, the teacher would not receive any payment. If the number of unique photographs was between 50 and 100 percent of the total number of days during which the school was in session, the teacher would receive a payment corresponding to the percentage of compliance (e.g. 70-percent compliance with supplying unique photographs would be equal to 0.70 × 500 = GMD 350). WFP field officers visited all schools three times and gave payments to all teachers, with the average total value of payments being GMD 2,925 over seven months (GMD 417 per month). Due to delays in the provision of the tablets used by teachers to take photographs of the meal ledgers, teachers received the full incentive of GMD 500 in January and February, regardless of the completion of the meal ledgers.

[38] To facilitate the financial transactions WFP collaborates with The Gambia Teachers' Union Cooperative Credit Union, which has branches throughout the country.

[39] Muralidharan, K. & Sundararaman, V. (2011). Teacher Performance Pay: Experimental Evidence from India. *Journal of Political Economy*, 119(1): 39–77.

[40] Duflo, E., Hanna, R. & Ryan, S.P. (2012). Incentives Work: Getting Teachers to Come to School. *American Economic Review*, 102(4): 1241–78.

[41] Barrera-Osorio, F. & Raju, D. (2017). Teacher Performance Pay: Experimental Evidence from Pakistan. *Journal of Public Economics*, 148: 75–91.

[42] Cilliers, J., Kasirye, I., Leaver, C. et al. (2018). Pay for Locally Monitored Performance? A Welfare Analysis for Teacher Attendance in Ugandan Primary Schools. *Journal of Public Economics*, 167: 69–90.

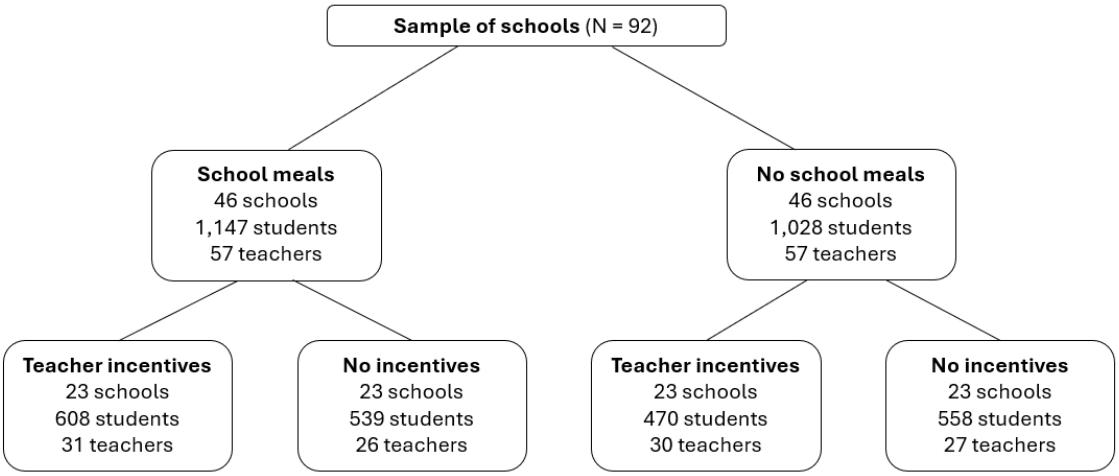
[43] Mbiti, I., Romero, M. & Schipper, Y. (2019). *Designing Effective Teacher Performance Pay Programs: Experimental Evidence from Tanzania*. Cambridge, MA, National Bureau of Economic Research.

[44] Barrera-Osorio, F., Cilliers, J., Cloutier, M.-H. & Filmer, D. (2021). *Heterogenous Teacher Effects of Two Incentive Schemes: Evidence from a Low-Income Country*. World Bank Policy Research Working Paper No. 9652.

[45] Chang, F., Wang, H., Qu, Y. et al. (2020). The Impact of Pay-for-Percentile Incentive on Low-Achieving Students in Rural China. *Economics of Education Review*, 75: 101954.

[46] Andrabi, T. & Brown, C. (2022) *Subjective versus Objective Incentives and Teacher Productivity*. RISE Working Paper Series. 22/092.

Figure 3: Results of the randomization



Source: authors.

49. Most schools in the study had one grade 3 class (containing 28 students on average). In the 17 schools that had more than one grade 3 class, the study enrolled all classes and teachers.

50. **Timeline:** The team completed the school mapping and study sample identification in September 2022. The team performed the randomization in November and informed schools about the interventions to be rolled out in their schools in November and December 2022. The school meals started being delivered in January 2023, halfway through the 2022/23 school year. The evaluation period spans from when the first meals were provided to students in January 2023 until student outcomes were recorded in October 2023.

3.4 Data collection

51. Data collection consisted of the following processes.

52. First, the team used a child high-frequency survey to measure all main and secondary outcomes between February and October 2023. The study sample consisted of 2,175 grade 3 children, representing an average of 24 children per school. The team administered the interviews at school, visiting each of the 92 schools five times: four times between February and July 2023 and a final visit in October 2023, at the start of the subsequent school year. During the fourth and fifth visits, the team collected data on the children's height and weight. The fifth visit also verified children's enrolment and grade status to capture grade progression, repetition or dropout[47] following the 2022/23 academic year. During these surveys, the team also asked children questions regarding the attendance of their teachers.

53. Second, the team conducted unannounced teacher attendance spot-check visits to all 114 grade 3 classes in all 92 schools, consisting of 5 random visits to each school between February and July 2023. During each visit, an auditor recorded whether the teacher was present.

54. Third, the team developed a standardized tool to collect and digitize school enrolment and attendance registers in partnership with the WFP country office and Ministry of Basic and Secondary Education.

[47] A child was defined as a dropout when they were not enrolled in the same school in the 2023/24 school year as they were in the 2022/23 school year (i.e. at the beginning of the study). There was no observation of transfers to other schools.

55. Finally, the evaluation team collected cost data through country office records and performed a cost effectiveness analysis using publicly available data. Further details and assumptions are reported in Annex 10.

56. A summary of the data collection timeline, aligned with the intervention roll-out, can be found in Annex 9.

3.5 Ethical considerations

57. The study strictly adhered to ethical guidelines for research involving human subjects, including the 2020 United Nations Evaluation Group (UNEG) standards. The WFP Office of Evaluation and the World Bank DIME department managed the oversight and enforcement of ethical considerations during all phases of the evaluation. The team implemented key ethical principles and practices, including ensuring informed consent and protecting the privacy, confidentiality and anonymity of participants. The team also obtained local and international institutional review board clearance of the study protocols and survey instruments prior to commencing the evaluation.

58. The team implemented the following key ethical principles and practices:

1. **Informed consent:** The team obtained consent from the parents or legal guardians at the start of the study for the child surveys, as well as child assent prior to each survey round. Refusing to take part in the survey had no bearing on eligibility for WFP support. The team informed the parents that they could withdraw their consent to include their children in the study at any time. No parents withdrew their consent during the study.
2. **Training and protocols:** Enumerators underwent extensive training and piloting to ensure that they asked uniform and contextually appropriate questions. Third-party experts trained the enumerators in taking anthropometric measures.
3. **Ethical oversight:** Ongoing monitoring and management of ethical issues occurred during the study, with raised concerns being addressed in line with established guidelines. The impact evaluation received ethical approval from the Medical Research Council Unit The Gambia at the London School of Hygiene & Tropical Medicine under study reference 28304.
4. **Programme exclusion:** The team gave all children enrolled in the impact evaluation from the 92 schools an equal chance to receive school meals. Due to operational constraints, 46 schools started these activities in 2023, and the remaining 46 schools started these activities in the following academic year.

59. In summary, the study prioritized ethical conduct regarding informed consent, privacy, cultural sensitivity and vulnerable participant protection. The team upheld the principles of ethical integrity and safeguarded participants throughout the research process.

60. The team collected quantitative data for this impact evaluation using two types of evaluation across five rounds: child high-frequency surveys and teacher spot-check visits. In addition, the evaluation team collaborated with the WFP country office and the Ministry of Basic and Secondary Education to digitize the administrative education and project implementation data.

4. Programme implementation

61. Prior to discussing the outcome results in detail, this section discusses the "participation fidelity" of the programme using the survey data from the impact evaluation. The analysis is based on reports obtained from children during each of the child high-frequency survey rounds. The team asked children to report during each round whether they had received a meal on the last school day prior to the visit.

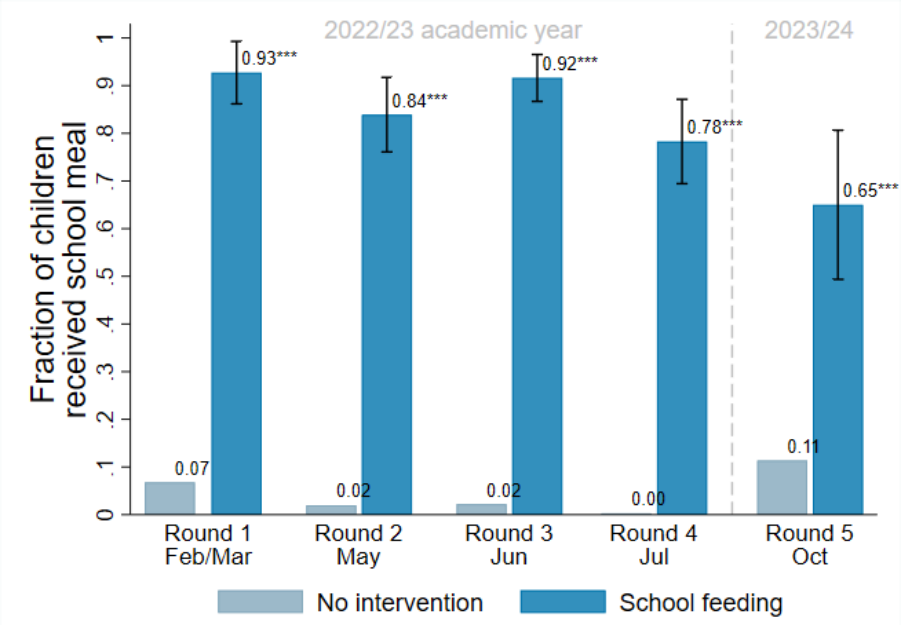
62. During the first four rounds (conducted in February, May, June and July 2023), the actual reported rate by children was high, with 91 percent of children in the schools assigned to receive school meals reporting having received such a meal. In each round, a small percentage of children in the comparison schools reported having received a school meal (ranging from 0 to 7 percent in the first four rounds). Reported rates of receiving a school meal in treatment schools remained high in the first three rounds and declined to 78 percent in July (Round 4), mainly because schools were preparing to close for the summer holidays. Round 5 was the final round of data collection, and it took place after the children returned to school (October 2023). At that time, it was agreed that preparations to include comparison schools could be initiated. As a result, there was an increase in school meals being provided in comparison schools (as shown in Figure 4: in comparison schools, 11 percent of children reported receiving school meals on the day prior to the interview). It was also noted that school meals had not yet begun to be provided again in all intervention schools at that time (65 percent of children reported receiving a meal at school on the previous day). This report will present the results from data collected during the 2022/23 school year (Rounds 1–4) and at the start of the 2023/24 school year (Round 5).

63. School meals delivery was comparable across the different types of schools assessed. The survey data showed that 85 percent of children reported having received a meal on the day before the interview in government schools versus 79 percent in private schools. There were no substantial differences across the two regions, as 86 percent of children in Region 3 reported having received a school meal on the day before the interview versus 80 percent in Region 6.

64. In schools implementing the teacher incentive intervention, WFP field officers conducting visits to collect attendance data also used these visits to review the recording of the meal/breakfast ledgers that grade 3 teachers were supposed to fill out daily, requiring them to be present at school. Across the 46 schools randomly selected for the teacher incentive programme, 61 grade 3 teachers received payments for completing the ledgers. WFP field officers monitored their work by asking them to take a daily timestamped photograph of the ledger, and the field officers regularly verified these timestamped photographs. Payments were made based on the number of unique photographs taken in the month being reviewed. If the number of unique photographs was less than 50 percent of the total number of days during which the school was in session, the teacher would not receive any payment. If the number of unique photographs was between 50 and 100 percent of the total number of days during which the school was in session, the teacher would receive an incentive amount corresponding to the percentage of compliance (e.g. 70-percent compliance with supplying unique photographs would be equal to 0.70 × 500 = GMD 350). WFP field officers visited all schools three times and gave payments to all teachers, with the total value of payments being GMD 2,925 over seven months (GMD 417 per month). Due to delays in the provision of tablets used by teachers to take photographs of the meal ledgers, teachers received the full payment of GMD 500 regardless of the completion of the meal ledgers in January and February.

65. The results presented are based on intention-to-treat (ITT) estimates. ITT analysis – a methodological approach often used in RCTs – includes every participant initially enrolled in the study with their originally assigned intervention group. This is important because it provides the most accurate measure of the impact of a WFP intervention on a population for any measured outcome within a context in which some people choose to (or are able to) participate and others do not choose to (or are not able to). This means that this analysis includes data from all treatment schoolchildren initially planned to receive school meals, which in this context aligns well with the share of children who received school meals in practice (symmetrically, this analysis also includes data from all comparison schoolchildren).

Figure 4: Fraction of children reporting having received a school meal on the previous day by survey round



*Statistical significance levels: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

5. Main findings

66. This section described the impacts of the school meals and teacher incentive interventions. The analysis estimates the impacts of school meals, teacher incentives and their combination by comparing children in schools assigned to receive these interventions with children in the comparison group not receiving any intervention.

67. Following the hypotheses, which are derived from the evaluation theory, not all interventions are expected to affect all specified outcomes. Depending on the outcome, the analysis combines different intervention groups to focus on the impacts of providing school meals, teacher incentives or all possible interventions.

68. **Impact of school feeding:** To estimate the impact of school feeding, the analysis compares children in the two arms assigned to receive school feeding ("school feeding only" and "school feeding with teacher incentives") with children assigned to a "pure comparison group" of children enrolled in schools with no school feeding nor teacher incentives, thereby controlling for teacher incentives.

69. Outcomes in this domain include:

    - child nutrition;
    - child mental health;
    - child physical health; and
    - child social cohesion.

70. This first set of outcomes is expected only to be influenced by the school feeding programme.

71. **Impact of teacher incentives:** To estimate the impact of teacher incentives, the analysis compares teachers pooled across the two arms assigned to receive teacher incentives ("teacher incentives only" and "school feeding with teacher incentives") with teachers in schools with no school feeding nor teacher incentives ("pure control"), thereby controlling for school feeding.

72. The outcome in this domain is teacher attendance.

73. **Impact of school feeding or teacher incentives:** Finally, this report explores outcomes that may be impacted by both the school feeding and the teacher incentive interventions. These include child

attendance, which is expected to increase, as school feeding and teacher incentive programmes decrease the opportunity cost of going to school. Finally, this report explores outcomes on school progression, cognitive ability and learning. These outcomes are expected to improve if children spend more time in the classroom and/or if their improved diets help them focus better in the classroom. The analysis of these indicators compares all treatment groups combined ("any intervention") against a comparison group of children enrolled in schools not receiving any of these interventions. The analysis also separates out all three intervention groups.

74. Outcomes in this domain include:

    - child attendance;
    - child school progression;
    - child cognitive ability; and
    - child learning.

    The exact regression specifications for each outcome are described in Annex 3. A full description of the outcomes and measures used is included in Annex 1.

75. The results discuss outcomes for each indicator section, relying on data collected across the five rounds between February and October 2023. As discussed in paragraph 65, all testing employed ITT analyses to estimate the impacts of the programme.

5.1 Child nutrition

Summary of findings: Receipt of school meals translated into improved perceived food security and dietary diversity measures. The proportion of children experiencing high levels of food security increased by 12 percent and the proportion of children reporting an above-median dietary diversity score increased by 22 percent, driven by increased intake of various food groups. These results were driven by large impacts on girls, who experienced an increase in perceived secure food security of 15 percent and an increase in dietary diversity of 29 percent. The proportion of children who reported consuming breakfast at home before going to school increased by 6 percentage points (from 53 to 59 percent), an effect that was mainly driven by girls.

76. The evaluation theory suggests that children may experience an improvement in their nutrition once they start receiving school meals. To test this theory in the context of a WFP programme, this evaluation examined whether offering children school meals resulted in any changes in a child's nutrition as defined by food security status and dietary diversity. Providing school meals could also lead to changes in a child's nutrition behaviours. For example, children receiving school meals might not receive meals at home if there is a process in place of intra-household allocations among household members not receiving school meals. Alternatively, if parents no longer need to provide children with a lunch to bring to school, these resources might instead be consumed as breakfast at home. This evaluation tested this by asking children to report whether they had eaten breakfast before school on the day of the interview and the day before.

77. Throughout the school feeding intervention, improvements in children's nutrition in terms of both self-reported food security and self-reported dietary diversity were observed. As illustrated in Figure 5, there was a 9-percentage point increase in the proportion of children who reported being food secure (from 73 to 82 percent). This difference was statistically significant.

78. There was also an increase in dietary diversity captured through 24-hour recall[48]: the proportion of children with an individual dietary diversity score above the median (score above 5) increased by

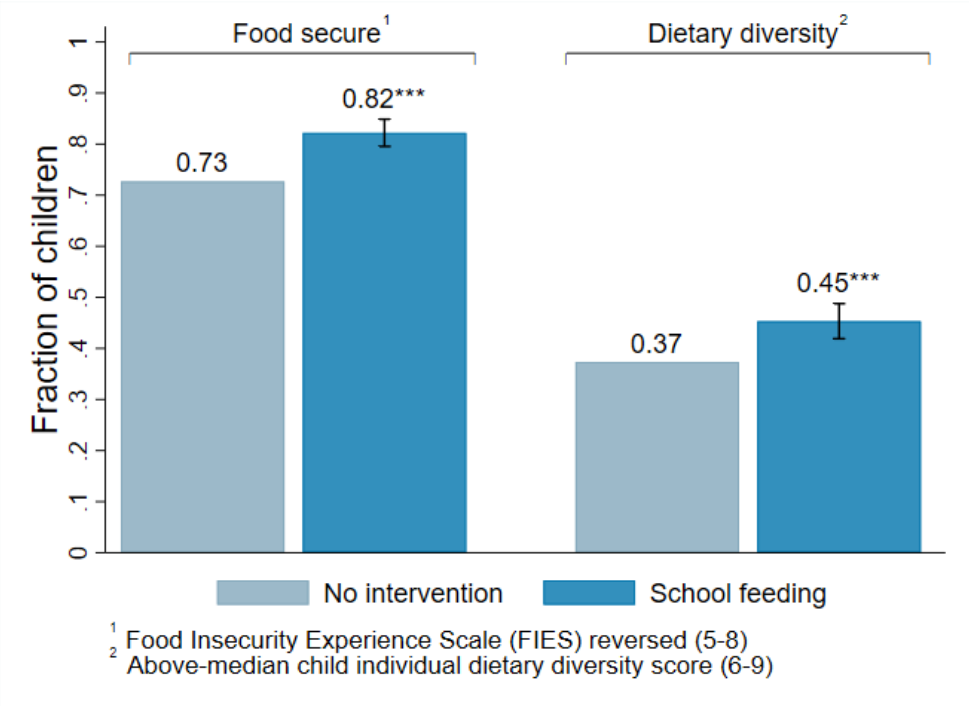
[48] A 24-hour recall is a retrospective, structured interview intended to capture detailed information about all foods, beverages, and sometimes dietary supplements consumed by a respondent in the past 24 hours.

8 percentage points from 37 percent in the comparison group to 45 percent in the group of children receiving meals (a 22-percent increase). This is equivalent to an average difference of 0.34 more food groups being consumed by children receiving school meals when compared with children not receiving school meals. These differences were statistically significant.

79. The increase in dietary diversity was driven by increased self-reported intake of various food groups. To determine which food groups contributed to the statistically significant increase in dietary diversity, an analysis of these individual food groups was conducted (**: ***p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

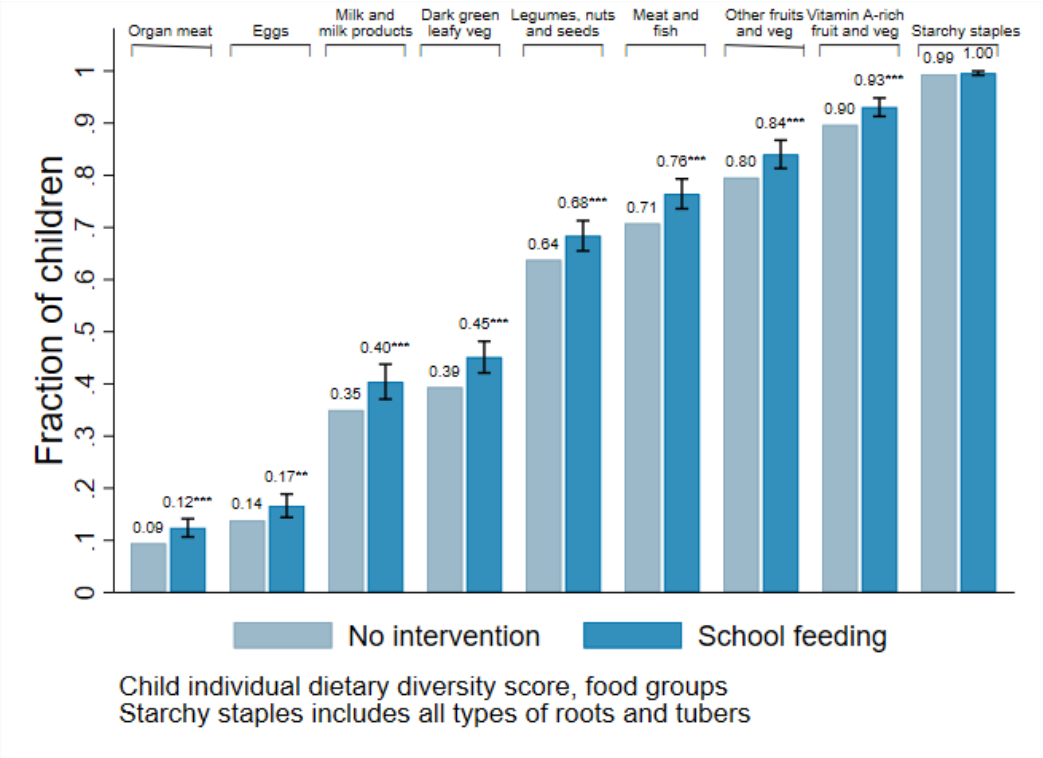
80. **Figure 6**); all groups showed increased consumption except for cereals. The school meals were varied and included five common Gambian dishes: *benachin* (rice, vegetables and dried fish), *plasas* (rice, groundnuts, green leaves, onions and tomatoes), *mbahal* (rice, groundnuts, dried fish, okra, bitter tomatoes, and beans), *cherreh* rice with groundnut soup (millet/maize/rice, groundnut paste and vegetables) and cassava with beans (cassava, beans and bread). This could explain the observed increase in the consumption of dark green leafy vegetables, legumes, nuts and seeds, meat and fish, other fruits and vegetables and vitamin A-rich fruits and vegetables. However, the increase in the consumption of meat, eggs and milk and milk products cannot be directly attributed to the school feeding programme, given that the school meals did not contain ingredients from these food groups. The increased consumption of these food groups might have been due to food reallocation within the household.

Figure 5: Fraction of children reporting above-median food security and dietary diversity



*Specification defined in Equation 1a in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

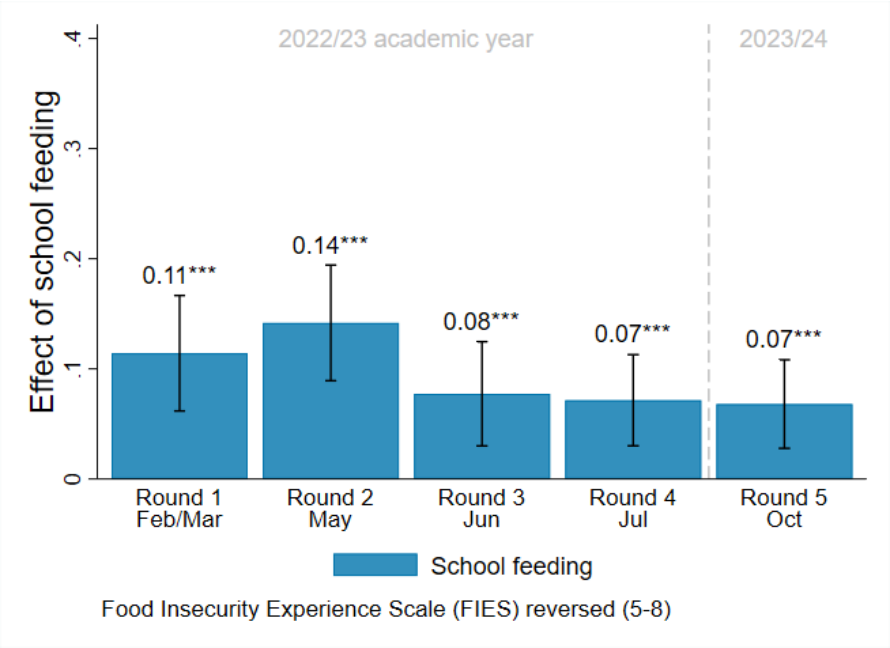
Figure 6: Fraction of children reporting consumption of each food group



*Specification defined in Equation 1a in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

81. The impacts of school feeding on food security and dietary diversity showed variation across the different survey rounds, although this variation was not statistically significant. As is shown in Figure 7, the estimated impacts on food security ranged from a 14-percentage point increase in May to a 7-percentage point increase in October. Estimated impacts on dietary diversity ranged from a 3-percentage point increase in June to a 12-percentage point increase in May (Figure 8). Given these estimates, there is no strong evidence to suggest that school meals can play an additional role in lowering seasonal fluctuations in food security in this context. It is possible that the observed impacts in the later rounds might have been driven by the reduced differences in service delivery between the intervention and comparison groups (as service delivery in the school feeding group was lower towards the end of the school year and the comparison group started to enrol children in the programme early in the 2023/24 academic year).

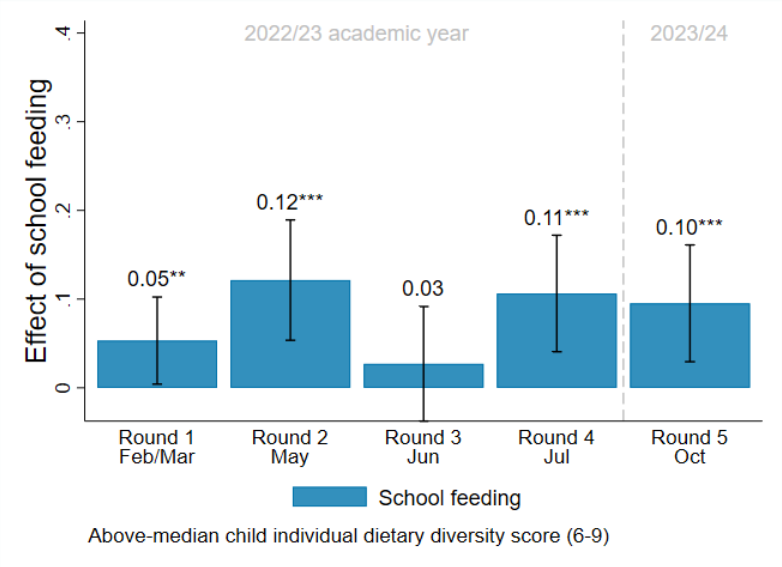
Figure 7: The effect of school feeding on food security by survey round



*Specification defined in Equation 1e in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

The lean season is considered to occur between June and October

Figure 8: The effect of school feeding on the child dietary diversity score by survey round

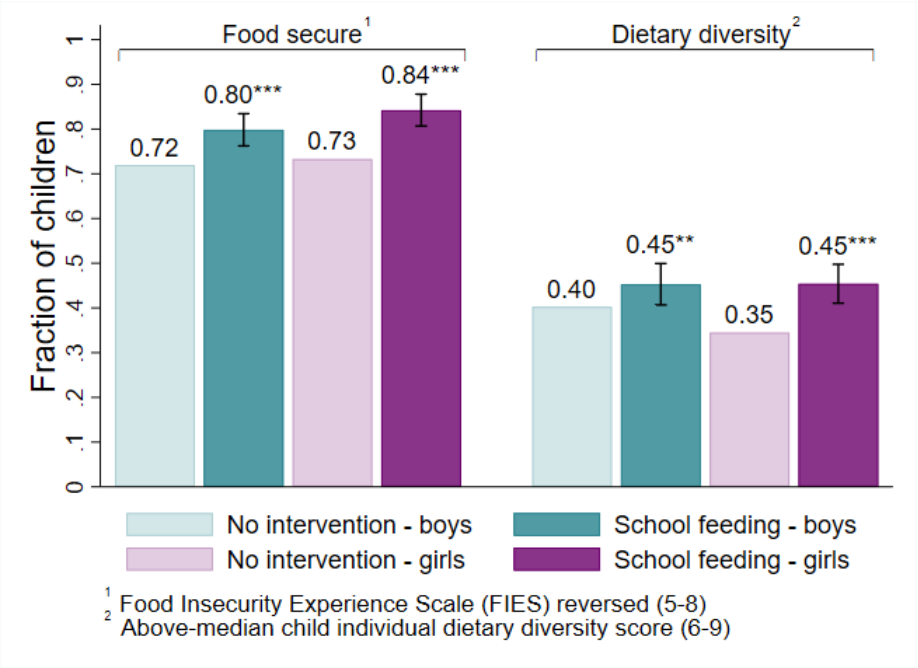


*Specification defined in Equation 1e in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

The lean season is considered to occur between June and October

82. The improvements in children's nutrition were mainly driven by girls, as is shown in Figure 9. Although both boys and girls experienced improved food security during the programme, the increase in the proportion of children who were food secure was greater for girls than for boys (15 percent compared with 11 percent, respectively). This is equivalent to an increase in consumption of 0.45 food groups for girls, with a comparison mean of 4.91, and an increase in consumption of 0.23 food groups for boys, with a comparison mean of 5.11.

Figure 9: Fraction of children reporting above-median food security and dietary diversity by gender

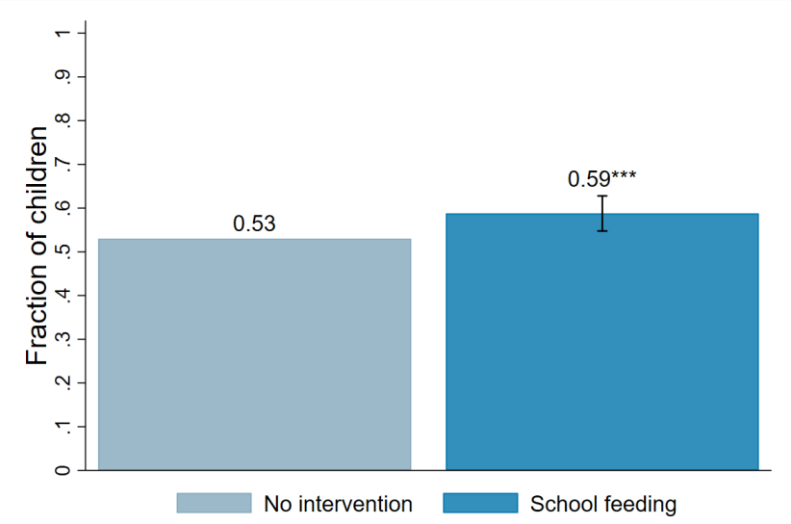


*Specification defined in Equation 1b in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

83. Although the impacts on both outcomes were greater for girls than boys, the difference was only statistically significant for dietary diversity. The gender breakdown for dietary diversity showed that the observed increase in the proportion of children with a dietary diversity score above the median from the comparison group was also more pronounced for girls, who experienced a 29-percent increase. This difference in the effect of school feeding between boys and girls was statistically significant. The improvement in dietary diversity outcomes for girls could be partially attributed to their lower baseline level of dietary diversity as well as to girls experiencing a greater increase in dietary diversity from the school feeding programme.

84. Although the child survey did not attempt to capture potential food reallocation between school meals and meals consumed at home or outside of school, it did ask children whether they had eaten before going to school. The proportion of children who reported consuming breakfast before school increased by 6 percentage points (from 53 to 59 percent; Figure 10). This increase was statistically significant. Although the study cannot definitively conclude why this occurred, it is feasible that parents who no longer needed to send their children to school with a lunch could utilize these resources to prepare breakfast at home.

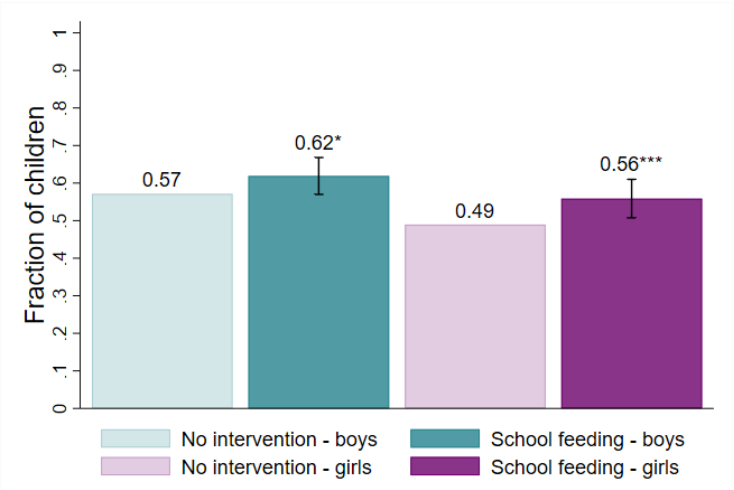
Figure 10: Fraction of children reporting they had consumed breakfast before going to school that day



*Specification defined in Equation 1a in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

85. The increase in the fraction of children who reported having consumed breakfast before going to school was mainly driven by girls, who showed a 7-percentage point increase (from 49 to 56 percent), as compared with a 5-percentage point increase for boys (Figure 11). These impacts were not statistically significantly different from each other.[49]

Figure 11: Fraction of children reporting they had consumed breakfast before going to school that day by gender



*Specification defined in Equation 1b in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

[49] This analysis does not use data from the meal ledgers that were provided in schools where grade 3 teachers were eligible for the incentive. Instead, this information was collected consistently across all children in all groups through the child high-frequency survey.

5.2 Child mental health

Summary of findings: Receipt of school meals translated into reduced self-reported stress and depression in children. The proportion of children reporting higher levels of depression decreased by 13 percent, and the proportion of children reporting medium to high stress decreased by 20 percent. These effects were particularly pronounced among girls, with there being a 23-percent decrease in the proportion of girls reporting moderate to severe depression and a 25-percent decrease in the proportion of girls reporting high stress levels.

86. Mental health outcomes are expected to improve as children consume sufficient, better-quality food and no longer need to worry about obtaining their next meal. To test this hypothesis, this evaluation used five mental health instruments to measure whether receiving a school meal reduced stress and depression while increasing agency and life satisfaction: the Patient Health Questionnaire-9 for Adolescents (PHQ-A),[50] White's Perceived Stress Scale for Children (PSS-C),[51] the Nowicki–Strickland Locus of Control Scale for Children,[52] Diener et al.'s Satisfaction with Life Scale[53] and the Cantril Ladder.[54] Details and references for these instruments are reported in Annex 1.

87. Children who received school meals reported lower levels of depression and stress. The proportion of children who reported moderate, moderately severe or severe depression, rather than mild or no or minimal depression, decreased by 6 percentage points (from 47 to 41 percent; Figure 12). This was a 13-percent decrease from the comparison mean, and the effect was statistically significant. A similar pattern was observed for stress levels. There was a statistically significant 8-percentage point decrease in the proportion of children reporting medium to high stress levels (from 40 to 32 percent). This 20-percent decrease indicates a substantial shift from higher to lower levels of stress after the provision of school feeding.

[50] Johnson, J.G., Harris, E.S., Spitzer, R.L. & Williams, J.B.W. (2002). The Patient Health Questionnaire for Adolescents: Validation of an Instrument for the Assessment of Mental Disorders among Adolescent Primary Care Patients. *Journal of Adolescent Health*, 30(3): 196–204.

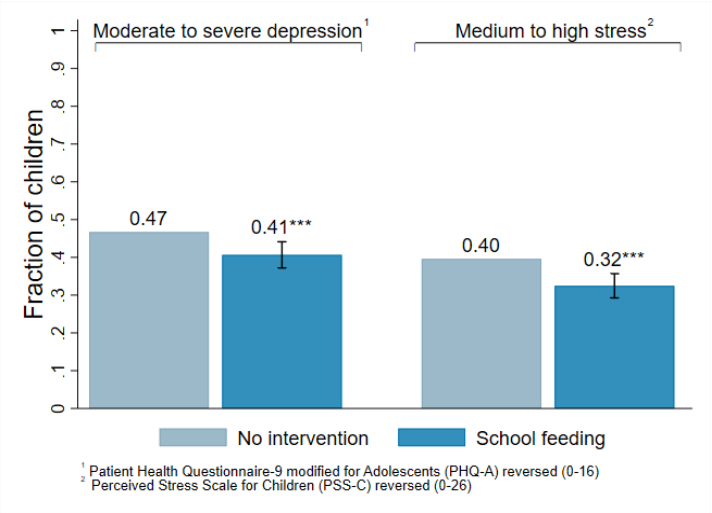
[51] White, B.P. (2014). The Perceived Stress Scale for Children: A Pilot Study in a Sample of 153 Children. *International Journal of Pediatrics and Child Health*, 2(2): 45–52.

[52] Nowicki, S. & Strickland, B.R. (1973). A Locus of Control Scale for Children. *Journal of Consulting and Clinical Psychology*, 40(1): 148–54.

[53] Diener, E., Emmons, R., Larsen, R. & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment*, 49(1): 71–75.

[54] Cantril, H. (1965). *The Pattern of Human Concerns*. New Brunswick, NJ, USA, Rutgers University Press.

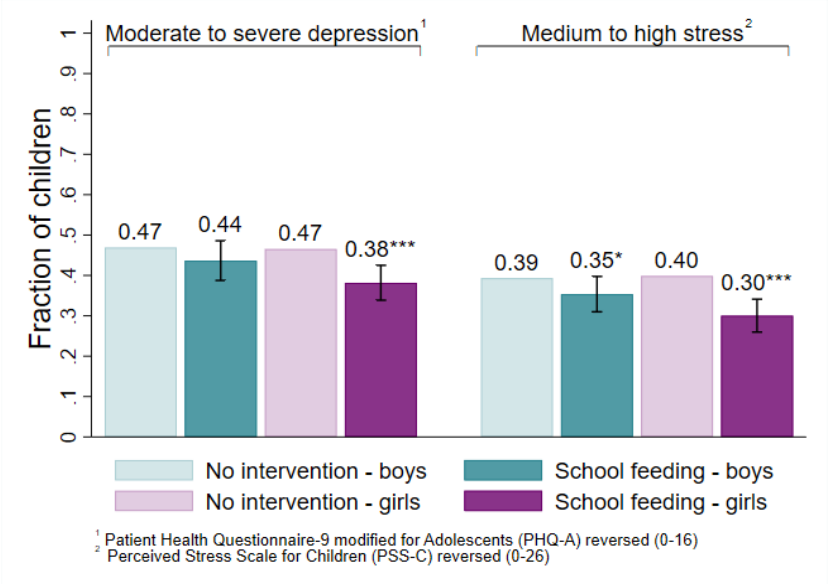
Figure 12: Fraction of children reporting above-median PHQ-A and PSS-C scores



*Specification defined in Equation 1a in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

88. In alignment with the impacts on nutrition, the decreases in the proportions of children reporting moderate to severe of depression and medium to high levels of stress were concentrated among girls (Figure 13). For depression, the proportion of girls reporting moderate to severe levels (as opposed to lower levels of depression) decreased from 47 to 38 percent, which was a statistically significant 9-percentage point decrease. This represents a 23-percent decrease. For stress, there was a statistically significant 10-percentage point decrease in the share of girls reporting higher stress levels (from 40 to 30 percent). This equated to a 25-percent decrease and was significantly different from the comparison mean and as compared with the results for boys. Girls and boys in the comparison group reported similar levels of stress and depression, suggesting that the observed impacts are unlikely to have been driven by girls "catching up" with boys. Instead, the results suggest that girls benefited more from the programme than boys in terms of mental health. A potential mechanism driving this differential impact could be the greater observed impacts on nutrition described in section 5.1.

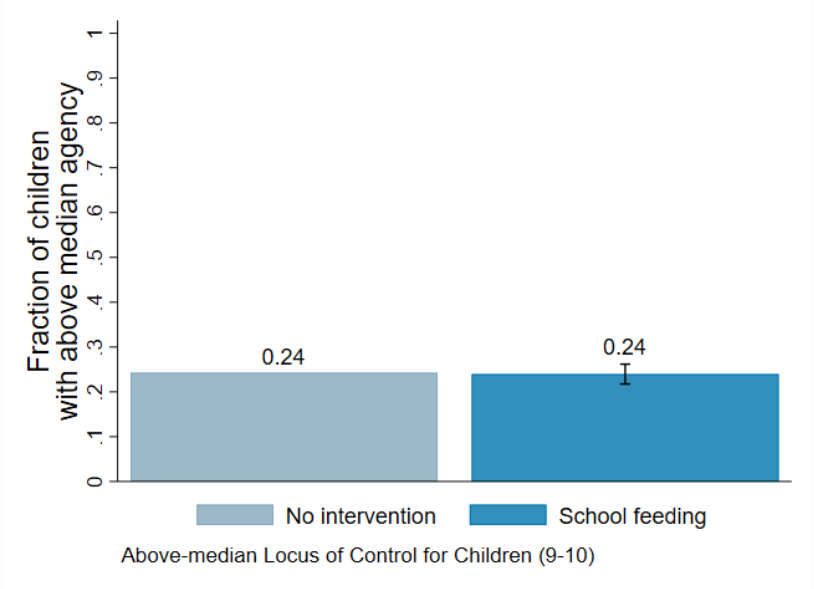
Figure 13: Fraction of children reporting above-median PHQ-A and PSS-C scores by gender



*Specification defined in Equation 1b in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

89. There were no statistically significant differences regarding agency between children receiving school meals and those not receiving them.[55] In both groups, 25 percent of the children gave at least 9 out of 10 answers indicating high personal agency (Figure 14). This result remained consistent even when disaggregating the analysis by gender.

Figure 14: Fraction of children reporting above-median agency

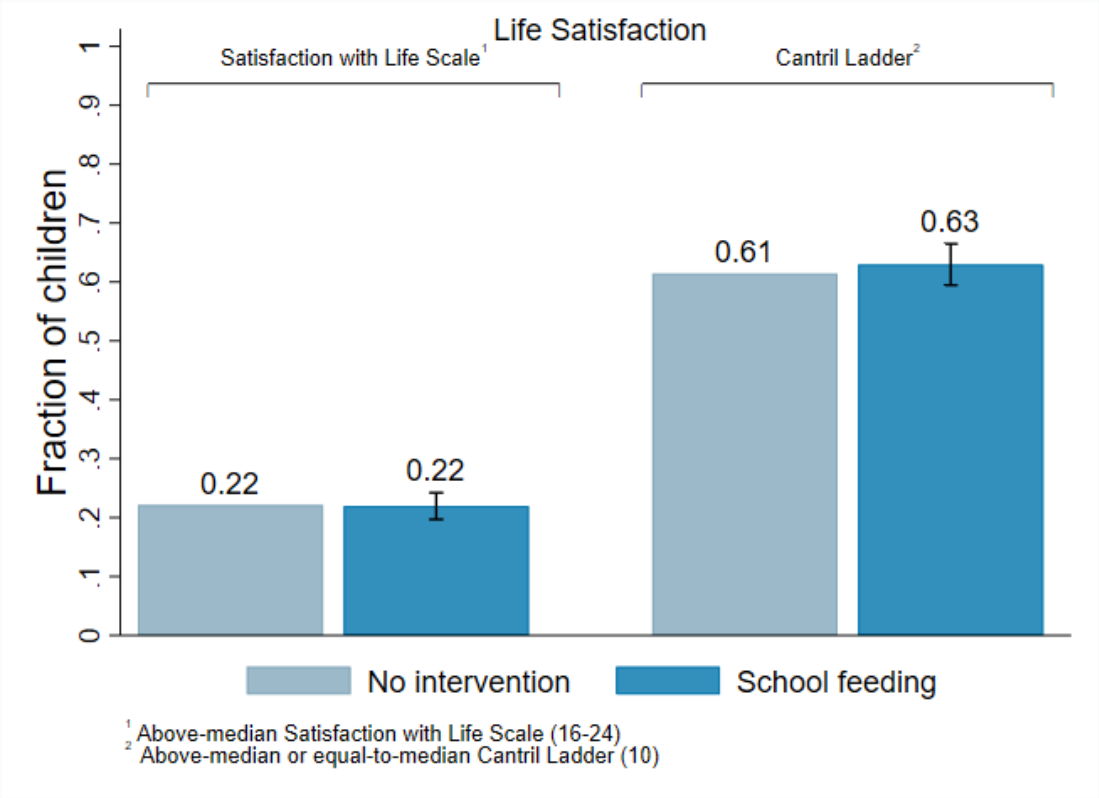


*Specification defined in Equation 1a in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

90. There were no statistically significant differences observed in life satisfaction between children receiving school meals and those who did not (Figure 15). Life satisfaction was measured using an adapted version of Diener et al.'s Satisfaction with Life Scale, including four statements along a six-point Likert scale. Life satisfaction was also measured using the Cantril Ladder, which measures responses on a scale from 0 to 10 (with 10 representing the best possible life for the respondent and 0 representing the worst possible life for the respondent) to the following question: "On which step of the ladder would you say you personally feel you stand at this time?". The inability to detect impacts on life satisfaction using the Cantril Ladder was at least partly due to the low variance in the responses, as 64 percent of children reported having a life satisfaction equal to 10. This result did not change when the analysis was disaggregated by gender.

[55] Agency is measured using ten questions adapted from a shorter version of the Nowicki–Strickland Locus of Control Scale for Children.

Figure 15: Fraction of children reporting above-median life satisfaction on the Satisfaction with Life Scale and above-median or equal-to-median life satisfaction on the Cantril Ladder



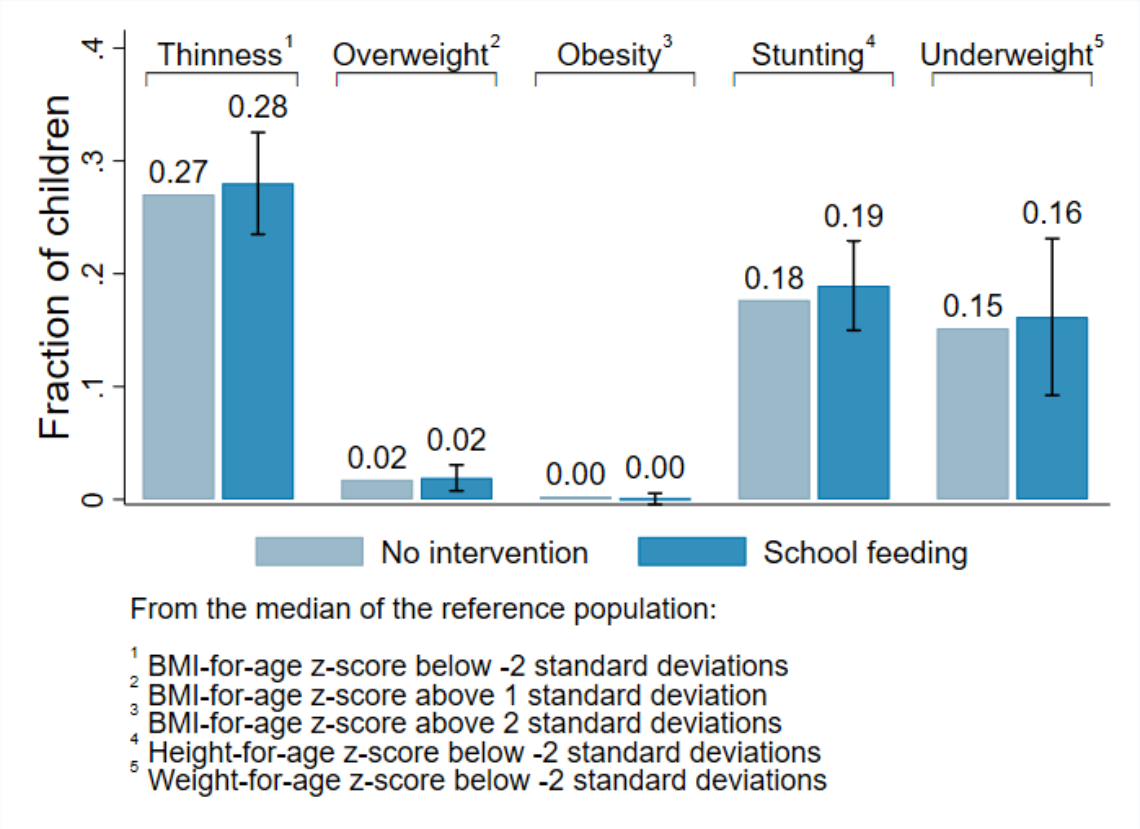
*Specification defined in Equation 1a in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

5.3 Child physical health

Summary of findings: There was no effect of school meals on malnutrition outcomes (obesity, overweight, thinness and stunting) during the study period. The team found no effect of school meals on the number of child sick days.

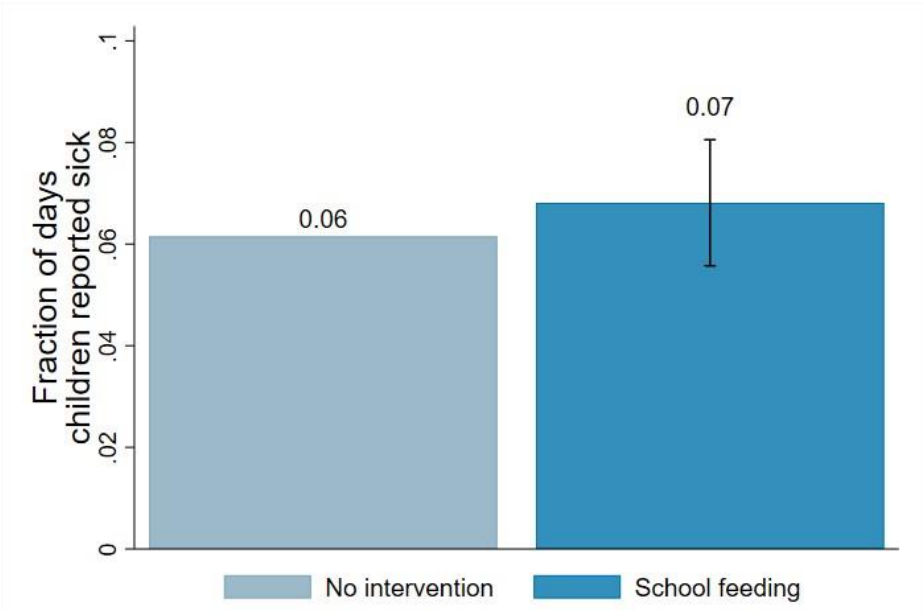
91. Physical health outcomes are expected to improve as children consume more and better-quality food. To test this hypothesis, the team measured children's weight and height to construct five malnutrition outcomes in line with the World Health Organization (WHO) growth reference data for children aged 5–19 years. Additionally, the child survey measured the proportion of days a child reported being sick over a seven-day period.
92. There were no statistically significant differences in malnutrition outcomes when comparing children receiving school meals with those who did not (Figure 16). This could have been due to the relatively short time frame of the study, consisting of less than one year of exposure.
93. There were no statistically significant differences in the percentage of days that children reported being sick over the past seven days (Figure 17). This result remained consistent even when the analysis was disaggregated by gender.

Figure 16: Fraction of children presenting malnutrition outcomes: thinness, overweight, obesity, stunting and underweight



*Specification defined in Equation 1a in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*
BMI = body mass index 95% confidence intervals

Figure 17: Fraction of days in which children reported being sick in the previous week



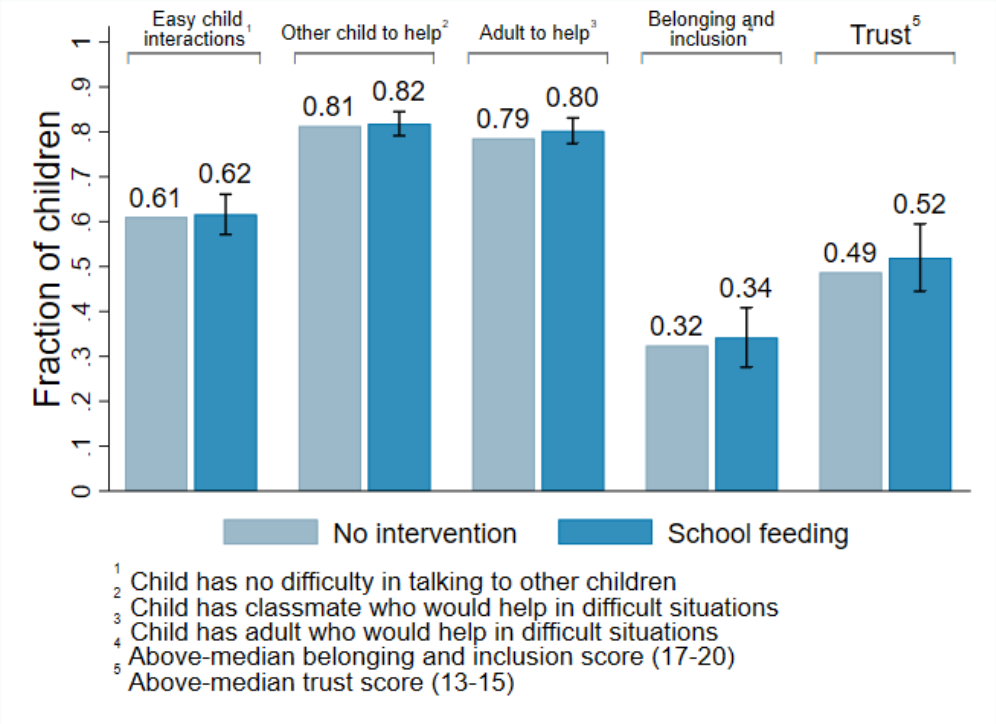
*Specification defined in Equation 1a in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

5.4 Child social cohesion

Summary of findings: There was no evidence of positive effects of school meals on children's feelings regarding social cohesion as measured by inclusion and belonging at school and trust.

94. For children and communities living in food-insecure settings, school meals may have an impact on social cohesion by fostering a sense of belonging and attachment to the community. Although The Gambia is not an emergency setting, various aspects of social cohesion in school, such as trust, tolerance, and belonging and inclusion, were measured to test this theory.
95. Although social cohesion outcomes improved on average, the evaluation did not observe statistically significant impacts on them when comparing children who received school feeding with those who did not (Figure 18). Similar patterns were observed when disaggregating the results by gender.

Figure 18: Fraction of children reporting improved social cohesion as measured by inclusion, belonging and trust outcomes



*Specification defined in Equation 1a in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

5.5 Teacher attendance

Summary of findings: Teacher incentives translated into a 10-percentage point increase in teacher attendance (from 74 to 84 percent). In addition, incentives increased teacher retention into the 2023/24 academic year by 17 percentage points (from 70 to 87 percent). These effects were driven by female teachers, who experienced a 17-percentage point increase in attendance (from 69 to 86 percent). The effect of teacher incentives on female teacher retention was even greater, demonstrating a 34-percentage point increase (from 56 to 90 percent).

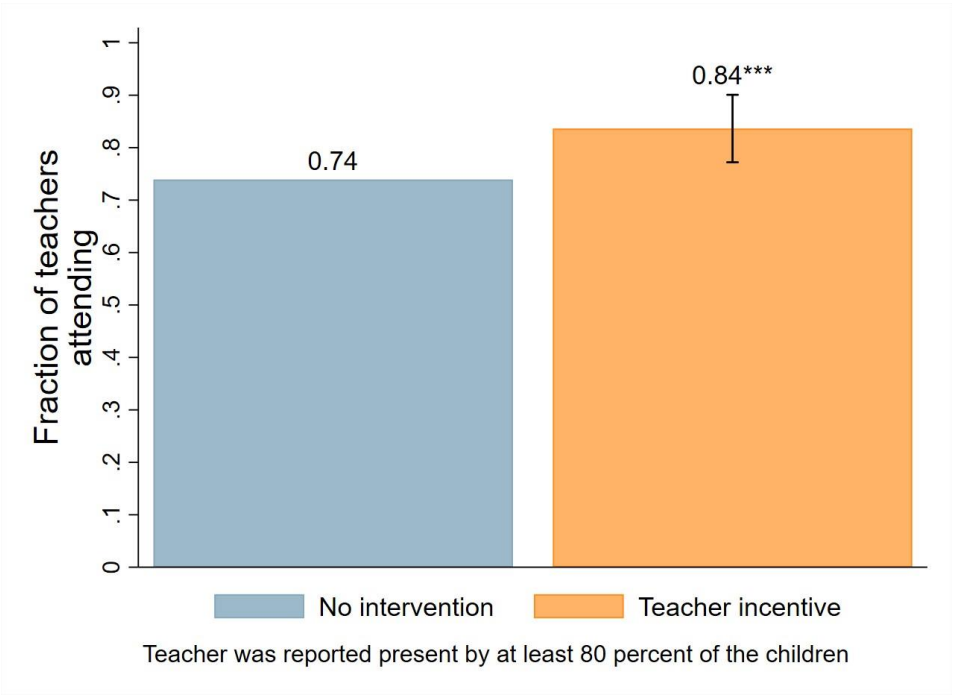
96. Based on the evaluation theory, the teacher incentive interventions are expected to improve both teacher attendance and retention among those eligible to receive the incentive. As the payment of the

teacher incentive is conditional on teacher attendance, teachers may be more likely to remain into the next academic year if the incentives and improved attendance strengthen their ties to their schools. To test this theory in the context of this WFP intervention, the evaluation examined whether providing teacher incentives improved teacher attendance and retention.

97. Teacher attendance during the 2022/23 academic year improved by 10 percentage points (from 74 to 84 percent) among teachers eligible for the incentive (Figure 19). This improvement was statistically significant.

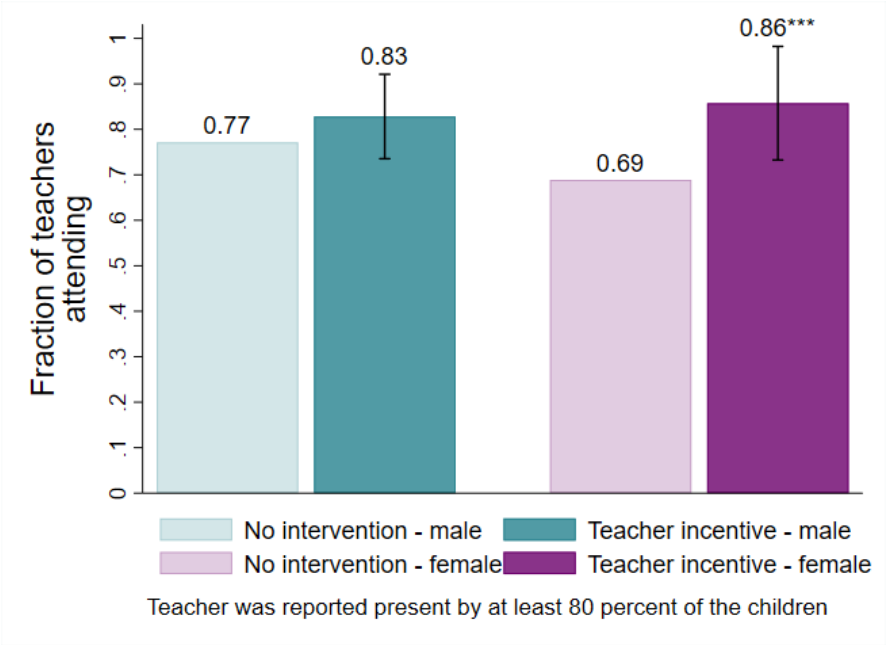
98. This improvement in teacher attendance was mainly driven by female teachers, who experienced a 17-percentage point increase in attendance (from 69 to 86 percent; Figure 20). This increase was statistically significantly different from the comparison mean. This impact on female teachers was driven by a "catch-up" effect, as the comparison mean of teacher attendance was lower for female teachers than for male teachers (69 and 77 percent, respectively) and resulted into a higher teacher attendance for female teachers than for male teachers (86 and 83 percent, respectively).

Figure 19: Teacher attendance



*Specification defined in Equation 2a in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

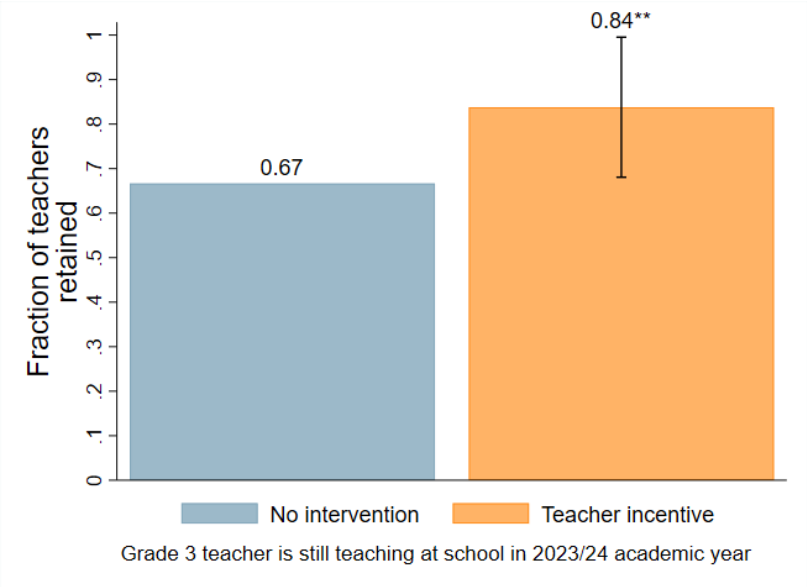
Figure 20: Teacher attendance by gender



*Specification defined in Equation 2b in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

99. Teachers were also more likely to remain in schools into the next academic year where these incentives were offered. Teacher retention from the 2022/23 academic year to the 2023/24 academic year improved by 17 percentage points (from 67 to 84 percent) among teachers eligible to receive the teacher incentive compared with those who were not (Figure 21). This difference was statistically significant.

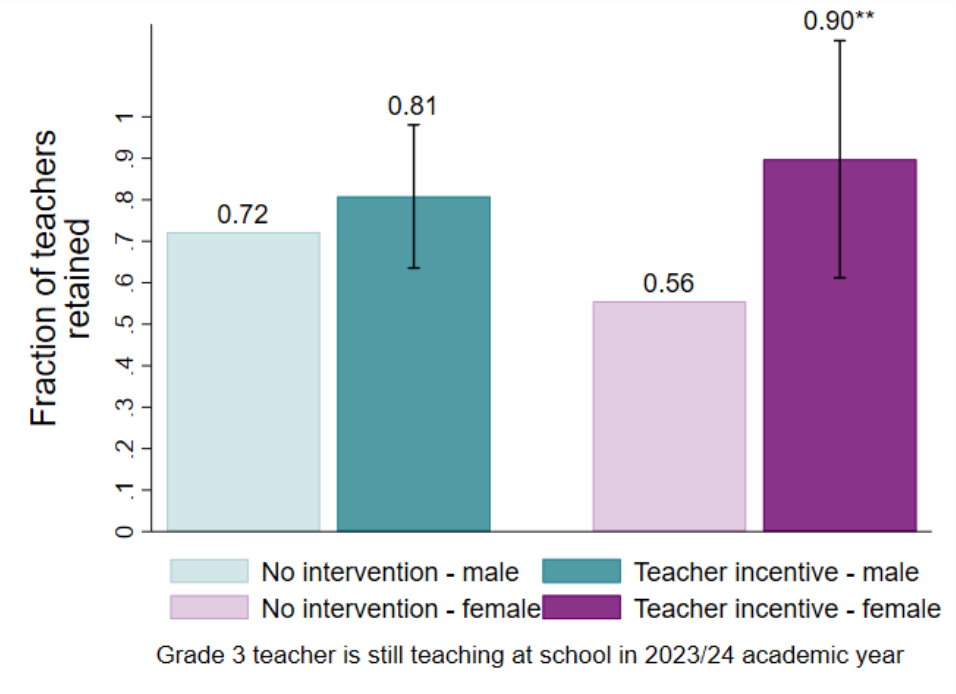
Figure 21: Teacher retention into the 2023/24 academic year



*Specification defined in Equation 2a in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

100. This impact on teacher retention was mainly driven by female teachers, who showed a 34-percentage point increase (from 56 to 90 percent; Figure 22). This increase was statistically significant. There was also a statistically significantly difference in retention between male and female teachers. The greater impact on female teachers was due to a "catch-up" effect. The comparison mean of teacher retention was lower for female teachers than for male teachers (56 and 72 percent, respectively), highlighting the greater impact of these incentives on female teachers.

Figure 22: Teacher retention into the 2023/24 academic year by gender



*Specification defined in Equation 2b in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

5.6 Child attendance

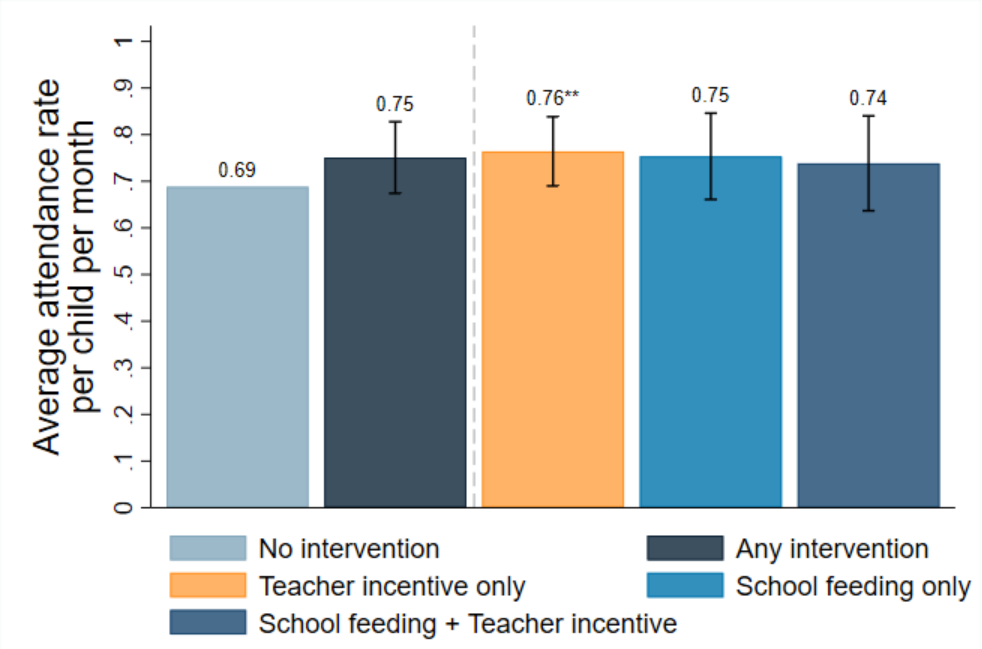
Summary of findings: Receipt of school feeding only, teacher incentives only or a combination of the two all translated into increased school attendance for children with low baseline attendance. Specifically, for children in the bottom 20th percentile of the baseline attendance distribution, any one of the interventions increased their attendance rate by 34 percentage points on average (from 20 to 54 percent attendance per month). There were no statistically significant differences in impact between the individual interventions. There was also a statistically significant decrease in the proportion of children dropping out during the school year (from 15 to 9 percent).

101. The evaluation theory suggests that school meals may impact child attendance and dropout rates over the school year. School feeding could increase attendance and decrease dropout rates through three mechanisms: reducing the opportunity cost of schooling; minimizing absenteeism due to illness; and creating a more positive school environment for children. Furthermore, incentivizing teacher attendance may further positively influence children's attendance and decrease dropout rates if teacher presence influences parents' decisions to send their children to school. To test this theory in the context of this WFP intervention, the evaluation examined two measures of child attendance and their engagement with

school: first, the study collected monthly attendance data for children who continued to enrol in school; and second, it assessed the likelihood of children's continued enrolment or of their dropping out throughout the school year.

102. On average, receipt of any one of the interventions did not have a statistically significant impact on the monthly attendance rate, although the direction of impact suggests that there was a trend towards improvement, as can be seen in Figure 23. The teacher incentive-only intervention arm showed a positive and statistically significant impact on the average attendance rate per child per month when compared with no intervention, but this effect was not statistically significantly different from the results obtained in the other intervention arms. There were no statistically significant differences when disaggregating the analysis by gender.

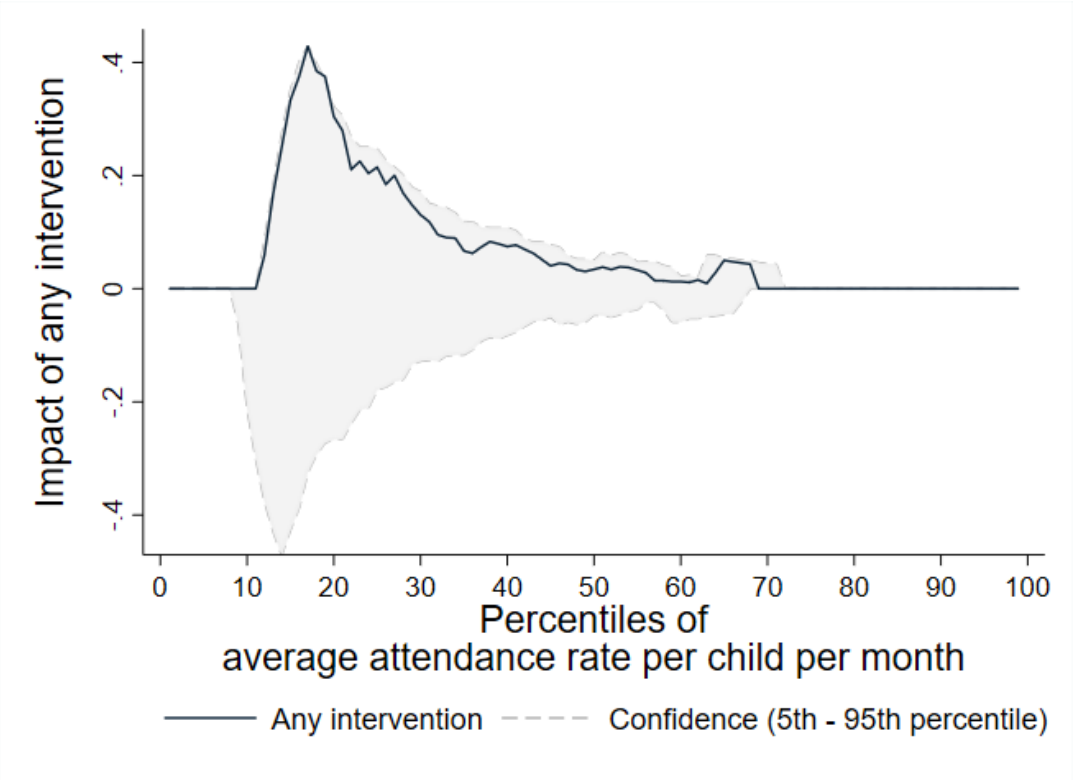
Figure 23: Average attendance rate per child per month: pooled (left), by arm (right)



*Specification defined in Equations 3a and 3c in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

103. However, there was evidence to suggest that all of the interventions had an impact on child attendance at the lower and higher ends of the distribution, as can be seen from Figure 24. Figure 24 presents the estimated impacts of the intervention across the attendance distribution. The greatest impact of any intervention on child attendance occurred for children in the bottom 20th percentile of the attendance distribution, and this effect decreased for children in higher percentiles of the attendance distribution. The reason for observed average effect being less than that observed for children in the bottom 20th percentile of the attendance distribution might be because of censoring at the extremes: the researchers did not expect to observe any effects at the lowest end of the distribution, as children who were rarely or never in school would not receive the meals, nor did they expect to observe effects for children who always attended, as their attendance rates could not increase further.

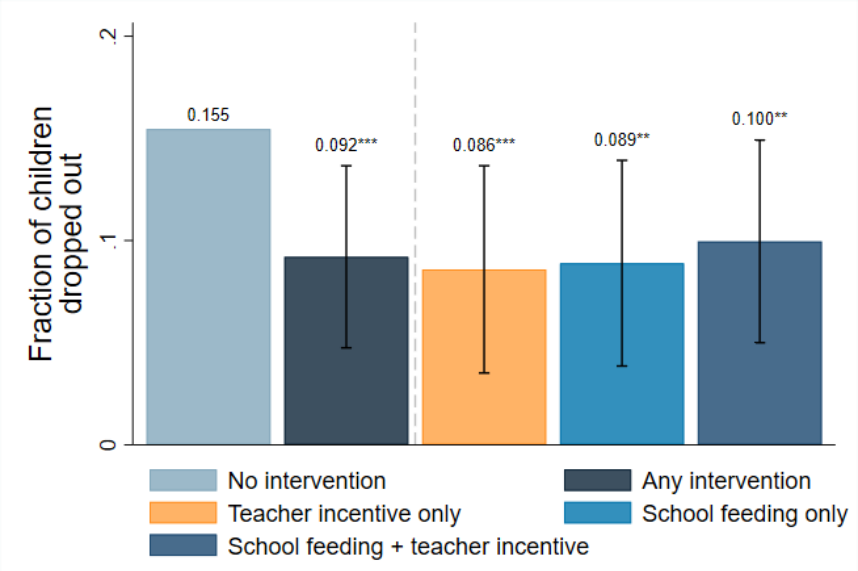
Figure 24: Average attendance rate per child per month per percentile



Specification defined in Equation 3a (with randomization inference) in Annex 3; 95% confidence intervals

104. Figure 25 indicates that any one of the interventions had a substantial effect on the likelihood of children remaining enrolled in the school throughout the school year. The proportion of children who dropped out during the school feeding year decreased by 6 percentage points (from 15 to 9 percent). This effect was statistically significant and was observed across all intervention groups. Individual interventions were not statistically significantly different from each other in terms of their impacts on dropout rates, suggesting that they affected dropout rates similarly. There were no observed statistically significant differences when disaggregating the analysis by gender.

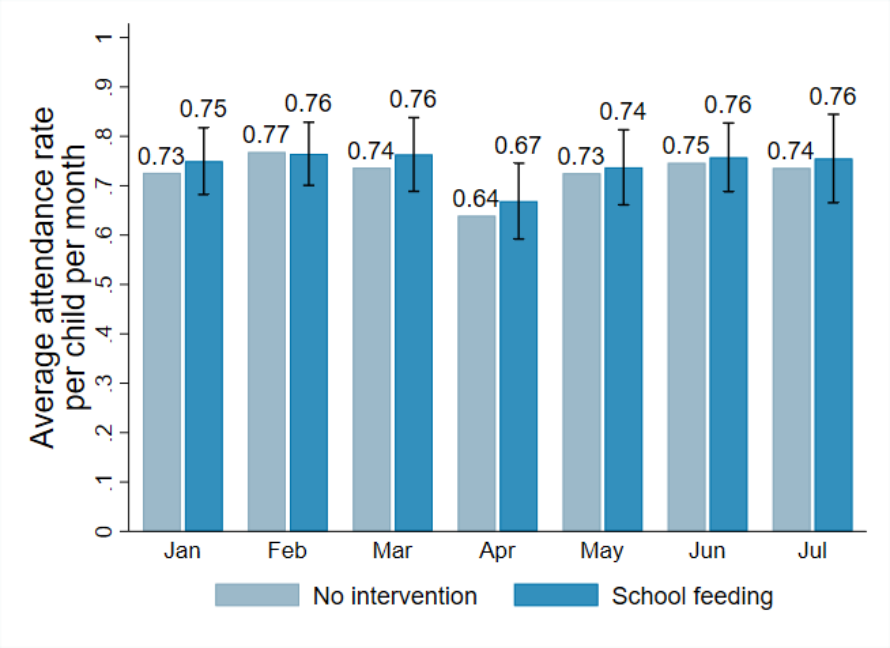
Figure 25: Fraction of children who dropped out during the school feeding year: pooled (left), by arm (right)



*Specification defined in Equations 3a and 3c in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

105. Figure 26 disaggregates attendance rate by month to verify whether school feeding affected children differently at various times throughout the year. The data suggest that there was overall seasonal variation in average attendance. However, the impact of school feeding did not vary significantly across the different periods.

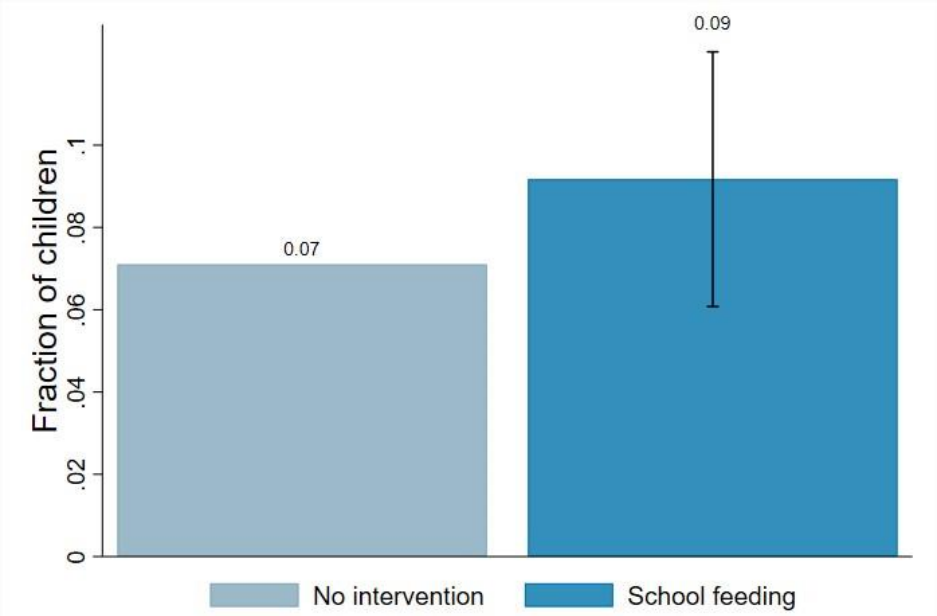
Figure 26: Average attendance rate per child per month



*Specification defined in Equation 1e in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

106. Although it is possible that the introduction of school feeding to certain schools may result in parents selectively transferring their children to those schools that provide these meals, this study found no statistically significant effects on new enrolment of children during the school feeding intervention (Figure 27). This observation holds even when disaggregating the analysis by gender.

Figure 27: Fraction of children newly enrolled in semester 2 or 3 during the school feeding year



*Specification defined in Equation 1a in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

5.7 Child school progression

Summary of findings: Tracking children into the 2023/24 academic year following the main evaluation period showed that providing any of the interventions led to a 7-percentage point increase in the fraction of children who were promoted to the next grade (from 70 to 77 percent). This effect was driven by a 5-percentage point decrease in the fraction of children who did not return to school following the summer break (from 17 to 12 percent). This represented a 29-percent reduction in the fraction of children who did not return to school following the end of the academic year. There was a negative correlation between attendance at baseline and likelihood of progression into the next academic grade. For children in the bottom 20th percentile of the attendance distribution at baseline, dropout rates decreased by 11 percentage points (from 41 to 30 percent). It is worth noting that children in the bottom 20th percentile of the baseline attendance distribution showed greater dropout rates compared with children not in the bottom 20th percentile of the baseline attendance distribution.

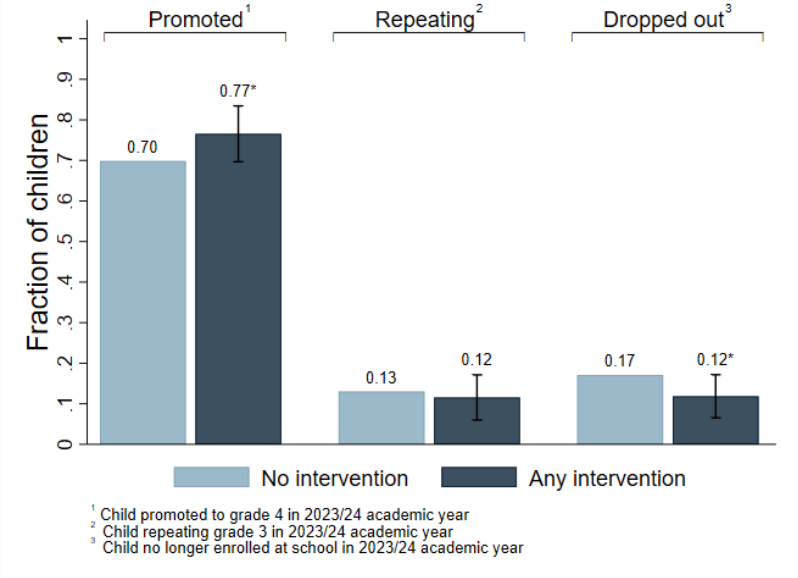
107. The evaluation theory highlights the potential for changes in student progression into the next academic grade in the following year, either directly through receiving meals or indirectly through increased attendance. It is expected that children who receive meals and/or spend more time at school are more likely to return and progress to the next grade in the following academic year. In addition, teacher incentives may increase teacher attendance and performance, which may lead to improved engagement among children. To test this theory in the context of this WFP intervention, this evaluation examined whether offering children school meals and/or providing teacher incentives resulted in improved school grade progression, as measured by the fractions of children who were promoted to the next grade, who

remained to repeat the same grade or who did not return to school. There was a negligible number of children who were demoted to the previous academic grade at the end of the year.

108. Providing any of the interventions resulted in a 7-percentage point increase in the proportion of children who were promoted to the next grade (from 70 to 77 percent; Figure 28). This effect was mainly driven by the combination of school feeding and teacher incentives (Figure 29). This increase in the proportion of children who were promoted was primarily driven by a 5-percentage point decrease in the proportion of children who did not return to the school that they had been enrolled in during the previous academic year (from 17 to 12 percent). This represented a 29-percent reduction in the fraction of children who did not return to school following the end of the academic year.

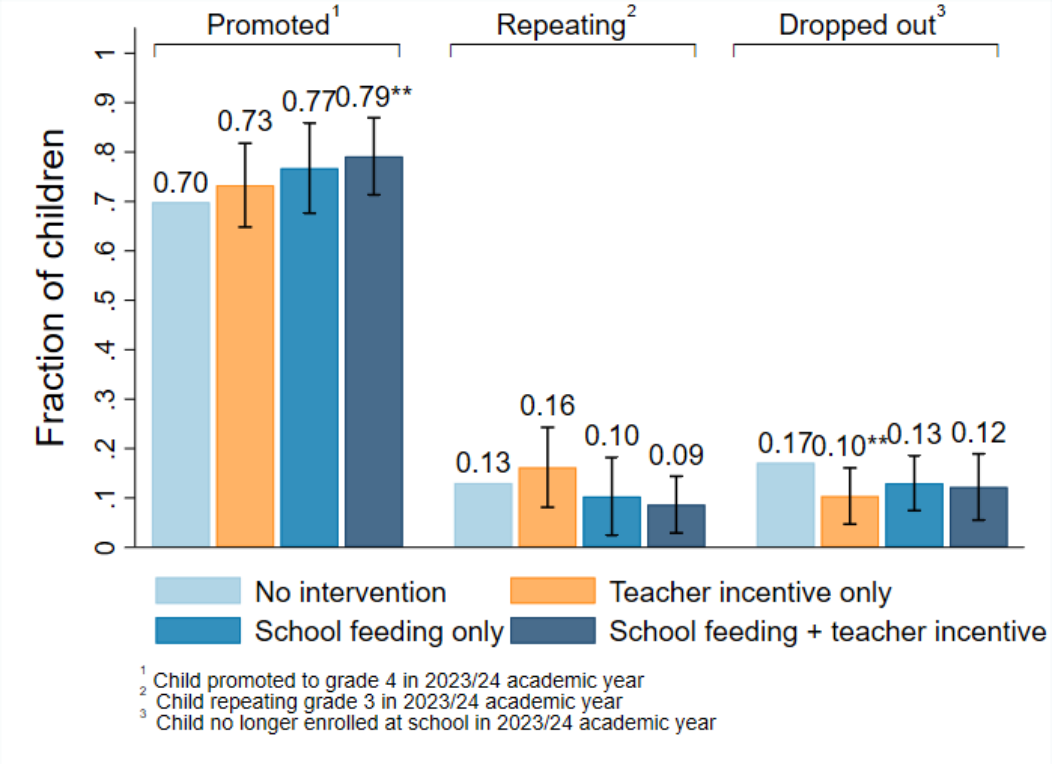
109. Although these impacts were stronger for girls than boys, the differences in impact were not statistically significant (Figure 30).

Figure 28: School grade progression into the next academic year for any of the interventions as compared with no intervention



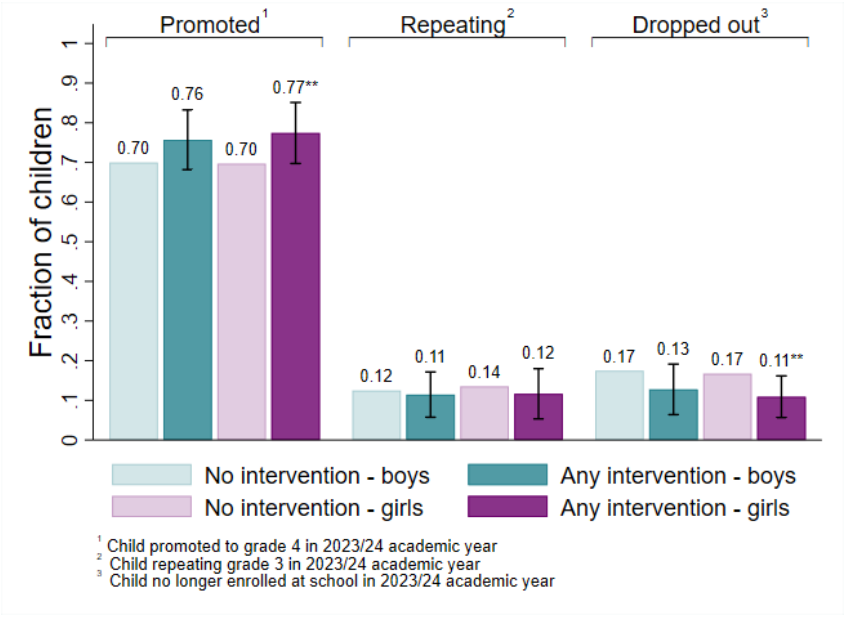
*Specification defined in Equation 3a in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

Figure 29: School grade progression into the next academic year and across the different interventions



*Specification defined in Equation 3c in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

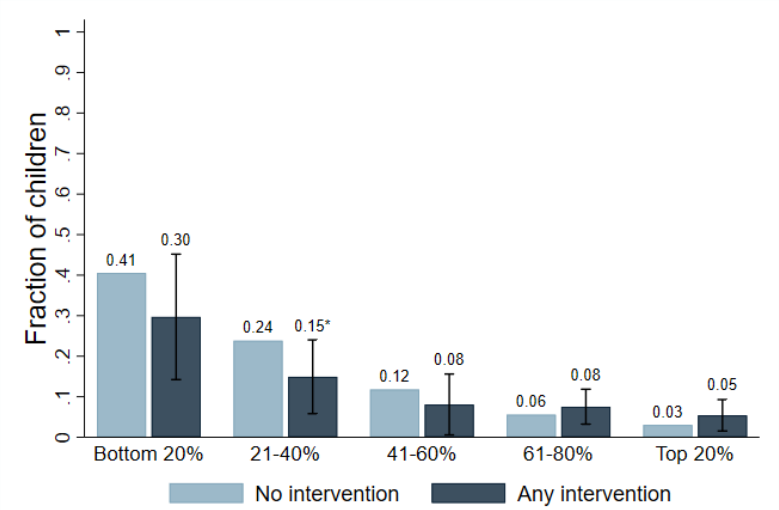
Figure 30: School grade progression into the next academic year for any of the interventions as compared with no intervention by gender



*Specification defined in Equation 1b in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

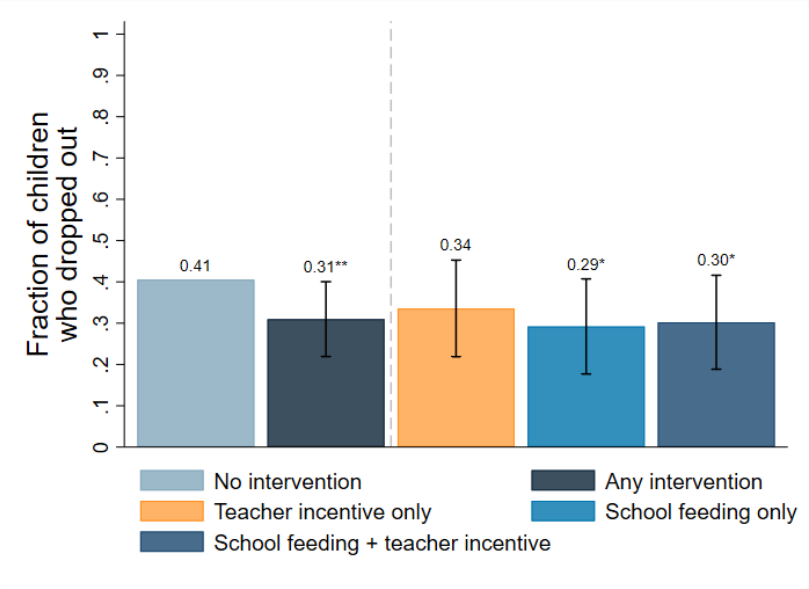
110. For children in the bottom 20th percentile of the attendance distribution at baseline, dropout rates decreased by 11 percentage points (from 41 to 30 percent; Figure 31). This difference was statistically significant. These higher dropout rates were statistically significantly different from those of children not receiving any intervention and across the various treatment arms. It is also notable that the children in the bottom 20th percentile of the attendance distribution at baseline demonstrated substantially higher dropout rates compared with those in the other quintiles, suggesting that there was a strong negative correlation between baseline attendance and dropout rate (Figure 32).

Figure 31: Children dropping out (not returning in the new 2023/24 academic year) by baseline attendance quintile



*Specification defined in Equation 3b in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

Figure 32: Children dropping out (not returning in the new 2023/24 academic year) for the bottom 20th percentile baseline attendees: pooled (left), by arm (right)



*Specification defined in Equation 3c in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

5.8 Child cognitive ability

Summary of findings: Generally, the children scored poorly on the cognitive ability tests. Receiving any of the interventions translated into a negative effect on the Stroop interference score – a measure of the ability to inhibit, especially with regard to distracters, with a lower Stroop interference score meaning greater difficulty with inhibiting interference. Children in the treatment groups scored 6 percent lower on average than those receiving no treatment (or 0.48 points lower than a comparison mean of 7.56). The negative effect on the Stroop interference score might have been driven by children being negatively affected due to their increased ability to read resulting in increased predicted performance in the incongruous task, but with their ability to read being insufficiently improved to perform better compared with children in the control group once interference was introduced.

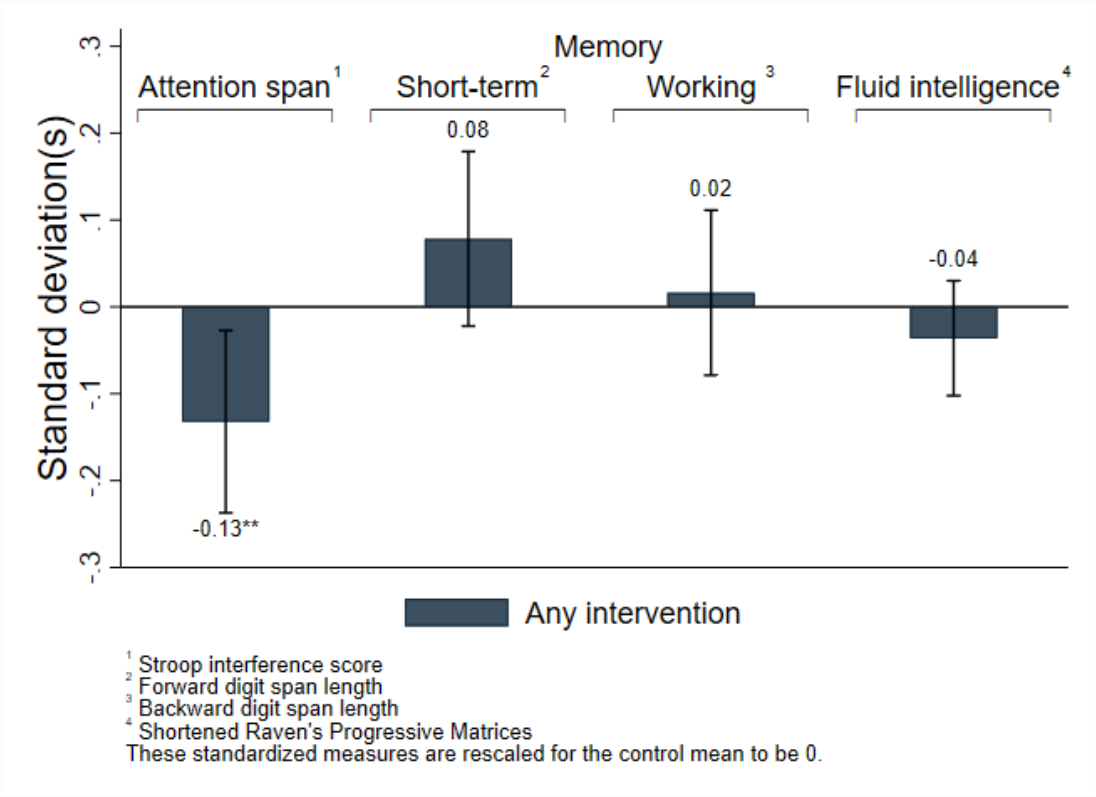
111. The evaluation theory suggests that there may be changes in children's cognitive ability over the period during which school meals are provided. School feeding may improve cognitive ability through two mechanisms: increasing children's likelihood of attending school; and ensuring that they are well fed while in school. Furthermore, teacher incentives may increase teacher attendance, which may positively influence children's cognitive ability. To test this theory in the context of this WFP intervention, the evaluation examined whether offering children school meals resulted in any changes in a child's cognitive ability. Cognitive ability was measured using a range of indicators, including the Stroop Colour and Word Test, forward and backward digit span and a shortened version of Raven's Progressive Matrices. More information about these indicators is available in Annex 1, and Table 1 provides a short summary of these indicators as well.

Table 1: Indicator, tool and measurement of cognitive abilities

Indicator	Tool	Measurement
Attention span	Stroop Colour and Word Test	Children are presented with written colour words, first in black ink and then in coloured ink, the colours of which differ from the written colour word. This is to test children's ability to deal with the interference, which is generally a sign of reading having become a more automatized skill.
Short-term memory	Forward digit span	Children are read aloud lists of digits of progressively increasing length, and they are then required to repeat the digits in the same order as that in which they were read aloud.
Working memory	Backward digit span	Children are read aloud lists of digits of progressively increasing length, and they are then required to repeat the digits in reverse order from that in which they were read aloud.
Fluid intelligence	Raven's Progressive Matrices (shortened and adapted for children)	Children are asked to identify the pattern or logical sequence in a grid of images and select the image that completes the sequence from the given options.

112. Providing any of the interventions had a negative effect on the Stroop interference score – a measure of the ability to inhibit automatic responses and to overcome cognitive interference such as distracters. In this evaluation, a lower Stroop interference score indicated greater difficulty with inhibiting interference. The score decreased by 0.48 points compared with a comparison mean of 7.56 points. This was equivalent to a statistically significant reduction of 0.13 standard deviations (SDs; Figure 33). None of the other cognitive ability indicators showed statistically significant differences. There were no statistically significant differences across the various interventions, nor when disaggregating the analysis by gender, for any of the cognitive ability outcomes.

Figure 33: Cognitive ability outcomes for any of the interventions as compared with no intervention



*Specification defined in Equation 3a in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

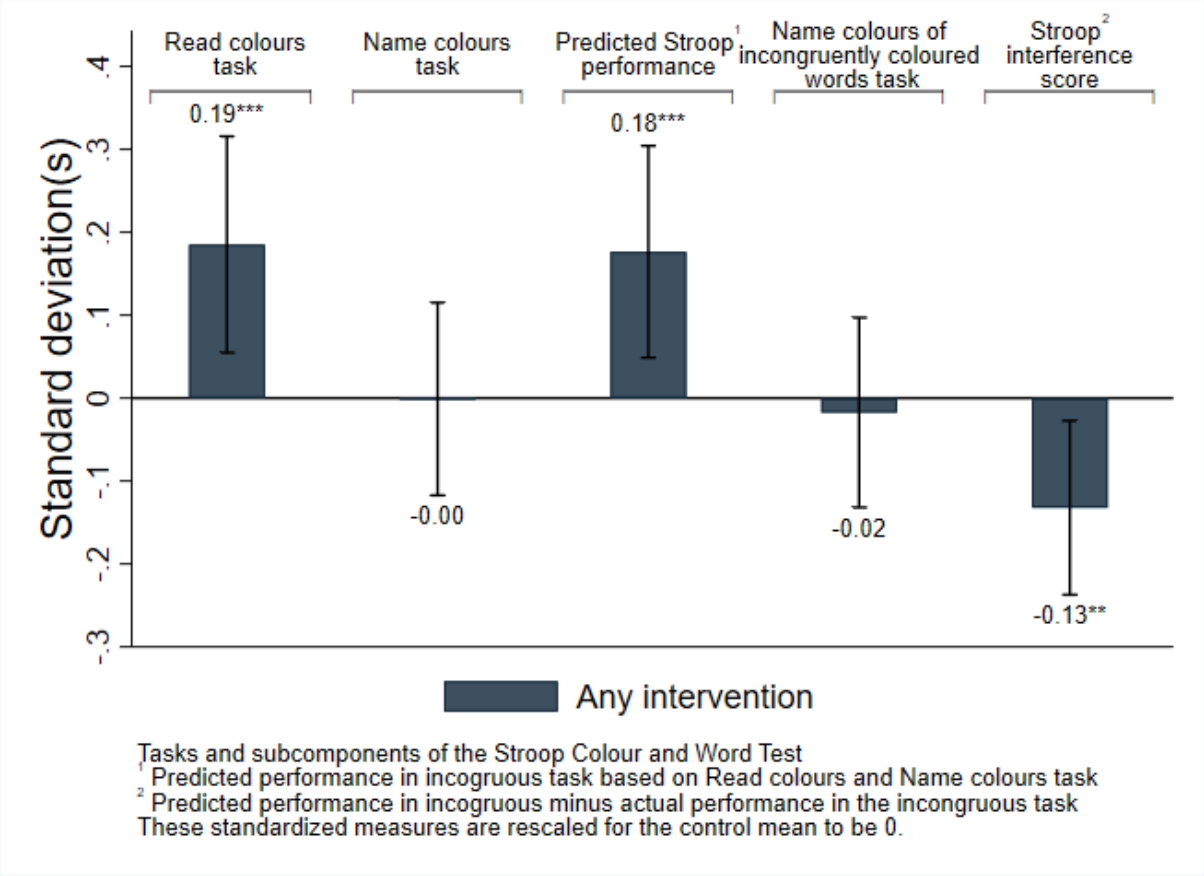
113. The negative Stroop interference score might have been driven by the fact that the children provided with any of the interventions might have been better able to read; however, they might also have been more distracted by text presented in a different colour from the colour word itself. This would inflate their predicted performance without improving their actual performance.[56] Figure 34 breaks down the components of the Stroop Colour and Word Test[57] to elucidate the factors underlying these surprising and negative results. Specifically, the "Read colours task" score assessed whether children could read the

[56] Children who are unable to read will have a low predicted score. Presenting words in a different colour from the colour word itself would not affect their ability to read these words (i.e. there is no actual interference introduced). However, with slightly improved reading skills, the predicted score would increase, but changing the colour of the text would distract the subject from reading the colour word.

[57] Scarpina, F. & Tagini, S. (2017). The Stroop Color and Word Test. *Frontiers in Psychology*, 8: 557.

colour words when they are presented in black ink. Children in the sample generally exhibited low reading ability, with many having been unable to read any colour words, producing a median performance of reading three words in 45 seconds. The interventions significantly increased the number of colour words a child could read, thereby improving their "Predicted Stroop performance" score. Performance in the "Name colour task" (which indicated whether a child could name a shown colour) remained unchanged. However, their reading ability did not increase sufficiently to lead to improved performance in the incongruent task, in which colour words were written in non-matching coloured ink and children were tasked with naming the colour words, as assessed in the "Name colours of incongruently coloured words task". Notably, both the intervention and comparison groups performed equally well on this task. This suggests that the overall negative results were driven by the fact that the children provided with any of the interventions were negatively affected by their improved reading ability, which increased their predicted performance in the incongruous task without yielding actual improvements.

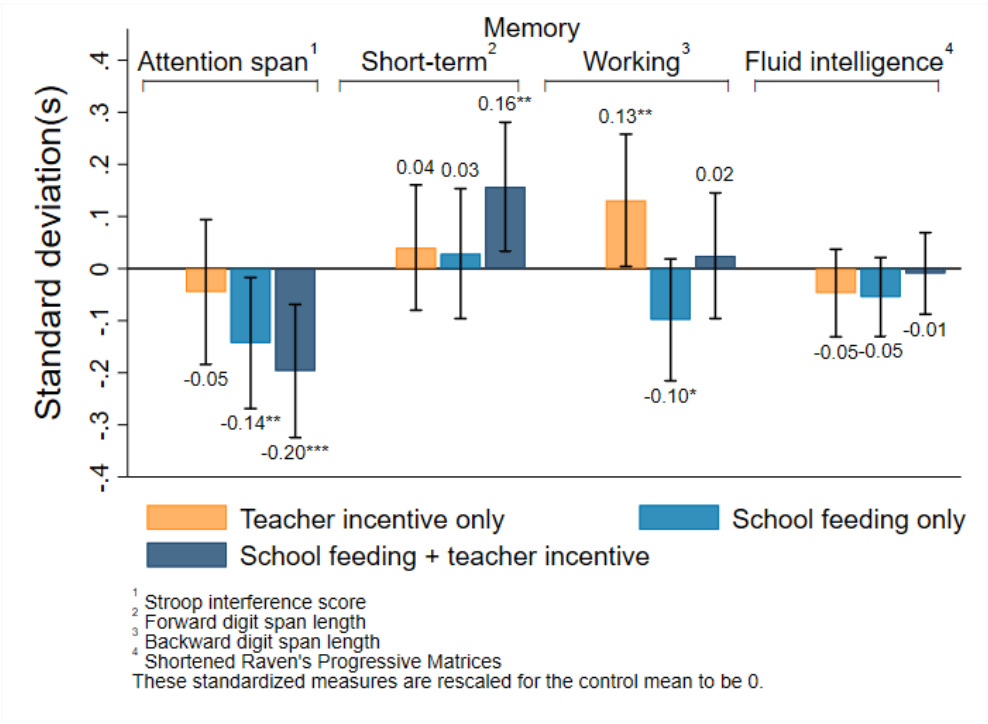
Figure 34: Stroop subcomponent outcomes for any of the interventions as compared with no intervention



*Specification defined in Equation 3a in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

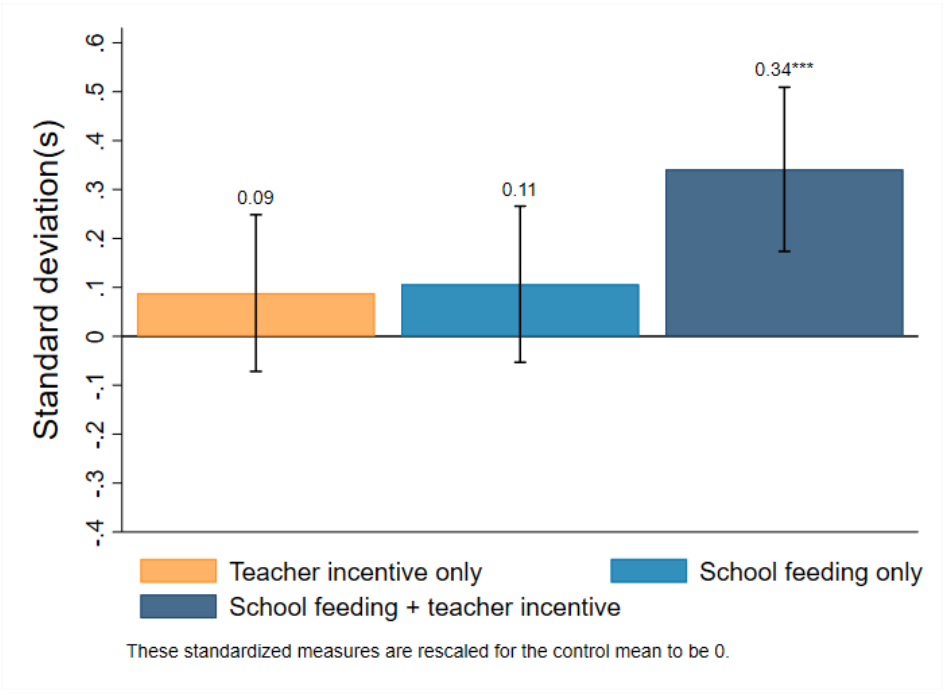
114. Disaggregating the results by intervention group indicated that there was a potentially greater impact when school feeding and teacher incentives were combined (Figure 35). As described in paragraph 113, the negative effect on the Stroop interference score could have been driven by improved performance in reading colour words (the reading monochromatic colour words subcomponent). For this subcomponent, performance improved most when school feeding and teacher incentives were combined, as can be seen in
115. Figure 35. A similar pattern was observed for the forward digit span test, as can be seen in
116. Figure 35.

Figure 35: Cognitive ability outcomes across arms



*Specification defined in Equation 3c in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

Figure 36: Read colour words subcomponent of the Stroop Colour and Word Test



*Specification defined in Equation 3c in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

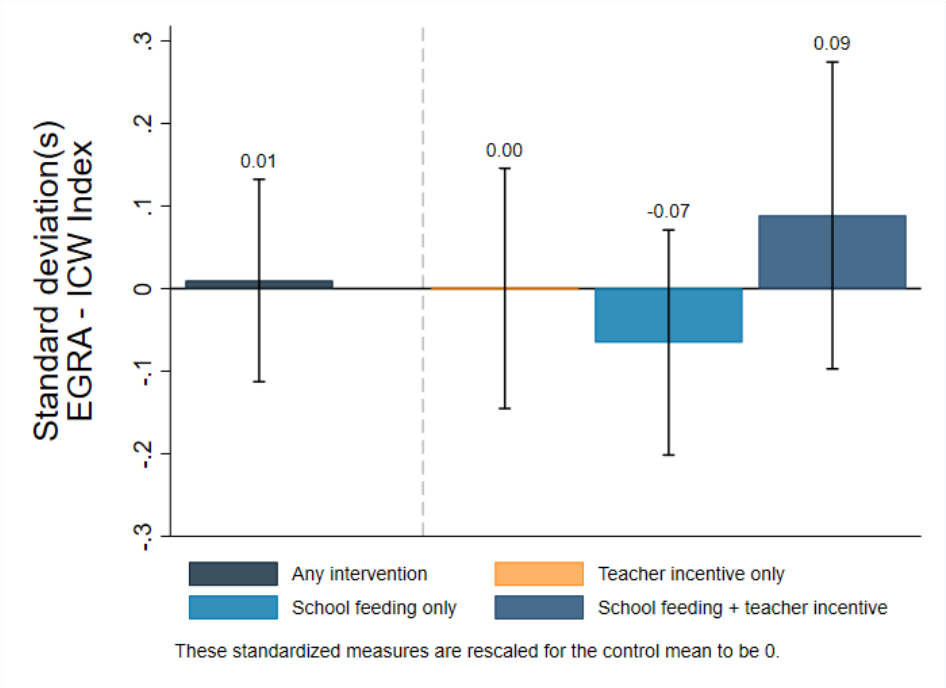
5.9 Child learning

Summary of findings: There was no evidence of any of the interventions positively impacting children's reading ability as measured by a weighted index of the core subtasks from the Early Grade Reading Assessment (EGRA).

117. The evaluation theory suggests that there may be changes in children's learning over a period during which school meals are provided. School feeding may improve learning through two mechanisms: ensuring that children are well fed and reducing absenteeism. Furthermore, teacher incentives may increase teacher attendance, which may also positively influence children's learning. To test this theory in the context of this WFP intervention, the evaluation examined whether offering children school meals resulted in any changes in a child's learning using the core subtasks of the EGRA.[58,59]

118. For children who were provided with any of the interventions, no statistically significant impacts were observed regarding any of the learning outcomes (Figure 37). There were no statistically significant differences across the different interventions or when disaggregating the analysis by gender.

Figure 37: EGRA inverse covariance-weighted index: pooled (left), by arm (right)



[58] EGRA tests can be designed by selecting any of 15 subtasks based on tasks that are most appropriate to the context being assessed. To ensure validity, there are five tasks (letter sound identification, non-word reading, oral reading fluency, reading comprehension and listening comprehension) that are considered to be core to the assessment, and it is therefore recommended that these always be included – these are referred to as the "core subtasks".

[59] Dubeck, M.M. & Gove, A. (2015). The Early Grade Reading Assessment (EGRA): Its Theoretical Foundation, Purpose, and Limitations. *International Journal of Education Development*, 40: 315–22.

*Specification defined in Equations 3a and 3c in Annex 3: *p < 0.1; **p < 0.05; ***p < 0.01; 95% confidence intervals*

6. Cost effectiveness

119. The goal of a cost effectiveness analysis is to document the costs of implementing a certain programme so as to obtain an additional SD of impact on a specific outcome area. It can also be conceived of as assessing the impact that can be achieved by spending USD 100 on implementing a given programme. Expressing changes in outcomes across different programmes while holding the investment constant, or vice versa, permits comparison across different interventions aiming to impact similar outcomes. Similarly, doing so can provide insights into the combined benefits that a given investment can achieve across multiple outcomes.

120. In the context of this evaluation, four main programme outcomes are included: dropout rate, food security, mental well-being and reading ability. It is important to note that, although these outcomes explore the multisectoral nature of school feeding, school meals programmes are also expected to affect local economies in the case of locally procured or home-grown food. These outcomes, however, are beyond the scope of this evaluation. The first part of this cost effectiveness analysis calculates the cost effectiveness of each intervention regarding a particular outcome. Then, to allow for a comparison of investment in the intervention across multiple dimensions, each outcome is translated into cost per averted adverse outcome. Finally, the impacts are converted into learning-adjusted years of schooling (LAYS) to allow for a comparison of the dropout rate results with results from other interventions and international experiences.

6.1 Cost effectiveness across interventions per selected outcome

121. The cost effectiveness analysis consists of two steps. The first involves calculating the total costs per beneficiary of each intervention across the following expenditure categories: programme administration and staff costs; implementation and programme material costs; transportation and per diem costs; targeting costs; training costs; and office costs. The second step involves dividing the total costs per beneficiary by the impacts (presented in section 5). Impacts are expressed in SDs to make them comparable across groups. This yields the cost required to achieve one additional SD of impact. These estimates are then compared with evidence from the literature regarding the cost effectiveness of other interventions aimed at achieving similar outcomes.

122. The detailed, itemized costing estimates that underlie the per-beneficiary costs are provided in Annex 10. It is important to put these figures into perspective. In this case, the teacher incentives were implemented in the context of a school feeding programme. The general programme coordination costs are assigned only to the implementation of the school feeding programme; the cost of the teacher incentives should, therefore, be interpreted as the marginal cost of adding it to another existing programme. Putting in place a stand-alone accountability and incentive scheme is likely to be more costly in other contexts. Therefore, the cost effectiveness of the teacher incentive scheme alone should not be assessed using only this information. Instead, the results for the school feeding only and the school feeding and teacher incentives combined interventions are compared with international experiences with other education interventions.

123. Table 2 summarizes the cost effectiveness analysis. It takes the cost per beneficiary of each intervention as input (column 2). The standardized impact estimates on dropout rates, food security, mental well-being and reading ability expressed in SDs of the control mean are reported in column 4. The analysis only reports on outcomes for which the treatment arm was shown to have a statistically significant impact, as reported in section 5. The cost per additional SD of impact reported in column 5 is calculated by dividing the cost per beneficiary (column 2) by the SD of impact per beneficiary (column 4).

Table 2: Cost effectiveness analysis

Intervention	Cost per beneficiary (USD)	Indicator	Change per beneficiary (SD)[60]	Cost per additional SD of impact (USD)	Averted adverse outcomes per USD 100	LAYS per USD 100
(1)	(2)	(3)	(4)	(5)	(7)	(8)
Teacher incentive	2.42[61]	Dropout rate	-0.18	-	-	-
		Food security	-	-	-	-
		Mental well-being	-	-	-	-
		Reading ability	-	-	-	-
School feeding	14.03	Dropout rate	-0.11[62]	127.54	2	0.16–1.21
		Food security	+0.25	56.12	1	-
		Mental well-being	+0.08	175.36	1	-
		Reading ability	-	-	-	-
Teacher incentive + school feeding	16.45	Dropout rate	-0.13	126.52	2	0.17–1.29
		Food security	+0.18	91.37	1	-
		Mental well-being	+0.07	234.96	1	-
		Reading ability	+0.34	48.38	2	-

124. As was also shown in section 5, impacts on dropout rates are similar across intervention arms. The cost per additional SD of impact for school feeding alone is USD 127.54, which is similar to the figure of USD 126.52 per additional SD of impact for the combined intervention.

125. The costing analysis shows that the cost per additional SD of food security is USD 56.12 for school feeding alone, whereas the combined arm is less cost-effective, resulting in an estimated USD 91.37 per additional SD of food security.[63] This is due to the higher price per beneficiary in the combined intervention (USD 14.03 versus USD 16.45) and there being no complementarities in combining school meals with teacher incentives: ensuring teachers are present in schools does not translate into greater

[60] Impacts are reported in SDs from the control mean to permit comparison across outcomes. These do not translate directly into the data presented in section 5.

[61] This should be interpreted as the marginal cost of adding it to another existing programme.

[62] The dropout rate results do not demonstrate significance for each individual treatment arm. However, the results consistently point in the same direction across groups and when the intervention groups are combined. The small sample size and resulting low statistical power are probably driving the limited statistical significance of each individual treatment arm.

[63] This is equivalent to 1.78 SD for USD 100 spent on school feeding and 1.09 SD for USD 100 spent on school feeding and teacher incentives combined.

impacts of school meals on food security, as the results show that the teacher incentive group did not demonstrate improved food security for children.

126. The results indicate that school meals are particularly effective at improving child mental well-being. The cost per additional SD of mental well-being is USD 175.36 for school feeding and USD 234.96 for the combined intervention. The combination of school feeding and teacher incentives is more expensive, and there is no evidence of complementarities in combining school meals with teacher incentives for improving mental well-being.

127. In this evaluation, school meals alone did not result in increased reading ability outcomes measured using the EGRA (Figure 37). However, there was evidence that the combination of the interventions increased children's ability to read colour words, as measured using the Stroop Colour and Word Test (Figure 36). Using this measure suggests that the cost per additional SD of reading is USD 48.38 for the combined school feeding and teacher incentive arm.

6.2 The combined impact of investment in each intervention arm

128. The evaluation calculates the cost per averted adverse outcome to allow for a multidimensional comparison. The analysis translates each outcome into a potential adverse outcome by establishing a threshold for each indicator after which the outcome for the child is deemed adverse (e.g. a child is food insecure or depressed). This enables a comparison of the impact of investing USD 100 on the estimated number of students who did not drop out, are not food insecure, are not depressed or cannot read for each package of interventions.

129. Calculations regarding the cost per averted adverse outcome indicate that spending USD 100 on school feeding prevents approximately two children from dropping out of school, one child from becoming food insecure and one child from becoming depressed. Finally, investing USD 100 on school feeding and teacher incentives combined prevents approximately two children from dropping out of school, one child from becoming food insecure, one child from becoming depressed and two children from not being able to read colour words.

6.3 Comparing cost effectiveness on dropout rates with other education interventions

130. Finally, to compare the cost effectiveness of the interventions studied with other interventions and similar experiences in other countries, the impacts on dropout rates are converted into impacts on LAYS, a measure that is widely used for cross-country comparisons of education interventions. The measure adjusts impacts on years of schooling for the additional learning that is estimated will place. The calculation is based on standardized tests conducted across a wide range of contexts. Estimates from a cross-country study suggest that, in The Gambia, one additional year of education in primary school is equivalent to 0.56 international years of education.[64,65]

131. Table 2 provides, for each intervention, lower and upper bounds of how many LAYS can be bought by USD 100 for each intervention. The lower bound assumes that the impacts of the dropout rate only last for one year, meaning that beneficiaries gain one formal year of education if they do not drop out.[66] The

[64] World Bank. (2023). *Human Capital Index Database*, https://databank.worldbank.org/source/human-capital-index

[65] This is obtained by dividing the latest available score obtained by Gambian children in standardized tests (352.9) by the maximum possible score (625.0).

[66] Impact in LAYS is calculated by multiplying the impact on dropout rate in percentage points by 1 (assuming the impact persists for one year) and by 0.56 (effective learning for one year); dividing LAYS by the cost per beneficiary yields the LAYS per USD 1, and multiplying that by 100 yields the LAYS per USD 100.

upper bound assumes that the impacts of the dropout rate persist until beneficiaries achieve the expected years of education in The Gambia, which is 7.52 years at the start of grade 3. This is equivalent to assuming that averting dropping out once is sufficient to prevent future dropping out.[67,68]

132. These estimates can be compared with the results from other education interventions. A recent World Bank report compiled LAYS results across a wide range of education interventions.[69] Combining the results showed that both school feeding alone and when combined with teacher incentives were as cost-effective as cash transfers or school inputs (e.g. providing textbooks, uniforms, etc.).

133. The cost effectiveness analysis shows that all interventions are similarly effective at reducing dropout rates. If dropout rate is the only outcome of interest in a given context, teacher incentives by themselves might be most cost-effective if they can be implemented at a lower cost than school feeding.

134. However, school feeding impacts child outcomes across multiple dimensions, such as food security and mental well-being. These impacts might not be sufficient to achieve improvements in educational outcomes, such as better reading ability, if the educational context in schools is not able to translate these impacts into learning. In this context, adding teacher incentives to an existing programme represents a low-cost, complementary intervention that increases teacher attendance and could support the translation of these impacts into learning.

[67] The figure is 9.52. Impact in LAYS is calculated in the same way as explained in footnote 69, with the only difference being that impacts are assumed to persist for 7.52 years instead of 1 year (i.e. impacts persist for the expected years of education in The Gambia minus the 2 years already completed by third graders, or 9.52 minus 2).

[68] World Bank. (2023). *Human Capital Index Database*.

[69] World Bank, FCDO & BE2. (2023). *Cost-Effective Approaches to Improve Global Learning: What Does Recent Evidence Tell Us Are "Smart Buys" for Improving Learning in Low- and Middle-Income Countries?* Foreign, Commonwealth & Development Office, the World Bank, UNICEF and USAID.

7. Conclusions and considerations for future programming

135. This section answers the evaluation questions (EQs) posed by the impact evaluation and discusses considerations for future WFP interventions.

EQ1. Does the provision of HGSF interventions impact children's food security, nutrition, health and education outcomes?

136. **Food security and nutrition:** Receipt of school meals translated into improved perceived food security and dietary diversity measures. The proportion of children experiencing high levels of food security increased by 12 percent, and the proportion of children who reported an above-median dietary diversity score increased by 22 percent, driven by increased intake across various food groups. These results were driven by substantial impacts on girls, who experienced an increase in perceived food security of 15 percent and a 29-percent increase in dietary diversity. The proportion of children who reported consuming breakfast before school increased by 6 percentage points (from 53 to 59 percent), an effect that was mainly driven by girls.

137. **Mental health:** Receipt of school meals translated into reduced self-reported stress and depression in children. The proportion of children reporting higher levels of depression decreased by 13 percent (from 47 to 41 percent), and the proportion of children reporting medium to high stress decreased by 20 percent (from 40 to 32 percent). These effects were particularly pronounced among girls, with a 23-percent decrease in the proportion of girls reporting moderate to severe depression and a 25-percent decrease in the proportion of girls reporting high levels of stress.

138. **Physical health:** As expected, given the limited duration of the evaluation, there were no measurable effects of school meals on malnutrition outcomes (obesity, overweight, thinness and stunting). There was also no measurable effect on number of child sick days.

139. **Social cohesion and trust:** There were no meaningful changes due to the programme in children's feelings regarding social cohesion as measured by inclusion and belonging at school and trust.

140. **Educational outcomes:** School meals increased child attendance and reduced dropout rates among children whose attendance was low to begin with. There were limited improvements in children's literacy test scores during the evaluation period. A more detailed discussion of the educational and learning outcomes is given in the response to EQ4.

EQ2. Are there heterogeneous impacts of providing home-grown school meals to primary school students in terms of gender?

141. The analysis revealed that the positive impacts of school meals on children's food security and dietary diversity were concentrated among girls. Similarly, the decreases in the proportions of children reporting moderate to severe depression and medium to high levels of stress were also concentrated among girls.

Consideration #1: Given the positive impacts of home-grown school meals on food security, nutrition and mental health (particularly among girls), the Government and the WFP country office are encouraged to consider continued investment in school meals programmes.

EQ3. Do school feeding programmes mitigate children's vulnerability to seasonal fluctuations and shocks?

142. Children can experience fluctuations in food security and dietary diversity throughout the year. Similarly, the impacts of school feeding on food security and dietary diversity showed variations across the different survey rounds. However, this variation was not statistically significant. The estimated impacts of school feeding on food security ranged from improvements of 14 percentage points in May to improvements of 7 percentage points in October. The estimated impacts of school feeding on dietary

diversity ranged from improvements of 3 percentage points in June to improvements of 12 percentage points in May.

Consideration #2: There is no strong evidence to suggest that school meals delivery should be timed to prevent seasonal fluctuations in food security.

EQ4. Does greater teacher attendance, improved through an accountability system based on monetary incentives, improve the impacts of school feeding programmes on educational outcomes? What is the relative cost effectiveness?

143. **Teacher incentives:** Teacher incentives translated into a 10-percentage point increase in teacher attendance (from 74 to 84 percent). In addition, teacher incentives increased teacher retention into the 2023/24 academic year by 17 percentage points (from 70 to 87 percent). These effects were driven by female teachers, who experienced a 17-percentage point increase in attendance (from 69 to 86 percent). The effect of teacher incentives on female teacher retention was even greater, demonstrating a 34-percentage point increase (from 56 to 90 percent). These findings reflect important gender dynamics in the labour force.

144. **School attendance:** Receipt of school feeding only, teacher incentives only or a combination of the two all translated into increased school attendance for children with low baseline attendance. Specifically, for children in the bottom 20th percentile of the baseline attendance distribution, any of these interventions increased their attendance rate by 34 percentage points on average (from 20 to 54 percent attendance per month). There were no statistically significant differences in impact between the individual interventions. There was also a statistically significant decrease in the proportion of children dropping out during the school year (from 15 to 9 percent).

145. **School progression:** Tracking children into the 2023/24 academic year following the main evaluation period showed that providing any of the interventions led to a 7-percentage point increase in the fraction of children promoted to the next grade (from 70 to 77 percent). This effect was combined with a 5-percentage point decrease in the fraction of children who did not return to school following the summer break (from 17 to 12 percent).

146. **Dropout rate:** For children in the bottom 20th percentile of the attendance distribution at baseline, the dropout rate decreased by 8 percentage points (from 47 to 39 percent). It is worth noting that children in the bottom 20th percentile of the baseline attendance distribution demonstrated substantially greater dropout rates compared with children not in the bottom 20th percentile of the baseline attendance distribution.

147. **Cognitive ability and learning:** Analyses of the impacts of the programme on cognitive abilities (e.g. forward and backward digit spans and Raven's Progressive Matrices) and learning (EGRA) showed that the children in the control and treatment groups did not perform differently in school. This suggests that the students who were induced to stay in school by the school feeding and teacher incentive interventions (due to the observed decrease in dropout rate and increase in attendance of the most vulnerable children) did not perform differently than the children who would have been enrolled and attending school even in the absence of the programme.

148. **Complementarities:** The evidence suggests that all of the interventions have the potential to positively affect school attendance and grade progression, particularly for those children who were the least engaged at baseline. The evaluation did not find substantial differences in impacts or complementarities, although the results indicate that there potentially were initial gains in children's ability to read when the interventions were combined.

149. **Cost effectiveness:** School feeding alone was more cost-effective than the combination of school feeding and teacher incentives in terms of improving dropout rates, food security and mental well-being. However, the combination of school feeding with greater teacher attendance increased children's ability

to read colour words as measured by the Stroop Colour and Word Test, which was not identified when investigating school meals or teacher incentives alone.

150. In conclusion, school meals programmes are effective at improving child outcomes across multiple dimensions, such as food security, education attendance and mental well-being. However, they might not be sufficient to achieve improvements in educational outcomes if the educational system is not able to translate these impacts into greater learning. The evaluation showed that adding an accountability system based on teacher incentives was a cost-effective way to increase teacher attendance, which, when combined with school feeding, improved learning outcomes on basic reading tasks. This, however, was not sufficient to improve children's overall literacy test scores.

Consideration #3: More work should be conducted to determine how school meals can complement interventions that maximize learning potential for children in schools, especially regarding cognition and learning outcomes. The WFP country office is therefore encouraged to consider how it can partner with the national government and coordinate with other organizations to support learning interventions implemented in conjunction with school meals programmes.

EQ5. What is the cost effectiveness of school feeding relative to other interventions?

151. HGSF programmes are expected to impact outcomes across multiple dimensions. For this reason, the cost effectiveness analysis on child outcomes covered multiple outcomes, such as dropout rate, food security, mental well-being and reading ability. Home-grown school meals could also impact local markets and farmers if food items are procured locally. However, assessing this was beyond the scope of this evaluation.

152. The cost per additional SD of impact for reducing dropout rates with school feeding is USD 127.54 per child over a seven-month period, which is similar to the figure of USD 126.52 per additional SD of impact for the combined school feeding and teacher incentives intervention. The cost per additional SD of food security is USD 56.12 for school feeding only, whereas the combined arm is less cost-effective, resulting in an estimated USD 91.37 per additional SD of food security. The cost per additional SD of mental well-being is USD 175.36 for school feeding, whereas it is USD 234.96 for the combined intervention. Finally, the cost per additional SD of reading ability is USD 48.38 for the combined school feeding and teacher incentive arm.

153. Calculations for the cost per averted adverse outcome indicate that spending USD 100 on school feeding over the seven-month period prevents approximately two children from dropping out of school, one child from becoming food insecure and one child from becoming depressed. Investing USD 100 on school feeding and teacher incentives combined prevents approximately two children from dropping out of school, one child from becoming food insecure, one child from becoming depressed and two children from being unable to read colour words.

154. Finally, dropout rates were converted to impacts on LAYS to compare the cost effectiveness of school meals with the cost effectiveness of other education interventions. When comparing the evaluation results with a wide range of other education interventions, school feeding alone and school feeding combined with teacher incentives were found to be as cost-effective as cash transfers or school inputs (e.g. providing textbooks, uniforms, etc.) in terms of improving LAYS.

Consideration #4: This evaluation demonstrates the cost effectiveness of home-grown school meals for achieving educational outcomes. To recognize the multisectoral nature of HGSF programmes, the evaluation also conducted a cost effectiveness analysis of other child outcomes related to health, nutrition, education and learning. As HGSF programmes can potentially impact local markets and farmers, the WFP country office is encouraged to explore and document the impacts of HGSF programmes on local economies.

Bibliography

Allen IV, J. (2024). *Double-Booked: Effects of Overlap between School and Farming Calendars on Education and Child Labor*. IFPRI Discussion Paper 2235. International Food Policy Research Institute. https://cgspace.cgiar.org/items/e22c0f13-188f-4c1e-b0c4-25cb2035fb2c (accessed 21 February 2025).

Andrabi, T. & Brown, C. (2022). *Subjective versus Objective Incentives and Teacher Productivity*. RISE Working Paper Series 22/092. https://doi.org/10.35489/BSG-RISE-WP_2022/092 (accessed 21 February 2025).

Barrera-Osorio, F. & Raju, D. (2017). Teacher Performance Pay: Experimental Evidence from Pakistan. *Journal of Public Economics*, 148: 75–91.

Barrera-Osorio, F., Cilliers, J., Cloutier, M.-H. & Filmer, D. (2021). *Heterogenous Teacher Effects of Two Incentive Schemes: Evidence from a Low-Income Country*. World Bank Policy Research Working Paper No. 9652. https://openknowledge.worldbank.org/server/api/core/bitstreams/26400f65-398f-5abe-b88a-cae048af1153/content (accessed 21 February 2025).

Cantril, H. (1965). *The Pattern of Human Concerns*. New Brunswick, NJ, USA, Rutgers University Press.

Chafetz, M.D. & Matthews, L.H. (2004). A New Interference Score for the Stroop Test. *Archives of Clinical Neuropsychology*, 19(4): 555–67.

Chang, F., Wang, H., Qu, Y. et al. (2020). The Impact of Pay-for-Percentile Incentive on Low-Achieving Students in Rural China. *Economics of Education Review*, 75: 101954.

Cilliers, J., Kasirye, I., Leaver, C. et al. (2018). Pay for Locally Monitored Performance? A Welfare Analysis for Teacher Attendance in Ugandan Primary Schools. *Journal of Public Economics*, 167: 69–90.

Dhaliwal, I., Duflo, E., Glennerster, R. & Tulloch, C. (2013). Comparative Cost-Effectiveness Analysis to Inform Policy in Developing Countries: A General Framework with Applications for Education. In Glewwe, P. (ed.), *Education Policy in Developing Countries*. Chicago, IL, USA, University of Chicago Press. Chicago Scholarship Online, 2014. https://doi.org/10.7208/chicago/9780226078854.003.0008 (accessed 21 February 2025).

Diener, E., Emmons, R., Larsen, R. & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment*, 49(1): 71–75.

Dubeck, M.M. & Gove, A. (2015). The Early Grade Reading Assessment (EGRA): Its Theoretical Foundation, Purpose, and Limitations. *International Journal of Education Development*, 40: 315–22.

Duflo, E., Hanna, R. & Ryan, S.P. (2012). Incentives Work: Getting Teachers to Come to School. *American Economic Review*, 102(4): 1241–78.

FAO, EU & CIRAD. (2022). *Food Systems Profile – The Gambia: Catalysing the Sustainable and Inclusive Transformation of Food Systems*. Food and Agriculture Organization of the United Nations. https://openknowledge.fao.org/items/662006ba-09f5-4c31-b37f-e17bda15cdc3 (accessed 21 February 2025).

IFAD. (2019). *Investing in Rural People in The Gambia*. International Fund for Agricultural Development. https://www.ifad.org/en/w/publications/investing-in-rural-people-in-the-gamb-1 (accessed 21 February 2025).

Johnson, J.G., Harris, E.S., Spitzer, R.L. & Williams, J.B.W. (2002). The Patient Health Questionnaire for Adolescents: Validation of an Instrument for the Assessment of Mental Disorders among Adolescent Primary Care Patients. *Journal of Adolescent Health*, 30(3): 196–204.

J-PAL. (2017). *Roll Call: Getting Children into School*. Technical report. Abdul Latif Jameel Poverty Action Lab. https://www.povertyactionlab.org/sites/default/files/publication/roll-call-getting-children-into-school.pdf (accessed 21 February 2025).

Levin, H.M. & McEwan, P.J. (2001). *Cost-Effectiveness Analysis: Methods and Application*. Thousand Oaks, CA, USA, SAGE.

Mbiti, I., Romero, M. & Schipper, Y. (2019). *Designing Effective Teacher Performance Pay Programs: Experimental Evidence from Tanzania*. Cambridge, MA, National Bureau of Economic Research. https://www.nber.org/system/files/working_papers/w25903/w25903.pdf (accessed 21 February 2025).

Muralidharan, K. & Sundararaman, V. (2011). Teacher Performance Pay: Experimental Evidence from India. *Journal of Political Economy*, 119(1): 39–77.

Nowicki, S. & Strickland, B.R. (1973). A Locus of Control Scale for Children. *Journal of Consulting and Clinical Psychology*, 40(1): 148–54.

Scarpina, F. & Tagini, S. (2017). The Stroop Color and Word Test. *Frontiers in Psychology*, 8: 557.

Snilstveit, B., Stevenson, J., Phillips, D. et al. (2015). *Interventions for Improving Learning Outcomes and Access to Education in Low- and Middle-Income Countries: A Systematic Review*. Technical report. 3ie. https://www.3ieimpact.org/evidence-hub/publications/systematic-reviews/interventions-improving-learning-outcomes-and-access (accessed 21 February 2025).

UNICEF. (2018). *The Gambia Education Fact Sheets – 2020*. Technical report. UNICEF. https://data.unicef.org/wp-content/uploads/2021/08/Gambia-Education-Fact-Sheet-2020.pdf (accessed 21 February 2025).

UNICEF. (2022). *Time to Teach: Teacher Attendance and Time on Task in Primary Schools*. UNICEF. https://www.unicef.org/innocenti/media/4796/file/UNICEF-Time-to-Teach-Mozambique-2021-EN.pdf (accessed 21 February 2025).

UNICEF & MoBSE. (2013). *The Gambia national disability study*. UNICEF Gambia in collaboration with the Ministry of Basic and Secondary Education (MoBSE). https://rodra.co.za/images/countries/gambia/research/Final%20National%20Disability%20Study_2013.pdf (accessed 21 February 2025)

WFP. (2021a). *School-Based Impact Evaluation Window: Concept Note*. Rome, World Food Programme. https://www.wfp.org/publications/school-based-programmes-impact-evaluation-window-concept-note (accessed 21 February 2025).**WFP.** (2021b). *School Feeding Programmes in Low- and Lower-Middle-Income Countries: A Focused Review of Recent Evidence from Impact Evaluations*. Rome, World Food Programme.

https://www.wfp.org/publications/school-feeding-programmes-low-and-lower-middle-income-countries (accessed 21 February 2025).

WFP. (2021c). *State of Food Security in The Gambia*. Technical report. Rome, World Food Programme. https://docs.wfp.org/api/documents/WFP-0000137452/download/ (accessed 21 February 2025).

WFP. (2022). *State of School Feeding Worldwide*. Rome, World Food Programme.

WFP, ECOWAS, CERFAM & the Research Consortium for School Health and Nutrition, an Initiative of the School Meals Coalition. (2024). *Home-Grown School Feeding in West Africa: A Landscape Analysis*. The Regional Centre of Excellence against Hunger and Malnutrition (CERFAM). https://www.wfp.org/publications/home-grown-school-feeding-west-africa-landscape-analysis (accessed 21 February 2025).

White, B.P. (2014). The Perceived Stress Scale for Children: A Pilot Study in a Sample of 153 Children. *International Journal of Pediatrics and Child Health*, 2(2): 45–52.

World Bank. (2011). *The Gambia Education Country Status Report*. Technical report. World Bank. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/284581468032133072/the-gambia-education-country-status-report (accessed 21 February 2025).

World Bank. (2023). *Human Capital Index Database*. World Bank. https://databank.worldbank.org/source/human-capital-index (accessed 21 February 2025).

World Bank, Foreign, Commonwealth & Development Office & BE2. (2023). *Cost-Effective Approaches to Improve Global Learning: What Does Recent Evidence Tell Us Are "Smart Buys" for Improving Learning in Low- and Middle-Income Countries?* FCDO, the World Bank, UNICEF and USAID. https://documents1.worldbank.org/curated/en/719211603835247448/pdf/Cost-Effective-Approaches-to-Improve-Global-Learning-What-Does-Recent-Evidence-Tell-Us-Are-Smart-Buys-for-Improving-Learning-in-Low-and-Middle-Income-Countries.pdf (accessed 21 February 2025).

Acronyms

AEA	American Economic Association
BMI	body mass index
CIRAD	Centre de coopération internationale en recherche agronomique pour le développement – French Agricultural Research Centre for International Development
DIME	Development Impact Evaluation (World Bank)
EGRA	Early Grade Reading Assessment
EQ	evaluation question
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
HGSF	home-grown school feeding
GAFSP	Global Agriculture and Food Security Program
IFAD	International Fund for Agricultural Development
ITT	intention-to-treat
J-PAL	Abdul Latif Jameel Poverty Action Lab
LAYS	learning-adjusted years of schooling
MHERST	Ministry of Higher Education, Science, and Technology
PHQ-A	Patient Health Questionnaire-9 for Adolescents
PSS-C	Perceived Stress Scale for Children
RCT	randomized control trial
SBP	School-based Programme
SD	standard deviation
UNEG	United Nations Evaluation Group
UNESCO	United Nations Education, Scientific, and Cultural Organization
UNICEF	United Nations Children's Fund
WFP	World Food Programme
WHO	World Health Organization

Annex 1 Specification of outcomes of interest

Table 3: Specifications of outcomes of interest

Outcome category	Outcome	Outcome description
Child nutrition	Food secure	A reversed adaptation of the Food Insecurity Experience Scale in the past week (0–8), the variable is a dummy that takes value 1 if scoring 5–8 (food secure) and 0 otherwise.
	Above-median child individual dietary diversity score	Women Dietary Diversity Score (0–9), the variable is a dummy that takes value 1 if scoring 6–9 (above the median) and 0 otherwise.
	Child individual dietary diversity score	Women Dietary Diversity Score (0–9).
	Starchy staples	A food group of the Women Dietary Diversity Score, which takes 1 if a child reports having consumed starchy staples in the past 24 hours and 0 otherwise.
	Dark green leafy vegetables	A food group of the Women Dietary Diversity Score that takes 1 if a child reports having consumed dark green leafy vegetables in the past 24 hours and 0 otherwise.
	Other vitamin A-rich vegetables or fruits	A food group of the Women Dietary Diversity Score that takes 1 if a child reports having consumed other vitamin A-rich vegetables and fruits in the past 24 hours and 0 otherwise.
	Organ meat	A food group of the Women Dietary Diversity Score that takes 1 if a child reports having consumed organ meat in the past 24 hours and 0 otherwise.
	Meat and fish	A food group of the Women Dietary Diversity Score that takes 1 if a child reports having consumed meat and fish in the past 24 hours and 0 otherwise.
	Eggs	A food group of the Women Dietary Diversity Score that takes 1 if a child reports having consumed eggs in the past 24 hours and 0 otherwise.
	Legumes and nuts	A food group of the Women Dietary Diversity Score that takes 1 if a child reports having consumed legumes and nuts in the past 24 hours and 0 otherwise.

	Milk and milk products	A food group of the Women Dietary Diversity Score that takes 1 if a child reports having consumed milk and milk products in the past 24 hours and 0 otherwise.
	Child consumed breakfast before going to school that day	Self-reported consumption of breakfast before going to school on the day of the survey (0 = no; 1 = yes)
Child mental health	Moderate to severe depression	The standardized total score on 8 out of 9 questions from the PHQ-A (0–24), reversed. A dummy that takes 1 if the score is between 0 and 16 (adapted moderate to severe depression categories to account for 8 questions) and 0 otherwise.
	PHQ-A	The total score of an adapted version of the PHQ-A (0–24), reversed.
	Medium to high stress	14 questions from White's PSS-C[70] along a four-point Likert scale (0–39), reversed. A dummy variable that takes value 1 if the score is between 0 and 26 (adapted medium to high stress categories to account for child indicator) and 0 otherwise.
	PSS-C	The total score on 14 questions from White's PSS-C[71] along a four-point Likert scale (0–39), reversed.
	Above-median Locus of Control	10 questions adapted from the Nowicki–Strickland Locus of Control Scale for Children.[72] A dummy variable that takes value 1 if the score is between 9 and 10 and 0 otherwise.
	Locus of Control	The total score from 10 questions adapted from Nowicki–Strickland Locus of Control Scale for Children.[73]
	Above-median Satisfaction with Life Scale	An adapted version of Diener et al.'s Satisfaction with Life Scale.[74] A dummy variable that takes value 1 if the score is between 22 and 24 and 0 otherwise.

[70] White, B.P. (2014). The Perceived Stress Scale for Children: A Pilot Study in a Sample of 153 Children. *International Journal of Pediatrics and Child Health*, 2(2): 45–52.

[71] White, B.P. (2014). The Perceived Stress Scale for Children: A Pilot Study in a Sample of 153 Children. *International Journal of Pediatrics and Child Health*, 2(2): 45–52.

[72] Nowicki, S. & Strickland, B.R. (1973). A Locus of Control Scale for Children. *Journal of Consulting and Clinical Psychology*, 40(1): 148–54.

[73] Nowicki, S. & Strickland, B.R. (1973). A Locus of Control Scale for Children. *Journal of Consulting and Clinical Psychology*, 40(1): 148–54.

[74] Diener, E., Emmons, R., Larsen, R. & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment*, 49(1): 71–75.

	Satisfaction with Life Scale	The total score from an adapted version of Diener et al.'s Satisfaction with Life Scale.[75]
	Above-median Cantril Ladder	The responses (on a ladder from 0 to 10) to one question: "On which step of the ladder would you say you personally feel you stand at this time?", equal to or above the median. A dummy variable that takes value 1 if the score is 10 and 0 otherwise.
	Cantril Ladder	The score from the responses (on a ladder from 0 to 10) to one question: "On which step of the ladder would you say you personally feel you stand at this time?".
Child physical health	Thinness	BMI-for-age score that is two SDs below the median according to the WHO references for school-age children and adolescents.
	Overweight	BMI-for-age score that is one SDs above the median according to the WHO references for school-age children and adolescents.
	Obesity	BMI-for-age score that is two SDs above the median according to the WHO references for school-age children and adolescents.
	Stunting	Height-for-age score that is 2 SDs below the median according to the WHO references for school-age children and adolescents.
	Underweight	Weight-for-age score that is 2 SDs below the median according to the WHO references for school-age children and adolescents.
	Proportion of days child reported sick in the previous week	Self-reported number of days the child was sick in the previous week.
Child social cohesion	Child easily talks to other children	Self-reported experience of whether a child find it easy to talk to other children.
	Child has classmates who would help in difficult situations	Self-reported experience of whether a child has classmates to help them in difficult situations.
	Child has an adult who would help in difficult situations	Self-reported experience of whether a child has an adult to help them in difficult situations.
	Above-median belonging and inclusion score	The score on four questions that measure a sense of belonging and inclusion (0–20), a

[75] Diener, E., Emmons, R., Larsen, R. & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment*, 49(1): 71–75.

		dummy variable that takes value 1 if the score is between 17 and 20 and 0 otherwise.
	Belonging and inclusion score	The score on four questions that measure a sense of belonging and inclusion (0–20).
	Above-median trust score	Three questions that measure a sense of trust (0–15), a dummy variable that takes value 1 if the score is between 13 and 15.
	Trust score	The score on three questions that measure a sense of trust (0–15).
Teacher attendance	Teacher present	A dummy variable with value 1 if a teacher is reported present by at least 80% of the children and 0 otherwise.
	Teacher retention	A dummy variable with value 1 if a teacher is still teaching at their school in the subsequent academic year and 0 otherwise.
Child attendance	Child newly enrolled during school feeding year	A dummy variable with value 1 if a child was reported to be enrolled at the start of semester 1 but enrolled during the school feeding year and 0 otherwise.
	Child attendance	Proportion of days a child was present by month as reported in the attendance ledger.
	Child dropped out during school feeding year	Child was reported not to be enrolled in school during the survey.
Child school progression	Child promoted	A dummy variable with value 1 if a child was promoted to a grade higher than grade 3 in the same school as in the previous academic year and 0 otherwise.
	Child is repeating grade 3	A dummy variable with value 1 if a child is repeating grade 3 in the same school as in the previous academic year and 0 otherwise.
	Child dropped out	A dummy variable with value 1 if a child is not enrolled in the same school as in the previous school year and 0 otherwise.
Child cognitive ability	Attention span: Stroop interference score, standardized	The standardized Stroop Colour and Word Test interference score (range before standardization: -6 to 12).[76]

[76] Chafetz, M.D. & Matthews, L.H. (2004). A New Interference Score for the Stroop Test. *Archives of Clinical Neuropsychology*, 19(4): 555–67.

	Attention span: Stroop interference score	The Stroop Colour and Word Test interference score (range: -6 to 12).[77]
	Attention span: reading monochromatic colour words, standardized	The standardized score of reading monochromatic colour words, a subtask of the Stroop Colour and Word Test.
	Attention span: reading monochromatic colour words	The score of reading monochromatic colour words, a subtask of the Stroop Colour and Word Test.
	Attention span: naming colours, standardized	The standardized score of naming colours, a subtask of the Stroop Colour and Word Test.
	Attention span: naming colours	The score of naming colours, a subtask of the Stroop Colour and Word Test.
	Attention span: naming colours of incongruently coloured colour words, standardized	The standardized score of naming colours of incongruently coloured colour words, a subtask of the Stroop Colour and Word Test.
	Attention span: naming colours of incongruently coloured colour words	The score of naming colours of incongruently coloured colour words, a subtask of the Stroop Colour and Word Test.
	Attention span: predicted Stroop performance, standardized	The standardized score of $\frac{Naming\ colours * Reading\ colours}{Naming\ colours + Reading\ colours}$.
	Attention span: predicted Stroop performance	The score of $\frac{Naming\ colours * Reading\ colours}{Naming\ colours + Reading\ colours}$.
	Short-term memory: forward digit span length, standardized	The standardized longest length of numbers a child can repeat in the same order as was read aloud to them (range before standardization: 2–9).
	Short-term memory: forward digit span length	The longest length of numbers a child can repeat in the same order as was read aloud to them (range: 2–9).
	Working memory: backward digit span length, standardized	The standardized longest length of numbers a child can repeat in the reverse order from what was read aloud to them (range before standardization: 2–8).
	Working memory: backward digit span length	The longest length of numbers a child can repeat in the reverse order from what was read aloud to them (range: 2–8).

[77] Chafetz, M.D. & Matthews, L.H. (2004). A New Interference Score for the Stroop Test. *Archives of Clinical Neuropsychology*, 19(4): 555–67.

	Fluid intelligence: Raven's Progressive Matrices score, standardized	The standardized score of the number of correct answers given on a shortened version of the Raven's Progressive Matrices test adapted for children (range before standardization: 0–15).
	Fluid intelligence: Raven's Progressive Matrices score	The score of the number of correct answers given on a shortened version of the Raven's Progressive Matrices test adapted for children (range: 0–15).
Child learning	EGRA index	An inverse-weighted covariance index of the EGRA core subtasks (letter sound identification, non-word reading, oral reading fluency, reading comprehension and listening comprehension).
	Correct letter sounds per minute, standardized	The standardized number of correct letter sounds read out loud per minute, a core subtask of the EGRA.
	Correct letter sounds per minute	Number of correct letter sounds read out loud per minute, a core subtask of the EGRA.
	Correct non-words per minute, standardized	The standardized number of correct non-words read out loud per minute, a core subtask of the EGRA.
	Correct non-words per minute	Number of correct non-words read out loud per minute, a core subtask of the EGRA.
	Listening comprehension, standardized	The standardized number of listening comprehension questions answered correctly, a core subtask of the EGRA (0–3).
	Listening comprehension	Number of listening comprehension questions answered correctly, a core subtask of the EGRA (0–3).
	Correct words per minute, standardized	The standardized number of correct words read out loud per minute, a core subtask of the EGRA.
	Correct words per minute	Number of correct words read out loud per minute, a core subtask of the EGRA.
	Reading comprehension, standardized	The standardized number of reading comprehension questions answered correctly, a core subtask of the EGRA (0–4).
	Reading comprehension	Number of reading comprehension questions answered correctly, a core subtask of the EGRA (0–4).

Annex 2 Baseline balance tables

155. The evaluation team conducted a baseline school mapping exercise to identify the study sample and confirm that none of the selected schools had recently implemented a school feeding programme. This mapping exercise also provided basic information about each school, such as number of students and teachers by grade and gender, teacher qualifications, infrastructure and previous experience with school feeding and other health-related programmes offered (e.g. deworming and nutritional education). The school mapping exercise was conducted in September 2022, at the start of the 2022/23 school year, before the randomization and thus any school feeding activities had taken place.

156. For the study, the provision of school feeding was cross-randomized with teacher incentives. The objective of the randomization was to obtain comparable compositions at baseline across the four groups: school feeding only; teacher incentives only; school feeding and teacher incentives; and neither. The randomization ensured that all differences observed at the end of the project were attributable (as causal impacts) to the intervention.

157. Table 4 compares the mean values of key outcomes of interest among the four groups. Tests were conducted to identify any statistically significant differences between the groups. Statistically significant differences at the 5-percent level emerged regarding whether schools had a functional kitchen and whether schools cultivated produce. However, there were no statistically significant differences at the 5-percent level when assessing the F-statistic to test for balance across all groups and when assessing joint significance across all of the variables, indicating that comparable groups had been successfully obtained.

Table 4: Balance table for the school mapping baseline exercise

	(1) SF + TI		(2) School feeding (SF)		(3) Teacher incentives (TI)		(4) None		F-test for balance across all groups		(1)-(2)		(1)-(3)		(1)-(4)		(2)-(3)		(2)-(4)		(3)-(4)	
															Pairwise t-test							
Variable	N	Mean (SE)	N	Mean (SE)	N	Mean (SE)	N	Mean (SE)	N	F-statistic/P-value	N	Mean difference	N	Mean difference	N	Mean difference	N	Mean difference	N	Mean difference	N	Mean difference
Number of students	23	316.65 (50.81)	23	273.00 (33.36)	23	253.13 (52.50)	23	267.22 (42.14)	92	0.48 0.70	46	43.65	46	63.52	46	49.43	46	19.87	46	5.78	46	-14.09
Share of female students	23	0.52 (0.02)	23	0.53 (0.01)	23	0.52 (0.02)	23	0.50 (0.02)	92	0.68 0.56	46	-0.02	46	-0.01	46	0.02	46	0.01	46	0.03	46	0.02
Number of teachers	23	9.00 (0.85)	23	7.74 (0.61)	23	6.91 (0.83)	23	7.91 (0.82)	92	1.22 0.31	46	1.26	46	2.09*	46	1.09	46	0.83	46	-0.17	46	-1.00
Share of female teachers	23	0.34 (0.05)	23	0.32 (0.04)	23	0.28 (0.04)	23	0.35 (0.04)	92	0.88 0.45	46	0.02	46	0.06	46	-0.01	46	0.04	46	-0.04	46	-0.07
Number of classrooms	23	7.39 (0.69)	23	6.43 (0.54)	23	6.00 (0.70)	23	7.26 (0.79)	92	1.02 0.39	46	0.96	46	1.39	46	0.13	46	0.43	46	-0.83	46	-1.26
Toilets available on school premise	23	1.00 (0.00)	23	1.00 (0.00)	23	0.91 (0.06)	23	0.96 (0.04)	92	1.26 0.29	.n	.n	46	0.09	46	0.04	46	0.09	46	0.04	46	-0.04
Water available on school premise	23	0.87 (0.07)	23	0.87 (0.07)	23	0.87 (0.07)	23	0.96 (0.04)	92	0.47 0.70	46	0.00	46	0.00	46	-0.09	46	0.00	46	-0.09	46	-0.09
School has functional kitchen	23	0.39 (0.10)	23	0.35 (0.10)	23	0.39 (0.10)	23	0.70 (0.10)	92	2.57* 0.06	46	0.04	46	0.00	46	-0.30**	46	-0.04	46	-0.35**	46	-0.30**
School has storage	23	0.78 (0.09)	23	0.83 (0.08)	23	0.70 (0.10)	23	0.96 (0.04)	92	1.82 0.15	46	-0.04	46	0.09	46	-0.17*	46	0.13	46	-0.13	46	-0.26**
School cultivates produce	23	0.87 (0.07)	23	0.91 (0.06)	23	0.65 (0.10)	23	0.87 (0.07)	92	2.38* 0.08	46	-0.04	46	0.22*	46	0.00	46	0.26**	46	0.04	46	-0.22*
F-test of joint significance (F-statistic)														0.80		0.86		0.83		1.26		1.30
F-test, number of observations														46		46		46		46		46

Significance levels: * p<0.1, ** p<0.05, *** p<0.01

Annex 3 Estimation strategies

158. This section describes the quantitative results obtained during the impact evaluation. The impact evaluation analysis is aligned with the pre-analysis plan registered with the AEA registry for RCTs. The pre-analysis plan includes detailed information on primary outcomes, research design, randomization method, randomization unit, clustering, sample size (total number, number of clusters and units per intervention arm) and regression specifications. The purpose of the pre-analysis plan is to outline the set of hypotheses and analyses that will be performed on the data before they are collected, ensuring the transparency of the process.

159. A series of models are estimated that depend on the outcome of interest and its corresponding theory of change as well as the data source.

160. **School feeding:** This model is for outcomes from the child high-frequency surveys with expected impacts from school feeding only. Letting Y_{cs} be outcome *Y* for child *c* in school *s*, Equation 1a is used to estimate outcomes that are theorized to only be affected by school feeding:

$$Y_{cs} = \alpha + \beta_1 School\ feeding_s + \beta_2 Teacher\ incentive_s + \gamma_s + \delta_t + \varepsilon_{cs} \quad (1a)$$

Here, $School\ feeding$ is an indicator that is equal to 1 if the child is in a school with school feeding (this pools across schools with and without teacher incentives). $Teacher\ incentive_s$ is an indicator that is equal to 1 if the child is in a school with teacher incentives (this pools across schools with and without school feeding) and *y* and δ are vectors of control variables for region, school type and survey round dummies. The primary coefficient of interest is β_1, the estimated impact of changing child outcomes through school feeding. Standard errors are clustered at the school survey round and student level.

161. The same effects are estimated while taking into consideration the child's gender. Letting Y_{cs} be outcome *Y* for child *c* in school *s*, Equation 1b is used to estimate outcomes that are theorized to only be affected by school feeding:

$$Y_{cs} = \alpha + \beta_1 School\ feeding_s + \beta_2 School\ feeding_s * Gender_{cs} + \beta_3 Gender_{cs} + \beta_4 Teacher\ incentive_s + \gamma_s + \delta_t + \varepsilon_{cs} \quad (1b)$$

Here, *Gender* is a dummy variable that is equal to 1 if the child is a boy. The primary coefficients of interests are β_1, the estimated impact of changing outcomes through school feeding, and β_2, the estimated additional impact of changing boys' outcomes through school feeding. Standard errors are clustered at the school survey round and student level.

162. The same effects are estimated while taking into consideration the school type. Letting Y_{cs} be outcome *Y* for child *c* in school *s*, Equation 1c is used to estimate outcomes that are theorized to only be affected by school feeding:

$$Y_{cs} = \alpha + \beta_1 School\ feeding_s + \beta_2 School\ feeding_s * School\ type_s + \beta_3 School\ type_s + \beta_4 Teacher\ incentive_s + \gamma_s + \delta_t + \varepsilon_{cs} \quad (1c)$$

Here, *School type* is a dummy variable that is equal to 1 if the school is a private school and 0 if the school is a public/government school. The primary coefficients of interests are β_1, the estimated impact of changing outcomes through school feeding, and β_2, the estimated additional impact of changing private school outcomes through school feeding. Standard errors are clustered at the school survey round and student level.

163. The same effects are estimated while taking into consideration the region in which the school is located. Letting Y_{cs} be outcome *Y* for child *c* in school *s*, Equation 1d is used to estimate outcomes that are theorized to only be affected by school feeding:

$$Y_{cs} = \alpha + \beta_1 School\ feeding_s + \beta_2 School\ feeding_s * Region_s + \beta_3 Region_s + \beta_4 Teacher\ incentive_s + \gamma_s + \delta_t + \varepsilon_{cs} \quad (1d)$$

Here, *Region* is a dummy variable that is equal to 1 if the school is in Region 3 (North Bank) and 0 if the school is in Region 6 (Upper River). The primary coefficients of interests are β_1, the estimated impact of changing outcomes through school feeding, and β_2, the estimated additional impacts of changing Region 3 outcomes through school feeding. Standard errors are clustered at the school survey round and student level.

164. The same effects are estimated while taking into consideration the round in which the survey was conducted. Letting Y_{cs} be outcome *Y* for child *c* in school *s*, Equation 1e is used to estimate outcomes that are theorized to only be affected by school feeding:

$$Y_{cs} = \alpha + \beta_1 School\ feeding_s + \beta_2 School\ feeding_s * \sum_{t=1}^{5} Round_t + \sum_{t=2}^{5} Round_t + \beta_3 Teacher\ incentive_s + \gamma_s + \varepsilon_{cs} \quad (1e)$$

Here, $Round_t$ is a dummy variable that is equal to 1 if the observation is relative to round *t* and 0 otherwise. The primary coefficients of interests are β_1, the estimated impact of changing outcomes through school feeding, and β_2, the additional estimated impact of changing outcomes in different survey rounds. Standard errors are clustered at the school survey round and student level.

165. For child outcomes from attendance data with expected impacts from school feeding only, the same estimations are used with two exceptions: δ represents month instead of survey round dummies (as attendance data are available at the month rather than the survey round level) and standard errors are clustered at the school level, in accordance with the clustered randomization design.

166. **Teacher incentives:** This model is for teacher outcomes, which are expected to be impacted by teacher incentives only, and the specification given in Equation 2a is estimated.

$$Y_{Ts} = \alpha + \beta_1 Teacher\ incentive_s + \beta_2 School\ feeding_s + \gamma_s + \delta_t + \varepsilon_{Ts} \quad (2a)$$

Here, Y_{Ts} is outcome *Y* for teacher *T* in school *s*, $Teacher\ incentive_s$ is an indicator that is equal to 1 if the teacher is in a school with teacher incentives (this pools across schools with and without school feeding), $School\ feeding_s$ is an indicator that is equal to 1 if the child is in a school with school feeding (this pools across schools with and without teacher incentives) and *γ* and δ are vectors of control variables for region, school type and survey round dummies. The primary coefficient of interest is β_1, the estimated impact of changing teacher outcomes through teacher incentives. Standard errors are clustered at the school level, in accordance with the clustered randomization design.

167. The same effects are estimated while taking into consideration teacher gender. Letting Y_{Ts} be outcome *Y* for teacher *T* in school *s*, Equation 2b is used to estimate outcomes that are theorized to only be affected by the teacher incentive:

$$Y_{Ts} = \alpha + \beta_1 Teacher\ incentive_s + \beta_2 Teacher\ incentive_s * Gender_{Ts} + \beta_3 Gender_{Ts} + \beta_4 School\ feeding_s + \gamma_s + \delta_t + \varepsilon_{ts} \quad (2b)$$

Here, *Teacher incentive* is an indicator that is equal to 1 if the teacher is in a school with teacher incentives (this pools across schools with and without school feeding) and $Gender$ is equal to 1 if the teacher is male. The primary coefficients of interest are β_1, the estimated impact of incentives given to teachers, and β_2, the additional estimated impact of incentives given to male teachers.

168. **Any intervention:** This model is for outcomes with expected impacts from any of the interventions. Letting Y_{cs} be outcome *Y* for child *c* in school *s*, Equation 3a is used to estimate outcomes that are theorized to be affected by school feeding and teacher incentives:

$$Y_{cs} = \alpha + \beta_1 Any\ interventions + \gamma_s + \delta_t + \varepsilon_{cs} \quad (3a)$$

Here, *Any intervention* is an indicator that is equal to 1 if the child is in a school with school feeding or if their teacher receives teacher incentives and *γ* and δ are vectors of control variables for region, school type and survey round dummies. The primary coefficient of interest is β_1, the estimated impact of changing child outcomes through school feeding. Standard errors are clustered at the school survey round and student level.

169. For outcomes from attendance data with expected impacts from any intervention, the same estimations are used with two exceptions: δ represents month instead of survey round dummies (as attendance data are available at the month level rather than the survey round level) and standard errors are clustered at the school level, in accordance with the clustered randomization design.

170. The same effects are estimated by taking into consideration the child's baseline attendance quintile. Letting Y_{cs} be outcome *Y* for child *c* in school *s*, Equation 3b is used to estimate outcomes that are theorized to only be affected by school feeding:

$$Y_{cs} = \alpha + \beta_1 Any\ Intervention_s * \sum_{q=1}^{5} Quintile_q + \sum_{q=2}^{5} Quintile_q + \gamma_s + \delta_t + \varepsilon_{cs} \quad (3b)$$

Here, *Quintile* is a dummy variable that is equal to 1 for quintile *q* and 0 otherwise. The primary coefficient of interest is β_1, the estimated impact of any intervention on changing outcomes per attendance quintile. Standard errors are clustered at the school survey round and student level.

171. **By treatment arm:** Given the factorial design of the impact evaluation, estimates of impacts by treatment arm are also provided. Letting Y_{cs} be outcome *Y* for child *c* in school *s*, Equation 3c is used to estimate outcomes that are theorized to be affected by school feeding and teacher incentives:

$$Y_{cs} = \alpha + \beta_1 School\ feeding_s + \beta_2 Teacher\ incentive_s + \beta_3 School\ feeding * Teacher\ Incentive_s + \gamma_s + \delta_t + \varepsilon_{cs} \quad (3c)$$

Here, *School feeding* is an indicator that is equal to 1 if the child is in a school with school feeding only, *Teacher incentive* is an indicator that is equal to 1 if the child is in a school with teacher incentives only, *School feeding * Teacher incentive* is an indicator that is equal to 1 if the child is in a school with school feeding and teacher incentives and *y* and δ are vectors of control variables for region, school type and survey round dummies. The primary coefficients of interest are β_1, the estimated impact of changing child outcomes through school feeding only, β_2, the estimated impact of changing child outcomes through teacher incentives only, and β_3, the estimated impact of changing child outcomes through school feeding and teacher incentives. Standard errors are clustered at the school round and student level.

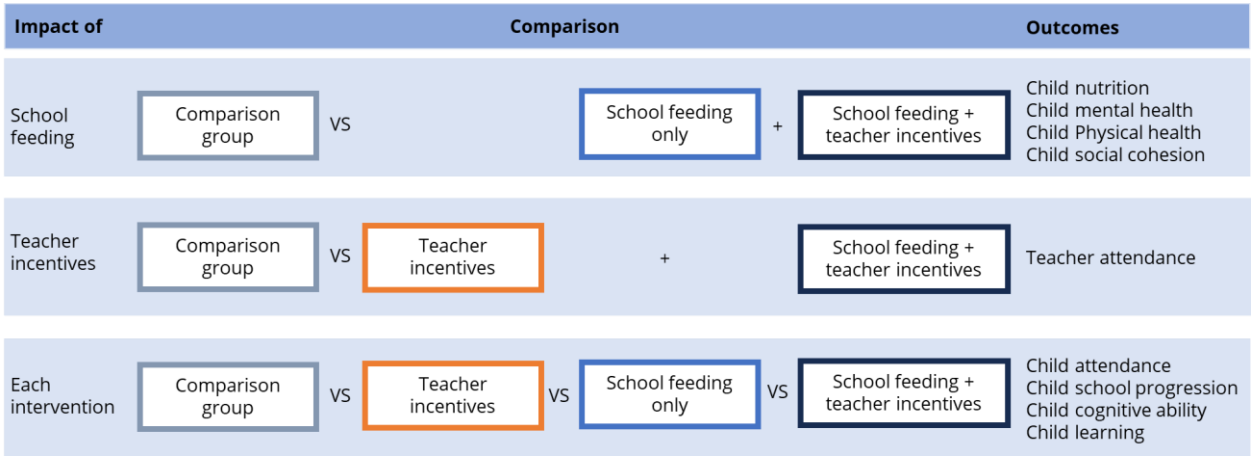
172. For outcomes from attendance data with expected impacts from any intervention, the same estimations are used with two exceptions: δ_t is a vector representing month rather than survey round dummies and standard errors are clustered at the school level, in accordance with the clustered randomization design.

173.

174. 8 provides an illustration of the three types of primary comparisons that are being made:

- The impacts of offering school feeding to children: This comparison compares children who go to schools that provide school feeding with those who go to schools that do not provide school feeding, regardless of whether teachers at the school receive teacher incentives.
- The impacts of teachers being eligible to receive teacher incentives: This comparison compares teachers who teach at schools that are eligible to receive teacher incentives with those who teach at schools that are not eligible to receive teacher incentives, regardless of whether children are provided with school meals.
- The differences in impacts between schools in which children receive a meal only, schools in which teachers are eligible to receive teacher incentives only and schools in which children receive a meal and teachers are eligible to receive teacher incentives. For any intervention, these three treatment arms are combined into one category.

Figure 38: Illustration of comparison of intervention groups for analysis



175. A feature of the clustered RCT design is that all selected beneficiary children or teachers within a school will receive the same intervention to avoid any "spill-over" concerns that might arise from a within-school child randomization approach. The child identification process in all 92 schools was the same regardless of "intervention" assignment to avoid bias.

Annex 4 Findings overview

Table 5: Overview table of school feeding outcomes

Outcome	School feeding (SE)	Control mean	N
Child nutrition			
Food secure	0.10***	0.73	8031
	(0.01)		
Above-median child individual dietary diversity score	0.08***	0.37	8031
	(0.02)		
Child individual dietary diversity score	0.34***	5.01	8031
	(0.06)		
Starchy staples	0.00	0.99	8031
	(0.00)		
Dark green leafy vegetables	0.06***	0.39	8031
	(0.02)		
Other vitamin A-rich fruits and vegetables	0.04***	0.80	8031
	(0.01)		
Other fruits and vegetables	0.03***	0.90	8031
	(0.01)		
Organ meat	0.03***	0.09	8031
	(0.01)		
Meat and fish	0.06***	0.71	8031
	(0.01)		
Eggs	0.03**	0.14	8031
	(0.01)		
Legumes and nuts	0.05***	0.64	8031
	(0.01)		
Milk and milk products	0.05***	0.35	8031
	(0.02)		
Child consumed breakfast before going to school today	0.06***	0.53	8031
	(0.02)		
Child mental health			
Moderate to severe depression	-0.06***	0.47	8031
	(0.02)		
Patient Health Questionnaire-9 for Adolescents (PHQ-A)	0.64***	16.45	8031
	(0.21)		
Medium to high stress	-0.07***	0.40	8031
	(0.02)		
Perceived Stress Scale for Children (PSS-C)	1.07***	27.73	8031
	(0.20)		
Above-median Locus of Control Scale	-0.00	0.24	8031
	(0.01)		
Locus of Control Scale	-0.01	5.68	8031
	(0.04)		
Above-median Satisfaction with Life Scale	-0.00	0.22	8031
	(0.01)		
Satisfaction with Life Scale	0.26**	13.83	8031
	(0.11)		
Above-median or equal-to-median Cantril Ladder	0.02	0.61	8031
	(0.02)		
Cantril Ladder	0.15**	8.71	8031
	(0.07)		

Outcome	School feeding (SE)	Control mean	N
Child physical health			
Thinness (BAZ -2 sd)	0.01	0.27	3063
	(0.02)		
Overweight (WAZ +1 sd)	0.00	0.02	3063
	(0.01)		
Obesity (WAZ +2 sd)	-0.00	0.00	3063
	(0.00)		
Stunting (HAZ-2 sd)	0.01	0.18	3063
	(0.02)		
Underweight (WAZ -2 sd)	0.01	0.15	670
	(0.04)		
Share of days child is reported sick in the previous week	0.01	0.06	8031
	(0.01)		
Child social cohesion			
Child easily talks to other children	0.01	0.61	3063
	(0.02)		
Child has classmate who would help in difficult situations	0.01	0.81	3063
	(0.01)		
Child has adult who would help in difficult situations	0.02	0.79	3063
	(0.01)		
Above-median belonging and inclusion score	0.02	0.32	3063
	(0.03)		
Belonging and inclusion	-0.10	15.97	3063
	(0.12)		
Above-median trust score	0.03	0.49	3063
	(0.04)		
Trust	0.02	12.21	3063
	(0.11)		
Child attendance			
Child newly enrolled during school feeding year	0.02	0.07	3551
	(0.01)		

*Significance levels: *p < 0.1; **p < 0.05; ***p < 0.01*

Table 6: Overview table of teacher incentive outcomes

Outcome	Teacher incentive (SE)	Control mean	N
Teacher attendance			
Teacher present	0.10**	0.74	460
	(0.04)		
Teacher retention	0.17**	0.67	114
	(0.08)		

*Significance levels: *p < 0.1; **p < 0.05; ***p < 0.01*

Table 7: Overview table of outcomes that may be affected by school feeding and/or teacher incentives

Outcome	Any intervention (SE)	TI only (SE)	SF only (SE)	SF+TI (SE)	Control mean	SF vs. TI p-value	SF vs. SF+ TI p-value	TI vs. SF+ TI p-value	N
Child attendance									
Child attendance	0.063	0.08**	0.07	0.05	0.688	0.77	0.76	0.55	23597
	(0.02)	(0.04)	(0.05)	(0.05)					
Child dropped out during school feeding year	-0.063***	-0.069***	-0.066**	-0.055**	0.155	0.88	0.59	0.50	8700
	(0.02)	(0.03)	(0.03)	(0.03)					
School progression									
Child promoted	0.067*	0.03	0.07	0.09**	0.699	0.46	0.58	0.16	3351
	(0.02)	(0.04)	(0.05)	(0.04)					
Child is repeating grade 3	-0.015	0.03	-0.03	-0.04	0.130	0.23	0.68	0.07	3351
	(0.02)	(0.04)	(0.04)	(0.03)					
Child dropped out	-0.053*	-0.07**	-0.04	-0.05	0.171	0.22	0.78	0.53	3351
	(0.02)	(0.03)	(0.03)	(0.03)					
Cognitive ability									
Attention span									
Stroop interference score, standardized	-0.132**	-0.045	-0.143**	-0.197***	0.000	0.17	0.41	0.04	8031
	(0.05)	(0.07)	(0.06)	(0.07)					
Stroop interference score	-0.477**	-0.163	-0.517**	-0.710***	7.565	0.17	0.41	0.04	8031
	(0.19)	(0.26)	(0.23)	(0.23)					
Reading monochromatic colour words, standardized	0.185***	0.088	0.106	0.341***	0.000	0.83	0.01	0.00	8031
	(0.07)	(0.08)	(0.08)	(0.09)					
Reading monochromatic colour words	0.885***	0.422	0.508	1.630***	4.193	0.83	0.01	0.00	8031
	(0.32)	(0.39)	(0.39)	(0.41)					
Naming colours, standardized	-0.001	0.042	-0.077	0.033	0.000	0.08	0.11	0.88	8031
	(0.06)	(0.07)	(0.07)	(0.07)					
Naming colours	-0.003	0.129	-0.235	0.099	10.154	0.08	0.11	0.88	8031
	(0.18)	(0.21)	(0.22)	(0.21)					
Naming colours of incongruently coloured colour words, standardized	-0.017	0.011	-0.075	0.011	0.000	0.20	0.18	1.00	8031
	(0.06)	(0.07)	(0.07)	(0.07)					
Naming colours of incongruently coloured colour words	-0.058	0.038	-0.250	0.037	9.909	0.20	0.18	1.00	8031
	(0.20)	(0.24)	(0.23)	(0.23)					
Predicted Stroop performance, standardized	0.176***	0.085	0.112	0.315***	0.000	0.73	0.02	0.01	8031
	(0.07)	(0.08)	(0.08)	(0.08)					
Predicted Stroop performance	0.419***	0.201	0.267	0.747***	2.344	0.73	0.02	0.01	8031
	(0.15)	(0.19)	(0.19)	(0.19)					

Outcome	Any intervention (SE)	TI only (SE)	SF only (SE)	SF+TI (SE)	Control mean	SF vs. TI p-value	SF vs. SF+ TI p-value	TI vs. SF+ TI p-value	N
Cognitive ability									
Working memory									
Forward digit span length, standardized	0.078	0.040	0.029	0.157**	0.000	0.85	0.05	0.06	8031
	(0.05)	(0.06)	(0.06)	(0.06)					
Forward digit span length	0.115	0.059	0.042	0.231**	6.083	0.85	0.05	0.06	8031
	(0.08)	(0.09)	(0.09)	(0.09)					
Backward digit span length, standardized	0.016	0.131**	-0.099*	0.025	-0.000	0.00	0.06	0.13	8031
	(0.05)	(0.06)	(0.06)	(0.06)					
Backward digit span length	0.015	0.123**	-0.093*	0.023	2.377	0.00	0.06	0.13	8031
	(0.05)	(0.06)	(0.06)	(0.06)					
Fluid intelligence									
Raven's Progressive Matrices, standardized	-0.036	-0.047	-0.055	-0.009	-0.000	0.84	0.21	0.36	8031
	(0.03)	(0.04)	(0.04)	(0.04)					
Raven's Progressive Matrices	-0.052	-0.068	-0.079	-0.014	2.097	0.84	0.21	0.36	8031
	(0.05)	(0.06)	(0.06)	(0.06)					
Reading									
Reading skills									
EGRA index, standardized	0.010	0.000	-0.065	0.089	0.000	0.36	0.10	0.37	3063
	(0.06)	(0.07)	(0.07)	(0.09)					
Correct letter sounds per minute, standardized	0.067	-0.000	0.060	0.132	0.000	0.57	0.53	0.25	3063
	(0.07)	(0.10)	(0.10)	(0.10)					
Correct letter sounds read per minute	1.119	-0.000	0.999	2.197	11.295	0.57	0.53	0.25	3063
	(1.24)	(1.58)	(1.58)	(1.73)					
Correct non-words per minute, standardized	0.030	-0.001	-0.026	0.109	0.000	0.77	0.19	0.30	3063
	(0.07)	(0.09)	(0.08)	(0.10)					
Correct non-words read per minute	0.224	-0.008	-0.192	0.815	3.093	0.77	0.19	0.30	3063
	(0.54)	(0.65)	(0.62)	(0.77)					
Listening comprehension, standardized	0.008	0.020	-0.122	0.119	0.000	0.14	0.05	0.45	3063
	(0.08)	(0.10)	(0.09)	(0.12)					
Listening comprehension	0.005	0.014	-0.085	0.083	0.278	0.14	0.05	0.45	3063
	(0.05)	(0.07)	(0.06)	(0.09)					
Correct words read per minute, standardized	0.084	-0.008	0.030	0.215*	-0.000	0.72	0.18	0.10	3063
	(0.08)	(0.09)	(0.10)	(0.13)					
Correct words read per minute	1.116	-0.111	0.395	2.853*	6.790	0.72	0.18	0.10	3063
	(1.05)	(1.21)	(1.31)	(1.69)					
Reading comprehension, standardized	0.005	-0.020	-0.086	0.111	-0.000	0.37	0.08	0.25	3063
	(0.07)	(0.08)	(0.08)	(0.12)					
Reading comprehension (percent), total	0.001	-0.003	-0.011	0.015	0.034	0.37	0.08	0.25	3063
	(0.01)	(0.01)	(0.01)	(0.02)					

SF: School feeding; TI: Teacher incentive.
*Significance levels: *p < 0.1; **p < 0.05; ***p < 0.01*

Annex 5 Stakeholder analysis

176. The stakeholder analysis for this evaluation identifies those who may influence or be influenced by the outcomes of the evaluation. Stakeholders encompass internal and external parties, including programme beneficiaries. The primary user is the WFP country office in The Gambia, but the evaluation aims for broader utilization of its findings.

177. In the context of the evaluation stakeholder categories include:

- Internal stakeholders
  a. Internal Gambia-based stakeholders: key personnel within the country office, including the country director, deputy country director, head of programmes, head of school feeding unit and all technical and management personnel
  b. Internal stakeholders outside of The Gambia: the Office of Evaluation, the Regional Bureau of Dakar and the School-based Programmes division.
- External stakeholders
  c. Communities: parent, students (boys and girls), parent's associations and local leaders
  d. International stakeholders: international non-governmental organizations, the GAFSP, the African Development Bank, United Nations agencies and forums in The Gambia
  e. National stakeholders: the Government, the Ministry of Higher Education, Research, Science and Technology (MHERST) and subnational government actors, non-governmental organizations, teachers and school boards.

178. The students are the direct beneficiaries of the programme. They are directly influenced by the success or the failure of the intervention. They have the highest stake in the results and will provide primary data for analysis. At the same time, the teachers are responsible for student education. Teachers are the key element in the success of the school feeding programme. Improving student performance and attendance depends on teacher presence and motivation. In most cases, teachers interact with parent's associations and other stakeholders to keep track of student performance.

179. Country office management and WFP staff in The Gambia have made significant contributions to the success of the programme in terms of anticipating any potential issues in the implementation of the programme and engaging with other stakeholders and programme partners to discuss issues raised.

180. Stakeholder engagement methods differ by category but may involve reviewing and providing input on evaluation documents, actively monitoring the design of the evaluation during programme implementation, participating in workshops and offering feedback on evaluation reports.

181. This engagement aims to ensure that diverse perspectives are considered and that the results of the evaluation are effectively used by stakeholders.

Annex 6 Overview tables by gender

Table 8: Overview table by gender of school feeding outcomes

Outcome	School feeding - girls (SE)	School feeding - boys (SE)	Control mean - girls	Control mean - boys	N - girls	N - boys
Child nutrition						
Food secure	0.11***	0.08***	0.73	0.72	4139	3889
	(0.02)	(0.02)				
Above-median child individual dietary diversity score	0.11***	0.05**	0.35	0.40	4139	3889
	(0.02)	(0.02)				
Child individual dietary diversity score	0.45***	0.24***	4.90	5.13	4139	3889
	(0.08)	(0.08)				
Starchy staples	0.00	0.00	0.99	0.99	4139	3889
	(0.00)	(0.00)				
Dark green leafy vegetables	0.08***	0.04*	0.38	0.41	4139	3889
	(0.02)	(0.02)				
Other vitamin A-rich fruits and vegetables	0.06***	0.03*	0.79	0.80	4139	3889
	(0.02)	(0.02)				
Other fruits and vegetables	0.04***	0.03**	0.89	0.90	4139	3889
	(0.01)	(0.01)				
Organ meat	0.04***	0.02*	0.07	0.12	4139	3889
	(0.01)	(0.01)				
Meat and fish	0.07***	0.04**	0.69	0.72	4139	3889
	(0.02)	(0.02)				
Eggs	0.04**	0.02	0.13	0.15	4139	3889
	(0.02)	(0.02)				
Legumes and nuts	0.06***	0.04*	0.59	0.68	4139	3889
	(0.02)	(0.02)				
Milk and milk products	0.08***	0.03	0.35	0.35	4139	3889
	(0.02)	(0.02)				
Child consumed breakfast before going to school today	0.07***	0.05*	0.49	0.57	4139	3889
	(0.03)	(0.02)				

Outcome	School feeding - girls (SE)	School feeding - boys (SE)	Control mean - girls	Control mean - boys	N - girls	N - boys
Child mental health						
Moderate to severe depression	-0.08***	-0.03	0.47	0.47	4139	3889
	(0.02)	(0.03)				
Patient Health Questionnaire-9 for Adolescents (PHQ-A)	0.90***	0.32	16.57	16.32	4139	3889
	(0.26)	(0.30)				
Medium to high stress	-0.10***	-0.04*	0.40	0.39	4139	3889
	(0.02)	(0.02)				
Perceived Stress Scale for Children (PSS-C)	1.44***	0.65**	27.76	27.70	4139	3889
	(0.26)	(0.26)				
Above-median Locus of Control Scale	0.00	-0.01	0.24	0.24	4139	3889
	(0.02)	(0.02)				
Locus of Control Scale	0.00	-0.02	5.68	5.68	4139	3889
	(0.05)	(0.05)				
Above-median Satisfaction with Life Scale	0.01	-0.01	0.20	0.24	4139	3889
	(0.02)	(0.02)				
Satisfaction with Life Scale	0.31*	0.23	13.69	13.98	4139	3889
	(0.16)	(0.14)				
Above-median or equal-to-median Cantril Ladder	0.01	0.01	0.63	0.60	4139	3889
	(0.02)	(0.02)				
Cantril Ladder	0.20**	0.09	8.64	8.77	4139	3889
	(0.09)	(0.09)				
Child physical health						
Thinness (BAZ -2 sd)	0.03	-0.01	0.26	0.28	1607	1453
	(0.03)	(0.03)				
Overweight (WAZ +1 sd)	-0.00	0.00	0.03	0.01	1607	1453
	(0.01)	(0.01)				
Obesity (WAZ +2 sd)	-0.01	0.00	0.00	0.00	1607	1453
	(0.00)	(0.00)				
Stunting (HAZ-2 sd)	0.03	-0.00	0.13	0.22	1607	1453
	(0.03)	(0.03)				
Underweight (WAZ -2 sd)	-0.06	0.08	0.18	0.12	348	322
	(0.04)	(0.05)				
Share of days child is reported sick in the previous week	0.00	0.01	0.06	0.07	4139	3889
	(0.01)	(0.01)				

*Significance levels: *p < 0.1; **p < 0.05; ***p < 0.01*

Table 9: Overview table by gender of teacher incentive outcomes

Outcome	Teacher incentive - female (SE)	Teacher incentive - male (SE)	Control mean - female	Control mean - male	N - female	N - male
Teacher attendance						
Teacher present	0.15**	0.06	0.69	0.77	150	310
	(0.06)	(0.05)				
Teacher retention	0.26*	0.04	0.56	0.72	33	81
	(0.14)	(0.08)				

*Significance levels: *p < 0.1; **p < 0.05; ***p < 0.01*

Table 10: Overview table of outcomes by gender that may be affected by school feeding and/or teacher incentives

Outcome	Any intervention - girls (SE)	Any intervention - boys (SE)	Control mean - girls	Control mean - boys	N - girls	N - boys
Child attendance						
Child attendance	0.073*	0.052	0.682	0.695	11566	12031
	(0.04)	(0.04)				
Child dropped out during school feeding year	0.004	0.000	0.024	0.029	3828	3720
	(0.01)	(0.01)				
School progression						
Child promoted	0.077**	0.057	0.697	0.700	1666	1685
	(0.04)	(0.04)				
Child is repeating grade 3	-0.019	-0.011	0.135	0.125	1666	1685
	(0.03)	(0.03)				
Child dropped out	-0.058**	-0.047	0.167	0.175	1666	1685
	(0.03)	(0.03)				
Cognitive ability						
Attention span						
Stroop interference score, standardized	-0.148**	-0.117*	0.094	-0.099	4139	3889
	(0.07)	(0.06)				
Stroop interference score	-0.535**	-0.424*	7.904	7.208	4139	3889
	(0.24)	(0.23)				
Reading monochromatic colour words, standardized	0.198**	0.171**	0.003	-0.003	4139	3889
	(0.08)	(0.08)				
Reading monochromatic colour words	0.945**	0.819**	4.209	4.179	4139	3889
	(0.39)	(0.39)				
Naming colours, standardized	0.000	-0.005	0.110	-0.115	4139	3889
	(0.07)	(0.08)				
Naming colours	0.000	-0.015	10.488	9.806	4139	3889
	(0.20)	(0.24)				
Naming colours of incongruently coloured colour words, standardized	-0.022	-0.015	0.102	-0.107	4139	3889
	(0.07)	(0.08)				
Naming colours of incongruently coloured colour words	-0.073	-0.050	10.250	9.551	4139	3889
	(0.22)	(0.26)				
Predicted Stroop performance, standardized	0.194**	0.157**	0.001	-0.000	4139	3889
	(0.08)	(0.08)				
Predicted Stroop performance	0.461**	0.374**	2.345	2.343	4139	3889
	(0.19)	(0.19)				

Outcome	Any intervention - girls (SE)	Any intervention - boys (SE)	Control mean - girls	Control mean - boys	N - girls	N - boys
Cognitive ability						
Memory						
Forward digit span length, standardized	0.125*	0.029	-0.062	0.065	4139	3889
	(0.07)	(0.06)				
Forward digit span length	0.185*	0.042	5.991	6.179	4139	3889
	(0.11)	(0.09)				
Backward digit span length, standardized	0.069	-0.039	-0.074	0.077	4139	3889
	(0.07)	(0.06)				
Backward digit span length	0.065	-0.037	2.307	2.450	4139	3889
	(0.06)	(0.06)				
Fluid intelligence						
Raven's Progressive Matrices, standardized	-0.067	-0.005	0.052	-0.054	4139	3889
	(0.05)	(0.04)				
Raven's Progressive Matrices	-0.097	-0.007	2.172	2.019	4139	3889
	(0.07)	(0.06)				
Reading						
Reading skills						
EGRA idex, standardized	-0.006	0.026	-0.015	0.019	1607	1453
	(0.08)	(0.08)				
Correct letter sounds per minute, standardized	0.081	0.050	-0.038	0.045	1607	1453
	(0.09)	(0.09)				
Correct letter sounds read per minute	1.342	0.833	10.663	12.036	1607	1453
	(1.56)	(1.56)				
Correct non-words per minute, standardized	0.065	-0.009	-0.069	0.076	1607	1453
	(0.08)	(0.10)				
Correct non-words read per minute	0.488	-0.067	2.579	3.663	1607	1453
	(0.62)	(0.75)				
Listening comprehension, standardized	-0.034	0.048	0.061	-0.064	1607	1453
	(0.11)	(0.08)				
Listening comprehension	-0.024	0.034	0.321	0.234	1607	1453
	(0.07)	(0.06)				
Correct words read per minute, standardized	0.094	0.070	0.009	-0.006	1607	1453
	(0.10)	(0.09)				
Correct words read per minute	1.247	0.928	6.903	6.707	1607	1453
	(1.33)	(1.25)				
Reading comprehension, standardized	-0.039	0.051	0.009	-0.008	1607	1453
	(0.09)	(0.09)				
Reading comprehension (percent), total	-0.005	0.007	0.035	0.033	1607	1453
	(0.01)	(0.01)				

*Significance levels: *p < 0.1; **p < 0.05; ***p < 0.01*

Annex 7 Overview tables with control variables

Table 11: Overview table with control variables of school feeding outcomes

Outcome	School feeding (SE)	Control mean	N
Child nutrition			
Food secure	0.09***	0.73	8031
	(0.01)		
Above-median child individual dietary diversity score	0.06***	0.37	8031
	(0.02)		
Child individual dietary diversity score	0.28***	5.01	8031
	(0.06)		
Starchy staples	0.00	0.99	8031
	(0.00)		
Dark green leafy vegetables	0.09***	0.39	8031
	(0.02)		
Other vitamin A-rich fruits and vegetables	0.03**	0.80	8031
	(0.01)		
Other fruits and vegetables	0.03***	0.90	8031
	(0.01)		
Organ meat	0.05***	0.09	8031
	(0.01)		
Meat and fish	0.04***	0.71	8031
	(0.02)		
Eggs	0.04***	0.14	8031
	(0.01)		
Legumes and nuts	0.06***	0.64	8031
	(0.02)		
Milk and milk products	0.04**	0.35	8031
	(0.02)		
Child consumed breakfast before going to school today	0.05**	0.53	8031
	(0.02)		
Child mental health			
Moderate to severe depression	-0.06***	0.47	8031
	(0.02)		
Patient Health Questionnaire-9 for Adolescents (PHQ-A)	0.60***	16.45	8031
	(0.22)		
Medium to high stress	-0.07***	0.40	8031
	(0.02)		
Perceived Stress Scale for Children (PSS-C)	1.06***	27.73	8031
	(0.21)		
Above-median Locus of Control Scale	-0.00	0.24	8031
	(0.01)		
Locus of Control Scale	-0.01	5.68	8031
	(0.04)		
Above-median Satisfaction with Life Scale	-0.01	0.22	8031
	(0.01)		
Satisfaction with Life Scale	0.20*	13.83	8031
	(0.11)		
Above-median or equal-to-median Cantril Ladder	0.01	0.61	8031
	(0.02)		
Cantril Ladder	0.13*	8.71	8031
	(0.07)		

Outcome	School feeding (SE)	Control mean	N
Child physical health			
Thinness (BAZ -2 sd)	-0.00	0.27	3063
	(0.02)		
Overweight (WAZ +1 sd)	0.00	0.02	3063
	(0.01)		
Obesity (WAZ +2 sd)	-0.00	0.00	3063
	(0.00)		
Stunting (HAZ-2 sd)	0.01	0.18	3063
	(0.02)		
Underweight (WAZ -2 sd)	0.01	0.15	670
	(0.03)		
Share of days child is reported sick in the previous week	0.01	0.06	8031
	(0.01)		
Child social cohesion			
Child easily talks to other children	0.00	0.61	3063
	(0.02)		
Child has classmate who would help in difficult situations	0.01	0.81	3063
	(0.01)		
Child has adult who would help in difficult situations	0.02	0.79	3063
	(0.01)		
Above-median belonging and inclusion score	0.02	0.32	3063
	(0.03)		
Belonging and inclusion	-0.14	15.97	3063
	(0.12)		
Above-median trust score	0.04	0.49	3063
	(0.04)		
Trust	0.05	12.21	3063
	(0.11)		
Child attendance			
Child newly enrolled during school feeding year	0.01	0.07	3551
	(0.01)		

*Significance levels: *p < 0.1; **p < 0.05; ***p < 0.01*

Table 12: Overview table with control variables of teacher incentive outcomes

Outcome	Teacher incentive (SE)	Control mean	N
Teacher attendance			
Teacher present	0.08**	0.74	460
	(0.04)		
Teacher retention	0.16*	0.67	114
	(0.08)		

*Significance levels: *p < 0.1; **p < 0.05; ***p < 0.01*

Annex 8 Limitations

182. This evaluation has several limitations.

183. **External validity:** The findings from The Gambia may not be universally applicable, and efforts are under way to assess external validity across similar interventions in different countries. To address this challenge, similar evaluation designs will be implemented in different contexts, and the application of the survey instruments and data collection tools will follow the SBP Impact Evaluation Window measurement framework.

184. **Short-term treatment effects:** The treatment assignment could be maintained only for one academic year, given the planned scaling up of the programme. As a result, the evaluation period was only seven months. This impact evaluation is therefore only able to identify the short-term effects of the interventions. Although this is sufficient to observe impacts on nutrition, mental well-being and school engagement, a longer period of evaluation might have provided evidence of impacts on downstream measures of cognition and physical health. The impacts identified in this report may be underestimates of the overall impacts of the programme.

185. **Differential attrition:** In addition, as with any in-field RCT, spill-over across schools and differential attrition are potential risks. The team worked closely with the implementing teams on the ground to monitor potential spill-over risks and to design clear implementation protocols. Differential attrition is to be expected as the data collection process took place in schools. However, no differences in completion rates were observed across the various intervention arms. Moreover, school dropout and attendance rates were outcomes that were expected to change, and although it is possible that the introduction of school feeding in certain schools might have resulted in parents selectively transferring their children to schools that provided such meals, this study found no statistically significant impacts on new enrolment of children during the intervention.

186. **Limited data budget to measure mechanisms:** Due to the limited data budget, the evaluation team focused its measurement efforts on schools. However, the following data, which could not be obtained in this evaluation, would also provide useful information regarding the mechanisms underlying the obtained results:

a. **Intra-household allocation:** The study only observed what food the sampled children received at home and in school. It did not measure how food might have been redistributed in the household.

b. **Tracking survey for children who dropped out:** The study did not measure outcomes for children who were no longer in school. The study found lower dropout and higher attendance rates in the intervention arms, generally among lower-performing students. As a result, the composition of the sample probably changed, but this would potentially indicate the lower bound of the real impact.

c. **Teaching practices:** Although the evaluation found evidence that teacher incentives were effective at increasing teacher presence, it is unknown whether these teachers had the instruments, tools and skills to teach effectively. More research is needed to understand the mechanisms underlying these findings.

187. **Disability inclusion:** As part of the 2020 Disability Inclusion Road Map, WFP is building on continued efforts to mainstream and standardize disability data collection methodologies, aligning with international standards and best practices. In the survey, disabilities were reported for 8 out of 2,175 children. Based on this estimation, approximately 4 out of 1,000 beneficiaries in the evaluated project had disabilities. Although this represents an important population, it is of insufficient size for this evaluation to estimate any differential impacts for disabled beneficiaries. This number is likely to be an underestimation of the overall proportion

of children with disability in these regions. According to a 2013 study, the child disability rate was estimated to be 9.9 per 1,000 children[78].

[78] UNICEF & MoBSE (2013). *The Gambia national disability study*. UNICEF Gambia, in collaboration with the Ministry of Basic and Secondary Education (MoBSE).

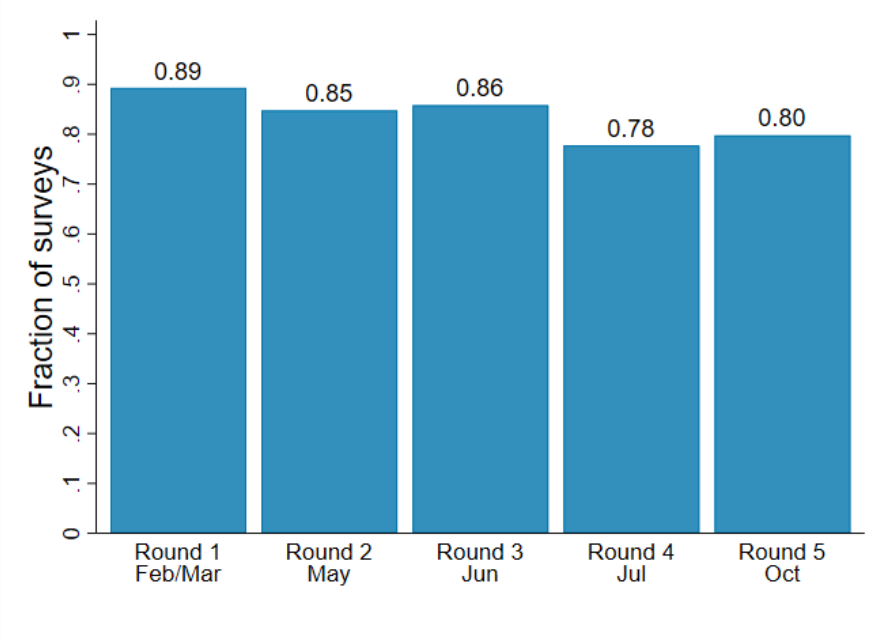
Annex 9 Detailed data collection

188. A child high-frequency survey measured all main and secondary outcomes between February and October 2023. The study sample consisted of 2,175 grade 3 children, or an average of 24 children per school. The interviews were administered at school. Each of the 92 schools was visited five times. Four visits were conducted between February and July 2023, and a final visit was conducted in October 2023, at the start of the following school year. During the fourth and fifth visits, children's height and weight data were collected. The fifth visit also verified children's enrolment and grade status to capture grade progression, repetition or dropout[79] following the 2022/23 academic year. During these surveys, children were also asked questions regarding the presence of their teacher.

189. The sampling frame for the child high-frequency survey was derived from the school attendance ledger from October 2023. The child sample was constructed by randomly selecting one grade 3 class per school. Parental consent forms were provided to all students in the selected classes containing up to 30 students. In the 32 selected classes with classroom sizes greater than 30, 30 children were randomly sampled from the attendance ledger and provided with parental consent forms. The questionnaire and measurement tools employed are described in Annex 1 (Table 3).

190. Children were only interviewed when both parental consent (once at the start of the data collection process and covering all the survey rounds) and child assent (at every round) were obtained. Overall, parental consent was obtained for 89 percent of the sample. For children with parental consent who were at school during a visit, child assent was obtained 99.9 percent of the time. The average response rate conditional on parental consent was 83 percent. Completion remained relatively stable across rounds, except for a decrease in completion in July, which can be attributed to the end of the school year and the start of the lean season, when children are often engaged in farming activities. No differences in completion rates were observed across the various intervention arms.

Figure 39: Completion conditional on parental consent for the child high-frequency survey



[79] A child was defined as a dropout when they were not enrolled in the same school in the 2023/24 school year as they were in the 2022/23 school year (i.e. at the beginning of the study). There was no observation of transfers to other schools.

Table 13: Completion conditional on parental consent for the child high-frequency survey by intervention arm

Intervention arm	Number of children surveyed	Number of schools surveyed	Completion rate (%) conditional on consent
No intervention	2 404	115 (23 per round)	82
School feeding	2 368	115 (23 per round)	85
Teacher incentive	2 404	115 (23 per round)	84
School feeding + teacher incentive	2 640	115 (23 per round)	83

191. The evaluation team hired an external team to conduct unannounced teacher attendance spot-check visits to all 114 grade 3 classes in all 92 schools. Five random visits were conducted in each school between February and July 2023. During each visit, an auditor recorded whether the teacher was present. For the first four rounds, data were collected for all 114 classes in 92 schools. For the last round, data were collected for 95 classes in 74 schools because some private schools had closed earlier for the summer break.

192. The evaluation team worked with the WFP country office and Ministry of Basic and Secondary Education to develop a standardized tool to collect and digitize school enrolment and attendance registers. Each school was provided with a register to record child and teacher attendance by the Ministry of Basic and Secondary Education. It was mandatory for all schools to fill in this ledger daily. WFP field officers visited schools regularly to collect all new records since the previous visit. During the first visit in December 2022, the field officers took all of the enrolment records and attendance data from the 114 grade 3 classes. In all schools during each visit, the WFP field officers recorded whether the teacher was present that day, providing an additional data point for triangulating the administrative and spot-check data.

193. Finally, the evaluation team collected cost data through country office records and performed a cost effectiveness analysis using the publicly available tool developed by Innovations for Poverty Actions (IPA),[80] which proposes an adapted version of the "ingredients method of costing".[81,82] The field coordinator was tasked with collecting this information from WFP staff colleagues. Further details and assumptions are reported in Annex 10.

194. A summary of the data collection timeline, which is aligned with the intervention roll-out, can be found in Figure 50.

[80] More information is available at https://poverty-action.org/cost-effectiveness-analysis

[81] Levin, H.M. & McEwan, P.J. (2001). *Cost-Effectiveness Analysis: Methods and Application*. Thousand Oaks, CA, USA, SAGE.

[82] Dhaliwal, I., Duflo, E., Glennerster, R. & Tulloch, C. (2013). Comparative Cost-Effectiveness Analysis to Inform Policy in Developing Countries: A General Framework with Applications for Education. In Glewwe, P. (ed.), *Education Policy in Developing Countries*. Chicago, IL, USA, University of Chicago Press.

Figure 40: Timeline of data collection

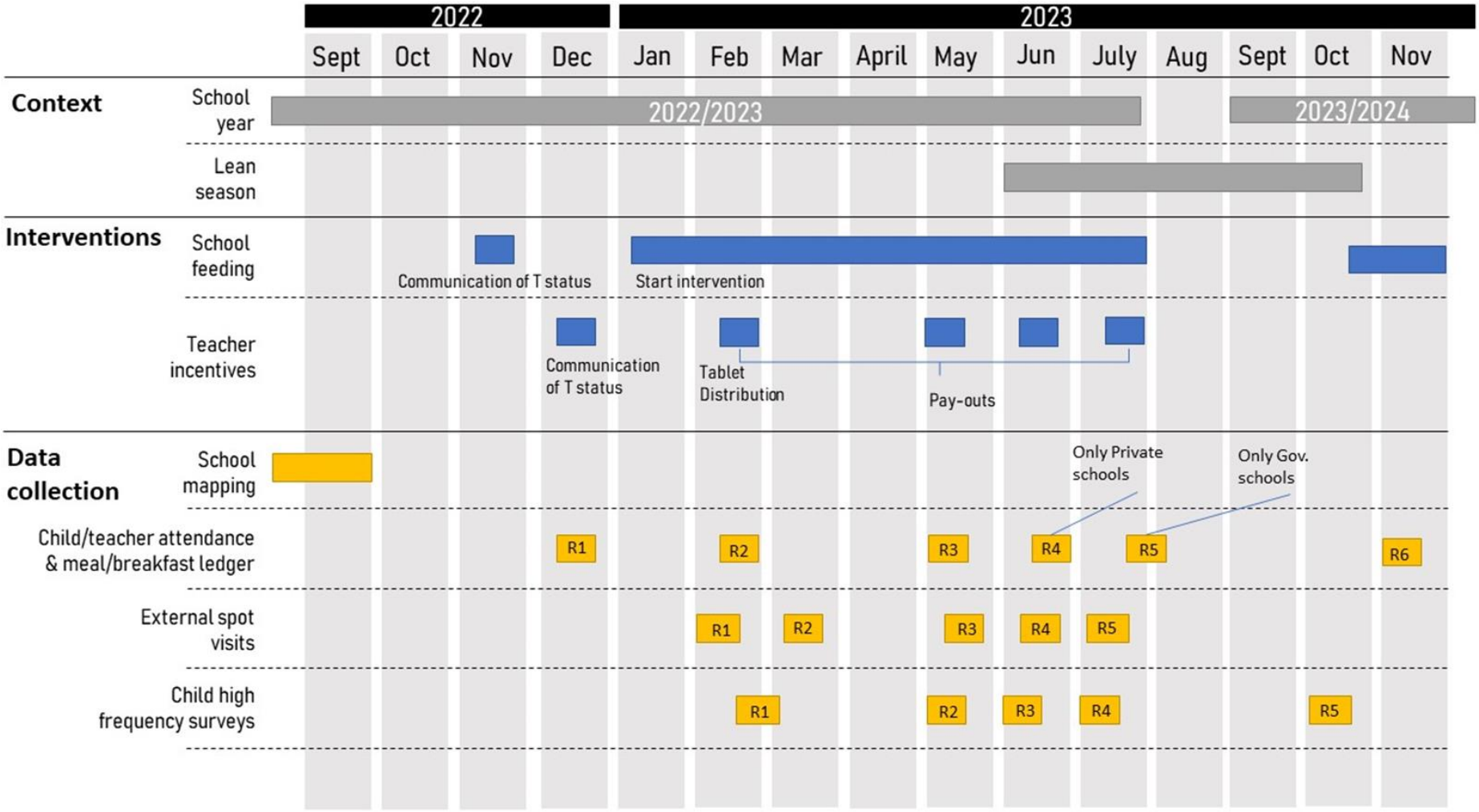


Table 14: Overview table of outcomes with control variables that may be affected by school feeding and/or teacher incentives

Outcome	Any intervention (SE)	TI only (SE)	SF only (SE)	SF+TI (SE)	Control mean	SF vs. TI p-value	SF vs. SF+ TI p-value	TI vs. SF+ TI p-value	N
Child attendance									
Child attendance	0.063	0.08**	0.07	0.05	0.688	0.77	0.77	0.56	23597
	(0.01)	(0.04)	(0.05)	(0.05)					
Child dropped out during school feeding year	0.010	0.019	0.011	0.003	0.155	0.48	0.55	0.24	7560
	(0.01)	(0.01)	(0.01)	(0.01)					
School progression									
Child promoted	0.068*	0.03	0.07	0.10**	0.699	0.40	0.53	0.11	3351
	(0.01)	(0.04)	(0.05)	(0.04)					
Child is repeating grade 3	-0.018	0.04	-0.03	-0.05*	0.130	0.20	0.53	0.04	3351
	(0.01)	(0.04)	(0.04)	(0.03)					
Child dropped out	-0.050*	-0.07**	-0.04	-0.05	0.171	0.27	0.90	0.50	3351
	(0.01)	(0.03)	(0.03)	(0.03)					
Cognitive ability									
Attention span									
Stroop interference score, standardized	-0.155***	-0.112	-0.160***	-0.179***	0.000	0.51	0.76	0.35	8031
	(0.05)	(0.08)	(0.06)	(0.06)					
Stroop interference score	-0.679***	-0.805**	-0.755***	-0.516**	7.565	0.89	0.40	0.37	8031
	(0.21)	(0.32)	(0.28)	(0.26)					
Reading monochromatic colour words, standardized	0.146**	0.070	0.098	0.246***	0.000	0.75	0.05	0.04	8031
	(0.07)	(0.09)	(0.08)	(0.08)					
Reading monochromatic colour words	0.989***	1.264**	0.715*	1.097***	4.193	0.27	0.34	0.74	8031
	(0.34)	(0.50)	(0.41)	(0.39)					
Naming colours	-0.021	0.034	-0.084	0.006	0.000	0.11	0.18	0.66	8031
	(0.06)	(0.07)	(0.07)	(0.06)					
Naming colours	-0.065	0.099	-0.282	0.056	10.154	0.25	0.19	0.87	8031
	(0.19)	(0.27)	(0.25)	(0.22)					
Naming colours of incongruently coloured colour words	-0.035	0.002	-0.074	-0.020	0.000	0.28	0.39	0.74	8031
	(0.06)	(0.07)	(0.07)	(0.06)					
Naming colours of incongruently coloured colour words	-0.214	-0.172	-0.429	-0.014	9.909	0.46	0.13	0.59	8031
	(0.20)	(0.28)	(0.27)	(0.24)					
Predicted Stroop performance, standardized	0.143**	0.076	0.103	0.229***	0.000	0.76	0.08	0.06	8031
	(0.06)	(0.09)	(0.07)	(0.07)					
Predicted Stroop performance	0.339**	0.181	0.243	0.543***	2.344	0.76	0.08	0.06	8031
	(0.15)	(0.21)	(0.17)	(0.18)					

Outcome	Any intervention (SE)	TI only (SE)	SF only (SE)	SF+TI (SE)	Control mean	SF vs. TI p-value	SF vs. SF+ TI p-value	TI vs. SF+ TI p-value	N
Cognitive ability									
Memory									
Forward digit span length, standardized	0.031	0.052	-0.014	0.066	0.000	0.41	0.25	0.86	8031
	(0.06)	(0.08)	(0.07)	(0.07)					
Forward digit span length	0.046	0.077	-0.020	0.097	6.083	0.41	0.25	0.86	8031
	(0.09)	(0.12)	(0.10)	(0.10)					
Backward digit span length	-0.034	0.060	-0.108	-0.019	-0.000	0.07	0.25	0.35	8031
	(0.06)	(0.08)	(0.07)	(0.07)					
Backward digit span length	-0.032	0.056	-0.101	-0.018	2.377	0.07	0.25	0.35	8031
	(0.05)	(0.08)	(0.07)	(0.07)					
Fluid intelligence									
Raven's Progressive Matrices, standardized	-0.030	-0.028	-0.051	-0.009	-0.000	0.60	0.26	0.65	8031
	(0.04)	(0.05)	(0.04)	(0.04)					
Raven's Progressive Matrices	-0.023	-0.050	-0.032	0.004	2.097	0.80	0.63	0.45	8031
	(0.06)	(0.07)	(0.07)	(0.06)					
Reading									
Reading skills									
EGRA index, standardized	0.005	0.000	-0.070	0.085	0.000	0.37	0.11	0.41	3063
	(0.07)	(0.08)	(0.07)	(0.10)					
Correct letter sounds per minute, standardized	0.063	-0.006	0.055	0.117	0.000	0.61	0.59	0.32	3063
	(0.08)	(0.11)	(0.10)	(0.10)					
Correct letter sounds read per minute	1.418	2.133	1.786	0.564	11.295	0.88	0.49	0.49	3063
	(1.40)	(2.13)	(1.77)	(1.68)					
Correct nonwords per minute, standardized	0.040	0.042	-0.044	0.124	0.000	0.37	0.11	0.47	3063
	(0.08)	(0.10)	(0.09)	(0.11)					
Correct nonwords read per minute	-0.150	0.229	-0.649	0.143	3.093	0.28	0.28	0.92	3063
	(0.61)	(0.86)	(0.78)	(0.65)					
Listening comprehension, standardized	-0.053	-0.102	-0.115	0.045	0.000	0.90	0.16	0.26	3063
	(0.07)	(0.10)	(0.09)	(0.11)					
Listening comprehension	-0.067	-0.121	-0.063	-0.037	0.278	0.46	0.71	0.25	3063
	(0.05)	(0.08)	(0.07)	(0.06)					
Correct words read per minute, standardized	0.074	-0.024	0.008	0.208*	-0.000	0.78	0.15	0.09	3063
	(0.08)	(0.10)	(0.11)	(0.12)					
Correct words read per minute	0.980	-0.319	0.108	2.760*	6.790	0.78	0.15	0.09	3063
	(1.12)	(1.36)	(1.42)	(1.64)					
Reading comprehension, standardized	-0.007	-0.040	-0.089	0.100	-0.000	0.54	0.11	0.23	3063
	(0.08)	(0.09)	(0.08)	(0.12)					
Reading comprehension (percent), total	-0.013	-0.017	-0.022	-0.002	0.034	0.66	0.14	0.21	3063
	(0.01)	(0.01)	(0.01)	(0.01)					

*Significance levels: *p < 0.1; **p < 0.05; ***p < 0.01*

Annex 10 Costing assumptions

195. The costs per beneficiary detailed in Table 5 were estimated using the following assumptions obtained through interviews with WFP country office staff. Summing up the total costs that apply to school feeding yielded USD 343,510, or approximately USD 14 per beneficiary, whereas summing up the total costs of the teacher incentives yielded USD 59,358, or approximately USD 2.4 per beneficiary.

Table 15: Costing analysis

Assumption	Value	Cost per month per school (USD)	Total cost (USD)	Intervention to which the cost applies
Number of schools[83]	87	-	-	-
Number of beneficiaries	24 475	-	-	-
Number of grade 3 teachers[84]	115	-	-	-
Number of feeding months	7	-	-	-
Number of feeding days per year	115	-	-	-
Number of ledger collection months	6	-	-	-
Number of ledger drop-off and training months	3	-	-	-
Meal cost (USD)	0.08 per child per day	369.3	224 903	School feeding

[83] This is the total number of schools that received school feeding through this programme in 2023 and not only the schools included in the impact evaluation.

[84] This is the number of teachers following assumptions of implementing school feeding and teacher incentives beyond those included in the impact evaluation.

		Meal cost per child per day * (number of beneficiaries/number of schools) * (number of feeding days per year / number of feeding months)	Cost per month per school * number of schools * number of feeding months	
Cooking cost (USD)	0.02 per child per day	92.33 Cooking cost per child per day * (number of beneficiaries/number of schools) * (number of feeding days per year / number of months)	56 228.97 Cost per month per school * number of schools * number of feeding months	School feeding
Tablet cost (USD)	109.14 per tablet	20.68 Cost of one tablet * number of grade 3 teachers / (number of schools * number of months)	12 594.12 Cost per month per school * number of schools * number of feeding months	Teacher incentives
Staff cost (USD)	5 292.2 per month	60.83 Staff cost per month / number of schools	37 045.47 Cost per month per school * number of schools * number of feeding months	School feeding
Teacher incentives cost (USD)	961.35 per month	11.05 Teacher incentives cost per month / number of schools	6 729.45 Cost per month per school * number of schools * number of feeding months	Teacher incentives
Implementation cost (USD)	111.36 per month	1.28 Implementation cost per month / number of schools	779.52 Cost per month per school * number of schools * number of feeding months	School feeding
Cash transfer cost (USD)	2 565.63 per month	29.49 Cash transfer cost per month / number of schools	17 959.41 Cost per month per school * number of schools * number of feeding months	School feeding

Ledger printing cost (USD)	1 403		1 403	Teacher incentives
Consent form printing cost (USD)	330.19		330.19	Teacher incentives
Consent form printing cost (USD)	330.19		330.19	School feeding
Ledger drop-off and training cost (USD)	10 679.36 per month	122.75 Ledger drop-off and training cost per month / number of schools	32 038.08 Cost per month per school * number of schools * number of ledger drop-off and training months	Teacher incentives
Ledger data collection cost (USD)	1 044 per month	24 Ledger collection cost per month / number of schools * (1 / 2)	6 264 Cost per month per school * number of schools * (1 / 2) * number of ledger collection months	School feeding
Ledger data collection cost (USD)	1 044 per month	24 Ledger collection cost per month / number of schools * (1 / 2)	6 264 Cost per month per school * number of schools * (1 / 2) * number of ledger collection months	Teacher incentives

Office of Evaluation

World Food Programme

Via Cesare Giulio Viola 68/70
00148 Rome, Italy
T +39 06 65131 **wfp.org**