



THE SCHOOL DISTRICT OF
PHILADELPHIA

Student Hunger and School Breakfast: Analysis of District- Wide Survey Results and School Breakfast Programs, 2018-19

Key Findings

- Students were more likely to participate in school breakfast programs if their school had a breakfast after the bell program.
- Students were more likely to report eating breakfast twice (at home and at school) if their school had a breakfast after the bell program.
- Students were less likely to skip breakfast if their school had a breakfast after the bell program.
- Teachers were more likely to report that hunger was a challenge at schools with higher rates of economic disadvantage.
- Teachers were more likely to report that hunger was a challenge at schools where more students reported not eating breakfast at all.
- Students were more likely to participate in school breakfast programs at schools with higher rates of economic disadvantage.

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Background

School breakfast programs help students succeed

Students learn better when they are well-fed. Research shows that eating breakfast at school is associated with improved academic performance, as well as better attendance and punctuality.¹ Likewise, skipping breakfast is associated with decreased cognitive performance, such as alertness, attention, memory, and problem-solving.^{2,3,4} There is strong evidence that providing breakfast to all students during the regular school day provides benefits such as reduced student hunger, reduced absenteeism, and greater educational attainment.^{5,6} However, studies on breakfast after the bell (BATB) alternative breakfast models have revealed mixed results, depending on the school context and school population characteristics.⁷ BATB models include several different strategies to increase breakfast participation and may yield different outcomes depending on the unique context of an individual school.

Ensuring that students have access to adequate nutrition is a critical concern in Philadelphia, where more than 76,000 children are estimated to be food insecure (22%).⁸ Furthermore, food insecurity is concentrated in particular schools and neighborhoods that are home to higher populations of economically disadvantaged families. The current situation is likely much worse in 2020 due to the effects of the COVID-19 pandemic.⁹

¹ J. Michael Murphy et al., "The relationship of school breakfast to psychosocial and academic functioning: Cross-sectional and longitudinal observations in an inner-city school sample," *Archives of Pediatric and Adolescent Medicine* 152 (1998): 899-907.

² Charles E. Basch, "Breakfast and the achievement gap among urban minority youth," *Journal of School Health* 81, no. 10 (2011):635-640.

³ Beverly J. Bradley and Amy C. Greene, "Do health and education agencies in the United States share responsibility for academic achievement and health? A review of 25 years of evidence about the relationship of adolescents' academic achievement and health behaviors," *Journal of Adolescent Health* 52, no. 5 (2013): 523-532.

⁴ Centers for Disease Control and Prevention, "Health and Academic Achievement," *National Center for Chronic Disease Prevention and Health Promotion, Division of Population Health* (2014),

https://www.cdc.gov/healthyyouth/health_and_academics/pdf/health-academic-achievement.pdf?s_cid=tw_shb10

⁵ Share our Strength, "Evaluating the Impact of Breakfast After the Bell on Chronic Absenteeism," *No Kid Hungry* (2019), http://bestpractices.nokidhungry.org/sites/default/files/2020-01/ChronicAbsenteeism_ResearchBrief_2.pdf

⁶ Food Research and Action Center and National Association of Secondary School Principals, "School breakfast after the bell: Equipping students for academic Success," (2015), <https://frac.org/wp-content/uploads/secondary-principals-bic-report.pdf>

⁷ Katherine W. Bauer et al., "Breakfast in the classroom initiative and students' breakfast consumption behaviors: A group randomized trial," *American Journal of Public Health* 110, no. 4 (2010): 540-546.

⁸ For more information on food insecurity rates in Philadelphia County 2016-2018 see:

<https://map.feedingamerica.org/county/2018/overall/pennsylvania/county/philadelphia>

⁹ Lauren Bauer, "The COVID-19 Crisis Has Already Left Too Many Children Hungry in America," *The Hamilton Project*, May 6, 2020,

https://www.hamiltonproject.org/blog/the_covid_19_crisis_has_already_left_too_many_children_hungry_in_america

The School District of Philadelphia works to ensure that all students have access to a healthy breakfast

The School District of Philadelphia’s (SDP) Division of Food Services offers free breakfast to all District students. The program has established a goal to serve breakfast to 70% of students in attendance each day.¹⁰ During the 2018-19 school year, the participation rate was 42%.¹¹ To boost participation, many District schools have adopted a variety of alternative breakfast programs that can be categorized as serving breakfast “after the bell.” Such programs eliminate the need for students to come to school early to eat breakfast. The most common examples are breakfast in the classroom (BIC) and breakfast in the cafeteria after the bell. Individual schools often implement a mixture of different approaches that may also include grab-n-go carts in various locations, BIC for specific classrooms only, or policies to serve breakfast to students that arrive late. Additionally, K-8 schools are much more likely than high schools to offer breakfast after the bell programs.

Breakfast before the bell is typically provided in the cafeteria before the beginning of the school day. Students must arrive early to school to eat breakfast.

Breakfast after the bell is typically offered as breakfast in the classroom (BIC) or in the cafeteria after the bell. Students eat breakfast as part of the regular school day.

Other breakfast programs not considered here include grab-n-go carts and policies to serve breakfast to students that arrive late.

District-Wide Survey responses offer context for school breakfast programs

To understand the extent to which hunger influences students’ experiences at school, SDP’s Office of Research and Evaluation (ORE) asks questions related to student hunger on the District-Wide Survey (DWS). Responses related to this topic are collected from students, teachers, and parents/guardians. This research brief uses District-Wide Survey data alongside breakfast program data from SDP Food Services to answer the following questions about the relationship between student hunger and school breakfast programs for K-8 schools:

1. How do student responses to District-Wide Survey questions about eating breakfast relate to the type of breakfast program offered at their school?
2. How do teacher responses to District-Wide Survey questions about student hunger relate to the type of breakfast program offered at their school?
3. How do parent/guardian responses to District-Wide Survey questions about food insecurity relate to the type of breakfast program offered at their child’s school?
4. How do student, teacher, and parent/guardian responses to District-Wide Survey questions relate to each other based on the type of breakfast program offered?

¹⁰ For more information on breakfast programs in SDP see: <https://www.philasd.org/foodservices/programs-services/breakfast/>

¹¹ For more information on breakfast participation rates in SDP see: <https://www.philasd.org/foodservices/programs-services/breakfast/2110-2/>

5. How do student, teacher, and parent/guardian responses to the District-Wide Survey questions differ by whether they are associated with a school with high or low levels of economically disadvantaged students?
6. How do student, teacher, and parent/guardian responses to the District-Wide Survey questions differ by breakfast program and whether they are associated with a school with high or low levels of economically disadvantaged students?

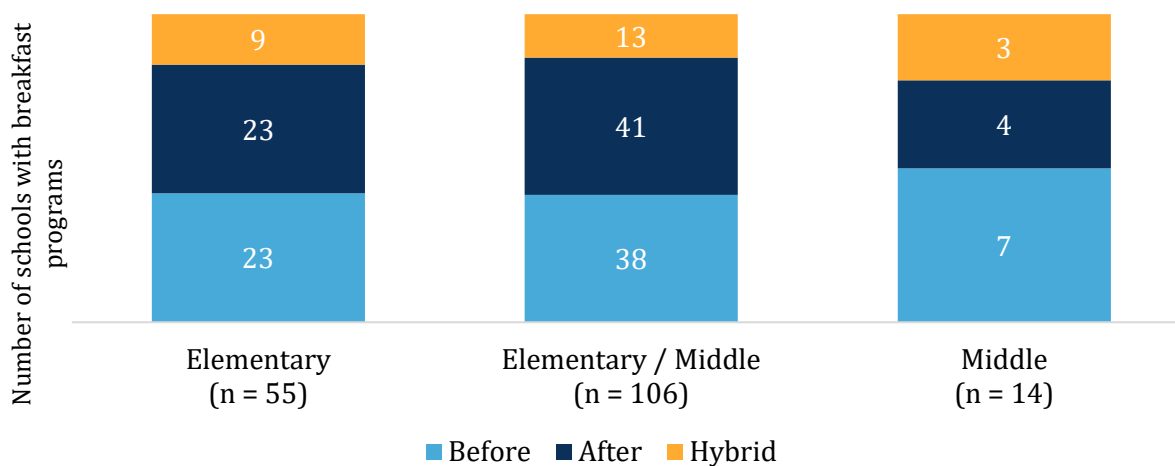
Methods

Schools were grouped according to the percentage of students offered breakfast after the bell

This research brief analyzes information for the 175 District schools serving K-8 students during the 2018-19 school year. Each school was categorized into one of three groups (*Before the bell*, *After the Bell*, or *Hybrid*) based on the percentage of students that were actively offered breakfast after the bell. These groups describe the predominant approach to breakfast in each school, but do not imply that only a single delivery method was in use. Many schools have implemented a combination of breakfast before the bell and breakfast after the bell for different grades or classrooms. The groups were assigned based on data provided by Food Services using the following definitions. Figure 1 shows the number of schools in each category by grade level.

- ***Before the bell*** refers to schools where less than one third (<33%) of students were actively offered breakfast during the regular school day. In other words, most students in these schools eat breakfast before school (or before the bell).
- ***After the bell*** refers to schools where more than two thirds (>66%) of students were actively offered breakfast during the regular school day. In other words, most students at these schools eat breakfast during school (or after the bell).
- ***Hybrid*** refers to schools where between one third and two thirds (33%-66%) of students were actively offered breakfast during the regular school day. In other words, students at these schools eat both before and after the bell.

Figure 1. The number of schools in our sample by breakfast program type and grade level



District-Wide Survey responses from students, teachers, and parents were linked to each school

ORE administers the District-Wide Survey (DWS) each spring to students, teachers, principals, and parents/guardians. The survey asks respondents a variety of questions about how they experience and perceive their schools.¹² This research brief analyzes 2018-19 responses from students, teachers, and parents/guardians. Response data was not available for every school due to low numbers of responses in some cases. The number of District schools with available data was 160 for the student question, 141 for the teacher question, and 120 for the parent question. A complete breakdown of the number of responses and schools included in the sample is provided in the Appendix. The following questions were included in the analysis:

- The student question was, “On a regular school day, do you eat breakfast?” and had five possible responses: “No,” “Yes at home,” “Yes at school,” “Yes at home and at school,” and “Yes somewhere other than home and school.” For the correlational analyses, the five responses were transformed into three categories: if students ate two meals (at school and at home), one meal (at school), or did not eat breakfast. The three categories were transformed and ranked where two meals (2) was the highest category, one meal (1) was the middle category, and did not eat breakfast as the lowest category (0). This ranking allows us to explore the data by hunger needs.
- The teacher question was, “Students report being hungry is a challenge” and had four possible responses: “Not a challenge,” “Slight challenge,” “Moderate challenge,” and “Great challenge.” For the correlational analyses, the four categories were assigned ordinal codes where “Great challenge” (3) was the highest category, “Moderate challenge” (2) was a

¹² For more information on the District-Wide Survey see: <https://www.philasd.org/research/programsservices/district-wide-surveys/>.

moderate category, “Slight challenge” (1) was a low category, and “Not a challenge” (0) was the reference category.

- The parent/guardian question was, “In the past 30 days, have you worried about having enough food for you and your family?” and had two responses: “Yes” or “No.” Figures 6-7 display data in this format. For correlational analyses, the response “Yes” was assigned a code of 1 and “No” was assigned 0.

The data was analyzed to determine whether District-Wide Survey responses were related to each other and to school breakfast programs

The findings included in this brief are based on both descriptive comparisons of the data as well as statistical tests to determine whether specific variables were related to one another. In particular, the relationships between the response data for each District-Wide Survey question were tested with bivariate Pearson correlations. This statistical method measures the strength and direction (positive or negative) of relationships between two variables. All other findings are based on descriptive analysis. The analysis was repeated for schools with higher or lower rates of economically disadvantaged students to determine whether this factor affected the results.

The level of economic disadvantage within each school was measured by the rate of students that qualified for free or reduced lunch. For the sample as a whole, the median percentage of economically disadvantaged students was 79%. Schools with economic disadvantage rates greater than the median were categorized as having high economic disadvantage. Schools with rates lower than the median were categorized as having low economic disadvantage. The number of responses and schools with available data in each category is listed in the Appendix.

Findings

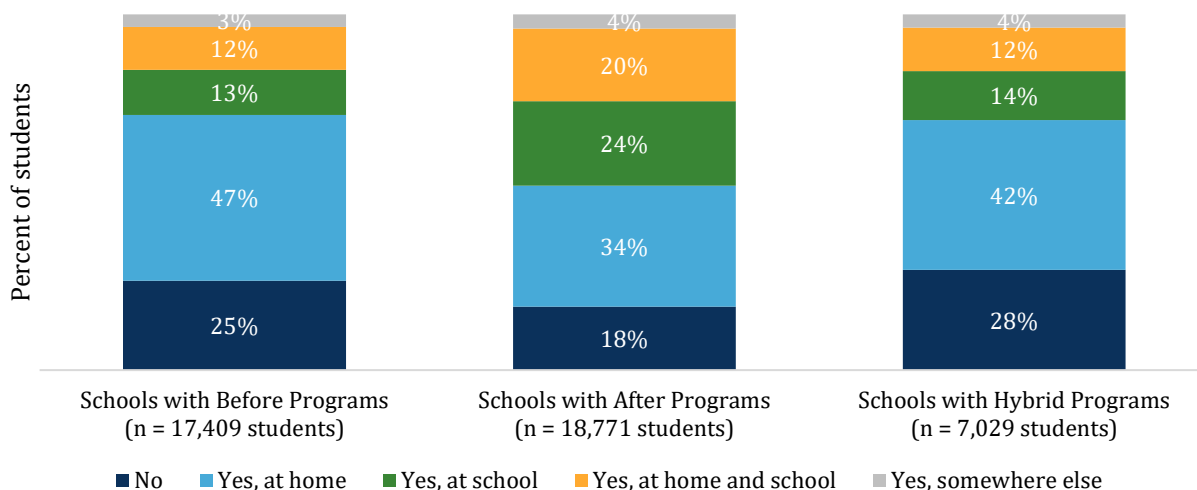
How do student responses to District-Wide Survey questions about eating breakfast relate to the type of breakfast program offered at their school?

Schools with *After the Bell* programs had the highest percentage of students eating breakfast at school and the lowest percentage of students eating breakfast at home.

Twenty-five percent (25%) of students attending *Before the Bell* schools did not eat breakfast on a regular school day, compared to 18% of *After the Bell* schools (7 percentage point difference), and 28% of *Hybrid* schools (3 percentage point difference). Forty-seven percent (47%) of students attending *Before the Bell* schools ate breakfast at home, compared to 34% of *After the Bell* schools (13 percentage point difference), and 42% of *Hybrid* schools (5 percentage point difference). Thirteen percent (13%) of students attending *Before the Bell* schools ate breakfast at school, compared to 24% of *After the Bell* schools (11 percentage point difference), and 14% of *Hybrid* schools (1 percentage point difference). Twelve percent (12%) of students attending *Before the Bell* schools ate breakfast at home and at school, compared to 20% of *After the Bell* schools (8 percentage point difference), and 12% of *Hybrid* schools (0 percentage point difference). Three percent (3%) of students attending *Before the Bell* schools ate breakfast elsewhere, compared to

4% of *After the Bell* schools (1 percentage point difference), and 4% of *Hybrid* schools (1 percentage point difference) (Figure 2).

Figure 2. Student responses to the 2018-19 DWS question, “On a regular school day, do you eat breakfast?” organized by breakfast program type



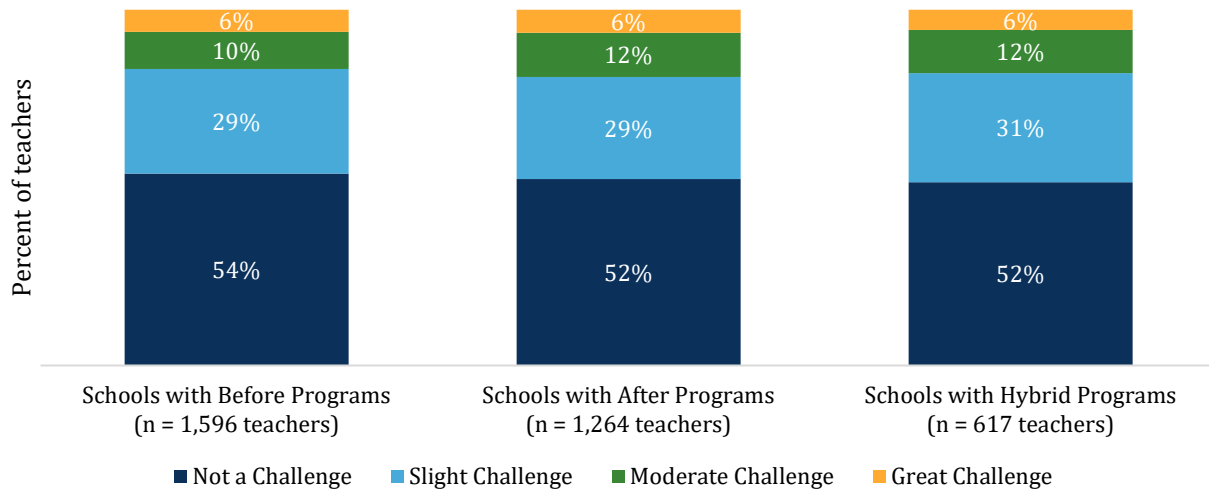
Source: SDP Food Services administrative data (2018-19); SDP District-Wide Survey (2018-19)

How do teacher responses to District-Wide Survey questions about student hunger relate to the type of breakfast program offered at their school?

Slightly more than half of teachers reported that student hunger was not a challenge in the classroom, with similar patterns across each breakfast program type.

Fifty-four percent (54%) of teachers in schools with *Before the Bell* breakfast programs reported student hunger is not a problem, compared to 52% of teachers in schools with *After the Bell* (2 percentage point difference), and 52% of teachers in schools with *Hybrid* programs (2 percentage point difference). Twenty-nine percent (29%) of teachers in schools with *Before the Bell* breakfast programs reported student hunger is a slight problem, compared to 29% of teachers in schools with *After the Bell* programs (0 percentage point difference), and 31% of teachers in schools with *Hybrid* programs (2 percentage point difference). Sixteen percent (16%) of teachers in schools with *Before the Bell* breakfast programs reported student hunger is a moderate or great problem, compared to 18% of teachers in schools with *After the Bell* programs (2 percentage point difference), and 18% of teachers in schools with *Hybrid* programs (2 percentage point difference) (Figure 3).

Figure 3. Teacher responses about whether “Students report being hungry is a challenge” organized by breakfast program type



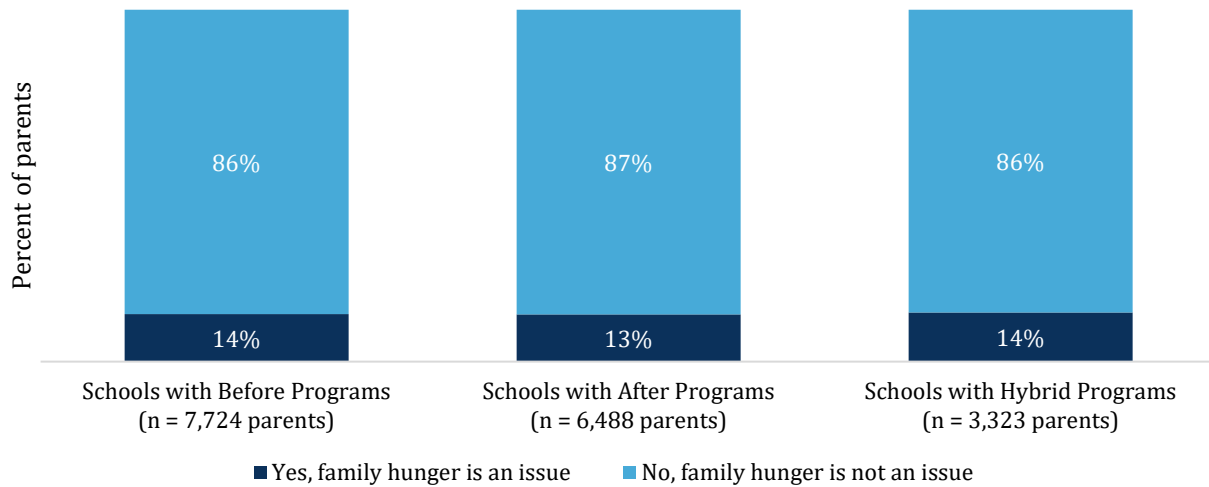
Source: SDP Food Services administrative data (2018-19); SDP District-Wide Survey (2018-19)

How do parent/guardian responses to District-Wide Survey questions about food insecurity relate to the type of breakfast program offered at their child’s school?

More than ten percent of parents/guardians reported being worried about having enough food at home, with similar patterns across each breakfast program type.

Fourteen percent (14%) of parents/guardians whose children are in schools with *Before the Bell* breakfast programs reported they have worried about having enough food at home in the last 30 days, compared to 13% of parents/guardians of children in schools with *After the Bell* programs (1 percentage point difference), and 14% of parents/guardians of children in schools with *Hybrid* programs (0 percentage point difference). Eighty-six (86%) of parents/guardians whose children are in schools with *Before the Bell* breakfast programs reported they have not worried about having enough food at home in the last 30 days, compared to 87% of parents/guardians of children in schools with *After the Bell* programs (1 percentage point difference), and 86% of parents/guardians of children in schools with *Hybrid* programs (0 percentage point difference) (Figure 4).

Figure 4. Parent/guardian responses to the question, “In the past 30 days, have you worried about having enough food for you and your family?” organized by breakfast program type



Source: SDP Food Services administrative data (2018-19); SDP District-Wide Survey (2018-19)

How do student, teacher, and parent/guardian responses to District-Wide Survey questions relate to each other based on the type of breakfast program offered?

Teachers were more likely to report that student hunger is a challenge when students reported skipping breakfast and when parents/guardians reported being worried about having enough food.

For all schools, student responses had significant relationships with teacher responses, $r = 0.21$, $p = 0.003$, but were not significantly related to parent/guardian responses, $r = 0.04$, $p = 0.6$ (Table 1). The more often students ate breakfast, the more teachers indicated student hunger was not a problem. Another way to look at it is that the more students reported not eating breakfast at all, the more teachers indicated student hunger was a problem. Parent/guardian and teacher responses had a significant positive relationship, $r = 0.42$, $p < 0.001$. The more teachers indicated student hunger was a problem, then the more parents/guardians reported hunger in the home was a problem.

Table 1. Bivariate correlations between the student, teacher, and parent/guardian for all breakfast program types

	Student	Teacher	Parent/Guardian
Student (n = 161)	-		
Teacher (n = 146)	0.21**	-	
Parent/Guardian (n = 121)	0.04	0.42***	-

Note: $p^* < 0.05$, $p^{**} < 0.01$, $p^{***} < 0.001$

How to read this table: The correlation matrix demonstrates the statistical relationship between student and teacher responses, student and parent/guardian responses, and teacher and parent/guardian responses. In the cell under “student” column and row next to “teacher,” there is a $r = 0.21^{**}$, this number indicates a moderate, positive relationship between student responses to the breakfast question and teacher responses to the hunger question. The symbol ** denotes a statistically significant relationship between the two variables; cells without the symbol mean there is not a statistically significant relationship between the two variables. “n” refers to the number of schools with available response data.

Before the Bell

For students at schools with Before the Bell programs, student responses were significantly positively related to teacher responses, $r = 0.26$, $p = 0.008$, but were not significantly related to parent/guardian responses, $r = 0.06$, $p = 0.6$ (Table 2). The more students reported not eating breakfast at all, the more teachers indicated student hunger was a problem. Parent/guardian and teacher responses had a significant positive relationship, $r = 0.45$, $p < 0.001$. The more teachers indicated student hunger was a problem, then the more parents/guardians reported hunger in the home was a problem.

Table 2. Bivariate correlations between the student, teacher, and parent/guardian for Before the Bell breakfast programs

	Student	Teacher	Parent/Guardian
Student (n = 68)	-		
Teacher (n = 58)	0.26**	-	
Parent/Guardian (n = 52)	0.06	0.45***	-

Note: $p^* < 0.05$, $p^{**} < 0.01$, $p^{***} < 0.001$. “n” refers to the number of schools with available response data.

After the Bell

For students at schools with After the Bell programs, student responses were not significantly positively related to teacher responses or parent/guardian responses (Table 3). Parent/guardian and teacher responses had a significant positive relationship, $r = 0.44$, $p = 0.002$. The more teachers indicated student hunger was a problem, the more parents/guardians reported hunger in the home was a problem.

Table 3. Bivariate correlations between the student, teacher, and parent/guardian for After the Bell breakfast programs

	Student	Teacher	Parent/Guardian
Student (n = 67)	-		
Teacher (n = 63)	0.05	-	
Parent/Guardian (n = 48)	0.08	0.44**	-

Note: $p^t < 0.10$, $p^* < 0.05$, $p^{**} < 0.01$, $p^{***} < 0.001$. “n” refers to the number of schools with available response data.

Hybrid

For students at schools with Hybrid programs, student responses were not significantly positively related to teacher responses or parent/guardian responses (Table 4). Parent/guardian and teacher responses had a trending positive relationship, $r = 0.35$, $p = 0.091$. The more teachers indicated student hunger was a problem, the more parents/guardians reported hunger in the home was a problem.

Table 4. Bivariate correlations between the student, teacher, and parent/guardian for Hybrid breakfast programs

	Student	Teacher	Parent/Guardian
Student (n = 25)	-		
Teacher (n = 24)	0.30	-	
Parent/Guardian (n = 21)	0.09	0.35 ^t	-

Note: $p^t < 0.10$, $p^* < 0.05$, $p^{**} < 0.01$, $p^{***} < 0.001$. “n” refers to the number of schools with available response data.

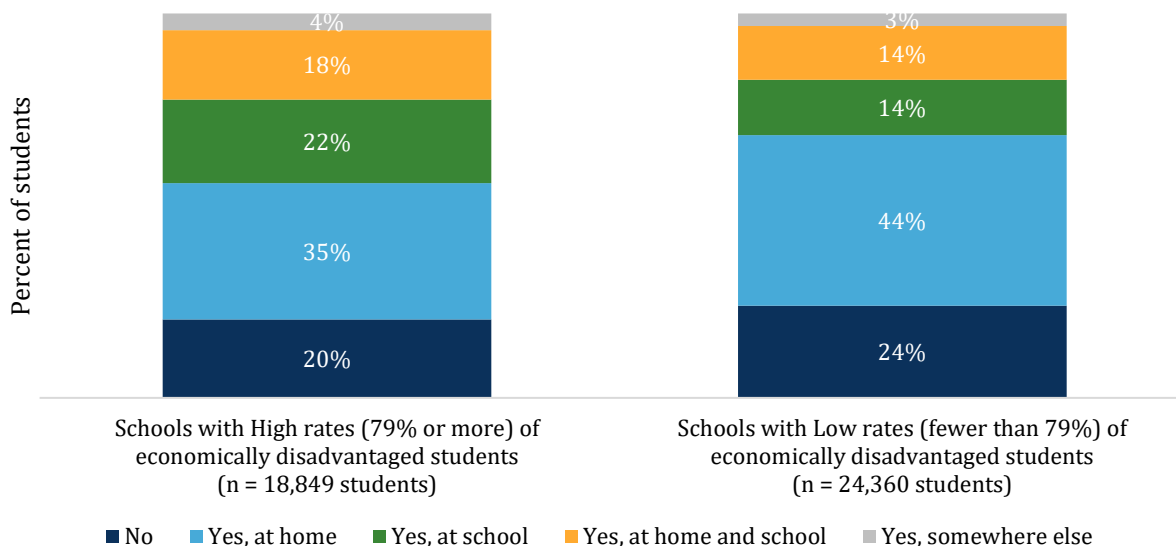
How do student, teacher, and parent/guardian responses to the District-Wide Survey questions differ by whether they are associated with a school with high or low levels of economically disadvantaged students?

Students attending schools with higher rates of economic disadvantage reported eating breakfast at school more often.

Figure 5 displays how students responded grouped by whether they attended schools with high or low percentages of economically disadvantaged students. Twenty percent (20%) of students attending schools with high percentages of economically disadvantaged students did not eat breakfast at all, compared to 24% attending schools with low percentages of economically disadvantaged students. Thirty-five percent (35%) of students attending schools with high percentages of economically disadvantaged students ate breakfast at home, compared to 44% attending schools with low percentages. Twenty-two percent (22%) of students attending schools with high percentages of economically disadvantaged students ate breakfast at school, compared to 14% attending schools with low percentages. Eighteen percent (18%) of students attending schools with high percentages of economically disadvantaged students ate breakfast at home and at school, compared to 14% attending schools with low percentages. Four percent (4%) of students attending

schools with high percentages of economically disadvantaged students ate breakfast somewhere other than home and school, compared to 3% attending schools with low percentages of economically disadvantaged students. A detailed breakdown of the number of responses and schools is included in the Appendix (Tables A1-A2).

Figure 5. Student responses to the question, “On a regular school day, do you eat breakfast?” by whether schools have a high or low percentage of economically disadvantaged students

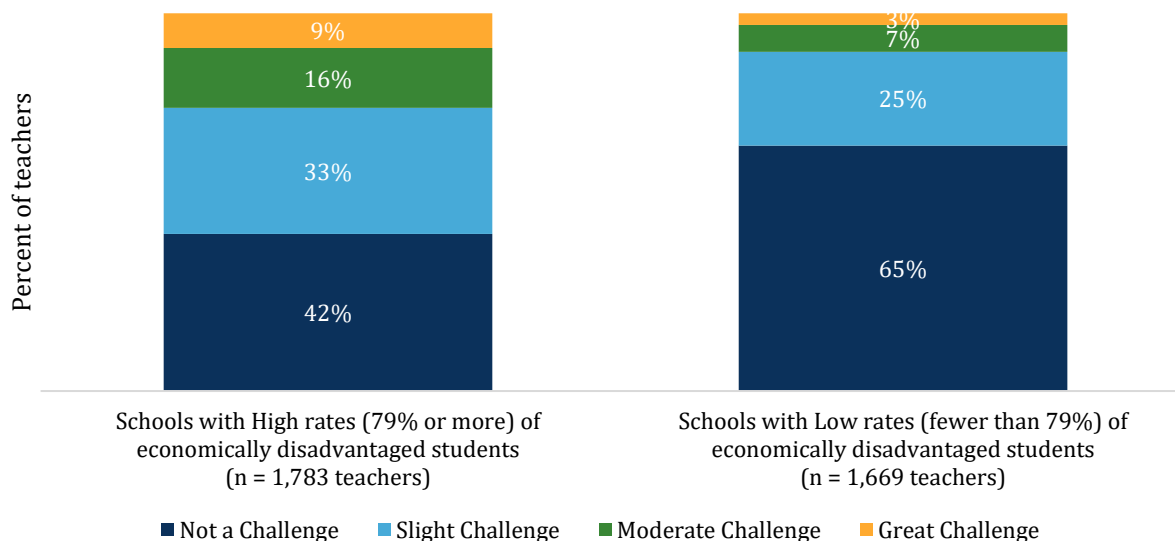


Source: SDP Food Services administrative data (2018-19); SDP District-Wide Survey (2018-19)

Teachers at schools with higher rates of economic disadvantage were more likely to report that student hunger is a challenge.

There were differences in teacher responses between teachers working at schools with high and low percentages of students who are identified as economically disadvantaged (Figure 6). Forty-two percent (42%) of teachers at schools with higher percentages of economically disadvantaged students reported student hunger was not a challenge, compared to 33% of teachers reporting student hunger was a slight challenge, 16% of teachers reporting student hunger was a moderate challenge, and 9% of teachers reporting student hunger was a great challenge. Sixty-five percent (65%) of teachers at schools with lower percentages of economically disadvantaged students reported student hunger was not a challenge, compared to 25% of teachers reporting student hunger was a slight challenge, 7% of teachers reporting student hunger was a moderate challenge, and 3% of teachers reporting student hunger was a great challenge. A detailed breakdown of the number of responses and schools is included in the Appendix (Tables A3-A4).

Figure 6. Teacher responses about whether “Students report being hungry is a challenge” by whether schools have a high or low percentage of economically disadvantaged students

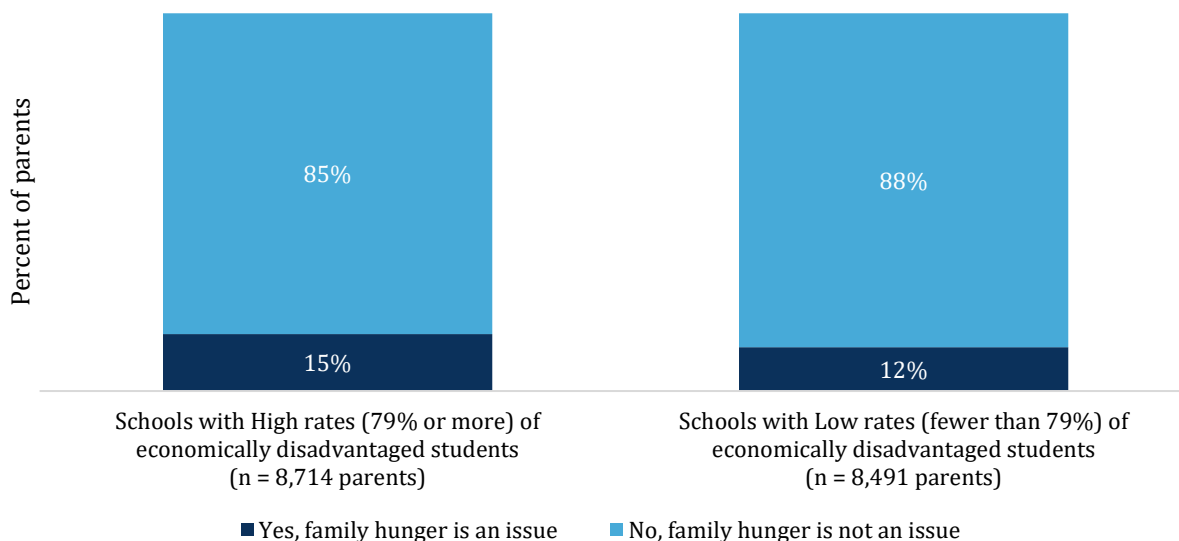


Source: SDP Food Services administrative data (2018-19); SDP District-Wide Survey (2018-19)

Parents/guardians of students attending schools with higher rates of economic disadvantage were slightly more likely to report being worried about having enough food.

There was a difference in survey responses for parents/guardians of students attending schools with high and low percentages of students who are identified as economically disadvantaged (Figure 7). Fifteen percent (15%) of parents/guardians of students attending schools with higher percentages of economically disadvantaged students reported family hunger was an issue in the last 30 days, compared to 12% of parents/guardians of students attending schools with lower percentages of economically disadvantaged students. Eighty-five (85%) of parents/guardians of students attending schools with higher percentages of economically disadvantaged students reported family hunger was not an issue, compared to 88% of parents/guardians of students attending schools with lower percentages of economically disadvantaged students. A detailed breakdown of the number of responses and schools is included in the Appendix (Tables A5-A6).

Figure 7. Parent/guardian responses to the question, “In the past 30 days, have you worried about having enough food for you and your family?” by breakfast program type and whether schools have a high or low percentage of economically disadvantaged students



Source: SDP Food Services administrative data (2018-19); SDP District-Wide Survey (2018-19)

How do student, teacher, and parent/guardian responses to the District-Wide Survey questions differ by breakfast program and whether they are associated with a school with high or low levels of economically disadvantaged students?

The largest differences between student responses from schools with higher and lower rates of economic disadvantage was found for *Before the Bell* programs.

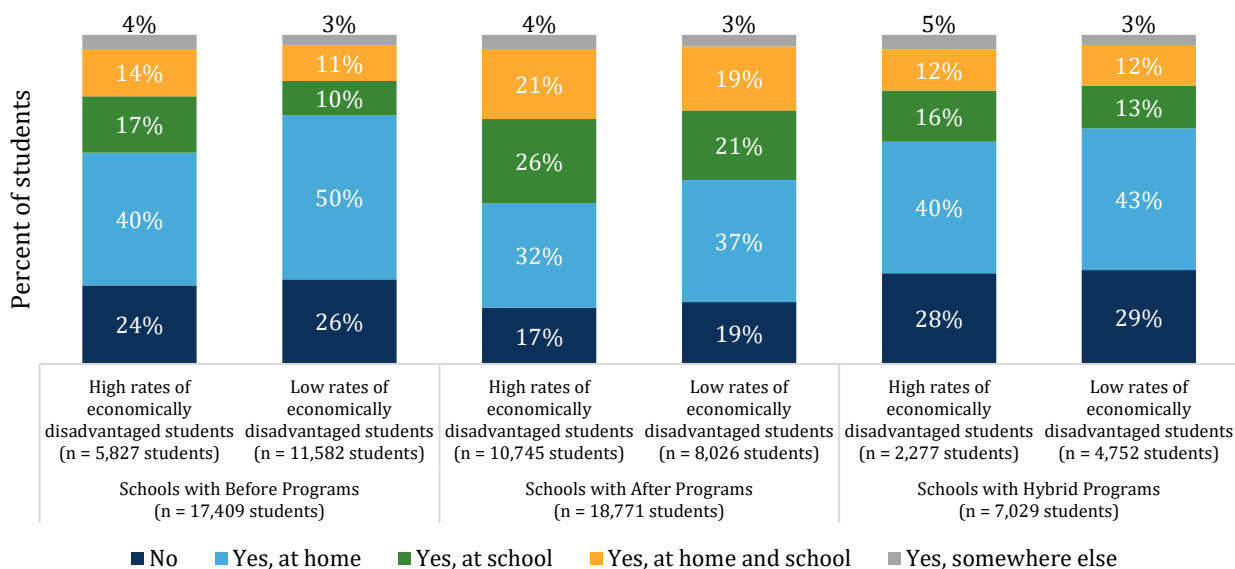
For students attending *Before the Bell* schools, there was a difference in responses depending on if the school had a high or low percentage of economically disadvantage students (Figure 8). Twenty-four percent (24%) of students attending schools with high percentages of economically disadvantaged students did not eat breakfast at all, compared to 26% attending schools with low percentages of economically disadvantaged students. Forty percent (40%) of students attending schools with high percentages of economically disadvantaged students at breakfast ate home, compared to 50% attending schools with low percentages of economically disadvantaged students. Seventeen percent (17%) of students attending schools with high percentages of economically disadvantaged students ate breakfast at school, compared to 10% attending schools with low percentages of economically disadvantaged students. Fourteen percent (14%) of students attending schools with high percentages of economically disadvantaged students ate breakfast at home and at school, compared to 11% attending schools with low percentages of economically disadvantaged students. Four (4%) of students attending schools with high percentages of economically disadvantaged students ate breakfast somewhere other than home and school, compared to 3% attending schools with low percentages of economically disadvantaged students.

For students attending *After the Bell* schools, there was a relatively small difference in responses depending on if the school had a high or low percentage of economically disadvantaged students (Figure 8). Seventeen percent (17%) of students attending schools with high percentages of economically disadvantaged students did not eat breakfast at all, compared to 19% attending schools with low percentages of economically disadvantaged students. Thirty-two percent (32%) of students attending schools with high percentages of economically disadvantaged students ate breakfast at home, compared to 37% attending schools with low percentages of economically disadvantaged students. Twenty-six percent (26%) of students attending schools with high percentages of economically disadvantaged students ate breakfast at school, compared to 21% attending schools with low percentages of economically disadvantaged students. Twenty-one percent (21%) of students attending schools with high percentages of economically disadvantaged students ate breakfast at home and at school, compared to 19% attending schools with low percentages of economically disadvantaged students. Four percent (4%) of students attending schools with high percentages of economically disadvantaged students ate breakfast somewhere other than home and school, compared to 3% attending schools with low percentages of economically disadvantaged students.

For students attending *Hybrid* schools, there was a relatively small difference in responses depending on if the school had a high or low percentage of economically disadvantaged students (Figure 8). Twenty-eight percent (28%) of students attending schools with high percentages of economically disadvantaged students did not eat breakfast at all, compared to 29% attending schools with low percentages of economically disadvantaged students. Forty percent (40%) of students attending schools with high percentages of economically disadvantaged students ate breakfast at home, compared to 43% attending schools with low percentages of economically disadvantaged students. Sixteen percent (16%) of students attending schools with high percentages of economically disadvantaged students ate breakfast at school, compared to 13% attending schools with low percentages of economically disadvantaged students. Twelve percent (12%) of students attending both schools. Five (5%) of students attending schools with high percentages of economically disadvantaged students ate breakfast somewhere other than home and school, compared to 3% attending schools with low percentages of economically disadvantaged students.

A summary of the number of responses and schools is included in the Appendix (Tables A1-A2).

Figure 8. Student responses to the question, “On a regular school day, do you eat breakfast?” by breakfast program type and whether schools have a high or low percentage of economically disadvantaged students



Source: SDP Food Services administrative data (2018-19); SDP District-Wide Survey (2018-19)

How to read this figure: This figure presents the percentage of students attending schools with higher or lower rates of economically disadvantaged students grouped by whether schools had Before, After, or Hybrid breakfast programs. For example, 40% of students attending schools with Before the bell breakfast programs attended schools with High rates of economically disadvantaged students ate breakfast at home on a regular school day. Whereas, 17% of students attending schools with Before the bell breakfast programs attended schools with High rates of economically disadvantaged students ate breakfast at school on a regular school day.

Teacher responses differed between schools with higher and lower rates of economic disadvantage, but those differences were similar across breakfast program types.

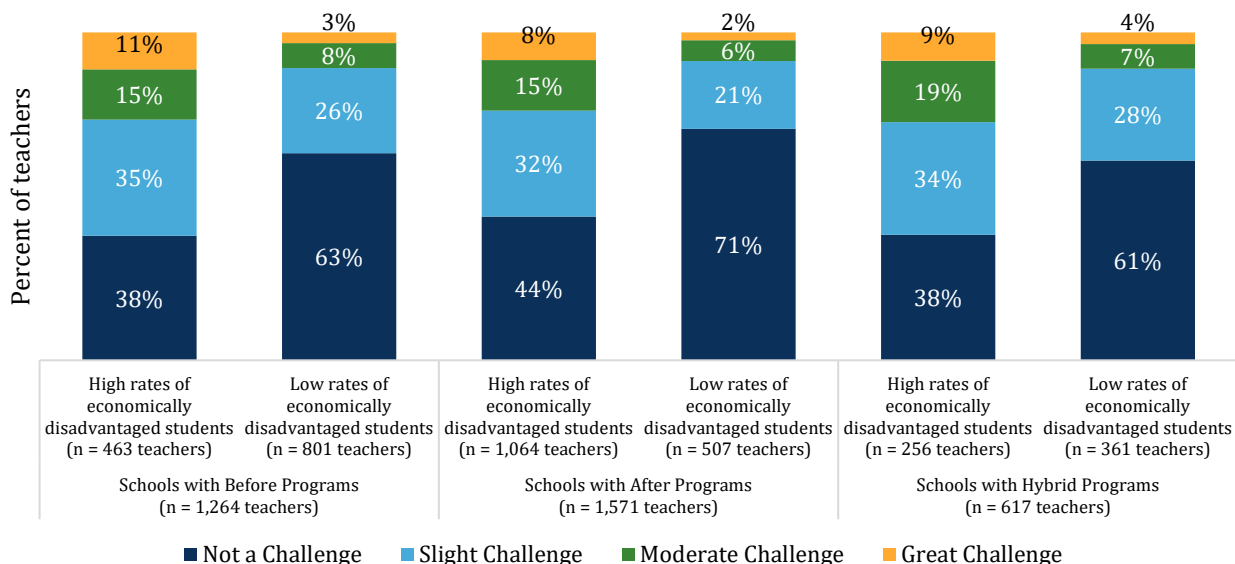
There were some differences in teacher responses for teachers at *Before the Bell* schools between schools with high and low percentages of students who are identified as economically disadvantaged (Figure 9). Thirty-eight percent (38%) of teachers at schools with higher percentages of economically disadvantaged students reported student hunger was not a challenge, compared to 35% of teachers reporting student hunger was a slight challenge, 15% of teachers reporting student hunger was a moderate challenge, and 11% of teachers reporting student hunger was a great challenge. Sixty-three percent (63%) of teachers at schools with lower percentages of economically disadvantaged students reported student hunger was not a challenge, compared to 26% of teachers reporting student hunger was a slight challenge, 8% of teachers reporting student hunger was a moderate challenge, and 3% of teachers reporting student hunger was a great challenge.

There were some differences for teachers at *After the Bell* schools between schools with high and low percentages of students who are identified as economically disadvantaged (Figure 9). Forty-four percent (44%) of teachers at schools with higher percentages of economically disadvantaged students reported student hunger was not a challenge, compared to 32% of teachers reporting student hunger was a slight challenge, 15% of teachers reporting student hunger was a moderate challenge, and 8% of teachers reporting student hunger was a great challenge. Seventy-one percent (71%) of teachers at schools with lower percentages of economically disadvantaged students reported student hunger was not a challenge, compared to 21% of teachers reporting student hunger was a slight challenge, 6% of teachers reporting student hunger was a moderate challenge, and 2% of teachers reporting student hunger was a great challenge.

There were some differences for teachers at *Hybrid* schools between schools with high and low percentages of students who are identified as economically disadvantaged (Figure 9). Thirty-eight percent (38%) of teachers at schools with higher percentages of economically disadvantaged students reported student hunger was not a challenge, compared to 34% of teachers reporting student hunger was a slight challenge, 19% of teachers reporting student hunger was a moderate challenge, and 9% of teachers reporting student hunger was a great challenge. Sixty-one percent (61%) of teachers at schools with lower percentages of economically disadvantaged students reported student hunger was not a challenge, compared to 28% of teachers reporting student hunger was a slight challenge, 7% of teachers reporting student hunger was a moderate challenge, and 4% of teachers reporting student hunger was a great challenge.

A summary of the number of responses and schools is included in the Appendix (Tables A3-A4).

Figure 9. Teacher responses about whether “Students report being hungry is a challenge” by breakfast program type and whether schools have a high or low percentage of economically disadvantaged students



Source: SDP Food Services administrative data (2018-19); SDP District-Wide Survey (2018-19)

The largest differences between parent/guardian responses from schools with higher and lower rates of economic disadvantage was found for *Before the Bell* programs, but differences were relatively small across each breakfast program type.

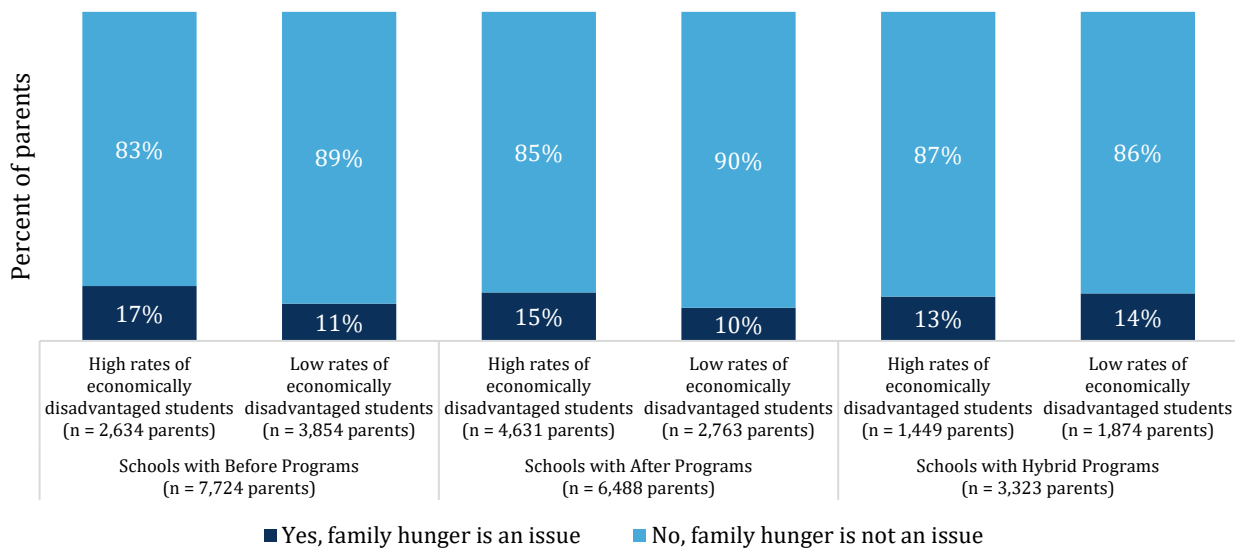
There were some differences in parent/guardian responses for parents/guardians of students attending *Before the Bell* schools between schools with high and low percentages of students who are identified as economically disadvantaged (Figure 10). Seventeen percent (17%) of parents/guardians of students attending schools with higher percentages of economically disadvantaged students reported family hunger was an issue in the last 30 days, compared to 11% of parents/guardians of students attending schools with lower percentages of economically disadvantaged students. Eighty-three (83%) of parents/guardians of students attending schools with higher percentages of economically disadvantaged students reported family hunger was not an issue, compared to 89% of parents/guardians of students attending schools with lower percentages of economically disadvantaged students.

There were some differences for parents/guardians of students attending *After the Bell* schools between schools with high and low percentages of students who are identified as economically disadvantaged (Figure 10). Fifteen percent (15%) of parents/guardians of students attending schools with higher percentages of economically disadvantaged students reported family hunger was an issue in the last 30 days, compared to 10% of parents/guardians of students attending schools with lower percentages of economically disadvantaged students. Eighty-five (85%) of parents/guardians of students attending schools with higher percentages of economically disadvantaged students reported family hunger was not an issue, compared to 90% of parents/guardians of students attending schools with lower percentages of economically disadvantaged students.

There were some differences for parents/guardians of students attending *Hybrid* schools between schools with high and low percentages of students who are identified as economically disadvantaged (Figure 10). Thirteen percent (13%) of parents/guardians of students attending schools with higher percentages of economically disadvantaged students reported family hunger was an issue in the last 30 days, compared to 14% of parents/guardians of students attending schools with lower percentages of economically disadvantaged students. Eighty-five (87%) of parents/guardians of students attending schools with higher percentages of economically disadvantaged students reported family hunger was not an issue, compared to 86% of parents/guardians of students attending schools with lower percentages of economically disadvantaged students.

A summary of the number of responses and schools is included in the Appendix (Tables A5-A6).

Figure 10. Parent/guardian responses to the question, “In the past 30 days, have you worried about having enough food for you and your family?” by breakfast program type and whether schools have a high or low percentage of economically disadvantaged students



Source: SDP Food Services administrative data (2018-19); SDP District-Wide Survey (2018-19)

Considerations for Future Research

Although this analysis provides general evidence of patterns that align greater issues with hunger with schools that have higher percentages of economically disadvantaged students, this memo does not strongly identify any benefits to any one of the three different types of breakfast programs. More research is needed to understand how the different breakfast program types can better serve schools with greater hunger needs.

A key limitation to the current brief is that a substantial percentage of students are not eating breakfast at school, but do have access to breakfast at school. Future research should collect insight into why students choose not to consume breakfast when it is readily available. For instance, is this an issue with the taste/quality of the food provided? Is this an issue with peer pressure when consuming food may inadvertently identify students as not having access to food at home? Are students not hungry during the hours that breakfast is provided? What changes could be implemented so that students choose to eat the breakfast provided?

A second limitation is that this analysis relies on survey responses to parent/guardian questions about food insecurity. The response rate for the parent/guardian District-Wide Survey was 23% and may be biased towards households with more resources. As a result, the level of worry about food may be higher than reported.

A third limitation is that this report does not examine high school level data, in part because few high schools have adopted alternative breakfast after the bell programs. Future research could

examine the extent to which high school students' needs are met by existing programs and if factors differ from K-8 schools when determining what types of programs are most appropriate for high schools.

Another area of focus for future research is the ways in which principals make decisions about breakfast programs. For instance, to what extent do principals use data to drive decision making? Do principals responsible for higher percentages of economically disadvantaged students deliberately choose a program that would serve the largest number of students? To what extent do principals consider school climate when deciding on a breakfast program, and how do climate factors influence their choice?

Summary of Findings: Student Hunger & School Breakfast, 2018-19

How do student responses to the District-Wide Survey (DWS) questions about eating breakfast relate to school breakfast programs?

Schools with *After the Bell* programs had the highest percentage of students eating breakfast at school (21%-26%) and eating breakfast at home and at school (about 20%); nearly double the percentages of students eating breakfast at school and at home and school compared to schools with *Before the Bell* and *Hybrid* programs. In contrast, schools with *After the Bell* programs had about 10 percentage points fewer students eating breakfast at home compared to *Before the Bell* and *Hybrid* programs, and 10 percentage points fewer students who reported not eating breakfast at all compared to *Before the Bell* and *Hybrid* programs.

How do teacher responses to the DWS questions relate to school breakfast programs?

Roughly 80% of teachers reported that hunger was not a challenge or was a slight challenge, whereas about 20% reported that hunger was a moderate or great challenge. Teacher responses did not differ much by the type of breakfast program at their school.

How do parent/guardian responses to the DWS questions relate to school breakfast programs?

About 15% of parents/guardians who responded to the survey reported that they worried about having enough food for their family in the last 30 days, while about 85% reported that hunger was not an issue. Parent/guardian responses did not differ much by the type of breakfast program at their child's school. These data points may underestimate the number of families where food insecurity is a concern.¹³

How do student, teacher, and parent/guardian responses relate to each other?

Overall, the more students reported not eating breakfast at all, the more teachers indicated student hunger was a problem. Similarly, the more teachers indicated student hunger was a problem, the more parents/guardians reported hunger in the home was a problem. The same pattern was found for schools with *Before the Bell* programs. However, for both *After the Bell* and *Hybrid* programs, only teacher and parent/guardian responses related to each other.

How do student, teacher, and parent/guardian responses to the District-Wide Survey questions differ by whether they are associated with a school with high or low levels of economically disadvantaged students?

Overall, higher percentages of students attending schools with higher rates of economically disadvantaged students were eating breakfast at school, and at home and at school, and smaller percentages were eating breakfast at home compared to schools with lower rates of economically disadvantaged students. Teacher responses followed a similar pattern: nearly 30 percentage points more teachers working at schools with higher rates of economically disadvantaged students reported student hunger to be a challenge than teachers working at schools with lower rates of economically disadvantaged students.

¹³ The DWS response rate for parents/guardians was 23% and may be biased towards households with more resources. More information about DWS response rates is available on the ORE website: <https://dashboards.philasd.org/extensions/district-wide-surveys/index.html#/response-rate>

How do student, teacher, and parent/guardian responses to the District-Wide Survey questions differ by breakfast program type and whether they are associated with a school with higher or lower levels of economically disadvantaged students?

For students, the largest difference in survey response between *High* and *Low* schools was found in schools with *Before the Bell* programs. At *Before the Bell* schools with lower rates of economic disadvantage, students were more likely to report that they ate breakfast at home and less likely to report that they ate breakfast at school compared to *Before the Bell* schools with higher rates of economic disadvantage. Teacher responses differed between *High* and *Low* schools for all breakfast program types. Teachers were consistently more likely to say that student hunger was not a challenge at schools with lower rates of economic disadvantage. Parent/guardian responses did not differ much between *High* and *Low* schools.

Key Takeaways

The results generally show that breakfast after the bell programs are associated with greater student participation and fewer students skipping breakfast. Additionally, the level of economic disadvantage was related to the extent of hunger as a challenge in the classroom. The following statements summarize the most important findings across all the research questions:

- Students were more likely to participate in school breakfast programs if their school had a breakfast after the bell program.
- Students were more likely to report eating breakfast twice (at home and at school) if their school had a breakfast after the bell program.
- Students were less likely to skip breakfast if their school had a breakfast after the bell program.
- Teachers were more likely to report that hunger was a challenge at schools with higher rates of economic disadvantage.
- Teachers were more likely to report that hunger was a challenge at schools where more students reported not eating breakfast at all.
- Students were more likely to participate in school breakfast programs at schools with higher rates of economic disadvantage.

For more information about student hunger and school breakfast programs, see the Office of Research and Evaluation website: <https://www.philasd.org/research/category/health-nutrition/>

Appendix

Table A1. Number of student responses broken down by breakfast program, economically disadvantaged rate, and type of response

Economically Disadvantaged	Breakfast Program	No	Yes, at home	Yes, at school	Yes, at home and school	Yes, somewhere else
High	After the Bell	1833	3418	2747	2284	463
	Before the Bell	1393	2347	1001	837	249
	Hybrid	627	911	354	282	103
	Total High	3853	6676	4102	3403	815
Low	After the Bell	1511	2975	1700	1561	279
	Before the Bell	2978	5776	1202	1266	360
	Hybrid	1356	2048	612	578	158
	Total Low	5845	10799	3514	3405	797
Total		9698	17475	7616	6808	1612

Table A2. Number of schools with available student response data broken down by breakfast program and economically disadvantaged rate

Economically Disadvantaged	Breakfast Program	Number of Schools
High	After the Bell	43
	Before the Bell	27
	Hybrid	11
	Total High	81
Low	After the Bell	24
	Before the Bell	41
	Hybrid	14
	Total Low	79
Total		160

Table A3. Number of teacher responses broken down by breakfast program, economically disadvantaged rate, and type of response

Economically Disadvantaged	Breakfast Program	Not a Challenge	Slight Challenge	Moderate Challenge	Great Challenge
High	After the Bell	467	343	164	90
	Before the Bell	176	164	71	52
	Hybrid	98	88	48	22
	Total High	741	595	283	164
Low	After the Bell	358	105	32	12
	Before the Bell	506	208	61	26
	Hybrid	220	101	27	13
	Total Low	1084	414	120	51
Total		1825	1009	403	215

Table A4. Number of schools with available teacher response data broken down by breakfast program and economically disadvantaged rate

Economically Disadvantaged	Breakfast Program	Number of Schools
High	After the Bell	39
	Before the Bell	22
	Hybrid	11
	Total High	72
Low	After the Bell	22
	Before the Bell	34
	Hybrid	13
	Total Low	69
Total		141

Table A5. Number of parent/guardian responses broken down by breakfast program, economically disadvantaged rate, and type of response

Economically Disadvantaged	Breakfast Program	Yes	No
High	After the Bell	683	3948
	Before the Bell	439	2195
	Hybrid	195	1254
	Total High	1317	7397
Low	After the Bell	277	2486
	Before the Bell	437	3417
	Hybrid	270	1604
	Total Low	984	7507
Total		2301	14904

Table A6. Number of schools with available parent/guardian response data broken down by breakfast program and economically disadvantaged rate

Economically Disadvantaged	Breakfast Program	Number of Schools
High	After the Bell	33
	Before the Bell	22
	Hybrid	10
	Total High	65
Low	After the Bell	14
	Before the Bell	30
	Hybrid	11
	Total Low	55
Total		120