

Optimizing School-Based Survey Participation: An Analysis of Participation Rates from the 2009-10 Oral Health and BMI Survey of Ohio Third Graders

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Background

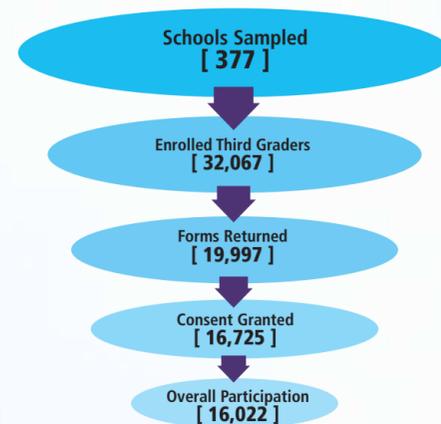
During the 2009-10 school year, the Bureau of Community Health Services, Ohio Department of Health (ODH) conducted an oral health and body mass index (BMI) screening survey among 3rd grade children. This marked the fifth school-based survey regarding the oral health of Ohio children since 1987. At 50%, the overall participation rate of the 2009-10 oral health and BMI survey was at the lowest level ever experienced by ODH.

Previous research has shown:

- Response rates to social and behavioral surveys have been declining in recent decades which may have increased the potential for bias of survey estimates due to the increase in likelihood that respondents and nonrespondents are different in some substantial way.^{1,2,3,4}
- Children whose parents return active consent are more likely to be White and have higher school performance, leaving minority and underachieving students to be under-represented in the sample.^{5,6,7,8,9}
- Community-level indicators of concentrated affluence, concentrated disadvantage, residential stability and urbanicity have been shown to be associated with the likelihood of individual survey response and refusal.¹⁰
- Determining school-level and community-level factors associated with survey response is important because while little information may be known about individual children whose parents are nonrespondents, a great deal is known about each school system and the surrounding community through additional data sources.

Research Question

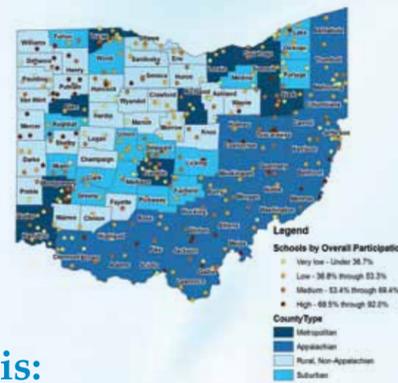
This study aimed to identify the factors associated with participation rates in a school-based oral health and BMI (open mouth, height and weight screening, and questionnaire) survey.



Sample:

- Stratified, random sample of 377 public schools
- Third grade children with parent or guardian consent were screened
- 16,022 third graders participated in screening (50.0% response)

FIGURE 1: Schools participating in the 2009-10 Oral Health and BMI Survey of Ohio Third Grade Schoolchildren



Analysis:

- Data were weighted and adjusted for non-response and against income and race data to reflect the underlying population
- Predictors of school form return, participation, and refusal rates were assessed by generalized linear modeling (GLM).

Results:

TABLE 1: Overall Sample Characteristics (N=377)

	Number of Schools	Average/Percentage
Form Return Rate		64.00%
Overall Participation Rate		51.40%
Refusal Rate		11.10%
Appalachian	101	26.79%
Rural	111	29.44%
Suburban	94	24.93%
Metropolitan	71	18.83%
Low Income	117	31.03%
Student Mobility Rate		9.91%
Enrollment		85
In-Person Facilitation	149	39.52%
Fall	78	20.69%
Winter	126	33.42%
Spring	173	45.89%
Internal Screener	317	84.08%
Contact to Screening Duration	142	
Rescheduled	36	9.55%

TABLE 2: Generalized Linear Model of School Survey Form Return Rates, 2009-10 Oral Health and BMI Survey (N=377)

		Coefficient	SE	p-value
School Characteristics	Appalachian	3.99	3.223	0.216
	Rural	-1.76	3.137	0.574
	Suburban	-1.49	3.087	0.629
	Metropolitan (Reference)			
	Low Income	-2.38	2.546	0.350
	Student Mobility Rate*	-0.95	0.212	0.000
Survey Characteristics	Enrollment*	-0.06	0.019	0.001
	In-Person Facilitation	2.09	2.092	0.318
	Fall*	-8.90	2.611	0.001
	Winter (Reference)			
	Spring*	-6.77	2.792	0.016
	Internal Screener*	9.46	3.148	0.003
	Contact to Screening Duration	-0.01	0.019	0.610
	Rescheduled	-1.53	3.736	0.683
	Intercept	76.41	5.039	0.000

*Significant at p<.05 level
R² = .192614

The following were significantly associated with lower form return rates and lower overall participation

- Higher student mobility
- Higher enrollment
- Being administered in the fall or spring quarters (versus winter quarter)
- Being conducted by external volunteers (versus internal (ODH) staff members)

TABLE 3: Generalized Linear Model of School Survey Participation Rates, 2009-10 Oral Health and BMI Survey (N=377)

		Coefficient	SE	p-value
School Characteristics	Appalachian	1.65	2.819	0.559
	Rural	-2.04	2.744	0.458
	Suburban	-1.75	2.700	0.516
	Metropolitan (Reference)			
	Low Income	0.65	2.227	0.769
	Student Mobility Rate*	-0.74	0.185	0.000
Survey Characteristics	Enrollment*	-0.05	0.017	0.005
	In-Person Facilitation	-0.18	1.821	0.922
	Fall*	-6.06	2.284	0.008
	Winter (Reference)			
	Spring*	-7.65	2.442	0.002
	Internal Screener*	9.28	2.753	0.001
	Contact to Screening Duration	0.00	0.017	0.807
	Rescheduled	-2.14	3.267	0.512
	Intercept	59.96	4.408	0.000

*Significant at p<.05 level
R² = .154437

TABLE 4: Generalized Linear Model of School Survey Refusal Rates, 2009-10 Oral Health and BMI Survey (N=377).

		Coefficient	SE	p-value
School Characteristics	Appalachian	1.16	1.248	0.354
	Rural	0.29	1.215	0.809
	Suburban	1.20	1.195	0.317
	Metropolitan (Reference)			
	Low Income*	-2.82	0.986	0.005
	Student Mobility Rate*	-0.25	0.082	0.002
Survey Characteristics	Enrollment	-0.01	0.007	0.132
	In-Person Facilitation*	2.18	0.810	0.007
	Fall*	-2.71	1.011	0.008
	Winter (Reference)			
	Spring	1.52	1.081	0.159
	Internal Screener	0.98	1.219	0.423
	Contact to Screening Duration	0.00	0.007	0.554
	Rescheduled	0.99	1.446	0.495
	Intercept	14.03	1.951	0.000

*Significant at p<.05 level
R² = .149673

The following were significantly associated with lower refusal rates

- Higher student mobility
- Higher percentage of low-income students (as enrolled in the free/reduced price meal program)
- Being administered in the fall or spring quarters (versus winter quarter)

Conclusions

- Form return has a greater influence on participation rates than survey refusal. Schools with greater student mobility and larger size were associated with lower form return and participation, so efforts to increase participation should focus more on schools with higher student mobility and larger size.
- Participation could be improved by using internal staff and surveying during winter. Schools with higher mobility and lower income students had significantly lower refusal rates, so efforts to improve participation in these schools should focus more heavily on form return.

Limitations

- Lack of information for students without returned consent forms
- Lack of information on school-level methods for encouraging form return.

Public Health Implications

- This analysis can guide efforts to more effectively increase participation in school-based health surveys that have active consent.
- Increasing participation can ultimately lead to greater quality of epidemiological data for public health programs.

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Appendix 1: Term Definitions

- Form Return Rate:** the number of forms returned divided by total third grade enrollment
- Participation Rate:** the number of students screened for either dental or BMI divided by total third grade enrollment
- Refusal Rate:** the number of students whose parents/guardians refused consent divided by third grade enrollment
- Appalachian:** the school is located in a county federally designated as Appalachian
- Rural:** the school is located in a county designated as rural and is not Appalachian
- Suburban:** the school is located in a county that borders a metropolitan county
- Metropolitan:** the school is located in a metropolitan county
- Low Income:** the school has more than 50% of students enrolled in the free/reduced price meal program
- Student Mobility Rate:** the percentage of students at the school who did not complete a full academic year
- Enrollment:** the total third grade enrollment of the school at the time of the screening
- In-Person Facilitation:** the survey was facilitated by an on-site visit rather than via phone and/or email
- Fall:** the school was screened between 9/1/09 and 11/30/09
- Winter:** the school was screened between 12/1/09 and 2/28/10
- Spring:** the school was screened between 3/1/10 and 6/4/10
- Internal Screener:** the school was screened by an ODH staff member rather than a volunteer
- Contact to Screening Duration:** the number of days between initial school contact and the date the screening was conducted
- Rescheduled:** the school screening date was rescheduled due to weather, illness, or other reason