

MLDS CENTER

Maryland Longitudinal
Data System

Better Data • Informed Choices • Improved Results

Prevalence and
upstream predictors of
remedial education in
Maryland community
colleges

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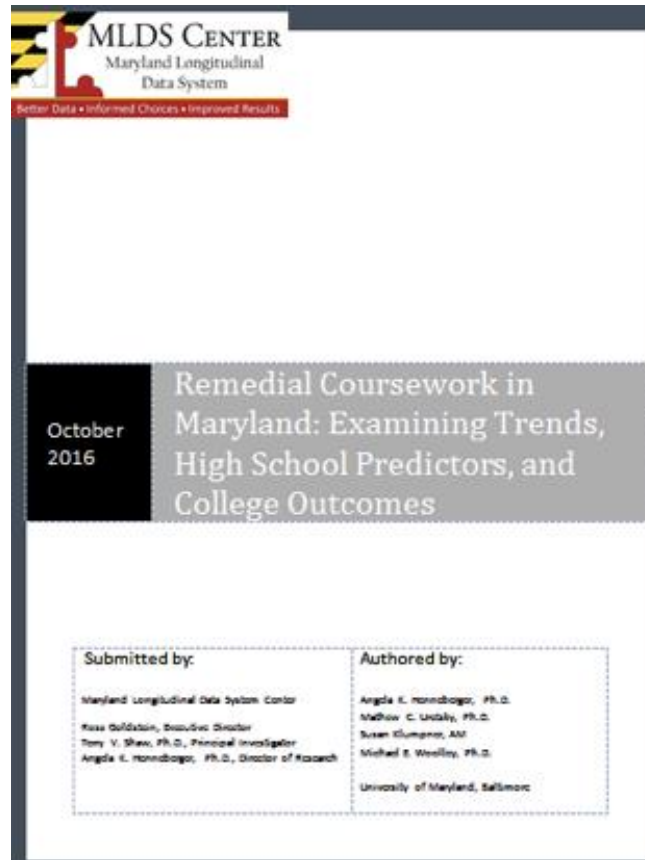
Introduction

- A college-ready student should enter college with the expectation of passing college coursework.
- Underprepared students need to take remedial coursework to prepare for college level
- Nationally, about 30-40% of students entering college need to take remedial coursework (NCES, 2014; Rose, 2012).
- May indicate a mismatch in high school academic preparation and college academic expectations.

Introduction Continued

- Minority students and low SES students are more likely to need remedial coursework (Attewell et al., 2006).
- High school academics also related to need for remedial coursework (Chen, 2016; Radford et al., 2012).
- Needing remedial coursework is associated with negative outcomes (Attewell et al., 2006; Clotfelter et al., 2015).
- Highlights the importance of early identification and intervention.

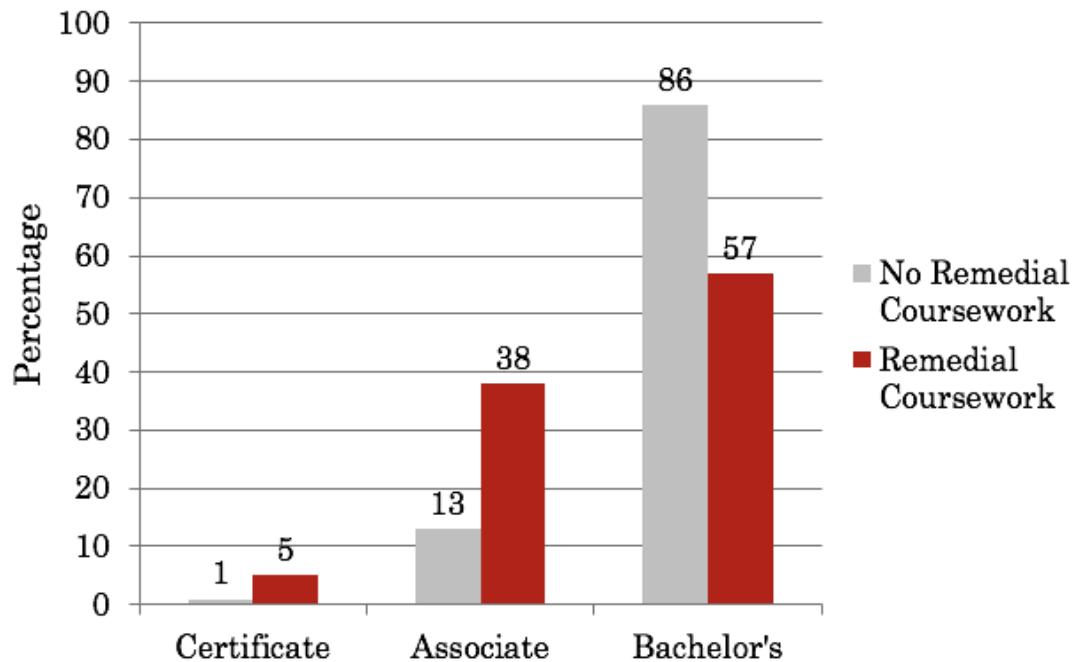
Prior Research from the MLDS Center





The Maryland Context: College Degree Outcomes

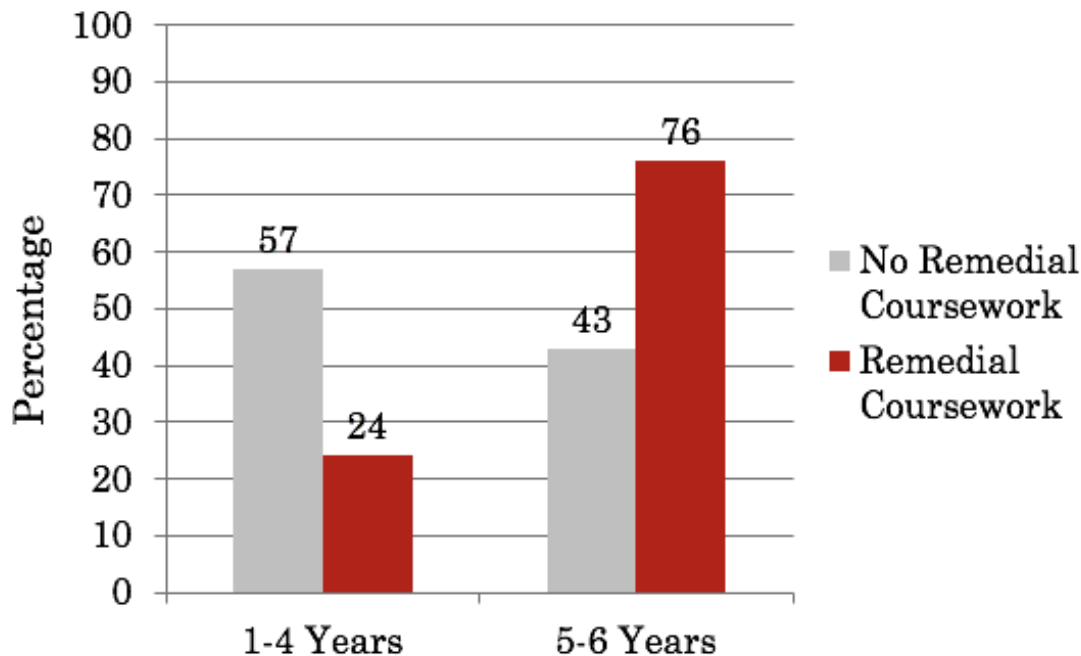
- Students who needed remedial coursework had lower rates of attaining a bachelor's degree and higher rates of attaining an associate degree



Data are from Maryland public high school graduates (2008-2009) who enrolled in a Maryland college (2009-2010)

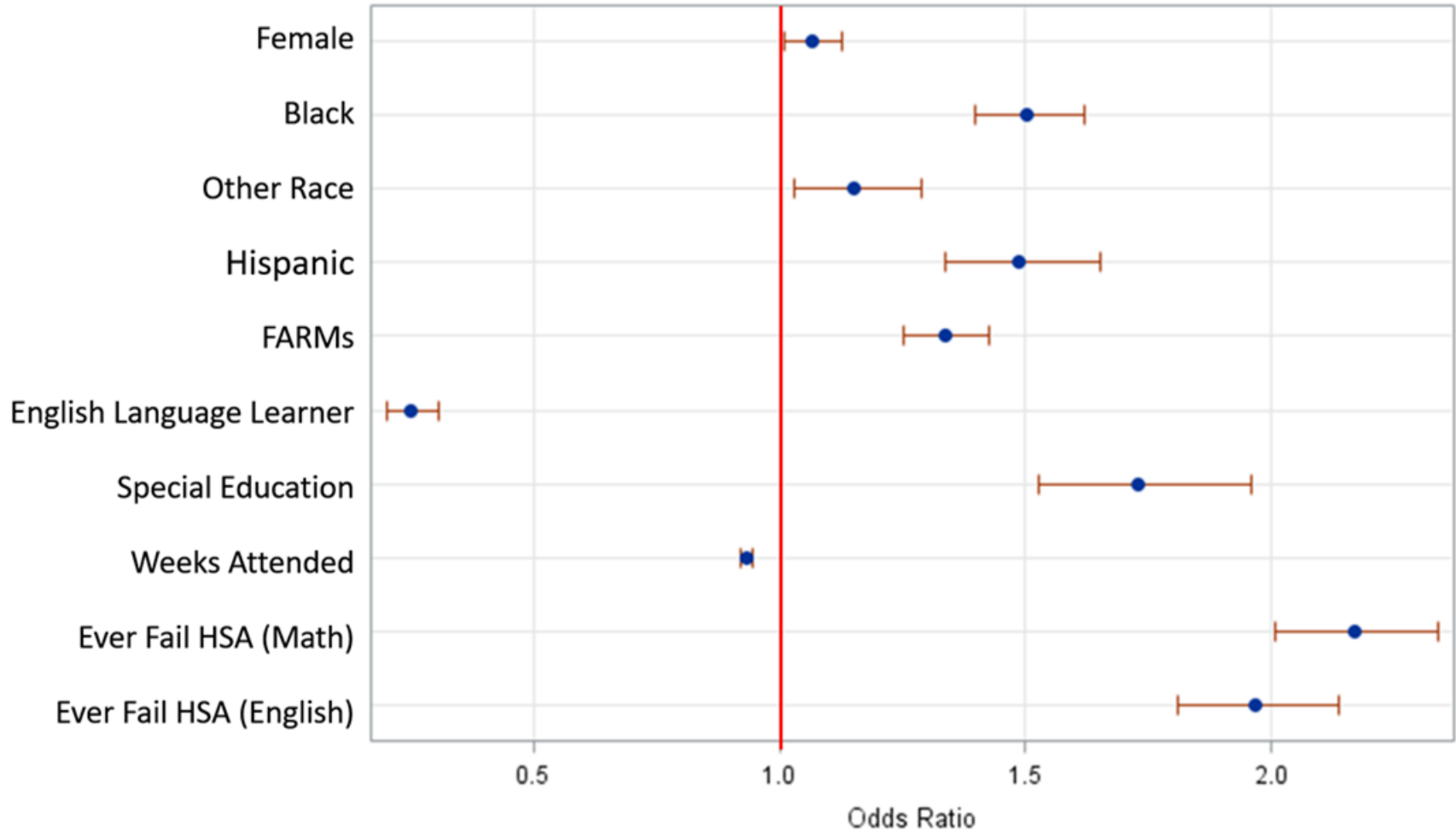
The Maryland Context: Years to Degree

- Students who needed remedial coursework took longer to obtain a degree (5-6 years)



Data are from Maryland public high school graduates (2008-2009) who enrolled in a Maryland college (2009-2010)

The Maryland Context: Predictors of Needing Remedial Coursework



Data are from Maryland public high school graduates (2013-2014) who enrolled in a Maryland college (2014-2015)

The Current Study

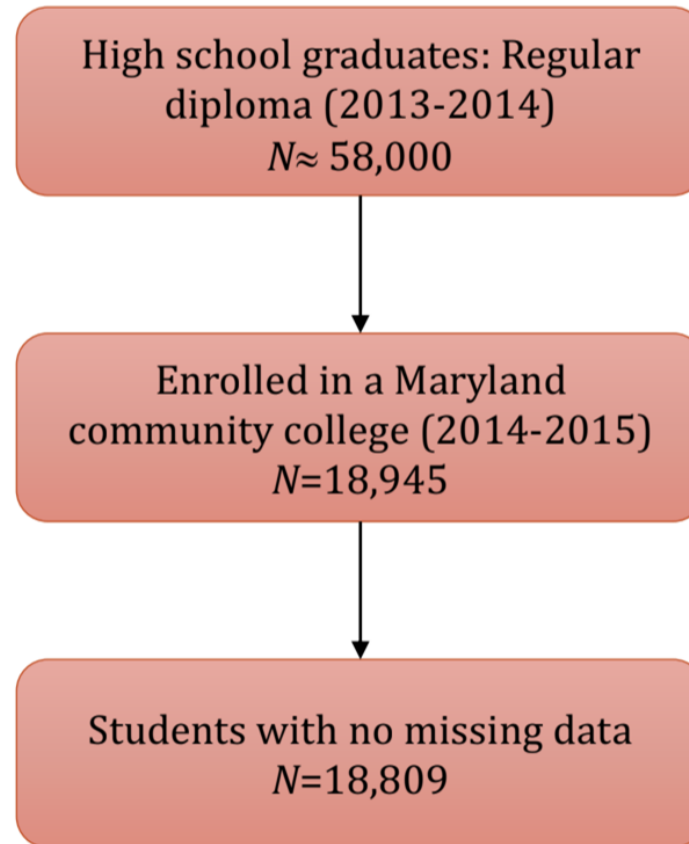
- Focuses on Maryland Community College students
 - Represent the majority of students who need remedial coursework (Chen, 2016; Henneberger et al., 2016)
 - Have a common cut point to determine need (Halbach, 2015)
- Expands upon the prior study to include high school-level predictors of remedial coursework
- Disentangling the role of student- and high school-level factors will help policy makers to determine whether student-oriented or school-oriented prevention may be most useful.

Method: Data

- Linked data sources postsecondary, college enrollment, and assessment data
- 5 years of administrative records from MLDS
 - 18,800 students attending
 - 228 high schools across
 - 24 local school systems in Maryland
- Inclusion criteria
 - Maryland public high school graduate AY 2013-2014
 - Enrolled in Maryland Community College AY 2014-2015

Sample Selection Criteria

Figure 1. Sample Selection



Method: Measures

- Dependent variable - Need for remedial coursework in (1) math & (2) English
- Independent Variables
 - Individual student characteristics.
 - demographic characteristics
 - attendance and academic performance; and
 - placement characteristics
 - High School-Level characteristics
 - % FARMS
 - % English Learner (EL)
 - % fifth year graduate
 - Average weeks attended

Method: Analyses

- Multilevel logit models
 - Two-level model (Student nested within school)
 - Dummy variables for 24 Maryland jurisdictions
- Random effects to model the intercepts
- Fixed effects for the independent variables
- All continuous covariates were grand-mean centered
- log-likelihood difference test



Student-level Sample Characteristics ($N = 18,814$)

	<i>n</i>	%
Female ($N = 18,809$)	9,860	52
White ($n=18,814$)	9,368	50
Hispanic ($n=18,814$)	2,379	13
English Language Learner ($n=18,814$)	1,037	6
FARMS Eligible ($n=18,814$)	7,771	41
Special Education ($n=18,814$)	1,758	9
GPA 3.0 or Above ($n=18,469$)	5,476	30
Foreign Language Indicator* ($n=18,469$)	7,533	41
Math Indicator* ($n=18,469$)	5,275	29
Science Indicator* ($n=18,469$)	3,314	18
Fifth-Year Graduate ($n=18,814$)	347	2
	Mean	SD
Weeks Attended ($n=18,803$)	34	4.658

Note. *Indicates student took two or more classes in the subject with a grade of B or higher.



School-level Sample Characteristics ($n=228$)

	Mean	SD
% FARMS	50	27.538
% English Language Learner	4	5.088
% Fifth-Year Graduate	10	15.358
Mean Weeks Attended	33	24.724

Note. *Indicates student took two or more classes in the subject with a grade or B or higher

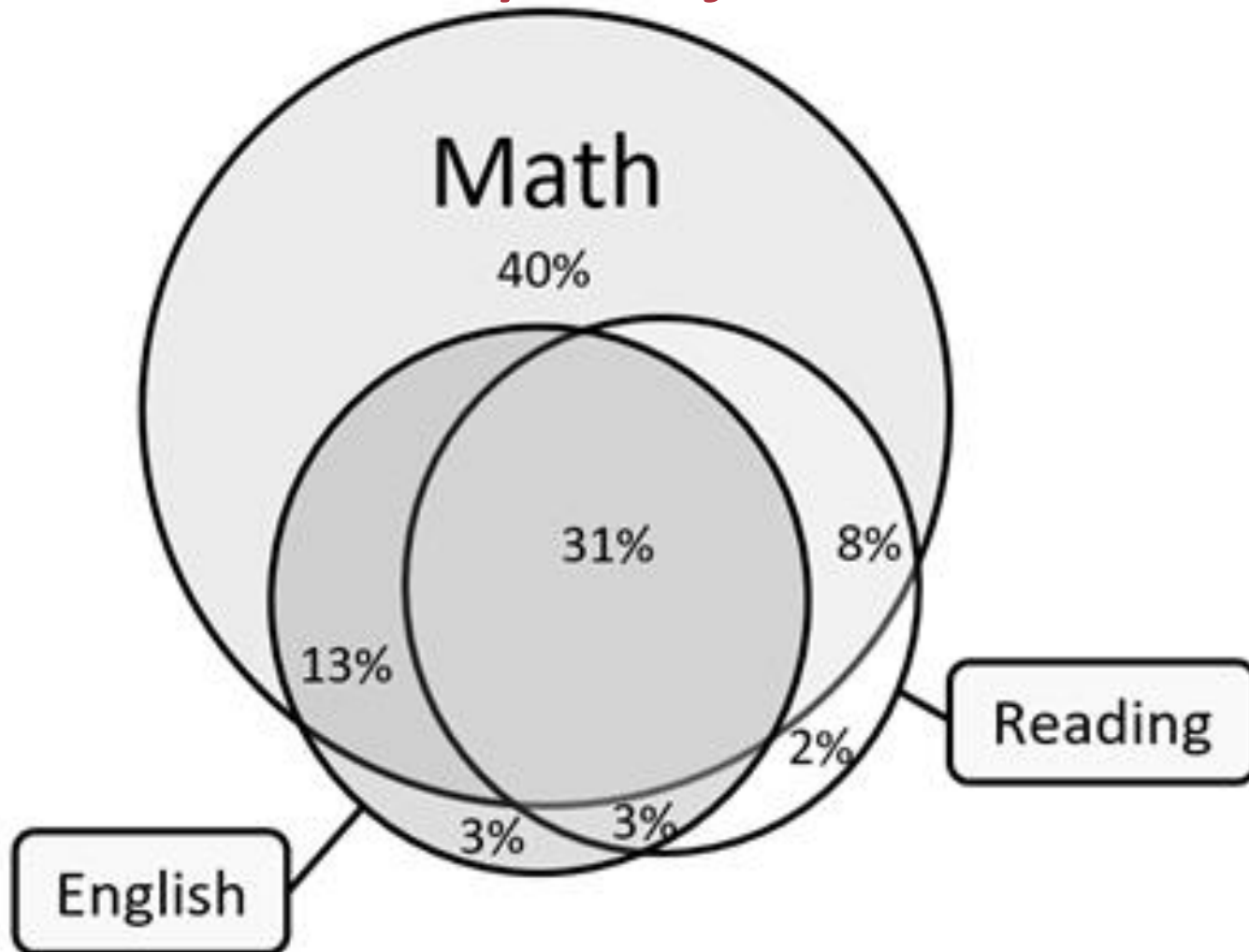


Percentage, Distribution, and Subject level Overlap of Remedial Assessment Outcomes

	Total ($N=18,814$)		Assessed to Need Remedial ($n =10,774$)	
	f	%	f	%
	Any Remedial	10,774	57	-
Math	9,925	52	9,925	92
English	5,315	28	5,315	49
Reading	4,738	25	4,738	44



Rates of Need for Remedial Coursework by Subject Area





Results for the Multilevel Model - Student Characteristics (Math)

	<i>p</i>	<i>OR</i>	
Fixed Effects			
Intercept	.001		
Student Characteristics			
Female	<.0001	1.476	↑
White	.410	.966	
Hispanic	<.0001	1.333	↑
English Language Learner	<.0001	.375	↓
Free & Reduced Meals	.031	1.088	↑
Special Education	<.0001	1.256	↑
GPA 3.0 or Above	<.0001	.609	↓
Foreign Language Indicator*	<.0001	.764	↓
Math Indicator*	<.0001	.420	↓
Science Indicator*	<.0001	.575	↓
Fifth-Year Graduate	.001	.664	↓
Weeks Attended	.834	1.037	



Results for the Multilevel Model - School Characteristics (Math)

	<i>p</i>	<i>OR</i>	
School Characteristics			
% FARMS	<.0001	1.089	↑
% English Language Learner	.242	.932	
% Fifth-Year Graduate	.029	.931	↓
Mean Weeks Attended	.989	1.002	
Covariance Parameters			
Intercept (School)	<.0001		

Results for Multilevel Model English

- Similar patterns to those of Math
- Differences for English:
 - White students were less likely to need remedial coursework in English (OR = 0.81)
 - Fifth year graduate non-significant for English
 - Fifth year graduate (school-level) non-significant for English

Discussion

- High levels of need for remedial coursework in Maryland community colleges
 - Highest rate for math
- Both individual-level and high school-level characteristics predict need for remedial coursework
 - Indicates the potential for multi-layered intervention at both the student and school levels
- Results were consistent for math and English with slight differences

Discussion - Student Level

- Student-level academic performance in high school had a larger influence on the odds that a student would need remedial education than socio-demographic factors.
- EL student placement and fifth-year graduation functioned as protective factors
 - The extra support provided to these students may help to alleviate the need for remedial coursework upon entering a Maryland community college.

Discussion - School level

- FARMs
 - Schools may be under-resourced in terms of preparing students for college-level coursework
- Percentage of fifth-year graduates
 - Additional supports may be provided in these schools
 - Schools with more experience with fifth year graduates may be better at preparing all students for college level math

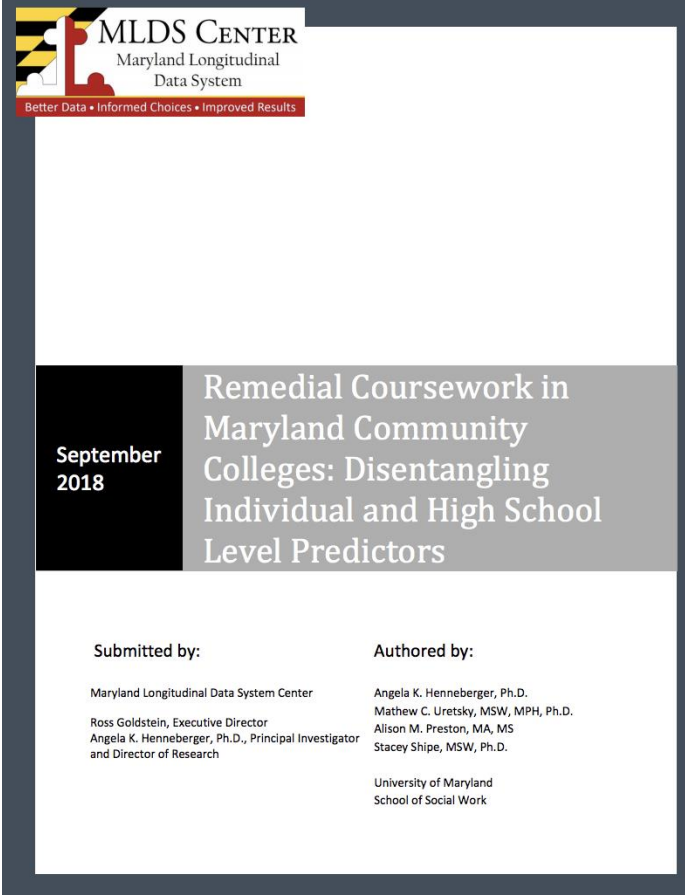
Limitations

- Not able to control for confounders not included in the MLDS, found to be important in other studies
 - Behavioral variables
 - Parental education
 - School climate
 - Teacher professional development on college readiness
- Dichotomous yes/no outcomes

Future Research

- Fifth-year of high school vs. remedial in college
- Early identification - trajectories
- High school course taking patterns
- Subject overlap
- Measurement issues
 - Psychometrics
 - Regression discontinuity

For More Information



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Remedial Coursework in Maryland Community Colleges: Disentangling Individual and High School Level Predictors

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