

Attrition of school principals: A survival analysis using seven years of administrative data from Pennsylvania

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BACKGROUND

- Some researchers have found that principal attrition is associated with a decrease in students' achievement as well as an increase in teacher turnover, with particularly harmful effects in schools with high rates of poverty (Béteille, Kalogrides, & Loeb, 2012; Miller, 2013)
- Understanding factors that are associated with the risk of principal attrition can help inform policies aimed at increasing their retention

RESEARCH QUESTIONS

- What proportion of principals leave their school of hire each year?
- What factors are associated with the risk of principal attrition?

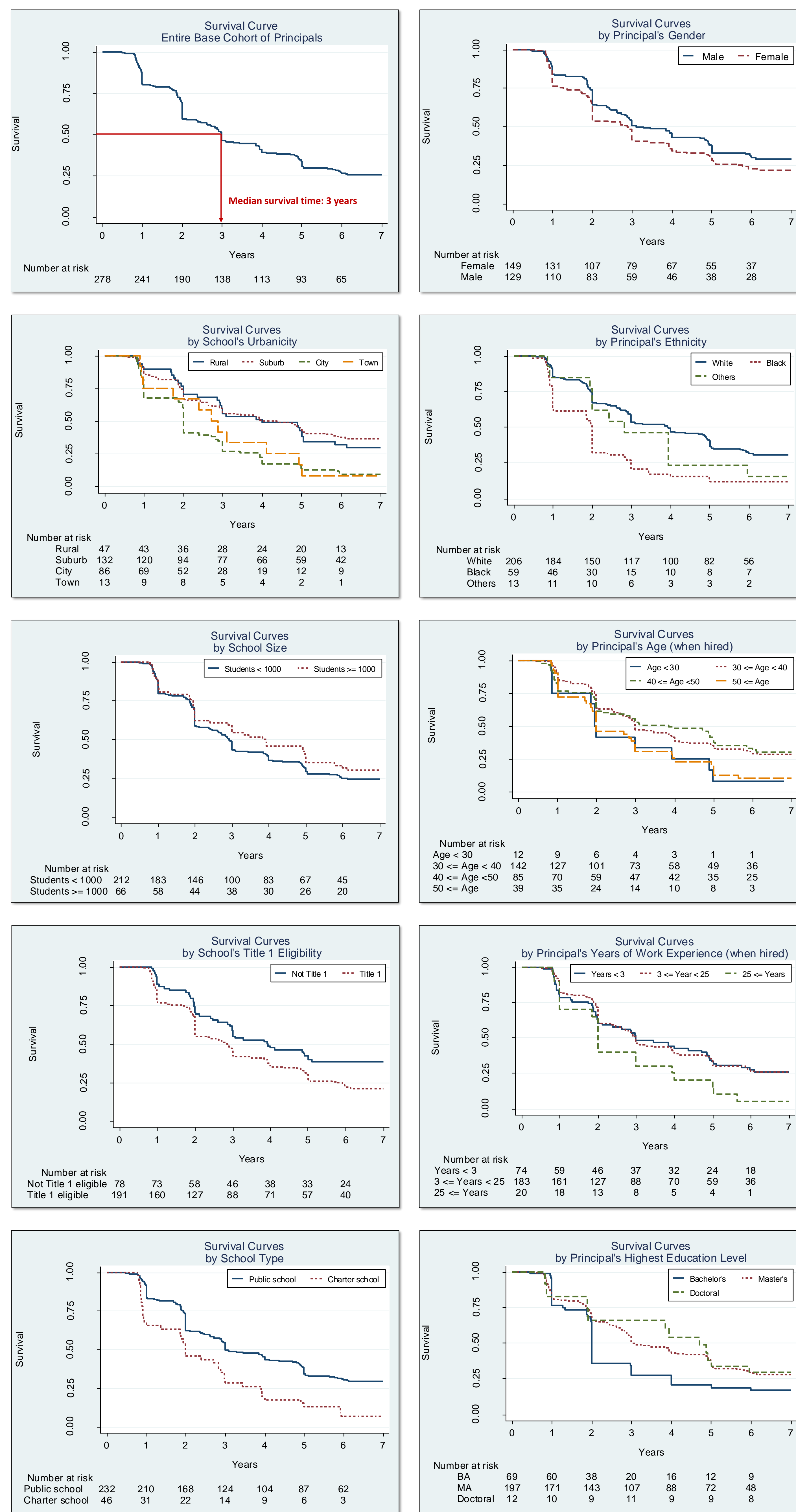
DATA

- Individual-level data (restricted datasets) were obtained from :
 - Administrative records on all principals in K-12 public and charter schools in Pennsylvania for academic years 2011-2012 to 2017-2018 (seven year period) provided by the Pennsylvania Department of Education (PDE)
- School-level data (public datasets) were obtained from :
 - Datasets maintained by the Pennsylvania Dep't of Education
 - Common Core of Data (CCD) database maintained by the National Center for Education Statistics (NCES)
- The base cohort included 278 principals
 - Only principals that were newly hired into a principal role by a K-12 public or charter school in Pennsylvania during the 2011-2012 academic year were included in the base cohort
 - Principals hired before the study period were excluded, due to lack of information on their date of hire

METHODOLOGY

- This study employed survival analysis, a statistical method used to analyze factors associated with the risk of an "event" happening (Allison, 2010)
 - The "event" was defined as a principal leaving the school where he/she was hired
 - Survival was measured in days, starting from the principal's date of hire (which fell during the 2010-2011 academic year)
- To visually analyze the observed attrition, survival curves were plotted to represent the percent of principals in the base cohort who remained in their position across the seven-year period
- The Cox proportional hazards model was used to identify factors associated with the risk of attrition among principals, controlling for all other variables in the model

SURVIVAL CURVES



DESCRIPTIVE STATS

Individual-level variables		%	n
Gender			
Male		54	149
Female		46	129
Ethnicity			
White		74	206
Black		21	59
Hispanic		2	6
Asian		1	3
Age (when hired)			
Age < 30		4	12
30 <= Age < 40		51	142
40 <= Age < 50		31	85
50 <= Age		14	38
Years of work experience (when hired)			
Experience < 3		27	74
3 <= Experience < 25		66	184
25 <= Experience		7	20
Highest education level (at the end of the 2011-2012 academic year)			
BA degree		25	69
MA degree		71	197
Doctoral / Specialist Degree		4	12
Annual salary (before deductions, in the 2011-2012 academic year)	Mean	93,540	21,953
Hours of professional development (in the 2011-2012 academic year)	SD	30	20
School-level variables		%	n
Urbanicity			
Rural		19	43
Town		6	13
Suburb		45	104
City		30	69
School size			
Less than 1,000 students		82	187
1,000 or more students		18	42
Title 1 eligibility			
Eligible		74	163
Not eligible		26	57
School type			
Public school		86	197
Charter school		14	32
Ethnicity			
% of white students	Mean	55	37
% of black students	SD	29	35
% of Hispanic students		9	14
% of other students ^a		7	6

COX REGRESSION

Individual-level variables	Hazard Ratio	
Gender (Reference: Female)		
Male	0.862	
Ethnicity (Reference: White)		
Black ^a	1.452	
Other (Hispanic, Asian, Multi-racial) ^a	0.933	
Age when hired (Reference: Age < 30)		
30 <= Age < 40	0.584	
40 <= Age < 50	0.631	
50 <= Age ^a	1.096	
Years of work experience ^b	1.000	
Highest educational level (Reference: BA) ^c		
MA	0.856	
Doctoral / Specialist ^{a, d}	1.462	
Annual salary ^e	0.860***	
Cumulative hours of professional development ^f	0.942***	
School-level variables		Hazard Ratio
Urbanicity (Reference: Rural) ^g		
Town	1.457	
Suburb	1.091	
City	1.815	
School size (Reference: Under 1,000 students) ^h		
1,000 or more students	0.963	
Title 1 eligibility (Reference: Not eligible) ^g		
Eligible	1.189	
School type (Reference: Public school) ^g		
Charter school	0.723	
% of minority students ^h	1.008	

Note. The hazard ratios and significance may not be accurate due to the small sample size (N=249).
^a These groups have a small sample size (<50).
^b Years of work experience when hired.
^c Highest educational degree when the event occurred.
^d An educational specialist degree (e.g., Ed.S.) is a terminal professional degree for individuals who have already completed a master's degree in education.
^e Salary (before deductions) when the event occurred, in units of \$6,000 annually (or \$500 monthly).
^f Cumulative hours of professional development when the event occurred, in units of 10 hours. Only ACT 48 professional development courses were included in the analysis.
^g During the 2011-2012 academic year.
^h Calculated by averaging information from the 2011-2012 academic year to the 2016-2017 academic year.
 *p<.05. **p<.01. ***p<.001

FINDINGS

- At the end of :
 - Year 1, 20% of the principals had left his/her position
 - Year 3, 50% of the principals had left his/her position
 - Year 7, 75% of the principals had left his/her position
- Observed attrition was greater among :
 - Female principals
 - Black principals
 - Principals who were over 50 years old or under 30 years old when they were hired
 - Principals with 25 or more years of work experience when they were hired
 - Principals with a bachelor's degree as the highest education level
 - Principals in schools in urban areas
 - Principals in schools with less than 1,000 students
 - Principals in schools eligible for Title 1 status
 - Principals at charter schools
- When controlling for all variables included in the Cox regression model, only two variables were associated with the risk of attrition among principals
 - Annual salary (\$6,000 increase in annual salary was associated with a 14% decrease in the risk of principal attrition)
 - Professional development (10-hour increase in cumulative professional development hours was associated with a 6% decrease in the risk of principal attrition)