

A DATA-DRIVEN EARLY WARNING SYSTEM FOR MINING ACCIDENT

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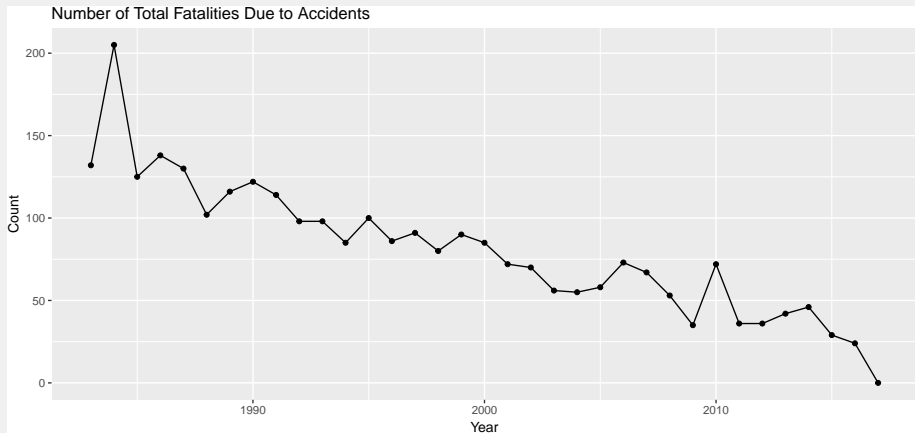
3/27/2017

- 1 INTRODUCTION: MINE SAFETY AND MSHA DATA
- 2 METHODS: DATA AND MODEL ASSUMPTIONS
- 3 RESULTS AND DISCUSSION

MINE SAFETY AND HEALTH ADMINISTRATION (MSHA)

- Formed in 1977
- Agency of the United States Department of Labor
- Mission
 - Prevent death, illness, and injury from mining
 - Promote safe and healthful workplaces for U.S. miners
 - Develop and enforce safety and health rules
 - Provide technical, educational, and other types of assistance

FATALITY TREND SINCE 1983



UPPER BIG BRANCH DISASTER

PRIMARY DATASETS

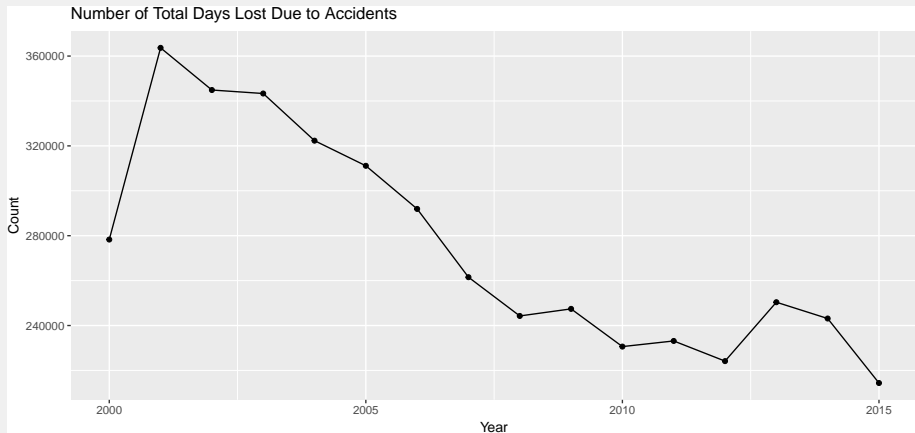
- **Mine accidents:** “msha__accident.csv” (681,386 obs., retrieved 1/26/2017, from https://enforcedata.dol.gov/views/data_summary.php)
- **MSHA assessed violations:** “AssessedViolations.csv” (2,169,804 obs., retrieved 12/10/2016, from <https://arlweb.msha.gov/OpenGovernmentData/OGIMSHA.asp>)

MASTER DATA TABLE

##	[1]	"mine_id"	"mine.name"
##	[3]	"year"	"quarter"
##	[5]	"active"	"num.days.lost"
##	[7]	"last.quarter.lost"	"last.year.lost"
##	[9]	"last.three.years.lost"	"num.days.restrict"
##	[11]	"last.quarter.restrict"	"last.year.restrict"
##	[13]	"last.three.years.restrict"	"num.death"
##	[15]	"last.quarter.death"	"last.year.death"
##	[17]	"last.three.years.death"	"num.dis"
##	[19]	"last.quarter.dis"	"last.year.dis"
##	[21]	"last.three.years.dis"	"viol.quantity"
##	[23]	"last.quarter.viol"	"last.year.viol"
##	[25]	"last.three.years.viol"	

MODEL

NUMBER OF DAYS LOST SINCE 2000



NUMBER OF VIOLATIONS SINCE 2000

