LONGITUDINAL DATA SYSTEMS IN WYOMING: THE IMPORTANCE OF CONTEXT

Presented to The Wyoming Workforce Development Council

April 25, 2014

Research & Planning Wyoming Department of Workforce Services

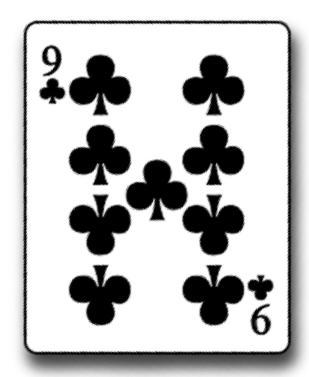
http://wyomingLMI.gov







By Edward Steed



Agenda

Supply, Demand, and Intervention into the Labor Market
-Michele Holmes' Presentation, WWDC, Feb. 2014

Agenda: LMI and SLDS Interventions into the Labor Market

- Labor Market Information (LMI) is established

LMI has the tools and methods, which is why we are involved in the development of the SLDS. We are going to use our tools and methods to demonstrate what an SLDS can become

- Statewide Longitudinal Data Systems (SLDS) are emergent

LMI and SLDS: R&P's Involvement

Wyoming SLDS Timeline

November 2010:	R&P invited to attend P20 Task Force SLDS design meeting.
March 2012:	Legislative funding and direction provided to Wyoming Enterprise Technology Services (ETS) and state agencies.
December 2012:	"Needs Assessment" published.
November 2013:	Request for proposals issued.

Implementation April 2014						
Janury 2014:	ETS awarded Houghton Miffin Harcourt the SLDS contract. Proposed project plan indicates contract closes November 2014					
March 2014:	R&P participated in U.S. Department of Education National SLDS Best Practices Conference.					

What is an SLDS?

WY LMI	Dimension	WY SLDS
 Employment & training program evaluation Enhance choice¹ 	Purpose	 Educational outcomes Accountability²
 Federal funding since 1960s 	History	 Federal funding since 2005; WY state funding since 2011
WYRegionalNationalGlobal	Geographic Scope	WY Only
 Social & behavioral scientists 	Primary Design	• Educators
X	Hypothesis Tested	o?

¹Source: USDOL WDQI Solicitation for Workforce Grant Applications.

LMI and SLDS: What is the Problem?

- Wyoming's average per-pupil spending in 2011-12 was fifth highest of all 50 states.¹
- Wyoming's 79% graduation rate in 2011-12 ranked 28th among all 50 states.²
- "We're spending a huge amount of money on education, and don't feel like we're getting the results we want." - Sen. Hank Coe, R-Cody.³
- "We invest a tremendous amount in our children. If we're not graduating the students, then we're not getting that return on investment." – Sen. Chris Rothfuss, D-Laramie.³

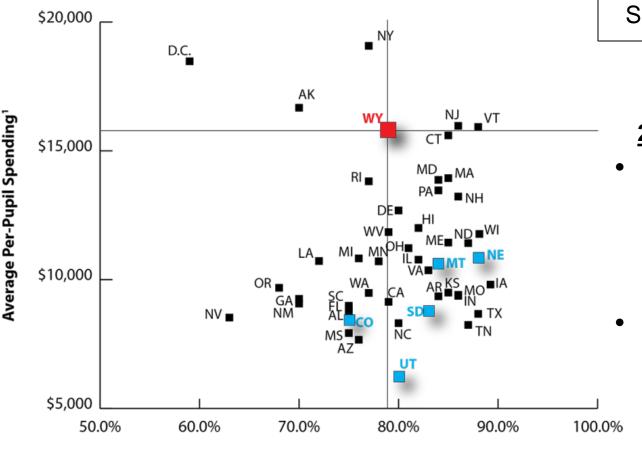
¹Source: 2011 Annual Survey of School System Finances. (2012). U.S. Census Bureau.

²Source: Regulatory Adjusted Cohort Graduation Rate, All Students: 2011-12. (2014). U.S. Department of Education.

³Source: Todd, L. (2014, July 14). In the nation's fifth biggest education spender, 1 in 5 Wyoming students will not graduate. *Casper Star-Tribune*.

LMI and SLDS: What is the Problem?

Graduation Rates and Average Per Pupil Spending by State, 2011-12



Legislative Responses to Campbell I through IV Supreme Court Rulings

2011-12 School Year:

- Only four states and the District of Columbia spent more per pupil than Wyoming
 - 27 states had higher graduation rates than Wyoming

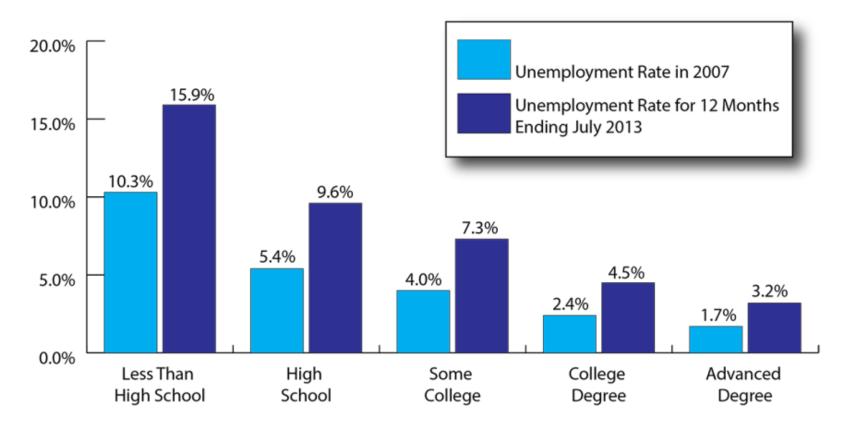
Note: The U.S. Department of Education did not publish graduation rates for the U.S., ID, KY, OK, or PR.

Graduation Rate²

¹Source: 2011 Annual Survey of School System Finances. (2012). U.S. Census Bureau.

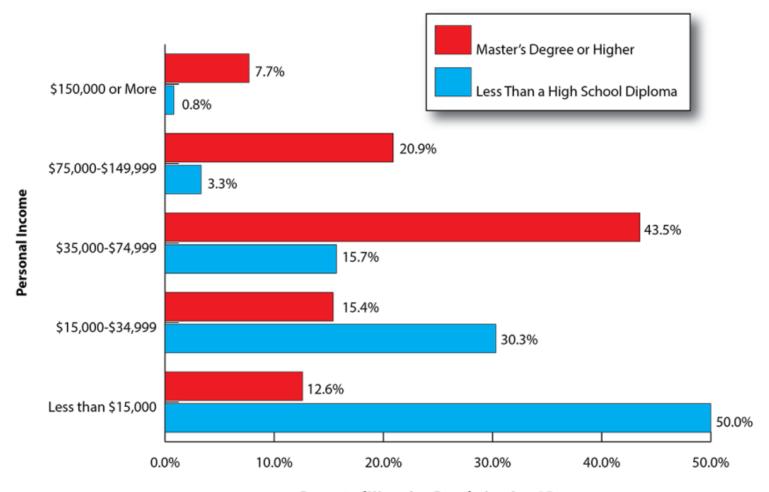
²Source: Regulatory Adjusted Cohort Graduation Rate, All Students: 2011-12. (2014). U.S. Department of Education.

U.S. Unemployment Rate by Education Level



Note: Due to the fact that the data are not seasonally adjusted, 12-month averages are used. Source: Author's analysis of Current Population Survey microdata.

WY Earnings by Selected Education Level



Percent of Wyoming Population Age 25+

Intermission

Questions?

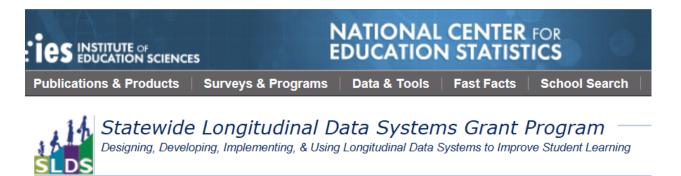
What is Labor Market Information (LMI)?

- "Labor Market Information (LMI) is an applied science; it is the systematic collection and analysis of data which **describes and predicts** the relationship between labor demand and supply." *The States' Labor Market Information Review, ICESA, 1995, p. 7.*
- The Research & Planning (R&P) section of the Wyoming Department of Workforce Services is Wyoming's LMI shop.

Meaning is a function of context.

What is a Statewide Longitudinal Data System?

2005: \$700 million SLDS competitive grants (Federal)



May 2012:

"The Institute of Education Sciences (IES) is pleased to announce today 24 new state-level grants to support the design and implementation of Statewide Longitudinal Data Systems (SLDS). The 2012 winners include eight first-time SLDS grantees: Delaware, Oklahoma, New Jersey, South Dakota, Vermont, West Virginia, Puerto Rico, and the U.S. Virgin Islands.

- 1. The design, development, and implementation of a statewide, longitudinal kindergarten through grade 12 (K-12) data system;
- 2. The development and linking of early childhood data with the State's K-12 data system; or
- 3. The development and linking of postsecondary and/or workforce data with the State's K-12 data system."

National Center for Education Statistics. (2012). http://nces.ed.gov

SLDS Grantee States

- Alaska: \$3.5 (2006); \$4.0 (2012)
- Arizona: \$6.0 (2007); \$5.0 (2012)
- Arkansas: \$3.3 (2006); \$5.0 (2009); \$9.8 (2009 ARRA)
- California: \$3.3 (2006); \$6.0 (2009)
- Colorado: \$4.2 (2007); \$17.4 (2009 ARRA)
- Connecticut: \$1.5 (2006); \$2.9 (2009)
- Delaware: \$4.6 (2012)
- District of Columbia: \$5.7 (2007); \$4.0 (2012)
- Florida: \$1.6 (2006); \$2.5 (2009); \$10.0 (2009 ARRA)
- Georgia: \$8.9 (2009)
- Hawaii: \$3.5 (2009); \$3.4 (2012)
- Idaho: \$5.9 (2009); \$3.1 (2012)
- Illinois: \$9.0 (2009); \$11.9 (2009 ARRA)
- Indiana: \$5.2 (2007); \$4.0 (2012)
- lowa: \$8.8 (2009); \$3.7 (2012)
- Kansas: \$3.8 (2007); \$3.9 (2009); \$9.1 (2009 ARRA)
- Kentucky: \$5.8 (2006); \$2.9 (2009); \$3.6 (2012)
- Louisiana: \$4.1 (2009)
- Maine: \$3.2 (2007); \$7.3 (2009 ARRA)
- Maryland: \$5.7 (2006); \$6.0 (2009); \$4.0 (2012)
- Massachusetts: \$6.0 (2009); \$13.0 (2009 ARRA)
- Michigan: \$3.0 (2006); \$5.5 (2009); \$10.6 (2009 ARRA)
- Missouri: \$9.0 (2009)
- Montana: \$5.8 (2009); \$4.0 (2012)
- Nebraska: \$3.5 (2007); \$4.4 (2012)
- Nevada: \$6.0 (2007); \$4.0 (2012)
- New Hampshire: \$3.2 (2007); \$5.0 (2012)
- New Jersey: \$4.0 (2012)

- New York: \$7.8 (2009); \$19.7 (2009 ARRA)
- North Carolina: \$6.0 (2007); \$3.6 (2012)
- North Dakota: \$6.7 (2009); \$3.9 (2012)
- Ohio: \$2.9 (2009); \$5.1 (2009 ARRA)
- Oklahoma: \$5.0 (2012)
- Oregon: \$4.7 (2007); \$3.7 (2009); \$10.5 (2009 ARRA)
- Pennsylvania: \$4.0 (2006); \$6.1 (2009); \$14.3 (2009 ARRA)
- Puerto Rico: \$4.7 (2012)
- Rhode Island: \$4.7 (2009); \$4.0 (2012)
- South Carolina: \$5.8 (2006); \$14.9 (2009 ARRA)
- South Dakota: \$3.0 (2012)
- Tennessee: \$3.2 (2006)
- Texas: \$7.9 (2009); \$18.2 (2009 ARRA)
- Utah: \$4.6 (2007); \$9.6 (2009 ARRA)
- Vermont: \$4.9 (2012)
- Virginia: \$6.0 (2007); \$17.5 (2009 ARRA)
- Virgin Islands: \$2.6 (2012)
- Washington: \$5.9 (2009); \$13.3 (2009 ARRA)
- West Virginia: \$4.8 (2012)
- Wisconsin: \$3.1 (2006); \$5.6 (2009); \$13.8 (2009 ARRA)

LMI and SLDS: R&P's Involvement

U.S. Department of Labor Workforce Data Quality Initiative (WDQI) to support SLDS Development

- Three-year grant
 - \$722,000
- Awarded July 2013
- "Use longitudinal data to evaluate the performance of Federally and State supported education and job training programs."
- "Provide user-friendly information to consumers to help them select the education and training programs that best suit their needs."

LMI and SLDS: Focus of Measurement

WY LMI (Established and evolving) Unemployment Insurance (UI) Wage Records	Proposed WY SLDS Stated Funded (Developmental)	-
(SSN, Year/Quarter, Gross Pay, UI Employer Account)	Student Records	
Linked to:	Linked to:	
Administrative Records • Employer characteristics	Teacher recordsPlant facility	
 Demographics 	Pre-K through postsecondary	Phase 1 Year 1
 Employment records from 10 LMI partner offices 		_
 Student Records for Hathaway Study (Wyoming Department of Education)* 	Socioeconomic status (Supplemental Nutrition Assistance Program [SNAP], Medicaid, etc.)	Phase 2
Survey Data Linked to Administrative Records	UI Wage Records (WY only)	Year 2
 Selected credentials (Nursing Survey) 		

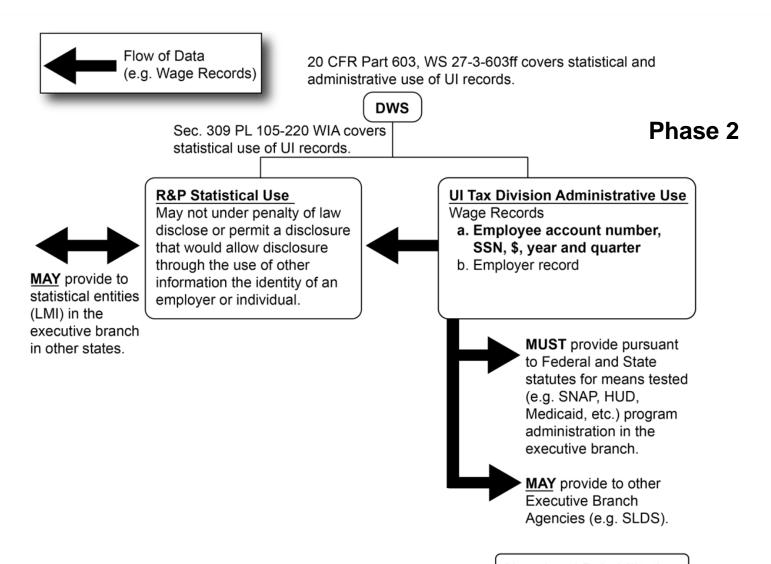
Job skills and employer satisfaction (New

Wyoming 2008.

Hires Survey)

*Source: Hathaway Student Scholarship Program Longitudinal Study, Chapter 95, Sec. 9, Session Laws of

DWS: Future Use of Wage Records in the SLDS



Vocational Rehabilitation, Labor Exchange

Intermission

Questions?

LMI Purpose: Enhancing Choice Potential Training Opportunities

Top 10 Occupations for Nonresident New Hires Requiring More than a High School Diploma, 2011-12

				Total	Nonres	idents	Wages	Turnover
Rank	SOC Code	Occupation	Education	N	N	Row %	Average Hourly Wage	% Employed 1 Quarter After Hire
1	47-2073	Operating Engineers and Other Construction Equipment	Post Secondary	3,614	705	19.5	\$18.00	69.0%
2	51-4121	Welders, Cutters, Solderers, and Brazers	Post Secondary	2,499	531	21.3	\$18.00	73.3%
3	47-2111	Electricians	Post Secondary	2,211	235	10.6	\$24.00	65.8%
4	11-1021	General and Operations Managers	Associates	1,354	177	13.1	\$31.25	93.7%
5	49-9071	Maintenance and Repair Workers, General	Post Secondary	1,590	165	10.4	\$13.50	83.2%
6	31-1014	Nursing Assistants	Post Secondary	1,958	135	6.9	\$12.00	87.3%
7	11-9021	Construction Managers	Bachelors	306	132	43.1	\$43.26	86.1%
8	17-3031	Surveying and Mapping Technicians	Associates	300	113	37.7	\$16.00	69.7%
9	49-9041	Industrial Machinery Mechanics	Post Secondary	859	111	13.0	\$20.00	90.4%
10	53-7021	Crane and Tower Operators	Post Secondary	379	108	28.4	\$22.72	82.8%
Subtotal,	All Occupation	ons Requiring More than a Hi	gh School Diploma	40,488	5,023	12.4%		
Total, All	Occupations			200,555	26,917	13.4%	\$14.50	76.4%

Purpose
History
Geographic
Scope
Primary
Design
Hypothesis
Tested

At least 1 in 5 new hires for this occupation was a nonresident.



- Provide education performance data to improve instruction quality
- Facilitate intervention with struggling students
- Track student progress over time.
 - Source: National Center for Education Statistics

Dimension
Purpose
History
Geographic
Scope
Primary
Design
Hypothesis
Tested

SLDS Purpose in Wyoming

The Wyoming Accountability in Education Act (WAEA) charges the Wyoming Department of Education to "use existing data to establish longitudinal data systems linking student achievement with teachers of record and relevant school principals, as necessary for the statewide education accountability system."

 Source: Wyoming Accountability in Education Act, § 21-2-202

LMI and SLDS History

WY LMI (Established and evolving)

Federal funding since 1960s:

- Manpower Development and Training Act (MDTA) of 1962
- Comprehensive Employment and Training Act (CETA): 1973
- Job Training Partnership Act (JTPA) of 1982
- Workforce Investment Act (WIA) of 1998
- Workforce Data Quality Initiative (WDQI): 2013

WY SLDS (Developmental)

Funded by:

- 2005: \$700 million SLDS competitive grants (Federal)
- 2011 Wyoming SLDS (State)

Dimension Purpose History Geographic Scope Primary

Hypothesis Tested

Design

Wyoming's Labor Market in Context

"... labor markets do not respect county or state boundaries" (Leonard, 2010).

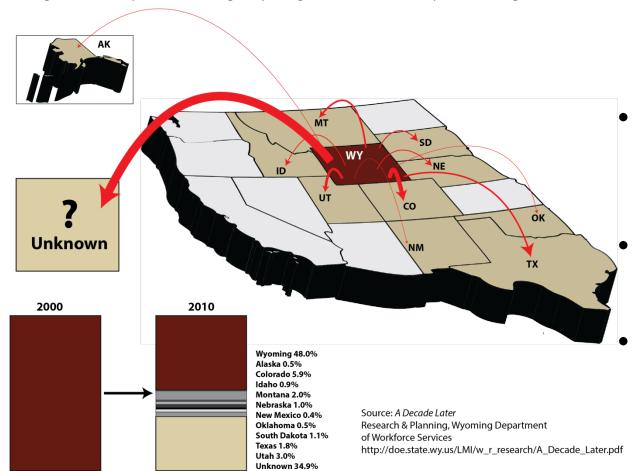
- In 2009, at least 25% of all Unemployment Insurance (UI) benefits paid were to nonresidents (Leonard, 2010).
- Dimension
 Purpose
 History
 Geographic
 Scope
 Primary
 Design
 Hypothesis
 Tested
- In Wyoming, out-of-state employers make up 27.3% of all employers and account for 55% of all employees (Quarterly Census of Employment and Wages [QCEW] 3/11/14 extract).
- A 2008 survey of nurses in WY revealed that 58.4% were non-native (*Retention of Nurses in Wyoming*, 2008).
- From 2004-2006 all of the net change in workers in WY came from nonresidents (Jones, 2007).

What is Wyoming's labor supply chain?

R&P Partner LMI Offices

A Decade Later: Where Did They Go?

Tracking the exit of 18-year-olds working in Wyoming in 2000 and where they were working in 2010.



Dimension
Purpose
History
Geographic
Scope
Primary
Design
Hypothesis
Tested

Data-sharing agreements with 10 LMI partner states.

MOU in progress with Ohio LMI office.

Ongoing discussions with North Dakota, Kansas, Minnesota, and Pennsylvania LMI offices.

Reference: A Decade Later: Tracking Wyoming's Youth Into the Labor Force. Presented to the Wyoming Workforce Development Council on January 9, 2013, in Cheyenne, WY, by Tony Glover.

WE-Connect

Connect[®]

Workforce-Education Connection

Wyoming • South Dakota • Nebraska

Informing school-to-work policy and personal choice in the Northern Plains and Rocky Mountain region.

A state coordination of the Workforce Data Quality Initiative.



Dimension

Purpose History

Geographic Scope

Primary Design

Hypothesis Tested

Intermission

Questions?

LMI and SLDS Research: Tools to Move From Description to Prediction

Research Type	LMI	SLDS
Description	x	X
ARIMA	X	
Regression	x	
Quasi- experimental Design	X	
Experimental Design		
Prediction		

Tools to Move From Description to Prediction:

Employment Growth

Auto Regressive Integrated Moving Average (ARIMA)

Description

ARIMA

Regression

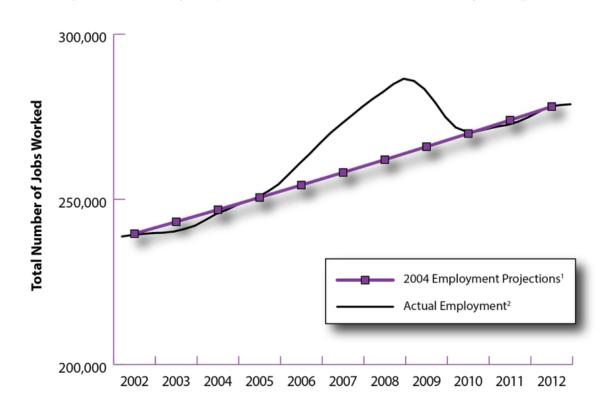
Quasiexperimental Design

Experimental Design

Prediction

Time series using 276 observations.

Long-Term Industry Projections Across All Industries for Wyoming, 2002-2012



¹Source: Wyoming Statewide Long Term Employment Projections: 2002-2012(http://doe.state.wy.us/LMI/proj2004/Wyoming_Report%203Dig%202012.pdf).

²Source: Quarterly Census of Employment and Wages (QCEW)(http://doe.state.wy.us/LMI/toc 202.htm)

From Description to Prediction:

Employment Projections

Auto Regressive Integrated Moving Average (ARIMA)

Occupational Projections

Cheyenne MSA Industry Occupational Projections 2012 to 2022.

			Projected	Net Change	Percent Change	Projected	Net Change	Percent Change	Annual Openings	Annual Openings
SOC		Base Employment	Employment	2012 to	2012 to	Employment	J	2012 to	Net	Replacement
Code	SOC Title	2012	2014	2014	2014	2022	2022	2022	Change	Need
21-	Educational, Vocational, and									
1012	School Counselors	188	198	10	5.3	237	49	26.3	5	20
Averag	e Hourly Wage: \$30.85	Typical Education: Mas	sters Degree							
Averag	e Annual Wage: \$64,161	Under Educated: 2.7	Typically Edu	ıcated: 96.8	3 Ove	r Educated: 0.4	17			
21- 1021	Child, Family, and School Social Workers	121	128	7	5.7	156	35	28.6	3	13
	e Hourly Wage: \$22.35 e Annual Wage: \$46,485	Typical Education: Bac Under Educated: 0.1	helors Degree Typically Edu	ıcated: 63.4	1 Ove	r Educated: 36	.41			

Tools to Move From Description to Prediction:

Unemployment Insurance (UI) Benefits Paid: 2006-2013

Regression

Description

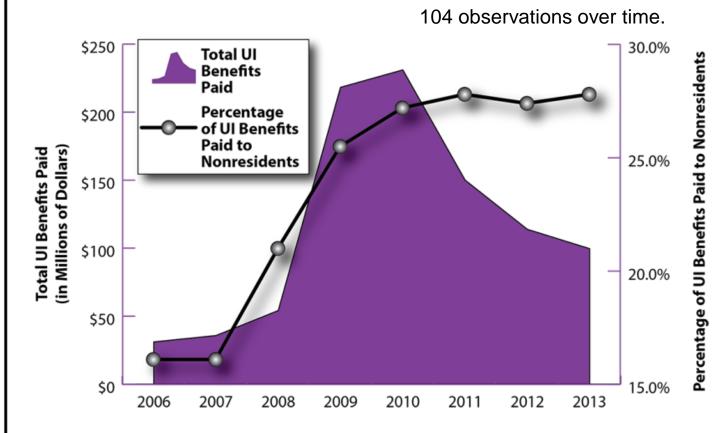
ARIMA

Regression

Quasiexperimental Design

Experimental Design

Prediction



Intermission

Questions?

Why do we need all these data?

Tools To Move From Description to Prediction: DWS/USDOL Unemployment Insurance (UI) Profiling Program

The purpose of regression analysis is to prevent UI benefit exhaustion by allocating scarce employment and training resources to claimants most in jeopardy.

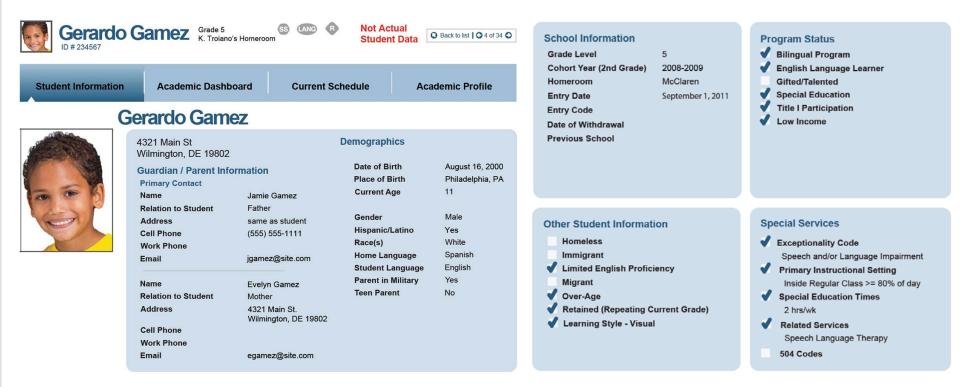
To intervene and prevent:

- Employer UI Tax Increases
- Worker Dislocation
- Dependence on public support: SNAP, TANF, Medicaid, Housing Assistance, etc. ...

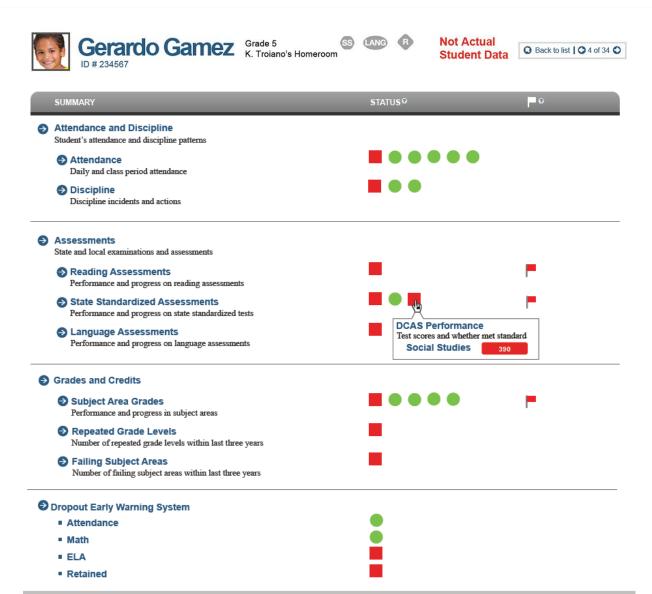
Predictions: UI Profiling Regression Model

		Table 2 - Mo	del Coefficients		`
Variable Type	Variable	Coefficient	Variable Type	Variable	Coefficient
Intercept (α)		-0.8679	ΜΟΝΤΗ (β)	12-DECEMBER	-0.0553
industry (β)	11-RAW	0.1044	OCCUPATION (β)	11-MANAGEMENT	0.3404
industry (β)	12-PROD	-0.0001	OCCUPATION (β)	13-BANKING	0.4803
industry (β)	13-DIST	-0.2684	OCCUPATION (β)	15-COMPUTER	-0.8724
industry (β)	14-INFO	0.2727	OCCUPATION (β)	17-ARCHITECT	-0.2096
industry (β)	15-FIN	0.0427	OCCUPATION (β)	19-LIFE SCI	0.1722
industry (β)	16-PROF	-0.3030	OCCUPATION (β)	21-COMMSERVIC	1.8342
industry (β)	17-HUM	0.0539	OCCUPATION (β)	23-LEGAL SVC	-0.1825
industry (β)	18-LEIS	-0.2358	OCCUPATION (β)	25-EDUCATION	0.2806
industry (β)	19-PERS	-0.1566	OCCUPATION (β)	27-ARTS & ENT	-0.8401
industry (β)	20-PUB	-0.1129	OCCUPATION (β)	29-HEALTH PRAC	0.0632
industry (β)	99-NUK	0.6031	OCCUPATION (β)	31-HEALTH SUPPT	0.0725
decl (β)	Declining Industry	-0.0441	OCCUPATION (β)	33-PROT SERVICE	-0.0211
Inten (β)		0.0872	OCCUPATION (β)	35-FOOD PREPSERV	0.5032
Indel (β)		0.2213	OCCUPATION (β)	37-BUILD GROUNDS	0.2627
wkselg (β)		-0.0552	OCCUPATION (β)	39-PERSONAL CARE	0.3056
num_emp (β)		-0.2038	OCCUPATION (β)	41-SALES	0.0157
rate (β)		0.2847	OCCUPATION (β)	43-OFFICE ADMIN	0.0593
MONTH (β)	01-JANUARY	-0.1010	OCCUPATION (β)	45-FARMING	-0.5173
MONTH (β)	02-FEBRUARY	0.0204	OCCUPATION (β)	47-CONSTRUCTION	-0.6841
MONTH (β)	03-MARCH	-0.2259	OCCUPATION (β)	49-INSTALLATION	0.0304
MONTH (β)	04-APRIL	-0.0846	OCCUPATION (β)	51-PRODUCTION	0.1206
MONTH (β)	05-MAY	-0.2618	OCCUPATION (β)	53-TRANSPORT	0.1616
MONTH (β)	06-JUNE	-0.1080	OCCUPATION (β)	99-ALL OTHER	-1.3754
MONTH (β)	07-JULY	0.1923	ed_numeric (β)	01-Less than High School	0.3775
MONTH (β)	08-AUGUST	0.3219	ed_numeric (β)	02-High School/GED	0.1199
MONTH (β)	09-SEPTEMBER	0.1293	ed_numeric (β)	03-Associate's Degree	-0.2206
MONTH (β)	10-OCTOBER	0.1324	ed_numeric (β)	04-Bachelor's Degree	-0.6494
MONTH (β)	11-NOVEMBER	0.0403	ed_numeric (β)	05-Master's Degree or Greater	0.1469
			ed_numeric (β)	06-Undefined	0.2257

Tools to Move From Description to Prediction: Regression Analysis SLDS School District Vision



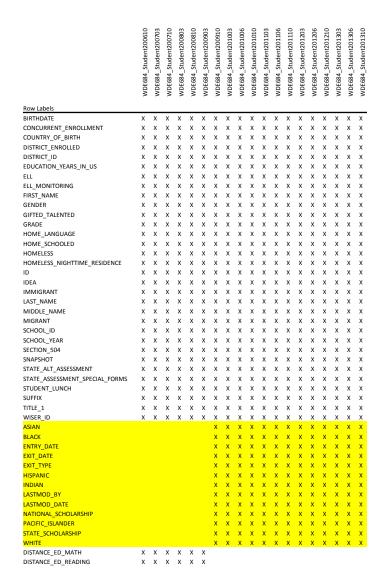
SLDS: School District Vision



SS Special Services (ANG) Language

♦ No Change

Student Record



- Sally Port strips off Personal Information Identifiers (PII)
- Replaces with system identification

How Are We Doing?

- Dr. Mark Schneider, Former Commissioner of the National Center for Education Statistics, 2006-2009

Data Check In, but They Don't Check Out

"One of the mistakes we have made, and remember we are \$700 million into the process, was that we did not have a use requirement...So what has happened is that we have made this huge investment in these data warehouses, which I think of...you remember there was something called the roach motel. You know roaches checked in, but they never checked out. So sometimes I think of these data systems as the equivalent. You know data checks in and we never see them again."

Source: Testimony of Dr. Mark Schneider to the Subcommittee on Higher Education and Workforce Training of the Committee of Education and the Workforce, U.S. House of Representatives, September 20, 2012.

Research & Planning

Wyoming Department of Workforce Services P.O. Box 2760 246 S. Center St. Casper, WY 82601 (307) 473-3807



DWS-RESEARCHPLANNING@wyo.gov http://wyomingLMI.org

Tom Gallagher, Manager tom.gallagher@wyo.gov

