How do we communicate, in a reasonable and relevant way, just how bad things are in the job market?

UNEMPLOYMENT CLAIMS SPIKE…
…THE ECONOMY SHUTS DOWN…WHAT DO WE DO?

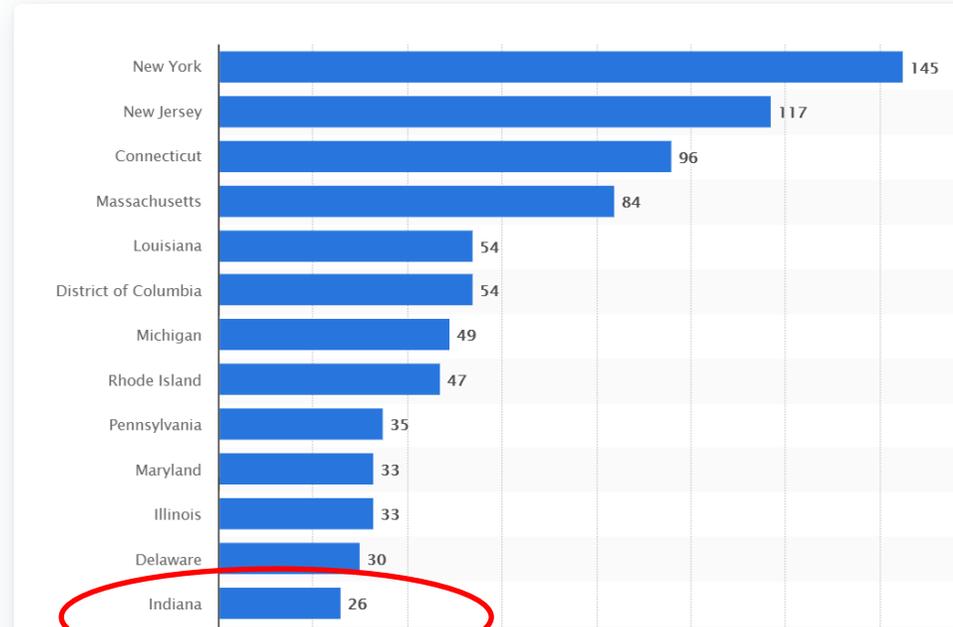https://www.youtube.com/watch?v=UCmBK9cGYO4

COVID-19 Death Rates by State and County

	Confirmed deaths (absolute)	Population (in millions)	Deaths per million
United States	89,428	327.17	273.34

U.S. 9ᵗʰ world wide

Death rates from coronavirus (COVID-19) in the United States
(per 100,000 people)

State	Rate
New York	145
New Jersey	117
Connecticut	96
Massachusetts	84
Louisiana	54
District of Columbia	54
Michigan	49
Rhode Island	47
Pennsylvania	35
Maryland	33
Illinois	33
Delaware	30
Indiana	26

Indiana 13th nation wide

May 11, 2020
(per 100,000 people)

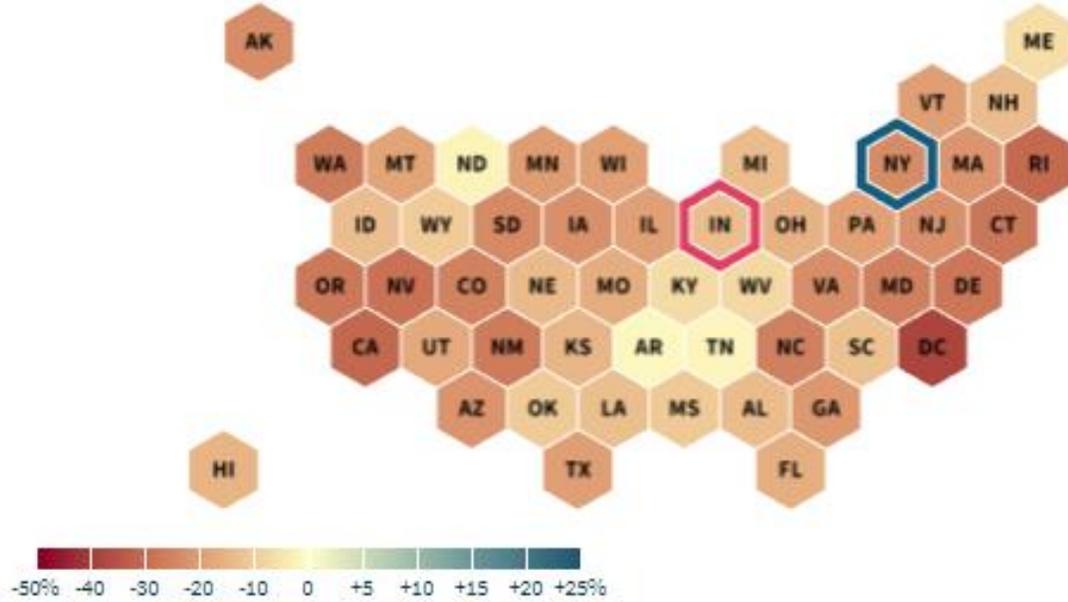| County	Rate
Trousdale, Tenn.	14 175
Dakota, Neb.	6 925
Lincoln, Ark.	6 842
Nobles, Minn.	5 747
Bledsoe, Tenn.	4 136
Cass, Ind.	3 996
Rockland, N.Y.	3 847
Colfax, Neb.	3 820
Marion, Ohio	3 653
Westchester, N.Y.	3 230
Pickaway, Ohio	3 213
Ford, Kan.	3 196
Seward, Kan.	3 023
Dawson, Neb.	2 970

Meat Processing is DEADLY

Source: https://www.statista.com/statistics/1109011/coronavirus-covid19-death-rates-us-by-state

Consumer Spending

Percent Change in All Consumer Spending ⓘ

Apr 30, 2020

-12.9%
Indiana

-19.3%
Illinois

-20.5%
USA

-23.6%
New York

-50% -40 -30 -20 -10 0 +5 +10 +15 +20 +25%

https://tracker.opportunityinsights.org/

Indiana is one of the lowest
percentage drops in the country

Health Care Spending

Apr 30, 2020

-46.2%
Indiana

-49.8%
USA

-52.6%
Illinois

-57.2%
New York

Hours Worked Small Business

Percent Change in Hours Worked in Small Businesses ⓘ

May 09, 2020

-42.2%
Indiana

-46.7%
USA

-48.3%
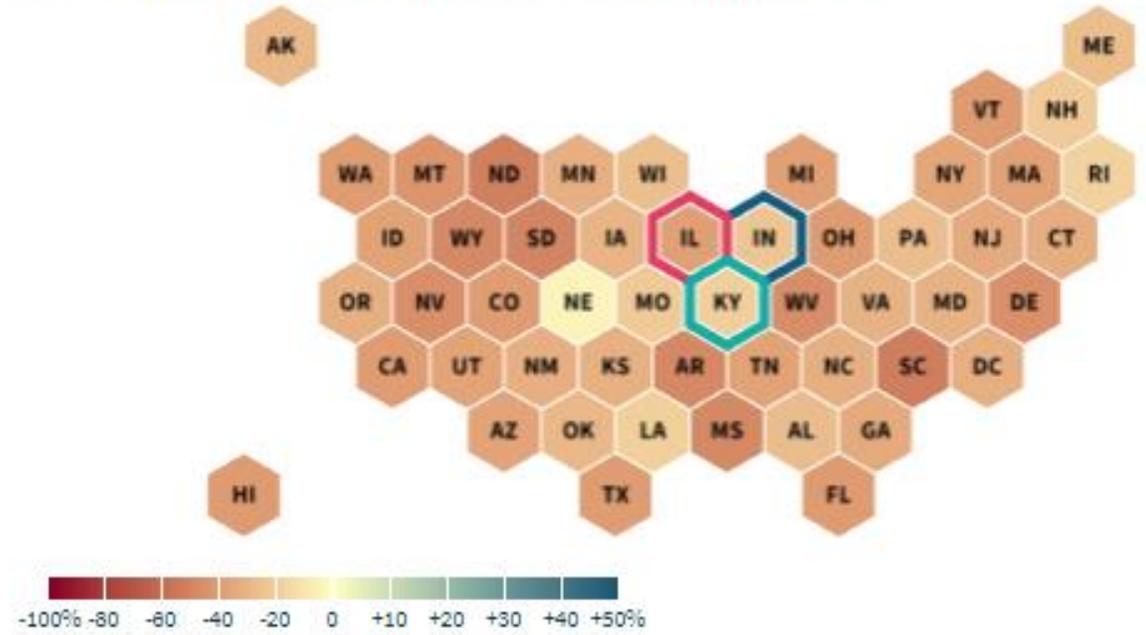Kentucky

-54.4%
Illinois

Job Postings

Percent Change in Job Postings ⓘ

Week of Apr 25, 2020

-18.7% Kentucky

-23% Indiana

-35.9% USA

-38.7% Illinois

Manufacturing
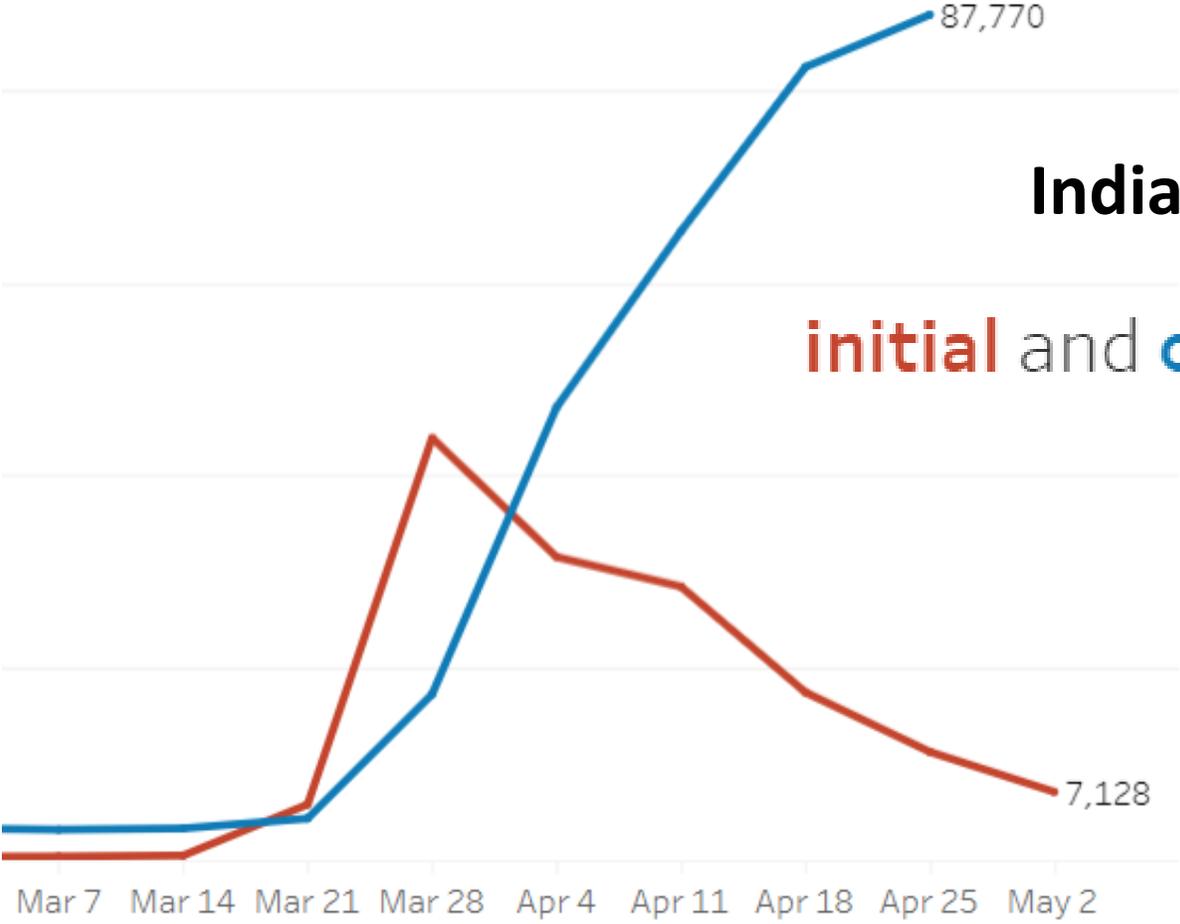
-24.2% Kentucky

-33.4% Indiana

-39.7% USA
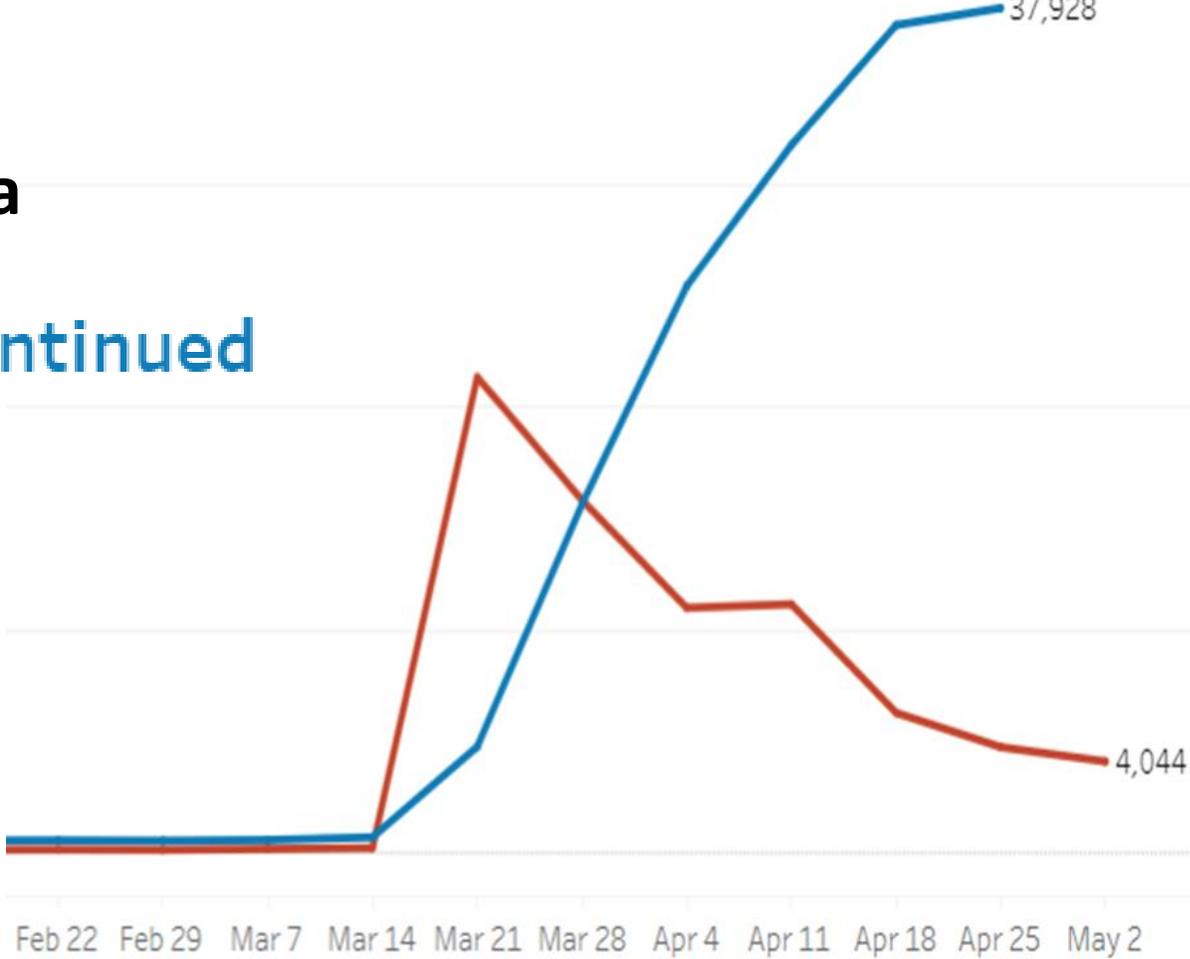
-44.1% Illinois

https://tracker.opportunityinsights.org/

Outline

✓ Introduction

❑ Estimating Unemployment Rate (U-3^) from Continuing UI Claims

❑ Which Industry Sectors have the greatest hurt?

    ❑ What sectors, if any, should be targeted for relief?

    ❑ What is the decision criterion?

        ❑ Ripple effects per job?

        ❑ Jobs per sector?

        ❑ Future viability and prospects?

        ❑ Most C-19 safe? Most C-19 dangerous?

❑ Scenario Testing U-3^

    ❑ How bad is it? Will it be? **What are your assumptions?**

❑ **The Policy Balancing Act**

Manufacturing weekly claims
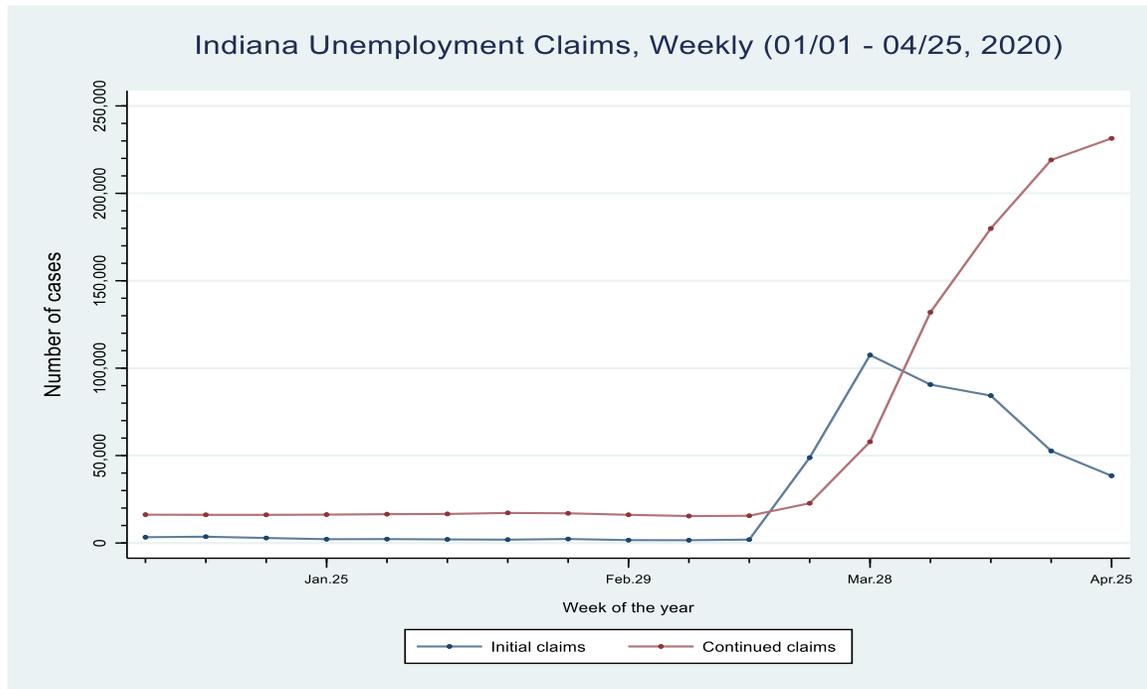
Hospitality weekly claims

Indiana

initial and continued

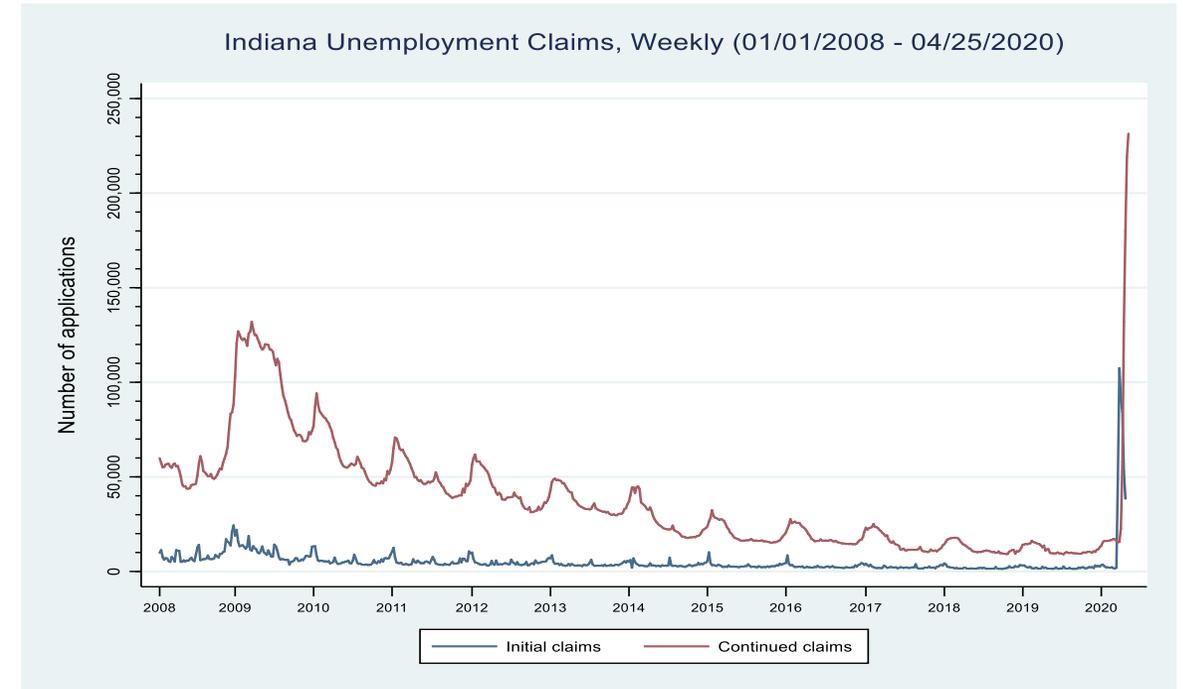www.stats.indiana.edu/claims/industry-visualization.asp

Predicting State (and Local) Unemployment Rate Using UI Continuing Claims

Ping (Claire) Zheng

Indiana Business Research Center

Indiana University

Kelley School of Business

Indiana Initial and Continuing Claims, Jan-April 2020
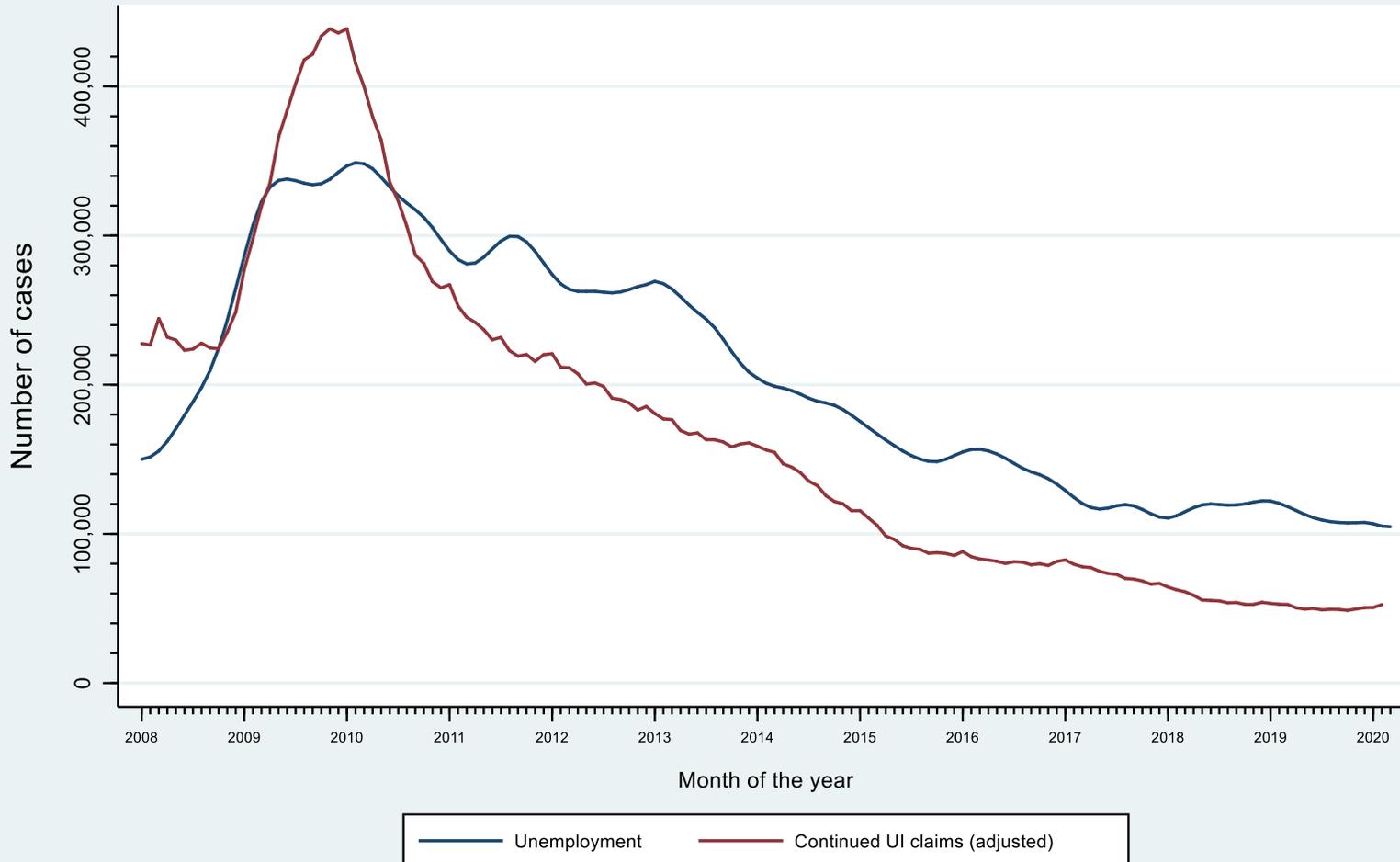
Indiana Initial and Continuing Claims, Jan 2008 – April 2020

Unemployment vs. Continued UI claims

Indiana's State Unemployment and Continued UI Claims
Monthly, Jan, 2008 - Mar, 2020

Our in-sample data are from monthly Indiana UI claims and BLS unemployment from Jan, 2008 to Feb, 2020

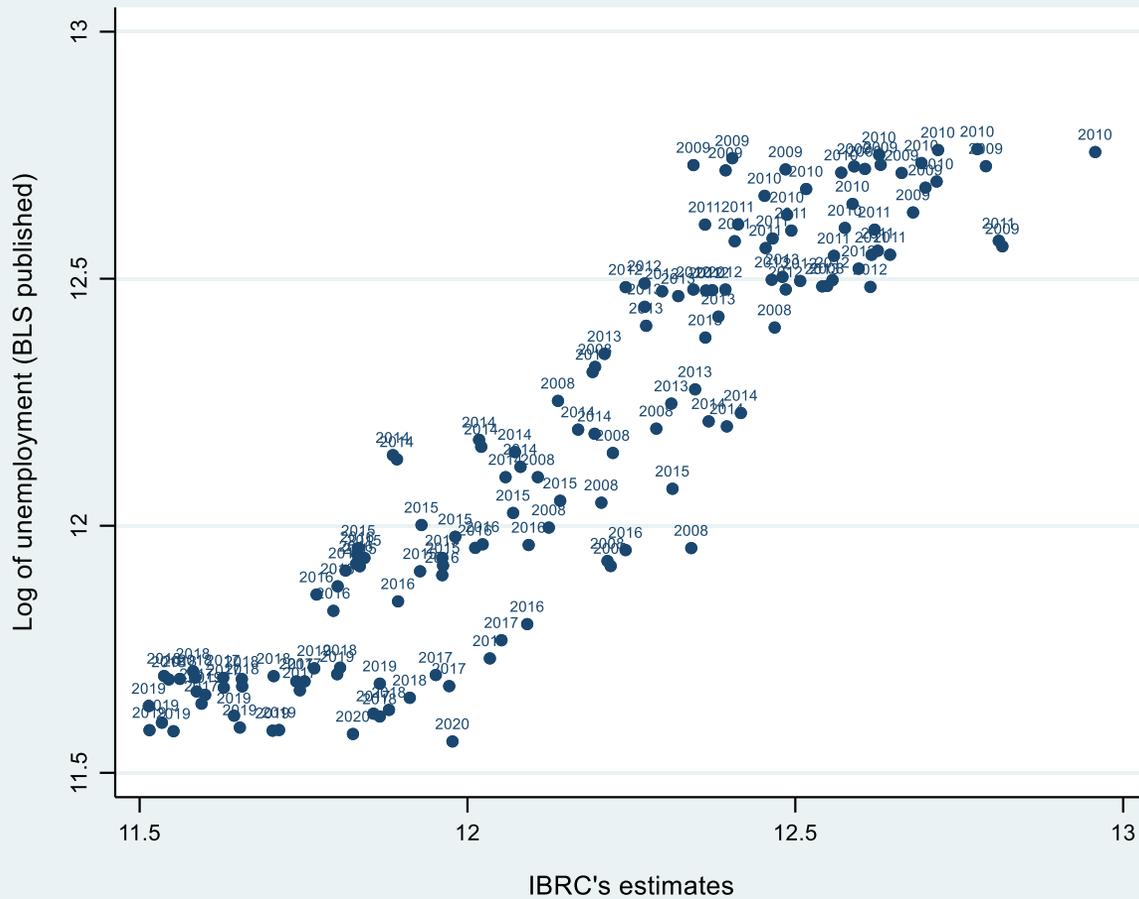February/March U-3^ for Indiana: **5.6%**

Methodology on Forecasting

- The **March unemployment rate – 5.6%** – for Indiana uses the Indiana labor force participation count in February 2020—BLS—as the denominator: 3,396,036

- To estimate the numerator, we sample monthly data, January 2008 to February 2020, to find the linear association between continued UI claims and unemployment

- Then, use the results to predict unemployment count for March and April, 2020

- Estimate the following regression equation:
$$\boldsymbol{ln(unemployment) = \beta_0 + \beta_1 * ln(UI\ claims) + \epsilon}$$

- The β_1 coefficient estimate, or the "response" rate, is approximately 0.60

  - *1 % increase in continued UI claims associated with 0.60 % increase in unemployment*

- To predict the unemployment for March 2020, we first plug in the March UI continued claims count, 111,706, to the equation above, and then use the exponential form of the fitted value to calculate the unemployment count/level of 189,203

Regional *Actual* versus Estimated Unemployment

MSA rates: Bloomington – Columbus – Elkhart – Indianapolis

Unemployment: Published vs. Estimated
Monthly, Jan,2008 - Feb,2020

Unemployment Rates for Selected Indiana Metropolitan Areas
Monthly, Jan, 2008 - Feb, 2020

Indiana Monthly Unemployment, Monthly (Jan, 2008 - Apr, 2020)

The red curves for March and April, 2020 are forecasts based on monthly continued UI claims.

INDIANA U-3 SPIKED IN APRIL ... AND MAY?

5.6 %   Estimate for March
17.5 % Estimate for April
???   For May?

Recent Forecasts of State and Regional Unemployment Rates

State of Indiana: April rate of 17.5%

MSA rates: Bloomington − Columbus − Elkhart − Indianapolis

Indiana Monthly Unemployment, Monthly (Jan, 2008 - Apr, 2020)

The red curves for March and April, 2020 are forecasts based on monthly continued UI claims.

Monthly Unemployment Rates for Selected Indiana Metropolitan Areas
(01/012008 - 04/25/2020)

The red curves for March and April, 2020 are forecasts based on monthly continued UI claims.

Indiana's Estimated Monthly Industrial Unemployment
(01/01/2008 - 04/25/2020)

Will this C-19 spike have the same industry dimensions...

... as this Great Recession historical pattern?

Indiana's Estimated Monthly Industrial Unemployment

(01/2008 - 12/2010)

(01/2020 - 04/2020)

Legend: Construction, Manufacturing, Retail, Transport/Warehouse, Admn Sppt/waste Mngm, Healthcare, Accommodation & Food Services

- Manufacturing was quickly and deeply hurt, based on claims for both events
- Hospitality (Accommodation & Food Services) and Healthcare held firm during the Great Recession
- Not so with COVID-19
- Construction was relatively cushioned from C-19
- Relatively speaking, Transportation/Warehousing appears to be holding up well

Real Time U-3, State and Regional

- **UI continued claims** predict real-time unemployment rates
- They can be used to forecast near-future unemployment for local areas, as well as industrial sectors
- UI claims provide a quicker and more flexible read on the market that potentially benefits policymakers and economic researchers
- *In the case of Indiana, a 1 percent increase in continued UI claims on average responds to a 0.6 percent increase in monthly unemployment count.*
- *Divide by labor force participation to get estimate*
- The model needs to be run separately for different areas and updated the model once new data become available.

COVID-19 does discriminate, based on industry

WHO GOT HURT...
...AND HOW BAD?

Scenario Testing

- Which Indiana industries have the greatest headcount?
- Which Indiana industries have the most value-added per worker?
- Which industries have the greater risk of COVID-19?
- Are we Demand-gap closing? Supply stimulating? Harm reducing?
- So many predictions
- So many assumptions
- So many webinar invitations for economic impact forecasts...
- ...so little time...

Indiana Employment, GDP per Worker and Economic Impact Multipliers with C-19 Risk Profile

Description	Employment (BEA, not BLS/DWD)	GDP per worker (compensation + returns to capital)	Supply Chain Effects (top 20% bold)	Income & Spending Effects (top 20% shaded)	COVID-19 Risk Range: 6 - 83 Avg = 58
9B - Administrative Government	390,570	$72,830	-	0.33	67.2
722 - Food Services and Drinking Places	285,334	$31,785	0.13	0.16	66.5
561 - Administrative and Support Services	224,119	$43,262	0.20	0.27	62.7
23 - Construction	222,130	$69,414	0.28	0.43	63.9
541 - Professional, Scientific, and Technical Services	218,416	$106,229	0.37	0.54	61.8
621 - Ambulatory Health Care Services	166,855	$91,461	0.24	0.56	82.8
336 - Transportation Equipment Manufacturing	135,098	$161,661	**0.86**	0.82	58.3
531 - Real Estate	129,783	$301,035	**0.86**	0.72	63.7
42 - Wholesale Trade	128,538	$171,600	0.76	0.73	n/a
622 - Hospitals	121,805	$87,601	0.46	0.57	83.5
624 - Social Assistance	75,595	$28,653	0.09	0.19	76.7

Indiana Employment, GDP per Worker and Economic Impact Multipliers with C-19 Risk Profile

Description	Employment (BEA, not BLS/DWD)	GDP per worker (compensation + returns to capital)	Supply Chain Effects (top 20% bold)	Income & Spending Effects (top 20% shaded)	COVID-19 Risk Range: 6 - 83 Avg = 58
211 - Oil and Gas Extraction	4,572	$7,044	0.71	0.34	13.0
114 - Fishing, Hunting and Trapping	455	$7,816	0.05	0.02	n/a
814 - Private Households	13,313	$12,672	-	0.07	n/a
485 - Transit and Ground Passenger Transportation	17,797	$18,870	0.08	0.12	56.8
213 - Support Activities for Mining	2,462	$19,937	**0.84**	0.40	6.1
453 - Miscellaneous Store Retailers	37,306	$23,158	0.10	0.14	65.4
812 - Personal and Laundry Services	77,878	$25,054	0.04	0.18	68.9
451 - Sporting Goods, Hobby, Musical Instrument, and Book Stores	16,743	$28,282	0.11	0.16	65.2
624 - Social Assistance	75,595	$28,653	0.09	0.19	76.7
722 - Food Services and Drinking Places	285,334	$31,785	0.13	0.16	66.5
112 - Animal Production and Aquaculture	26,193	$34,095	0.33	0.19	n/a
445 - Food and Beverage Stores	40,483	$39,028	0.16	0.21	65.0

Indiana Employment, GDP per Worker and Economic Impact Multipliers with C-19 Risk Profile

Description	Employment (BEA, not BLS/DWD)	GDP per worker (compensation + returns to capital)	Supply Chain Effects (top 20% bold)	Income & Spending Effects (top 20% shaded)	COVID-19 Risk Range: 6 - 83 Avg = 58
622 - Hospitals	121,805	$87,601	0.46	0.57	83.5
621 - Ambulatory Health Care Services	166,855	$91,461	0.24	0.56	82.8
623 - Nursing and Residential Care Facilities	81,513	$43,902	0.18	0.27	80.5
624 - Social Assistance	75,595	$28,653	0.09	0.19	76.7
446 - Health and Personal Care Stores	26,543	$50,031	0.15	0.29	76.6
812 - Personal and Laundry Services	77,878	$25,054	0.04	0.18	68.9
611 - Educational Services	66,603	$39,036	0.09	0.23	68.8
713 - Amusement, Gambling, and Recreation Industries	37,065	$64,643	0.19	0.22	68.6
9B - Administrative Government	390,570	$72,830	-	0.33	67.2
722 - Food Services and Drinking Places	285,334	$31,785	0.13	0.16	66.5

Predicting the Unemployment Rate: U-3^

Assumptions from the past? Based on the present? Assumptions of the future?

DEALER'S CHOICE

	Historical UI % Great Recession	UI Claims - 3wk avg C-19	DEALER'S CHOICE	ADP U-3^ U.S. (May 6)	ADP U-3^ U.S. Scale 2X (May 6)	INDUSTRY AVERAGE ADP U-3^ (scale 2X) & Historical
GDP Change	-10.32%	-11.40%	-48.2%	-15.4%	-35.2%	-20.5%
Job Numbers -- head count delta (BEA)	(331,375)	(367,035)	(1,923,054)	(693,690)	(1,387,381)	(847,710)
Total U-3^ Change based Estimates	-8.41%	-9.32%	-48.8%	-17.6%	-30.7%	-21.5%
Choose Your Assumptions =>						
11 - Agriculture, Forestry, Fishing and Hunting	0.3%	0.1%	20%	**0.5%**	**1.0%**	0.7%
21 - Mining, Quarrying, and Oil and Gas Extraction	0.3%	0.0%	60%	**0.0%**	**0.0%**	0.1%
22 - Utilities	0.1%	0.0%	0%	**3.8%**	**7.6%**	3.9%
23 - Construction	15.8%	1.5%	40%	12.9%	25.8%	20.8%
31-33 - Manufacturing	28.2%	33.5%	80%	17.5%	35.0%	31.6%
42 - Wholesale Trade	4.0%	3.3%	60%	10.9%	21.8%	12.9%
44-45 - Retail Trade	8.1%	9.6%	80%	13.3%	26.6%	17.4%
48-49 - Transportation and Warehousing	4.5%	4.1%	60%	17.8%	35.6%	20.1%
51 - Information	1.3%	0.6%	10%	16.1%	32.2%	16.7%
52 - Finance and Insurance	2.4%	0.6%	20%	3.3%	6.6%	4.5%
53 - Real Estate and Rental and Leasing	1.4%	1.1%	40%	19.8%	39.6%	20.5%
54 - Professional, Scientific, and Technical Services	3.4%	2.1%	20%	8.9%	17.8%	10.6%
55 - Management of Companies and Enterprises	0.5%	0.8%	20%	0.0%	0.0%	0.2%
56 - Administrative, Support, Waste Management,	10.6%	9.5%	60%	19.8%	39.6%	25.1%
61 - Educational Services	2.2%	2.2%	20%	15.9%	31.8%	17.0%
62 - Health Care and Social Assistance	7.1%	10.6%	20%	12.9%	25.8%	16.5%
71 - Arts, Entertainment, and Recreation	1.4%	3.0%	80%	56.4%	100.0%	50.7%
72 - Accommodation and Food Services	5.2%	12.6%	80%	52.9%	100.0%	52.6%
81 - Other Services (except Public Administration)	2.3%	4.2%	80%	23.6%	47.2%	24.8%
90- Government	0.9%	0.5%	0%	8.2%	16.4%	8.7%

Description	Employment (BEA)	VA/worker	AVG Income per Worker	2-digit historical UI Claims % of industry total	LOSS EMPLOY based on historical UI claim %	GDP Historical Loss	Scenaio ADP Industry %	Scenario Job Loss ADP	ADP GDP % loss
221 - Utilities	15,405	$452,774	$127,502	0.1%	18	$ (8,108,419)	3.80%	585	264,872,940
23 - Construction	222,130	$69,414	$58,545	15.8%	35,182	$ (2,442,143,352)	12.9%	28,655	(1,989,047,654)
311 - Food Manufacturing	46,607	$126,068	$57,532	28.2%	13,148	$ (1,657,594,006)	17.5%	8,156	(1,028,212,701)
332 - Fabricated Metal Product Manufacturi	63,142	$114,121	$70,487	28.2%	17,813	$ (2,032,847,872)	17.5%	11,050	(1,261,039,429)
333 - Machinery Manufacturing	44,613	$148,828	$89,608	28.2%	12,586	$ (1,873,098,125)	17.5%	7,807	(1,161,897,662)
334 - Computer and Electronic Product Man	11,800	$163,503	$89,501	28.2%	3,329	$ (544,266,228)	17.5%	2,065	(337,633,483)
335 - Electrical Equipment, Appliance, and (	8,907	$104,493	$76,219	28.2%	2,513	$ (262,579,244)	17.5%	1,559	(162,904,886)
336 - Transportation Equipment Manufactur	135,098	$161,661	$84,242	28.2%	38,113	$ (6,161,317,127)	17.5%	23,642	(3,821,994,222)
337 - Furniture and Related Product Manufa	25,456	$79,364	$55,223	28.2%	7,181	$ (569,950,561)	17.5%	4,455	(353,565,754)
339 - Miscellaneous Manufacturing	31,550	$128,032	$79,773	28.2%	8,900	$ (1,139,547,187)	17.5%	5,521	(706,864,292)
42 - Wholesale Trade	128,538	$171,600	$84,729	4.0%	5,195	$ (891,453,449)	10.9%	14,011	(2,404,289,205)
484 - Truck Transportation	69,124	$81,235	$67,798	4.5%	3,139	$ (254,997,964)	17.8%	12,304	(999,518,727)
541 - Professional, Scientific, and Technical	218,416	$106,229	$74,473	3.4%	7,370	$ (782,885,941)	8.9%	19,439	(2,064,987,808)
561 - Administrative and Support Services	224,119	$43,262	$36,842	10.6%	23,676	$ (1,024,263,676)	19.8%	44,376	(1,919,783,489)
562 - Waste Management and Remediation	10,342	$148,677	$66,040	10.6%	1,092	$ (162,425,954)	19.8%	2,048	(304,490,384)
611 - Educational Services	66,603	$39,036	$35,774	2.2%	1,438	$ (56,142,749)	15.9%	10,590	(413,387,777)
621 - Ambulatory Health Care Services	166,855	$91,461	$83,895	7.1%	11,856	$ (1,084,379,624)	12.9%	21,524	(1,968,604,277)
622 - Hospitals	121,805	$87,601	$75,589	7.1%	8,655	$ (758,192,470)	12.9%	15,713	(1,376,472,300)
623 - Nursing and Residential Care Facilities	81,513	$43,902	$39,062	7.1%	5,792	$ (254,283,539)	12.9%	10,515	(461,629,332)
624 - Social Assistance	75,595	$28,653	$28,271	7.1%	5,372	$ (153,908,298)	12.9%	9,752	(279,419,813)
711 - Performing Arts, Spectator Sports, and	29,346	$47,197	$26,307	1.4%	409	$ (19,311,657)	56.4%	16,551	(781,156,447)
712 - Museums, Historical Sites, and Similar	1,895	$49,239	$34,193	1.4%	26	$ (1,300,679)	56.4%	1,069	(52,636,131)
713 - Amusement, Gambling, and Recreatio	37,065	$64,643	$28,103	1.4%	517	$ (33,407,187)	56.4%	20,905	(1,351,366,269)
721 - Accommodation	30,833	$70,078	$43,274	5.2%	1,596	$ (111,856,334)	52.9%	16,310	(1,142,967,870)
722 - Food Services and Drinking Places	285,334	$31,785	$20,842	5.2%	14,771	$ (469,512,948)	52.9%	150,941	(4,797,690,647)

Indiana Historical vs. U.S. Current (ADP May 6)

Description	2-digit historical UI Claims % of industry total	LOSS EMPLOY based on historical UI claim %	GDP Historical Loss	Scenaio ADP Industry %	Scenario Job Loss ADP	ADP GDP % loss
221 - Utilities	0.1%	18	$ (8,108,419)	3.80%	585	264,872,940
23 - Construction	15.8%	35,182	$ (2,442,143,352)	12.9%	28,655	(1,989,047,654)
311 - Food Manufacturing	28.2%	13,148	$ (1,657,594,006)	17.5%	8,156	(1,028,212,701)
332 - Fabricated Metal Product Manufacturi	28.2%	17,813	$ (2,032,847,872)	17.5%	11,050	(1,261,039,429)
333 - Machinery Manufacturing	28.2%	12,586	$ (1,873,098,125)	17.5%	7,807	(1,161,897,662)
334 - Computer and Electronic Product Man	28.2%	3,329	$ (544,266,228)	17.5%	2,065	(337,633,483)
335 - Electrical Equipment, Appliance, and (	28.2%	2,513	$ (262,579,244)	17.5%	1,559	(162,904,886)
336 - Transportation Equipment Manufactur	28.2%	38,113	$ (6,161,317,127)	17.5%	23,642	(3,821,994,222)
337 - Furniture and Related Product Manufa	28.2%	7,181	$ (569,950,561)	17.5%	4,455	(353,565,754)
339 - Miscellaneous Manufacturing	28.2%	8,900	$ (1,139,547,187)	17.5%	5,521	(706,864,292)
42 - Wholesale Trade	4.0%	5,195	$ (891,453,449)	10.9%	14,011	(2,404,289,205)
484 - Truck Transportation	4.5%	3,139	$ (254,997,964)	17.8%	12,304	(999,518,727)
541 - Professional, Scientific, and Technical	3.4%	7,370	$ (782,885,941)	8.9%	19,439	(2,064,987,808)

2018 Indiana GSP ≈ $370 *Billion*

Indiana Historical vs. U.S. Current (ADP May 6)

Description	2-digit historical UI Claims % of industry total	LOSS EMPLOY based on historical UI claim %	GDP Historical Loss	Scenaio ADP Industry %	Scenario Job Loss ADP	ADP GDP % loss
611 - Educational Services	2.2%	1,438	$ (56,142,749)	15.9%	10,590	(413,387,777)
621 - Ambulatory Health Care Services	7.1%	11,856	$ (1,084,379,624)	12.9%	21,524	(1,968,604,277)
622 - Hospitals	7.1%	8,655	$ (758,192,470)	12.9%	15,713	(1,376,472,300)
623 - Nursing and Residential Care Facilities	7.1%	5,792	$ (254,283,539)	12.9%	10,515	(461,629,332)
624 - Social Assistance	7.1%	5,372	$ (153,908,298)	12.9%	9,752	(279,419,813)
711 - Performing Arts, Spectator Sports, and	1.4%	409	$ (19,311,657)	56.4%	16,551	(781,156,447)
712 - Museums, Historical Sites, and Similar	1.4%	26	$ (1,300,679)	56.4%	1,069	(52,636,131)
713 - Amusement, Gambling, and Recreation	1.4%	517	$ (33,407,187)	56.4%	20,905	(1,351,366,269)
721 - Accommodation	5.2%	1,596	$ (111,856,334)	52.9%	16,310	(1,142,967,870)
722 - Food Services and Drinking Places	5.2%	14,771	$ (469,512,948)	52.9%	150,941	(4,797,690,647)
811 - Repair and Maintenance	2.3%	2,066	$ (135,280,458)	23.6%	21,046	(1,378,301,591)
812 - Personal and Laundry Services	2.3%	1,804	$ (45,194,417)	23.6%	18,379	(460,459,435)
813 - Religious, Grantmaking, Civic, Profess	2.3%	1,968	$ (90,809,807)	23.6%	20,048	(925,197,243)
	8.6	(331,375)	(38,688,125,965)		(620,734)	(57,587,849,461)
		-8.41%	-10.32%		-15.8%	-15.37%

Easing the Lockdown – How quickly and how smartly?

FINDING THE SWEET SPOT

Wharton Model

Policy Scenario: Baseline Policy | Partial Reopening | **Full Reopening**
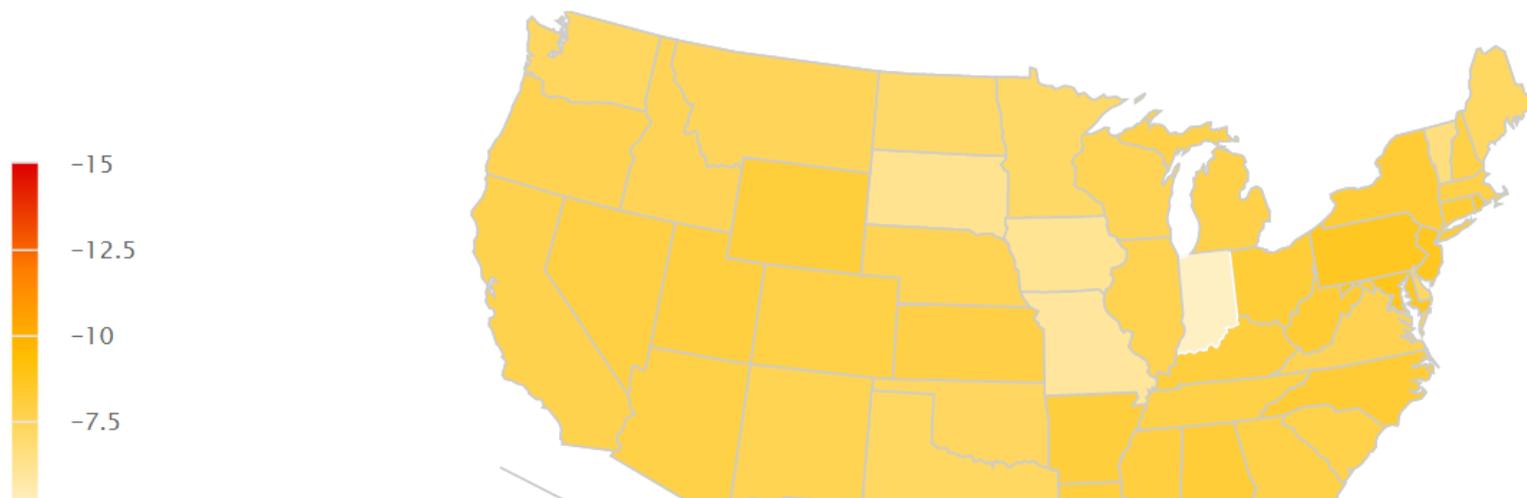
Behavior Scenario: **Baseline Behavior** | Reduced Distancing

Map view: GDP, year-over-year percent change

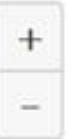https://budgetmodel.wharton.upenn.edu/issues/2020/5/1/coronavirus-reopening-simulator

Five Settings to Scenario Test and **Find the Balance** between **C-19 Safety** and **Economic Recovery**
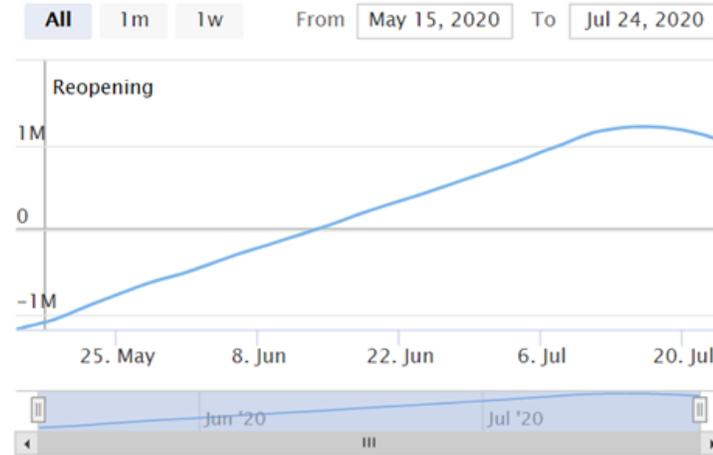
How Fast and How Safe?

Jul 15, 2020

Shows the trade offs between rapid re-opening and recovery, versus the safety risks

Does not provide scenarios for industry and occupation specific interventions:
which industries to open, to how deploy PPE most effectively or social distancing strategies?

Conclusion

- ✓ Introduction

- ✓ Estimating U-3 from Continuing UI Claims

- ✓ Which Industry Sectors are in the greatest hurt?
  - ✓ What sectors, if any, should be targeted for CARES Act relief?
  - ✓ What is the decision criterion?
    - ✓ Ripple effects per job?
    - ✓ Jobs per sector?
    - ✓ Future viability and prospects?
    - ✓ Most C-19 safe? Most C-19 dangerous?

- ✓ Scenario Testing for the Unemployment Rate: U-3^
  - ✓ How bad is it? Will it be? **What are your assumptions?**

- ✓ **The Unemployment Rate will show how well polices were balanced**