Why Has the US COVID-19 Crisis Been So Severe? The Employer-Sponsored Health Insurance Channel

Eiichiro Kazumori, The University of Massachusetts

This Version: January 2, 2022. (First Public Version: December 2020.)

Greetings

- Thank you for the opportunity for the presentation.
- Today we discuss the question "Why is the COVID-19 Crisis in the US so severe? What needs to be done?"
- The organization of the talk is:
    - Introduction
    - Health Insurance Coverage Before the COVID-19 Crisis
    - Health Insurance Coverage in 2020
    - Effect of Health Insurance Coverage on the COVID-19 Crisis
    - Counterfactual Policy Analysis with the ACA Repeal or the Full Medicaid Expansion

Section 1. Introduction and Summary

- Research Question: Why Is The US COVID-19 Crisis So Severe?
- Previous Explanations
- Lessons from the Financial Crisis: Identifying the Systemic Risk
- Crucial Novelty of the Paper: Health Insurance Coverage and COVID-19
- Main Results

The US COVID-19 Crisis

- The US has a disproportionately large share of cases and deaths compared with other countries:
  - The US population is only 4.3% of the world population.
  - But the US has 19.2% of the world's cases and 15.2% of the world's deaths as of December 31, 2021.
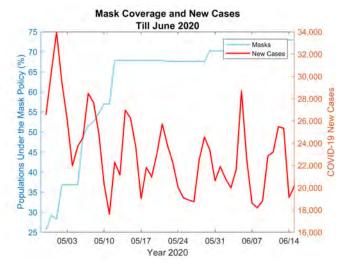- Why is it that the US COVID-19 crisis has been so severe?

Previous Explanations

- Delay in the Mask Mandate
- Lack of Large-Scale Testing

Explanation 1: Delay in Mask Mandate

- Chernozhukov, Kasahara, and Schrimpf (2021) use the data till June 2020 and estimate that the mask mandate early in the pandemic could have reduced cases and deaths in Spring 2020 (also see Kazumori (2020)).

- But this theory does not explain surges after the mask mandate was implemented.
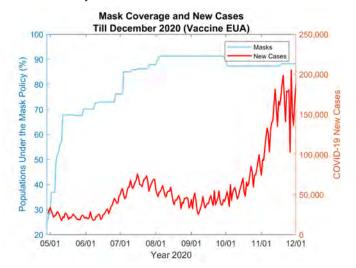
Mask Mandate and COVID Cases Till June 2020

- The data until June 2020 show that an increase in mask coverage was associated with the decline in COVID-19 cases then.

Mask Mandate and COVID Cases Till December 2020

- But the data till December 2020 suggest that the mask mandate may not be the whole story.

Mask Coverage and New Cases Till December 2020 (Vaccine EUA)

Explanation 2: Lack of Large-Scale Testing

- Large-scale testing would have avoided the crisis (Taipale, Romer, and Linnarsson (2020)).
- But lack of large-scale testing alone would not explain the disproportional severity of the US Crisis compared with other countries.

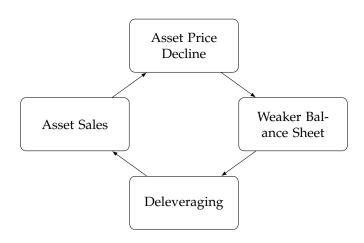# Lessons from the Financial Crisis: Need to Identify the Systemic Risk

- Then one needs to identify systemic vulnerabilities in the current US health system for such a severe crisis.

Example: Systemic Risk in the 2008-09 Financial Crisis

- Bernanke, Geithner, and Paulson (2020) identify that excessive leverage of the financial institutions created systemic vulnerabilities for the financial system:

"This buildup of leverage, especially runnable debt, helped to make the financial system vulnerable to an unexpected shock. (...) Both the borrowers and regulators underestimated the run risk of short-term liabilities. (...) The gaps and weakness of the regulatory system certainly contributed to the vulnerability of the financial system in the run-up to the crisis."

Leverage Amplification Mechanism in the 2008-2009 Financial Crisis (Adrian and Shin (2008))
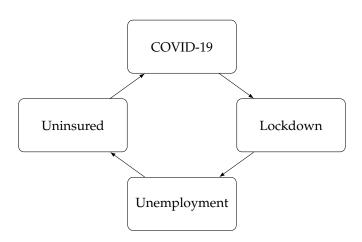
Crucial Novelty of the Paper

- This paper is the first paper that studies the unique severity of the US COVID-19 crisis via its unique health insurance system:
  - Significant number of uninsured population (28.9 million in 2019).
  - Employer-sponsored insurance system (ESI hereafter) where majority of people are insured.
  - High health care costs.

The ESI Amplification Mechanism

- An increase in COVID-19 cases and deaths will lead to lockdowns.
- Such lockdowns will lead to significant increases in unemployment.
- When people lose jobs, these people risk losing health insurance.
- These uninsured people become vulnerable to COVID-19 because they no longer afford to pay for the expensive health care.
- Such increases in cases and deaths will trigger further lockdowns.

The ESI Amplification Mechanism in the 2020-2021 US COVID-19 Crisis

Example 1: Essential Workers

- Essential workers have an uninsured rate of 13% compared to 8% of nonessential workers (Johnson (2020)).
- Essential workers spend time in close proximity to others thus can become superspreaders (Lewis (2021)).

Example 2: Concerns for Medical Costs (Farmer (2020))

When Darius Settles died from COVID-19 on the Fourth of July, his family and the city of Nashville, Tenn., were shocked. Even the mayor noted the passing of a 30-year-old without any underlying conditions — one of the city's youngest fatalities at that point.

(...) His wife, who works for Tennessee State University, says he was worried about costs as he went back to the hospital a second time; she tried to reassure him. "He said, 'I bet this hospital bill is going to be high.' And I said, 'Babe, it's going to be OK.' And we left it alone, just like that," she says.

(...) Darius Settles knew he was in bad shape. But he didn't attempt to make a third trip to the hospital. Instead of 911, he called his father, pastor David Settles, and asked his father to come pray for him.

(...) He sat by his son's side. Darius' wife made some peppermint tea, and when they put it to his lips, Darius didn't sip. They thought he had fallen asleep. But he was unconscious.

Example 3: Gallup Survey (Witters (2020b))

- Over half (58%) of non-White adults versus 32% of White adults report that they are either "extremely concerned" or "concerned" about being able to pay for the cost of care if they are diagnosed with COVID-19.
- 24% of adults reported that the household has been unable to pay for medicine or drugs that a doctor had prescribed because the household didn't have enough money to pay for them in June 2020.

2020 Data Quality Issues

- There have been difficulties in data collection in 2020.
    - The standard ACS 1-year data product would not be released for 2020 because the data do not meet the statistical quality standards (Cook and Daily (2021)).
- We conduct our analysis with the national-level data and the state-level data.
- The contribution of the paper is to conduct the first study of the effect of health insurance coverage on the US COVID-19 crisis.
- It would be a topic of ongoing research to develop a methodology to deal with the 2020 data.

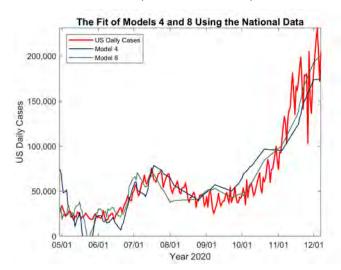# Main Result: Health Insurance Coverage in 2020

- The uninsured rates increased in the summer of 2020 after the lockdown.
    - COBRA and Medicaid did not fully offset the loss of coverage from ESI.
- The uninsured rates then decreased in the fall 2020 following reopening of businesses.
- The uninsured rates started to increase again in the winter as distressed employers were not able to provide health insurance to employees.
- The loss of coverage was concentrated on vulnerable population:
    - Working age
    - Hispanic
    - Low educational attainment
    - Low income

Main Result: The Effect of Uninsured Rate on COVID-19 Cases

- We consider the data before the vaccine EUA to focus on the effect of uninsured rate.

- To be consistent with the previous research, we consider policy variables used in Chernozhukov, Kasahara, and Schrimpf (2021).

- We consider 16 specifications using national and state-level data and various combinations of explanatory variables.

- We find a statistically significant effect of uninsured rates on COVID-19 daily cases for all 16 models with the p-value <0.01.

An Example: Fits of the Models

- The models fit the data well (R^2 0.796 and 0.888).

The Fit of Models 4 and 8 Using the National Data

Main Result: Counterfactual Policy Analysis

- Repealing ACA
- Full Medicaid Expansion

Counterfactual 1: Repealing ACA

- Since the ACA became the law in 2010, House Republicans passed repeal bills more than 50 times between 2010 and 2016 (Berenson (2017)).
- Recently, in *California v. Texas*, the Supreme Court ruled to leave the entire ACA intact.
- What could have happened if ACA had been repealed?

The Effect of Repealing ACA

- The ACA Repeal could have increased the cases by 3.42 times when the national data was used and 3.76 times when the state-level data was used.
- The result is consistent with the intuition that a country cannot contain the pandemic when people cannot afford medical care.
- The US COVID-19 crisis could have been catastrophic without ACA.

Counterfactual 2: Full Medicaid Expansion

- The ACA expands Medicaid coverage for most low-income adults to 138% of the federal poverty level (FPL).
- As of December 2020, 36 states and the District of Columbia had expanded Medicaid eligibility, whereas the remaining 14 states had not.
- What would have happened if Medicaid had been expanded to all these states before the crisis?

The Effect of Full Medicaid Expansion

- The full Medicaid expansion could have reduced the per-capita COVID-19 cases from 538% of the world average to 190% when the national data was used and to 150% when the state-level data was used.

- The result is consistent with the intuition that having health insurance coverages comparable with other countries could have mitigated the US COVID-19 cases to the level comparable to other countries.

Takeaway of the Paper

- In the 2008-2009 financial crisis, excessive leverages of financial institutions created a systemic risk to the financial system.
- In the 2020-2021 COVID-19 crisis, uninsured population and ESI create a systemic risk to the health system.
- After the 2008-2009 financial crisis, the US adopted long-term responses for the financial system such as Dodd-Frank, BASEL III, OFR, and FSOC.
- The US would need similar long-term responses for the health system.

Comparison of the Financial System and the Health System

	Financial System	Health System
Systemic Risk	Excessive leverage	Uninsured, ESI
Externality	Fire-sales spillover	Spreading to others
Crisis	2008-09	2020-21
Short-term Response	Asset purchases	Vaccine, ARP
Long-term Response	Dodd-Frank	?

Section 2. Previous Literature

- This study is related to prevlious literature on
  - Significance of health insurance coverage for health outcome
  - Impact of ACA on health insurance and health outcome
  - Social determinants of health for COVID-19

Significance of Health Insurance Coverage for Health

- The previous literature identifies several channels that health insurance coverage affects health outcomes such as
  - Medical service utilization (Card, Dobkin, and Maestas (2008) and Finkelstein, Taubman, Wright et al. (2012))
  - Emergency use (Doyle (2005), Hadley (2007), and Taubman, Allen, Wright, et al. (2014))
  - Follow-up care (Asplin, Rhodes, Levy, et al. (2005))
  - Prescription medication (Baicker, Allen, Wright, et al. (2017))
  - Preventive care (Bailey, O'Malley, Gold, et al. (2015))
  - Charges (Dusetzina, Basch, and Keating (2015))
  - Access to primary care (Smith, Akira, Hudson, et al. (2017)).
- This paper studies how the health insurance coverage (or the lack thereof) affects the COVID-19 cases.

Impact of ACA on Health Insurance and Health Outcome

- The Affordable Care Act delivers a significant impact on health insurance coverage and health outcome through various channels:
    - Impact on health insurance coverage (Collins, Robertson, Garber, et al. (2012), and Agarwal and Sommers (2020))
    - impact on a health outcome (Sommers, Baicker, and Epstein (2012), Miller, Johnson, and Wherry (2021), Sommers, Long, and Baicker (2014), Goldin, Lurie, and McCubbin (2021), Swaminathan, Sommers, Thorsness, et al. (2018), and Khatana, Bhatla, Nathan, et al. (2019))
    - financial impact on hospitals (Dobson, DaVanzo, Haught, et al. (2017))
- This study complements these studies by studying the impact of health insurance coverage on the COVID-19 cases.

Social Determinant of Health in the COVID-19 Crisis

- There have been significant interests in he social determinant of health during this pandemic such as
  Rodriguez, Solomon, de Lemos, et al. (2020), CMS (2021b), and
  Polyakova, Udalova, Kocks, et al. (2021).
- This paper complements their analysis by considering health insurance coverage as another social determinant of COVID-19.

Section 3. Health Insurance Coverage Before the COVID-19 Crisis

- The US Health Insurance System
- The Impact of ACA on Health Insurance Coverage
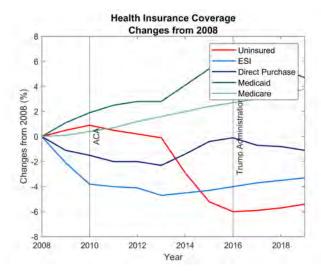- Health Insurance Disparities Before the Crisis

The US Health Insurance System

- The U.S. health insurance system is a mix of public and private insurers and health care providers:
  - Employer-sponsored health insurance is a plan provided through an employer (179 million, 55.4% in 2019).
  - Direct purchase is coverage purchased from an insurance company or through a federal or state marketplace (42 million, 13.1%).
  - Medicare is for adults 65 and older and people with disabilities (58 million, 18.1%).
  - Medicaid finances the delivery of primary and acute medical services, as well as long-term services, to a low-income population (64 million, 17.2%).
  - Significant number of uninsured (30 million, 9.2%).

The Impact of ACA on Health Insurance Coverage

- The ACA is a comprehensive health care reform law enacted in March 2010.
  - Individual Mandate: Almost all people were required to have health insurance coverage.
  - Employer Mandate: Large and medium-size employers must offer a health insurance.
  - Medicaid Expansion: Expanded eligibility to low-income adults, eliminating categorical restrictions on coverage in states.
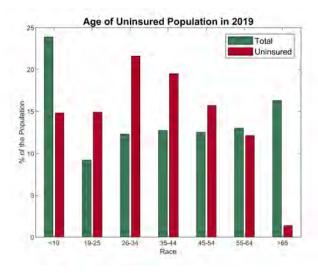 - Health Insurance Marketplaces: Individuals and small employers can purchase non-group insurance.

Health Insurance Coverage Changes from 2008

Health Insurance Disparities Before the Crisis

- Age: Disproportionately in the age group of 19-54.
- Ethnicity: Disproportionately Hispanic or African American.
- Education: The majority have education of high school graduates or less.
- Work Experiences: The majority are part-time workers or do not have jobs.
- Total Household Income: Almost half of the population has a household income of less than $50K.

Age of Uninsured Population

Ethnicity of Uninsured Population

Education of the Uninsured Population

Household Income of the Uninsured Population

Section 4. Health Insurance Coverage in 2020

- Surge in Unemployment in Spring 2020 and Its Impact
- The COVID-19 Crisis Reinforced the Health Insurance Disparities
- FFCRA and CARES Act

Surge in Unemployment in Spring 2020

- On March 13, 2020, President Trump proclaimed that the COVID-19 outbreak constitutes a national emergency.
- Starting in March, states started to adopt stay-at-home orders.
- The unemployment rate in April 2020 increased by 10.3 percentage points to 14.7 percent, the highest rate and the most significant over-the-month increase since 1949.

What Happens When a Worker Loses ESI

- When a worker loses ESI, there are ways that the worker could obtain insurance coverage:
  - Special enrollment in another group health plan (such as a spouse's employer's group health plan)
  - COBRA continuation coverage
  - Special Enrollment in individual market insurance coverage
  - Health coverage through Medicaid/CHIP
- But these safeguards did not completely offset the loss of coverage from ESI in 2020.

Health Insurance Coverage in 2020

- Uninsured rates increased in the summer and then in the winter as the distressed employers were no longer able to provide health insurance.

Health Insurance Coverage in 2020
Changes from 4/29

Who Got Uninsured in 2020?

- Age: Significant increase for the age group 35-44.
- Ethnicity: Significant increase for Hispanics.
- Education: Predominantly the population with less than high school educational attainment.
- Work Experiences: The majority are part-time workers or do not have jobs.
- Total Household Income: Uninsured rates of low-income groups have increased in the spring and summer of 2020. (The uninsured population has higher nonresponse rates.)
- Thus the COVID-19 Crisis further reinforced the existing health insurance coverage disparities.

Age of Uninsured Population in 2020

Ethnicity of Uninsured Population in 2020

Education of the Uninsured Population in 2020

Uninsured among Education Groups in 2020

- Less than High School
- High School
- College
- Bachelors and Above

(%, Smoothed) vs Year 2020

Household Income of the Uninsured Population in 2020

FFCRA and CARES Act

- The Families First Coronavirus Response Act (FFCRA) requires employers to provide their employees with expanded family and medical leave for COVID-19.
- The Coronavirus Aid, Relief, and Economic Security (CARES) Act has the Provider Relief Fund for testing, treatment, and vaccination for uninsured individuals.

Insufficiencies of FFCRA and CARES Act

- The uninsured population average annual total household income is around $50K.

- The average cost of hospital care for COVID-19 ranges from $51,000 to $78,000 (Hackett (2020)).

- FFCRA eliminates cost-sharing in only a few situations (Chua and Conti (2020)).

- Providers are not required to participate in the CARES Act Provider Relief Fund program (Schwartz and Tolbert (2020)).

- Reimbursement till February 2021 is just 26,891 cases with a total of $1.89 billion (CDC (2021b)).
    - Only a fraction of more than 14 million cases by December 2020.

- Thus these safeguards are not sufficient and the uninsured population are vulnerable to COVID-19.

Section 5. Coverage and COVID-19

- Data
- Effect of Uninsured Rates on Daily New Cases Controlling Policy Variables and the Time Trend
- Controlling for the Unemployment Rates

Data

- The COVID-19 cases data are from the New York Times website. We consider the data before the vaccine EUA of December 11, 2020 to focus on the effect of health insurance coverage.

- We obtain the uninsured rates data from the CDC Household Pulse Survey till the week of November 25-December 7.

- We obtain the unemployment rate (seasonally-adjusted) from BLS.

- The population data is from the 2019 National and State Population Estimates (NST-EST2019-0).

- To be consistent, we consider policy variables used in Chernozhukov, Kasahara, and Schrimpf (2021) from the same data source (Raifman, Nocka, Kristen, et al. (2020)).

Descriptive Statistics of Policy Variables

- The descriptive statistics of policy variables used in this paper are consistent with Chernozhukov, Kasahara, and Schrimpf (2021) (Figure 9) that considered the data till June 2020.

Correlation Among Policy Variables

- The correlation matrix is consistent with Chernozhukov, Kasahara, and Schrimpf (2021) (Table 2) who considered the data till June 2020.
- Correlations with the mask mandate are negative because the mask mandates were introduced as the economy reopened.

	Stay at Home	Business	Restaurant	Movie	Mask
Stay at Home	1				
Closed Business	0.98	1			
Closed Restaurant	0.92	0.94	1		
Closed Theaters	0.95	0.90	0.86	1	
Mask Mandate	-0.55	-0.69	-0.66	-0.43	1

First Models

- We first consider the linear regression models ("Model 1-4") to estimate the effect of US uninsured rates on US daily cases using the equation:

$$
\begin{aligned}
(\text{US Cases})_t = \ & \alpha + \beta(\text{US Uninsured Rates})_t \\
& + \sum_{j \in \{\text{policies}\}} \gamma_j(\text{Policy Variable } j)_t + \delta t + \varepsilon.
\end{aligned}
$$

- The coefficient of interest is β, an estimate for the impact of US uninsured rates on US daily cases controlling for
  - Policy variables (masks, closures, and stay-at-home order)
  - Time trend

Results

- Uninsured rates have statistically significant effects on COVID-19 cases for all 4 models.

US Daily Cases	(1)	(2)	(3)	(4)
Uninsured (%)	23036.42***	46228.18***	46100.41***	44337.96***
	(0.00)	(0.00)	(0.00)	(0.00)
Mask Mandate (%)		-2343.82***	-1534.56***	-1518.06***
		(0.00)	(0.00)	(0.00)
Closures (%),			787.54***	1479.37**
			(0.00)	(0.02)
Stay at Home (%)				-797.48
				(0.23)
Time Trend	643.94***	1070.69***	1097.55***	1081.36***
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	Yes	Yes	Yes	Yes
Observations	223	223	223	223
R-squared	0.619	0.78	0.794	0.796
F-statistics	179	259	211	169

Controlling Unemployment Rates

- We now control for the unemployment rate ("Model 5-8"):

$$
\begin{aligned}
(\text{US Cases})_t \\
= \ & \alpha + \beta(\text{US Uninsured Rates})_t \\
& + \gamma(\text{US Unemployment Rate})_t \\
& + \sum_{j \in \{\text{policies}\}} \delta_j(\text{Policy Variable } j)_t + \epsilon t + \varepsilon.
\end{aligned}
$$

- The coefficient of interest is β, an estimate for the impact of US uninsured rates on US daily cases controlling for
  - Unemployment rates
  - Policy variables (masks, closures, and stay-at-home order)
  - Time trend

Introduction and Summary   Literature   Coverage Before 2020   Coverage in 2020   **Coverage and COVID**   Counterfactuals   Conclusion

○○○○○○○○○○○○○○○○○○○○○○○○○○ ○○○○   ○○○○○○○○○   ○○○○○○○○○○○ ○○○○○○○●○○   ○○○○○   ○○○○○

Results

- Uninsured rates have statistically significant effects for all models.

US Daily Cases	(5)	(6)	(7)	(8)
Uninsured (%)	38178.18***	35464.97***	35467.98***	30309.75***
	(0.00)	(0.00)	(0.00)	(0.00)
Unemployment (%)	45906.17***	54254.37***	54248.43***	57544.73***
	(0.00)	(0.00)	(0.00)	(0.00)
Mask (%)		658.94**	659.28**	834.82***
		(0.02)	(0.02)	(0.00)
Closures (%)			-0.59	1723.98***
			(0.16)	(0.00)
Stay at Home (%)				-2041.69***
				(0.00)
Time Trend	2097.33***	2246.09***	2245.99***	2274.32***
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	Yes	Yes	Yes	Yes
Observations	223	223	223	223
R-squared	0.876	0.88	0.88	0.888
F-statistics	518	399	317	287

Fits of the Model

- The models fit the data well (R^2 0.796 and 0.888).

The Fit of Models 4 and 8 Using the National Data

Robustness Check with the State-Level Data

- The results are robust with the state-level data that also provide good fits.

The Fit of Models 12 and 16 Using the State-Level Data

Section 6. Counterfactual Policy Analysis

- Effect of the ACA Repeal
- Effect of the Full Medicaid Expansion

Counterfactual 1: Repealing ACA

- We follow Banthin, Simpson, and Blumberg (2020) who estimate that 21.1 million people would be uninsured from repealing ACA.
- The COVID-19 cases could have increased 3.42 times (confidence interval 2.59 to 4.25).
- The result is consistent with the intuition that a country cannot contain a pandemic when people cannot access the health care.

Effect of Repealing ACA

- The ACA repeal could have had catastrophic impacts.

Counterfactual 2: Full Medicaid Expansion

- We follow Buettgens (2021) who estimate the uninsured population would have decreased by 4.19 million for the age 19-65 with the full Medicaid expansion.
- Full Medicaid expansion could have reduced the per-capita COVID-19 cases from 538% of the world average to 190% with the national data to 150% with the state-level data.
- The result is consistent with the intuition that having health insurance coverages comparable with other countries could have mitigated the US COVID-19 cases to the level comparable to other countries.

Effect of the Full Medicaid Expansion

- Full Medicaid expansion could have mitigated the severity of the US COVID-19 crisis.

Effect of Medicaid Full Expansion on COVID-19 Cases Using the National Data

Section 7. Conclusion

- Summary
- Future work

Summary

- The COVID-19 crisis has caused disproportionately severe damages to the US compared with other countries.

- Understanding why the US COVID-19 crisis has been so severe is an essential question for the US health care system.

- The contribution is that this paper is the first to propose the idea that a significant number of uninsured and the employer-sponsored health insurance system could create a systemic risk to the US health system.

- We find that the uninsured rates have statistically significant effects on the COVID-19 cases after controlling unemployment rates, time trend, NPIs, and state heterogeneities.

- A counterfactual analysis finds that
    - Repealing ACA could have created a devastating impact.
    - Full Medicaid expansion could have significantly mitigated the severity of the US COVID-19 crisis.

Future Work

- This study shows the usefulness of the systemic approach to the health system.
- It would be significant to develop a methodology to be able to deal with the 2020 data.
- The analysis suggests the need to study coordinated responses of the public health and health insurance system.
- This analysis shows the need to further study the relevance of the lessons of the 2008-2009 financial crisis to the health system.

Takeaway of the Paper: Need for Systemic Responses to the US Health System

	Financial System	Health System
Systemic Risk	Excessive leverage	Uninsured, ESI
Externality	Fire-sales spillover	Spreading to others
Crisis	2008-09	2020-21
Short-term Response	Asset purchases	Vaccine, ARP
Long-term Response	Dodd-Frank	?

Thank you!

📄 Adrian, T., and H. S. Shin. 2008. "Liquidity and Leverage."
Federal Reserve Bank of New York Staff Reports. No. 328.

📄 Agarwal, S.D., and B. D. Sommers. 2020. "Insurance Coverage
after Job Loss: The Importance of the ACA during the
Covid-Associated Recession." New England Journal of Medicine.
Volume 383. Pages 1603-06.

📄 Arrow, K. 1963. "Uncertainty and Welfare Economics of Medical
Care." American Economic Review. Volume 53. Number 5. Pages
941-973.

📄 Asplin B. R., K. V. Rhodes, H. Levy, N. Lurie, A. L. Crain, B. P.
Carlin, and A. L. Kellermann. 2005. "Insurance Status and Access
to Urgent Ambulatory Care Follow-up Appointments." JAMA.
Volume 294. Number 10. Pages 1248-54.

📄 Baicker, K., H. L. Allen, B. J. Wright, and A. N. Finkelstein. 2017.
"The Effect of Medicaid on Medication Use among Poor Adults:

Evidence from Oregon." Health Affairs. Volume 36. Number 12. 2110-14.

Bailey S.R., J. P. O'Malley, R. Gold, J. Heintzman, M. Marino, and J. E. DeVoe. 2015. "Receipt of Diabetes Preventive Services Differs by Insurance Status at Visit." American Journal of Preventive Medicine. Volume 48. Number 2. Pages 229–233.

Baker, R. E., S. W. Park, W. Yang, G. A. Vecchi, C. J. E. Metcalf, and B. T. Grenfell. 2020. "The Impact of COVID-19 Nonpharmaceutical Interventions on the Future Dynamics of Endemic Infections." Proceedings of the National Academy of Sciences. Volume 117. Number 48. Pages 30547-30553.

Banthin, J., M. Simpson, M. Buettgens, L. J. Blumberg, and R. Wang. 2020. "Changes in Health Insurance Coverage Due to the COVID-19 Recession: Preliminary Estimates Using Microsimulation." Robert Wood Johnson Foundation.

📄 Banthin, J., and J. Holahan. 2020. "Making Sense of Competing Estimates: The COVID-19 Recession's Effects on Health Insurance Coverage." Urban Institute.

📄 Berchick, E. R., L. Mykyta, and S. M. Stern. 2020. "The Influence of COVID-19-related Data Collection Changes on Measuring Health Insurance Coverage in the 2020 CPS ASEC." Census Working Paper 2020-13.

📄 Berenson, Tessa. 2017. "Reminder: The House Voted to Repeal Obamacare More Than 50 Times." Time.

📄 Bernanke, B, Geithner T, and H. Paulson, with J. Liang. 2020. First Responders: Inside the U.S. Strategy for Fighting the 2007-2009 Global Financial Crisis. Yale University Press.

📄 Bootsma, M. C. J., and N. M. Ferguson. 2007. "The Effect of Public Health Measures on the 1918 Influenza Pandemic in U.S.

Cities." Proceedings of the National Academy of Sciences. Volume 104. Number 18. Pages 7588–7593.

Buettgens, M. 2021. "Medicaid Expansion Would Have a Larger Impact Than Ever during the COVID-19 Pandemic." Urban Institute.

Buffington, C., J. Fields, and L. Foster. 2021. "Measuring the Impact of COVID-19 on Businesses and People: Lessons from the Census Bureau's Experience." US Census Working Paper CES-21-02

Card, D., C. Dobkin, and N. Maestas. 2008. "The Impact of Nearly Universal Insurance Coverage on Health Care Utilization: Evidence from Medicare." American Economic Review. Volume 98. Number 5. Pages 2242-58.

CDC. 2021a. "National Health Interview Survey."

📄 CDC. 2021b. "Claims Reimbursement to Health Care Providers and Facilities for Testing, Treatment, and Vaccine Administration of the Uninsured."

📄 Chang, S., E. Pierson, P. W. Koh, J. Gerardin, B. Redbird, D. Grusky, and J. Leskovec. 2020. "Mobility Network Models of COVID-19 Explain Inequities and Inform Reopening." Nature. Volume. 589, Pages 82–87.

📄 Chernozhukov, V., H. Kasahara, and P. Schrimpf. 2021. "Causal Impact of Masks, Policies, Behavior on Early Covid-19 Pandemic in the U.S." Journal of Econometrics. Volume 220. Number 1. Pages 23-62.

📄 Chiu, A., L. Bever, and A. E. Cha. "Driven by Covid deaths, U.S. Life Expectancy Dropped by 1.5 Years in 2020." Washington Post.

📄 Chua, K.P., and R. M. Conti. 2020. "Despite The Families First Coronavirus Response Act, COVID-19 Evaluation Is Not Necessarily Free." Health Affairs Blog.

📄 CMS. 2021a. "National Health Expenditure Data"

📄 CMS. 2021b. "Preliminary Medicare COVID-19 Data Snapshot."

📄 Cohen. R., E. P. Terlizzi, A. E. Cha, and M. E. Martinez, Division of Health Interview Statistics, National Center for Health Statistics. 2020. "Health Insurance Coverage: Early Release of Estimates From the National Health Interview Survey, 2019."

📄 Cohen. R., E. P. Terlizzi, A. E. Cha, and M. E. Martinez, Division of Health Interview Statistics, National Center for Health Statistics. 2021. "Health Insurance Coverage: Early Release of Estimates From the National Health Interview Survey, January–June 2020."

📄 Collins S. R., R. Robertson, T. Garber, and M. M. Doty. 2012. "Gaps in Health Insurance: Why So Many Americans Experience Breaks in Coverage and How the Affordable Care Act Will Help Findings from the Commonwealth Fund Health Insurance Tracking Survey of U.S. Adults, 2011." The Commonwealth Fund.

📄 Cook, M.C., and D. M. Daily. 2021. "Webinar on the Impact of the Pandemic on the American Community Survey." US Census.

📄 Correia, S., S. Luck, and E. Verner. 2020. "Pandemics Depress the Economy, Public Health Interventions Do Not: Evidence from the 1918 Flu."

📄 Courtemanche, C., J. Garuccio, A. Le, J. Pinkston, and A. Yelowitz. 2020. "Strong Social Distancing Measures in The United States Reduced The COVID-19 Growth Rate." Health Affairs. Volume 39. No. 7.

📄 Cox, C., and D. McDermott. 2020. "What Have Pandemic-Related Job Losses Meant for Health Coverage?" KFF.

📄 Dafny, L. S., Y. W. Soon, Z. B. Cullen, and C. T. Stanton. 2020. "How Has Covid-19 Affected Health Insurance Offered by Small Businesses in the U.S.? Early Evidence from a Survey." NEJM Catalyst Innovation in Care Delivery.

📄 Dobson, A., J. DaVanzo, R. Haught, P-H. Luu. 2017. "Comparing the Affordable Care Act's Financial Impact on Safety-Net Hospitals in States That Expanded Medicaid and Those That Did Not." The Commonwealth Fund.

📄 Doyle Jr, J. 2005. "Health Insurance, Treatment, and Outcomes: Using Auto Accidents as Health Shocks." Review of Economics and Statistics. Volume 87. Number 2. Pages 256-270.

📄 Dusetzina, S., B. E. Basch, and Nancy L. Keating. 2015. "For Uninsured Cancer Patients, Outpatient Charges Can Be Costly,

Putting Treatments Out Of Reach." Health Affairs. Volume 34. Number 4.

Fair Health. 2020. "Key Characteristics of COVID-19 Patients."

Falk, G., J. Carter., I. A. Nicchitta, E. C. Nyhof, and P. D. Romero. 2020. "Unemployment Rates During the COVID-19 Pandemic: In Brief." Congressional Research Service.

Farmer, B. 2020. "Hospital Bills For Uninsured COVID-19 Patients Are Covered, But No One Tells Them." NPR.

FDA. 2020. "FDA Takes Key Action in Fight Against COVID-19 By Issuing Emergency Use Authorization for First COVID-19 Vaccine." December 11, 2020.

Finkelstein, A., S. Taubman, B. Wright, M. Bernstein, J. Gruber, J. P. Newhouse, H. Allen, K. Baicker, and The Oregon Health Study Group. 2012. "The Oregon Health Insurance Experiment:

Evidence from the First Year." The Quarterly Journal of Economics, Volume 127. Number 3. Pages 1057-1106.

📄 Garfield, R., G. Claxton, A. Damico, and L. Levitt. 2019. "The Uninsured and the ACA: A Primer." KFF.

📄 Goldin J., I. Z. Lurie, and J. McCubbin. 2021. "Health Insurance and Mortality: Experimental Evidence from Taxpayer Outreach." The Quarterly Journal of Economics. Volume 136. Number 1. Pages 1-49.

📄 Gruber, J. 2017. "Delivering Public Health Insurance Through Private Plan Choice in the United States." Journal of Economic Perspectives. Volume 31. Number 4. Pages 3-22.

📄 Hackett, M. 2020. "Average Cost of Hospital Care for COVID-19 Ranges From $51,000 to $78,000, Based on Age." Healthcare Finance.

📄 Hadley, J. 2007. "Insurance Coverage, Medical Care Use, and Short-term Health Changes Following an Unintentional Injury or the Onset of a Chronic Condition." JAMA. Volume 297. Number 10. Pages 1073-1084.

📄 Health Resources and Services Administration. 2020. "HRSA COVID-19 Claims Reimbursement to Health Care Providers and Facilities for Testing."

📄 IHME COVID-19 Forecasting Team. 2020. "Modeling COVID-19 Scenarios for the United States." Nature Medicine.

📄 Johnson, A. "Uninsured Rates are Putting Essential Workers at Greater Risk."

📄 Lewis, D. 2021. "Superspreading Drives the COVID Pandemic and Could Help to Tame It." Nature News Feature.
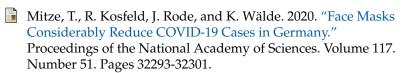
📄 Kazumori. E. 2020. "The Cost of Waiting Three Weeks: Lessons from the 2007-09 Financial Crisis for the 2020 COVID-19 Pandemic Crisis."

📄 Keisler-Starkey K., and L. N. Bunch. 2020. "Health Insurance Coverage in the United States: 2019." Census.

📄 KFF. 2020. "Population Distribution by Age."

📄 Khatana, S.A.M., A. Bhatla, A. S. Nathan, J. Giri, C. Shen, D. S. Kazi, R. W. Yeh, and P. W. Groeneveld. 2019. "Association of Medicaid Expansion With Cardiovascular Mortality." JAMA Cardiol. Volume 4. Number 7. Pages 671-679.

📄 Kirzinger, A., C. Muñana, B. Wu, and M. Brodie. 2019. "Data Note: Americans' Challenges with Health Care Costs." KFF.

📄 Kurani, N., and C. Cox. 2020. "What Drives Health Spending in the U.S. Compared to Other Countries." Peterson-KFF Health System Tracker.
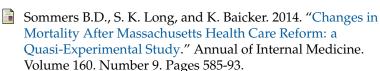
📄 Lyu W., and G. L. Wehby 2020. "Community Use Of Face Masks And COVID-19: Evidence From A Natural Experiment Of State Mandates In the US." Health Affairs. Volume 39. Number 8. Pages 1419-1425.

📄 The National Center for Coverage Innovation. 2020. "The COVID-19 Pandemic and Resulting Economic Crash Have Caused the Greatest Health Insurance Losses in American History."

📄 Miller S., N. Johnson, and L. Wherry. 2021. "Medicaid and Mortality: New Evidence From Linked Survey and Administrative Data." The Quarterly Journal of Economics. Volume 136. Number 3. Pages 1783-1829.

📄 Mitze, T., R. Kosfeld, J. Rode, and K. Wälde. 2020. "Face Masks Considerably Reduce COVID-19 Cases in Germany." Proceedings of the National Academy of Sciences. Volume 117. Number 51. Pages 32293-32301.

📄 Polyakova M., V. Udalova, G. Kocks, K. Genadek, K. Finlay, and A. Finkelstein. 2021. "Racial Disparities in Excess All-Cause Mortality During the Early COVID-19 Pandemic Varied Substantially Across States." Health Affairs. Volume 40. Number 2.

📄 Raifman, J., K. Nocka, J. Kristen, et al. 2020. "COVID-19 US State Policy Database."

📄 Rodriguez, F., N. Solomon, J. A. de Lemos, S. R. Das, D. A. Morrow, S. M. Bradley, M. S.V. Elkind, J. H. Williams, D. Holmes, R. A. Matsouaka, D. Gupta, T. J. Gluckman, M. Abdalla, M. A. Albert, C. W. Yancy, T. Y. Wang. 2020. "Racial and Ethnic Differences in Presentation and Outcomes for Patients

Hospitalized with COVID-19." Circulation. Volume 143. Number 24.

📄 Rudowitz, R., E. Hinton, M. Guth, and L. Stolyar. 2020. "Medicaid Enrollment & Spending Growth: FY 2020 & 2021." KFF.

📄 Rothbaum, J., and A. Bee. 2021. "Coronavirus Infects Surveys, Too: Survey Nonresponse Bias and the Coronavirus Pandemic." Census WP2020-10.

📄 Schwartz, K., and J. Tolbert. 2020. "Limitations of the Program for Uninsured COVID-19 Patients Raise Concerns." KFF.

📄 Smith D. A., A. Akira, K. Hudson, A. Hudson, M. Hudson, M. Mitchell, and E. Crook. 2017. "The Effect of Health Insurance Coverage and the Doctor-Patient Relationship on Health Care Utilization in High Poverty Neighborhoods." Preventive Medicine Reports. Volume 7. Pages 158–161.

📄 Sommers B.D., S. K. Long, and K. Baicker. 2014. "Changes in Mortality After Massachusetts Health Care Reform: a Quasi-Experimental Study." Annual of Internal Medicine. Volume 160. Number 9. Pages 585-93.

📄 Sommers, B.D., K. Baicker, and A. M. Epstein, 2012. "Mortality and Access to Care among Adults after State Medicaid Expansions." New England Journal of Medicine. Volume 367. Pages 1025-1034.

📄 Swagel, P. "Legal, Political, and Institutional Constraints on the Financial Crisis Policy Response." Journal of Economic Perspectives. Volume 9. Number 2. Pages 107-22.

📄 Swaminathan, S., B. D. Sommers, R. Thorsness, R. Mehrotra, Y. Lee, and A. N. Trivedi. 2018. "Association of Medicaid Expansion With 1-Year Mortality Among Patients With End-Stage Renal Disease." JAMA. Volume 320. Number 21. Pages 2242-2250.

Taipale, J., P. Romer, and S. Linnarsson. 2020. "Population-Scale Testing Can Suppress the Spread of COVID-19." Medrxiv.

Taubman, S. L., H. L. Allen, B. J. Wright, K. Baicker, and A. N. Finkelstein. 2014. "Medicaid Increases Emergency-Department Use: Evidence from Oregon's Health Insurance Experiment." Science. 343. Pages. 263-268.

Tikkanen, R., R. Osborn, E. Mossialos, A. Djordjevic, and G. Wharton. 2020. "2020 International Profiles of Health Care Systems." The Commonwealth Fund.

United States Census Bureau. 2020. "Measuring Household Experiences during the Coronavirus Pandemic."

United States Census Bureau. 2021a. "Selected Characteristics of the Health Insurance Coverage in the United States."

📄 United States Census Bureau. 2021b. "Selected Characteristics of the Uninsured in the United States."

📄 United States Census Bureau. 2021c. "Annual Social and Economic Supplement (ASEC) of the Current Population Survey (CPS)."

📄 United States Census Bureau. 2021d. "American Community Survey Tables for Health Insurance Coverage."

📄 Witters, D. 2020a. "In U.S., 14% With Likely COVID-19 to Avoid Care Due to Cost." Gallup.

📄 Witters, D. 2020b. "In U.S., Large Racial Divide in COVID-19 Cost Concerns." Gallup.

📄 Zhou R A., B. Katherine, S. Taubman, and A. N. Finkelstein. 2017. "The Uninsured Do Not Use The Emergency Department

More—They Use Other Care Less." Health Affairs Volume 36. Number 12. Pages 2115-22.