

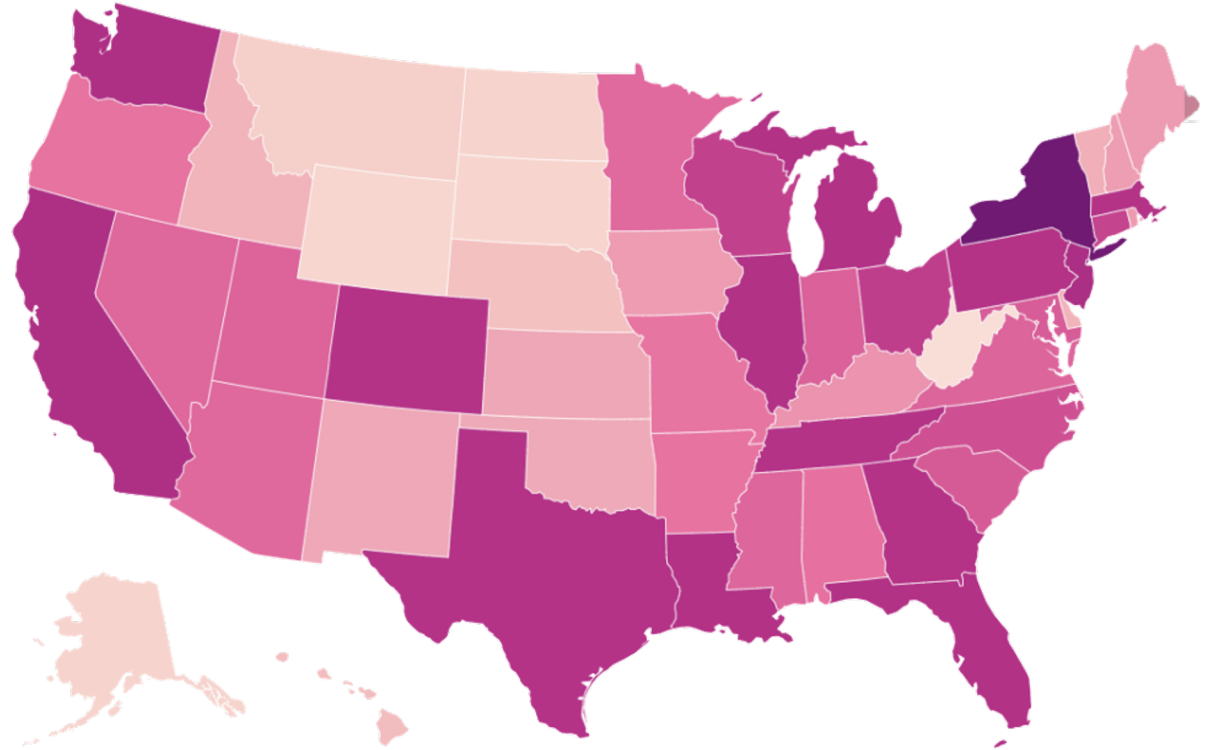


COVID-19 Impact on Fraud at Financial Institutions

What is happening and how to prepare for what's coming

Randal Cox | Chief Data Scientist
Cahn Tran | CEO

April 29, 2020





Outline

- Economic Impact
- Payments and Transactions Analysis
- Impact on Banks and Credit Unions
- Fraud Implications
- Risk Mitigations



- Leading breach & card-compromise fraud solution
- Machine learning based predictive analytics
- Anti-fraud consortium network
- FIS, Fiserv, MasterCard, and CUNA partners

About Rippleshot

THOUSANDS of banks & credit unions protected

Founded in
2013

MILLIONS of Cards Monitored

Headquartered in
Chicago, IL

BILLIONS of card transactions processed



BY FEATURES KPMG

2016

FINTECH100

Leading Global Fintech Innovators

AWARD-WINNING

KPMG's Fintech100: Leading Global fintech innovators



This is a Black Swan Event

Black swan events are impossible to predict due to their extreme rarity yet have catastrophic consequences.

Other Black Swan Events:

- 2008 Financial Crisis
- 9/11
- Spanish Flu





What We'll Cover:

- What is the economic impact?
- How deep is the shock to the system?
- What does a recovery look like?
- What does our payments analysis show?
- What does this mean to banks and credit unions?
- What are the fraud implications?
- What are some mitigation strategies?

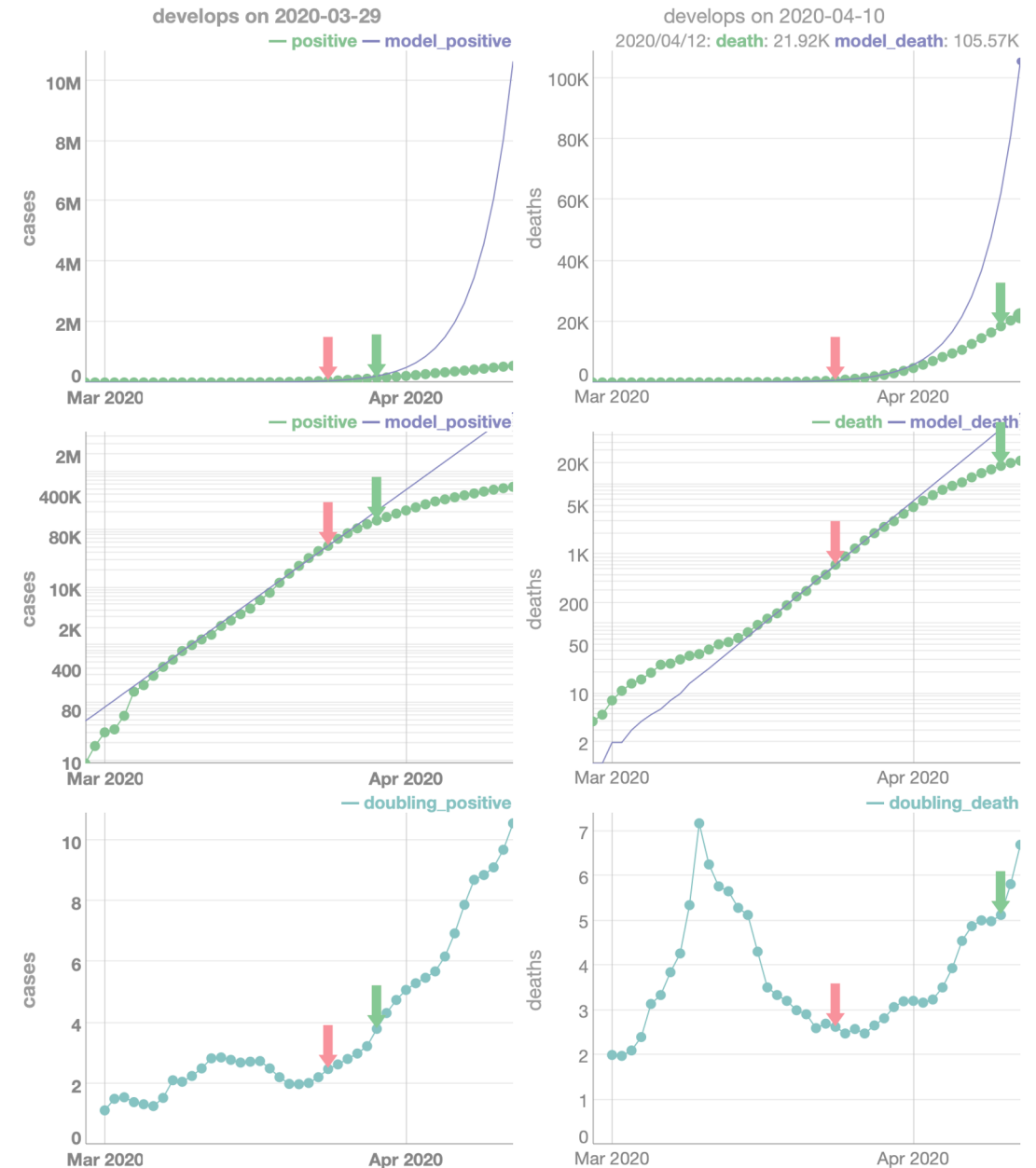




Randal Cox, PhD
Chief Data Scientist

Pandemic Models

- Cases
- Hospitalizations
- Deaths





COVID-19 Financial Impacts



Authorizations

Lost Revenue & decrease in transaction volumes



Relationships

Fragile financial health of merchants and cardholders



Frauds

Increase in fraud rates, volatility & breaches, scams



Research Data Sources

Data
Consortium

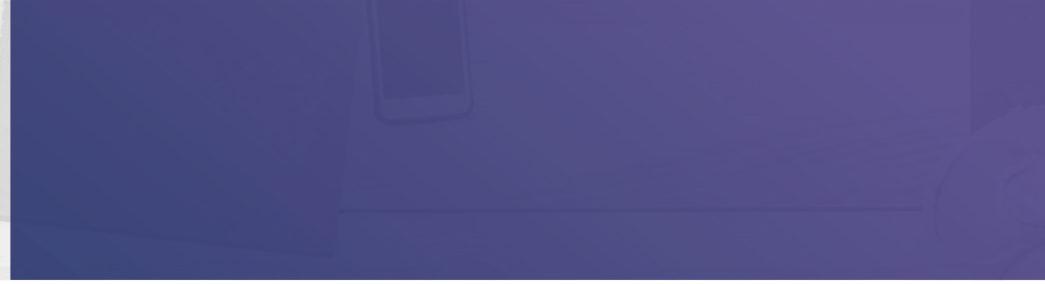
Public
Sources

 RippleShot Proprietary Transaction Data



Economic Impact

- Financial Pandemic Models
- Historical Pandemic



Model: Simulations (Before) Optimistic

World Bank (<https://shrtm.nu/ozGR>)

- 1 to 5% GDP drop
- \$800B economic losses

2009 Health Economics Paper (<https://shrtm.nu/M743>)

- 3% to 21% loss in GDP

2006 Paper by European Commission (<https://shrtm.nu/FYr3>)

- 1.6% GDP drop
- Economy only grows 0.5%



Model: Forecasts (After)

World Economic Forum

- \$1T loss to global economy

Greg Daco of Oxford Economics (<https://shrtm.nu/3TGw>)

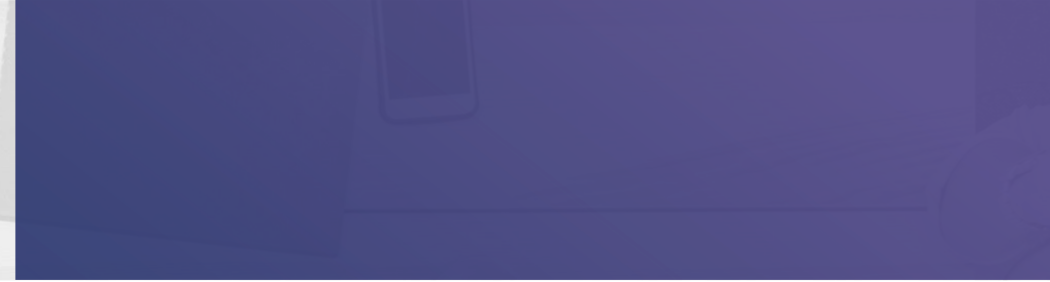
- 12% drop in GDP
- Recession inevitable

Goldman Sachs (<https://shrtm.nu/aT3G>)

- 34% GDP loss

IMF (<https://shrtm.nu/KBzJ>)

- Worst Economic Downturn Since the Great Depression
- Global growth to -3% ? **CONTRACTION**

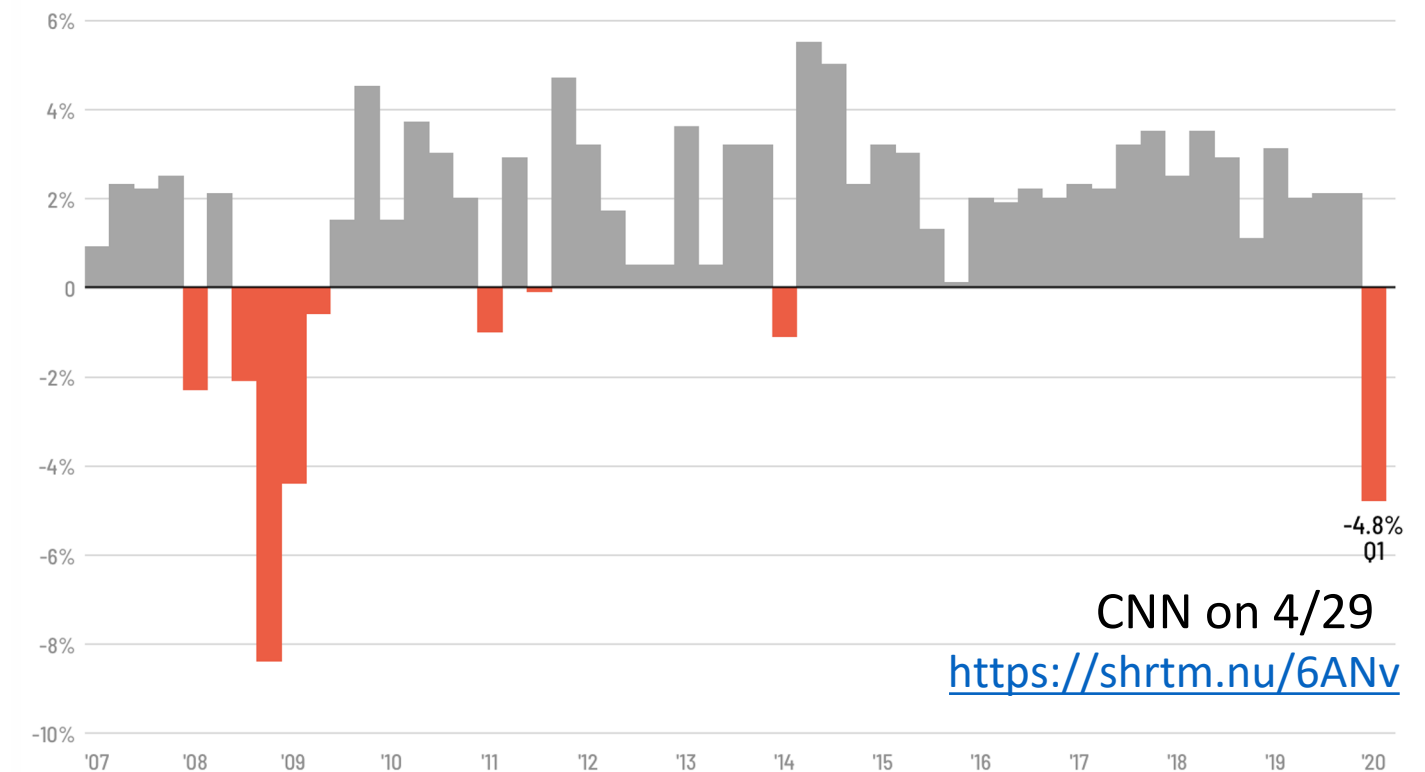


Many groups have made grimmer predictions as the pandemic has evolved:

- **The World Economic forum:** \$1T in global loss
- **Oxford Economics:** Recession is inevitable; or we are already in one
- **Goldman Sachs:** Predicted a loss of a third of our GDP
- **International Monetary Fund:** We will enter a contraction, worse than any since the Great Depression

US GDP turns negative, worst since 2008

US GDP shrank at a 4.8% annualized rate in Q1 due to the coronavirus pausing the economy.



Note: Percent change from preceding period, quarterly, seasonally adjusted.

Source: US Bureau of Economic Analysis, FRED

Graphic: Tal Yellin, CNN

CNN on 4/29

<https://shrtm.nu/6ANv>

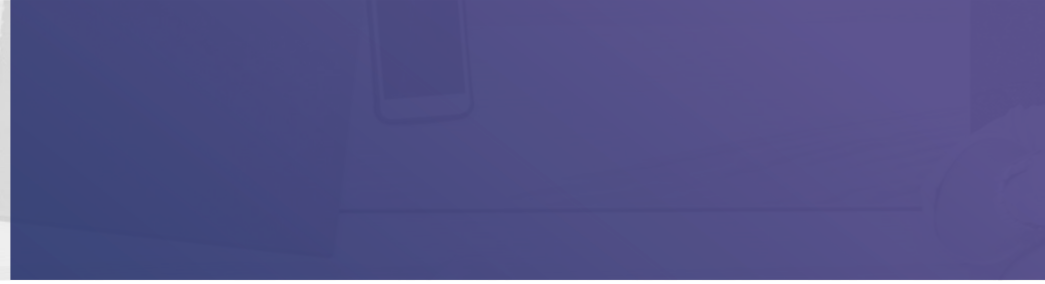


Model: Forecasts (After)

- Contraction of GDP
- \$1T Economic Loss
- Recession Inevitable



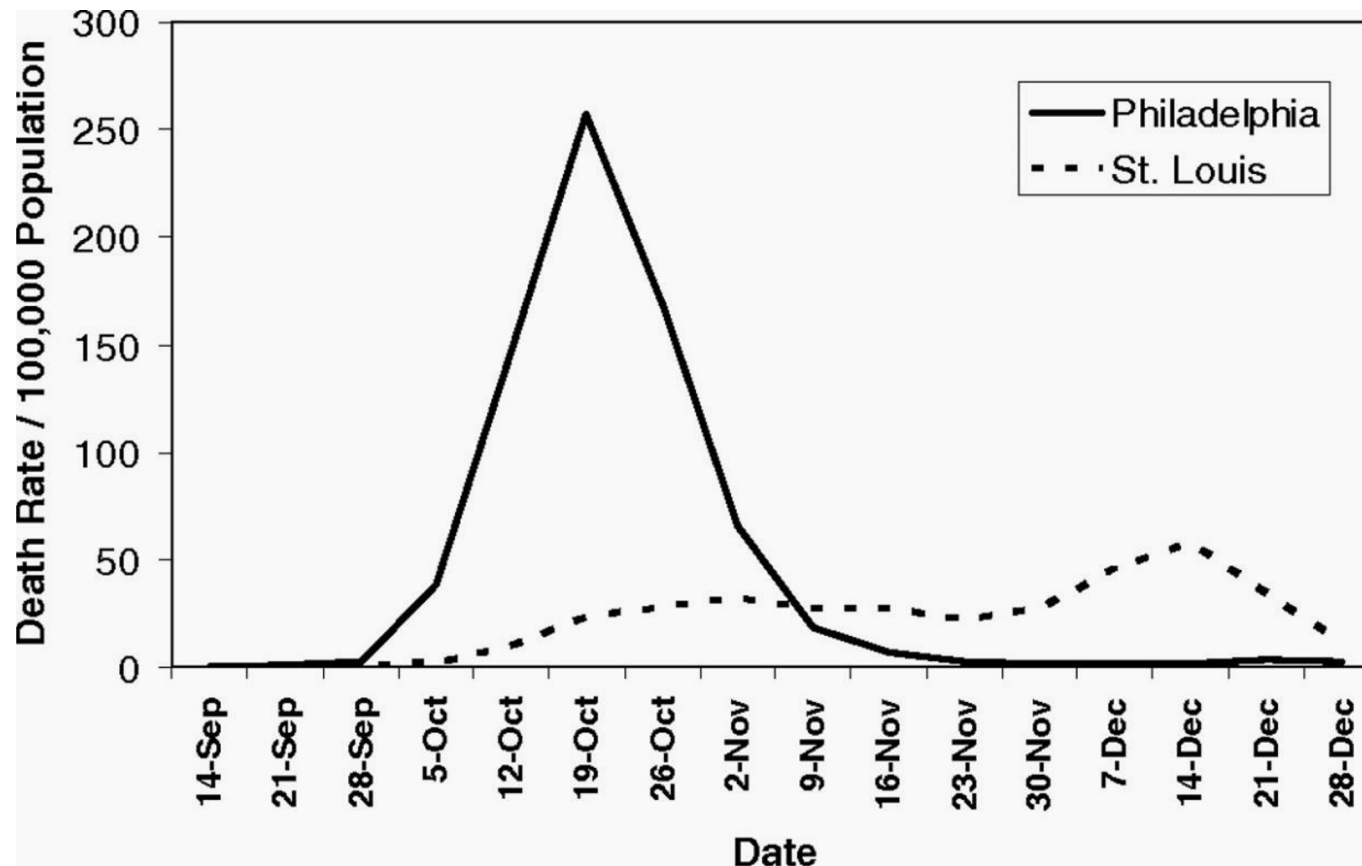
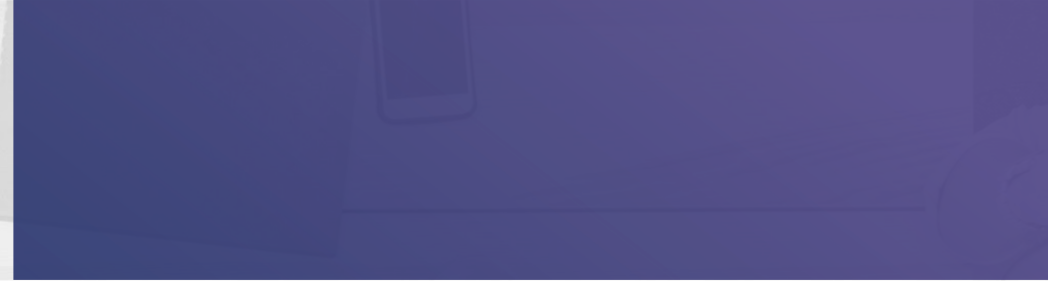
Historical Pandemics



1918 Pandemic

Sparse economic data

- **Fed Reserve Bank of St. Louis** (<https://shrtm.nu/UiOg>)
 - **Health care** overload
 - Double-digit **losses** in revenue
 - **Cities** had higher mortality, disruption
 - Fast recovery after LAST wave



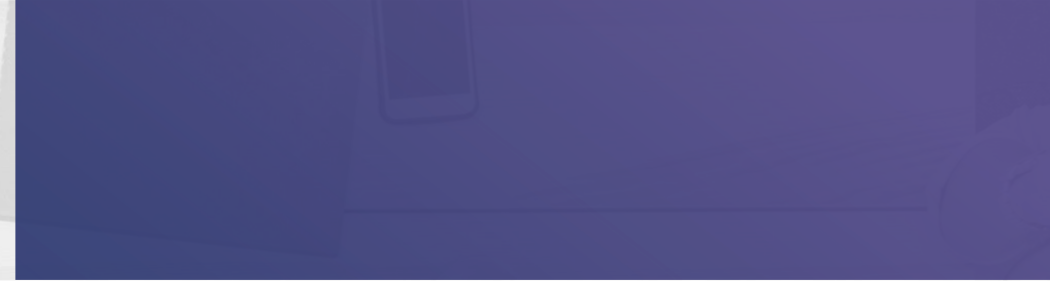
Regional differences in mortality and recovery

Proceedings of the National Academy of Sciences

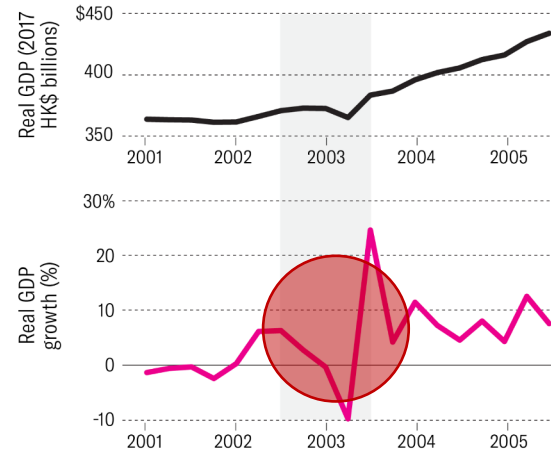
Hatchet, et al

<https://shrtm.nu/KBzJ>

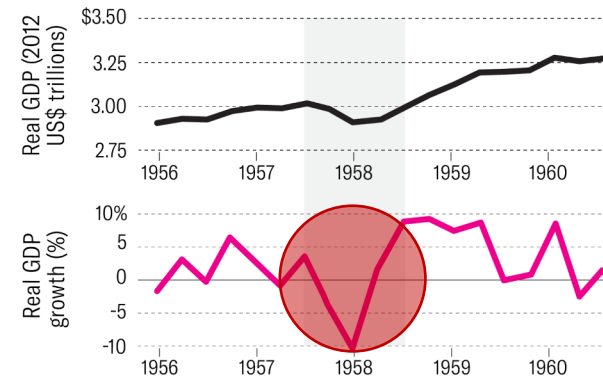
Employment recovery also better in St. Louis



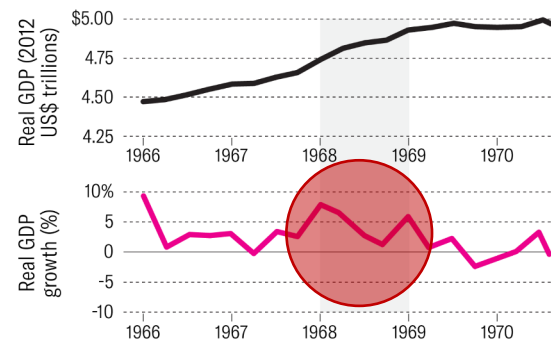
2002 SARS – 286 global deaths



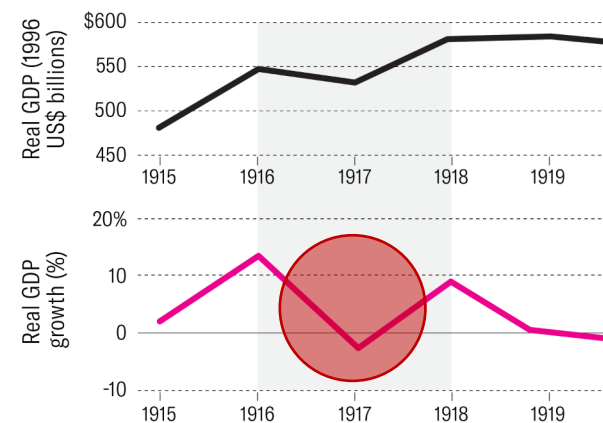
1958 H2N2 (“Asian”) flu – 116,000 U.S. deaths



1968 H3N2 (“Hong Kong”) flu – 100,000 U.S. deaths



1918 Spanish flu – 675,000 U.S. deaths



V-Shaped Epidemics

These shocks all look like recessions, not profound depressions.

Looking at other large epidemics shows roughly a similar pattern of shock and recovery.

Harvard Business Review
<https://shrtm.nu/Nlu8>



Recession not Depression?

- Short duration shock
- Pandemic Rebounds
- 1918 Rebound
- \$2T Federal Stimulus
- \$5T in Fed liquidity

Recession unless epidemic lasts a long time

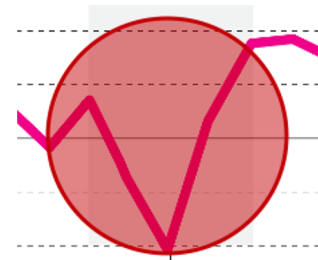
Predictions

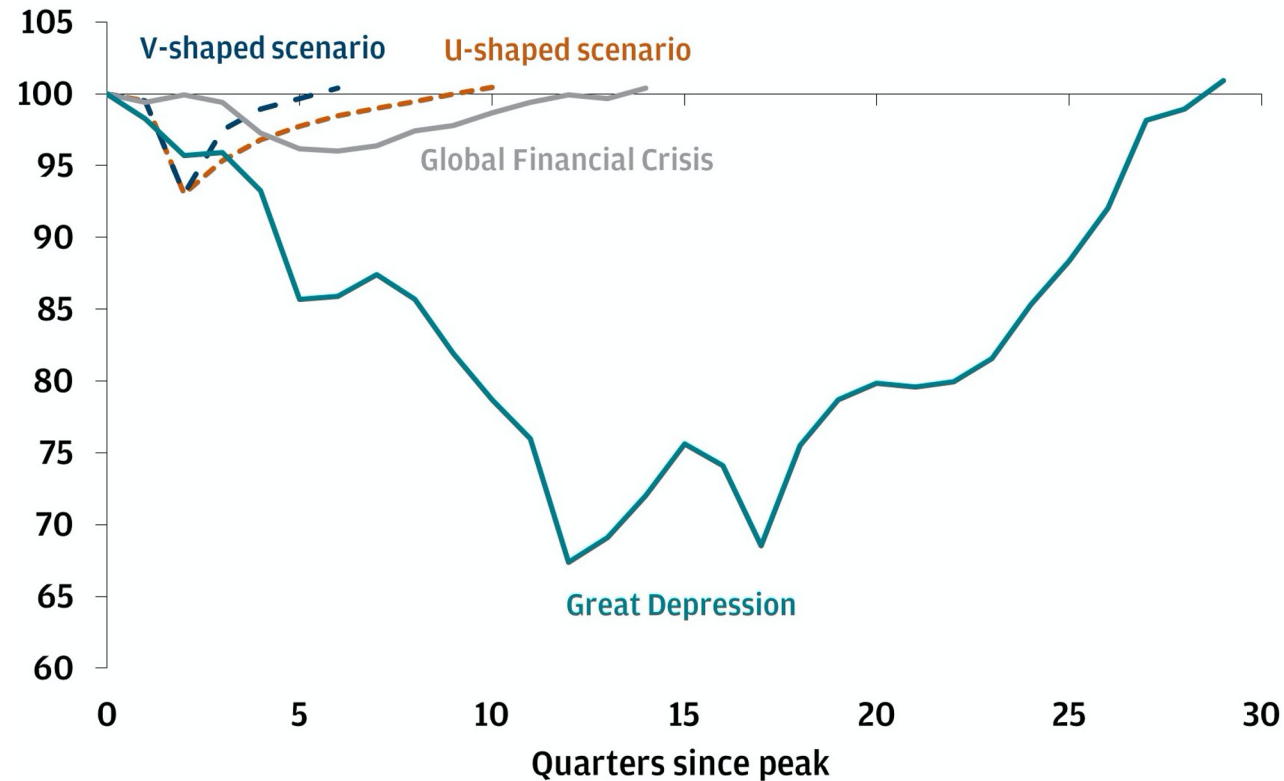
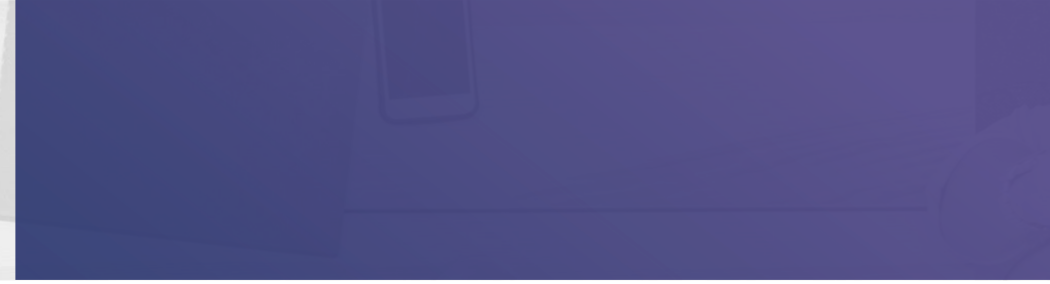
During Shutdowns

- CNP spending drops 20-30%
- CP spending drops 40-50%
- Diverse regional and temporal effects

After Shutdowns

- V-Shaped Recovery
- Regional recovery differences
- Second and third waves?





Duration will depend on:

- Waves
- Treatments
- Vaccines

JP Morgan and Bureau Economic Analysis

<https://shrtm.nu/ELf0>



Authorizations

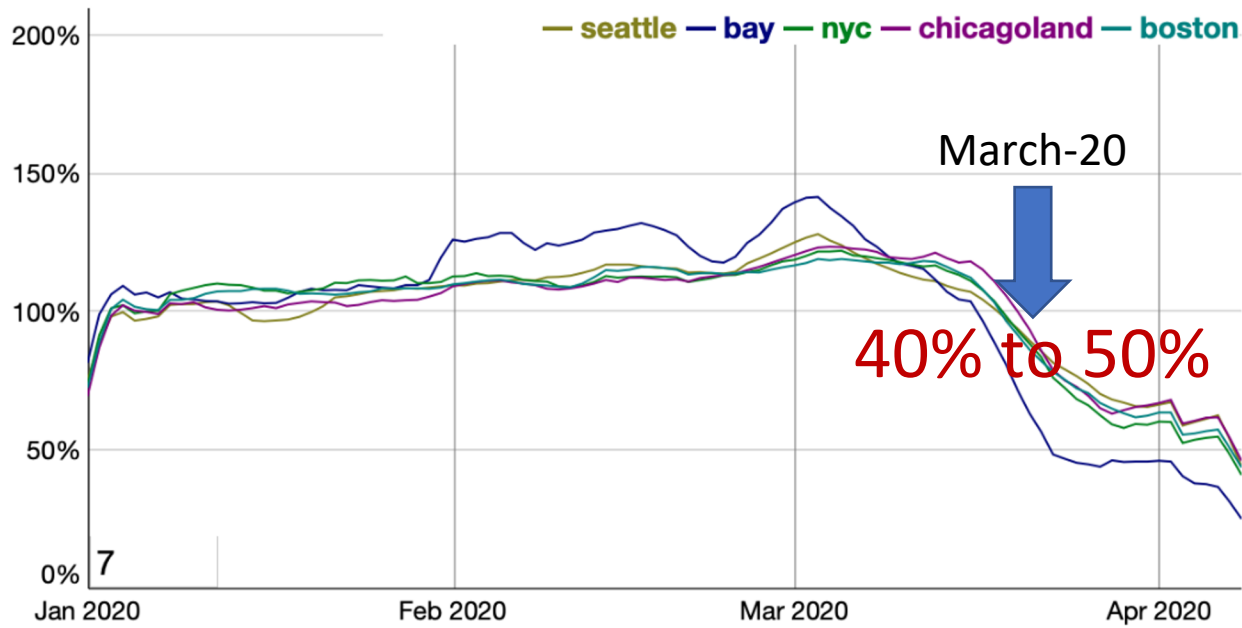
Payments and Transactions Analysis

Declines in Transactions and Dollars Spent

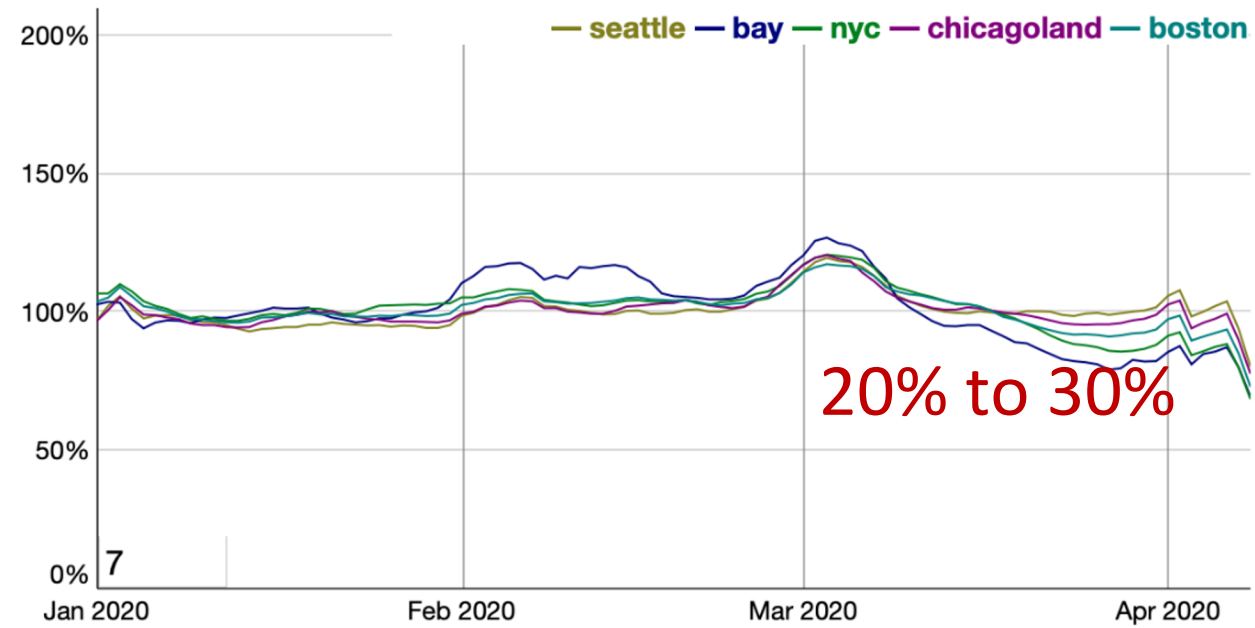


Declines in Transaction Volume

Card Present



Card Not Present

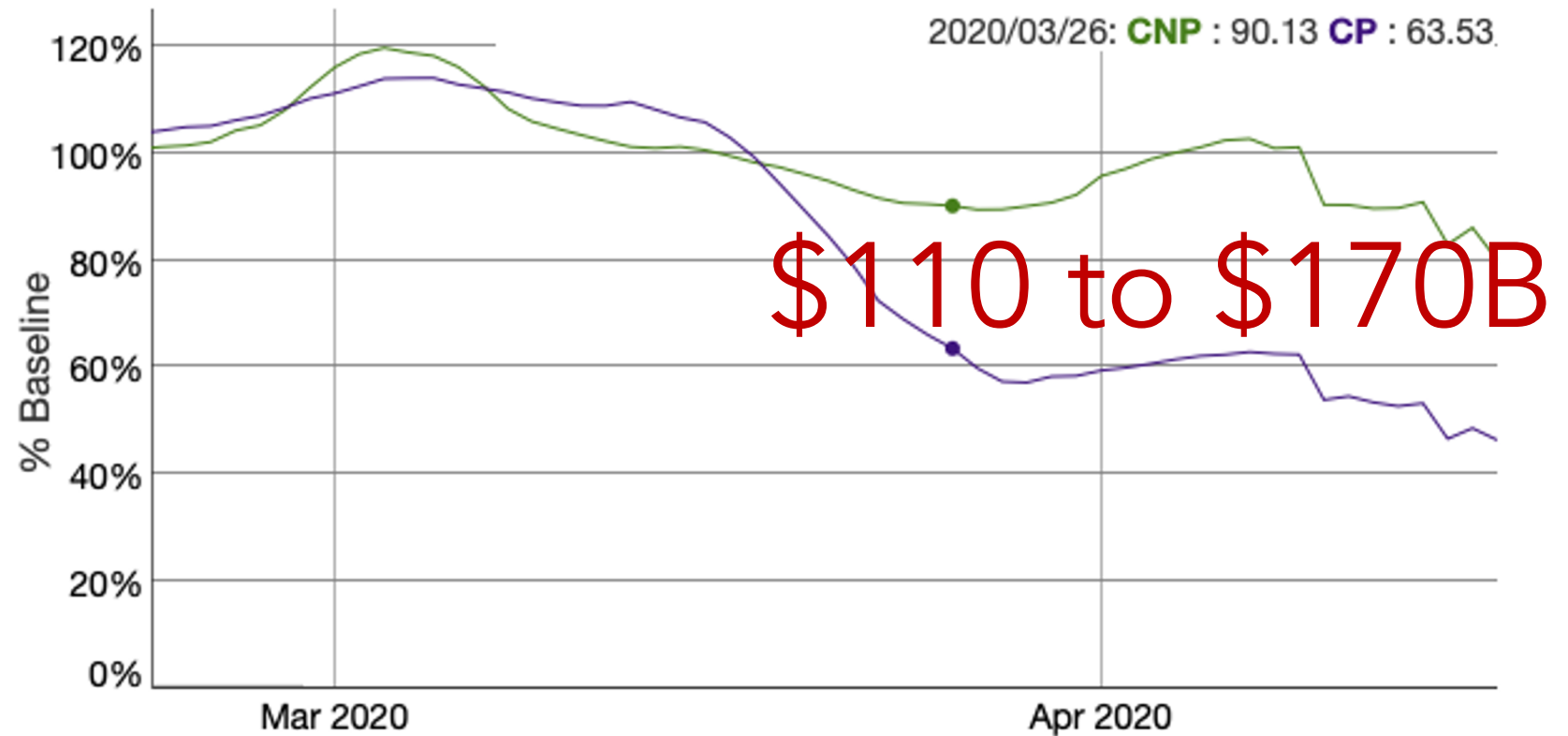


 Rippleshot Proprietary Transaction Data



Authorizations

U.S. as a Whole



Ripplshot Proprietary Transaction Data



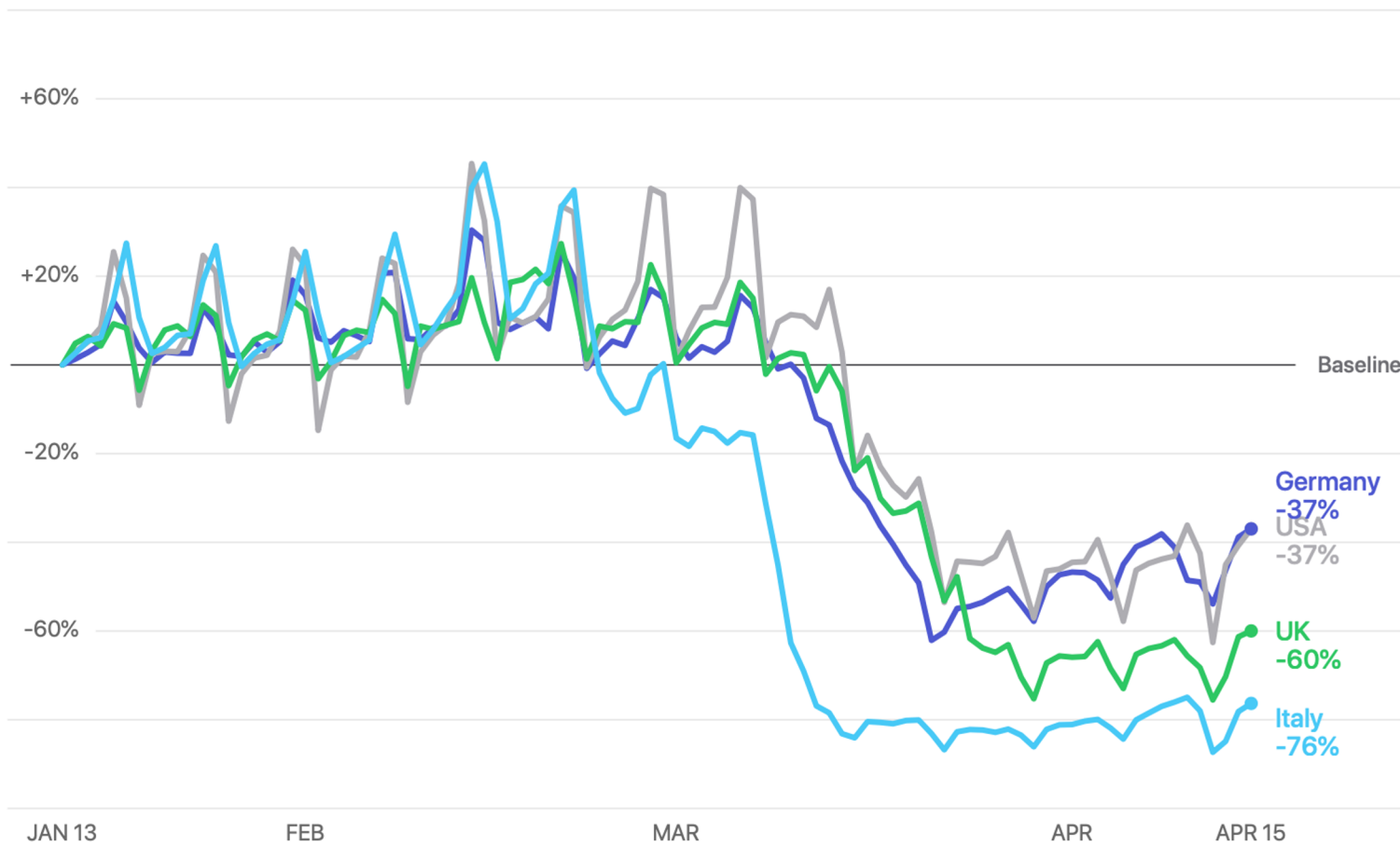
Authorizations

↓ Travel → ↓ Card Present

Our observations are widely corroborated by measurements of travel.
As consumers travel less, they make fewer brick and mortar purchases



Authorizations



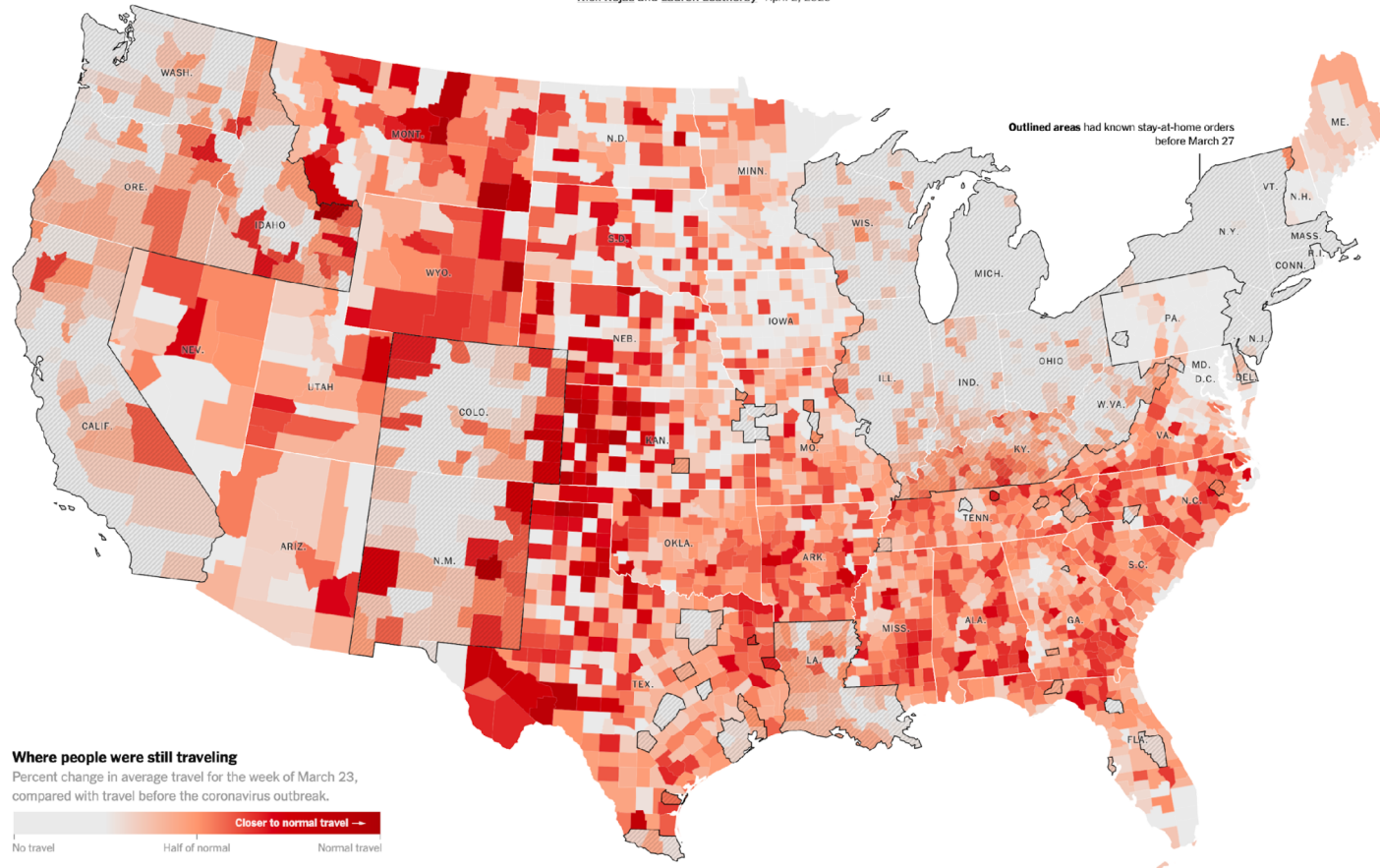
Apple Maps:

Travel of All Kinds Down
<https://shrtm.nu/Qcvl>



Authorizations

Kirk Kojas and Lauren Leatherby April 2, 2020



NYT: Travel During Shutdowns

<https://shrtm.nu/fhq1>

Transaction Analysis Key Takeaways

- CP
 - 40-50% decline in hot spots
- CNP
 - Some recovery
 - Growth likely post-Pandemic



Impact on Banks and Credit Unions

Current and Projected Declines in Merchant Transactions and Dollars Spent



Business Partnerships

Business Partnerships

Predicting Merchant Survival



Business Partnerships

Failures

Decreases
Transactions

Hibernation

Failed
Business



Risks from Business Failures

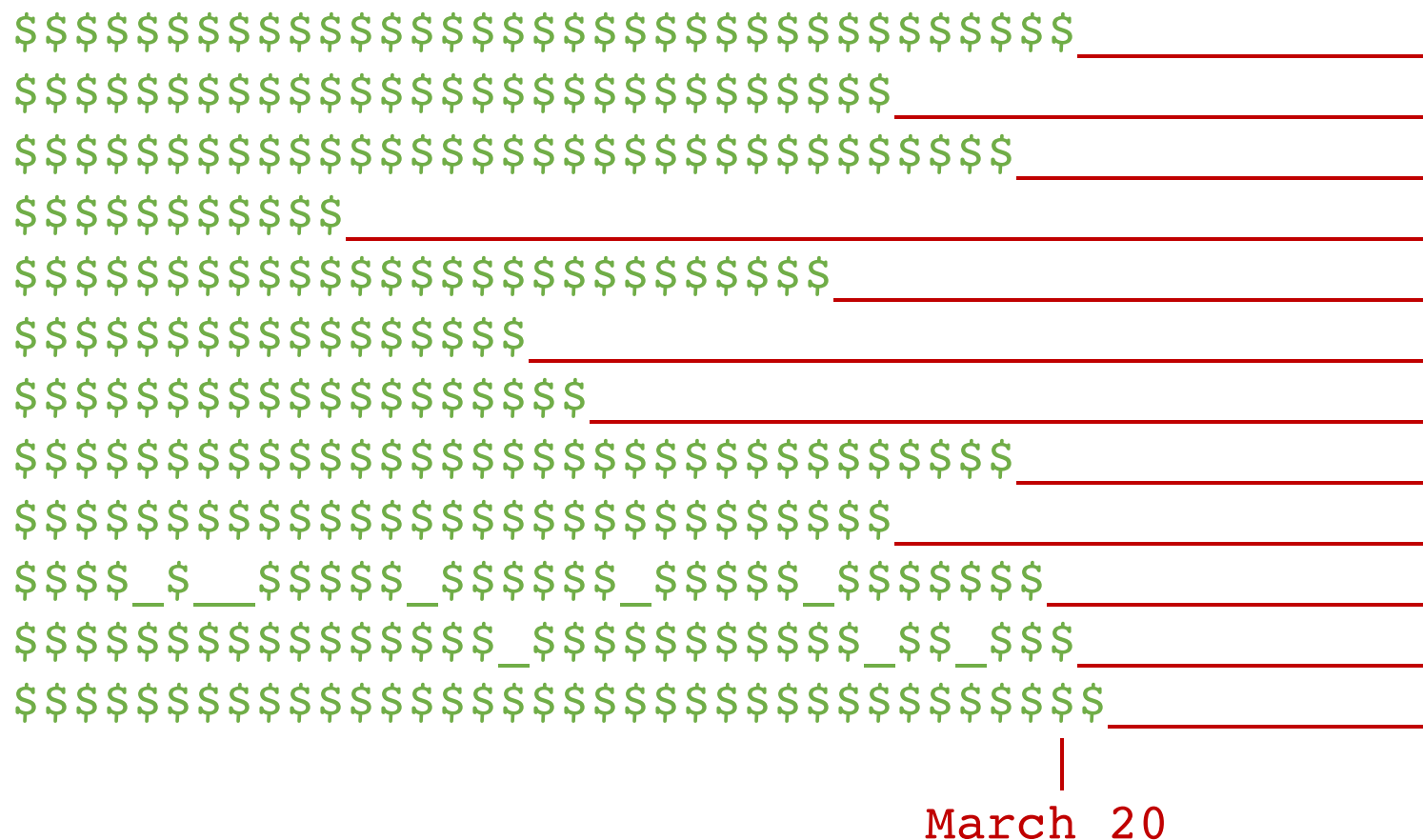
- Commercial Accounts
- Existing Loans
- Emergency Loans
- Consumer Chargebacks



Business Partnerships

Businesses Stop

 Rippleshot Proprietary Transaction Data



A digital map of which days there was spend at CP merchant.

\$
Transactions
ns
Bay Area
Seattle
Chicago
NYC



Businesses Just Stopping

| Area | Businesses Stopping |
|----------|---------------------|
| Bay Area | 11% |
| NYC | 9% |
| Seattle | 10% |
| Chicago | 6% |

The rate of closed merchants is currently at 30%. This data is just from a 14-day period.



Existing Loans

- High-touch contact
- Forbearance/hibernation
- Restructuring
- Emergency Federal Loans

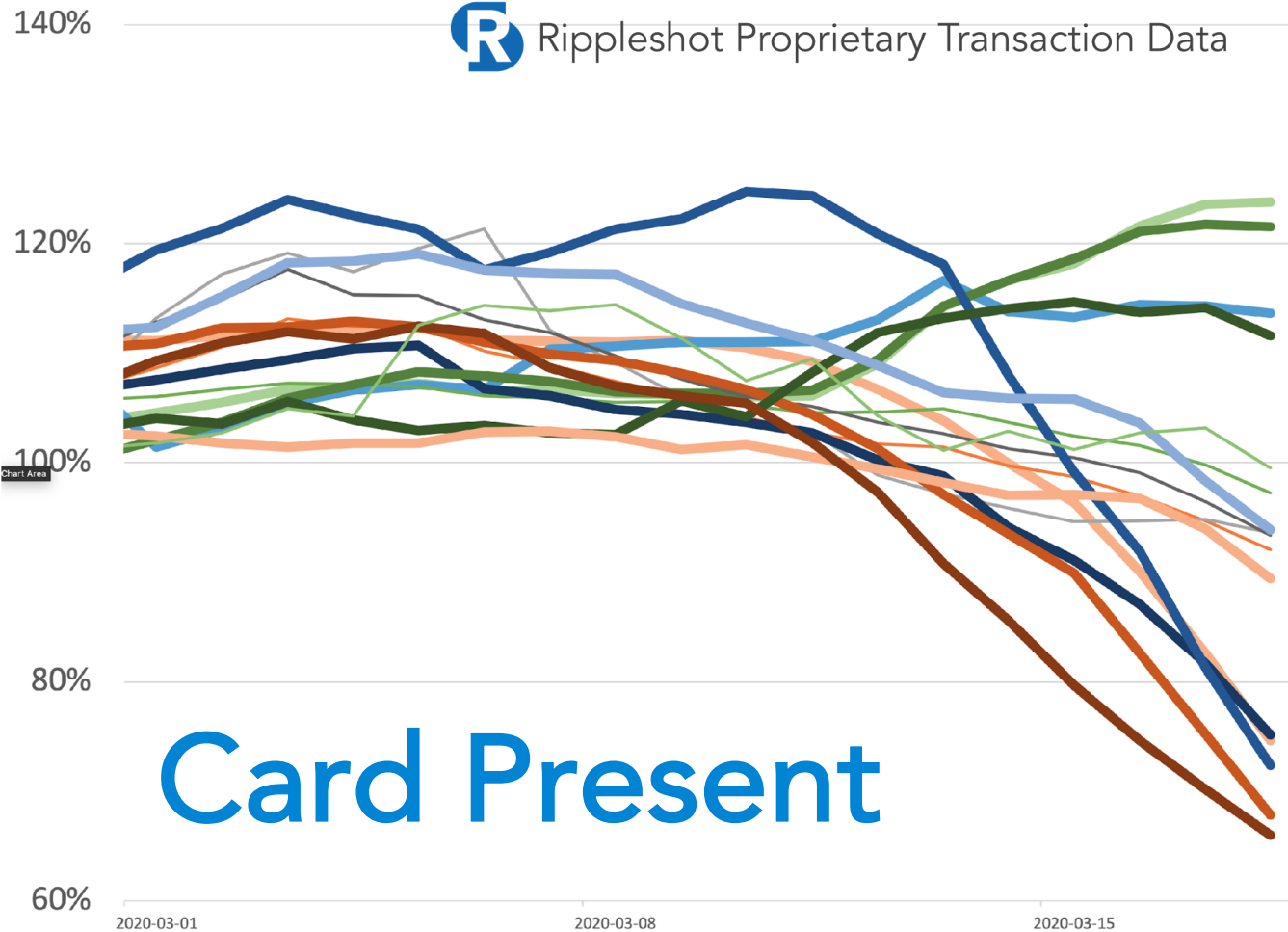


Who Is Most At Risk?

- Which MCC?
- CP or CNP?



Business Partnerships



Ag, Med, Food (+5 - 20%)

Retail(+5%)

Banking (-10%)

Govt, Clothing, Business Service (-15% - 40%)

Air, Lodging, Car (-40%)



Business Partnerships

CP ? CNP

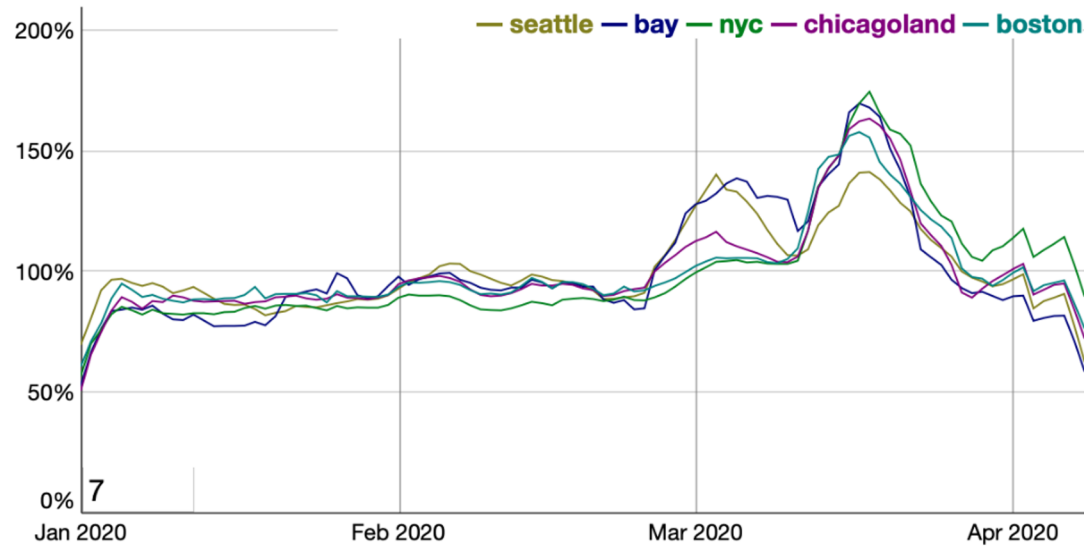
One big trend in business success under the pandemic is the migration from card present to card not present. A great example is in groceries.



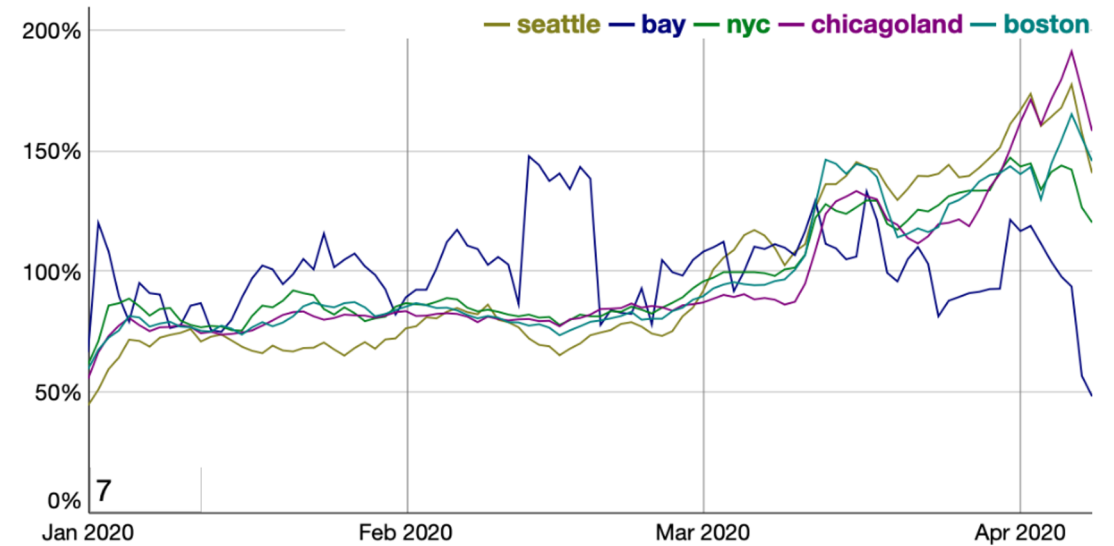
Business Partnerships

Grocers

Card Present



Card Not Present



 Ripplshot Proprietary Transaction Data

Above data is transaction dollars for grocery stores only in the regions hit early by the pandemic.



Impact on Banks Key Takeaways

Merchants

- Merchant impact severe
- Many won't survive
- Predict merchants that
 - Fail
 - Hibernate
 - Survive and grow
- Increased chargebacks



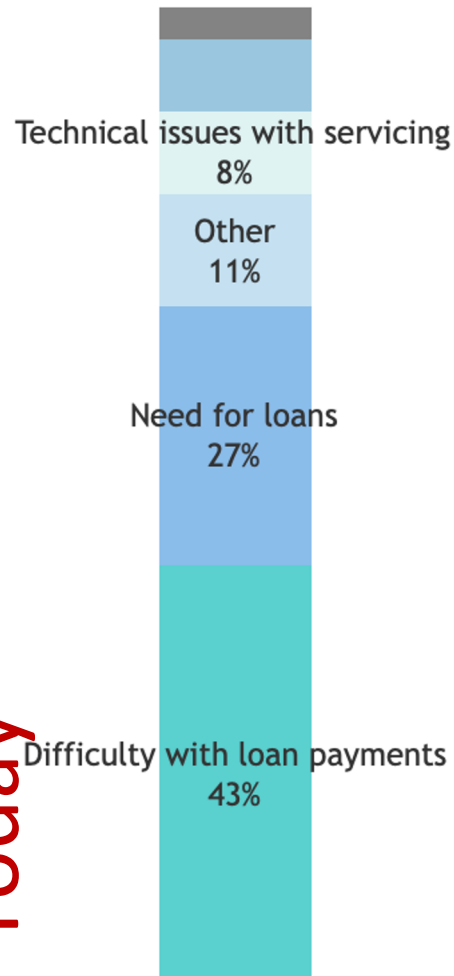
**Cardholder
Partnerships**

Cardholder Partnerships



Cardholder Partnerships

Customer Impacts Today



Next 30 Days



ABA & Alloy Labs

COVID-19 Bank Impact Survey

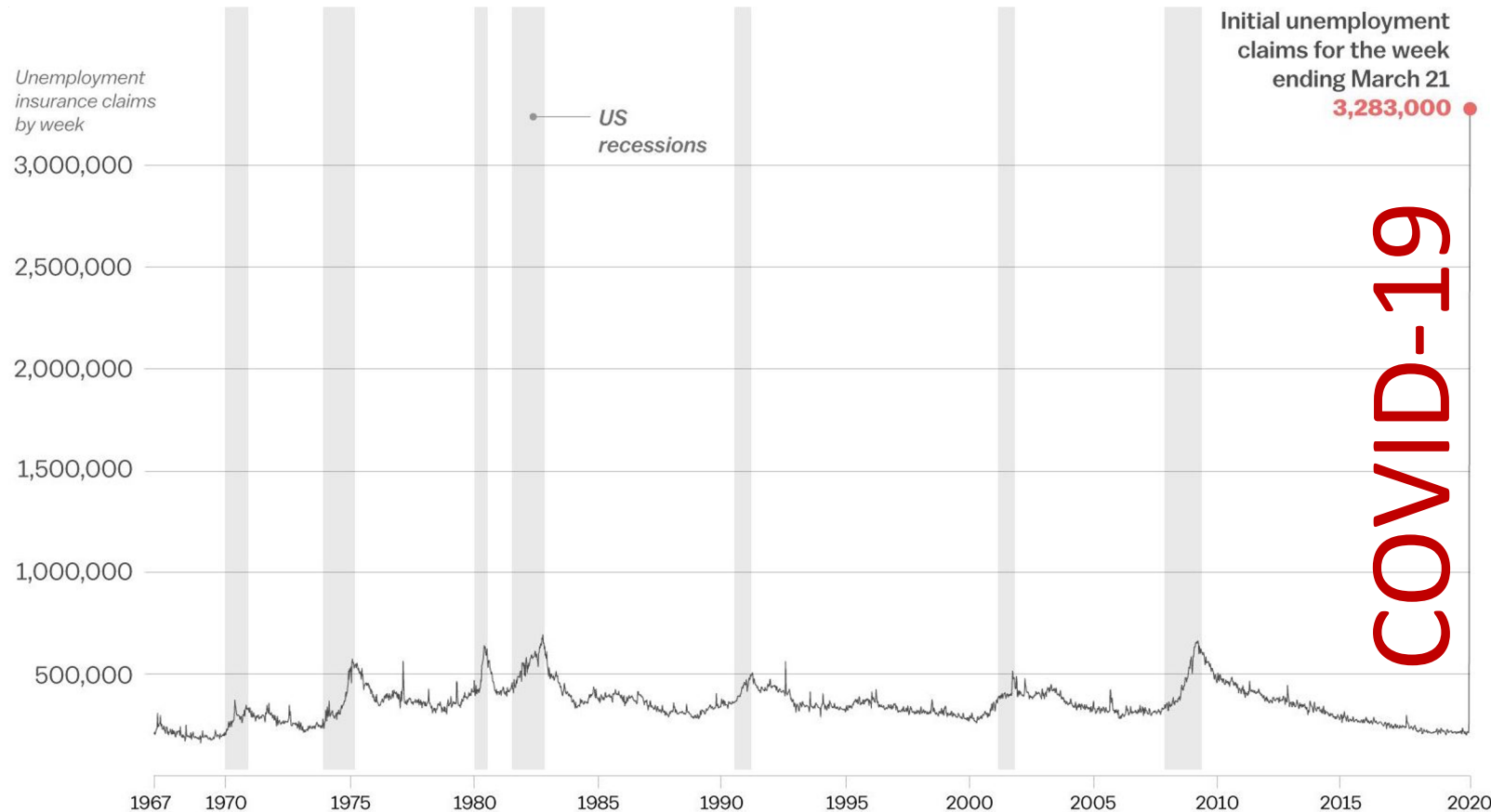
<https://shrtm.nu/qXxl>

The ABA and Alloy Labs conducted surveys with bankers and in April it showed they are worried about problems with loans. This fear is growing with time.



Cardholder Partnerships

UNEMPLOYMENT



This is a plot of unemployment claims dating back to 1967. You can see big swings for U.S. recessions.

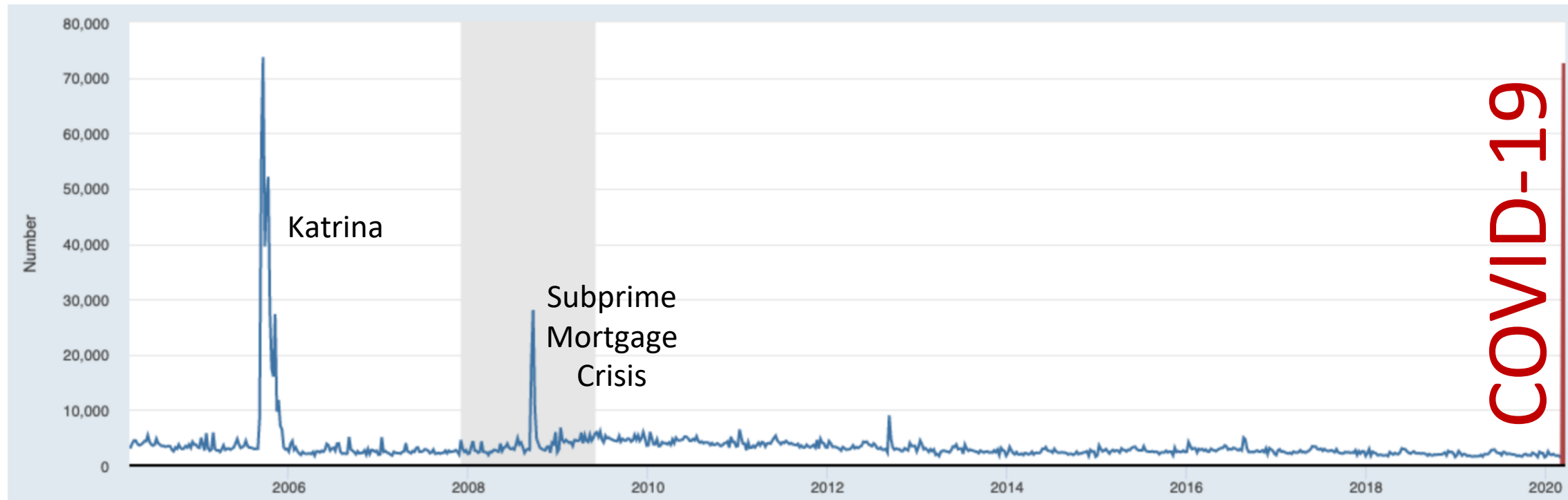
5x bigger than our worst recessions.



Cardholder Partnerships

UNEMPLOYMENT

Louisiana





Cardholder
Partnerships

UNEMPLOYMENT

1/3 Americans

Family either laid off or reduced pay

ABC News - <https://shrtm.nu/FVh4>

15% Unemployment

Goldman Sachs Projection

<https://shrtm.nu/oK8Q>

South China Morning Post

China at least 6.4%

<https://shrtm.nu/mSUX>

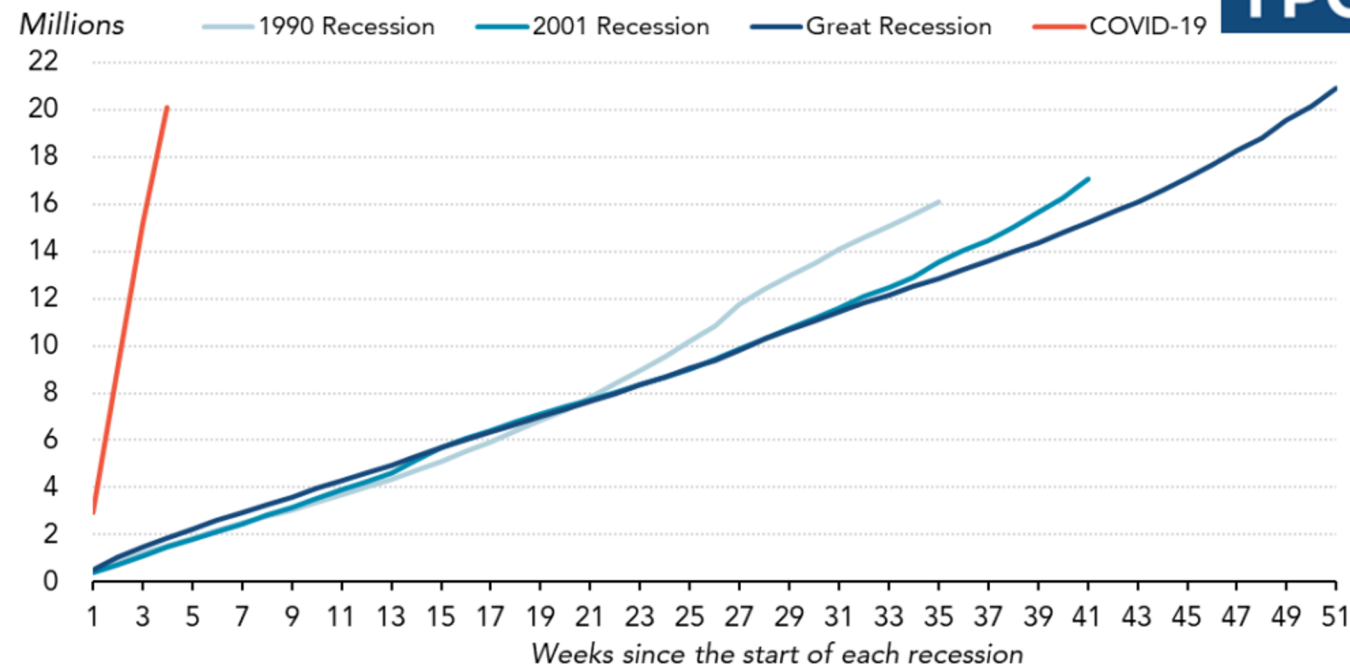


Cardholder Partnerships

UNEMPLOYMENT

FIGURE 1

Cumulative Unemployment Insurance Claims



Source: United States Department of Labor, Employment & Training Administration.

Fastest Growth in Unemployment

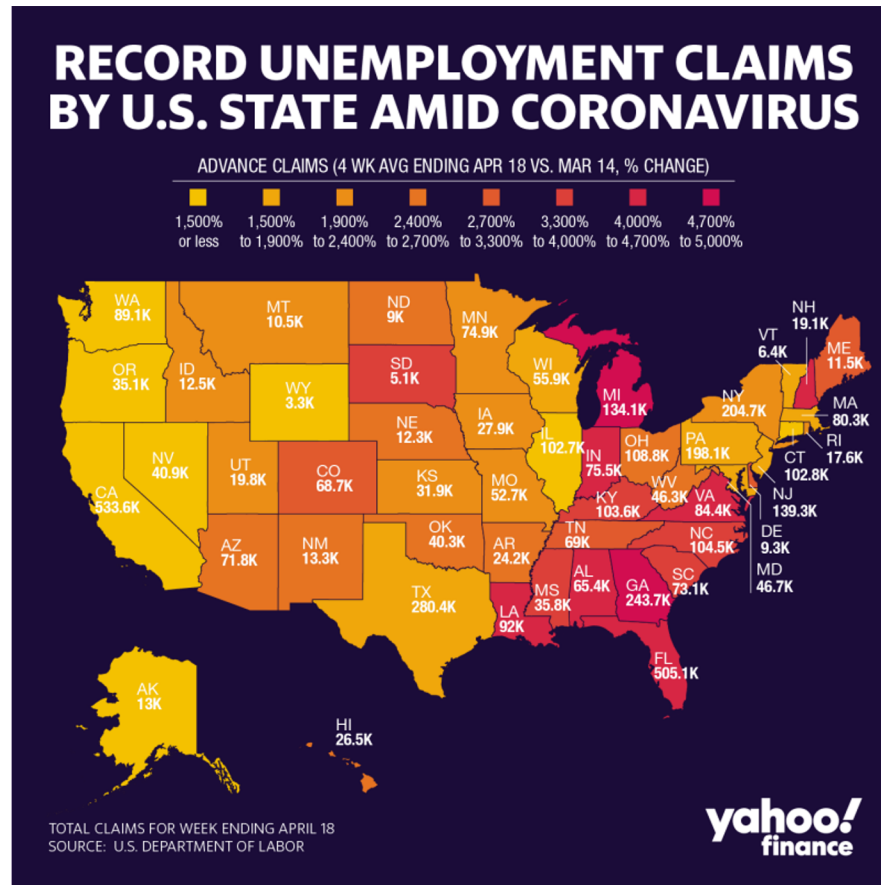
Unemployment is going up than even our worst recent recessions.

Tax Policy Center & Dept Labor - <https://shrtm.nu/VXWC>



Cardholder Partnerships

UNEMPLOYMENT



Yahoo Finance - <https://shrtm.nu/Nud5>

Worst Hit States

- Michigan
- The South



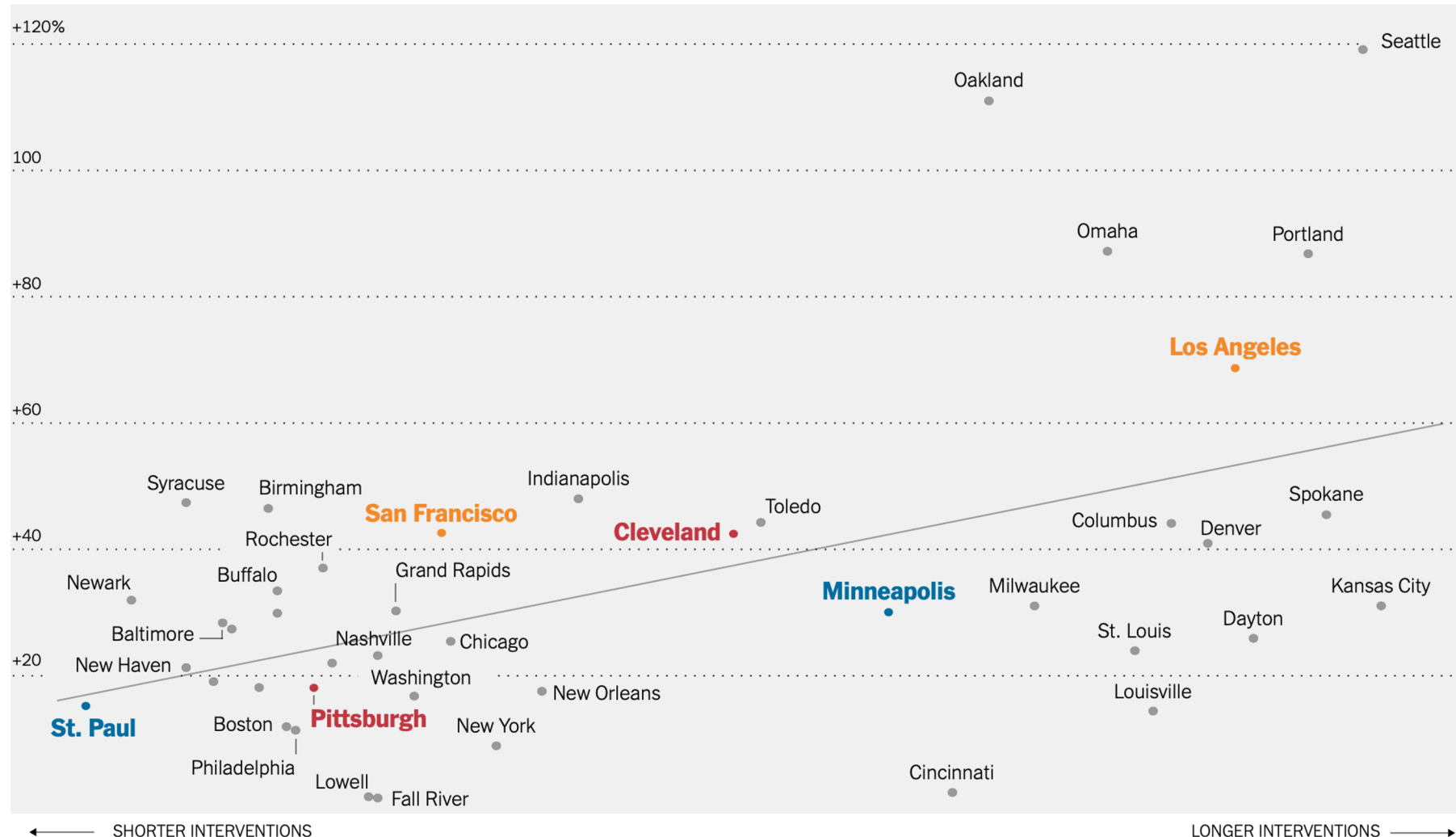
**Cardholder
Partnerships**

Unemployment Recovery

Historical precedent says that GDP bounces back from previous pandemics.



GROWTH IN MANUFACTURING EMPLOYMENT 1914 TO 1919



1918 Pandemic

Aggressive Interventions

Higher Employment Growth

The longer quarantines and shutdowns were in place, the fewer people died and the faster the city bounced back to hiring.

Paper out of:

Fed Reserve Board

Fed Reserve Bank of NY

Sloan School of Management

<https://shrtm.nu/UjCz>



Cardholder Risks

- Decreased savings
- Decreased transactions
- Loan defaults
- Migration to another bank

Impact on Banks

Key Takeaways

Consumers

- Huge unemployment in near term
- Consumer recovery staggered
- Higher growth in areas with early intervention



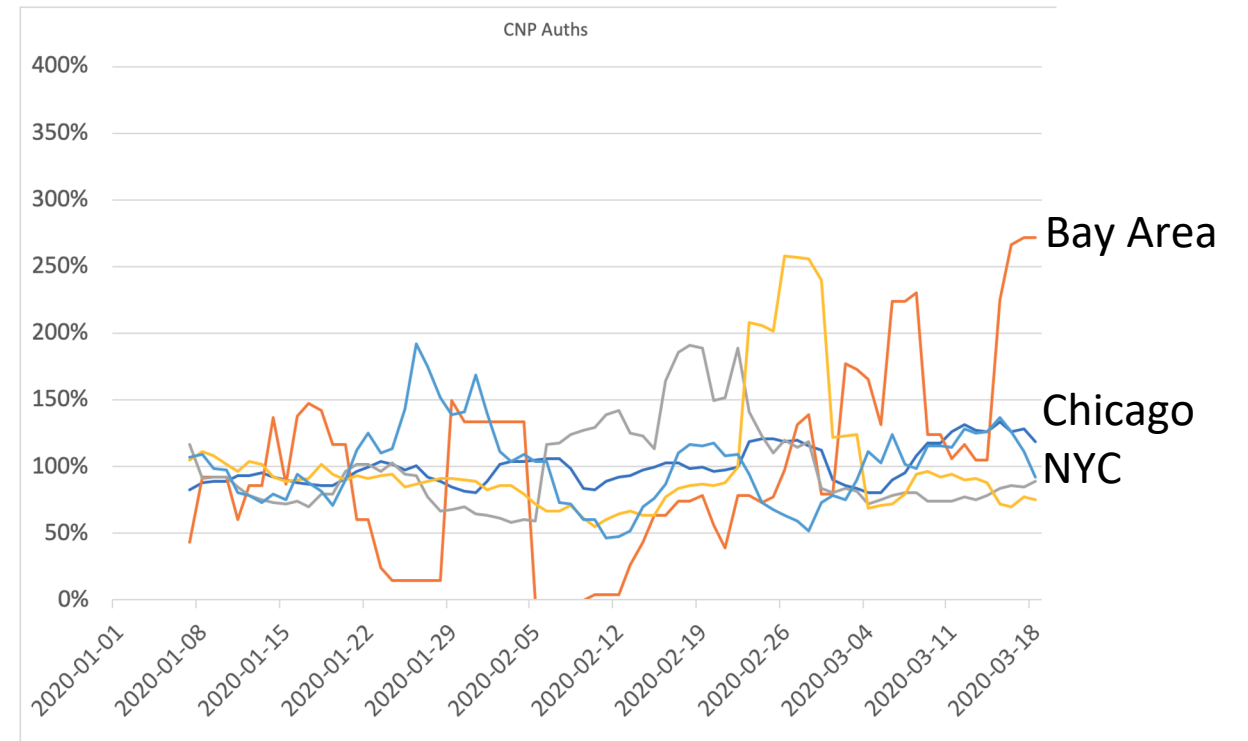
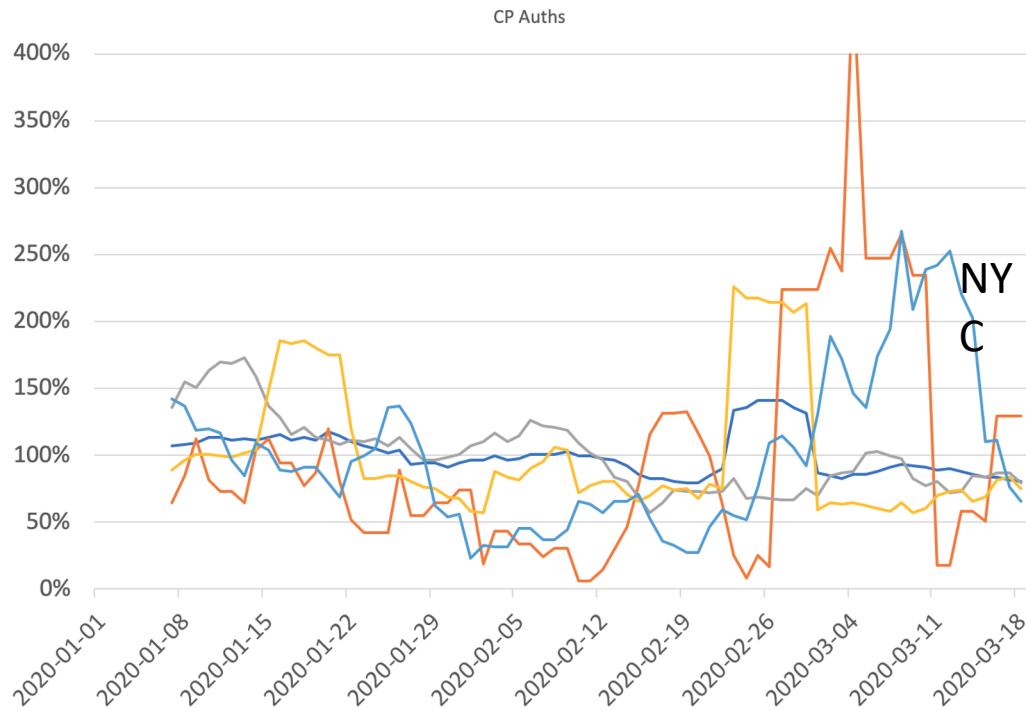
Fraud Risk

Fraud Risks



Fraud Risk

Transaction Fraud



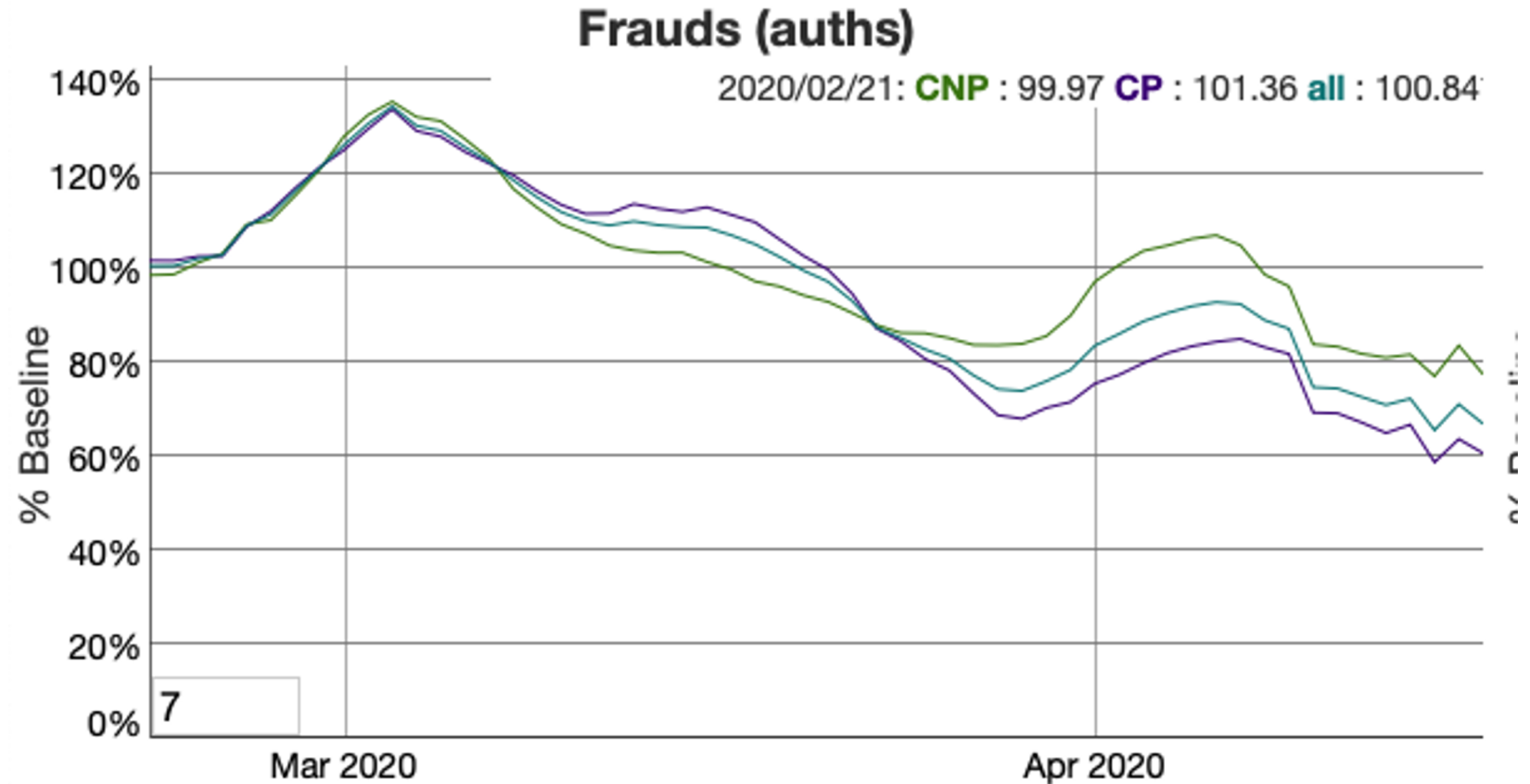
 Rippleshot Proprietary Transaction Data



Fraud Risk

Across the U.S.

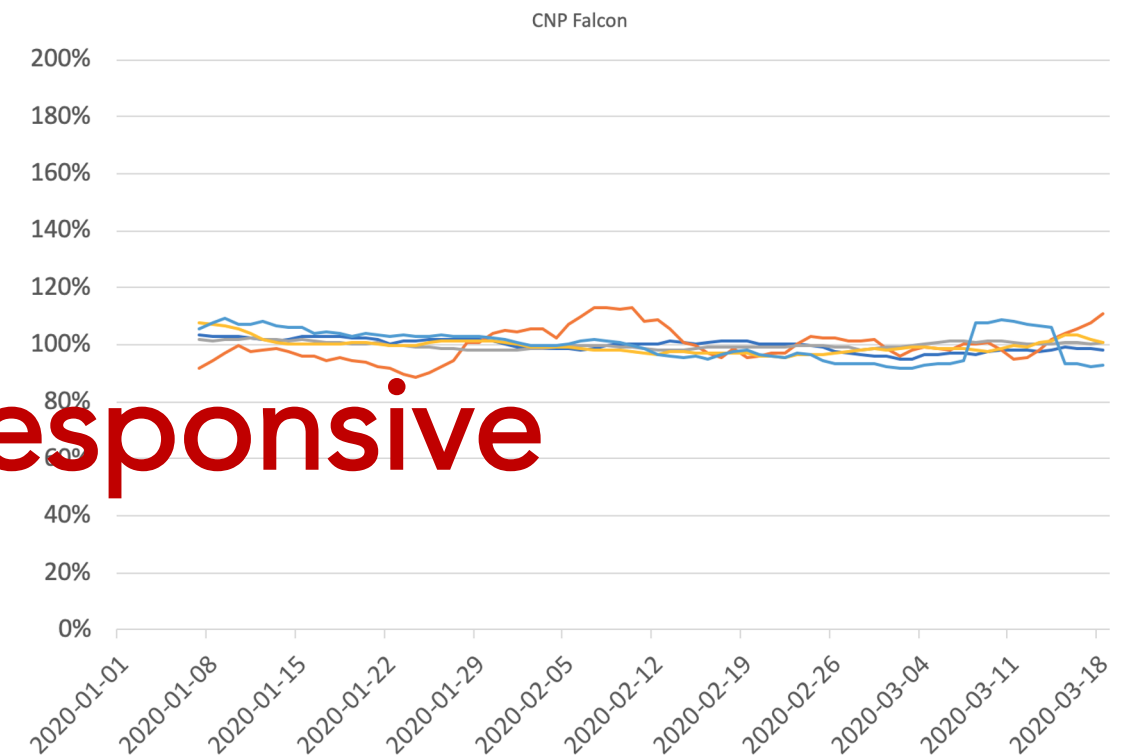
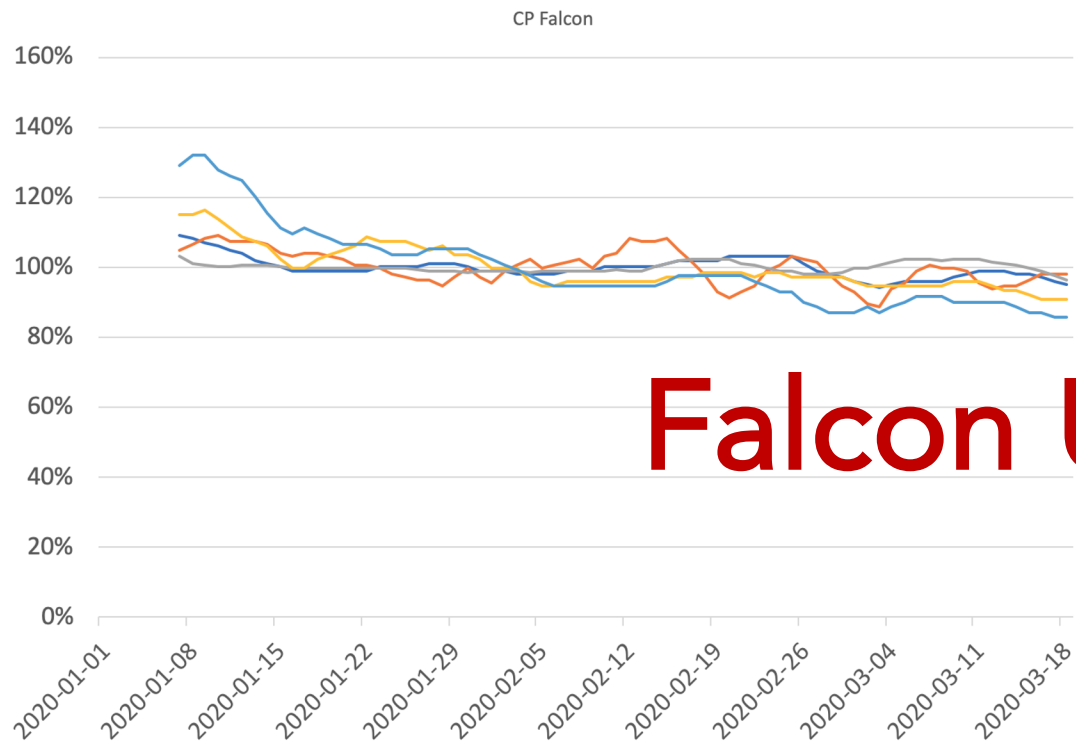
- Large increase in fraud transactions as people prepared for the pandemic.
- A return to normal and even a reduction in fraud at the start of the shutdowns
- Another surge in early April





Fraud Risk

High scores out of Falcon are basically unresponsive to the increasing fraud. This is for the same hard-hit regions. It shows the relative uptick in high fraud scores. This doesn't change in response to the pandemic



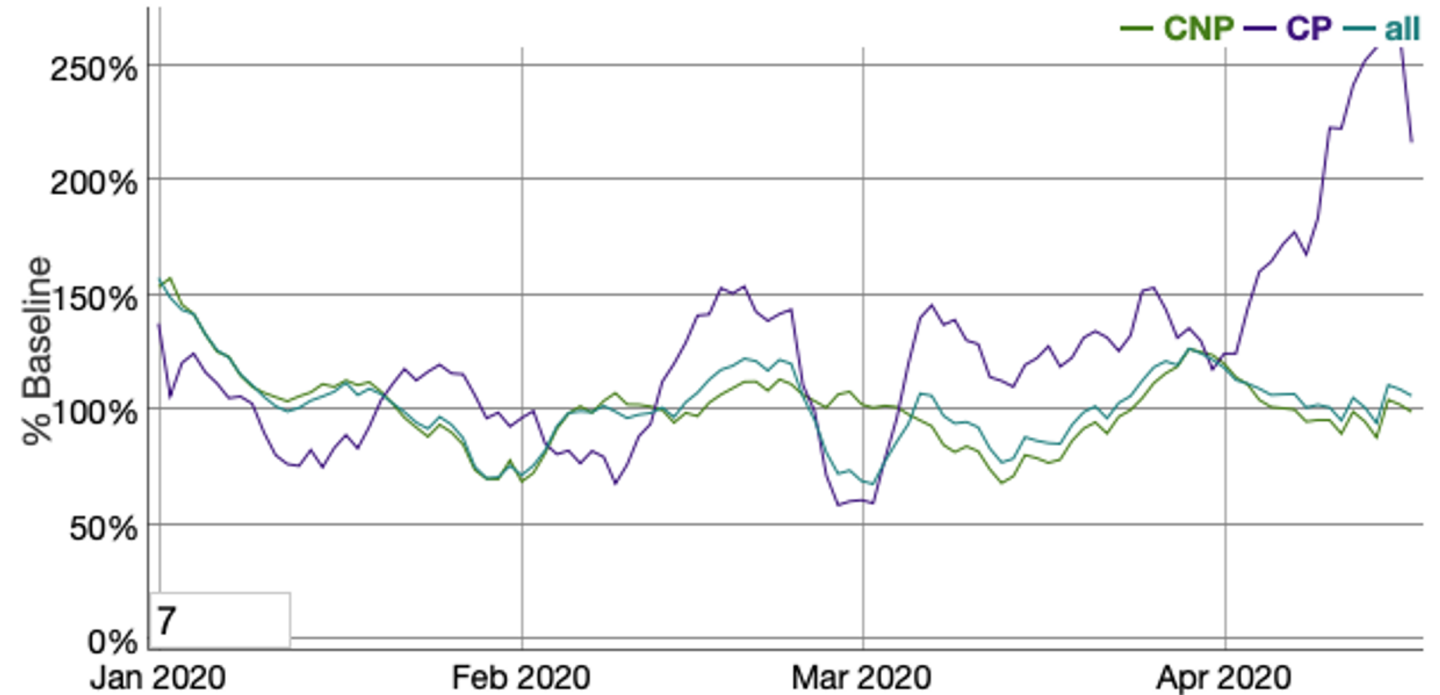
Falcon Unresponsive



Fraud Risk

FPR

- **CP Errors:** As consumer behavior changes, decline rules are becoming less effective
- **CP problems** notable in March; severe in April



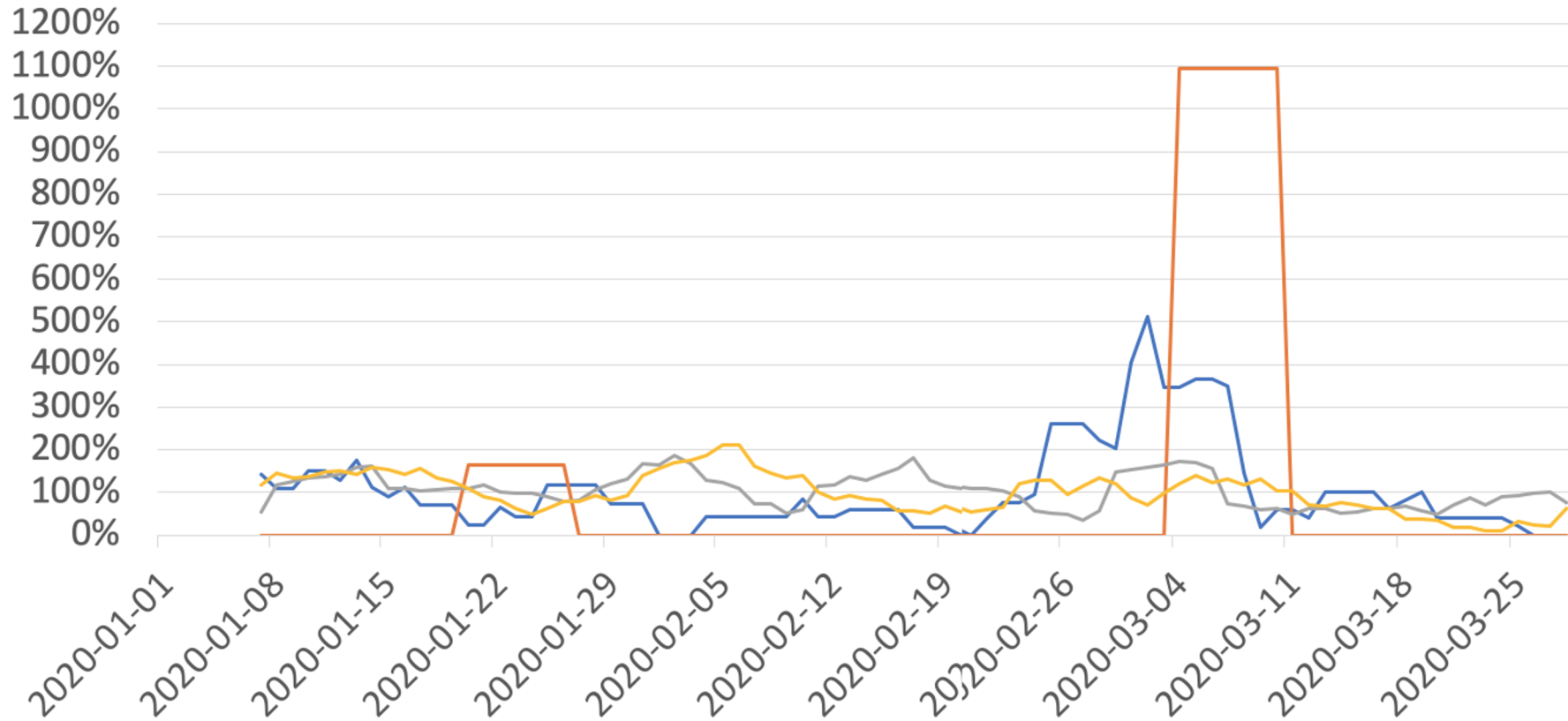
Ripplshot Proprietary Transaction Data



Fraud Risk

Groceries

Fraud Rate





Fraud Risk

| | Store Name | Threat | Merchant ID | CP/CNP | MCC | Location | Fraud Cards | Total Cards | Attempted \$ | Capture % |
|----|--|--------|-------------|--------|------|-------------------|-------------|-------------|--------------|-----------|
| 1 | ADVANCE AUTO PARTS #873 FREDERICKSBUR VA | ● | N/A | CP | 5533 | FREDERICKSBUR, VA | 3 | 10 | \$0-99 | 0% |
| 2 | PAYPAL "DIGITALEMPI 4029357733 CA | ● | N/A | CNP | 7392 | 4029357733, CA | 2 | 2 | \$400-499 | 0% |
| 3 | Legacy Theaters Staunton VA | ● | N/A | CNP | 7832 | Staunton, VA | 2 | 2 | \$0-99 | 0.15% |
| 4 | WENDYS #6216 WILLIAMSTON NC | ● | N/A | CP | 5814 | WILLIAMSTON, NC | 2 | 2 | \$0-99 | 0% |
| 5 | AMAZON.COM AMAZON.CA AMAZON.CA CA | ● | N/A | CNP | 4816 | AMAZON.CA, CA | 2 | 2 | \$100-199 | 0% |
| 6 | AMZN Mktp CA AMAZON.CA WA | ● | N/A | CNP | 5969 | AMAZON.CA, WA | 2 | 2 | \$100-199 | 0% |
| 7 | SQ "RND COFFEE Roanoke VA | ● | N/A | CP | 5814 | Roanoke, VA | 2 | 2 | \$0-99 | 0% |
| 8 | 14954 N UMBER 14954 N UMBER BURGESS VA | ● | N/A | CP | 6011 | BURGESS, VA | 2 | 2 | \$0-99 | 0% |
| 9 | THE RIVAH KILMARNOCK VA | ● | N/A | CNP | 5947 | KILMARNOCK, VA | 2 | 2 | \$1k-2k | 0% |
| 10 | WENDYS #314 GLEN ALLEN VA | ● | N/A | CNP | 5814 | GLEN ALLEN, VA | 2 | 2 | \$0-99 | 0% |
| 11 | GLENDA LYN'S, LLC RUSTBURG VA | ● | N/A | CP | 5462 | RUSTBURG, VA | 2 | 2 | \$100-199 | 0% |
| 12 | PIZZA HUT #31214 https://ipcha VA | ● | N/A | CNP | 5812 | https://ipcha, VA | 2 | 3 | \$0-99 | 0% |
| 13 | CHINCOTEAGUE ISLAND CHINCOTEAGUE VA | ● | N/A | CP | 8011 | CHINCOTEAGUE, VA | 2 | 3 | \$0-99 | 0% |
| 14 | PAYPAL "DIGITALEMPI 402-935-7733 CA | ● | N/A | CNP | 7392 | 402-935-7733, CA | 2 | 3 | \$400-499 | 0% |
| 15 | PAYPAL "SHOPHQ 402-935-7733 MN | ● | N/A | CNP | 5331 | 402-935-7733, MN | 2 | 3 | \$0-99 | 0% |
| 16 | PAYPAL "SHOPHQ 4029357733 MN | ● | N/A | CNP | 5331 | 4029357733, MN | 2 | 3 | \$0-99 | 0% |
| 17 | MYBENEFITSKEEPER.COM CHRQ.MYBK.COM FL | ● | N/A | CNP | 6300 | CHRQ.MYBK.COM, FL | 3 | 3 | \$0-99 | 0% |
| 18 | RITE AID STORE - 3743 WINCHESTER VA | ● | N/A | CP | 5912 | WINCHESTER, VA | 2 | 2 | \$0-99 | 50% |
| 19 | EXXONMOBIL 42110742 WAYNESBORO VA | ● | N/A | CP | 5542 | WAYNESBORO, VA | 3 | 3 | \$200-299 | 0% |
| 20 | THE MENS WEARHOUSE #353 GLEN ALLEN VA | ● | N/A | CP | 5611 | GLEN ALLEN, VA | 2 | 3 | \$0 | 0% |
| 21 | CHICKAHOMINY FAMILY QUINTON VA | ● | N/A | CP | 8011 | QUINTON, VA | 2 | 2 | \$0-99 | 66.67% |
| 22 | CHICKAHOMINY FP QUINTO QUINTON VA | ● | N/A | CP | 8011 | QUINTON, VA | 2 | 2 | \$0-99 | 66.67% |
| 23 | VA ABC STORE 167 BERRYVILLE VA | ● | N/A | CP | 9399 | BERRYVILLE, VA | 2 | 3 | \$0-99 | 0% |

Breaches

10x More

Most Egregious Breaches

Merchants where most of their customers' cards get used fraudulently

*These are smaller businesses where the fraudsters harvest all the cards and use them for fraud spends elsewhere.



Rippleshot Proprietary Transaction Data



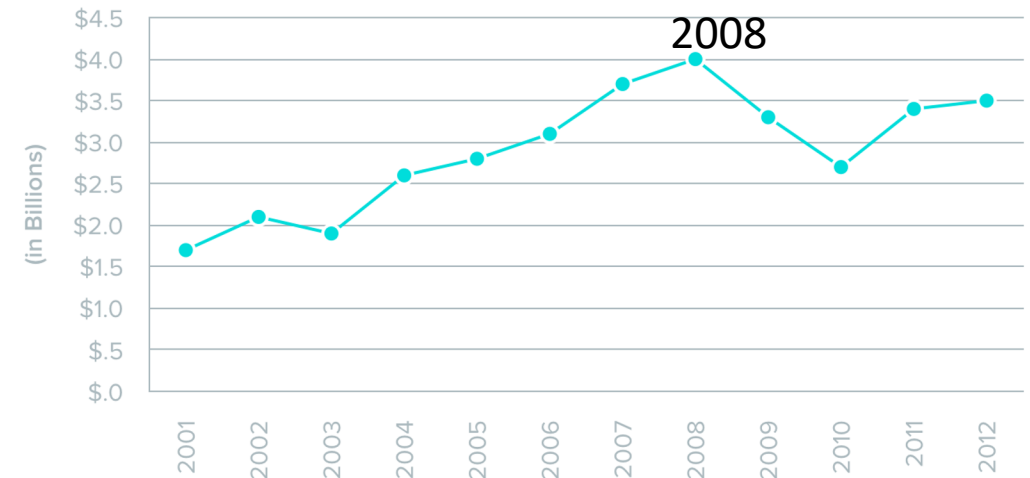
Fraud Risk

Past Economic Shocks

(2008, dotcom, Katrina)

- **+47% more breaches (2008)**
- CreditCards.com (<https://shrtm.nu/Y3Js>)
- **+25% frauds (2006 to 2008)**
- WalletHub (<https://shrtm.nu/Rhyc>)
- **+20-400% fraud losses (Target, Home Depot, Wawa,...)**

 Rippleshot Proprietary Transaction Data





Consumer Scams - Predicted

Frank On Fraud (<https://shrtm.nu/WNx7>)

- Stimulus Check (request up-front money)
- CDC (phishing)
- Government Imposter (request money)
- Investment (Ponzi schemes)
- Product (sanitizers, test kits, vaccines)
- Employment (laundering, request money)
- Televangelist (request money, fake cures)
- Cleaning (fake claims)
- Malware (fake URLs with malware)
- Provider (demand payment for relative's COVID-19 medical bills)
- Medical News (phishing)
- Ransomware App (Android so far)
- Identity theft



Consumer Scams - Already Here

- 18K COVID reports
- Robo-callers
(federal employees)

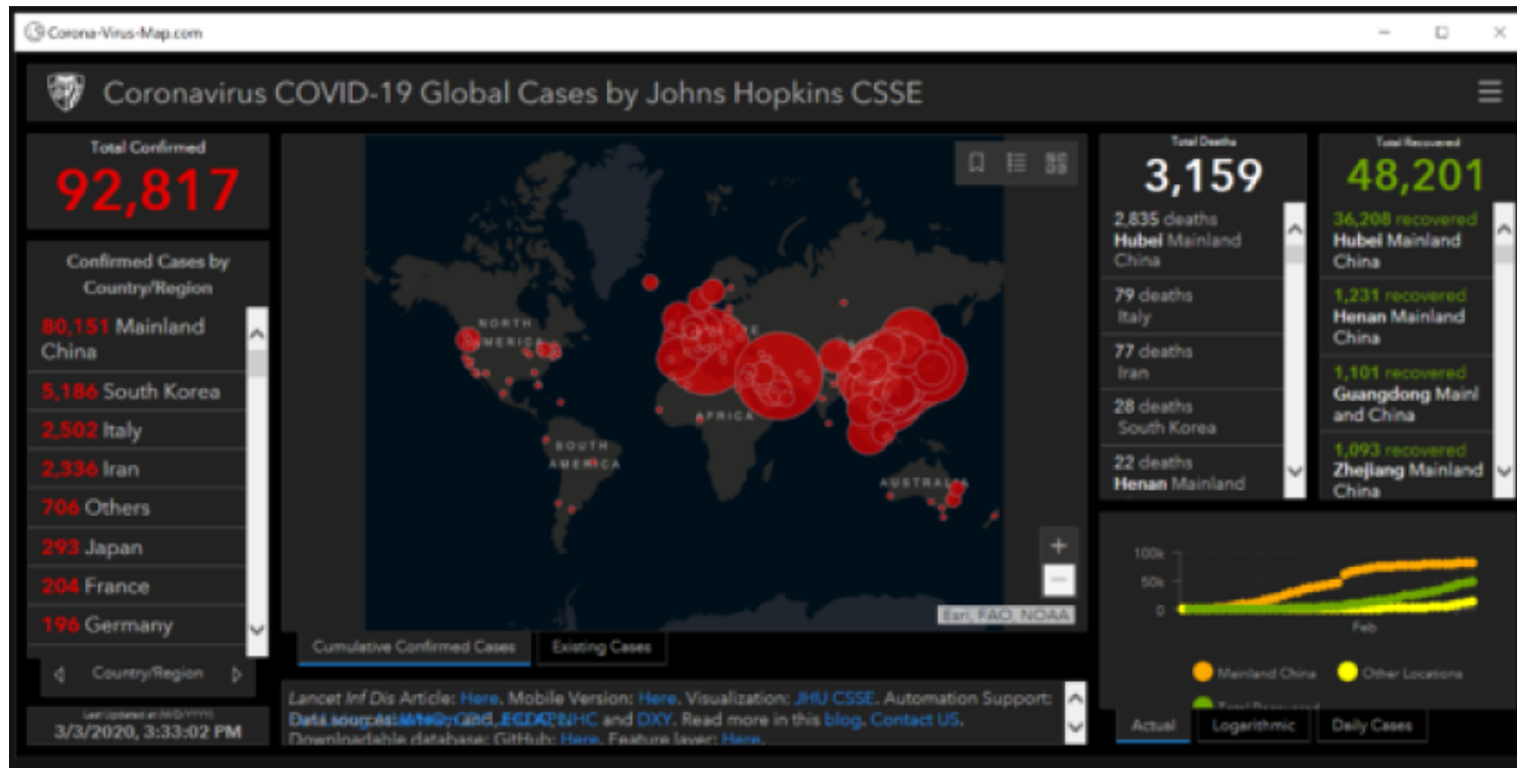
FTC - <https://shrtm.nu/8FA0>



Fraud Risk

Fake URL with malware

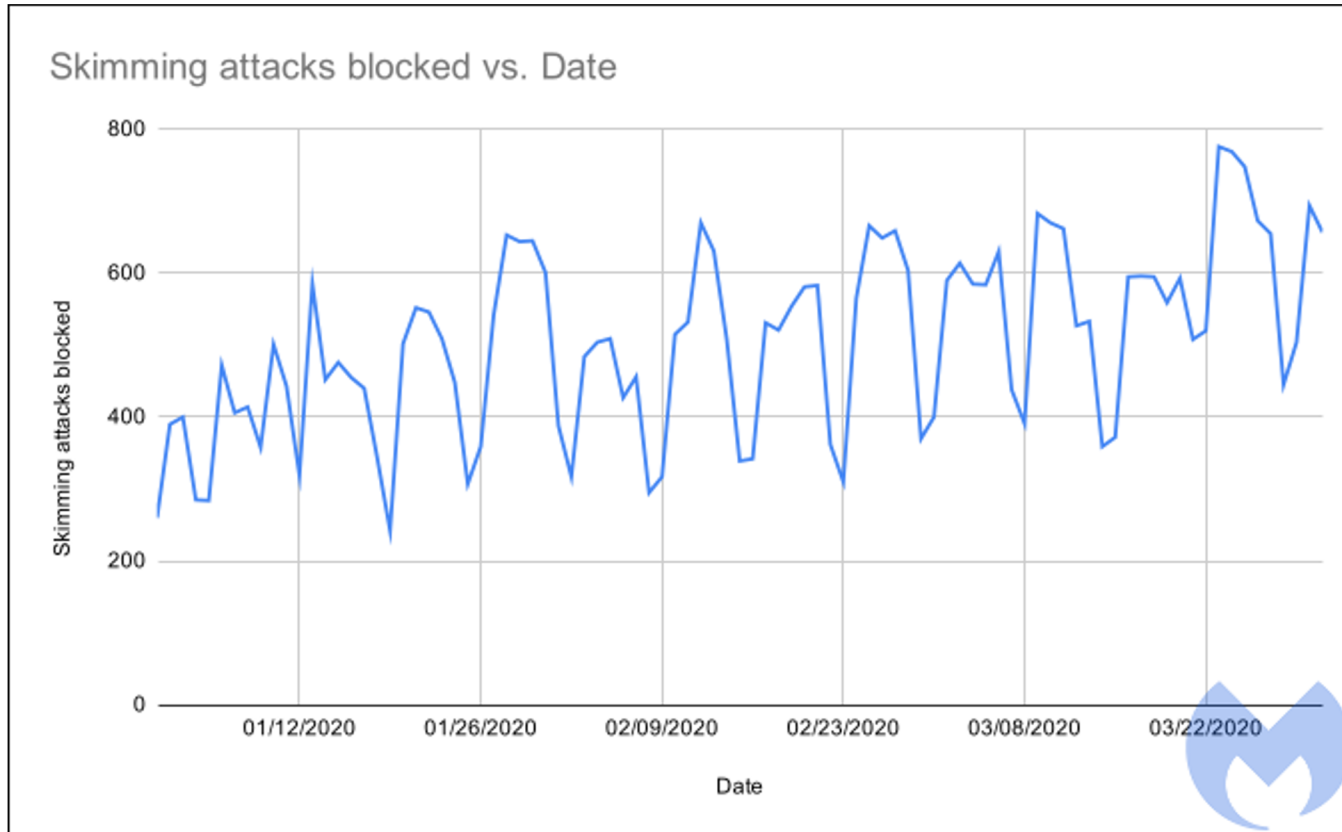
Credit Union Times - <https://shrtm.nu/PgXO>



Fraudsters embed malware in a fake copy of the famous Johns Hopkins COVID case tracker. They get people to go to a URL claiming to track COVID cases, where they get their Android phones infected.



Fraud Risk



Malwarebytes

<https://shrtm.nu/M2Aj>

+26% in March

They report a steady uptick in skimming attacks , though the fraudsters have been ramping up.



Bank Frauds

Frank on Fraud (<https://shrtm.nu/WNx7>)

- Transaction Fraud (more online, hard to tell from fraud)
- Breached merchants (merchants have few staff)
- ATM Fraud (more unobserved)
- Application Fraud & Identity Theft (less scrutiny)
- Mortgage & Insurance (hard to inspect)
- Check or ACH Kiting (less oversight)



Fraud Risks Key Takeaways

Transaction Fraud

- Dramatic, Erratic Increases
- Yearly fraud losses
 - **could increase 25-50+%**
- Falcon and declines not keeping pace
- FPR surges



Fraud Risk

Fraud Risks Key Takeaways

Other Fraud

- More online fraud
- More skimming



FI Risks



Decreasing authorizations



Threats to your relationships with merchants & cardholders



Volatile increase in Frauds — both in transactions and online

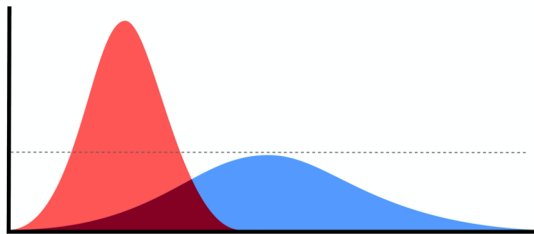


Fraud Mitigation

Risk Mitigation Strategies



Flattening the Covid-19 Fraud Curve



- **Implement** data distancing to prevent phishing and online scams
- **Deploy** merchant-based decision rules to reduce CNP fraud and chargebacks
- **Subscribe** to early alerts and re-issuance on major breaches like Wawa
- **Create** mule hunting team to close fraudulent accounts
- **Enlist and educate** consumers on protecting data to prevent account takeover
- **Use** transaction analysis to monitor health of merchants
- **Invest** in digital transformation (web, mobile, payment, re-issuance)



Phishing and Online Scams

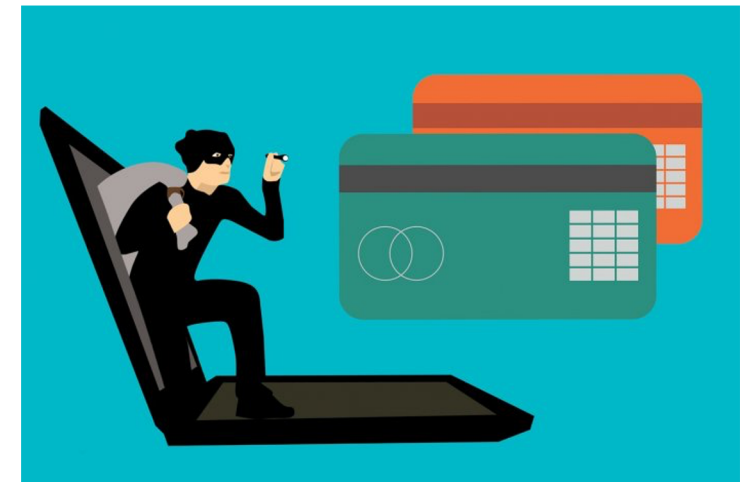
- Educate customers on common and current scams by email or posting alerts on website
- Train staff and call center on current scams
- Monitor online scams through websites like
 - Fraud.org - <https://www.fraud.org/>
 - Tripwire - <https://shrtm.nu/PnZ5>
 - Guardian Analytics - <https://shrtm.nu/PJ8U>





CNP Fraud and Charge Backs

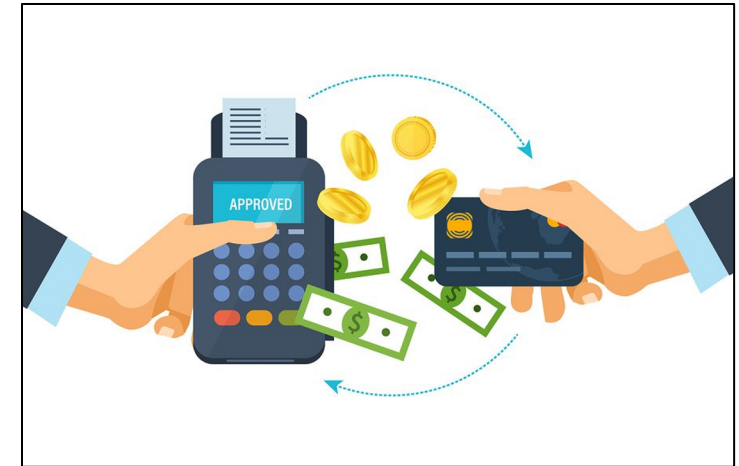
- Write specific merchant-based decision rules on merchant with high chargebacks
- Use internal transaction data or Ripplshot's list of High Fraud Merchants
 - <https://rippleshot.com/rules-assist/>





Data Breaches and Card Compromises

- Monitor early alerts and re-issue on major breaches like Wawa (5x fraud reduction from early re-issuance)
- Monitor breaches at
 - <https://krebsonsecurity.com/>
- Sign up for breach alerts at Ripplshot
 - <https://info.rippleshot.com/blog>





Fraud Mitigation

Money Mule Scams

- Educate consumers on money mule scams
 - Email
 - Website
 - Webinar
- Specific targets include elderly, young, and financially distressed
- Create mule hunting team to review and close fraudulent accounts





New Account Opening and Account Take Over

- Enlist and educate consumers on how to protect their data
- Encourage consumers to freeze their credit file
 - [Consumer FTC](#)
 - Encourage consumers to lock their mobile number to prevent porting
 - [Krebs](#)
 - Train staff and call center to be on the lookout for suspicious inquiries to get final piece of data
- Add alert to KYC process





Fraud Mitigation

Merchant Accounts

- Monitor daily transactions to determine health of merchants
- Use internal data or consortium data like Rippleshot's
 - <https://rippleshot.com/rules-assist/>





Invest in Digital Transformation

- Online banking
- Mobile banking
- Mobile payment
- Digital re-issuance





Additional Resources

Interactive COVID Economic Data

<https://info.rippleshot.com/covid-economics> — Randal Cox, PhD

High Fraud Merchants List Merchant transactions monitoring

Contact: Anna Kragie, Marketing Director, anna@rippleshot.com