When Time Really Matters: Analyzing Data in the Time of COVID

Miklós Koren (@korenmiklos)

CEU Economics and Business webinar

When time really matters

When time really matters

- November 2019: outbreak in Wuhan
- December 27, 2019: new coronarivurs
- December 31, 2019: WHO informed
- January 30, 2020: WHO declares public health emergency
- March 11, 2020: WHO declares pandemic
- by March 31, 2020: most countries adopted strict social distancing measures

Typical statistics publication calendar (BLS.gov)

March, 2020

Month View | List View

Date	Time	Release
Wednesday, March 04, 2020	10:00 AM	**State Unemployment (Annual)** for Annual 2019
Thursday, March 05, 2020	08:30 AM	**Productivity and Costs (R)** for Fourth Quarter 2019
Friday, March 06, 2020	08:30 AM	**Employment Situation** for February 2020
Wednesday, March 11, 2020	08:30 AM	**Consumer Price Index** for February 2020
Wednesday, March 11, 2020	08:30 AM	**Real Earnings** for February 2020
Thursday, March 12, 2020	08:30 AM	**Producer Price Index** for February 2020
Friday, March 13, 2020	08:30 AM	**U.S. Import and Export Price Indexes** for February 2020
Monday, March 16, 2020	10:00 AM	**State Employment and Unemployment (Monthly)** for January 2020
Tuesday, March 17, 2020	10:00 AM	**Job Openings and Labor Turnover Survey** for January 2020
Thursday, March 19, 2020	10:00 AM	**Employer Costs for Employee Compensation** for December 2019
Thursday, March 19, 2020	10:00 AM	**Employment Situation of Veterans** for Annual 2019
Friday, March 20, 2020	10:00 AM	**Metropolitan Area Employment and Unemployment (Monthly)** for January 2020
Tuesday, March 24, 2020	10:00 AM	**Multifactor Productivity Trends** for Annual 2019
Friday, March 27, 2020	10:00 AM	**State Employment and Unemployment (Monthly)** for February 2020
Tuesday, March 31, 2020	10:00 AM	**Occupational Employment and Wages** for May 2019

NOTE: All times on calendar are Eastern Time.

Last Modified Date: March 13, 2020

Time-sensitive questions

- How does the virus spread?
- How many ventilators, PPEs, nurses etc. will we need? By when?
- What (non-pharmaceutical) interventions are effective against it?
- Which of these are most cost effective?
- What can policy do to mitigate the costs?
- (in addition to genome sequencing, drug and vaccine development, clinical research)

The response of open science

The response of open science

- Government, academia and industry came together quickly and effectively. (But: pressing issues remain.)
- Troves of data shared.
- Research results published fast.
  - 83 issues of *Covid Economics*, about 500 papers published.

Is this the future of policy analysis?

About 250,000 Covid-related articles

Timely data collection

How to avoid the 2-3-month lag of official statistical releases? (Plus several months of peer review.)

Reuse existing data collected during normal course of business:

- administrative
- private

Good examples with data

Medical

enormous amount of clinical, epi, virology data OPEN

Stock returns

STANDARD

Financial transactions

- What and how did people buy during the Great Lockdown? Evidence from electronic payments. Bruno P. Carvalho, Susana Peralta and João Pereira dos Santos
- Who spent their COVID-19 stimulus payment? Evidence from personal finance software in Japan. Michiru Kaneda, So Kubota and Satoshi Tanaka
- The English Patient: Evaluating Local Lockdowns Using Real-Time COVID-19 & Consumption Data. John Gathergood and Benedict Guttman-Kenney
- Consumption Dynamics in the COVID Crisis: Real Time Insights from French Transaction & Bank Data. David Bounie, Youssouf Camara, Etienne Fize, John Galbraith, Camille Landais, Chloe Lavest, Tatiana Pazem and Baptiste

Bad examples with data

Benefits

Speed

Universal coverage

Concerns

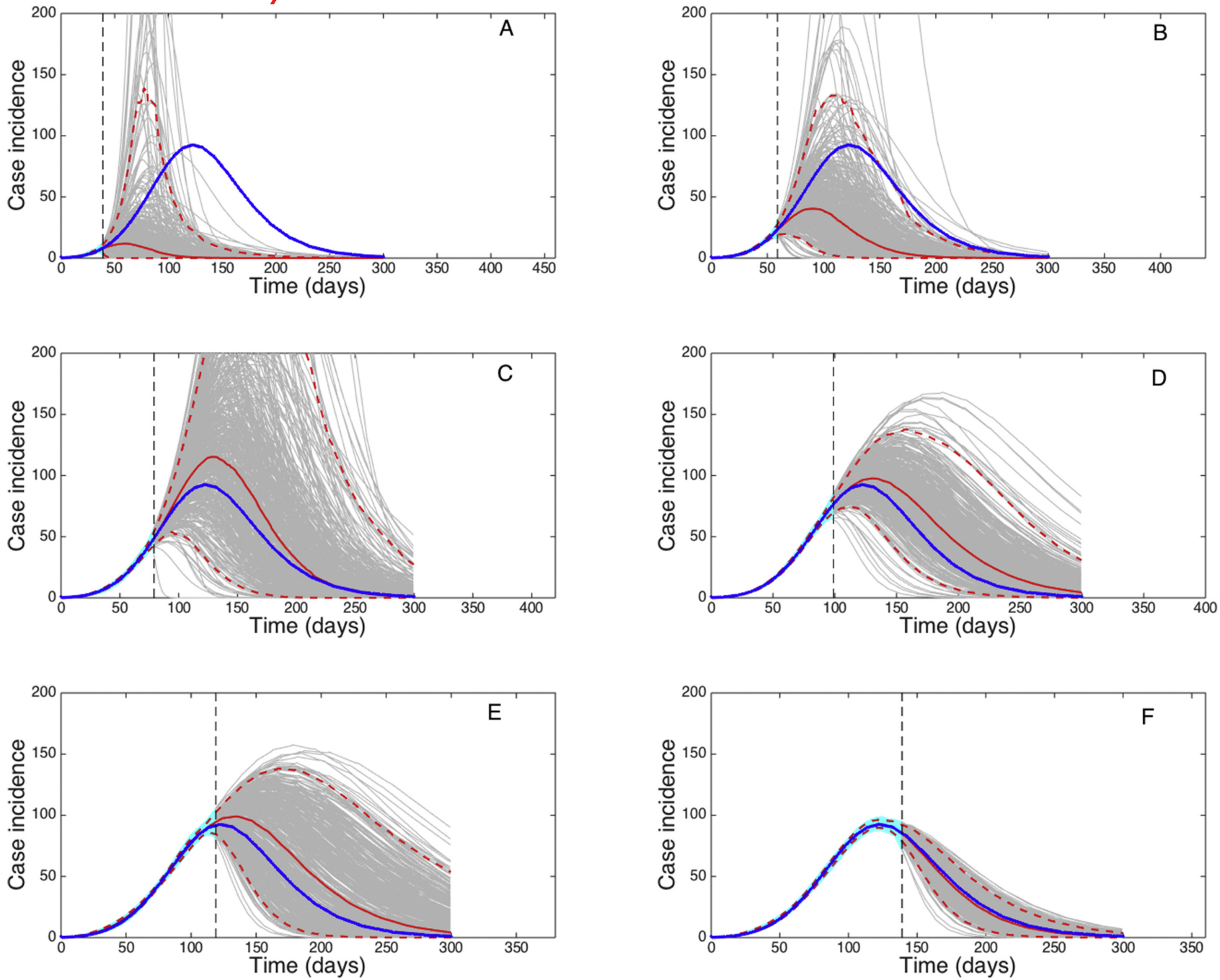
Statistics

- Sampling
- representativity
  - only for small random samples

Economics / system modeling

- Lucas critique
- relative to SIR model of pandemic
- nonlinear responses
  - Gerardo Chowell, 2017. Fitting dynamic models to epidemic outbreaks with quantified uncertainty: A primer for parameter uncertainty, identifiability, and forecasts, Infectious Disease Modelling, Volume 2, Issue 3, https://doi.org/10.1016/j.idm.2017.08.001.

Peaks of pandemic are notoriously hard to forecast (Chowell 2017)



Politics

- incentives to hide/share information
  - governments
  - corporations

The COVID shock

Visits to retail and recreation places collapsed

Figure 1: Data from Hungarian cell phone users (Google Mobility Report 2020)

Many workplaces are shuttered

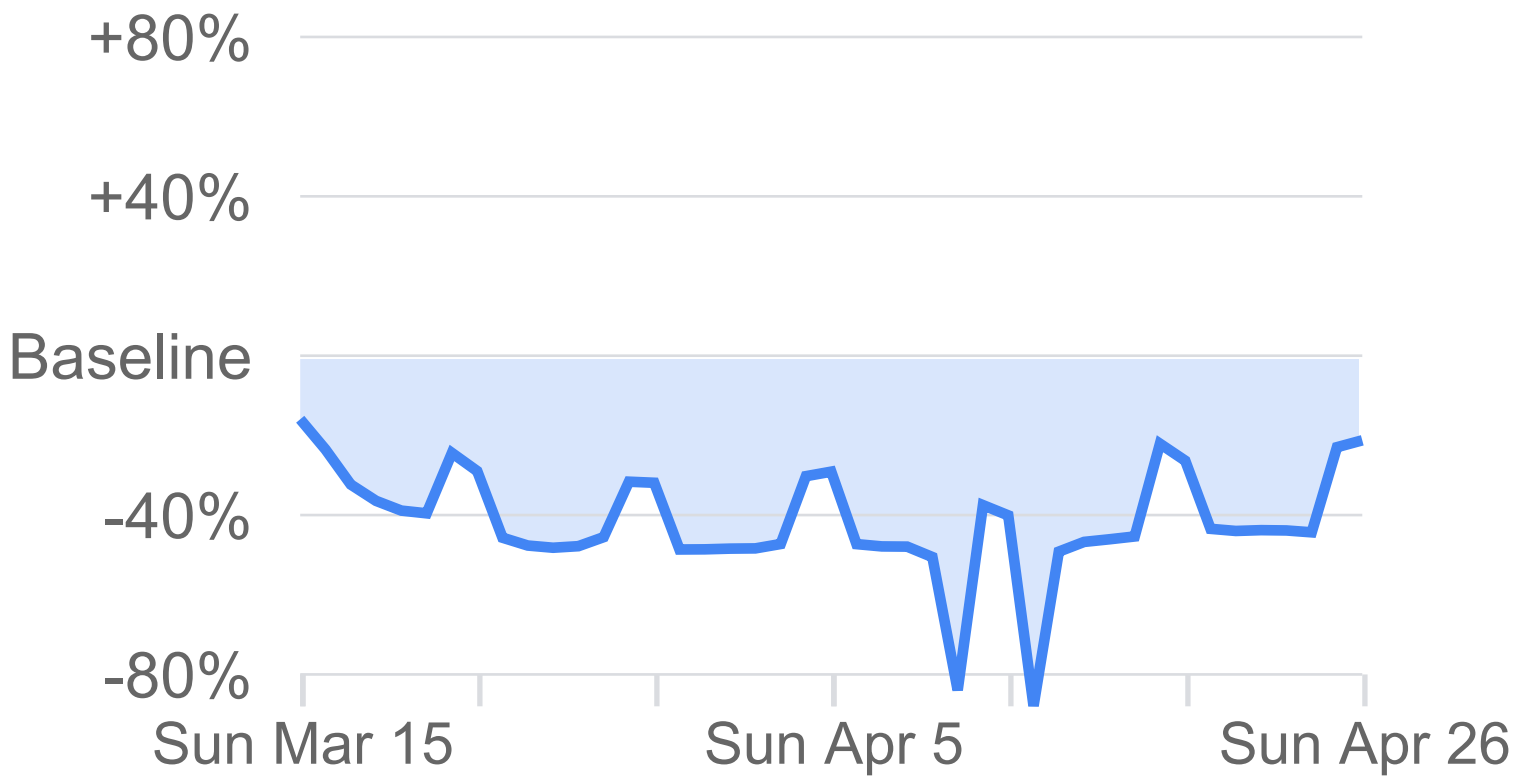


Figure 2: Data from Hungarian cell phone users (Google Mobility Report 2020)

People are staying at home

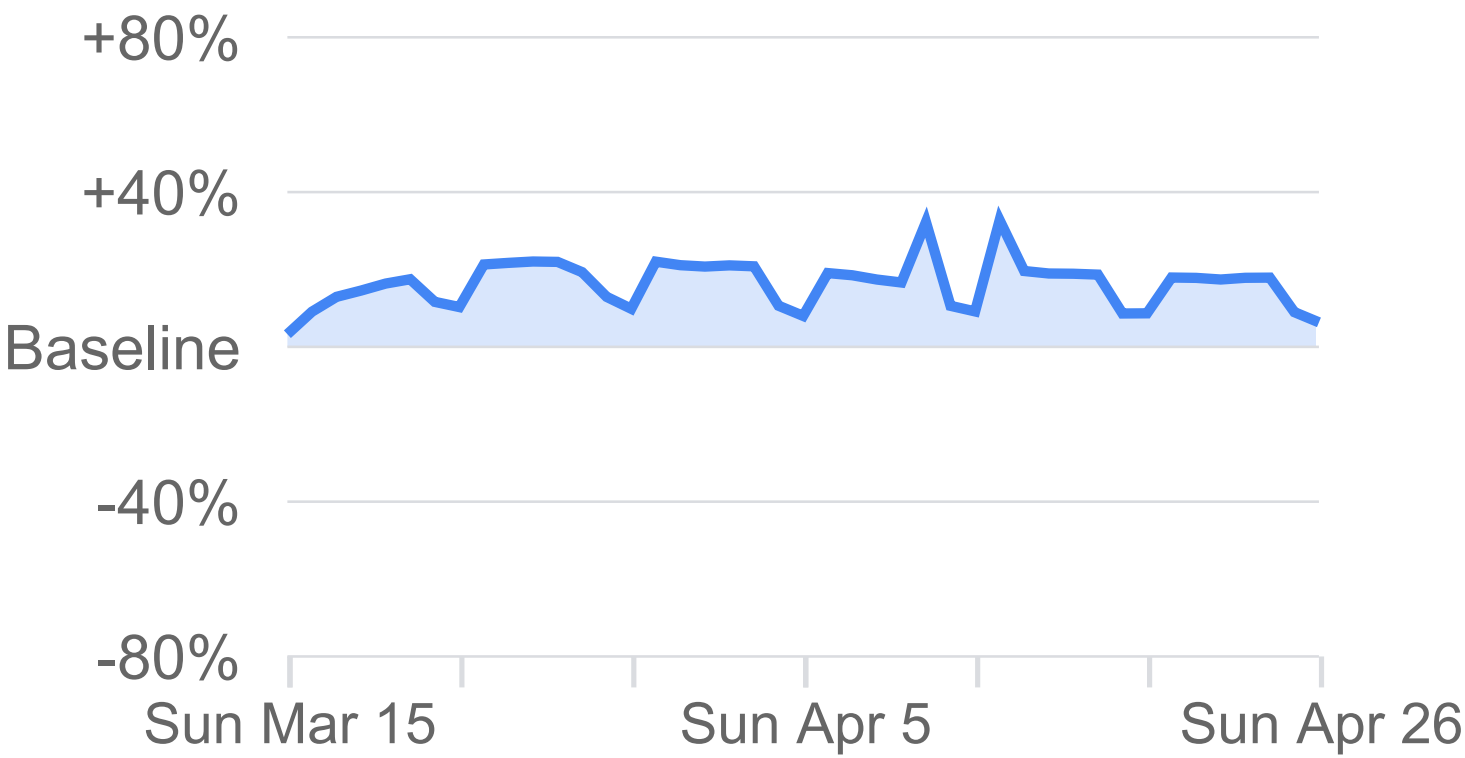


Figure 3: Data from Hungarian cell phone users (Google Mobility Report 2020)

Which jobs are most affected?

Important for economic subsidy, vaccination programs.

The most communication intensive sectors

Many occupations rely heavily on face-to-face communication

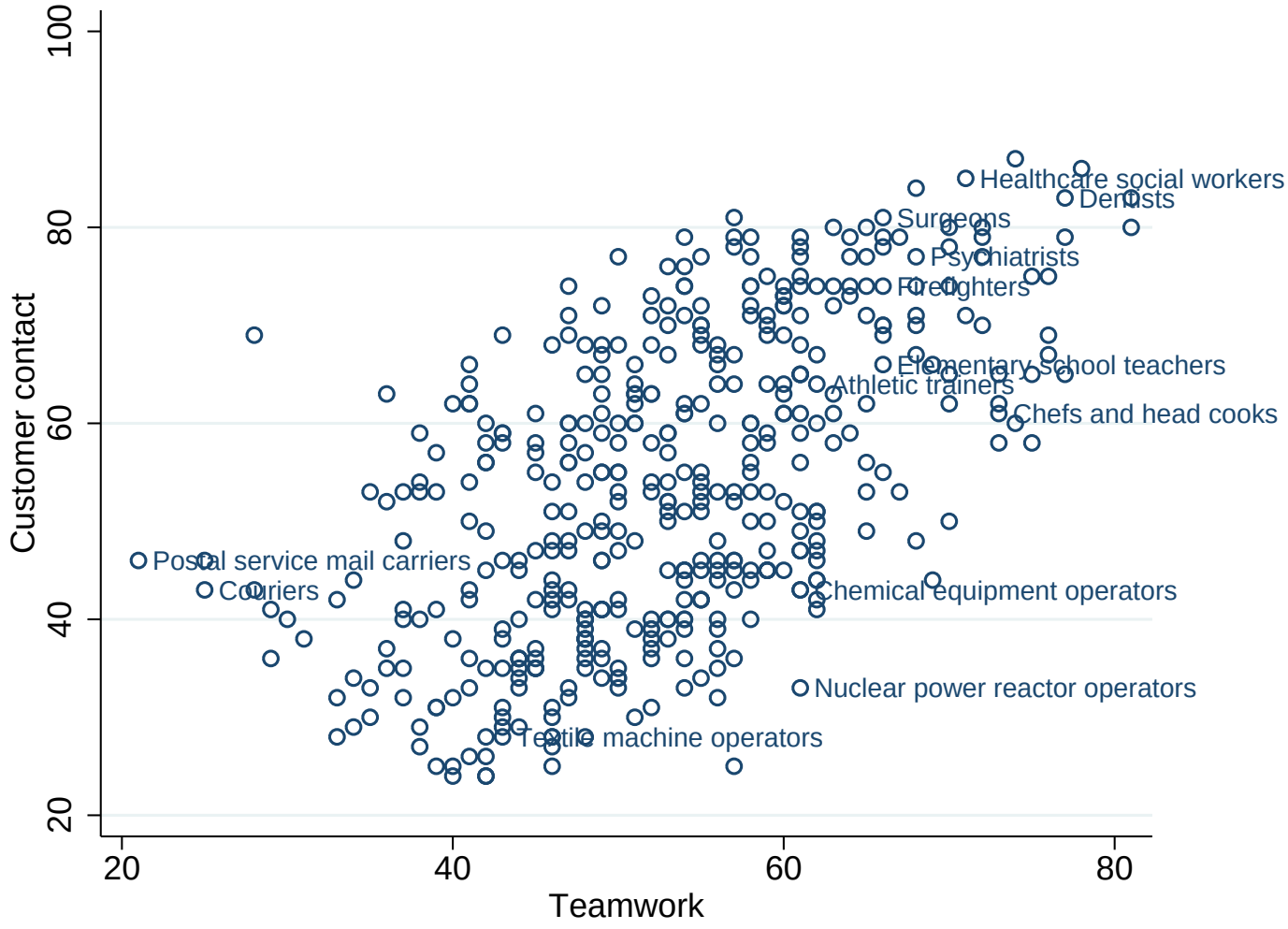


Figure 4: Teamwork refers to face-to-face communication with coworkers, Customer contact with customers (Koren and Pető 2020, based on U.S. data)

Face-to-face intensive industries have contracted the most

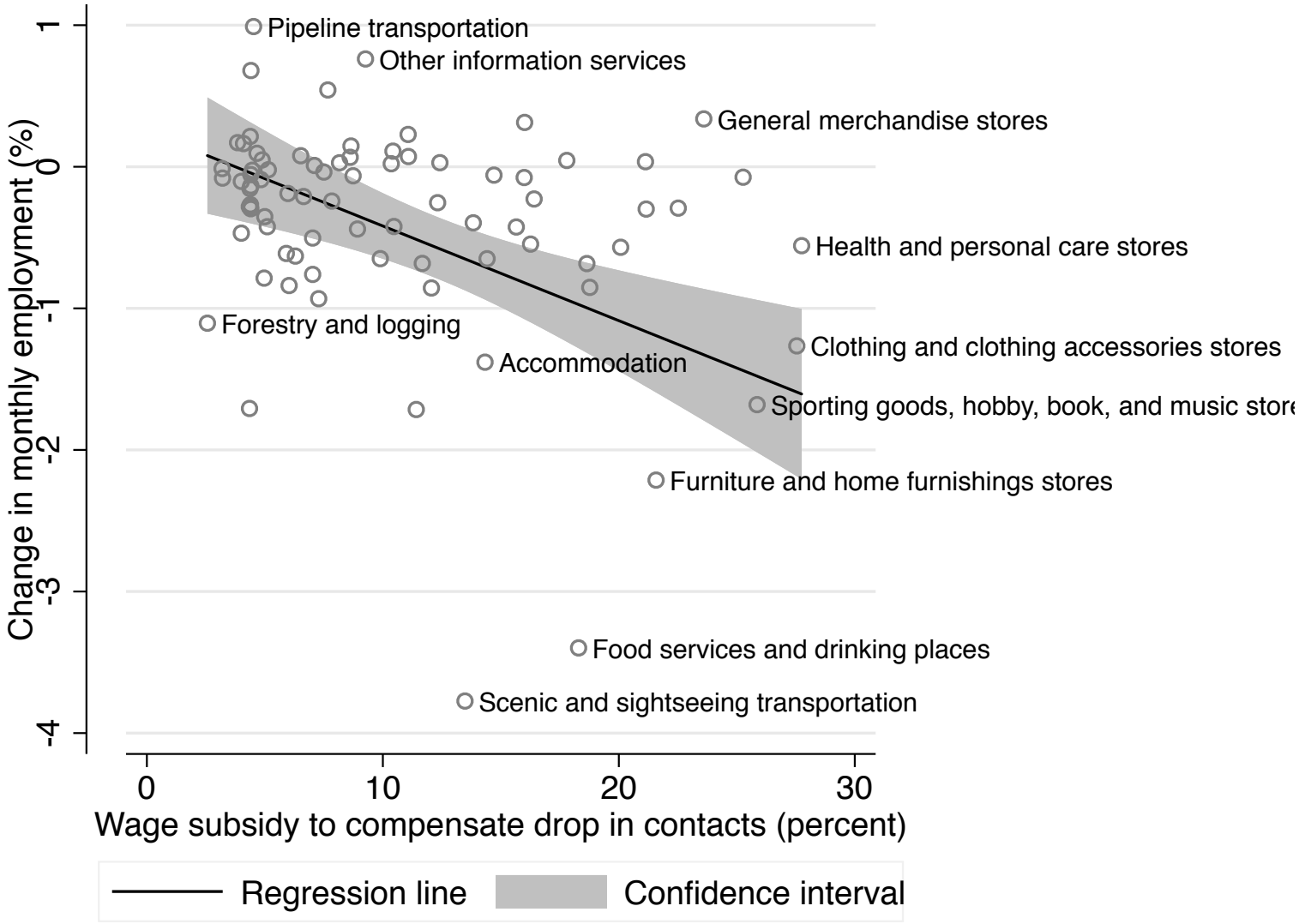


Figure 5: Employment change in March 2020 against compound measure of social-distancing cost (Koren and Pető 2020, based on U.S. data)

Job losses explained by fewer customer visits *and* communication intensity

	(1)	(2)	(3)
Customer-facing workers (share, [0, 1])	-0.418**	-0.463***	0.012
	(0.164)	(0.152)	(0.173)
Teamwork-intensive workers (share, [0, 1])	0.024	0.254	0.600
	(0.563)	(0.532)	(0.839)
Presence-intensive workers (share, [0, 1])	0.079	-0.051	-0.005
	(0.125)	(0.136)	(0.113)
Change in number of monthly visits (log)		0.185***	-0.119
		(0.063)	(0.131)
× customer-facing share ([0, 1])			1.021**
			(0.447)
× teamwork-intensive share ([0, 1])			0.332
			(1.500)
Observations	79	78	78
R^2	0.187	0.302	0.435

Regression results of change in log industry employment between February and May 2020 estimated by ordinary least squares (unweighted). Explanatory variables in Column 1 are the shares of customer-facing, teamwork-intensive and presence-requiring workers. Column 2 controls for the change in log monthly visits to industry establishments. Column 3 interacts the change in visits with the share of face-to-face intensive workers in the two occupation groups. Robust standard errors are reported in parentheses. *p*-values are denoted by asterisk: * <.1 ** <.05 *** <.01. Sample excludes hospitals, clinics, and government establishments, as well as farming and fishing which are not present in CBP.

https://doi.org/10.1371/journal.pone.0239113.t003

Tax-equivalent losses are huge

Industry	Wage subsidy	Employment
Retail Trade	234	15,672
Arts, Entertainment, and Recreation	30.2	2,472
Accommodation and Food Services	26.1	14,394
Educational Services	22.2	3,828
Other Services (except Public Admin.)	14.5	5,941
. . .		
Wholesale Trade	1.8	5,934
Construction	1.1	7,639
Manufacturing	1.1	12,852
Management of Companies and Enterprises	1.1	2,447
Agriculture, Forestry, Fishing and Hunting	0.5	55
Average	**39.9**	**116,441**

"Wage subsidy" displays the percentage decrease in labor costs necessary to compensate businesses for the reduced number of customer-worker contacts. "Employment" is the February 2020 employment of the sector in thousands [33]. The last row shows the employment-weighted average wage subsidy. Table excludes hospitals, clinics, and government establishments which are not present in CBP.

https://doi.org/10.1371/journal.pone.0239113.t004

The year after

The year after

What will be the long-run consequences? To speculate, we use

- The 2017 CEU-MTA Business Relations Survey.
- A mini survey of 2020 CEU MBA students.

The CEU-MTA Business Relations Survey

CEU and MTA asked 1,200 Hungarian, Slovakian and Romanian manufacturing firms about relationships with their key buyers and suppliers.

Meetings are important for joint innovation

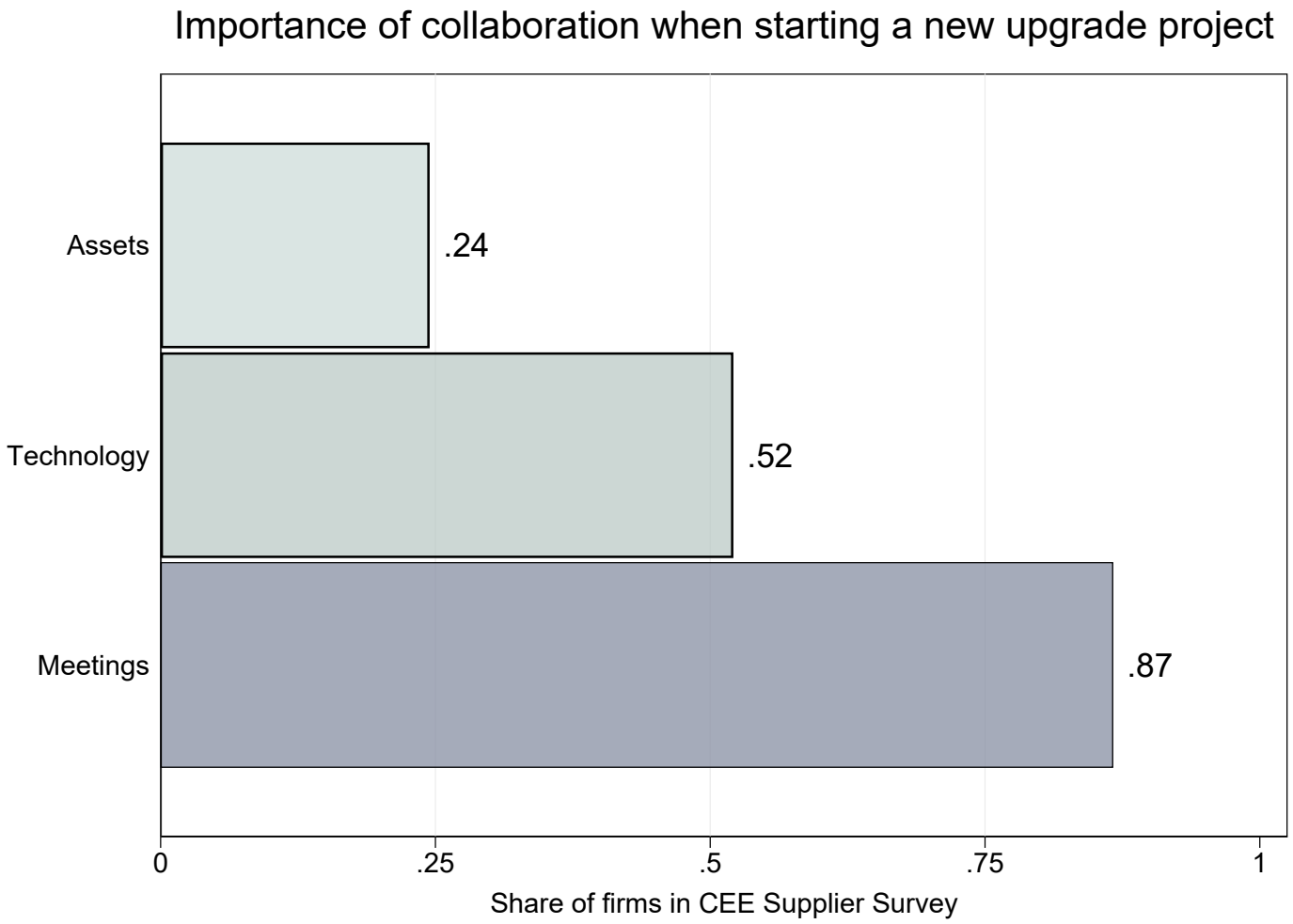


Figure 6: A third of firms collaborated with their key customer in order to improve their product (Békés, Koren, Muraközy and Telegdy 2019)

This collaboration remained after start

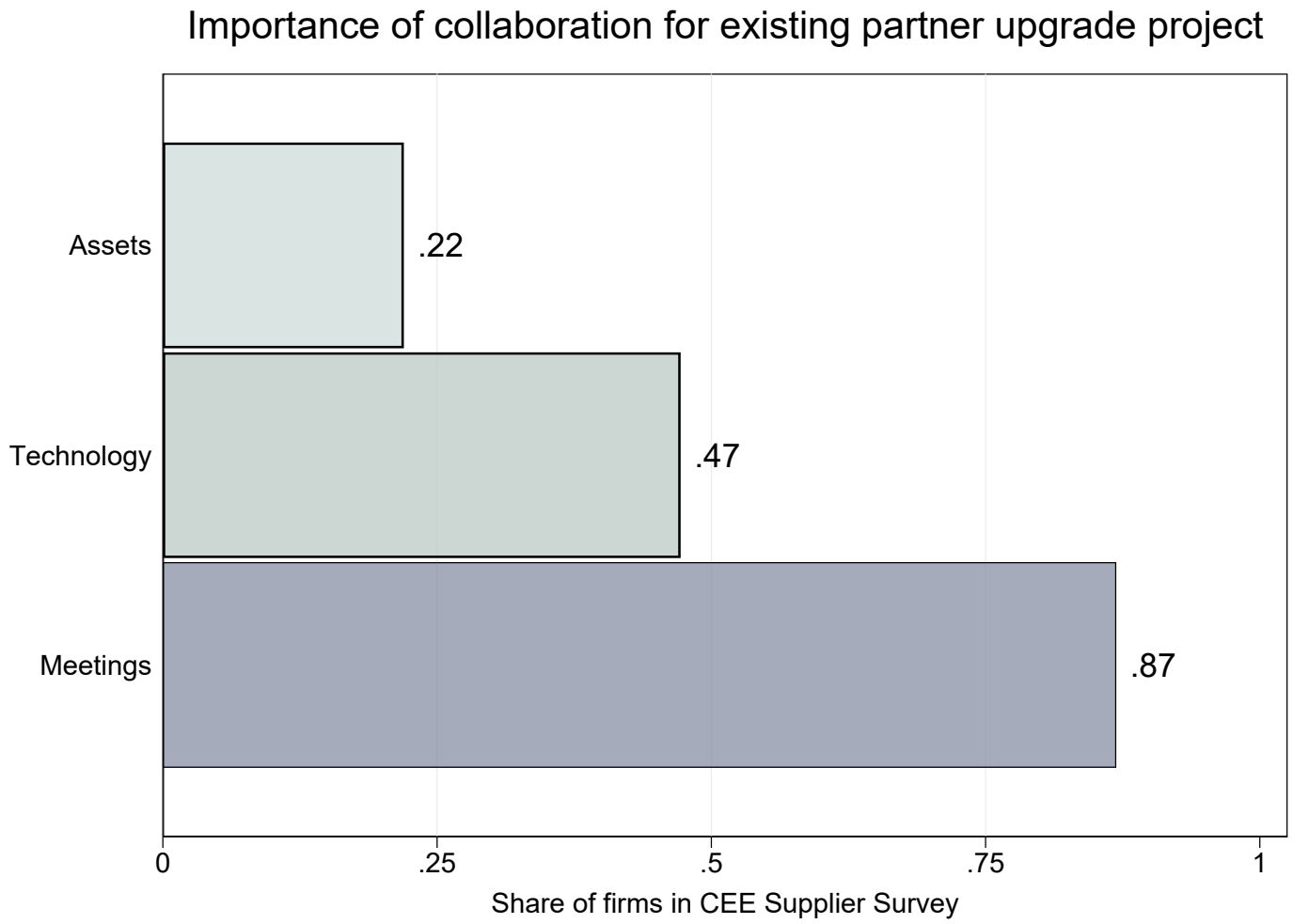


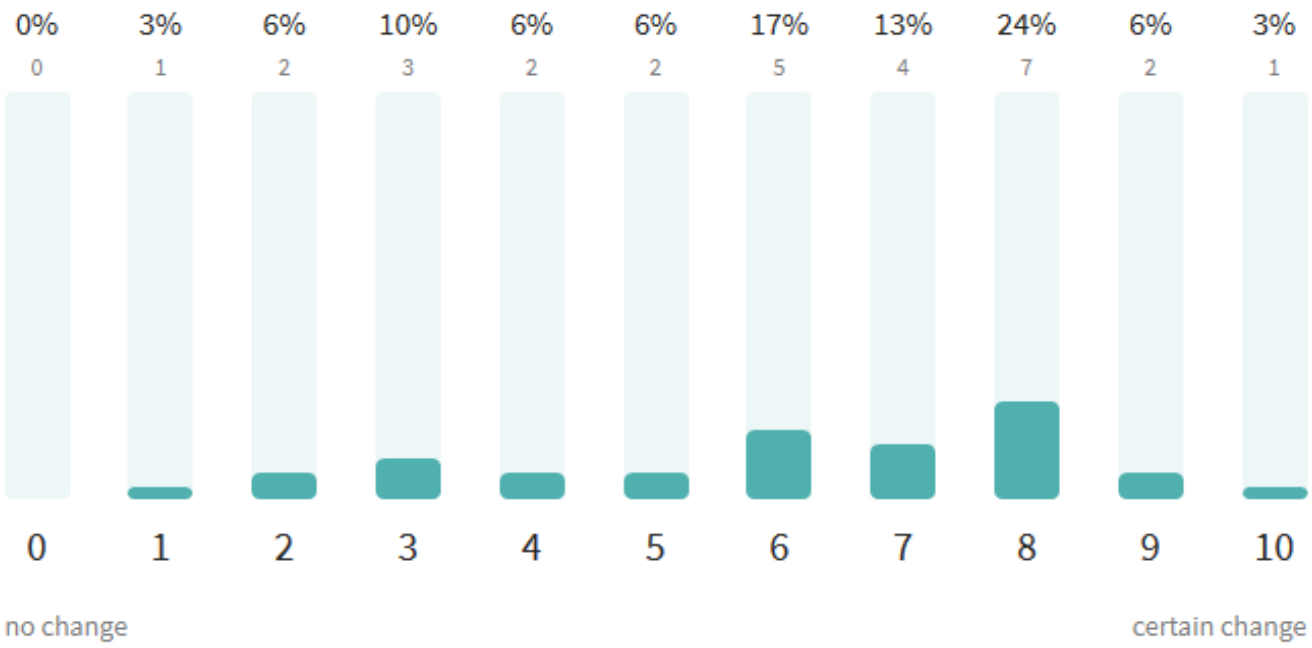
Figure 7: A quarter of firms collaborated with their key customer in order to improve their product (Békés, Koren, Muraközy and Telegdy 2019)

Major business changes are expected

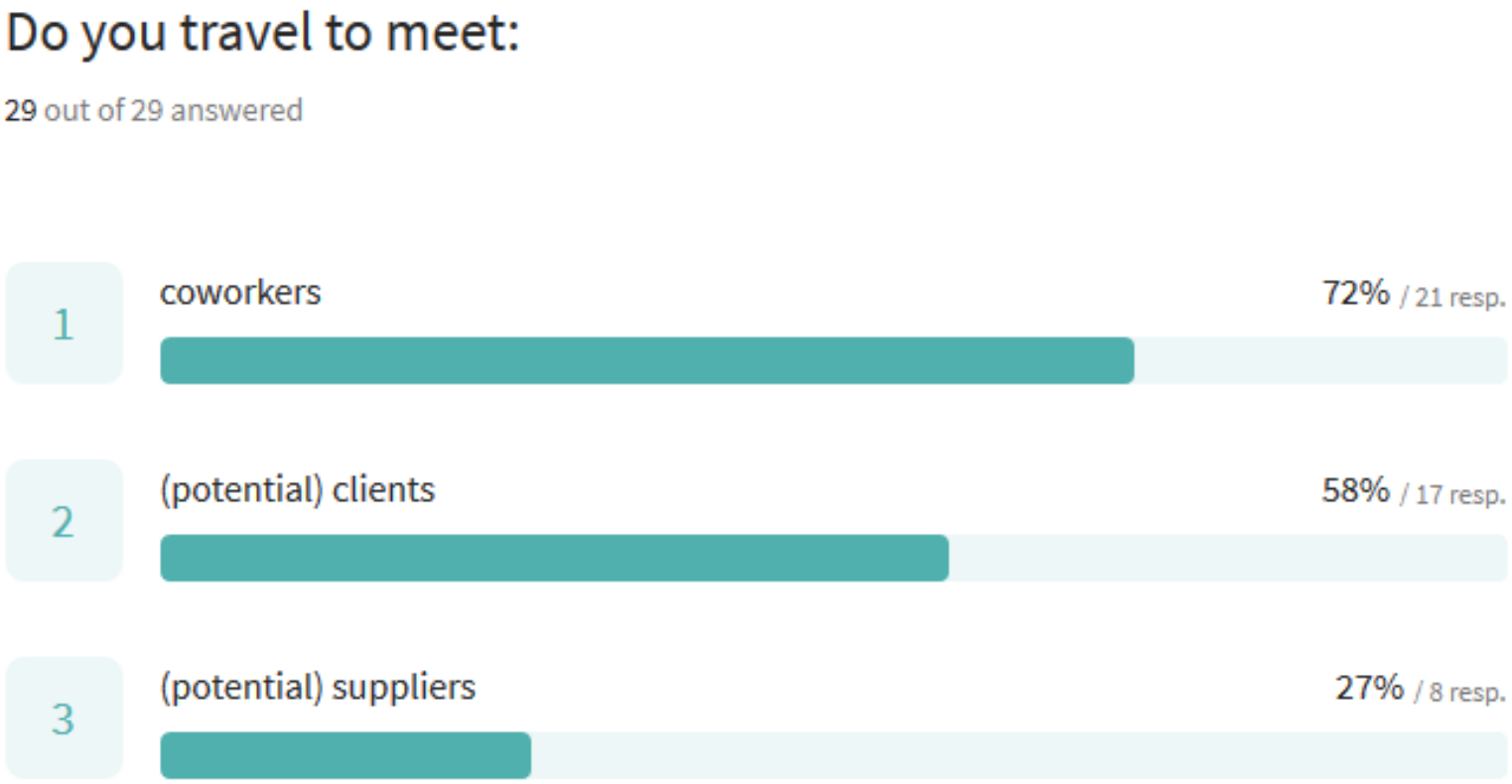
There is a lot of uncertainty about the post COVID-19 life. How likely will your business be different next year because of the crisis?

29 out of 29 answered

6.0 Average rating



Most meetings are with coworkers and clients



Lack of new business opportunities is strongest risk

Why are face-to-face meetings important for you work?

I work as a sales professional, where face-to-face interactions are key to build trustful relationships with my customers.
Face-to-face meetings ensure better quality of transferring strategic messages.
Non-verbal communication counts at least 30% of the total messages during meetings.
To build strong, lasting relationships.

Can videoconferencing tools substitute for face-to-face meetings in your work?

We tried several times videoconferencing with customers, but not successfully. I doubt that we can switch to videoconferencing completely.

“Lack of client and staff interaction reduces quality of service “

They can, up to certain level.

Yes, we already moved to video conferencing, no loss in productivity

Conclusion

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- Face-to-face interaction is a key aspect of many jobs.
- In internal teamwork, working from home is a good alternative. But not for customer contact.
- Retail services suffer the most, in proportion to our predictions.

Thank you

Connect on Twitter: - @korenmiklos